Operator: Welcome and thank you for standing by. At this time all participants are in a listen only mode. Today's conference is being recorded. If you have any objections, you may disconnect at this time. Now I would like to turn the meeting over to Dr. Donald Marion. You may begin.

Dr. Marion: Thank you and good day and welcome everybody to our first webinar for 2018. Today's webinar will be on traumatic brain injury and we're very pleased to be presenting Dr. Yll Agimi and Miss Lauren Earyes as our speakers. My name is Donald Marion. I am the senior clinical consultant for neurosurgery at The Defense and Veterans Brain Injury Center and I will be your moderator for today's webinar. Today's presentation, and additional resources are available for download from the files pod, and will be archived in the online education section of the DVBIC website.

Before we begin, let us review some webinar details. If you experience technical difficulties, please visit DCOE, spelled DCOE.mil/webinars to access trouble shooting tips. Please feel free to identify yourself to other attendees via the chat box, but refrain from marketing your organization or product, please. All who wish to obtain continuation education credit or certificates of attendance and who meet eligibility requirements, must complete the online CE evaluation. After the webinar, please visit http://DHAJ7.CDS.PESGCE.COM to complete the online CE evaluation and download or print your CE certificate or certificate of attendance. The evaluation will be open through Thursday, January 25th of 2018. Throughout the webinar, you are welcome to submit technical or content related questions via the Q and A pod located on the screen. All questions will be anonymous. Please do not submit technical or content related questions via the chat pod.

Alright, I will not move on to today's webinar. Traumatic brain injury in the military after transition to ICD 10. Many of you, I'm sure, are familiar with ICD 9 and now we're in the world of ICD 10. Clinicians practicing within the military system, treat their patients and code their own administrative data using a combination of diagnostic and procedure codes. The data generated form these administrative codes informs key strategy and reporting criteria, circulated throughout and beyond the Department of Defense. As a provider, are you confident that your coding accurately portrays your patient's presentation and content of the medical visit? I know when I was practicing, this was a real stickler and something I had to pay a lot of attention to.
Are you familiar with the Defense Health Applications of the data extracted from your medical encounter records? Are you able to access current statistics on traumatic brain injury in the DOD, to help frame your discussions with your patients and their families? For example, how do you know how well that patient is going to do with a particular injury as based on an ICD 10 code? Are you aware of common pitfalls in data interpretation and do you feel confident that you are able to discuss aggregated DOD TBI data while avoiding these pitfalls?

All important questions, I think. The presenters today, Dr. Yll Agimi and Miss Earyes, will answer these questions as well as familiarize participants with how The Defense and Veterans Brain Injury Center leverages clinician centered, administrative data on an ongoing basis and publishes quarterly reports produced out of the Office of Surveillance at DVBIC.

Upon completion of today’s webinar, participants will be able to: Examine how provider coding connects to ongoing efforts to estimate the incidence and prevalence of traumatic brain injury in the military. Demonstrate how clean coding practices can improve the accuracy of data that providers generate. Integrate DVBIC TBI surveillance data into their clinical practice and communications with confidence.

I'd like to introduce our presenters today and I'm delighted to be able to introduce Dr. Yll Agimi, who is our lead epidemiologist and the Defense and Veterans Brain Injury Center, Office of Surveillance and has been there since 2011. Dr. Agimi has worked as a researcher, senior analyst and lead scientist in various prestigious organizations. He is co-author, and has published several research studies on TBI, dementia, mental health and TBI coding practices and procedures among others. Dr. Agimi is a graduate of the university of Pittsburgh Graduate School of Public Health. Go Panthers. Where he obtained his doctorate and masters degrees in public health and epidemiology.

Our second speaker is Miss Lauren Earyes. She is a clinical epidemiologist at DVBIC Office of Surveillance. Previously, she was an outreach clinician at the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury and an acute care nurse in the medical and neuro intensive care unit. Miss Earyes obtained her masters in Public Health and graduates certificates in environmental and occupational health and risk science and public policy, at Johns Hopkins University Looper School of Public Health. For my money, one of the best in the country, actually. She received her bachelor of science and nursing suma cum laude at George Mason University and was the recipient of a George Mason presidential scholarship.

With that, I'm going to turn it over now to our first speaker, Dr. Agimi.

Dr. Agimi: Thank you. Thank you very much. Welcome everybody. So briefly, I'll go through a couple slides here. The topic, [inaudible 00:06:56] after the transition to ICD 10, CM at the end there, inferred. We, let me just continue here, a few
disclosures for the audience. Myself and Lauren have no financial relationships to disclose and the views of course expressed in this presentation are those of the authors and don’t represent the official policy or position of the Department of Defense or the U.S. government. For an educational activity, please follow the guidelines given out previously in the presentation. Again, financial support was not received for this activity.

We have a quick poll that we post. The audience would be able to respond to and perhaps just give us a couple second together, the input from the audience in terms of their area of practice or expertise as they join this presentation.

We’re getting, both in the chat box and ... we’re having some responses coming in now. Hopefully all of the participants can also see the responses there. I think behavioral health seems to be represented very well. We see certainly, neurology, primary care, rehab and health care administration of course as expected. Thank you very much. I think this kind of gives us an idea, certainly on the audience, but also in terms of in their respective fields and their interests in this topic.

Thank you for that. We’ll continue on here. We have broken the presentation in a couple different topics, couple different chunks. The first one here is measurements of TBI in the military. And starting off with definition. It’s actually public health surveillance, perhaps a new term, but has been called and gone by a number of names including logical surveillance clinical, surveillance syndrome, surveillance. Of course a lot of the genesis of our surveillance being back in the day of infectious disease surveillance, but of course a lot of conditions feed cancer including injury and traumatic brain injury are monitored on a continuing basis. Now the key term monitor continuing basis leads me to another definition of surveillance, that’s from the WHO. Really defining public health surveillance and the continuous, systematical action analysis interpretation of health related data needed for the planning, implementation and evaluation of public health practice.

Now as with definitions, they tend to say a lot in a few words, but key words there again being continuous. Surveillance is supposed to be continuous and continues to be in an active or passive way, collect data on a particular topic, in our case, traumatic brain injury. It tends to be systematic, meaning it has to have a well-defined methodology by which the collection occurs. Of course, the interpretation of health related data is something as well that occurs within our office, but also is something which we share with others to facilitate the interpretation of data. But also, at the end of this definition, the other key words being planning, implementation and evaluation. Public health surveillance, unlike some other types of work, is meant and tends to have some reach or support some sort of action. So, it’s not amiable to speak about this in terms of the differences with research, but it is intended to be goal oriented with regards to some sort of action. While it can generate new knowledge, that new knowledge is supposed to be action or activity related or oriented.
Continue on to the next slide. A brief outline of the types of topics we hope to touch upon. To generally update viewers, again on the surveillance definition and the various surveillance products that we work here with DVBIC. What the TBI incidence numbers are or the way ... also known as the worldwide TBI numbers. What they say and do not say about TBI specifically and TBI in the military and in more broader contents. This is a product which is widely disseminated from our office and we always are cautious as viewers, audiences and users use that information and interpret it in more specific terms. So, we wanted to go through it briefly, but really see and highlight what it means and what methods we use to come up with those numbers. Then we'll continue on to a discussion of key factors on TBI that are sometimes overlooked. And then a few examples of information gleaned from TBI coding that we have combined from various work that we have done here including chart review work.

Continuing on to slide 21 now. Again, some distinction given that why we have a lot of clinicians online looking at the webinar today. There's always a question with regards to the difference and distinction with the type of work we do within The Office of Surveillance or surveillance practice in general that is done by research. There is of course a lot similarities, a lot of goals. A lot of similar goals. Collection analysis of health related information to move knowledge forward. Research of course tends to be hypothesis driven while surveillance, for the most part, is really condition driven. It's meant to ... the goal is not to solely generate knowledge, but goal is to generate actionable knowledge. Actionable being a key term in a sense that the authority which usually is provided to surveillance activities is meant that activity leads to perhaps improvement ina program. So it cannot be without the action at the end.

And of course, there's a lot of differences with regards to, as I mentioned, authority. Surveillance activities tend to have broader mandates to monitor the health and wellbeing of service members, but in this case specifically, monitor the condition of traumatic brain injury. It tends to be also associated with an element time. Surveillance must be timely. We cannot call something appropriate or a good surveillance activity if it gathers data and disseminates that information two or three years after it has been gathered because the use, the utility of that activity is questionable. So surveillance activities, for the most part, tend to be associated with the element, time.

Additionally, it tends to be also related to the element, entity. Because surveillance, while you monitor a particular condition and you ... in an adequately, timely fashion disseminate that information, it is also a responsibility of those conducting surveillance to insure that that information is delivered to the appropriate entity. And that the appropriate entity is one who is supposed to take that information and improve a project, reduce risk to service member if that has been identified and so on and so forth. So there's a couple of key elements within surveillance that make it a ... that define the spectrum of work required within surveillance. We hope that the work that we do in other surveillance entities too, really tries to touch upon that. Certainly monitor condition. Do it in a timely fashion, but also identify the entities which
hopefully will be able to do something about a condition or an issue or a problem that has been identified.

Now to slide 22 here. Just kind of briefly to kind of highlight some of the approaches, primarily the data actually that we use to conduct surveillance. For the most part, we use the medical data repository and it’s really just the repository of all the digital data that has been collected on the service member. Includes information from all time PHCS, that a lot of the audience may know. It includes information from TMDS, metered medical data storage. Until recently it was difficult to accessing it, but now it’s part of the MDR.

And think of the MDR, really as a big portal with a lot of very [inaudible 00:17:06] separate data bases. Which can be vitals that the service member ... that were recorded when a service member had an encounter. That could be radiology that was ordered when the service member was seen. Could be also the diagnosis code that were entered when a patient was diagnosed with a particular condition. While they are a bit scattered, because they are in different data bases, the role and the work that we do here is try to create a picture of a particular condition, with a particular question. By saying for example, benzodiazepine description patterns. And what we have to do is go into one of the files and see if it was an outpatient visit, link that with the pharmacy data and see if a benzo was prescribed.

The way we essentially do surveillance within our office is by looking at the medical records, or the digital medical records, as the ... and of course with the data that has been logged there. We call ... this is, I guess, the more active part of surveillance. Where we try to identify a problem or an issue by actively trying to construct and then gather data on issue. There’s also passive ways and passive ways is essentially when we have routine and continuous reported to us on particular issue. Until recently we had the BISA, the [inaudible 00:18:39] ordered in combat that was routinely reported to us and to some other entities.

That would be called a passive, in the sense we received that. So there's other forms as well. Again, just to highlight, this is not research, the type of work that we do is not research. While it certainly can generate hypotheses and lead to other work in the research realm, the efforts that we do are not research oriented.

Continue on to slide 23 here. To kind of highlight some of the work that we've done so far and the areas of interests and also that fall within our realm. Tend to be looking at the incidences where the new cases of TBI are occurring. Again, try to identify those in a timely basis sets whether we are getting the appropriate data. Whether they are true cases. Whether the coding is inappropriate and we have to not count them. So this is where the true positives, false positives come in and so we spend a good amount of time in that type of work. Try to see if we are missing some cases. Do we have to create estimates of how many cases were missed and so on and so forth.
Dr. Agimi:

Recently something that has been of more interest as well is at any given time, how many patients with traumatic brain injury do we see? So, more the period prevalence of TBI. If we have questions from our sites, in terms if they're saying, "Well, truly I certainly care about TBI, but there's no patient who has TBI alone." So, they tend to be associated with other conditions, other comorbidities. We try to also address that question by trying to create profiles of patients that are more complex in the sense that they may have psychological health conditions that may have other conditions. And really try to group these profiles. I get to create these profiles for the utility of our lead researchers, who are for the most part, the clinicians in different sites.

One piece of work which is of interest and we believe has immediate implications is trying to identify service members that have a higher risk of sustaining a first TBI. And the reason I'm saying a first TBI is primarily related to some restrictions that we have with the data. And I'll spend a few minutes on that later. Because this one really fulfills that condition of being timely, the timeliness of that investigation, but also the immediate implication and activity that can be associated. So, right now, we're looking for all of the service members that have been deployed. If there's a way to identify groups, be it ages, be it genders, be the combination of services or ranks and so on. That we feel have a higher risk of sustaining a TBI and perhaps trying to inform the command that it's actually identifying various group for preventative practices.

With the Office of Surveillance is also housed within the Office of Clinical Affairs here at DVBIC. Very interesting topic that we've been following now and appending some time is a topic of care patterns. Because again, we have a wide purview, we also have ... given our access to the various sources for our surveillance work, we are able to see the flow of patients from the time they had a PBHA to the time they were evaluated or screened perhaps, to the time they were diagnosed. If they were referred to a private sector or a civilian sector, we would be able to see those encounters as well. If they had radiology, pharmacy type of orders. That in a sense, given our wide purview, we are able to follow the patient as they flow through the system. It is more time intensive and we are a small office, but for the most part, that's something that has been in the interest of the office and DVBIC in general.

And the last one really that it also related to the today's topic, is we monitor coding practices. Because our office and the work we do informs, certainly clinicians, informs our supervisors and so on and so forth, we rely heavily on the data. And of course the data is essentially a representation of the coding. So we try to monitor to the best that we can the coding practice within the clinical field and see how appropriate it is in terms and see if there's any issues that we need to address. We certainly monitor the coding guidelines. We monitor the CMS coding guidelines and whenever the ICD 10 committee adds or removes codes, as they did last October, so in terms we try to reflect that within our methodology.
Alright, continuing on here to slide 24. This is a bit of a representation of how the data flows while it's a short wire diagram. We only wanted to emphasize the key elements because it is much wider. There's other data sets and so on and so forth. For the most part, the TOLTA computer there, really indicating the terminal where the provider is entering the data. Where the provider has a new appointment, sees a patient, conducts [inaudible 00:25:29] screening, enters the notes and so on and so forth. Orders medication or radiology and so forth. That is happening at that stage, where we call the clinician phasing.

That information of course is coded and sent off to the MDR. The MDR being the big repository and within the MDR are all of the various data bases. Each representing something different about the patient. The PNTSD, the deploy data, the CBR, being the clinical data, the sitter being the inpatient. The data bases themselves are not that important, but really the idea here is to highlight that there's a flow. We, in the Office of Surveillance, and I guess a lot of other researchers, for lack of a better word, who work with data are in the back. So we are really in the backend. We are waiting and using the data that has been coded as a result of the work a provider does in the front. There's usually a lag of a couple months depending on what data you use, but usually it means that within the auto system, you perhaps have auto mobile or auto terminals or even auto theater at some point, at some point is supposed to go through MDR and then down to the data bases which we then access to try to answer a question.

Now this is, we believe that this is important because it's one directional. In the sense whatever is entered at the time that the provider sees the patient, is what we get at the end. So, if it's entered correctly, excellent. If some information and some coding is incomplete, then of course that is what we get. Sometimes we have to infer things, but sometimes it makes the use of the data difficult. Which also brings us to clarification.

And then briefly becoming familiar with TBI. Hope I'm not taking too, too long here, but again, the definition. The overall definition for TBI for our work. Now, a lot of you are familiar with this definition of what TBI is and of various clinical symptoms of TBI which allow a service member essentially to diagnose TBI. Be it alteration in mental status, confusion, disorientation, slow blinking, loss of memory of course, a big one. And then of course, the last one is a period of loss or decreased level of consciousness. Now, these really being key symptoms that a patient may display for provider to diagnose traumatic brain injury. Now as all providers in today's webinars know, as you look for, as you're trying to diagnose the patient, usually there is no code which has traumatic brain injury. It's going to be a ICD 10 appropriate code which infers that these are the symptoms which the patient has had, has presented.

Now here on slide 27, briefly, again, that definition of course. The previous definition was accepted by the Department of Defense. This slide highlights the authority that is given to the DVBIC and Office of Surveillance to document this type of work. And I think this is important primarily because this gives us the flexibility and also the mandate to conduct surveillance and inform other
entities. We are supposed to report, at least at the time of fighting, supposed to report to FHPNR now reporting to PHA, their research and development a group J9.

Dr. Agimi: Primarily, it is important to see that, or to highlight, that there's a mandate which authorizes a group to conduct a surveillance. There's a definition, which also comes from the Department of Defense, that specifies what the condition is. This one allows us to conduct surveillance on TBI. The other mandate or memo specifies what RBI is. Kind of narrows down the scope or surveillance.

Here on slide 28, just briefly a bit of background on this authority, really. Starting with 2007 which was the Secretary of Defense Affairs memo. Which really tries to define the reporting of ... because as we'll discuss later, there's a number of codes, a number of ways you can define traumatic brain injury. If you're trying to code a patient's visits and trying to diagnose a patient with traumatic brain injury, there is no traumatic brain injury code specifically. So there's going to be other diagnosis codes that fall within the general category of TBI.

Starting with 2007, the memorandum, I'm going to try to define the reporting on the TBI and establish a common definition. Then in 2010, the DPM was inactive. The DPM trying to obtain courage, reporting from theater with regards to TBI. And then the DPM in 2012, was upgraded to a dual deep. Again, which promotes surveillance and monitoring of service members in theater. And then in 2015, again, the memorandum, which updates the definition and reporting. I believe the next slide will continue with the 2015 definition there and up to now. Never the less, the 2015 definition really being the TBI definition that we currently use. As I mentioned earlier, we're going to spend a couple minutes just talking about the world wide numbers. And warning, the next slides are going to be similar to this one with regard to the type of information. But the reason we felt it was important to talk about this one was because there's some conditions with this figure.

Since 2000, from 2000-2017, not perfect order, we have identified 375,230 service members with at least one TBI. Certainly this means there's 375,000 service members who are unique that have been diagnosed to have TBI. Now of course, we're talking about a lot of service members who have deployed. We know that this number does not represent traumatic brain injury. This member represents service members with at least one traumatic brain injury. We can say that these 375,000 are unique service members. The reason this is important is it also highlights the restrictions that we face in monitoring and conducting surveillance on TBI because of how we code. Because of how we code an interaction or an encounter with a service member, with a patient in our case.

Because we have difficulties in distinguishing a diagnosing encounter from an encounter or a repeat visit, what we call or a management encounter. Because for the most part, currently, they are being coded the same. We cannot distinguish if they are a new TBI or a second visit or first TBI. This is when the
coding guidelines were supposed to clarify things and it hasn't unfortunately. Even with ICD 10, we have not seen an improvement or the expected improvement in coding so that we would be able to distinguish. And then we'll get into that a bit later and the reason we mention this is the consequence of our current coding practice, our current coding behavior. That while we can say that throughout this period we've identified 375,000 who have TBI, for the most part we do not know how many TBI's have ever been sustained by our service members because it is very difficult if we want a high degree of certainty, to say how many service members were actually diagnosed with multiple TBI, with a second and a third and so on.

For your information there and just to provide some context on the work that we do, but also how everything is linked and how everything is related from the provider effacing systems in ALTA. As the provider is seeing, how many providing seeing the patient to the n'th product that is used to inform our leaders.

The other slides again are broken down by army, by service. Army 220,000 since the beginning of 2000. Navy about 50,000, 51,00. Air force similarly 51 and then the marines at 53,000 since 2000. At the end here, slide 34, just briefly, how we try to support the specific sites or other MPX that sometimes approach us with questions. One of the ways for example is to try to monitor where care is being rendered to service members where TBI related care is occurring. We look at the top MPF's. WE look at the region and so on and so forth. This is just something to represent the type of work that we do.

We're also looking at coding practices, new cases and sometimes we also have questions where care is being received. Which are the top facilities? Which are the top clinics? What are the top symptoms that patients present themselves with and so on.

Discussion data, speaking from an informed approach, slide 35. Here I think hoping I can get this up some. Issues which have always been of interest to a lot of the audience. There's always the coding. The myth that assign a TBI code, that there's one code. Or assign a severe TBI code and looking into the ICD 10 coding guidelines, you can find a minor TBI code.

The classification of severe, mild, moderate, is actually a classification which the DOD community has given to a group of codes. Again, TBI codes by themselves are about 200 unique codes which represent the condition of TBI. Again, to highlight that there is no single, severe TBI code. There is no single mild TBI code. There are sometimes concussion codes. And also we have to be careful because while concussion does represent mild TBI, there's a few additional mchilds in there. In addition to the codes that just say concussion.

For the most part, trying to make the point that the classification of mild, moderate, severe TBI, is the classification in which the DOD TBI community of interest has determined starting in 2008 I believe, to apply to a group of codes
and to say, "Well, these 100 codes mean mild TBI. These hundred others mean moderate TBI." And so forth. The actual number being different, but of the purposes of an example.

Dr. Agimi:

Also, my coding as a provider informs data analysts, those at the back end, of the minimally necessary injury information such as the date and cause of injury. Now this is problematic because for the most part it is not true. Primarily because coding, the external cause of injury coding, won't give us information on the external cause of injury. But, usually we have some ... the date of diagnosis and the date of injury, we tend to treat those as separate.

This is more important in the military than in the civilian world. Primarily because date of diagnosis tend to be much later than date of injury. Especially for service members in the deployed setting. We treat this with caution. If possible, we always tend to extend, also we have resources, we look into the notes and see if date of injury or date of event has been logged. But just because we see date of encounter and a TBI code, it is sometimes difficult to infer that was the date of injury as well.

And then, clinical coding in the MHS communicates each TBI sustained during military service. Again, this goes back to the worldwide numbers example because we have difficulty in discerning whether a TBI code represents the first TBI, or a repeat visit for a second TBI. This is a issue of high stress and a lot of interest because we know with TBI, as with other injuries, just the fact that you had one injury doesn't mean that you will not get a second. And often you do. So, that's something which we are spending a lot of time in trying to find a good way. But so far, it's quite problematic in being able to ascertain the second TBI from the current coding.

Continuing on to 37. Here again, the myth being that there's a single ICD code for each TBI severity and then that's not the case. Currently there are about 200 codes, ICD 10 codes, that DVBIC and the DOD TBI community of interest has associate with a TBI diagnosis. And the full list, I believe, is in the file attached to this presentation. And I think, if I'm not mistaken, the file also has the severity classification attributed to each of those. Meaning that is you have a concussion with no loss of consciousness, the severity's going to be mild because a group of experts, again within the DOD has decided to attribute that severity classification to that particular code.

Again, there's about 200 codes and these change can be up to, not to scare anyone, but there can be up to 800 codes if you figure up in extender A, in extender D or in extender X. So, if we're counting the extenders, which represent effective treatment, repeat visit versus sequela, it will triple. But, for the most part there are 200 unique codes which say something about a condition, clinical condition which the DOD has decided to represent TBI.

Now, and again, the final digit in the TBI code designates where the patient is along the continuum of care. Even with that ... that was actually the hope that
we had with move to ICD 10 because the extenders, A and D, were ... we had hoped would help us make that distinction. Because initially, one interpretation was that you have a condition, let's say S06, for as Ox, which is concussion and if you were to add and an extender A, then you would be the first or the initial encounter. And then we hoped that we would see D's afterward, meaning that's the same patient coming back or conditions for the same conditions. So, we would only count the A; however, how we keep seeing it in the data is that we see A's for the same patient repeatedly. It's sometimes even in an extended period of time so it's difficult to see whether the patient got injured again the next day or it's coming back for the same condition.

And again, each code of the 200 codes can only have one severity assigned to it. Mild, moderate, severe or penetrating. Sometimes in our data we do see that one patient is being given two different codes, two different TBI codes, one mild, one moderate. We tend to take the higher code. Anytime we see that, we take the higher one. We count the higher one. But in the sense, these being the restrictions of topic coding.

And then here on slide 38, injury data again is quite difficult because we are monitoring traumatic brain injury. Essentially we are monitoring certainly the condition and the symptoms of TBI, but ideally we'd also like to monitor the occurrence. The time and the type of injury within ambulatory data, we don't get a lot of information. I think up to 90% of, sorry 50% of the data within ambulatory care, outpatient care, does not contain information on what the cause of injury was. If we were to hope to inform practice and they inform preventative efforts, it's difficult to infer that the remainder are a representative sample.

Within the inpatient, patient's who are hospitalized, we do have good information on the cause of injury so that is very good. We try to forward that on to other services. I guess we have a pole number two here for the audience. I hope we can present it. There you go.

I think this is an important and interesting exercise in itself because we have about 120 or so respondents so far and the majority of the say that over 50% of their patients have more than one concussion during the course of their military service. Which I think really highlights the importance of certainly this issue, but also the importance that we fix the problem that we have. Primarily not being able to distinguish. With spending some effort on this issue and so sometimes we have our hands tied. But, for the most part the idea is to double the effort. To be able to really identify the patients that have more than one TBI and hopefully that can be. So thank you for that information.

And again, on slide 40 here, just as I've prepared to hand it off to Lauren, TBI numbers reflect each TBI sustained during military service and only TBI's sustained while in the military. Again, this goes back to the worldwide numbers and what we are doing there. We are restricting on how we count and also we are being very conservative because we are only allowing essentially one TBI per
service member if we wanted to put it that bluntly. Because we know that as long as we have not seen that patient before in our date, and as long as we see the TBI once, we have attributed a TBI to the patient. And we know that the patient will keep coming back with TBI later that year or two years later from then, likely to represent a new TBI. However, there is no consensus as of yet on what is the best way to count.

There is some group that there working after 30 days or after 50 days. Now those are a bit subjective ‘cause they're not data driven ways and if we say after 30 days that I can guarantee you that the number of TBI’s in the DOD will double or quadruple. Then of course, it would be important to defend that number. We are spending some time on that, but that tends to be the issue.

I'm going to switch seats here with Lauren and she will continue on here with the remainder.

Ms. Earyes:

Thank you Dr. Agimi. Very well said. For the next half hour presentation, we'll focus on some of the clinical implications and how clinicians can guide coding, increase quality of data provided in ... the quality of data that clinicians are providing surveillance which guides research and practice. One very important piece to remember about surveillance data, the numbers, the worldwide numbers that Dr. Agimi so well presented, is that these numbers are focused on timeliness, but measure when surveillance methodology recognizes the TBI.

Our first example illustrates two patients. It’s the story of two patients and it really attempts to explain that TBI occurrence, diagnosis and a recognition by surveillance, all are three separate events that might fall on the same day or they might fall on separate days. When we present our worldwide numbers, they’re presented on a quarterly basis. We do our best to insure timely reporting; however, as you can see from patient A, initially there’s a blast that occurs in July. This is a potentially concussive event and because the patient does experience a loss of consciousness or is not sure. Maybe they had a AOC, this is when the concussion is occurring. This is happening in combat or in training and later, a month later, we have an encounter and this is our first opportunity for a clinician to recognize the TBI in a way where ... an opportunity for them to enter the TBI into the medical record that's retrievable. Perhaps they received attention on battlefield and it wasn't entered. Or it was entered and it wasn't uploaded. There's many things that can cause a lapse or a delay in data.

The same service member has a headache and later on presents several, in this case, a few months later. Sometimes it’s not until years later that a service member presents. So there can be a significant delay. In patient B, a very quick example. There was a motor vehicle accident. The patient was seen by EMS and then presented at the ER. All three events occurred on the same day. If you see data that's reported for the third quarter of 2017, in some cases, all three events, both the recognition, the encounter where that TBI code was entered as well as the TBI itself all occurred in that third quarter. In some incidences,
although we're presenting for two, three, they're falling over the span of months or years.

Clinical coding versus medical. Clinical documentation versus medical coding. The best clinical documentation can be extremely helpful to an individual reviewer; however, they're two separate things. What a provider needs to make sure of is that their clinical coding is telling the story they want to tell about the patient. Their clinical documentation is a primary story and ... it can't be aggregated at a larger level. So the system that you all work in can be somewhat limiting in terms of gathering reports. For reviewers to find out what's going on with that group of patients at any given MTF, or clinic, that group of TBI patients, there isn't a simple way for us to go into ALTA and run report on TBI patients all at one MTF. We have a two part system in surveillance where we pull aggregated dated from the MDR and if we want a deeper dive to look at clinical notes, we can pull individual social security numbers and go in; however, if you want both your documentation and your coding to agree, you're going to have to choose the most specific code that you possibly can.

Again, clinical documentation can be very helpful for a trained researcher. It can be entirely thorough, but unless that coding reflects the documentation, it can speak very little to surveillance or researchers. The medical coding on the other hand is retrievable via surveillance technology. We can analyze trends and monitor clusters of TBI with this medical coding and if we use this medical coding, not your clinical documentation, but really the medical coding to draw from, to inform Congress, to inform command, medical operations. And as I said, they're not equipped with.

Some coding pitfalls. We've seen all kinds of excellent examples of coding and we've seen some pitfalls that clinicians can fall into. Some clinicians become comfortable using the same concussion code for every patient that comes into clinic. We want to make sure, I'm sure no one here is doing that, but we're not recycling the same concussion codes for either every concussion, every brain injury or every severity. See if you see a mild concussion, they all receive a same concussion code. I'll go on to how we can break those down to be more specific.

Another difficulty with aggregating our data from medical coding in the DOD system is that DOD providers aren't necessarily having to bill for the majority of their patients, so they do have the opportunity to choose incomplete codes that would be rejected in a civilian environment. Also known as a non-billable code or a non-specific code. Another pitfall that some people fall into is, you have someone who presents with a very old injury and they code it as if it's a fresh injury with one of those A terminal digits, like Dr. Agimi [inaudible 00:56:40].

Real life coding examples. Is there a real example that we could pull from ULTA in MDR and matched up what we saw in MDR. The story that one provider on one patient told with their codes versus the story that was told in their clinical documentation. A practice that we don't want followed is that if a service member is seen five times at a TBI clinic over a period of one month and each
time, for the same injury, for the same service number at the same clinic. That TBI with an A in the seventh place was entered. Even if you're a different provider, please use an A for the first time that the service member is seen with a TBI. If that service member already has an A code, please move on from A to D.

Ms. Earyes

A patient is seen, so examples we would like followed, is one case that patient was seen in an ER for a new head injury. There was an A code entered. Two days later they followed up as instructed with their primary care provider and that primary care provider chose a TBI code with a D as the seventh digit. And two weeks later, the patient was referred to neurology and the neurologist also chose a D and then made their own correction in that they noticed that the patient did not report a loss of consciousness. So they changed the sixth digit to a more specific choice of zero which indicates that there was no loss of consciousness.

In our included resources, we included the DVBIV coding guidance. That guidance does specify a mnemonic E, L, S and E. The first is for etiology. The second L, or the first L second digit is for location. The third letter of the mnemonic is severity. This doesn't rate for the mild, moderate, severe or penetrating which are the common parlants which we report our TBI in, but instead refers to whether or not there was a loss of consciousness and if so for how long, how severe was that loss of consciousness. Was there a death. Was that death a result from another injury or from this brain injury. When you are choosing a code, I'd recommend going digit by digit for the extenders, digits seven, six, five and four. E,L,S and second E. And choosing the most specific entry for each choice. Again, we've talked about A, D and X.

Laation, data entry, as I've said feeds surveillance. So we speak in epidemiological terms about two kinds of measurements that we do amongst others. Once is TBI incidents, which measures new cases of TBI and we produce a product in surveillance for this measurement. That's the worldwide numbers which we've spoken about. And that's available to all the DOD and civilians on that link. To that prevalence, begins to address how many people have TBI at any given time, within a population. There's different ways to define that. If that, when someone is having an active disease state, whether they still have lingering symptoms, or sequela. And the product we produce that reflects this is the TBI Medical Encounters Reports, which also conveys the burden of TBI care in the military at any given time. This product is currently available only to key advisors and command leadership.

You as a provider can improve surveillance data by, through your coding and we'd really appreciate if you were able to do that. As I said, it needs to tell the story that you want to tell if that data was aggregated at a larger level, whether it be if you were going to aggregate all of the data from your clinic or from your MPX or from your command. If we were going to take all of your codes and aggregate that data, are we communicating the accurate burden and incidence
and prevalence and symptoms and comorbidities that you're TBI patients are experiencing?

One disclosure or caveat is that this is not a coding webinar. Although there's a great amount of experience on our team, none of us are coding professionals. Each command does have free sources on staff as well as we have, we posted trainings and that coding training were recommended with our main training network here. Or our guide is something that I print out and have at my desk when I'm going through and working through my report. Improving date, we've discussed clean documentation and coding. I think by far and wide, that providers that I've reviewed, all do an amazing job on their documentation of their traumatic brain injuries.

Very few in a recent study we did, were missing a date of injury. But, when you're going through and talking about your patient's traumatic brain injury, please try to be accurate as much as possible with a month, a date and a year. Sometimes recollection doesn't allow that. Do your best you can, whether you want to say, "Noticed they experienced a brain injury one month before returning from deployment. Return from deployment was August 1st, therefore, perhaps in the summer of that year." As much as you can narrow it down. Cause of injury, contributory factors, location of injury. Both where the patient was and where the location where the injury was on their body. Any other injuries besides the brain injury that were sustained at the same time. Any complications in the healing. Any comorbidities that they experienced. If they had headaches before the brain injury. Anything that would be relevant to how the patient's outcomes might fair that would be contributory to their course, along their course of injury, are all very important. And by far and wide, everyone does a wonderful job.

Here's just again, the DVBIC guidelines. One piece that I’d to reiterate that's in the coding course is that there are DOD specific codes for screening. The hope is that, the instructions are, that if you have somebody, a patient has experienced a potentially concussive event and they present with symptoms and they screen negative for TBI, you code the negative screening. You code their symptoms and other circumstances and that's it. You don't need to code a TBI because that wasn't your diagnosis. Now, if they code positive, if they screen positive, than you would code the TBI injury diagnostic code and their symptoms, circumstances of the injury etc.

At this time, we don't ask that a positive screen code is entered; however, there is one that exists. DOD 121 is a negative screen, then there's positive screen that follows, declined at etc. A clean coding. How else can you coding be clean? Among all new TBI's diagnosed after ICD 10 was implemented, less than 10% had a screening code of any type. Again, I mentioned, just now, and if you take the ATN or brush up on your coding training, they'll reiterate that again via screening codes.
Next, another way to be a little cleaner is choosing the most specific diagnostic code possible. If you have someone who sustain a car injury, I'm sorry a motor vehicle accident, and a brain injury in that motor vehicle accident for which they never sought care, and now they're seeking care for the first time at your office. And this injury just happened 48 hours ago and now they're having a headache. Post-concussion syndrome may not be the first code that you might turn to. They have sustained an injury. They have an LIC. And injury code might be more specific. You have more ability to tell us more about the injury. Where on their head they were hit. Where they are in their presentation of care. Again, in this example, it's their first time presenting for care so you choose an A extender. Post-concussion code would not be necessarily the best diagnosis to choose 48 hours past injury.

Okay, next one. Make sure if you're using a history of TBI code, that you're using it correctly. I'm going to move on. So please, TBI coding. Again, I've mentioned two things. The etiology, the location, the severity, the ways they are in the care. It's a hard ask, but again, if it's brand new TBI, choose A, if they've been seen before choose D. Choose S if it's truly a sequelae.

It would be great if we had one code that could communicate a brand new TBI. That should be A, but because A is being chosen multiple times, we're at this moment unable to differentiate new TBI's more than once in a patient's lifetime. And as you all reported, you know you're patients are having more than one TBI. So cleaner coding could help us rely on the intended use of the codes. Also, if a positive screen began to be implemented and used correctly, that would be another way. Not all cases are equal in timeliness.

We did do a recent data pole where we went back and looked at 160 patients that were diagnosed with TBI for the first time in 2016 and 2017 and by using the first code that they were recognized with, remember recognition is not the same as occurrence, so when surveillance first became aware of this patient's TBI. But it was not perhaps the same day as the patient's TBI. So, we went into the patient's record. We matched MDR data with ALTA data and we saw that the strength of coding differed based on what code the patient first presented with in our surveillance methodology. In this case if for some reason the code wasn't visualized, perhaps it was with [inaudible 01:07:49] care and there was a lag in our receipt of the code, but they were recognized for whatever reason, we did have a 14 month delay.

If it was an A code or a D code, those were shorter. Those were much, much shorter in their delay. Again, a history of TBI code like DOD, I'm sorry DOD0101 or the Z87 code, that's history of TBI, those had the longest delay. In those cases, those cases were years old by the time they were reported to us. Not necessarily the first time that patient received care for that TBI, but the first time they were recognized by surveillance methodology.

Causes of injury. Causes of injury by service in active duty service members in the same case review. We broke it down by service and we saw that there were
differences in the most common cause of injury. Mid-service Marine and Army had many more combat related injuries, blasts being the leading causes. Air Force had, it could be suggested, that they had less occupational related causes of injury or risk of injury and therefore they were more likely to sustain their TBI's during their course of their their every day lives. In that mostly being a personal motor vehicle accident. And maybe it was some what split, blow to head, which in man times was recreational or sport recreation or a fall. Which quintessentially is also the most common cause in civilians, fall is the most common cause.

Moving on to case studies. How would you code this encounter? A service member presents at your practice stating that while deployed seven years ago, she sustained three blast explosions. She had no prior documentation of brain injury or concussion in her medical record because you did a medical record review. How do you code this statement of blast exposure. That statement that she makes. It states that she had no loss of consciousness, but she felt dazed, maybe. Does your diagnosis change if she's complaining of a headache after today's visit. So, she's unclear of her recollection. It might be, if I as a provider was hesitant to diagnose her, at this juncture, doesn't mean that's my last opportunity. But at this juncture, if I was not going to diagnose her with a brain injury or if I was, if I was going to go with her account of alteration of consciousness, I would say that she had a history of mild traumatic brain injury and she was presenting today with headaches. So I would choose answer 3. That RS1 code is a code for headache and the second code DOD0102 is code for history of brain injury, mild.

Your next case study is that you're practicing in a specialty area. You're in neurology or behavioral health and you receive a referral from primary care to evaluate a service member post-moderate TBI. The diagnosis of moderate TBI was already made in primary care or another setting like the ER. But, either way, there already have been an injury code with an initial visit and an A extender at the end. This is the first time you're seeing the patient for her TBI and when gathering a constructive history from the patient on her injury, she reports she hit her head on the right side and she lost consciousness for about an hour. Which TBI code would you choose in addition to any other codes applicable to the visit?

In this case the correct answer, you need to make sure that you're choosing the D code because we're still within an active injury period. So, D would be appropriate. It's neither an initial visit nor a sequelae. But, we need to make sure we're correctly choosing a moderate code. So the DOD0103 would be the appropriate code. We would choose SS6013D which is a follow-up visit for a moderate TBI. And then we'd choose DOD0103 which is also answer three.

Now we're wrapping up. In conclusion the key take aways that we're hoping you're leaving with are that surveillance and research are not equal. There's different stringency with the data entry. In research you'll have fewer data enters. In surveillance have many people, all across the country and world,
entering data and it's on the entire population rather than a subset. Confidence levels can vary between the two and methodologies are different as well. Each having its own unique purposes and mandates. [inaudible 01:13:20] should conduct ongoing surveillance on TBI in the military using clinical coding, may help you understand that. The MHS coding environment does not obligate the completion of key [inaudible 01:13:29]. When you're going through and entering your information, some fields are mandatory, but certain fields that we'd like to be mandatory are not yet mandatory. So you do have the wherewithal to click those fields and leave data on the table that will never be, it would be accessed or aggregated, meaningfully. 

Surveillance that is strengthened by provider adherence to code. If people don't adhere to a standardization of coding methodology, we're not able to aggregate data in a way that provides meaningful and actual data. As a provider, we hope you feel confident in your ability to use the data products that we produce so that you can frame the questions of patients with other providers at conferences when you're presenting that you feel confident to be able to use the data products. Or request data products from us so that you can present with confidence. And we also have our email address available. So even if you'd like to request data, have some questions with it or have a consult on how to best describe or reference data, we're more than happy to do so. We really hope to bridge that relationship with U.S. providers and researchers and presenters and subject matter experts in your field.

Additionally, if you're presenting our publishing data, please remember that the occurrence between us, the actual events and the seeking of care or the reporting of that Brian injury as well the recognition. Those are three separate events and there could be a lag in some cases we noticed the lag is very great in fact ina recent data pool, we notice that more related, combat related injury tended to have the largest lag. Whether that is because there's a gap, although care is being received in the field, there may be a gap between the uploading of documentation of that infield care to common systems from which we draw data or it could have been a mild injury or a repetitive concussive event that wasn't disclosed until much later. Sometimes that's separation or retirement. There's different reasons that data lags and we're looking to [inaudible 01:15:56] that as we begin to improve reporting. With that, I'd like to thank everybody and turn it over back to our moderator.

Dr. Marion: Great job Lauren and Yll. Thanks for a wonderful presentation. You actually made what is usually kind of a dry topic, pretty interesting and I appreciate that. If you have any questions for our presenters, please submit them via the question and answer packet on the screen. So, it's that time to answer questions from the audience. If you have not already done so, you may submit questions via the question pod located on the screen. WE will respond to as many questions as possible. Joining us for the Q and A portion of this webinar are Mr. Emanuel Baah and Mr. Tesfaye Deressa. Mr. Baah is a certified public accountant and holds a masters degree in business administration. He's a surveillance analyst at the Defense Health Agency, DVBIC. Mr. Baah worked as a
financial advisor and budget consulting analyst for several federal agencies in the marketing analyst, in the private sector. He's held positions in project management, business process analysis and improvement and served as an active Navy logistian.

Mr. Tesfaye Deressa is a surveillance systems analyst at DVBIC Office of Surveillance. He joins DVBIC in 2015. Prior to joining, he worked in academia and research as well as in the business sector as an analyst. Mr. Deressa holds a master of science degree in biology and a certificate in computer programming. He also received training in pharmacy biostatistics and data analytics. Alright, so, question and answer session is now happening. Let me take moderator prerogative and ask the first question which is Ted. Anyone who wants to answer it. Why are we only counting one TBI? We know that many service members have multiple TBI's when they're in the service and so why is all this data only about one TBI?

Dr. Agimi: I guess I'll take the first stab at responding. That's a good questions, Don. There's no easy way of counting multiple TBI's. There are ways. We believe there are ways; however, there's no consensus on what is the best way to do that and I think for the most part it's the consensus that is the sticking point or the problem. Primarily because as is of course the audience can also contribute to various ways we could do it. One way could be you could count anybody with an extender A after six months. The minute you see the service member come back after six months, you could say, "Okay, well, we make you eligible for a second TBI." That could certainly be a way and there's no problems in terms of from our data approach to do that. IT's just, we believe that it is not practice or data driven, so part of hopefully this year, 2018 and a bit of last year, there is an effort which is really looking at and drilling into this. And there's something that involves a lot of clinicians within DVBIC and then perhaps others at some point. But, really see, what is a rule that we can apply if the coding itself is questionable? What is a rule we can apply?

And the rule doesn't have to be only with time, for example, we could look at a presentation of symptoms. We could look at where the person is being seen. So, we could look at a couple of things and we're doing that now to really try to narrow down the best coding algorithm which we can apply to the data that has the highest true positives for multiple TBI's. We have a bit of an effort going on now where the idea is to do just that. Look at the data over a period of a couple of years and see if we can observe some patterns of the repeat TBI's and then identify those service members and then have a clinician go into the medical record and validate. What we identified as a second TBI. What we didn't identify as a second TBI. And if so, we can apply that algorithm to the remainder of the data. But-

Dr. Marion: But these are all possibilities, Yll, but is there actually an effort ongoing? I mean a year from now, two years from now, are we going to know how many people had multiple TBI's?
Dr. Agimi: Yes, I think the timeline on this effort is sometime within 2018. We're supposed to go up with a rule. And a rule which hopefully we can support with data and validation. But yes, to your point Don, there is an effort and that effort has a timeline. By hopefully mid of this year and if we don't stretch it too, too much. We're supposed to come up with a rule that will give us an estimate of how may service members have second TBI's and essentially would continue to apply that rule unless the data, at least that rule changes and hopefully it doesn't. But in the sense, there is an effort and hopefully by mid of this year we'll have a sense of what multiple TBI's look like.

Dr. Marion: Great, alright, one of the first questions we got in our chat box is, what effects could the underestimating or overestimating of TBI in the military have for DOD clinical operations, clinicians and/or patients?

Dr. Agimi: Yeah-

Dr. Marion: Maybe I could have Lauren take that one.

Dr. Agimi: Sure, sure.

Ms. Earyes: Because the surveillance numbers on instance and prevalence are used by Congress and researchers and medical command, well recent examples of past surveillance data has been used as far as how to guide acuity determinations at TBI clinics. A misrepresentation of that could skew the data in a way that would have ... that might not make those decisions the most timely and accurate possible. Which could only harm, or potentially harm those patients. It wouldn't be the giving the best possible care to both patients and the best care environment for practitioners to practice in. Another way we use data, or data has been used in the past, are to help researchers know where different patient, pocket of patient populations, reside across the country and the world. We could have trouble recruiting patients for study if data was skewed. Also there used to make hiring decisions and staffing decisions.

Dr. Marion: That's important data.

Ms. Earyes: It is very important data.

Dr. Marion: Go ahead. Alright, there are several different questions about genesis. I don't know anything about genesis. Can ... a couple of people asked questions-

Dr. Agimi: While we haven't been able to see the chat in terms of what questions have been asked about the genesis, a lot of what we said today is based on ULTA. And the reason it's based on ULTA is because the data which we've received within MDR, is a direct result of the information which the provider enters within ULTA. And in the outpatient setting or centers if they're inpatient. To tell you the truth, how that will work out with genesis is still unclear. We don't have data from genesis yet. I believe we will be receiving data from genesis at some
point because the MDR is still going to receive that. How the provider inputs the data within genesis is going to be very interesting. We can't really anticipate how that is going to impact our work, but I think we're treating that and we will be treating that with a lot of caution.

And the reason is because for example, all the providers in the webinar today, when they're opening a new appointment, for example, within the appointment as they're entering the information on the patient, there is one click. One box which says injury related or not. For example, let's say that most participants today enter or click on that button. It means that we get it in our data that that patient visit was injury related. Now, let's just assume for a minute that the forms or the in forms that genesis is going to introduce or their layout is going to be slightly different. Even a slight change like that could influence our data in the back. To answer your question by not answering your question, I'm really saying that we're monitoring and hopefully we don't anticipate that it's not going to be a easy transition.

Dr. Marion: Are we collecting data on TBI prior to military service?

Mr. Deressa: No, we're not.

Dr. Marion: Why?

Mr. Deressa: Because the base doesn't support it as of yet. Most of them are not going to be shaded well with evidence in the medical practice. It's going to be predominantly by recruiting stations, pretty much. Or at maps when they join in the service. Did you have this? Is going to be in the record. We will not have any match of MTF data and location. We don't consider-

Dr. Marion: I guess from my clinical perspective, if we're worrying about multiple TBI's and long term effects of those multiple TBI's, in the future, it might be important to have that, right? Would you agree?

Mr. Deressa: If I can have it in a reliable way.

Mr. Baah: We don't collect TBI prior to military service. Actively, but if I knew, could during screening, report they had a TBI, we could capture that formal history with TBI.

Dr. Marion: Okay.

Mr. Baah: So, if they TBI didn't happen military service, but because the recruiter reported he or she had TBI prior, it could be captured in a formal history of TBI.

Dr. Marion: Well that's good to hear. Dr. Agimi, did we do a good job of collecting TBI data prior to 2006?
Dr. Agimi: That is a good question. No, I'm not going to say no. Of course I think we did the best we could. But if the audience is familiar with the worldwide numbers, for example, at the end of ... in the bottom of the website there, there tends to be a chart. Which really follows the feel on the overall numbers with the burden of TBI and so on and so forth. And we see a rapid increase. Now we know that the rapid increase is due to a number of reasons. One is of course there was combat intense, a lot of the operations were really wrapping up there in 2006, and seven and eight and so forth. We were sending ... our soldiers were sustaining more TBI's so we were catching that. But also during that period a lot of the efforts to identify TBI were being put in place including coding.

A lot of what we see, this is essentially called a surveillance effect. Because once you put your efforts to identify or monitor and issue, you will find more of that issue or more of that condition. So, before 2006, for the most part, we believe that we underestimated the number of service members that were, that had sustained a TBI. So they did sustain the TBI clearly, it's just they were never diagnosed or if they were, they were never entered into the resulting databases. There's a few issues there, but for the most part before 2006, those numbers, we believe, are severely underestimating the burden of TBI.

Dr. Marion: Well, I think that's all the time we have. Again, I so appreciate, Lauren, you and Yll's unique abilities to make this a pleasurable and an interesting and informative lecture. Thank you very much. You guys have obviously done a lot of work in preparing a really fact packed slide presentation. After the webinar, please visit http://dhaj7.cds.psgce.com to complete the online continuing education evaluation and download or print your CE certificate or certificate of attendance. The online CE evaluation will be open through Thursday, January, 25th, 2018. The chat function will remain open for an additional ten minutes after the conclusion of the webinar to permit attendees to continue to network with each other.

Believe me, we will pass on your questions to our speakers and we'll get you answers, albeit offline. Join us again on our next webinar presentation, The connected Health Webinar Department of Defense Mobile Health Practice Guide, Third Edition will be held on February 22nd, 2018 at this same time, 1:00-2:30pm eastern time. The next DVBIC traumatic brain injury webinar, entitled, DVBIC: A Quarter Century of Advancements in Clinical Care, will be held on March 8th of this year. Again, the same time, 1:00-2:30pm eastern time. You may contact the Psychological Health Resource Center toll free or email for more information and with that, we conclude the webinar today and thank you. Have a wonderful day and a belated Happy New Year all.