



## HIT Policy Committee Final Transcript January 13, 2015

### Presentation

#### Operator

Thank you, all lines are now bridged.

#### Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology

Thank you. Good afternoon everyone, this is Michelle Consolazio with the Office of the National Coordinator. This is the meeting of the Health IT Policy Committee. This is a public call and there will be time for public comment at the end of today's meeting. As a reminder, please state your name before speaking as this meeting is being transcribed and recorded. I will now take roll. Karen DeSalvo?

#### Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services

Present.

#### Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology

Hi, Karen. Paul Tang?

#### Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation

Here.

#### Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology

Hi, Paul. Alicia Staley? Anjum Khurshid?

#### Anjum Khurshid, PhD, MPAff, MBBS – Director, Health Systems Division – Louisiana Public Health Institute

Yes, I'm here.

#### Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology

Hi, Anjum. Aury Nagy? Charles Kennedy? Chesley Richards?

#### Chesley Richards, MD, MPH, FACP – Director, Office of Public Health Scientific Services – Centers for Disease Control and Prevention

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Chesley. Christine Bechtel?

**Christine Bechtel, MA – President – Bechtel Health Advisory Group**

Good morning.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Christine. Chris Lehmann?

**Christoph U. Lehmann, MD, FACMI, FAAP – Professor, Pediatrics & Biomedical Informatics – Vanderbilt University School of Medicine**

Good morning, Michelle.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Chris. David Kotz?

**David F. Kotz, PhD – Associate Dean of the Faculty for the Sciences – Dartmouth College**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, David. David Lansky?

**David Lansky, PhD – President & Chief Executive Officer – Pacific Business Group on Health**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, David. And David Bates?

**David Bates, MD, MSc, FACMI – Senior Vice President for Quality and Safety, Chief Quality Officer – Brigham & Women’s Hospital & Partners**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, David. Deven McGraw? Devin Mann? I know Devin’s on...Devin Mann. Gayle Harrell?

**Gayle Harrell, MA – Florida State Representative – Florida State Legislature**

Here from sunny Florida.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Gayle.

**Christine Bechtel, MA – President – Bechtel Health Advisory Group**

She's rubbing it in.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Kim Schofield?

**Kim J. Schofield – Advocacy Chair – Lupus Foundation of America**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Kim. Madh Agarwal? Marc Probst?

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Marc.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

Good morning.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Neal Patterson? Patrick Conway? Paul Egerman?

**Paul Egerman – Businessman/Software Entrepreneur**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Paul. Scott Gottlieb? Thomas Greig?

**Thomas W. Greig, MD, MPH – Chief Medical Information Officer – Department of Defense**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Thomas. And Troy Seagondollar?

**Troy Seagondollar, RN-BC, MSN, UNAC/UHCP – Regional Technology Nursing Liaison – Informatics Nurse – Kaiser Permanente**

Here.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Hi, Troy.

**Troy Seagondollar, RN-BC, MSN, UNAC/UHCP – Regional Technology Nursing Liaison – Informatics Nurse – Kaiser Permanente**

Hello.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Okay, with that I'm going to turn it over to you Karen.

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Great; thank you Michelle. Good morning everybody from not 74 degree Florida, beautiful Washington where is sunny, though cool. I'm excited about the chance today to talk about one of the really hidden treasures of health information technology, which is its role in advancing the public's health, whether that's in urgent issues like in community...disease outbreaks such as Ebola or emergency preparedness or just the everyday needs of tracking immunizations for communities and families.

And so I just want to thank the team for putting together this agenda which is going to spotlight some important policy and standard issues and some successes that we've had. And I want to thank John Loonsk, who back in October flagged this for Paul and I as an opportunity with the situation of Ebola to really remind the health IT community and others that health information technology not only supports clinical care, but there is, as part of Meaningful Use and other efforts, there has been an infrastructure that is developing and evolving that supports public health and has been working to support preparedness.

A lot of exciting and interesting work in this space, quite frankly, and I know we're not going to get to all of it today. I hope this starts to whet our appetite as we think about, for this committee's purposes that future vision of health IT in a broader ecosystem beyond the clinical environment and ways that we need to be considering advancing that. And I will very much look forward to the feedback and thoughts from this group today about where this field should go. I've had some nice conversations with folks at CDC and at ASTHO and with Bill and Marcus from JFIT and I think there's a lot to be learned about the successes, but we also know that there are opportunities to continue to advance a public health IT infrastructure and make sure that it is a part of the bigger ecosystem.

The reality is that all of us every day are faced with challenges and threats to our public health and most of the time actually we never know that there was an impending challenge because public health saved their life and we didn't know it. It's sort of a way to think about really highly functioning. On the other hand, when disaster strikes and we need to have that infrastructure and that ready communication and that way to identify people at risk and reach out and support them, there is also this need for the infrastructure.

So I'm really looking forward to hearing from the presenters today and I just want to thank again, Dawn and Paul and Jim Daniel and others for organizing this to give us a snapshot and help us start thinking strategically about any potential opportunities and roles that the Policy Committee and the ONC and the federal government should be considering in thinking about, from the policy and standards arenas going forward to see that we have the right kind of health IT ecosystem to support the public's health. And that is all I have.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Good. Thank you. And this is Paul Tang and welcome to everybody for this meeting and I'm also looking forward to hearing about how...the role of public health or the role of HIT in support of public health and how on a broader agenda we can deal with some of the policy and the standards issues to make it better. So we have...we're going to start off with our usual data updates from CMS and ONC before going into the session on public health. Before I do that, I want to remember to entertain a motion to approve the minutes which were distributed earlier.

**Gayle Harrell, MA – Florida State Representative – Florida State Legislature**

So moved by Gayle Harrell.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you, Gayle. A second?

**Christine Bechtel, MA – President – Bechtel Health Advisory Group**

Christine.

**Troy Seagondollar, RN-BC, MSN, UNAC/UHCP – Regional Technology Nursing Liaison – Informatics Nurse – Kaiser Permanente**

This is Troy Seagondollar, I second.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Any further additions to the minutes? If not, all in favor say aye please.

**Multiple speakers**

Aye.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

And any oppose or abstain? All right, so the minutes are approved. And so now we'll turn to both Beth Myers and Dawn Heisey-Grove to talk about some data related to Meaningful Use and others. Beth?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Thank you, Paul. This is Elisabeth Myers from CMS...just wait for the slide to come here. Actually, we can go to the next slide. We have a few data updates; I want get through them relatively quickly, I think the majority of the questions today will actually be likely on the ONC's slides, so I want to give them an opportunity to talk through that as much as the time will allow.

So just a quick update on our registration and payment data; next slide, please. So, our registrations are up over 500,000 through the end of November 2014; you can see the breakdown there. We've had an uptick both in eligible professional for Medicare and Medicaid. Next slide, please. Overall incentive payments for Medicare, we are at over 17 billion dollars that have been paid out in the program to date. Next slide, please. Oh, this came out very tiny. The one that I wanted to point out in here is that we are, if you sort of look in that middle blue bar, I apologize for the size of the font here today; we have over 67,000 Medicaid eligible professionals who have attested to Meaningful Use at this point in time. Next slide, please.

And our unique providers paid...November, reminder, these are always through the end of the month that is mentioned; we have 428,000 providers who have received an incentive payment to date, that is for meeting Meaningful Use or also for AIU is included in this number. Next slide, please.

Total program payments through the end of November, you can see again there is...oops, that is a mistake on that slide as well, I'm sorry; that should have been the numbers. But we are over 26 billion dollars that have been paid out for the program to date, through the end of November. Next slide, please.

So our raw attestation data; again, as I did last time, I've included the previous month so you can see the changeover the time period. Next slide, please. So these were the numbers through December 1, 2014. You can see that we had about 3696 hospitals who had successfully attested through that point. Next slide. And you can see here that the attestations through January 1 are at 4093.

So just to give you a comparison, the total attestations at that point was 4112 for last year. So we're looking at a pretty comparable number. We do have some non-returners each year; obviously we'll do our usual annual update on the non-returners once we've done the analysis on that data. But I did want to flag that we have a pretty close comparison for 2014 and for 2013 for the two years. We did have over 1800 hospitals attest to Stage 2 of Meaningful Use and you'll also see that there are 300 new participants.

The last thing I wanted to flag on this slide is that we do want to remind people that when we're talking about returning providers or any providers who had previously demonstrated Meaningful Use before 2014, that if they were unable to demonstrate Meaningful Use in 2014, they do have until April 1 to file a hardship exception application for the 2016 payment adjustments that is attached to the 2014 performance year. So those will be live in the next few weeks and hospitals will be able to begin applying for those hardships if they were unable to implement Meaningful Use in 2014.

You will note that the EPs that have successfully attested to 2014 through the end of January are at about 7600. You'll see a little bit more information analyzing the patterns of attestation in our ONC presentation. So I'm actually going to go ahead and say we'll pass it off to ONC and then take questions at the end, if that's all right with everyone.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Good, thank you Elizabeth. Dawn?

**Dawn Heisey-Grove, MPH – Office of Planning, Evaluation and Analysis – Office of the National Coordinator for Health Information Technology**

Okay, if we can go to the next slide. Keep going, next slide; and one more. Thank you. Today I will be talking about two main things; the timing of hospital attestations as we near the close of their 2014 attestation period. And then I'm going to talk through what Stage 2 eligibility means and how hospitals and professionals are coming along with that. Next slide.

First I'm going to focus on the historical attestation trends and how the hospitals trends for 2014 correlate to those historical trends. Next slide, please.

So I know that everyone has seen this slide before but it bears presenting again because it makes the point that historically the majority of attestations come in after the close of the fiscal year for hospitals, and calendar year for the eligible professionals. This slide also serves as a reminder that we're just now entering that teal or light blue section of attestation timing for the professionals. January and February is after the close of their calendar year for 2014. So that means we should expect to see most of the attestations for our professionals come in in January and February, given the historic trends that we see here.

So the next slide is...will show you how hospitalizations for 2014 followed those historical trends. This slide shows the number of hospital attestations that were received, by month, following the close of the first quarter for fiscal year 2014. Remember, hospitals attest on a fiscal year which means their first quarter ran from October through December of 2013. So the first time an eligible hospital could attest was January 14...2014, which is where this chart starts.

There are three lines on the graph that show the different hospital cohorts that attested in 2014. The green line that pretty much lives at the bottom of the graph, is the hospitals that are brand-new to Meaningful Use in 2014. What you see is this group had a little jump in June and July, because those hospitals had to attest by June 30 in order to avoid 2015 payment adjustments.

The red line includes hospitals that first attested to Meaningful Use in 2013 and so they're coming back in 2014 to attest to Stage 1. And you'll see that those attestations didn't spike until late September, at...again, at the close of their fiscal year.

The blue line shows hospitals who first attested to Meaningful Use in 2011 or 2012, and those are the hospitals that are actually eligible to attest to Stage 2 in 2014. And again you see the same pattern as what we see with the red lines, those hospitals barely attested until mid-to-late September of last year.

So this graph shows that unless a hospital had to attest before the close of the fiscal year, which is the new hospitals in the green line, they waited until after the fiscal year closed. So, this trend that you see here in this graph shows that even more so than in the previous slide that the hospitals really...that the shift to after the end of the fiscal year is even more prominent this year than it has been in the past. Next slide.

So next I'm going to talk about Stage 2 attestations, who are eligible to attest to Stage 2 and among those who are attesting, what are they doing. Next slide. So this...the first and most important thing to remember is that not all hospitals and eligible professionals were able to attest to Stage 2 in 2014; not everybody is eligible.

In order to be eligible to attest to Stage 2, hospitals and EPs had to first attest to Meaningful Use in either 2011 or 2012 and they had to complete...so basically they had to complete two years of Stage 1. So, any hospitals or EPs who had first attested in 2013 had to come back in 2014 and complete their second year of Stage 1 so they could not attest to Stage 2. What that means is that about...a little over half of our eligible hospitals and critical access hospitals are eligible to attest to Stage 2 and about 4 in 10 of our eligible professionals are able to attest to Stage 2. The rest...coming to attest in 2014 are going to be attesting to Stage 1. Next slide.

So now we're going to take a look at the eligible hospitals that could attest to Stage 2 and see what they're doing. On the left is a repeat of the pie chart that you saw in the previous slide to remind you that again, only a little over half of our eligible hospitals are actually able to attest to Stage 2. The pie on the right shows you the proportion who have actually attested; it's about 80% of all of the hospitals who are eligible to attest to Stage 2 who actually did that. And you see that three-quarters of them, 77%, attested to Stage 2 and the remaining quarter that have already attested through November, so there's another one more month of data that we still have to go, but another quarter took advantage of the flexibility rules that were made available and attested to Stage 1. So again, with one month remaining 8 to 10 of our Stage 2 eligible hospitals attested to Meaningful Use and three quarters of them attested to Stage 2. Next slide.

So now we're going to do the same breakdown but with our eligible professionals. Again, only 4 in 10 eligible professionals are actually eligible to attest for Stage 2 and of those that have attested, 60% are attesting...have attested to Stage 2 and 40% have attested to Stage 1. And this segment is much smaller because our eligible professionals have three more months from the date of this data; remember, these data are through November 2014, so they have December, January and February to attest. And if they have attestation patterns anything like what we saw for the hospitals, we're not going to see most of those attestations come in until January or February. Next slide.

So just want to review the key take home points from the presentation. Next slide; again the vast majority of eligible hospital attestations for 2014 came in after the fiscal year closed. This presentation doesn't include the December data, so we expect to see more hospital attestations as we get those December data. The eligible professionals have another three months from the date of these data to attest, because again we're showing you November so they have December, January and February to attest. So we expect a lot more attestations to come in if they follow the same trends that we saw for the hospitals. Next.

We showed that not all eligible professionals and hospitals are actually eligible to attest to Stage 2 in 2014; just a little over half of hospitals and less than half of the professionals can actually attest to Stage 2 in 2014 and the rest return in 2014 to attest to Stage 1. In addition, CMS gave eligible providers the ability to attest to Stage 1 using flexibility rule options. And we see that hospitals and EPs are taking advantage of those offerings. However, the majority of Stage 2 eligible hospitals attest to Stage 2 and 6 in 10 Stage 2 eligible professionals attested to Stage 2.

And next slide. We will take questions now.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you very much to both of you and let me open up the stage for questions from the committee.

**Paul Egerman – Businessman/Software Entrepreneur**

So this is Paul Egerman; I have a couple of questions. One was...first let me say thank you Dawn and Beth, great presentation, as always. And Beth, I was just a little confused at the end of your presentation I thought you were showing some slides from January...some data from January of this year; did I look at that wrong? Whereas Dawn seemed to be going only through November.

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Sure, you're not wrong. What we were able to do with the data that we can pull, I can get a very raw count of the total attestations that have come in and that are locked; in other words that they've been accepted and are locked for payment. We can't actually process that data and be absolutely certain of the numbers until after those attestations have been processed and payment processing has begun. So that's why there's always a bit of lag in the deep data that we can analyze that ONC has available and has presented on today and those very top line raw numbers.

So the January numbers that I presented are again the very top line raw numbers. There are actually a few attestations that are still in processing, that happens every year, there's an error that someone has or there's a need to sort of walk them through because there might be something wrong with how their banking information is going, so it may be locked. So those very raw attestation numbers are what I presented on that last slide for January, so that's through January 1. As mentioned, we do have a few more, just a handful, that were working through the processing and then the full data that we're able to verify and analyze is always about a month behind because it does have to go through that locking and validation process. So when...

**M**

(Indeterminate)

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

...ONC is...theirs is through the end of November.

**Paul Egerman – Businessman/Software Entrepreneur**

So does that January data though give us a pretty good estimate as to how we did with Stage 2 attestation?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Yes.

**Paul Egerman – Businessman/Software Entrepreneur**

And if I saw it right, there are 1800...

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Its 1800...

**Paul Egerman – Businessman/Software Entrepreneur**

...possible out of a universe of roughly 4000; so...

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Out of a universe of 2000...I'm sorry; I just lost the slide deck that Dawn had up. With Stage 2, it's a universe of 2000...I think, 100 something; if we can go back to slides from Dawn's presentation?

**Dawn Heisey-Grove, MPH – Office of Planning, Evaluation and Analysis – Office of the National Coordinator for Health Information Technology**

Yeah, it's 2115 who have attested through November 2014 and that number did go up in December.

**Elisabeth Myers, MBA – Office of E-Health Standards and Services –Centers for Medicare & Medicaid Services**

Back one more slide, please. You can see the total there of...that's 2115 of the Stage 2 eligible professionals you had. And if we're talking about that it's a little over half of those who are possible, so that's actually getting pretty darn close to the total. So 1800 again as Dawn mentioned isn't out of the full 4000. The full 4000 is everyone who could attest to Stage 1 or Stage 2. So when we talk about 1800 who have attested to Stage 2, that's out of those who are eligible. That's sort of what Dawn has been trying to present here that out of those who are eligible for Stage 2, who had already come in and attested through the end of November, we're looking at about 70...a little over 75% have actually attested to Stage 2 or attested total.

**Paul Egerman – Businessman/Software Entrepreneur**

And so as of January it's still 75%?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Who have attested to Stage 2 or attested total?

**Paul Egerman – Businessman/Software Entrepreneur**

Attested to Stage 2.

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

...attested to Stage 3 total we're pretty close to the same amounts that we've done from previous years. So the remaining providers, that 23% that you see in this slide through the end of November would be Stage 2 providers who, because they may have been unable to fully implement 2014 edition software, attested to Stage 1 and used the flexibility options instead.

**Paul Egerman – Businessman/Software Entrepreneur**

Well let me ask that question very differently; from these numbers, should we be encouraged with the progress made by Stage 2? Is this successful?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

I would say yes it actually is. I mean, it's very encouraging to see that enough providers were able to implement the software to get this high a percentage actually able to demonstrate Stage 2 based on the software that's available to them. Again our big concern over the course of the past year has been the availability of the additional software that's necessary for all providers to participate in the program. So this is encouraging; we had been obviously over the course of the year, doing a lot of measures to try and provide some flexibility and relief for providers who were struggling with their software. So it is encouraging to see how many providers are still coming in and still able to demonstrate Stage 2, which means that the software availability issue is resolving slowly but surely.

**Paul Eggerman – Businessman/Software Entrepreneur**

Great, thank you.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Paul, I'm going...

**Gayle Harrell, MA – Florida State Representative – Florida State Legislature**

And this is Gayle, I'd like to follow-up on that if I may.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Yes and then I just want to let everybody else know, and thank you Gayle for raising your hand on the web software, that helps us pick a queue; so why don't you go ahead and then I'll also summarize a little bit, because I found this data very interesting. Go ahead, Gayle.

**Gayle Harrell, MA – Florida State Representative – Florida State Legislature**

Thank you so much and the data is very, very interesting. If we're at about 77% of people who have attested to Stage 2, you're indicating or seem to be indicating that it was bec...the other remaining 23% which has not was because of the lack of the updates in their software programs. Is that what I am hearing or are there other reasons that are causing 23% not to attest?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

So the only reason that they would be allowed to attest to Stage 1, if they were scheduled to be in Stage 2, is if they didn't have the software in place; the rule is very explicit on that that across-the-board you could only use the flexibility options included in the rule that we published in August, well technically in Sep...the very, very beginning of September. Those options for flexibility and the use of certified EHR technology were explicitly designed around the use of EHR technology, not around whether or not you met a particular measure of Meaningful Use either for Stage 1 or Stage 2. So what you're seeing here is that 23% could only attest to Stage 1 this past year if they didn't have the full software available to them to successfully demonstrate Stage 2 of Meaningful Use.

**Gayle Harrell, MA – Florida State Representative- Florida State Legislature**

And if I can follow up, please; are there any dropouts who were...who had attested to Stage 1 but not because of unavailability of software, but simply did not attest to Stage 2?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

So we will do a full analysis where we take the total data and cross it back to all of the individual expected participants. As I mentioned at the end of my presentation, each year we do a review of non-returners; in other words, those who have previously demonstrated meaningful use who, for whatever reason, do not come back in. And we actually do a lot of analysis of those providers and participants and what their specialties are what their performance looked like in past years. So we will have that full analysis as we go through the data.

We do have non-returners each year, we had non-returners from 2011-2012 that actually were at a much higher rate than we had between 2012 and 2013. So we'll be doing the same analysis between 2013 and 2014 to see who didn't return to the program and what data we can understand about them and their performance and potentially any challenges they may have faced.

**Gayle Harrell, MA – Florida State Representative – Florida State Legislature**

Thank you. I'd like to see that, is that going to be available at our next meeting?

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

It may not be available that early, but as soon as we can get it we will.

**Gayle Harrell, MA – Florida State Representative – Florida State Legislature**

Thank you very much, appreciate that.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you...before the next question, I think I'm going to try to summarize because this is actually...this data is pretty hard to understand and I got an insight from this particular data that I didn't have before and I wanted to see if I could summarize. And also, if that's...and Dawn can check my work, but I think it addresses some of the questions that both Paul Egerman and Gayle Harrell raised so far.

So what I heard was, for the eligible hospitals already 4093 have attested and that compares very closely to, at this particular point in time in the cycle of the fiscal year in 2013 when it was 4112. So, 4093 versus 4112 is very close. So in other words, this whole phenomenon of people waiting until the end, which is natural for all of us, seems to be holding true and we're, in a sense, on track with previous years. That was point one. The second point I would appreciate it is we may not see the folks who, for other reasons, the whole hardship exceptions, were not able to; they have until April 1 to declare that, so some of those folks who haven't attested may actually qualify for the hardship exception. So that's...I think those two together say that we're pretty much on track with previous years.

The biggest ah ha for me is this whole who's eligible for Stage 2 because in the past we sort of focused on well, who's attesting and we've been looking at really small numbers because people don't...people wait until the last part of the cycle to truly attest. But actually only about half of eligible hospitals are even eligible to attest for Stage 2. So most...half of the folks are only going to be attesting for Stage 1, so just using the Stage 2 attesters is...it's sort of missing the big denominator. Certainly only 40% of eligible providers are eligible.

So the encouraging part is that 80% of those that are eligible, which is the proper denominator, have already attested...I mean 80% are eligible and three-quarters of those who were eligible did for Stage 2 and the others used the Flexibility Rule. So I guess looking at...we're pretty much on track with 2013 that the majority of folks who could attest for Stage 2 did in fact and we still have...eligible providers still have three months more data to accumulate.

Did that help anyone? It sort of was a big sort of ah ha for me in terms of, how do we interpret the actual sort of raw numbers with Stage 2. I think we were a little bit...it's a little bit hard to understand because the denominator is really different this year. But first, did I explain this correctly Beth and Dawn?

**Dawn Heisey-Grove, MPH – Office of Planning, Evaluation and Analysis – Office of the National Coordinator for Health Information Technology**

Yes.

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Yes.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

And did I help anybody else get the ah ha?

**Christine Bechtel, MA – President – Bechtel Health Advisory Group**

Yes definitely Paul, thank you.

**Troy Seagondollar, RN-BC, MSN, UNAC/UHCP – Regional Technology Nursing Liaison – Informatics Nurse – Kaiser Permanente**

It's always difficult...this is Troy Seagondollar; it's always difficult when you're looking at the statistics. The only thing that I looked at, and I went through the same exercise you did, Paul, is to try to figure out what the percentages are in raw numbers. And I actually got, out of the total of the Stage 1 and Stage 2 eligibles who attested to Stage 2, I got about a 32% out of the grand total. How did I do that, I mean it would be hard to explain, but it seems like a low number.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

So, I think we're going to have to...I don't want to spend a whole lot more time on it but, the big ah ha for me is the denominator and that might be one of the ways you might be getting a lower number.

**Troy Seagondollar, RN-BC, MSN, UNAC/UHCP – Regional Technology Nursing Liaison – Informatics Nurse – Kaiser Permanente**

Right.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

So the big take home is, we're pretty much on track compared to last year, the previous years and 80% of the folks who could attest to Stage 2 did or at least did attest, the majority of which did attest to Stage 2. So, it seems pretty encouraging, I'd have to agree with Beth and Dawn. We might...we'll keep coming back and we'll have yet another update next month that will be really important to the hospitals and then we'll start to see the eligible providers come in, because they have 3 more months. Okay, let me go back to the hands and the next one was Marc Probst.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

Good and I do appreciate all this information, thank you. Thanks for a second. So another way to look at this, whether it's denominators or numerators is, do we have any estimate on how many eligible providers and eligible hospitals will start incurring penalties this year? Because some of the press that I've seen, the number seems really large; but the press is what it is. I was just wondering if we have any estimation as to, if they're incurring penalties that means they haven't...or they're going...well, that that's going to be a negative, at least to the program.

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Sure, this is Beth Myers from CMS and generally speaking, we have a little over 200 eligible hospitals who have begun receiving a payment adjustment. And we have ab...I think it's just fewer than 250,000, I think it's about 240,000 eligible professionals who will be receiving a payment adjustment. I want to qualify those numbers, though, and we'll have some better analysis on that going forward because those payment adjustments are based on your percentage of Medicare claims volume.

So, when you're talking about the eligible professionals especially, the number who are actually receiving a significant payment adjustment, and by significant I mean if we did a cut-off estimate of say \$5000 dollars above or below; it's actually a very, very small number that are receiving any form of significant payment adjustment. So we need to do some further analysis to understand why exactly it is that these particular individuals are not coming in and participating in the program.

So I do want to clarify that anyone who's receiving a payment adjustment this year is actually independent from a lot of this data that we've presented today. It's based on whether or not you had come in to the program in 2013, so it's whether or not you've actually started the program at this point, is what we're looking at for those particular payment adjustments. So what we're trying to do some analysis on is, is there a big factor that is making people choose not to necessarily participate? For example, is their Medicare claims volume so low that a payment adjustment is significantly low? But we'll have more data on that going forward over the next month or so.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

Thank you, that was very helpful.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Marc, this is Paul and if you recall from back in 2010 or so when the program started, 2011 is when they really started, we sort of recognized that for the providers, they were going to be gaining more from the incentive part, the getting more money part. For the hospitals, they were more interested that they'd have a bigger financial impact on the penalty side. So I think we're actually seeing some of that. Remember, so the payment adjustment only applies to your Medicare payment and so some people may have a lot, some people have very little. So that's the point that Beth is making about the...so folks, the number of providers who have more than \$5000 in payment adjustment is actually very low.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

No, I think that's helpful Paul. I think the one comment I would make on that is what we're looking for is improved healthcare through the use of electronic medical records...

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Right.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

...regardless of whether they're getting paid by Medicare, Medicaid or commercial funding. And if they're not finding value, or maybe they're just not attesting, you know, maybe they are using an EHR well...

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Correct.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

...so, I agree we don't know enough about the numbers yet.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

...there's a cost...

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Yeah and that's the second analysis that we'll be looking at doing is trying to identify...because we do know there are providers out there who use EHRs who may not be participating. So that's some of the analysis that we're going to look into trying to do. Obviously we'll do some straight up analysis of our data first off, but we'll also look into what type of research can be done on the field as a whole.

**Marc Probst – Vice President & Chief Information Officer – Intermountain Healthcare**

I think that's really helpful, thank you for the clarification.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Any other committee members have a question or a comment? Good, well thank you to both Beth and Dawn. I think we're starting to have a better appreciation, or at least I am, in terms of how to interpret the data and what the implications to individual providers, whether they're EPs or EHS. And it's somewhat reassuring to see that we're pretty much on track with previous years and that the majority of folks who are eligible for Stage 2 are actually attesting. Thank you and we look forward to more information next month.

**Dawn Heisey-Grove, MPH – Office of Planning, Evaluation and Analysis – Office of the National Coordinator for Health Information Technology**

Thank you.

**Elisabeth Myers, MBA – Office of E-Health Standards and Services – Centers for Medicare & Medicaid Services**

Thank you.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay, so now we're going to begin the panels related to outbreak management and we're going to start out with Chelsey Richards, who is the Deputy Director of Public Health Scientific Services at the CDC, as well as the Director of the Office of Public Health Scientific Services. And so in these roles he's advisor to CDC Director and oversees the NCHS, National Center for Health Statistics, the MMWR, the Vital Signs publication and the Epidemic Intelligence Service and other scientific training programs. So he...the OPHSS has approximately staff and campuses in Atlanta, Hyattsville, Maryland and the Research Triangle Park in North Carolina. So Mr. Richards is going to start off this series of panels on outbreak management and public health. Chelsey?

**Chesley Richards, MD, MPH, FACP – Director, Office of Public Health Scientific Services – Centers for Disease Control and Prevention**

Thanks Paul and I want to thank both you and Karen for putting outbreak investigation and management and more broadly public health on the agenda. I think this is critically important and I think we're very appreciative of having this opportunity.

I think what I'm going to do is just present a few comments to the committee as framing comments. We have some really great people on the agenda today and they will go into more detail for issues that are relevant for outbreak investigation and management, and how that our leadership in health IT at this moment in time could be really instrumental in advancing our ability to effectively respond to outbreaks.

In terms of CDC's role, I want to say up front, and it's not part of the slide...if we can go on to the next slide. It's not part of the slide, but it's critically important that in the US, state and local public health departments are really the leads for outbreak investigation and have the authorities to do the kinds of things you do in outbreak investigation and then its subsequent management. And CDC plays a role in supporting state and local health departments in coordinating, in supporting them, providing technical assistance and we have the ability to deploy staff, which we do quite often to support the local and state health departments. And we have literally hundreds of outbreaks each year on a variety of infe...mostly infectious disease issues, but other issues related to injury, to large preparedness related events and other types of exposure events that can be framed as an outbreak.

In particular around multistate disease outbreaks, CDC serves as a lead coordinator between the variety of public health departments and partners at a local and state level in the detection...the initial detection of the outbreak, defining its size and extent, looking for what the source of the outbreak or what the risk factors are and then taking action on that. And we provide assistance in four specific areas; disease surveillance, the outbreak response teams, laboratory testing which we do here both as a reference lab at CDC and in collaboration with our state and local and clinical labs, and then assisting state and locals both in regional outbreaks but also at the national level in informing and protecting the public.

In the last year, to frame sort of the volume, CDC has sent scientists and doctors out 750 times to respond to health threats so while Ebola obviously is in the news, something that everybody has been sort of exposed to, there are a lot of other threats that we respond to on a regular basis. And that's only the tip of the iceberg. The state and locals do many investigations that you'll hear more about at a local level, that don't rise to the level of a national response. Now the response that we do from CDC and in collaboration with our state and local health departments is often also done in collaboration with the FDA, particularly around medication issues, EPA, the Veterans Administration and other federal partners; so it's really a team effort.

On the next slide I wanted to put up just a couple of examples of outbreaks that you may have been familiar with and sort of what the specific issues there might be. If you remember, in 2012 and 2013 there was a large, multistate outbreak related to fungal meningitis that was related to steroid injections from a product that was distributed from New England. And one of the issues there was really being able to harness the information in electronic health records and be able to consolidate it from a public health investigation standpoint. That would speed the investigation along and it would have helped in terms of the identification of cases because these cases were somewhat difficult to identify.

In a Ebola that we've heard a lot in the media in the last year, issues that came up that many of the members and their organization, certainly ONC and we were engaged in were the clinical guidelines that were being produced during the outbreak in real-time and how to support screening and possible case identification at the clinical facility level and how we get that logic into the EHR decision-support. There are the issues around isolation and infection control and contact tracing that again can be facilitated by effective EHR integration with what the public health issues are.

And then another example is the Chikungunya virus which is an emerging pathogen, emerging virus that's coming from the Caribbean and gradually we're seeing cases. It's new to the US and so that having a more effective real-time linkage with laboratory testing but there's limited capacity, but getting those results in more real-time I think will help us be able to identify as that virus emerges where we need to direct public health response activities. Next slide.

So in framing this and I think John Loonsk will be doing more of this after me, but in framing this and thinking about some of the high-level opportunities that the committee could help us think through. Identifying synergies between public health IT and developing population health management IT in clinical care, I think, would be really helpful areas to focus on. As clinical entities of ACOs and other integrated delivery systems are increasingly focusing both on leadership and activities around public health management for their members, having that more effectively link with public health IT would give us certainly a lot of assistance in trying to address some of these outbreak investigations and management issues.

A second issue is fostering the sharing of IT infrastructure among state and local partners to facilitate better connection with clinical care. A third issue would be further engagement in public health in terms of relevant standards development activities. One of the things that last year Dr. DeSalvo facilitated was actually the addition of CDC as a member to this committee and I think that's been helpful for us to both understand the committee's deliberations and to infuse sort of the work that we do in public health with where the committee is going and more activities like that linking the clinical activities in health information technology with public health would be really helpful.

And then finally advancing the development of public health guidance in electronic formats that can be used to support clinical decision-making and we saw this firsthand with Ebola; again the emerging real-time development of guidance as we learned more about how the disease was playing out or would potentially play out in the US, having that ability to produce our guidelines in a way both at the national and local level that could be easily taken up into EHR products that would have been really helpful. And I think making more progress and strategies to do that would be also something the committee could assist with.

I think the next slide is my last slide. I just want to emphasize again that you have...we have a number of really great people talking today about specific use cases and I'll leave time for that. But we are very appreciative from both Paul and Karen to have this on the agenda and have this discussion today and I look forward to the discussion. Thank you.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thank you Dr. Richards and this is Jim Daniel and I'll be facilitating the rest of the public health presentations. I'm going to keep our introductions of our speakers fairly brief; their full biographies were sent out with the agendas. But first we're going to have Dr. John Loonsk who is currently the Chief Medical Officer for CGI and an adjunct associate professor at the Center of Population Health at Johns Hopkins and has previously served in leadership roles both at ONC and CDC.

And Dr. Loonsk is really going to help set the stage for us a little bit more and talk about the contact and terminology. And throughout the day, you're going to hear some recurring themes about the maturity of many of the public health IT systems, but the need for that integration with clinical care and electronic health records. And Dr. Loonsk is really going to set the stage for kind of talking overall about the different integration points and an overview of the different public health IT systems that are used and then will get into much more detail of those systems with some of our other speakers. So Dr. Loonsk, please go ahead.

**John W. Loonsk, MD, FACMI – Chief Medical Information Officer – CGI; Adjunct Associate Professor, Center for Population Health IT – Johns Hopkins Bloomberg School of Public Health**

Thanks Jim and thank you to the Drs. DeSalvo and Tang and to the Health IT Policy Committee for committing time to talk about and think about some of these issues. I also want to thank ASTHO, NACCHO, CSTE and JFIT, all public health related organizations that have been supportive of this. And also thank Laura Kahn who did yeoman's work in helping to put the session together. So, if you can go to the next slide.

Ebola has brought to the fore important considerations for health IT. But much of that initial attention emanated from the suggestion at first that an EHR was involved in clinical response challenges, and largely that proved to be not necessarily accurate. The dire circumstances internationally though, and experience with other previous US emergency events really shows us how important health IT readiness is to being prepared for outbreaks and events. And we're going to focus on is the area of outbreak management and response, here in the US, there are other issues internationally and we just need to recognize, as Karen suggested, that those needs are a subset of the broader public health and emergency management needs here as well. Next slide.

So what we're going to think about and talk about today, as we know most of EHR functions are associated with the provision of care and the support for the reimbursement system. But we're going to be talking about some other EHR functions that relate to supporting outbreak management and response. We're also going to be talking about functions of other public health IT systems that must support a prepared infrastructure here. And as Jim suggested, we're going to talk also about the interoperability needed among them, between EHRs and other health IT systems in public health and among the different organizations and entities that support the public health IT infrastructure, all needing to work with each other to support health IT that is interoperable and functional.

As was suggested earlier, state and local health department have a primary responsibility for most outbreaks. In circumstances where they're...which they are typically non-cross jurisdictional and typically public health emergency hasn't been invoked. But if the state leadership is responsible for leadership in...of the 50 states and 6 to 8 large local health departments are responsible for coordinating the health IT infrastructure, it can create challenges in terms of the cohesive nationwide approach.

Another challenge for health IT is the variability of the way that each of these individual organizations is constructed, and that includes healthcare as well as health departments nationally. They're highly variable in their organization and that presents problems from the standpoint of how IT can be arranged to support them. There's also significant variability between infectious disease, environmental and natural disaster emergencies. And if you go to the next slide, we're going to be particularly focused on some of the infectious disease activities today, but these other areas also have needs and requirements as well.

Thankfully public and population health functions, as Dr. Richards suggested, share many needs, that there are many from an IT standpoint when many of these activities look-alike. Whether that be outbreak management, hospital infection control, chronic disease management, specialty registries, research; they have a lot of common IT requirements that could be potentially synergized. One of the challenges here is that frequently because the incentives for these activities largely derive from funding, government funding, that the funding tends to be come down in specific program silos. And one of the issues you will be hearing about today is the challenge that is developed when each different program has its own approach to how something needs to be pursued.

Another important point for the committee to understand is that population health IT and public health IT and aggregate data are not synonymous. Much of what you're going to hear about today is about public health functions that manage individual cases and patients; just as healthcare manages individual patients and cases. Aggregate data is important for situational awareness and for rolling out, particularly as one gets further and further away from clinical care, through levels of government to a national picture. And as I suggested before, the types of emergencies can be highly variable; even among infectious diseases, there are great sources of variability...next slide, in public health emergencies as well.

So even infectious diseases the pathogen is significant relative to how the outbreak occurs, how the event lays out. How infectious that is? The average number of secondary cases from a primary one makes a big difference in how an outbreak occurs. And then the method of spread, whether it's airborne, airborne droplets, or bodily fluids; the host resistance and the duration of contagiousness are also important factors. And if you think about this, and as is expressed on the bottom of this slide, if you have a low initiation, if you have an outbreak where it's not highly infectious, where the initial numbers are low, where the host resistance might be high. On the left side, in actuality paper and phones may suffice; and there are a good number of outbreaks where the health IT is not critical to the response.

On the other extreme, when it's highly infectious, think flu here; where the spread is largely needs to be contained by broad measures of washing hands and closing meeting places, the data largely usable in that circumstance are aggregate data. They're not the individual case data. Between these two extremes however, there is a really important role for health IT to manage cases and manage an outbreak and that's some of what you're going to hear about today. Next slide.

So thinking about some of this terminology and thinking about how an outbreak lays out. There's a situation at the initiation where the first case is identified. Prior to that, there is usually limited awareness, even in the circumstance of Ebola for example, before Mr. Duncan presented in Dallas, there was a degree of awareness but not significant awareness of just how prominent some of these issues may be for US emergency rooms and clinical care. This situation is...changes once the index case, he was not the index case for Ebola, but was the index case for the Ebola situation in the United States, once that comes to the fore.

And it's also a time when potentially in identifying the first case, something like syndromic surveillance, getting data in to try to identify the outbreak, could potentially help. But in practice, very few outbreaks are identified that way and that providers are still by far the best detectors for outbreaks and events. And one of the challenges there though is that they're not primarily reporters. And we'll talk more about the issue of reporting and how it plays out in an outbreak as well. Next slide.

So once the initial case has been identified, the index case has been identified, there usually is heightened awareness and that brings additional and different information needs. So once Mr. Duncan came to the fore and there was an awareness of the fact that this too could be an issue in the United States, the needs...the information needs to support providers in emergency rooms and elsewhere were progressed and we'll hear some about how that changes as an outbreak occurs. During almost every outbreak what is the definition of a case will change.

And think about this as a case, a case in this context is some demographic information about a patient, some critical clinical data. Not infrequently a lab result is involved; a positive lab result is involved in meeting a case definition, but not always. And an important function here is getting these cases in clinical care that might be cases, to people that are working the possibility of an outbreak; managing that outbreak. They have a particular focus; they're focused on the population of possible outbreak cases. And working that population is different than working individual patients coming into clinical care. Next slide, please.

An important part of that, getting that information to those who are working the case is reporting and it's reporting for monitoring of the event, getting a general sense. In every outbreak, every emergency there's an important need to have a, what is called situational awareness of what is happening where at a high level. But in this case, where you have an outbreak, it's important also to have cases being exchanged so that they can be managed by those who are working the case. And in this point, the focus moves outside of the electronic health record and it moves to an array of public health systems that are important to that management.

As I mentioned earlier, that providers of care are not first and foremost reporters and so there are issues with them reporting. They don't always know who to report to, how to report or exactly when to report. And so the yield, the number of cases that are actually reported to public health, can sometimes be quite low. The CDC a year or so ago published information around the reporting of Lyme disease for example, where only one out of every 10 Lyme disease cases that were documented in clinical care were reported to the health department. This is despite the fact that it is a reportable condition which by law should be reported to the health department. Now one would hope in a prominent outbreak, when an index case has already been identified that there would be greater attention to that reporting, but it is important to understand that reporting doesn't always happen as it should.

Another need is to link back for further investigation of the outbreak. And Dr. Richards alluded to this in terms of the fungal meningitis outbreak, but it's really important in routine outbreaks as well. When getting some piece of information that there may be a possible case, a significant effort is then endeavored by public health to investigate the case to confirm whether that is indeed a case or not. And that is part of a routine link back and an information need as well. Next slide.

So talking about what happens then inside of public health, and this is happening in a surveillance system or an outbreak management system. When public health receives possible and confirmed cases, one of the areas of attention is the people who had exposure to a confirmed case, or to a possible case. These are the contacts and one of the things that health IT can have a significant role in is managing this spread of additional people who are not confirmed cases, but for whom attention and management and for whom public health must work to determine whether they're going to be cases. And contact tracing is about doing that. I think most of you have heard about contact tracing in the context of Ebola in Africa. Contact tracing is an important function of surveillance and outbreak management systems here as well to work this issue specifically. Next slide, please.

So once the...some of the contacts are identified to be positive, and that again is usually done with lab results, but it's sometimes done with further investigation, then that brings to bear a new set of contacts for those who were initially contacts; so it's the second generation of contacts. And the population of possible cases expands really geometrically. Next slide. Because after those contacts are...some are confirmed and some are ruled out, then there is an even broader set of possible contacts. Next slide, please.

And filling out that picture, when that moves to a next step, you can see how it's really almost a geometric progression in terms of cases that need to be managed and cases that need to be worked. This is not intended to be a sensationalist graph; it is intended to show what is fundamentally an information management issue. Next slide, please.

When those cases and those possible cases are being worked and you don't have a vaccine or you don't have a medication, the information management of those cases is one of the critical tools in managing that outbreak. And the graphic that I just presented to you was really a representation of how SARS was transmitted in Singapore in 2005 and before; a case spreading to contacts, contacts being confirmed, other cases and so on. Next slide.

There are other functions that need to be considered in terms of health departments working these issues and they...managing cases goes beyond just getting it from EHRs and getting them into the health department, at each level of government, there are important issues of having specific, clear case counts. If there are discrepancies in case counts across these areas, people get very concerned and it's a huge coordination issue to have specific case counts lists.

Countermeasure delivery and tracking; so when you are responding to the outbreak and you need to provide medication and provide vaccine, managing those data, managing the supportive data around those activities is important as well, as is managing quarantine. If...during SARS, for example, in Hong Kong, they used smart bracelets as you might see on someone who was in detention in their house to manage cases to ensure that they did not transmit the disease to other individuals. That may not be an approach that would fly in the United States, but it puts a fine point on the fact that managing these cases and managing their spread is an important activity.

And then finally, in the sort of the tale of an outbreak lifecycle, there are inevitably research and long-term follow up needs that are also part of the picture and important to focus on from a data management and data accumulation standpoint as well. Next slide.

So before widespread EHR adoption, systems, you know, software systems for surveillance and outbreak management did exist and they still do exist. But case reporting was really manual and that contributed to some of the low reporting yield that I alluded to earlier. What it looked like was going onto a webpage or submitting a paper form that was later input into a surveillance system. And I pointed to earlier that it's not necessarily just a question of providers...lack of provider compliance, it is very difficult for them to at times to understand when they need to report, how they need to report and where to report.

Electronic laboratory reporting, which you all have seen support of through Meaningful Use and HITECH, is in some ways a surrogate for full case reporting. In electronic laboratory reporting, or ELR, there is automated delivery of a lab result from a lab to the health department as a surrogate for a full case report. This can be challenging at times because the lab result doesn't necessarily include the demographics of the patient, it doesn't necessarily include critical clinical data about the patient, and it doesn't even sometimes include who the ordering physician was.

There has also been support for syndromic surveillance and the syndromic surveillance activity really began out of just also about automated data coming from another source to a health department, in this case from clinical care. And it really started with the admission, discharge and transfer data and chief complaints because those were the data that were available. So the emphasis here and there...and subsequently have been some interesting things that have been found in what a patient presents with when they show up to an emergency room, for example.

But a lot of the impetus for syndromic surveillance was the automated and more immediate nature of the reporting included. And I should point out that the type of data that syndromic surveillance does use is not suitable for case management at this time because it doesn't include the demographics data and the information to link back to that case and to manage that case in the health department. Next slide, please.

So what you're going to hear about today are these different functions that I've gone through. Some of them are functions for EHRs but a lot of them are functions for non-EHR health IT systems and they have implications because of this for the exchange, the interoperability that needs to occur between them. There are needs for case-based exchange or case reporting, there are aggregate data needs for exchange, but there's also important information that needs to be provided to EHRs to support providers in their decision-making and screening activities around possible cases as well. And then finally, there are those information needs for further investigation. Next slide.

So electronic records, now that there is broad adoption, play an important role in managing this to move it forward. Supporting index case and a subsequent case screening is dependent on the information that is provided to them. Right now, as was alluded to earlier, most of that information is still intended to be read by a provider and not processed by a system, not processed by an electronic health record. And you're going to hear some of the activities that were engendered to try to move forward in that space.

I mentioned earlier that guidance frequently changes during an event. Every outbreak I've been associated with has had a change in case definition at some point; that's something that needs to be considered in terms of how information exchange and how that case reporting flows. I mentioned that there is...the case reporting involves additional data beyond just lab results and getting them into outbreak management systems and support for subsequent investigation. Next slide

So surveillance or outbreak management systems exist now, they've existed for some time. One of the traditional challenges they've had, and I mentioned previously the idea that some funding programs are sometimes siloed with their expectations. It wasn't that long ago that the CDC and the state and local health departments that the surveillance systems were oriented to an individual disease so that every disease, or most of them, had their own software system that was intended for simply supporting surveillance for that activity.

That's not a long-term direction and integration of these systems has now occurred. So now there are better integrated systems at the state and local level for doing outbreak management and surveillance. Some of them are commercial, some of them are self-developed and the CDC has played a role in helping to develop systems that can be shared by those states who need them as well. There are also mobile outbreak systems at times that you can imagine are important, certainly internationally and in some situations nationally as well. Next slide, please.

Another critically important component of the health IT systems are the public health labs and their lab information management systems. These labs support testing, sometimes when...that only public health labs will do, and you'll hear some of that; and they also support testing at times when only public health labs will do it, when commercial labs will not test anymore during the throes of an emergency event. They work through rigorous preparedness protocols to be able to test for these pathogens, and they also work extensively on surge capacity.

If you can imagine the picture of that outbreak occurring in the anthrax attacks after 9/11, there were over 200,000 white powder lab tests that needed to be conducted. At that time they were all conveyed with faxes and phone calls, but now there's a need for lab result reporting from public health labs to health departments as well as back to clinical care. And all of these systems need to be integrated. Next slide.

Earlier I mentioned that there are information needs around countermeasure tracking and delivery systems. There was some notion at one point that when an emergency event occurred that the medications would be just freely distributed and that there wouldn't be a need to manage and track them. But in fact, in every outbreak and every emergency event that we're aware of, there were significant needs to track them, whether it be doing adverse events monitoring around what might be at times a new vaccine or it might even be an IND vaccine at the time that it is being rolled out. And so there are data needs for managing those.

There are also needs for managing the countermeasures that are in the national stock pile and countermeasures that are in the commercial supply chain. And we saw some of this, for example, in the flu vaccine shortage where one of the flu vaccine manufacturers was taken offline and there was a maldistribution of the flu vaccine. There were information management needs in rectifying that maldistribution and to do that, there needed to be knowledge of what the vaccine supply was in the manufacturer's stores? What was in the distribution system? And what was in the retail component of the distribution system, whether that be in clinical care or in a health department clinic. And to be able to order and reorganize that distribution was a health IT information management challenge.

And an important part of this, too, from the standpoint of countermeasures, is the connections with information manage...immunization information systems. And the fact that, for example, not all immunizations are given, delivered in clinical care. If they're delivered in a pharmacy, those don't always make their way, the data about those, into the immunization information system which can be a challenge. And there are other information flows that need to be considered as well, from the standpoint of how those countermeasures are tracked and distributed as well. Next slide.

We won't spend much time today, but I will once more recognize the important research and long-term follow-up activities that are associated with outbreaks and outbreak events. This is an important part of a learning health system; learning from outbreaks is an important way to forestall them in the future. And so collecting the information that can support these activities in an ongoing way to make sure that we understand the dynamics moving forward is an important part of an event as well.

This is increasingly important in the context of emerging infectious diseases where we have changing environmental pressures, where we have issues with antibiotic resistance and other data management needs. We need to understand how the outbreak develops if we're going to deal with the threats and best apply health IT population management to it moving forward. And this area, which you're going to be hearing about today, is a really important part that is the health IT of outbreak management is a really important part of the safety net that the public expects from the health IT system nationally. So thank you for your attention.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thank you Dr. Loonsk and we do have a large period of time at the end of today for full committee discussion, but I did, since we're a little ahead of schedule, want to stop for a moment and see if there were any question...clarifying questions for either Dr. Richards or Dr. Loonsk about their presentations. Can we get the...

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

And I don't see any hands raised, anybody want to raise their hand? I think we can proceed.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Okay, great. Thank you. So next we're going to hear a little bit about what John talked about in the beginning of this presentation and that's some of the activities that happen within the electronic health record and that case identification, the types of screenings that might need to go in clinical care and the integration of those screening guidelines and other clinical guidelines, with public health recommendations and how we might be able to do a better job of integrating those recommendations coming from public health with clinical care and with EHRs.

And we're going to hear from Dan Chaput, who is a public health policy analyst with the Office of the National Coordinator for Health IT, as well as Bryan Clark, who's working with Cerner as a software engineer. And both Brian and Dan were heavily involved in our Ebola response activities here at ONC. And we'll hear some about those activities and how that identification, screening and clinical guidelines can perhaps be better integrated with electronic health records.

**Daniel Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology**

Hi, this is Dan Chaput from ONC and we're going to be drilling down into one of the areas that Dr. Loonsk discussed earlier here which is the question of screening within EHR and also the question of guidance flowing either from a health department or CDC into an EHR and what that process would look like. So first we'll be hearing from Cerner; if you could go to the next slide. I'll do a brief discussion of knowledge representation, very brief, then we'll hear from Cerner Corporation and Bryan Clark on the role of the EHR in the Ebola response and then I will discuss a logic model and vocabulary for moving knowledge from a health department into an EHR or a set of EHRs. Next slide, please.

Boxwalla in 2011 suggested a framework for knowledge representation within health. This is a framework which is very much like frameworks used in other industries for decision support or distributing guidance. At the first level here we see a narrative text. This is really English, it's easy to communicate and pass knowledge from one person to another. The semi-structured is organized text; the idea here is to clearly define your terms, eliminate your ambiguity. The structured level is coded and interpreted by computers; it's shareable, it's reusable so it can be shared between systems. And that final level is a coded, executable system that's interpretable by clinical decision support system.

This screen is not to suggest that in every scenario or any scenario that one would want to meet the executable level or that all decisions would be automated, this is really just a representation of the framework. There are reasons to go to one level and not the other, a variety of reasons, and in the case of clinical decision support and what we're looking at today; we're really looking at guidance and not firm decisions or rules. So I will sometimes use the terms interchangeably, but what we're really looking at today is guidance. I will now turn it over to Bryan Clark from Cerner and he will discuss their experience with EHR and Ebola. Bryan, are you on?

**Bryan Clark, MIS, MBA – Managing Director, Emergency Medicine - Cerner Corporation**

I am on, can you hear me okay?

**Daniel Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology**

Yup.

**Bryan Clark, MIS, MBA – Managing Director for, Emergency Medicine – Cerner Corporation**

All right; great. So this is Bryan Clark with Cerner Corporation...and if you go ahead and advance to the next slide, I'd appreciate it. So I'm the general manager of our emergency department solutions here at Cerner and we led the effort within Cerner to respond to the Ebola threat in the best way possible with inherent technology in our EHR. So, I'll be covering that a little bit about the process we went through and some of the challenges and then potential opportunities for us as well, as we move forward.

So to get started, I want to reiterate what we've kind of heard throughout the day is that from a Cerner perspective our stance is definitely not that the EHR is going to remove clinical judgment or face-to-face interaction. We will be there to collect the information, disseminate the information and make sure it is available at the right time. So as you see on this slide, we focused on these three rights or four rights; but it's ask the right questions, provide the right information and notify the right people at the right time. The last bullet point is extremely important as it's important for us to make sure that we're communicating outside the four walls of the organizations, as well as the EHR when the patient's at risk.

So, for example, if you take travel history in one location but maybe don't get enough symptom sort of information, as they move across organization, potentially across EHR, we need to be able to make sure that that information travels with them so that upon presentation you immediately know that there's symptoms and travel history present. Next slide, please.

So from asking the right questions perspective, we start to get into some of the conversations that you just heard around structured versus narrative, so...and I'll use some of the terms interchangeably. For me structured will be referred to as discrete and then narrative will also be referred to as reference text. So within the questions we began by looking at CDC recommendations and making sure that we were following the necessary algorithms and putting in the correct information as far as country, symptoms, etcetera right out of the gate. So we put in a couple of questions as far as screening for travel and exposure. We actually went with exposure right out of the gate as well, even though that was not part of the initial algorithm.

And then from there we just...you start following a workflow down, and you'll see these screens a little bit later, but you have a response of "yes" to either one of those, then moves on to the next portion which we would consider to be the human intervention, the clinical decision time. Does this person need to be isolated or removed from general population? If so, then you check that as well and a comprehensive...and then we'll move on from there. So you'll hear me use another wor...or another couple of words throughout here of screening fatigue.

So through various interviews and conversations within Cerner, we were really starting to ask too many questions. So you need to make sure as well within the EHR that you're being prudent with the questions that you're asking and you're stopping at the right time and you're advancing to the more detailed questions at the right time as well.

So based off the answers to those questions above, we'd moved to a more comprehensive set of questions within an infectious disease screening form where you would actually get the discrete or structured values for the symptoms and the countries that they had traveled to, etcetera. And that's crucial in these sorts of situations to allow for reporting and analytics and case studies to be performed after, or even hopefully real-time in case identification or potential outbreaks. Next slide, please.

So continuing on with the right questions. So we went for symptoms specific to Ebola and MERS, so we looked at the countries that we host from a Cerner perspective from our clients and made sure that we were tackling the appropriate infectious diseases at the time. We also made sure to include links to the CDC or the WHO to make sure that we were always showing the most real-time and pertinent information. As you'll hear later, some of the challenges is that as content is being updated, making sure that we're staying updated as well and we found, obviously, that links to the changing documentation on the CDC website or other organizational websites was the easiest way to make sure that the appropriate information was being displayed.

So then, you see the word reference text here, and again, that's going to refer to the narrative that you just heard. But this is referring to the donning and doffing instructions for PPE. And this is also something that we know, it evolved over time as a part of the Ebola outbreak and again, making sure that that was available right there, heads up. So we did take that balance of what do we link to versus what we put right there, heads up, easy for people to see. We thought protecting the clinicians and the providers was of utmost important, so made sure that that information was available heads up as well. Next slide, please.

So we believed in ask early, ask often. So we don't want screening fatigue but we also want to make sure we're not missing anybody. We took multiple site visits, in particular we went out to Emory to see how everything was happening at their site and as we know, they were in the middle of a lot of this. And we saw a need for putting this up right up front in the quick registration process. So we had kind of shielded away from that as those individuals tend to not be too clinical; however, we did find it extremely important for us to ask very simple questions such as travel to a high risk country, and they could have a reference sheet sitting in front of them or were they exposed to a contagious disease, potentially?

And the idea with this is not necessarily going to the straight to the isolation precautions, but at least getting them out, away from the general public in that situation to allow for further screening to occur by a professional. And so that's what you see in this screen, the quick registration that we have within Cerner, making sure that we're capturing that information right up front, as soon as they walk through the door. Next slide, please.

So this slide is where you get into the initial screen before you get to the more detailed. So this is asking the question of any exposure and symptoms or travel and symptoms and a yes to either one of those, then you go down and you start answering the droplet contact or airborne contact precautions for MERS. So it's hard to do here virtually, but if you take a look at the first two boxes up top, the contact with person or travel to a country with, those that start that way, that's what we refer to as discrete data or structured data. So that would be reportable within the system, we'd be able to go identify any patient that entered a hospital where we check yes or no to either one of those. And similar to that, the yes or n/a that you see below as well, those are also discrete data elements or structured elements, as you heard before.

So then in the box that is square...that has the square around it, that's what we refer to as the reference text. And that's pulled directly from CDC data to make sure that right there, heads up, they have the information that they need to ask right questions. So it's not good enough for us to just ask the question, we've got to make sure that whoever is asking the question knows what countries are going to be...are currently affected and what are the symptoms that you're looking for.

And so that's the primary screen that you see and that is where it stops and starts, so that's where we were trying to avoid the screening fatigue. It's as simple as four questions, gets you in and out and determines whether or not you need to take into a deeper dive and go into a further infectious disease screening at that point in time. Next slide, please.

So here you'll see right within that screen, we did allow for additional detailed information to be look...to be seen. So it's not...it was not expected for you to answer everything on the screen, sign off on it and then hope for communication etcetera to occur before you saw the necessary PPE instructions. And so we sort of gave the ability to link directly to, as I mentioned before, a subset of the PPE instructions within a reference stream, as well as a link to the CDC to see the current recommendations as well. So if you were to determine isolation...that isolation was required, you would be able to see the reference text right there, heads up as well. Next slide, please.

So the next few slides are going to talk about the other critical fac...another critical piece of this is that while the EHR is certainly not intended to remove verbal communication between clinicians, providers, it is also important for all this information to be available in every aspect of an EHR, heads up. And so this just gives you the workflow that occurred, and we will use ED as our example. But somebody presents to the ED, you answer yes to the symptom or the travel question and you answer yes that I'm going to put them into isolation.

So once that occurs, there are triggers within the EHR that allow for an order for droplet and contacts isolation to occur. So that way, anybody that's looking at this patient's record knows that there's a risk and that isolation needs to occur. It places an order for a consult to infectious control. It notifies the user of isolation precautions and Ebola risk, which you'll see here shortly.

And then it also pages a physician and sends notifications to what we refer to as a message center, which is a communication, email type inbox that allows for individuals to know what's going on and just communicate with each other. In this case, it sends a high-priority message indicating that there is something going on with this individual.

And then the other piece of this that we do is we automatically trigger an ED infectious risk plan of care to make sure that the appropriate actions are being taken as soon as possible on that patient. And this just helps with limiting the amount of interaction that these individuals have to have with the EHR and really, truly focus on the patient in these situations versus making sure all of this information is populated in the EHR right up front. So next slide, please.

As I just mentioned, you can see this is where the isolation precaution order has been placed and is available within the EHR and then you can see that over on the right side, this is an open chart alert. So once every 24 hours, the first time you open that patient's chart, you'll be notified of the isolation precaution for Ebola with additional information and again, links to the CDC to make sure that you are as knowledgeable as possible about this patient and that you're not putting yourself at risk when you were to go take care of this individual. Next slide, please.

So this just goes into a little bit more detail on that precautions alert that you just saw on the previous slide, just to show and a little bit more clear that there is a link to the CDC and then again a direct link out to the CDC website. And so what I'll say here, and this is a potential opportunity and I haven't been able to get in and do a lot of work, and I know that there's been some work done already, but we were struggling, from a Cerner perspective of what was the most recent active content and what was the most recent...has the page been updated, etcetera. And making sure that if we link to a page or that there's a critical page within the CDC, that that page is the one that's always used so we never change the address of the page.

And if there is an update, that there's an easily identifiable version or update, date, time, etcetera. And a lot of the stuff that I've seen come out has really started to hit home on that. And you also have the ability on the CDC website to watch these pages and see if there are changes to them. So, a lot of great progress was made there and that was a conversation between Cerner and Karen and ONC to make sure that we had the right links and that they were going to stay up-to-date and active. So that was a first opportunity and I feel like we've already tackled that one successfully. Next slide, please.

So this just gives you a picture of making sure that the information is disseminated through the whole continuum of care to make sure that all providers, clinicians that will interact with this patient are aware of what's occurring they're aware immediately if there is an Ebola risk in a hospital. So in this case the infectious control practitioner gets an alert right heads up within their workflow dashboard to ensure that they know that they need to engage in this patient as soon as possible. And just as you saw within the ED workflow, that's the most critical aspect of what we looked at when we were creating the standards across Cerner is to make sure that everybody that we felt would need to be responsible or aware of this patient's condition was done so as soon as isolation precaution was triggered from within the triage form. Next slide, please.

So these last two slides here, I just wanted to emphasize again that these were inherent functionality to Cerner, so we didn't go out and develop a brand-new solution to respond to Ebola, we already had an infectious disease screening form within Cerner. And we obviously had to enhance that from a content perspective to make sure we had the right countries and the right symptoms, etcetera, to make sure that it was appropriate for our clients.

So the way we did this is we spent a day going through and reviewing our standard infectious disease process for our clients, seeing what did and didn't apply for Ebola and then making sure that we had the appropriate build instructions for our clients that are client-hosted and not hosted by Cerner, so that that way they could go make these changes in their system by themselves. And so we did that through Cerner, which was referred to as a priority review flash that contained all the specific information for those clients who go perform that build on their own.

And what we found when we did that is that a very good portion of our clients were already taking advantage of the functionality that's available within Cerner and had that screening in place. They were well prepared for an Ebola patient presenting at their hospital. So then the other part of it that Cerner's responsible for is we do have Cerner-managed client domains, so we made sure that all of that content got pushed in there within a couple of days as well.

And then we continued over the next few weeks to review existing capabilities within Cerner. How can we expand on the standard content that we've built, made sure we were reviewing the evolving CDC guidelines, etcetera, to make sure that we were keeping our content up-to-date and as effective as possible, and we'll talk to that here in just a second but that was, quite frankly, the biggest struggle which doesn't sound like much of a struggle, but when you really think about and just the removal of a country.

So I believe it was last week we removed Mali from the list of countries for Ebola. And we needed to get in and make that change and even though it was just a reference text change, which is a more simple change than doing a discrete or a structured change, there is still a little bit of thrashing that occurs from an IT perspective and from a Cerner code and package perspective to make sure our clients have that content available to them as real-time as possible. And while removal of a country is less urgent than the addition of a country, it's still important for EHR providers to get that content out in as real-time as possible to create the confidence that we are following and tracking this and providing the solutions available to our clients. Next slide, please.

Okay, so some lessons learned and some thoughts for the future, and this is the last slide for me; so you've heard me talk about it a few times, but it's fully expected in these situations is as dynamic of an environment as Ebola was, the most challenging situation for us was just keeping up-to-date on the algorithms and the content and making sure that we are keeping the screening relevant for our clients. And so we really need to focus heavily on the version control and making sure that content on the websites are updated. And that's a good interim solution is providing links out to the CDC website as far as PPE instructions, for example, and just making sure that we're getting people to the right side as fast as possible. A thought we had going forward is making sure that this is available in a little bit more real-time.

And this is definitely a future thought, but using technologies that are available such as SMART on FHIR and having the CDC creating an application that adheres to those standards and that EHRs can then just plug into that standard. So that way, as content is updated, that CDC SMART on FHIR app would just be updated and then the EHR could just consume that versus everybody taking what the CDC has said and trying to update their individual EHRs. So we do see some technology coming down the pike here that's going to allow for us, I think, be a little bit more organized going forward and hopefully be able to respond a little bit quicker.

And then the final topic I'm going to close with is that as some are probably aware, Cerner is part of the CommonWell Health Alliance which is focusing on interoperability and making sure that we're sharing the appropriate information at the right time. And so part of our response to Ebola was meeting with this group and showing what we had learned from Emory Healthcare, what we had learned from our best practice standards and what we had learned from other client visits as well. And really the way we viewed it is, it really was not a time to be competitive, it was a time to collaborate and make sure that everybody was putting the appropriate screening out in front of the...out in front of their clients as quickly as possible.

And ultimately that turned into a fantastic conversation of making sure that we were included infectious disease information within the continuity of care, again to make sure if somebody has a pertinent travel history, pertinent symptoms, etcetera, that they go from organization to organization; that you make sure that you're catching that sort of information. So that was a great conversation with the CommonWell Health Alliance and we continue to operate under that as well to make sure we are moving forward with that and the interoperability portion of EHRs. And with that, I will turn it back over to Dan.

**Daniel Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology**

Thank you, Bryan. And yes, to...you can go to the next slide. To follow up on the question of everyone stepping up, do want to recognize Cerner and thank them for their participation here and in the meetings that we were having and many other EHR developers also stepped forward and shared information readily during this event. And it was a very, very positive, collaborative effort on the parts of the EHR vendors and they should all be recognized for that.

So backing up a step, Bryan was looking at what the EHR actually does when it has some knowledge about some screening that needs to take place. The question then came up during that process, how does public health share that knowledge with EHR vendors? What's the optimal way? What's the optimal set of artifacts that we would want to communicate requirements for decisions or for guidelines to EHR developers?

On the next slide, we talked about the idea that we promoted was to produce some knowledge artifacts, and these were just mockups, to describe process flows, decisions, reference standard, recommended value sets and do them in a standardized format. The idea that we'd be taking a step up that chain of sharing knowledge and moving from just referenced text or narrative to a semi-structured format and then determine after that first step, how far we really wanted to go. So what we wanted were resources that could be used to enable decisions easier, faster, more effective; make sure we were consistent and to make sure that they were clear and consistent when it came to the clinical recommendations. Next slide, please.

So we started with an artifact that was posted on the CDC website and that is the name of the artifact, and the documents used here today are for discussion, they should not actually be used for developing software or clinical guidelines. This is not a complete documentation set that I'm presenting here today, just a disclaimer there. Next slide, please.

So what I did was I prepared documents with the advice of CDC on a number of questions, some clinicians, and then presented them back to the EHR developer community and discussed them; asking the question, would this type of documentation make it easier for you? You here being that EHR implementers and developers, to implement the guidelines would it reduce the amount of time necessary? Would it improve consistency across customer sites; ED, ambulatory, wherever the guidelines were to be implemented? Next slide, please.

What we came up with was sort of a simple primary document set; the two main documents were a process flow and a companion narrative. The process we went through was a typical business analysis effort to take the narrative, which is again written in more of an English format and reduce it clearly to processes and decisions. The idea was that processes could be either manual, implemented in the EHR or some combination of both. Not that this...our work here would be...would dictate how an EHR should work or what the clinical guid...how the clinical guidelines should be implemented in a clinical event. But rather to just to give leeway for different developers or different scenarios to put their own business processes around it, but to ensure that the guidelines themselves, that the decisions were consistent.

And there are some reasons for that; one is that the decision should only have logic, they shouldn't have variation. They are guidelines but there shouldn't be lots of room for interpretation. They should also be testable; that developing a test case against the decision should be possible, whereas the entire process, since they can be manual or automated, would be difficult to test but the decision is when they stand alone should be easier to test. Next slide, please. And you can go to the next slide.

So, this...here we go. This was our narrative document, our source, as Bryan referred to it as the reference text. It's not sort of information that's necessarily ready to hand off to a developer. Maybe developers would take this and run in some cases, but some would immediately start pushing back and say, what does the blue mean? What does the light brown mean? What does the dark brown mean? What am I supposed to do here? What am I supposed to do there? What do I do at this point where the process forks?

There are a lot of questions and as Bryan alluded to, there were also questions early on as to, is this the latest, greatest document? How do I know if it is updated since I've last worked on it? As Bryan mentioned, those issues were identified early on and solved very quickly with version control and mailing lists that could be subscribed to in order to keep track of when these documents were updated. So, very early on, some very straightforward document management disciplines were added over the top of the process and worked quite well from there on in.

On the next slide you can see what I reduced the processes down to, the processes and decisions, and just used plain old flowcharting techniques. The processes are in squares, the decisions are in triangles. The processes here, for example, gather travel and exposure history, in Bryan's case that translated directly to a screen where they collected the travel information. Once that screen was saved, then it would provide guidance for the clinician in terms of where to go next. Same travel history could be done manually, collected manually, the decision would be the same, but the idea here is that we've broken out process and decisions clearly so that when the decisions change, just the decisions can change. So example, if Mali needs to come out of the list, you don't have Mali embedded in the procedure for gathering travel and exposure history, but you have it embedded in a list which you'll see defined on the next screen. So, it's very simple business practices here, just broke it down.

On the next screen, we had a companion document...here we go, thank you. And at this point you see where we start to drill down into real detail into the value sets. Over on the right hand side, where you can see the value sets, the object IDs to obtain those value sets, where the code system is, what codes are used. And then the actual...and what code system is used and then the actual codes themselves. In this case, Mali isn't here, but in Bryan's case, this is where Mali could be added or taken out and it's only in that value set that the change would be taking place. So it makes it very easy to identify changes from one version of the rules to the next for developers to understand the total impact of their change to the system. So, next slide. Thank you.

So this was the entire narrative that we started off with. There was some ambiguity, particularly in that large box 3, I understand you can't read this, the print is very small. The large box 3 had multiple questions and processes all built-in. So on the next slide, we broke that out to just a much simpler process flow and along with each one of these items included the value sets and any other suggestions either for gathering the information or proceeding on with normal processes. So we were very careful to break out the guidance from the processes.

And our conclusions on the next slide, after meeting with the EHR vendor community, and this is just as a result of meetings, there aren't really scientific surveys here behind this. Yes the developers liked this, they felt it would have been easier to implement using guidelines such as these and would reduce the amount of time necessary to adopt new and changed guidance, and would improve the consistency. So, it definitely points out a need that that is there to provide the developer community with guidance in a clear way when we're sharing knowledge from public health agencies. Next slide, please.

So there is the ongoing need, the semi-structured data worked, there is probably additional information that we can include there. To John's point where John was talking about public health being much more than just event outbreaks, but these could be included for chronic disease management and other scenarios; any scenario where a public health agency wanted to share information with an electronic health vendor. So, that wraps up my part of the discussion and we will...I'll turn it back to Jim Daniel.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thank you Dan very much and so now we will pause and see if there are any committee discussion on the presentation by Dan and Bryan. And I'd like to thank both of them, I know they worked very hard during our Ebola response and I think some of you may have actually been on some of our calls that we held for the EHR vendors, where a lot of this material was also presented.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Jim, Karen has a question or comment.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Go ahead, Karen.

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

So thank you guys for the presentations and let me make a word to say thank you to the developers. So many leaned forward so quickly and made adjustments to their products in response to not just the outbreak itself but to the requests from the providers on the frontlines; and so we really appreciate that. And as was described, we worked to build the bridges; we, ONC were necessary with CDC and others to create the opportunity for data to be more easily shared.

I think some of the critical issues that you all raised are relevant to think through as you go forward about how...what is kind of the expected back infrastructure, something like the CDC guidelines and rich with information websites can be more easily accessed by tools for providers who are really busy, particularly in environments like the emergency room.

And so, just thinking forward, did you have thoughts or suggestions about how, aside from SMART on FHIR, it's kind of the same notion as your coding a patient and want to find things in their medical record. This is sort of someone sick or you suspect that they may have a public health issue and you quickly want to quickly find information from sort of a larger website like the CDC. So any thoughts or suggestions you had around that would be welcome.

And I guess I had a second question, and I'll go back on mute; but...which is about data. So in addition to Cerner, I wondered if other developers that you had spoken with had any quantifiable information about the number of individuals who might have been screened as potentially being febrile, been on travel and had some risk factors and had any information about how much your tools were used or the changes were used before and after. Thanks.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thanks, Karen, and Bryan, maybe I'll give you the opportunity to respond first.

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

Yeah, sure. So I'll respond to actually the second question first. The second question, we have that data available, I unfortunately don't have it right here in front of me. So, I don't want to misspeak, but Karen we'll be happy to share that with you after this meeting if you would like us to.

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

That would be great.

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

Yeah. And then as far as the first question, make sure I fully understand what you're asking. I think you're asking for is there a need for an easier way to search through the CDC website to get to pertinent information? Is that also a need in addition to the SMART on FHIR sharing, etcetera? And...

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

So would an app tool have been helpful or is there a way to point to that information so that when you're trying to figure out how to don and doff right there in the ED, you can get to it really quickly and get to the right version.

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

Yeah, I think that would have been fantastic. As you say, and I'm just sitting here thinking that, I was able to get through the website and get to the information ultimately, but if you could...if there was just a simple, hey, here's your Ebola website, here's your PPE donning and doffing instructions and then just a quick hit link that would have been great.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Great, thanks Bryan.

**Daniel Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology**

And as far as information on counts, I don't have that information. Karen, if you want information beyond what Cerner has, I am sure folks could share that and we could gather that information. As far as other places to go for information, there are other systems that have been under development. There are resources such as RCMT, the Reportable Conditions Mapping Table.

There's another system, RCKMS, which is a similar system that is used to look at particular points of information in a clinical care event that could be used to identify scenarios where tracking for other disease needs to be followed up. So, for example, things that would say potential chlamydia, potential Lyme disease, based on looking at clinical information; so there are resources out there that could be made available to EHRs potentially in the future and in some sort of future architecture. But it's again it's a question of interoperability and getting systems basically talking to each other. And, those would not be constrained to any particular architecture underneath, be it FHIR or SOAP or RESTful or Direct, but it would be agnostic to the technology underneath. The important thing would be that the communication needs to take place between systems.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay, I have three hands up; Anjum is first.

**Anjum Khurshid, PhD, MPAff, MBBS – Director, Health Systems Division – Louisiana Public Health Institute**

Hi, thank you, and thanks for the presentation. So my question was related to the implementation of a system like this, and maybe Bryan can answer this question. So at two levels I would like to understand if you have any insights or experience of the challenges in implementing something like this in EMRs? One is from the point of view of other EMR vendors; so when you shared it with other EMR vendors, did you identify any challenges that they may have in doing what Cerner had done? And then the second is the implementation of these systems in the clinical settings, from a clinicians or providers perspective, in how easy or disruptive this may have been to their normal workflow?

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

Sure, it's a great question. The first question you ask, when we were talking to the CommonWell Health Alliance, the most common issues are what I referenced within the PowerPoint slides is, most EHRs have the capabilities inherent within their system to be able to go, build the screening in. However, the frequent updates to the content were the most challenging item to keep up-to-date and make sure that that was being delivered to the client in a timely fashion.

Beyond that, we didn't hear anybody speaking to a custom Ebola-like application that was created or anything like that, it was all really just related around the speed in which the content was evolving and I must say, necessarily so. I don't think the content was changing unnecessarily by any means, it's just the nature of the situation was causing it to evolve that much...that quickly.

And so, the second question you asked around disruption is...it's an interesting question. We've worked very, very closely with Emory and we really didn't get negative feedback in the ED settings and the acute setting. Now from an ambulatory perspective, we did get some push back as to the scope of the screening that was taking place and is it too much, too little, etcetera.

And that's where you heard me use the term screening fatigue and that's really where I started to kind of emphasize that was making sure that yes, you do need to screen everybody but you don't need to ask the specific, you know, you don't need to document specific countries somebody travelled to or the specific symptoms, etcetera, except for those certain circumstances where you do feel that there is a risk and where the system had flagged a risk.

So we really simplified our form down to those four questions that you saw and making sure that that was really all that they saw. And once that was implemented, we did not get any more negative feedback as far as disruption that was occurring.

**Anjum Khurshid, PhD, MPAff, MBBS – Director, Health Systems Division – Louisiana Public Health Institute**

Great, thank you.

**Daniel Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology**

So...

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay, next is...oh.

**Daniel Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology**

Sorry, thank you. A brief follow-up on the question of the provider perspective and the disruptiveness, especially when you take this concept and extend it beyond something like an immediate need as with an Ebola patient to isolate the patient. I think a lot of thought does need to be given as to whether this is something that needs to happen interactively with the provider at that point where the provider is giving clinical care, or if that's something that can be queued up for follow-up later on in the day, such as an example where it's a case of a disease where the provider is responsible for reporting that to a local public health agency, but it doesn't necessarily need to happen right at that point where clinical care is taking place, or possibly even the provider is not the person in the organization responsible for that follow-up with public health. So...

**Anjum Khurshid, PhD, MPAff, MBBS – Director, Health Systems Division – Louisiana Public Health Institute**

Yes, that makes sense, thank you.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay, next on the list is David Kotz, please.

**David F. Kotz, PhD – Associate Dean of the Faculty for the Sciences – Dartmouth College**

Yeah, I really appreciated this presentation, in particular John's survey of the various types of healthcare IT involved, including the non-EHR systems and Bryan's description of Cerner's reaction answered a lot of my questions. I'm really interested in the research that might be needed to improve IT support for public health response, particularly in two areas; one would be the data aggregation, you know, as cases or possible cases are discovered, collecting and analyzing that data on a nationwide scale is important.

And I'm wondering whether there are privacy challenges that might either become a barrier or be a place where we need to focus some research efforts. The Privacy Workgroup is currently working through big data in healthcare IT and the privacy challenges there and it would be good for us to know, in this case, whether that's an issue.

And then the second is the potential for mobile technology for support of public health response. In particular, maybe it would be useful for case management or contact tracing with the number of people who carry mobile technology, it might be useful in knowing where they've been or where they're going. Thanks.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Great. So this is Jim and I think I'm going to ask Dr. Loonsk to address those questions briefly but also say that I think that some of this might come up in some of the later presentations as well, and we should revisit this question at the end of the day as well. But, let me let Dr. Loonsk start and see if any of our speakers so far would like to add.

**John W. Loonsk, MD, FACMI – Chief Medical Information Officer – CGI; Adjunct Associate Professor, Center for Population Health IT – Johns Hopkins Bloomberg School of Public Health**

Thanks, Jim. So just briefly, the reporting of cases and in many circumstances possible cases are required by law in many states. And so there is a basis for this in state law, which is for...the needs for reporting. That being said, this is a very important area for which there's a lot of misunderstanding and I think it would be very helpful for the Policy Committee to help weigh in and clarify and work some of the patient confidentiality issues associated with these activities. There's clear basis for it, but there's a lot of misunderstanding as well and it's an area where things can get...definitely more information can be shared.

From a mobile technology standpoint, there are absolutely roles for using mobile technologies for outbreak responders, and you mentioned for...I think, also alluded to where there are possible cases might be engaged. From a mobile responder standpoint, there's always the question of integration or here one of our major themes today is how it connects up...how these systems connect up with each other and that's an important context for using mobile technology. Here in outbreak investigations, it's a developing event so it usually starts with something that's very focused, where a mobile application or mobile technologies could be useful; but then as it grows, you see bigger and bigger data management needs and you start to have to, not just from a data quantity standpoint, but from the number of people participating and working them, you need to share them. So suddenly you need five people managing the same data or 10 people or more. And so that's one of the challenges, but absolutely something that can...is important to work through.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

All right. Thank you Dr. Loonsk; and, Bryan do want to add anything to either of those questions?

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

No, I don't think so, that was...I appreciated the feedback that was on there. Thanks.

**James Daniel, MPH – Public Health Coordinator – Office of e National Coordinator for Health Information Technology – US Department of Health & Human Services**

And I know we'll have some both state and local health departments on later, so I think we'll revisit that one later as well.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay, our final question is from Paul Egerman.

**Paul Egerman – Businessman/Software Entrepreneur**

Great. Thank you, it was a fascinating presentation. I have a question for Bryan. I'm on the Certification and Patient Safety Committee that David Bates and Larry Wolf was running and we've heard some fairly passionate presentations about the importance of user centered design and a formalized process of getting user feedback, and also formalized testing on any changes that...if there's anything to change the user interaction with the system. And so my question for you Bryan, as you went through all of this at Cerner, did you go through a user-centered design process? Did you encourage your customers to do the same thing, even though that would have possibly delayed implementation by 2 to 4 weeks? Or do you think that there are some circumstances where you have one of these outbreaks, where you don't have time to do the normal processes?

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

Sure. So, you're speaking to a passion of mine; I came from an engineering background and moved over to the business side here at Cerner but can totally relate what you're speaking to. And from our perspective on this, what we did here is we put clinical staff in front of this content in this implementation that we had, that we had built out inside of an internal Cerner domain to make sure that it was going to flow and make sense and that the information was going to be provided at the right places within the EHR and not be too obtrusive.

I mean, we are adding an additional level of screening so it's going to have a certain level of impact to the individual's workflow, but for the most part we wanted to make sure that it was as simple as possible and the data was in relevant locations within the EHR. So there was testing that occurred prior to it going out and as you heard, we worked closely with Emory as well and this is a model that you hear frequently from Cerner, but prior to us releasing new content or going through content design or software design, etcetera, we will review that with clients to make sure that that's going to positively affect the users interaction with the EHR and not negatively impact it.

And so there was a...about to your point, you said 2-4 weeks, there was about a week long delay in the second release of our software to make sure that it was going to meet the standards and expectations of usability for the clients. And that testing is ongoing prior to any release that we send out, unless it's a simple update such as a country removal or addition, for example.

**Paul Egerman – Businessman/Software Entrepreneur**

So you did do...it sounds like you did do some of it and there was a delay of about one week. I'm taking a guess from your answer though, you did not do the entire formalized process where you retained all the testing material and made sure that you had like 20 users or something tested...

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

So yeah, the first release from Cerner was actually that priority review flash that I referred to that laid out the build recommendations for our clients that have the access to their domains to do the build themselves. And so there was actually no software release as a part of that or content release as a part of that and we did the testing just in-house with a few nurses, to make sure that that was going to flow appropriately.

So you're correct, that first release was not a true, what I would consider software content release. The next release that I was referring to that was delayed by about a week did go through full testing in-house at Cerner prior to being released and we did document the testing materials as well. Now the number of users that hit it, I can't speak to that right here, but we have a very formalized processes. We are ISO certified so we do have to go through a very specific, rigorous testing process prior to sending software out to our clients.

**Paul Egerman – Businessman/Software Entrepreneur**

Right, and so that's a response about software changes, but the user-centered design also actually also relates to any change in configuration...the software doesn't change anything...

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

Sure.

**Paul Egerman – Businessman/Software Entrepreneur**

...user input.

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine - Cerner Corporation**

Yup.

**Paul Egerman – Businessman/Software Entrepreneur**

But your response is helpful to understanding. An unrelated question, as I understood your material, you communicated with your colleagues at the CommonWell Health Alliance in terms of what you were doing. Did you communicate with people who are not part of the Health Alliance, like, say Meditech or EPIC or members of the EHR Association through this process?

**Bryan Clark, MIS, MBA – Managing Director for Emergency Medicine – Cerner Corporation**

So we were on at least one if not two calls where that larger EHR community was brought in and what we had done was communicated, we also shared that information with Karen to remove any proprietary information out of it of course, but to use as needed as well. So we did share that information broadly, not just CommonWell.

**Paul Egerman – Businessman/Software Entrepreneur**

Right, thank you.

**James Daniel, MPH Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Yeah, and this is Jim and I would add, on those calls, we had well over 1000 attendees on many of those calls where we opened it up to the larger EHR and public health community and those presentations from Cerner were made.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay, that exhausts the questions for now, so do we want to go on to the next panel?

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Okay, thank you very much.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thanks Dan and Bryan.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Yes, so now we're going to hear a little more about some of the fairly mature systems that public health is using, more on the public health side to do a lot of the case management and content tracing that John talked about in his introduction. So, we're going to hear a little bit more about what actually goes on on the public health side, but we're also going to hear the need for that integration with clinical care or those systems.

And as you listen to these presentations, I'd like for people to think about not only their use in outbreak situations in an emergency situation like Ebola, but remember that these systems are used on a daily basis. These are the systems that we use for tuberculosis and for STDs; so these are systems that aren't just put into place when there is an emergency response that is needed by public health, but we're using these every day. And their functionality is critical and that interoperability with clinical care is critical on a daily basis, not just in emergency situations.

So, we're going to have two presenters from...so to hear about state health department perspective and local health department perspective. Again, these full bios are in the packages that were sent.

But Janet Hamilton is an epidemiologist with the Florida Department of Health and is currently the Surveillance System Section Manager of the Bureau of Epidemiology there and Dr. Annie Fine, who I almost say almost needs no introduction, is with the Bureau of Communicable Disease at the New York City Department of Health and Mental Hygiene and is the Medical Director of the Reportable Disease Data Analysis and Informatics Unit.

So I believe we're going to start with...did I say, oh, Annie Fine. Sorry, I think...I was just told that I said something wrong, and then we'll move on to...so we'll start with Janet and move on...start with Annie and move on to Janet.

**Annie Fine, MD – Medical Director of the Reportable Disease Data Analysis and Informatics Unit, Bureau of Communicable Disease (BCD) – New York City Department of Health and Mental Hygiene (DOHMH)**

Okay, thank you so much, Jim. Good morning everybody and thank you very much for the opportunity to speak with you. It's truly an honor to represent the local frontline public health perspective in our collaborative effort to protect the public from outbreaks of infectious disease. And in the short time that I have, I'll be trying just to give you a flavor for the information needed by public health in order to accomplish our goal, which is to minimize morbidity and mortality due to these outbreaks.

I'm going to touch upon several large outbreaks which we've worked on over the past 15 years, since I joined the New York City Department of Health, discuss the steps of these outbreak investigations and in general, what we do for outbreak investigation, review our data needs and then just touch upon how leveraging data from EHRs would help us. But mostly just to give you a sense of what we do and the information that we use to do it. Next slide, please.

Sorry, I'm advancing my own slides as well. Okay, I know this meeting was prompted by...in part by the recent Ebola outbreak and in this situation, we were obviously aware of what was going on in West Africa so we did have time to prepare for cases here, anticipating how they would present to the medical setting. Whenever there's a situation like this one, we actively alert and reach out to clinicians and hospitals and provide them with the key features that they should be looking for and reporting to us. And in this case, it was fever with compatible systems and travel to infected areas...an affected area.

But the challenges were that from a surveillance point of view, that the symptoms were very nonspecific and our margin of error was essentially zero. So in New York City, the way we do this, we call it enhanced surveillance; we use a health alert system which is via email and we hope that as many providers as possible see it. But, we know we don't reach all providers with our network of emails through our health alert network. We also hope that procedures are instituted, and it was really interesting to see that presentation just now, to rapidly identify these patients and isolate them.

In the case of Ebola, we also conducted unannounced drills with fake patients just to be sure those procedures were in place. And as you know, we are now conducting active monitoring of all returning travelers as well as healthcare workers who cared for patients of Ebola for fever and symptoms. And in New York City we ended up monitoring hundreds of people daily, which we continue to do, but these activities don't really involve the EHR, per se, the monitoring.

...our...database which is a robust, web-based database that we use for surveillance and outbreak investigation, in order to track all of these people, but then also to use that same system when they do become ill, to track their illness and even to receive lab data should they be tested for Ebola.

When one of these folks becomes ill, we need to work closely with evaluating hospitals to try to roll in alternative diagnoses and rule out Ebola either just by testing or on clinical grounds. And fortunately, we do have a good test available in our public health laboratory locally, but we do not test every patient because many of the ones reported to us have illness which is really not suggestive of Ebola or they may even have travel that doesn't put them at risk. Rapid access to clinical and laboratory data from the hospital is absolutely critical for us in evaluating these persons under investigation, especially with the enormous amount of media and pressure on and from our leadership.

So the key needs in this outbreak for us were the availability of rapid diagnosis at our local public health laboratory, the ability to launch a rapid contact investigation to find all contacts, assess their risk and quarantine or monitor them as needed. We also did need, when we did have our case in New York City, to create a timeline and we just bas...because this was mentioned in the previous presentation, we did use some mobile technology in that we used cell phone records to track the patient, where he spent time; so that was extremely helpful. And we also do environmental cleanup as needed. And for all of these activities, we use our own robust data systems that don't specifically interact with the EHR. Next slide.

Now going back in time, I wanted to touch on a few other outbreaks, partly to illustrate the different types of information needs that different outbreaks present and each one is individual. The West Nile outbreak in 1999 was detected because of a single report by an astute clinician. An infectious disease doctor in Queens who reported a cluster of cases of what seemed to be an unusual weakness syndrome associated with mental status changes, possibly encephalitis or even initially maybe botulism is what she thought.

The initial cases were in a several square-mile area of Queens, seen here on the top left and the top right. And I should note that encephalitis itself was a reportable disease, but because it is not laboratory reported, it was only reportable by providers and we received very few reports citywide each year, about 8 to 12 total for the entire city for a year. So, we didn't really have good baseline data to compare this with, but it definitely seems to be unusual.

So recognizing that this was unusual just based on this one report, the key initial questions for us were what was the pathogen? And what was the extent of this outbreak? We quickly developed a clinical case definition based on the initial cases and asked clinicians around the city to report similar cases. We actually conducted active surveillance by phone, calling ICUs, neurologists and infectious disease doctors at every hospital in New York City to find cases and collect specimens to be tested at public health laboratories, even before we knew what the pathogen was.

Specimens had to be sent to CDC and to the New York State Department of Health for testing. So you can imagine how much easier this process would have been if we could have been able to query for similar cases across electronic health records in the city. We identified over 600 suspected cases, even though we confirmed far fewer. We are hampered by not having a good laboratory test locally and also because even the CDC didn't have a good laboratory test at the time.

Once we knew it was West Nile, which took several weeks, our goals were to understand this illness, understand its spectrum of clinical features, the risk factors for the illness, the sequelae and outcomes; all of which required additional information from the medical sector, which was all manually obtained at that time. Obviously, the control measure we now know was mosquito control, but we had no mosquito surveillance at that time, so we had to use human cases to guide and target the control measures.

So the real critical need was to know where people lived and also where they had been in the preceding two weeks so that we can know where this mosquito control needed to be targeted. An unappreciated additional challenge I wanted to mention during this outbreak, was the need to collect specimens from all of these people, send them to reference public health laboratories and link the results back to the patients and epidemiologic data from our investigations.

It sounds like it could be not so hard, but it is incredibly challenging when you don't have common identifiers for patients or specimens and especially when there is a high volume of specimens as there was for this outbreak with more than 1000 specimens over a couple of weeks. So this is a really key point is the integration of laboratory and epidemiological data is really what has been a huge challenge and continues to be a challenge, although we've made a lot of progress on it. This was also true, as mentioned by John, during the anthrax event where we had so many white powder events as well as other environmental specimens from media outlets and other sites that we had to link back to individual patient exposures. Next slide, please.

Turning to pandemic influenza, in this outbreak we had very little warning in contrast with the previous ones. Our outbreak in New York City began essentially one day after the announcement of a novel strain being responsible for the outbreak of severe respiratory disease in Mexico. In New York City, we had a large cluster of what was thought to be maybe sore throat or strep throat reported at a local high school involving hundreds of kids going to the nurse on one day and it turned out to be what was then called swine flu.

So we knew it was here, but again, it was a new strain of influenza and we had to figure out and track out how widespread it was very rapidly and more importantly, we had to figure out how severe it was, not knowing...knowing that it was a novel strain but having no idea of the range of symptoms that it would cause. In order to do that, we needed numerator data for hospitalizations, complications and death and ideally denominator data for infection in the population, which of course we couldn't get. So instead we used measures of influenza-like illness for people who went to emergency departments and we also conducted a population phone survey for ILI, for influenza-like illness.

We also needed to know who, what ages and people with which underlying illnesses were at risk for more severe outcomes. We needed to be able to provide guidance on targeting antiviral medication and also on community measures and eventually vaccines to try to mitigate the impact of the virus and to follow the trajectory of the epidemic.

So the challenges in this situation were primarily having poor diagnostic tests available in the clinical sector, having limited capacity in the public health sector to do that testing for the virus and needing to rely on nonspecific measures of the epidemic, such as ILI, which we know is kind of a mishmash, not all novel influenza, H1N1, and having the pressure to report actual numbers when we knew that not everyone could possibly be tested and that the tests that we had were insensitive. Next slide, please.

So in this type of situation, syndromic surveillance became much more useful and we relied on our emergency department syndromic surveillance system with reports of chief complaints to help us understand the course of the epidemic. The rates of ILI in various age groups, as you can see in top graphs broken down by borough and age, gave us a real-time sense of what was happening in outbreak and who was most at risk; where it was in time and which populations.

We also used our emergency department syndromic surveillance disposition data, when it was available, to try to understand the proportion of those who were being seen in emergency departments, who were being admitted as gauge severity. There were limitations on these data because disposition data are often quite incomplete and delayed and not available from all hospitals. So this is an area that we continue to work on improving. Next slide, please.

The last big outbreak I'll touch upon quickly was SARS. Here again, this outbreak was detected elsewhere, but this was a very...a highly lethal disease and affecting healthcare workers with a high probability of spread in the healthcare setting. Knowing how explosive this could be in New York City, we conducted intense surveillance once again, but did not initially have easy access to testing, so we couldn't test everyone. So similar to the West Nile situation, we asked clinicians to report immediately cases based on a clinical case definition of severe respiratory disease in people who had traveled to affected areas.

Luckily we could use travel history; however, if we had had a local outbreak or local transmission, we would have not been able to rely on travel history and we would have been in a situation more like the one faced by Toronto. So I just wanted to point out that the decisions for us regarding how wide a net to cast in situations like this are sometimes the most difficult. We can't test every person who might have the disease; we can't test only those who clearly seem to have the disease and we sort of have to set our case definition clinically in sort of this happy medium place where we're getting, based on the lethality of the disease as well, but these are really tough decisions.

And, it certainly would be helpful to have a sense of how many people would meet those case definitions in the clinical sector when making those decisions. Should we try to track and test all patients with fever and respiratory symptoms? All patients with pneumonia, etcetera? And these decisions have to be made very rapidly at the beginnings of these types of outbreaks.

For SARS, we had similar control measures available to us as in the Ebola situation, basically rapid identification, isolation, use of adequate PPE and infection control. But because this infection was potentially more explosive in a healthcare setting, we had a different need for very rapid identification of possible contacts in that setting for people who may not have been detected right away.

So, this points to the importance of being able to integrate information across healthcare settings; as in the Toronto situation where you had an individual diagnosed with SARS who had been previously in a different healthcare facility but had been unrecognized as having SARS. And having the ability to query across individual facilities was exceedingly necessary in that situation. In Toronto actually, the lack of a robust outbreak management system and contact tracing system was cited retrospectively as one of the reasons that they even had a second wave of SARS in Toronto. So after that, we actually did look far and wide for a good outbreak management system that would be integrated with our own surveillance system and were able to implement that over the subsequent years, fortunately for us. Next slide, please.

So, those are...these are the more high-profile outbreaks that I just spoke about and they're quite familiar to everyone, even if the details of the public health response and information needs are not as well understood. However in New York City, every day we are on the lookout for unusual clusters of illness and we receive a very high-volume of reports every day, more than...almost 1000, just to my program, which doesn't even include sexually transmitted diseases, tuberculosis and vaccine preventable diseases.

We run a weekly analysis of our cases to try to detect clusters in space and time. And we use a four-week baseline, we compare...we use a four-week period and compare it to a baseline composed of many four-week periods over the past five years and we run fairly sophisticated statistical analyses on these data and have automated reports which come out every week.

So this is just an example of one that actually happened. This first signaled last month; we had a Legionella signal on our routine analysis for the northern part of the Bronx, and you can see the output, this is what comes out automatically. We also have a map which gets output automatically and for where the cases mapped in as little numbers there. There's more information that comes out with it as well, which enables our analysts to have quick access to information that's useful for them in investigating this. So, next slide please.

So it turned out that there is indeed an outbreak of Legionella now going on in a very densely populated area of the Bronx. And it's ironic because I wasn't sure I could mention it, even though I'd put it in the slides, because I wasn't sure it was public, yet. But it came out about 20 minutes ago, while we are on this call. So now I feel comfortable talking about it with you. But we are feverishly working to try to determine what the source is.

We suspect that it is the power plant pictured here, which is serving the largest apartment complex in the United States. And we've identified 11 cases just in December and we are now using our health alert system and requesting physicians to test for Legionella in patients who meet a case definition and then to report those cases immediately to us. The reason we detected this outbreak is because it is a reportable disease. It is primarily reported via electronic laboratory reporting and we have a baseline upon which we can run this data analysis for detection of aberrations. We also take advantage of the fact that our data are geocoded automatically and we are able to detect two cases in one building using a building identification number which did happen and which raised the level of awareness that this actually was something unusual going on.

So in order to do this, you can see how critical it is that we get good and complete laboratory data and patient address. We now need to nail down the source of the outbreak using molecular epidemiology and other methods which relies on physicians or clinicians to test and collect cultures ideally so that we can match them with the environmental specimens which we're collecting from this power plant.

All...15 specimens actually were collected from the power plant, from the cooling towers. There are five cooling towers in the power plant and all 15 tested positive for Legionella. But we have to match them back to a patient specimen, which we don't currently have yet. We have PCR positive, but no culture. And then obviously we have to work with the facility to try to stop the contamination at the source. Next slide, please.

So every day in New York City it's something new and this is just a sample of what we call our outbreak meeting agenda for the past week, just to give you a taste of the kinds of things we see every week. In addition to what I just described, we have Meningococcal meningitis in the MSM population. For each of those cases, we do intensive case management. We have to track all their contacts, sometimes we use social media to do that and we try to get as many contacts as possible prophylaxis...so that they will not become ill. We also have foodborne outbreaks; for foodborne outbreaks we use sources such as Twitter and Yelp to detect these outbreaks and almost every week we find something. And then a smattering of other weird things, as you can see, and all of these have some interaction with the medical information as well. Next slide, please.

So keeping these examples in mind, I just wanted to quickly review what are the steps of an outbreak investigation? This kind of is a little bit redundant with what John mentioned before, but I'll just go through it from our perspective. So first is detection and verification of an outbreak. This does rely on reporting and a central data repository from the many various points in space and time that might be seeing individual cases. And that's really the main reason for having the surveillance system concentrated in public health.

Much of our data comes from electronic laboratory reporting. In New York City this is very high-volume, much of it, it's not...it comes in, although some is standardized with LOINC and SNOMED codes, etcetera, some is very non-standardized with and requires a lot of manual effort to clean it up and make it useful. It requires IT systems that start at the hospital or the commercial laboratory with many integration points along the way that our data go from those sources to the state and then down to the local health department. And within the local health department, it goes through an initial kind of data processing, cleaning application and then into our surveillance system; all electronically.

But because it's all electronic, there are many opportunities for failure and data problems at each integration point and these things do happen. So, we need good quality assurance systems to make sure the data aren't dropping out due to all kinds of problems that happen along the way.

We also rely on provider reporting for clinical data as well, to complement the electronic lab reporting data. And we have a web-based provider reporting system as well as our traditional methods, which are paper and phone, which we still definitely need. We also use provider reporting importantly to provide a backup to our lab reporting. And this is the way we find problems with our ELR feeds.

For example, recently with our Chikungunya cases that are coming in due to travel to the Caribbean, we found that we were missing a large number of cases because the laboratory tests were going from hospitals or outpatient providers to a large commercial laboratory and then to the commercial laboratories' reference laboratory and along the way, patient address was dropping out and so those cases couldn't make their way back to us, because the testing laboratory didn't have patient address. So, these are some of the challenges we face when we have...we're relying strictly on laboratory data. And so we use the provider reports to point to a clue; we don't get provider reports for every case, we know that, we know we have underreporting right now, but we use that to point to problems in our ELR data.

We also clearly use syndromic for case detection and, as I mentioned before, we need to know the baseline and background rates in order to interpret the data that we do get. And then once we detect the outbreak, we do active case finding to try to determine the full extent of the outbreak and the case...we have to adjust our case definition as we go, as has been mentioned before.

Then when...in order to triage and investigate our suspect case report; so we might have a very large number of suspects cases in comparison with actual cases, maybe way out of proportion. And all of that activity involves not only patient interview, which is critical for assessing...getting risk factor data, but also many phone calls to providers and labs, all of which could be made much more efficient and less burdensome to both sides, to public health as well as to the providers and laboratories if there were improved integration with EHR data; and then finally the collection and transport and tracking of lab specimens, as I mentioned before. Next slide, please.

We have made a lot of progress on...oh, let me just talk about the description and initial analysis of data to develop hypotheses about the source of transmission; that's the next major step once we start to accumulate a good number of the cases, try to assess how this infection might be transmitted, then conducting all of the laboratory testing that needs to be done. And I just wanted to mention that because of our current systems with electronic lab reporting, a good system where we have interoperability between our ELR data and our surveillance system, we have made a lot of progress on integrating laboratory and epidemiologic data.

This is huge; because I remember, for example, sitting in our emergency operations center during the H1N1 outbreak and having the labs results with the number of positives. But because the system at that time did not integrate lab and epi data, we couldn't say which patients those lab results were for and whether they were an individual with mild symptoms or a school principal who had just been hospitalized and died or a pregnant woman who had presented in preterm labor. So, we have come close to fixing that; our public health laboratory now talks to our epidemiologic database and we're getting good lab data primarily from the hospital and commercial laboratories.

But the big gap, I think, really is in integrating a lot of the clinical data electronically. We...I mentioned our web-based data system and it's wonderful, but it's not integrated at all with the EHRs, which I really do believe is the next major frontier for public health that will be very challenging.

Okay, I'm going to go to the next slide. So public health reporting is critical. I remember that when I was a pediatrician and sometimes case reporting could seem like just a bureaucratic requirement, it's hard to understand why you have to do it. Ideally we would like provider reporting to be as minimally burdensome as possible and the information from providers could ideally be as automated as realistically feasible and not be redundant with our ELR data to the extent possible. I think that would be ideal.

For example, in New York City we're thinking about removing hepatitis C as a provider reportable disease, but right now we still do rely on those provider reports to detect problems with the completeness of our ELR data. But we could use EHRs for that, if we had the ability to query them.

Same with high-volume STDs and the critical need for treatment information from the clinical sector; this could ultimately reduce the burden on providers for individual case reporting. Our laboratory data is extremely powerful; it has improved our systems greatly, but is still problematic. And I've already talked about syndromic and the possible role of EHRs and RHIOs. Paper and phone is still important and for those unusual cases we will always be relying on an astute clinician to report certain types of diseases and certain unusual situations. Next slide, please.

When we have larger or more complex outbreaks, we have a demand for real-time data making electronic integration more critical. Also there is a definite use case for bidirectional communication with providers and labs and we have done some of that working with an outpatient network in the Bronx and inserting alerts from us into the EHR system to prompt...to provide information as well as to prompt reporting in certain situations. So hopefully that type of work can move forward as well.

We...in larger, more complex outbreaks, there's a lot of focus from the media and from our leadership on individual outcomes. This is a very challenging area for us because in order to detect outcomes such as did the patient get discharged? Did the patient die? Did the patient get better? It's...we would have to follow up on those patients every day and we can't do that, we simply don't have resources to do that.

In these outbreaks there is a need for rapid GIS analysis and maps and we've definitely gained proficiency in that area as I showed with the Legionella outbreak. And we then have to evaluate our control measures and treatment. All of this is extremely dynamic, so all of our systems must be flexible and must be scalable. Our own system now is extremely flexible, we can add data elements easily in less than a day, and we can...because it's a web-based system it's much more robust than what we used to use, which was Access, Excel, those types of systems. And then in these larger outbreaks, multiple jurisdictions can be affected, so having systems that can work across jurisdictions and common case definitions and common standards is clearly ideal. Next slide, please.

So, the key areas where I think EHRs could help are...some of them are quite simple, like literally providing improved demographics and contact information for providers and patients. All this work requires that we be able to know where a patient lives; reach a patient, interview a patient and in order to do that, we need the demographics. And same thing for the providers; frequently we need medical information, we have to call a provider and we that...we need to know who that provider is and how to reach that person rapidly. So EHRs have a lot of that information and sometimes it's not available from the labs that are reporting to us.

We also could use EHRs for individual patient lookup as well as querying and population-based data, which would be extremely helpful in a number of the ways that I suggested. For routine reporting to support detection, EHRs would be...it would be great, although I realize this is an extremely difficult area to move forward in, for case finding once we have a known outbreak, it would be fantastic to be able to query using a case definition and then also to look for confirmed cases.

And then to assess medical risk factors. So clearly you're not going to get, well you might get some travel history as mentioned before, but you're not going to get a full travel history. You're not going to get a great occupational history or a food consumption history from an EHR, but you can find out if that person has diabetes, if they have neurologic underlying disease and these medical risk factors for disease help us to target the population who is at risk; and that's critical for some diseases. And identifying populations in need of care; we're working on hepatitis C, we're trying to find those populations to reach out to them. This is an area that would be really helpful if we could use EHR data for checking outcomes and severity of illness, as I just mentioned, and then the bidirectional communication. Next slide, please.

Many times discussions about outbreak management focus on detection, the fire alarm. But once detected the management and need for ongoing information is far from over. The pieces that EHRs could help with are finding all the cases, confirming them, assisting with provision of specimens for laboratory diagnostics, determining who is at risk from a medical point of view and tracking the course of the outbreak, as well as evaluating interventions and determining the outcome of those interventions. All these are critical to putting out the fire and restoring our population to health. So I'm looking forward to hearing about collaborations in the future with these goals in mind and thank you very much for your attention.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you, Annie. Jim, I just want to remind you that we're...this section ends at 1 o'clock, so...

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Okay, great. Is it okay if we go a few minutes into break, Paul or do we need to...

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Yeah, just a few minutes; we do need to give people a break.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Okay, right. Great. So Janet, we'll turn it right over to you. Janet? And we can move to the next slide, too.

**Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

Thank you so much, everyone. This is Janet Hamilton from the Florida Department of Health and also I'm a member of CSTE and sit on the Executive Board for the Council of State and Territorial Epidemiologists, where I represent the surveillance and informatics steering committee in that vein. I'm really honored to be talking with all of you today and I applaud the committee for convening this panel on this really crucial topic and I think that you'll find many common themes between this presentation and the others. Next slide, please.

While we're talking about the context of outbreak management, that's really set in this broader context of public health surveillance. Public health has many interactions with clinical care and we have different data needs depending on those individual surveillance activities. When you think of vital statistics, like birth and death registries, large registries for illness events like cancer or birth defects, the reportable disease and condition surveillance which you've heard a bit about already today, but that's really where public health issues, that list diseases. And then we expect that when they're identified by providers, clinicians or laboratories that they will send us the information.

The outbreak management activities which we'll be talking a lot more about, periodic active surveillance and you heard some of that specifically in Dr. Fine's presentation where she gave the example of New York City actually actively calling to identify additional individuals associated with the outbreak. And we often do this active periodic surveillance associated with outbreaks when we're trying to find more cases. Another example specifically in Florida here is, after the enterovirus D68 was identified earlier in the year, we then requested labs to send us, our public health lab, additional specimens so that we could do testing to evaluate them for enterovirus D68. And then, of course, we have additional needs and interactions with clinical care around emergency response events; things like hurricanes, wild fires, or post-Haiti earthquake. Next slide, please.

So reportable disease and condition surveillance, that's really the traditional core of our public health surveillance activities. And what we're trying to do on the public health side is to learn about every single person with a reportable disease. So we want to then do that in order to promptly identify all cases of the disease or outbreak and determine if they require public health intervention. We do that to plan, assess and evaluate our control measures and prevention interventions like vaccine and is a vaccine is effective? And also we do...our reportable disease activity is to detect individual outbreaks, to detect those changing trends or patterns in disease occurrence.

And so when we make something reportable, the expectation then is that we will be notified of every single event. And the purpose of that notification is that public health, for the most part, follows up on each and every one of those. That means most of the time, calling the individual to do an interview with the person in order to identify their risk factors. It would really be ideal if that initial report had all the information we need to contact the patient, but many times it doesn't. Next slide, please.

So looking at the conditions for which reportable disease surveillance occurs, this is a pretty common list, this is Florida's list of reportable diseases and it covers the gamut; infectious diseases, environmental diseases, birth defects, cancers, occupational diseases, all of which have the potential for outbreaks and clusters. And what I'll really focus on then is this concept around outbreak activities of the detection of the initial event, the situational awareness, once detected that monitoring of the events to provide updates on progress, is it getting better? Is it getting worse? What are the new areas that are impacted? That's situational awareness.

And then how are we best actually manage the outbreak. How are we going to do what we need to do in coordination with clinical care to prevent secondary cases from occurring? Issuing those countermeasures and then evaluating if what we're doing is actually working. So as I said, we want to know about each and every individual event, and largely when you look at this reportable disease today, even though state law requires reporting by clinicians, labs and hospitals, the detection activities are really burdened by ELR. We really rely heavily on the labs.

ELR between the private sector and public health is really important and in Florida now, over 60% of all of our cases were first identified through that receipt of an electronic laboratory report. It is incredibly improving both speed and timeliness, both of which are critical during outbreak situations. We are able now in Florida to more quickly identify individuals, so we've cut our case identification time from nine days to five days, that's really four days earlier than for us to do our disease prevention work. Four days earlier to identify possible exposed individuals and four days sooner we can prevent, for example, someone who may be sick from infecting others.

Unfortunately, we really do see a lot of missing patient contact information, and this has come up a few times, but it's very time-consuming to track down that information so that we can do that reach out with the patient. And we're using important provider time to try and track down that information by following up with them, as well as using public health resources that could be used more efficiently.

We really see some of the most critical pieces of information missing when we interact with our reference labs, so those individual locations where specimens have been forwarded sometimes multiple times. And I would just say when you think about this, the more that specimens are forwarded, the more information actually becomes lost. Sometimes we don't even get the individual provider who ordered the result, so when we're missing patient information, it becomes really difficult to try and follow back and particularly in outbreak settings, then we have difficulty linking back with the clinical care provider. Next slide, please.

We also do a lot of work for our outbreak activities around syndromic surveillance, which may be better called, in some situations, pre-diagnostic surveillance. And the thrust of syndromic surveillance initially was to detect events, even before diagnoses are made. I think where we've really seen tons of benefit is in the situational awareness arena where we're able to monitor the progress of larger events once they're actually recognized, and we'll look at some of that.

I think when you think of syndromic surveillance, it's really speed versus completeness. So, how can we get data in more quickly which could help us on detection and providing better situational awareness? But we may be missing some key pieces of information. For us right now, one of our crucial data sources is emergency department visits. So essentially we're getting an individual record for each emergency department visit that occurs in the state and what we do then is run some algorithms to determine where we're seeing certain increases and certain kinds of disease events. So for example, are we seeing increases or decreases in influenza-like illness?

Because we do get individual records, although they are completely de-identified, we've also had some good success in implementing some other kinds of detection algorithms around individual cases. So, here what we have done is actually automate some processes for running what I will call key word searches on that chief complaint data, essentially what the patient says is wrong with them when they show up at the triage desk and we're looking for missed cases of reportable diseases. Again, those things required by law to be reported to public health so that we can do some of this additional outbreak investigation and other activities, but sometimes aren't reported.

So for us, during calendar year 2014, through using our syndromic surveillance system, we were able to identify 279 cases of reportable disease that had not been previously reported to the county health departments. And of those, 34% were actually part of clusters and those clusters that we looked at that had previously not been reported or identified included pertussis, cryptosporidiosis, E. coli, shigella...shigellosis, varicella, ciguatera fish poisoning, carbon monoxide poisoning and pesticide related illnesses. There's still a lot of work to be done on the predictive value positives, but it certainly demonstrates, I think, a real critical potential for how we could improve some of our interactions and certainly improve case reporting. Next slide, please.

So how does public health get a lot of its needed information? As we've talked about today it's that initial report from either the clinician or the laboratory that often does not have all of the information that public health needs for completing the investigation. So I've listed some of those here, I mean, public health really needs the person, the place and the time. Who is impacted? When is the event occurring? Where is it occurring? What is affecting the individual? So the who, the when, the where and the what.

And you know, when we look at all of the things that public health does depending on the exposure or situation, maybe more or less of the information will be in the electronic health record. Certainly if the exposure is in a healthcare setting that could expect more, but many times it's not. So I think we have a reasonable expectation that we could have good clinical and laboratory information to help us confirm the diagnosis, especially when we have the changing case definitions and certainly an expectation of good treatment information or medications given to the patient.

Depending on the individual situation, we may or may not be able to use the EHR to find additional information about where the exposure event actually occurred. If it's in a healthcare setting, hopefully that would be a great resource, but certainly if it's outside of the healthcare setting, so for example something like West Nile, probably not as helpful to determine where the exposure event occurred.

Maybe we could utilize information to determine the denominator present, the total number of people exposed or impacted but likely not. Information about the environmental setting, how the patient may have become ill? For example, was it due to an insect bite, food consumed, exposure in certain travel locations, and then further prevention activities needed. Have we identified all of the exposed family members needing treatment or vaccine? Next slide, please.

So, looking at those outbreak management needs during outbreaks and events, what's really different about outbreaks? And I'm going to look at some examples, as we did in Dr. Fine's presentation, but I think, you know, so we've talked about reportable diseases and topics of detection, situational awareness and mitigation. And one thing that I just really want to highlight that's different about outbreaks is speed; the speed at which information needs to flow. Everything is on a really compressed timeframe and it's that really compressed timeframe that can make a big difference and it's a more compressed timeframe than for having interactions with clinical care as well.

We will never get rid, I think of...and nor do we want to, of actually having the opportunity to talk with clinicians during outbreak settings, but we certainly have an opportunity to improve our efficiencies with electronic movement of information so that clinicians are spending their time interacting with public health in areas where we really need their help developing additional guidance documents or looking at clinical spectrums and pictures. But spending less time actually trying to provide some of those nuts and bolts information to public health that could be gotten in the clinical record, so that essentially the clinician can really be providing or spending more of their time doing clinical care and public health, of course, is then spending less time gathering information to do our disease control work. Next slide, please.

So we've been convened today under some of the challenges around Ebola and I'm going to try and not repeat some of the same kinds of things that you've already heard, but it's new, there's lots of public attention. And certainly for us here in Florida, one thing that's been really different is the detailed daily travel monitoring for the 21 days. We have lots of handoffs at our individual county health departments and lots of handoffs across state lines, because we're actually keeping up with individuals for 21 days so everywhere they go, whether they're staying here in Florida or whether they are traveling to another state.

We are able in Florida to track those travelers in the same system that we would use when we report cases. So, the good news is that we do have a seamless interaction between our reportable disease surveillance system and our outbreak management system. But there's still a lot of activity that public health has been doing around the monitoring that's been somewhat new to us and certainly all the interactions that we've had.

We've also worked really hard to identify potential cases, to really improve that detection event. And again, here's where we have used our syndromic surveillance system. And when we first started doing that...so we had about a four-week period where we started looking at our syndromic surveillance event results and we put one of these free text queries in place and we actually identified 27 visits of folks that had presented to the emergency department or urgent care. Most of those, I would say, once public health did the initial follow-up and interaction, really had no risk factors for Ebola. We did identify four patients that were part of an Ebola hospital drill, so I think we were really happy that our detection algorithm was working. And then we had four individuals that did have appropriate clinical symptoms and had travel exposure but when we did the additional data collection activities, those travel exposures were for non-affected countries. So again, it's really trying to improve our detection activities. Next slide, please.

Around H1N1, we also had some key challenges; we had many new susceptibles in the population. One of the really big things that stand out here is how communicable it was, it was spreading so quickly that public health quickly became overwhelmed with individual case counts within short period of time. So we were relying heavily on our syndromic surveillance system to provide situational awareness for monitoring the event.

Additionally, we were really dealing with the speed of information. We were having daily questions about what the trends were, whether they were increasing, decreasing or staying the same. And you can see in this graph below, the red line is data from our syndromic surveillance system where we were monitoring influenza-like illness results.

We also had a big challenge initially around specimen collection and forwarding the specimens for testing because there was no testing to identify this new strain in the private sector. So we had lots of requests from clinical care for testing, and that was really new to us, to be sort of the primary diagnostic location. And of course, very early on, CDC was the only location where that clinical testing could be completed and we had huge pressures to get those results back. But there was no electronic ordering system and results were slow to come back from the federal level coming on paper, resulting in lots of results getting triaged in order to link those laboratory results back to the individuals and of course provide those results back to clinical care. Next slide, please.

During fungal meningitis, we also had some key challenges. So, this situation of the multistate fungal meningitis infections associated with injections as a preservative free methylprednisolone acetate compounded by the New England Compounding Center again, lots of clinical and public health interactions. In Florida, we had a total of exposed individuals of over 1000 and that was really only...ended up being in two of the four affected counties and we worked very closely with clinical teams to reach all of those exposed persons with multiple calls, home visits and tracking, including tracking people who went overseas.

We had very detailed clinical record reviews. Unfortunately, we found poor clinical documentation of medications ordered versus administered in the EHRs. And really, what we ended up having to do in Florida was identify those persons exposed based on product shipment dates rather than actual product administration.

We had challenges around long treatment courses and they were difficult on patients and we needed to track those patient outcomes. This was new and unusual, we weren't really sure how patients would respond overall and many had underlying health conditions. We had challenges around screening of individuals. So now that we had these exposed individuals, some of the recommendations that we issued...

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology –US Department of Health & Human Services**

Janet?

**Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

Yes?

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

I'm so sorry, Paul...I mean, we do need to go on break just to keep on schedule but we will come back to you right after break...

**Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

Okay.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

...and let you finish. I'm so sorry for the interruption, but we do need to go on break and we'll come right back to you after break. Paul, do you want to let us know when we're coming back, or Michelle?

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Yeah, so we'll be back at 1:15, it's really just a bathroom break, to stay schedule.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Okay, great...

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Why don't we...Paul, why don't we give people a few more minutes just so they can, if they need to do something. Could we do 1:20 PM?

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Sure, 1:20 PM.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Okay. Thank you, so we'll be back at 1:20 PM. Thank you everyone.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Sorry for the interruption, Janet but we'll come right back to you when we're back.

**Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

No problem.

**Operator**

And we're back.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thank you. Jim and Janet and Paul, is everyone back?

### **Multiple speakers**

Yes.

### **James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Janet, are you ready to go?

### **Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

I'm ready.

### **James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

We'll turn it right back to you then and get started. Thank you.

### **Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

Okay, great. Thank you so much. So as I was mentioning with fungal meningitis, one of the really key things that we saw that was challenging was around screening issues. So we had some physicians that were hesitant to perform some of the screening activities that we requested which were lumbar punctures on individuals, because of other patient concerns. But we really wanted to be sure that we were following up with them then, to give them the most new and important guidance.

So, we had the high demand for case counts, updates twice daily, number of new cases, the number of exposed, the number of individuals reached, and of course those numbers and information kept changing. While we were really excited about the potential and use for EHRs, we did find some frustrations with our utilization of EHRs here in Florida. Staffs at the individual facilities were not familiar with how to perform queries to return the sets of results. They were very familiar with looking up individuals for an individual encounter and putting notes in related to that individual, but not necessarily querying across the system to identify a set of individuals that may have been exposed.

Additionally, we saw challenges around how information was actually recorded in the EHR. So, we found that a lot of information was often not recorded. Other key procedure information was also not recorded. So again, we ended up having to cast a much broader net to identify all persons exposed and the EHR really could have been beneficial there to limit the number of individuals that we needed to follow up and manage, and also the number of individuals that needed to be followed up and managed clinically. We had multiple resource intense outreach efforts to all exposed individuals and that initial outreach for active case findings was very important.

I'll go ahead and move on to the next slide in the interest of time. And I just want to highlight a couple of things on the MERS outbreak. Just a few points that really stand out, we had multilayer contact tracing. For MERS, there was a very big concern in healthcare setting around exposure to healthcare workers and again, tracking those contacts was important because we actually ended up putting healthcare workers on furlough for a time.

Additionally, we wanted to use the EHR for identifying contacts, and it was there useful for identifying certain contacts, for example, the individuals that were waiting within the waiting room. Although we realized quickly that most ill individuals are actually waiting with someone in those waiting rooms and of course, the EHR did not record those who are waiting with the waiting. It also really stands out for laboratory issues; it's so new that we didn't have good guidance on what specimens to collect. So we cast the net broadly and collected a lot.

Initial specimens were negative, but it was actually the induced sputum specimens that were best and so it was that information then that we utilized when collecting additional specimens, especially on those high-risk exposures. It also stands out for another reason in terms of additional, I guess the term special studies for all exposed. So, we don't have good information around MERS for the secondary infection rate. So we actually wanted then to do some follow-up work on all of those airline contacts, healthcare workers and others exposed to get both acute and convalescent specimens to determine asymptomatic infection rates. Next slide, please.

You've heard these individual examples, so next slide, please. Again, what we're doing every day is the slide that I'm looking for. So again, we do all of this work every day and here are some examples of current outbreaks that are going on at the county health department level. I'll highlight just one here which is different in some ways because it's associated with the carbon monoxide in warehouse workers where we've seen sit...in this individual situation, it's very important that we have good information about their occupational history. We had exposures in an individual warehouse where a forklift was operating inside and they had closed the doors because of cold weather. All the exposures were Hispanic males and it highlights that real need to capture good occupational information as well as demographics to assess disparities.

For syndromic surveillance, next slide, please, often referred to as our event monitoring, I'll just highlight that we have utilized our syndromic surveillance system...again, next slide, please...for our event monitoring activities. We've utilized it heavily after certain events like hurricane Wilma where, if you look at the first graph at the top, we saw an increase in carbon monoxide, the middle graph increase in bites and stings and the bottom graph increases in injuries. All of these enabled public health to do a lot better on our prevention messages and getting those out.

The individual slide...or the individual graph over on the side of this slide is what we saw post Haiti earthquake related to morbidity. We, in Florida, had a number of individuals that presented for care after they had been evacuated and we wanted to monitor those individual events and determine what their care seeking needs were. And also help loop back with the clinical sector is to determine where patients may be needed to be diverted. Next slide, please.

Our outbreak and event detection needs; it's really important that we establish dataflow connections and leverage those electronic feeds, ideally prior to events. It's this balance between the speed of information versus the completeness. Different electronic connections support different activities. With electronic laboratory reporting and syndromic surveillance, we have utilized those very efficiently in the public health sector, and that's a real success and steppingstone. Ultimately, our public health goal is to reduce the time accessing and gathering information, patients are contacted sooner; the source of illness is identified more quickly, leading then to improve disease prevention. Next slide, please.

So what is our future state? I would say it's really to satisfy our unmet needs, an expectation of electronic information sharing. Public health has been operating for a number of years in not necessarily the most electronic of environments. And sometimes we're too willing to continue to do business under old paper models, but we really cannot afford to do that during outbreak settings. We would like to see a seamless interaction, and especially once initial events have been identified. Multimodal interactions, I would say, for public health and EHRs. It's not just the automated submission of information, but sometimes needing direct access into those individual records to identify and perform queries for not only specific individuals, but queries for a set of individuals based on known criteria.

I think our future state would also have more understanding by users of EHRs that EHR data is useful beyond an individual patient encounter to address population health needs. Many times, we see information isn't recorded correctly or accurately in EHRs, and while if an individual is looking for that record in reading through the information with a patient in front of them to provide clinical treatment, the information is there and documented. But, to do some of these broader activities that we're interested in doing around outbreak management, querying sets, identifying individuals exposed. We really need the EHRs to be used effectively and to have that information recorded in the locations that we're expecting them to be recorded in; so really, a more full understanding of the potential and the range of the utility of EHRs.

So just to finish up, I guess what's not on my slides, where do we go from here? I think there's really so much information that we are discussing today that we're just scratching the surface on public health and clinical care and interoperability issues. We really see this as the beginning. We'd like to see the Policy Committee either convene a task force or a group of individuals to really flesh out some of these ideas, to move the dialogue forward to the next step and we are really pleased that we are having this dialogue today.

We see a need for consistency and coordination across federal programs; I think that's number two. This will really help us move forward effectively, rather than continuing to operate in fragmenting ways with differing guidance and differing sets of standards; another area where I think this group could be very influential.

And then the third one I think really is to keep our interactions with clinical care and the private sector efficient to help us think through how we can save time, allowing providers more patient time and public health more time to do disease prevention. We in public health are able to benefit then through the same resources and funding incentives that the private entities have benefited from in order to do this effectively. Thank you all so much.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thank you, Janet, very much. Paul, do you want to move to some committee discussion and we will keep the next set of presentations much shorter so that we'll have the 30 minutes at the end for discussion as planned?

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay. Well, we have to watch our time here; you have about...a few minutes left.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Okay.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Do you know how long each of the remaining speakers is going to be taking?

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

We can get back on schedule so we start our discussions at, I believe the agenda says at 2:15 PM, so we will stick to that. So we'll be done by 2:15 PM to start the discussion at the end.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Great, so just...yeah, thank you for managing that. Are there any questions for Annie or Janet? Anjum?

**Anjum Khurshid, PhD, MPAff, MBBS – Director, Health Systems Division – Louisiana Public Health Institute**

Yes, thank you for the presentations. I think it was the question of data aggregation and patient identification across different systems was raised in both the presentations. So if you could comment briefly your experience in New York or Florida of trying to utilize health information exchanges that either the state HIEs or regional HIEs. And are there certain features that may be more helpful if HIEs include certain kinds of data that may not be available to you right now?

**Annie Fine, MD – Medical Director of the Reportable Disease Data Analysis and Informatics Unit, Bureau of Communicable Disease (BCD) – New York City Department of Health and Mental Hygiene (DOHMH)**

I can comment a little bit; this is Annie Fine. We actually are doing a study on that right now looking at two health information exchanges in New York City. They're not very integrated as compared with some other parts of the country, but we have three health information exchanges in New York City right now. But looking at two of them, we did compare them with our traditional case investigation data and found that at least currently, they're very good for getting laboratory, x-ray, admission dates, that type that of data but they're very poor for getting actual symptom data or case onset type of data.

So those types of data would be quite helpful to improve within those HIEs. They're probably more difficult to structure, but that would be extremely helpful for us. We're also using them for person finding in large public health emergencies across facilities; haven't actually utilized that functionality yet but it is set up and ready to go should we have another situation like hurricane Sandy. So, just...Janet might also want to comment.

**Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

I think you summarized it really well.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Great, thanks. Are there any other hands raised Paul or should we move on?

**Paul Tang, MD, MS – Vice President, Chief innovation and Technology Officer – Palo Alto Medical Foundation**

There aren't any so why don't you go ahead.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Great, thank you very much. So next we're going to hear a little bit about what happens in a public health lab. So we've heard, I think, from both Janet and Annie how oftentimes the tasks that are happening to support public health response aren't being done by commercial labs and hospital labs because they're not capable. They don't want to perform them or that expertise really just...in the public health labs and so we need that interoperability with our public health labs as well, both to be interoperable with clinical care and the with the other public health systems. So we're going to be hearing from Scott Becker, who is the Executive Director of the Association of Public Health Laboratories as well as Chris Atchison, who is the Director of the State Hygienic Lab in Iowa. I'll turn it right over to you guys.

**Scott J. Becker, MS - Executive Director - Association of Public Health Laboratories (APHL)**

Great, thank you very much, this is Scott Becker from APHL. I'm trying to go at rapid speed to keep us on time, so, next slide. For the course of this short presentation, I want to focus on even why the question on focusing on laboratories, give a short frame around the public health lab systems and examples of the labs in action in preparedness and response. Discussion about some of the challenges related to search capacity and then we'll wrap up with impacts on HIT. And also Chris will talk about the interconnectedness from the state perspective. Next slide.

So why even focus on laboratory data; very importantly lab results are a component in 70% of clinical decisions. With the advent of point of care tests and rapid diagnostics and other things that is even going up. The statistic I show here is how many billions of lab tests are performed annually, that's actually very old data; it's now about 12.5 billion lab tests and increasing. So, the data points are in incredibly...that the number of data points is just incredible, when you think about it. Next slide.

We've used the term public health laboratories throughout a number of the conversations today and I want to focus on some of the mission differences. I think they're pretty clear, but just to be even clearer. Clinical and hospital labs have the different mission than public health labs, some...there is some overlap but the focus for public health labs are on populations. There are times when we pivot between being a typical clinical lab and a public health lab and that happens often during outbreaks, especially in the beginning. But the key is that it is interdependent, so we really need that connectivity in order to identify public health threats. Next slide.

I want to give the definition of a network which is a group or system of interconnected people or things. APHL and our members view state public health laboratories as a system and our definition of the system is, an alliance of labs and other partners within a state that supports the 10 essential public health services under the aegis of the state public health lab. The system members and stakeholders operate in an interconnected and interdependent way to facilitate the exchange of information, optimizes services and optimizes core functions of public health labs. So, you can already see that a key component of what we do is data exchange. Next slide.

If you look at this depiction, it's the continuum of public health laboratory...of laboratory services and the connection between both specimens and data and information, beginning oftentimes in clinical laboratories. And as you heard from our epidemiology colleagues, moving up to the state level either a state epi, state public health lab and then, of course, the federal reporting requirements. Next slide.

On this page we give some examples of some of the testing that's done in a typical state public health laboratory. So you have things from newborn screening, which is really hundreds of thousands of tests, actually millions of data point each year, rabies testing, which is not nearly as high and then all those white powders. The white powders that need to be tested, we call those just white powder events, there are thousands each year. I can guarantee you that a public health lab is testing for white powders today, all the way through TB and then monitoring of things like radiation from any nuclear power plants. Next slide

I want to highlight of the 11 core functions of public health labs, the few that are directly relevant to this conversation; disease prevention, control and surveillance. A core function of a public health lab is integrated data management, this is really a focus, and I'll get through to some examples later. Of course reference and specialized testing and then the preparedness and response function. Next slide.

In terms of disease prevention, control and surveillance in partnership with epidemiology, testing for emerging and reemerging diseases, antibiotic resistance of course and newborn screening as we discussed. Again, the focus is on recognition of outbreaks, early detection and population -based surveillance. Next slide.

I want to give some example of cost savings. Now admittedly this data is about 10 years old, so this is something that I think the system could do better, which is quantifying things. But if you look at the data as of 10 years ago and think about where costs have gone now, the fact that we do this testing really does save money in the long run. Next slide.

I want to give an example of a laboratory network; PulseNet is an example of a network that's utilized again every day, its DNA fingerprinting of bacteria from patients to find clusters of disease that could represent recognized outbreaks. It's a national subtyping network and it's been in constant use for about 15 years. So participating labs upload data to the national database, there is database management locally that's used. What's going to change here is the advent of new technology, next-generation sequencing and the many, many, many more data elements that are going to come from that. So, I think we're going to begin to see shifts in...even within the public health networks of the amount of information that's needed to be transferred. Next please.

We'll go on to preparedness and response. Laboratories have a key role in disaster preparedness in terms of the rapid identification and collaboration with all the other key partners. Also surge capacity, as a system we help each other and that's proven time and time again during outbreaks. And as was discussed earlier, outbreak situations sometimes bring out the best and sometimes the worst, right? You have opportunities for sharing in outbreaks, but they tend to be high profile events, a lot of pressure and this is where public health is also political health. The laboratory doing a test could have the governor's office calling, certainly state epi, state health official, CDC, FBI, you name it, all waiting for that result. It's an incredible amount of pressure in an already pressure filled situation. So that need for surge, that need to help each other out is built into the response. Next slide.

So I'm going to go back to the earlier days of bioterrorism and the anthrax response from 2001. Public health laboratories tested 125,000 samples in a four month period and that represented more than a million tests at the time. There was not good data flow then; we were collaborating with the U.S. Postal Service, CDC and others. So it was again, one of those very pressure filled times; we did not have the systems in place. Again, those threats are still there and there are still those thousands of white powder events each year. Next slide.

The network that was stood up in 1999 by CDC, FBI and our organization is the laboratory response network. It has a multitude of types of laboratories that each have a different role in the network. Next slide. For LRN-B, which is the biological component and that's what I'll focus on here, it's a tiered approach. There are sentinel clinical labs; these are hospital labs, these are private labs, some local public health laboratories, thousands across the country that have a job to recognize, rule out and then refer upward to the next level.

Which is...next slide, confirmatory level...I'm sorry, the reference level, which are typically the state and very large local or municipal public health laboratories. There are about 160 of them currently in the country and 70% of them are within the governmental public health sector. And these are the ones doing the testing for level A agents and the others. And they all have BSL-3 capabilities. One of their jobs is to provide that data to inform public health decisions. So this is the level of the lab where everyone's waiting for the results to come out.

The next slide describes the federal labs, the national labs and these are largely at CDC and within the Department of Defense. They are responsible for the R&D, if you will; assay development and then some very specialized testing. And they have the highest level of biosafety capability and capacity. So that's really the network. So how...next slide.

How does reporting happen in this network? Early reporting of LRN results was through results messenger; this was deployed in 2003. It's a standalone application and it facilitated electronic reporting of LRN data for the first time and it dramatically reduced the latency, the reporting latency, but it still required manual entry. So what we've now done is moved from the LRN results messenger to a new initiative, using that same system, but it's an integration; it's called LIMS<sub>i</sub>, LRN Lab Information Management System integration. And CDC is partnering with us to optimize information flow between CDC and the participating labs.

So this is really where, if you can imagine data coming off the instruments, going through the LIM system and then going directly to CDC. So it's a direct connection, it's a much faster approach. So that's an example of where data integration has been a success. Let's move onto another example which is pandemic influenza. Actually, I'm going to take a quick drink here. So, next slide after that.

I wanted to talk about how influenza data is delivered in this country. As of today, 49 state labs can send lab results for influenza directly to CDC using an automated message, and we're now going from 2.3.1 to a new standard of 2.5.1. So we're expanding that. What's happened through this initiative called the PHLIP, the Public Health Laboratory Inf...okay, Interoperability Project, was to speed the data to CDC epidemiologists so they can see at a national level what was going on. So we have near real-time flu surveillance data. This is the data flow that comes into CDC for the FluView, for those of you who know that system. It is a much, much quicker way and its reduced time and other resources for epidemiology tremendously and it's really helped the laboratory as well.

So let's move forward to two slides from now and remind ourselves about H1N1. We talked about H1N1 in some of the other talks, so I'm not going to go through the case details, but we know that it showed up in Texas and it was confirmed as swine flu. Next slide.

What happened in Texas was indicative of what was going on very early in the country. So just to give you a sense of how things quickly snowballed, look at the number of practitioners that responded to saying they would submit specimens. It went from eight to 1000 in just a few days, so it's an outbreak built up very, very quickly. Next slide.

I called the experience in Texas the Texas two-step, okay? And the reason I do that is because if you think back to one of the first slides when I talked about the mission roles of public health labs versus clinical, in this case in the U.S., public health laboratories had to take that clinical laboratory role. And then only later, after surge, were they able to pivot back to the role as being a surveillance laboratory, if you will, to determine what was really going on in the country.

Having begun the process of moving data electronically for influenza, we were able to very quickly modify the message when H1N1 was determined and once we determined what the nomenclature was etcetera, and working with Regenstrief, we were able to push out a message through the network so that that reporting was just seamless. And that worked out really, really well.

It gave us the idea that we should look at an ROI, what has this really done for our country and what will it do? So we contracted with RTI and they published economic analysis of the PHLIP project and we estimate by 2018, which is not that far away, it'll save over \$3 million for the system. That doesn't sound like a lot, but in a governmental public health world, it is a lot. Each lab saved up to \$10,000 a year doing this and we...I don't have the data on the exact cost for CDC, but we know that the data is now harmonized across the country. So we know that that's been very helpful. Next slide.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

So we're going to have to give you the five-minute warning and you might want to skip maybe towards...over to the end with your big picture and data flows, because I think those are some of the things the Policy Committee would really like to hear about.

**Scott J. Becker, MS – Executive Director – Association of Public Health Laboratories (APHL)**

Okay, let me...before turning it over to Chris, I want to just point out that if you think about outbreaks, outbreaks require a surge of some sort. So we'll go to the slide that's IT needs during surge. There are interoperability needs; there are human resource needs both for informatics and for laboratory. There is the need for flexible and adaptable systems and also for scalability.

But my last point is that we need bidirectional data exchange with federal agencies, and that was the point Janet made as well. I mean, it's not just during search. So what I'm saying here is yes, we as submitters will also like electronic result reporting back from our federal counterparts as well. And again, not just during an outbreak. So I'm going to turn it over to Chris to talk about state specific needs.

**Christopher G. Atchison, MPA – Director, State Hygienic Laboratory – University of Iowa; Associate Dean for Public Health Practice, Clinical Professor in Health Management and Policy, College of Public Health – University of Iowa**

Well thanks a lot, Scott. And I assume I'm coming out across okay. I want to thank the committee for allowing the public health labs to contribute to this. I think the examples that have been given from epi before include much of the public health laboratory thinking. Indeed, I would argue that labs inform much of the evidence that epidemiology discussed during their presentations. So, I'd like to circle back to some key themes that have marked this discussion as well as get into the kind of specific examples that Scott described.

One of the important themes, I spent a bit of time in policy discussions, one of the important themes that I think needs to be well appreciated is the distinction between personal health and population health. The Maryland Health Officer, Josh Sharfstein, just wrote an article for Milbank Quarterly recently in which he talked about the insurers are now using "population health" to refer to practically any effort to enhance the health status of who, their members. Consequently when we talk about population health we really need to have an understanding of its breadth.

And if I can go to the slide on Meaningful Use and obviously that's what we're talking about, this committee began your discussions this morning talking about the second stage. Meaningful use, I think, when it gets to its full implementation does need to have this very understanding knowledge of what population health and public health means. And I think this discussion should give you a lot of information in that regard.

If we can move to the flow of data today's slide, which is a couple down, I think Scott described in detail kind of how it works, but consistent with this notion that I've laid out of population health, I'd hope that you kind of think about two systems that interact, moving from a population...a personal health care system that involves patient-centered care, with the public health laboratory, to a certain extent, as the nexus in this modest Venn Diagram moving into the kind of dynamics that Bryan Clark described, population health describing.

Moving on, the big picture slide; this describes not at is systems level, but more at an operational level the kind of interconnectivity dynamics that need to exist. The arrows there need to be virtual in time, in other words, public health labs need to be coordinating between themselves in a multijurisdictional, geopolitical multijurisdictional way, not only across states but obviously to the nation as well. And so that kind of an activity informed within an all hazards type of context is terribly important.

Moving on, some of the important essential capabilities of the labs do include identification and surveillance. Some of the specific, though, issues, and Scott touched on some of these but I'd like to highlight, public health or healthcare focuses on patients; public health labs aim at population results and integrating information. Healthcare focuses on diagnosis; public health, as the epi discussion described, creates a context for the disease looking at it within the community as a whole. Specific diagnosis of identified disease, whereas public health labs are identifying unique cases, novel diseases using established tests where public health labs may very well have to develop new tests; laboratory developed tests is a common feature of public health labs. Using secondary data is important to public health labs and keeping that information, as the epi presentations described, is vital.

And the other thing we're not defined so much within an accountable care organization, that model for deliver today. But rather we're defined by organizations like the Centers for Disease Control or the Department of Homeland Security. The notion of patient confidentiality, while important in public health labs, nonetheless we need to have systems that enable us to inform public dissemination of that information. And I alluded to this, whereas diseases may be naturally occurring, in public health labs, in fact, we may be dealing with criminal activity. And so a whole different dimension how we keep information available for possible criminal activity later is very important.

Moving on to the next slide, the interoperability, just a couple of examples.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

If you could just move onto your top concerns slide, I'm afraid we really are think we really are running out of time. I think that one's a really important one.

**Christopher G. Atchison, MPA – Director, State Hygienic Laboratory – University of Iowa; Associate Dean for Public Health Practice, Clinical Professor in Health Management and Policy, College of Public Health – University of Iowa**

Sure, well, moving on to the existing structures; that describes how we have been funded in the past and it represents public health labs integrating a lot of sources to enable the kind of services that we've described. The current landscape, of course you all recognize that, that's the next slide in which the complexity is increasing, funding is not and the responsibilities of the public agencies are increasing while the availability of a workforce obviously across the professions is reducing.

If I could go to the top concerns, as I've been prompted, I think the unique and critical role that the public health community plays needs to be more actively included. I think my presentation tried to make that stress. I think the federal agencies need to look at their state and local partners as well as colleagues in delivering this critical aspect of population public health services that we've been talking about. And indeed including the laboratories as partners in this is terribly important as well.

And this includes the unity between not just the public sector laboratories but the laboratory response network reflects the clinical work from private laboratories, clinical laboratories and public laboratories as well and pulling all of that information together to support the kind of expectations that come out of today's discussions is vitally important. Again, thanks for the opportunity.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thank you very much to Scott and Chris. And just to save time, we're going to go right into countermeasure management. We have a very short presentation from them. We're going to skip our closing remarks and leave the last part of the discussion...the last part of the meeting for full committee discussion.

So we'll have Ben Erickson, a public health analyst with Strategic National Stockpile and Ulrica Andujar, a public health analyst with the Immunization Services Division very briefly go over countermeasure management. We'll end at the very latest by 2:15 PM and go right into the full committee discussion. Thank you. Ben...I'm not sure who's going first, Ben or Ulrica.

**Benjamin Erickson – Public Health Analyst, Strategic National Stockpile – Centers for Disease Control & Prevention**

Okay, thank you. First of all, I want to say thank you for giving me the opportunity to present here. It looks like we're going to have to jump through this. Luckily I don't have that many slides. I wanted to give you a little overview of what we've been working on for the past few years. This all started back during the H1N1 response, the fall and spring. We had...can you go to the next slide?

What we're going to do is go through the needs, what we identified going through the H1N1 response and then the inventory system that we had developed and what kind of...how does it address the gaps and how it mitigates some of the issues that we went through during the H1N1 response. Next page.

So during the fall of H1N1 response, we were getting overwhelmed by calls from our state and local public health departments that they were being overwhelmed by ad hoc requests for inventory levels. And this is the..., the N95 respirators, all the stuff that was used during H1N1; a lot of different agencies wanted to know, where is it? What are you doing with it? How much of it is being used? So instead of burdening the states to collect that information; we took the project of collecting it on behalf of them and then be able to report it out to these different agencies.

So we put together a medical countermeasure situation report which basically asked, where are you are distributing your products? How much of it do you have on hand? And when you distribute throughout the state, usually you receive it at the state warehouse. They'll distribute it to a regional distribution center if they have one, if not, they'll ship it directly down to their local health department and then from there they'll go out to the clinics, the points of dispensing, etcetera. So what we wanted to capture is, how much of this stuff do you have and where is it?

And during...these data elements were put together by different agencies that you can see here, and the goal was to get a situational awareness of what's on hand and kind of give us a foreshadowing, where do we need to focus our resources for future deployment. Excuse me. Can you go to the next page?

So this sheet was put together and sent out to all the different states, every single week, and the responses were collected and they were sent back to me and we would aggregate...collected the totals aggregately and be able to report it to these different agencies. The problem with that is that...sorry that my computer just froze. The states came back and said, well you know, you didn't really give us a heads up that we were going to be asking for this information, we didn't put procedures together or policies to track that type of information.

And a lot of times what they did is they pushed it out from this date warehouse, distributed it and kind of washed their hands from it. So there seemed to be...we identified a significant gap between state warehouses and their local health departments and having that line of sight or that chain of custody all the way down to that local level. So what we had decided to do is to bridge that gap between state and local or regional distribution centers and build an inventory system; if you'll go to the next page?

And with that...next page...with that...we decided to put a workgroup together that was made up of state and local public health workers, people that we work with on a day-to-day basis who handle products from the Strategic National Stockpile or others. And we wanted to find out from them what do they want in an inventory system? What do they need it to do? How does it need to work? And we had this group come together and develop this inventory system, which is called the Inventory Management Tracking System.

And out of these workgroup members, we developed a mission which is to increase the capacity of all levels of public health, no matter where it is. To track and manage the medical and non-medical countermeasures; so it's medical countermeasures for whatever type of event we're responding to, or it could be used for the day-to-day stuff or PPE, cots, paper, pens, anything you want to put in there it can track.

The focus of this is to track it during daily operations. We didn't want this to be a system where you only pick it off the shelf when there's an event or a public health emergency, we wanted constant usage or it to be scalable so they can use it for their day-to-day inventory, whether it's pens, paper, water, etcetera or in response to the event.

So by having this mission statement and this inventory system, what we're trying to do is bridge that gap, see what's on hand at all levels, not necessarily at the state or regional, but also down to that local level. And it also gives the end-users a way to have the chain of custody so they know what's going on and have that capability to track and manage it, no matter where it is. Could we go to the next slide, please?

So this inventory system, the framework was vetted through state and local public health professionals who work with their inventory every day and know what they need, and we wanted to build a system for them. It was designed, obviously to focus on the day-to-day operations, so there isn't any just-in-time training. We wanted it to be simple and something that they can use in routine so when a public health emergency happens or some large-scale event, they'll be able to just jump in there and be able to run.

One of the big things we realized is that there a state and local health departments who insist on using their own inventory system. We obviously understand that and acknowledge it, so we needed to have an open architecture and the interoperability to communicate with those existing systems. So some states will have their own inventory system at the state level, but their locals will use this system, this IMATS system that we developed or vice versa; the state will want to use this IMATS system and locals want to use their own. So we needed to have a multiple input and output interoperability so that it could take inventory data and export it out from ours and have a structured format that can be built in so it can be imported into their own.

In addition to the reporting, we wanted to automate the reporting process so there wasn't the manual labor of typing in the numbers and the effort that I had to put into collect it, aggregate the numbers and send it out; we wanted to have an automated system. And again, focusing on the fact that there are many states that want to use their own inventory system, we need to be able to interface both with those inventory systems as well as the states that chose to use IMATS.

So, we devised...developed this inventory data exchange specifications and it's basically a structured format in which we utilize PHIN MS, which is the Public Health Information Network Messaging System already being used at CDC to securely send and receive critical and sensitive data over the Internet to those existing inventory systems. And by sending those messages out, we can request how much Tamiflu do you have on hand, Tamiflu-75 or whatever the product is. They'll receive it securely, populate it within the state of how much they have and send it back to us and we can get a snapshot of what they have on hand. And obviously again, we needed to make sure it stayed open architecture and had the ability to interface with any inventory system no matter where it is. Next slide, please. Oh, that is pretty much it. Are there any questions?

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

So let's just move onto on to the next presentation and then we'll have our discussion at the end.

**Benjamin Erickson – Public Health Analyst, Strategic National Stockpile – Centers for Disease Control & Prevention**

Okie doke.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Ulrica? Ulrica, you might be on mute. Last...okay, so I think we may have had technical difficulties with our last presentation; I think we got a really good overview though of the countermeasures and response from our previous speaker. I know we were running a little behind. Anyway, so that's good and we can move right on into our full Policy Committee discussion about all of our topics.

We were not going to really have closing remarks; the only thing that I would like to say to make sure that the policy committee members are aware of is, you heard a lot about the functions of public health and the health IT systems that are supporting those functions and where the integration with clinical care and EHRs need to happen. And I do want everyone to be aware that we do have a Public Health Tiger Team that is part of the Standards and Interoperability Framework that is looking at all these issues and trying to find existing standards to help facilitate these transactions. So that is something that we do have going on that I want people to be aware of, but let me stop with that and turn it over for questions from the committee.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

All right, thanks, Jim. This has certainly been a very informative and educational session that's really given us a chance to look at the whole outbreak management needs and some of which...a lot of which are done on paper and with a lot of hard work by our dedicated public health professionals and some where there's a crying need for help from the IT point of view.

A lot has to do with standards so that information can be passed and understood, digested by each of the different systems and then given to the public health professionals and...on the efferent arm where we can talk to the providers on the front lines and make sure they both report and notice things, but also take advantage of the digested material that the public health departments have produced. So I can see a lot of good that a rich infrastructure could provide, which I think is the goals of the presentation. Are there...Karen, do you want to make any other comments or any other committee members have comments or questions for the general group?

**Karen B. DeSalvo, MD, MPH, MSc –National Coordinator – Office of the National Coordinator for Health Information Technology- Department of Health & Human Services**

Thank you Paul and I echo what you said. It was a really rich and interesting conversation and I think begs a lot of questions not only about standards which the Tiger Team, we would like to see them work on and address and perhaps we can articulate that better going forward. There may be some policy issues as well that would be worthy of discussion and some of them perhaps even fall in the interoperability space and so we have a double win as we're working towards operability. So, that might be the sort of thing we can think through and then come back either to the committee with or if the committee has ideas today, happy to take care of those as well. Thanks.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Any other committee member comments or questions? Anjum? You must be on mute...

**Anjum Khurshid, PhD, MPAff, MBBS – Director, Health Systems Division – Louisiana Public Health Institute**

Yes, thank you. Sorry, I was just getting off mute. So, excellent presentation and let me say that I fully support the integration and inclusion of the public health community in our discussions and congratulate Karen and her team for actively engaging that community in these discussions. So it's great to have a full session that has been focused on this.

My question basically, so most of our discussion today was focused on the use of health data collected in EHRs for the purpose of...and thinking about how it can be used for public health functions which is an important and current need. However, it is still fairly clinical setting focused and has suffered from the challenges of a fragmented health delivery system and siloed information in our databases and in warehouses. It also does not include, although there were some references to it, but the integration of data that is outside the EHR system or outside the clinical system but yet is very important for a lot of public health problems and outbreaks and also our responses to it.

Our experience from New Orleans again has led a lot of those responses, shows that data about electricity or about water and roads and others can be extremely important in terms of thinking of responses to some of these infections. Also understanding of the environment in which the people who are infected are living can help us understand their stress.

So, if you want to really be forward-looking and integrate the new trends for collection and consumption of health information that is more person centered rather than clinical setting centered, then shouldn't we engaging those who are directly collecting and providing information to an increasing part of the population through services like Facebook and Google and Amazon, etcetera, using mobile and cloud computing to better understand not only the infectious disease spread, but also localized conditions, individual behavior, environment which may help or kind of adversely affect the outbreaks and our responses to this.

So my question is where those discussions taking place and what are the levers that our Policy Committee may use to facilitate or expedite such discussion?

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

So great, that's an excellent question Anjum and I think probably to kickoff that conversation I'll ask Janet and Annie from a state and local perspective to help address that. And as you are, I'm really focusing on the part of your question about what activities the HIT Policy Committee might engage in to help address these issues? Janet, do want to start?

**Janet Hamilton, MPH – Surveillance Section Administrator, Bureau of Epidemiology – Florida Department of Health; CSTE Executive Board, Surveillance and Informatics Steering Committee**

Sure, thank you. I think that is really an excellent question and when we look at our outbreak situations, it really is a lot of information that is not in the EHR and I hope some of that really came through in the presentation. So in terms of trying to look at these other kinds of environments where data is being collected, I think there is a lot of activity where public health is looking at that; I mean, for example, we are actively looking on some of these sites like Facebook and Yelp to try and find additional information about individuals.

And I think when you think about the policy committee, I mean that's where this concept of having good coordination and thinking through all of the difference public health and interoperability needs. That I think this is really the conversation where we're continuing to have this as a beginning and so convening under this group some kind of an additional task force to really look at those pieces, I think would be a great next step for the committee. And I'll let Annie comment additionally, too.

**Annie Fine, MD – Medical Director of the Reportable Disease Data Analysis and Informatics Unit, Bureau of Communicable Disease (BCD) – New York City Department of Health and Mental Hygiene (DOHMH)**

Yeah thanks Janet. I'm going to be...I wish I could address this better because it's really not the area that I focus on. I do know there's a lot of activity in at our health department looking at especially the use of social media and ways of communicating with the public directly outside the clinical sector for sure about all kinds of behaviors.

We do...I know within...I just sit in the Bureau of Communicable Diseases, that's what I know and we were talking about outbreaks, so that's what I was talking, but even in that realm, we are, as I sort of just briefly touched upon, we're using Yelp and we are starting to use Twitter as data sources and working collaboratively with academic centers to use those sources to detect food-borne outbreaks. For example, just look for little terms like "vomiting" or "restaurant" or "I got sick," and clusters of those types; so we're certainly exploring those as sources.

That being said, I do think that for this fundamental public health activity, we still always will need to interact with the clinical sector also, just to confirm cases because we can get so far with detection but ultimately we need those laboratory diagnoses or at the very least, a clinical assessment to really go forward and investigate further. So...but certainly...and in the other realms of chronic disease, these are major, major sources for us as well. But if you want more information about that, I could connect you up with folks at the health department here who are working on it.

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Thank you.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

That was very interesting and just one anecdote; when we had the restricted supply of vaccines, we had to be letting our patients know strata by strata from a list point of view, on a week-by-week basis and actually we did use Facebook and people were listening. So that was one way we could to communicate with them that it's your turn to come in. Next committee member is Chris Lehman?

**Christoph U. Lehmann, MD, FACMI, FAAP – Professor, Pediatrics & Biomedical Informatics – Vanderbilt University School of Medicine**

So, I actually incidentally, I don't know, read a paper this morning, an article this morning about typhoid Mary and how she was forced to live on the north part of the island...so, it was interesting to sit and think about the consequences of collecting data and observing outbreaks and acting to them. But my point really that I wanted to make is along the lines of what was just said.

I'm interested in the vulnerable population and they are often cohorted, you know, children and students, the elderly, people in the military and I think it's important that in the process of looking where our data sources should be coming from and what data we need to integrate is that we look at these places where these kinds of populations are actually housed. So I believe that data from school health systems, from nursing homes, from the VA or DoD, they could help in syndromic surveillance in the following of patients and identification of transmission rate, etcetera. So I think it will behoove us well to pay attention to especially these populations, because of their nature have been cohorted, often also a source outbreaks.

**Annie Fine, MD – Medical Direct of the Reportable Disease Data Analysis and Informatics Unit, Bureau of Communicable Disease (BCD) – New York City Department of Health and Mental Hygiene (DOHMH)**

I would like to echo that...this is Annie Fine. I totally agree with that and I just want...I was about to mention that school health is a major source of data for us, we do have a stream from our school health nurse system, where they enter data right in the schools. We also have a lot of...we're doing a lot of work with nursing homes and congregate facilities including correctional health facilities in identifying cases rapidly in those settings because of the ability to geocode data right away and know where we're seeing signals arise. So thanks for that comment.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you. Karen, your hand was up and then it's...

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – Department of Health & Human Services**

Well, I was going to...thank you, Paul. I wanted to just underscore a few, actually now a few of the comments that have been made. I think this was such a nice presentation today, an example of how the clinical environment can provide supporting data to public health and vice versa. But there were some snapshot examples of ways that other technologies in the health IT ecosystem can begin to paint a picture of the public's health more broadly.

And there are some really nice examples of the way that's being done in places like Houston to look at air quality and rates of asthma exacerbation, for example. And certainly, I think, even in the Ebola situation, many and you probably know, or if you don't I'll share that the manifest from the flights were shared with the health department so that when someone was coming to the US from West Africa, the health department would get a name, address and phone number; information so they would be able to track someone and there's a little more detail to it.

But part of the point of raising all that is, for public health, especially when there's a global outbreak, that individual who's coming to the US may not actually have an electronic health record in this country to draw from, or they may not touch the system, but we'd still want to be able to engage in monitoring of them. And so there are certainly other data sources we want to make sure we have opportunity to take advantage of.

And certainly on the other hand, it can also, if you just think about communicable disease, provide more fluidity and support for the people who are being monitored, so they don't have to keep checking in with healthcare with their broader public health. And I just wanted to...two things; one...two things that Anjum said; one is about it being person centered, which is kind of what I'm trying to get to with this latter point is that public health, we think of these broad populations but at the end of the day, it's that person we're trying to wrap around and protect. So whatever we build should be supportive of them.

And the second piece was about preparedness and that always makes us think about, oh, there's been a disaster, now we have to run in and try to help people. But anybody who's been involved in that space knows that you're going to have a much better chance of helping and supporting and saving lives if you're prepared in advance. And that's where the data becomes so helpful because it helps you know the potential risk in a community and individuals who are at the most risk, whether that's from power outage or underwater fire and lets you mobilize...forces in a more strategic way to get at them.

So I think, I mean, the opportunities are pretty broad and there are many things that ONC is involved in that go beyond even just what you saw today including in preparedness. So, I'm sure there will be plenty to speak about if we decide to...at least think about carrying forward where we see some policy opportunities or gaps.

And while I'm thinking of it, we had CDC presented day, but ASPR, the Assistant Secretary for Preparedness and Response...you already know, were discussing this agenda this morning and she just was weighing in on how important this notion is and the work that we're doing together between ONC and ASPR and there's so much opportunity to do a better job at protecting the public's health more broadly. So that's carrying a little water for her.

**Paul Tang, MD, MS – Vice President Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you. Tom Greig is next.

**Thomas W. Greig, MD, MPH – Chief Medical Information Officer – Department of Defense**

Hi, this is Tom Greig from the DoD. I just want to thank Karen and Paul particularly for a great agenda. I think these were outstanding speakers. It was just an amazing covering of a great deal of information. As you guys know, surveillance and preventive medicine is our primary mission in DoD to make sure our forces are well taken care of. I just wanted to say that the issues that have been brought up are ones that we've encountered as well and we're looking forward to participating and bringing public health and the electronic health records together. I want to emphasize that the challenge really is the whole idea of information management and bringing in external information, both from...into the public health electronic system as well as to the EHR. So, just thank you very much. This has been amazing and look forward to reinforcing this effort.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you. Any other comments or questions from the members? So we've heard a number of topics come up which intersect, I think, with the two FACA groups, the Policy Committee and the Standards Committee. One clear tie-in is of course the interoperability work that's a priority for ONC, but across the federal agencies, and that certainly can be wrapped in and it may be wrapped into the Interoperability Roadmap, or it certainly can be something that this committee comments on.

Another area is standards and we heard how some, for example LOINC is used some, but there are a lot of updated elements that are important to public health that aren't necessarily standardized at this point, and that's something we could ask our sister committee to work on as well.

And maybe a third area is as a FACA committee we provide advice where requested or helpful. It sounds like there can actually be sort of a public health perspective to health data that crosses the traditional CDC, and we just heard Tom talk about the DoD; so there's a force there. There's certainly the "civilian force," how can we just have the broad but protected sharing of data so that we can all benefit? Maybe there is a way...there might be some way that the FACA committee can be helpful taking a broader perspective and digesting sort of the some of the broad field...you sort of heard today, but from a, maybe one limited area of the federal government as we find HIT really spans so many agencies, the federal and state and local government.

And maybe the final comment is on the person centeredness. If we think about public health and we just have that word health in there and we've limited ourselves...I mean we know we're not limited to EHRs, but it sounds like we're not even limited to things that are associated with agencies that have the word health in it. So, we really need to communicate to and from people, because those are our signal detectors as well...need reach. And so what's been brought up are things like the social media as an important afferent and efferent arm.

So I think there are a lot of topics that have been raised, that was a good part of the session. Now maybe we should ask ourselves what kinds of work should we consider doing for future efforts, either in a task force or some other venue; open it up for comments on those topics.

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – Department of Health & Human Services**

Well, this is Karen, Paul; I know I'm not raising my hand, but...one thing I would...see, you remind me to go out of order a little bit because I failed to mention at the outset of the meeting that I wanted to remind everyone that our Federal Health IT Strategic Plan is still out for public comment at HealthIT.gov. There is...there are some objectives related to public health for use cases for health IT, but also in some of the adoption and the sharing elements.

So if folks wanted to take a look at what the Feds, including DoD, CDC and others had been thinking about in the strategic plan, that would be a good place to look just generally. So I would just remind folks. And that reminds me then that the Strategic and Innovation committee of this Policy Committee is looking at the Federal Health IT Strategic Plan, so perhaps that's a place to start with a list of kind of priority issues that might arise from the work that is happening in that group.

And then the second is our Interoperability Roadmap, which we'll talk about implementation and a pathway to getting to interoperability. You will see that there's some information in there about public health. We do expect that to be out in the next few weeks, so that will be further opportunity for the Policy Committee and Standards to have a chance to have kind of, if you will, a straw man sort of so from the Strategic Plan a set of priorities and in the roadmap some notions around operationalizing some of those priorities.

**Charles Kennedy, MD, MBA – Chief Executive Officer – Accountable Care Solutions – Aetna**

Sorry, this is Charles and I don't have my hand up, but a quick comment from the kind of the health plan side of the equation. One of the things I'm noticing recently in the industry is as ACOs become more and more prevalent I'm starting to find more and more ACOs starting to ask questions of the health plan regarding the role of public health in almost a commercial setting. In other words, if I'm an ACO and I'm focused on population health, I begin to think about and consider public health methodologies and public health strategies. And so I wasn't on for the entire call, but maybe another use case to consider might be population health, public health and the intersection with commercial care delivery and whether there are things that help might our agenda move forward there.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

And one...another way of stating that is, we've been trying to address the lack of interoperability out here in the private sector and this has been a lot of talked about, well gosh, that even happens in the public sector. So I think we need to address it very broadly and just trying to point out it's certainly front and center in the interoperability roadmap and we just make sure that we have this public health data...data for public health use instead of like scrolling them off into there's public health data and there's clinical care...data that can be used in public health, have that perspective as we look at both the interoperability roadmap and the strategic plan.

Other comments? Any other final asks from the group that has talked to us today? I certainly want to thank everyone for their preparation and this really has been an educational and informative layout of all of the ways that data supports the public health responsibilities.

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – Department of Health & Human Services**

Thanks...

**James Daniel, MPH – Public Health Coordinator – Office of the National Coordinator for Health Information Technology – US Department of Health & Human Services**

Yeah, this is Jim and I would just like to say thank you for this opportunity. We really appreciate it and we heard some asks, I think, for coordination with the Policy Committee and we'll definitely be reaching back out to make sure we follow-up on those.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you. Any other final comments before we open it up for public comment? Okay, operator, we can open it up please?

**Public Comment**

**Lonnie Moore – Meetings Coordinator – Altarum Institute**

If you are listening via your computer speakers, you may dial 1-877-705-6006 and press \*1 to be placed in the comment queue. If you are on the phone and would like to make a public comment, please press \*1 at this time. Thank you.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

While we wait to see if we have a public comment, I just wanted to remind everyone our next meeting is on February 10. It is an in-person meeting and it will actually be at the Gateway Marriott, a different location than we've been lately and it will be structured a little bit different than we've done recently. So in the morning we'll have a Policy Committee meeting, a short meeting to report out and provide comment on the strategic plan. And then the second part of the day will be a joint meeting with the Standards Committee; so, just wanted to set expectations for everyone that it will be a little bit different. And we do have a public comment. If you could please state your name and who you are representing and just a reminder that you have three minutes for public comment. Charlie, please go ahead.

**Charlie Ishikawa, MSPH – Executive Secretary – Joint Public Health Informatics Taskforce (JPHIT)**

Hello, can you hear me okay?

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

We can hear you.

**Charlie Ishikawa, MSPH – Executive Secretary – Joint Public Health Informatics Taskforce (JPHIT)**

Great. Hi everybody, this is Charlie Ishikawa; I am the Executive Secretary to the Joint Public Health Informatics Task Force, JPHIT. I'd like to just provide a quick word of thanks to Dr. Tang and Dr. DeSalvo for bringing this to the Policy Committee and to the Policy Committee for your time and to the speakers for the excellent speeches and thorough very coverage of this awesome topic; also to the ONC for your leadership and the CDC, Dr. Richards and the leadership of your staff.

I wanted to make one comment with regards to a theme that I heard throughout all the speakers, and this is from my observations is I think a lot of the speakers in their asks and the things that they talked about on how things can be improved for outbreak management and that function of public health. A lot of them talked about, I think, the infrastructure and the need to improve the public health informatics infrastructure, at a local level, at a state level and at a federal level, especially when it comes to interjurisdictional data exchange and those capabilities.

So I'd like to just underscore that that point was being made I think by all the speakers and I think they were talking about it not only in just a technology way, you know, with electronic health records and other technologies that gather data on human activities and those observations. But I think they were also talking about the workforce and the need for workforce investments and workforce development, both workforce that are currently in place but also our upcoming workforce, students and such. And I think there are also some legal issues that were hinted at and underscored by some of the speakers. So as the Policy Committee continues this conversation and this dialogue, I would encourage you to keep those three things in mind, and mainly that this is an infrastructure issue for public health.

So, Dr. Tang had mentioned the broader perspectives here and I think...I would like to say that we really look forward to having this perspective broadened for public health. It's great to have it part of the Policy Committee's discussion today. Remember there are lots of other things that public health departments do that rely upon data and informatics. And thank you again from JPHIT to you all, we really appreciate this time and I look forward to supporting you and the public health community in the future in this dialogue. Thank you.

**Paul Tang, MD, MS – Vice President, Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Thank you.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thanks and we have no further public comment at this time.

**Paul Tang, MD, MS – Vice President Chief Innovation and Technology Officer – Palo Alto Medical Foundation**

Okay. Well I certainly on behalf of the committee want to thank the tremendous...the presenters we had today, really excellent information. And I think...the last comment, really I don't think we consider this talking only about outbreak management, we're really talking about the need of the common data to serve the public's good and the perspective public health...public and population health.

So thank you and thank you to the committee members and see you in February.

**Troy Seagondollar, RN-BC, MSN, UNAC/UHCP – Regional Technology Nursing Liaison – Informatics Nurse – Kaiser Permanente**

Thanks, Paul.

**Michelle Consolazio, MPA – Federal Advisory Committee Program Lead – Office of the National Coordinator for Health Information Technology**

Thank you everyone. Have a great rest of the day.

**Karen B. DeSalvo, MD, MPH, MSc – National Coordinator – Office of the National Coordinator for Health Information Technology – Department of Health & Human Services**

Thank you all.

**Public Comment Received During the Meeting**

1. Given recent hacking of both private and governmental entities, how are we supposed to balance patient information protection and ubiquitous information access via EHR?
2. Where are these questions addressed on public record?

<b>Meeting Attendance</b>			
<b>Name</b>	<b>01/13/15</b>	<b>12/09/14</b>	<b>11/04/14</b>
Alicia Staley		X	
Anjum Khurshid	X	X	
Aury Nagy		X	
Charles Kennedy	X		
Chesley Richards	X		
Christine Bechtel	X	X	
Christoph U. Lehmann	X		
David Kotz	X		
David Lansky	X	X	
David W Bates			
Deven McGraw	X	X	
Devin Mann	X	X	
Gayle B. Harrell	X	X	
Karen Desalvo	X	X	
Kim Schofield	X	X	
Madhulika Agarwal			
Marc Probst	X	X	
Neal Patterson		X	
Patrick Conway			
Paul Egerman	X		
Paul Tang	X	X	
Scott Gottlieb			
Thomas W. Greig	X		
Troy Seagondollar	X	X	
<b>Total Attendees</b>	<b>17</b>	<b>14</b>	<b>0</b>