DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention
Division of Tuberculosis Elimination

Advisory Council for the Elimination of Tuberculosis

June 5, 2012

Atlanta, Georgia
and via teleconference

Record of the Proceedings

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Minutes of the Meeting

The Department of Health and Human Services (HHS) Centers for Disease Control and Prevention (CDC), National Center for HIV/AIDS, Viral Hepatitis, STD and TB Elimination (NCHHSTP) Division of Tuberculosis Elimination (DTBE) convened a meeting of the Advisory Council for the Elimination of Tuberculosis (ACET) on June 5, 2012, via teleconference and in person in Building 8 of CDC's Corporate Square Campus, Conference Room A/B/C, in Atlanta, Georgia.

Call to Order, Welcome, and Roll Call: June 5, 2012

Shannon Jones III
Acting Director of Public Health and Community Services,
City of Austin / Travis County
Texas Health and Human Services Department
ACET Chair

Mr. Jones called the meeting of ACET to order at 11:02 a.m. on Tuesday, June 5, 2012. He noted that the Webinar format was new for ACET and that they would conduct at least one meeting per year via Webinar. He asked meeting participants to share their feedback regarding the format. He emphasized the importance of maintaining a quorum throughout the meeting.

Hazel Dean, ScD, MPH
Deputy Director, NCHHSTP
Centers for Disease Control and Prevention
ACET Designated Federal Official

Dr. Dean reminded the group that all ACET meetings are open to the public, and all comments made during the meeting are a matter of public record. Members should be mindful of potential conflicts of interest (COI) identified by CDC's Committee Management Office (CMO) and should recuse themselves from voting or participating in those discussions. She asked that ACET members identify potential conflicts of interest during the roll call.

Dr. Dean recognized that ACET members Dr. Iram Bakhtawar and Dr. Christine Hahn would rotate off of the committee as of June 30, 2012. She thanked them for their contributions and said that a Certificate of Appreciation signed by CDC Director Dr. Tom Frieden and NCHHSTP Director Dr. Kevin Fenton would be mailed to them. Approval has been received for a nomination package for members to replace Drs. Bakhtawar and Hahn. Dr. Dean welcomed *ex*

officio members Dr. J. Nadine Gracia from the Office of Minority Health (OMH) and Dr. Craig Shapiro from the Office of Global Affairs (OGA).

Dr. Dean conducted a roll call of ACET voting members, *ex officio* members, and liaison representatives who were present in person and via teleconference. She verified a quorum of ACET voting members and *ex officio* members.

Mr. Robert Scott, CDC, oriented ACET regarding protocols and procedures for participating in the meeting.

Modeling TB Epidemiology

Andrew Hill, PhD
Data Management and Statistics Branch
Division of Tuberculosis Elimination/NCHHSTP
Centers for Disease Control and Prevention

Dr. Hill presented a recently-published transmission model for tuberculosis (TB) trends in the United States (US) and discussed projections of TB trends for the US-born and foreign-born populations.

The TB elimination goal is 1 case per million annually. In 1989, the ACET Strategic Plan set strategic goals for elimination by 2010, with an interim goal of 35 cases per million by 2000. CDC surveillance indicates that overall incidence rates in 2000 were 58 cases per million, and in 2010 were 36 cases per million. If current rates of decline are maintained, then elimination of TB throughout the US could be expected by the early 22nd Century.

In 2010, 60% of all TB cases were among the foreign-born population. The foreign-born population itself constituted 12% of the total US population. At that time, the US-born population experienced TB rates of 16 cases per million, and the foreign-born population TB rate was 181 per million. If current rates of decline persist, then elimination of TB is expected in the US-born population by the middle of the 21st Century, and in the foreign-born population by the middle of the 22nd Century.

Dr. Hill shared with ACET a graphic representation of TB incidence trends in the US from 1993 through 2010. Until the year 2000, TB incidence in the overall US population was declining at a rate of 7.3% per year. The rate of decline then slowed to 3.8%. TB rates in the foreign-born population have declined at a steady rate of 3.8% per year. TB rates in the US-born population also declined in 2002 from a rate of 10% per year to a rate of 5.9% per year. Because of an unexpected decrease in cases, the rates have not been extrapolated beyond the year 2008; however, Dr. Hill provided data points for 2009 and 2010 for reference. The number of TB cases in the foreign-born population has remained relatively constant in recent years, but the contribution of cases from the foreign-born population has increased.

Reactivated TB plays a significant role in driving TB incidence in the US. The World Health Organization (WHO) estimate for worldwide latent TB infection (LTBI) is approximately one-third of the world population. A probable estimate of LTBI that is imported into the US among newly-arriving foreign-born persons is approximately 20%. A National Health and Nutrition Examination Survey (NHANES) study in 2000 estimated LTBI prevalence in the overall US population at 4.2%, or 11 million people. LTBI prevalence in the US-born population was 1.8%,

or 5 million people, and 18.7%, or 6 million people, in the foreign-born population. Genotyping studies have indicated that the proportion of cases due to reactivation, as opposed to recent infection, is approximately 60% to 70% in the US-born population and 75% to 85% in the foreign-born population. These data informed the TB transmission model.

The scope of the TB transmission model was to develop a relatively simple model based on previously-published paradigms and TB transmission models in the literature to assess relative impacts on time to elimination of treatment of active TB disease and LTBI. The model aimed to assess whether the constant rates of decline will persist. The model also incorporated the contributions of incidence rate in the foreign-born population to overall incidence rates. Finally, the model assessed the effect of reducing transmission of disease as an interim step to elimination.

The model structure is a differential equation model, which is a common approach in infectious disease. The model fit to 2000 through 2008 surveillance data for the US- and foreign-born populations. The model allowed for external recruitment of people arriving in the US with LTBI and distinguished between recent infection, which includes people who developed disease within 2 years of infection, and long-term reactivated TB. The model allowed for cross-infection between US-born and foreign-born populations. Parameter ranges were drawn in accordance with current epidemiological literature. DTBE staff ran many scenarios of the parameter values to assess the model.

Dr. Hill presented to ACET a diagram of the model flow, which begins with US births and foreign arrivals into a mostly susceptible population. The model assumes that the US births do not have TB and that the foreign-born arrivals are susceptible at a rate of approximately 80%. By coming into contact with a person with infectious TB, there is a probability that a susceptible person can develop either acute latent infection, which progresses to disease quickly, or long-term latent infection, labeled “Chronic LTBI,” which progresses to disease via reactivation. The model distinguishes between infectious and non-infectious TB. It also allows for re-infection, in which case a person infected with long-term, latent infection can be re-infected by coming into contact with an infectious person. The route to active TB disease is then accelerated. Because of mathematical limitations, it was not possible to model foreign-born persons who leave the US for their country of origin and then return to the US. Further refinement of the model is needed to accommodate this scenario, which is likely to worsen the projections of incidence rates. The model assumes that people with infectious or non-infectious TB are being treated at a high rate in the US and also allows for the treatment of latent infection. The model can assess the impact of increasing treatment of latent infection on projected incidence rates as well as the impact of the proportion of arrivals of foreign-born persons with LTBI.

The model yielded densities for best-fitting parameters for 2000 through 2008 incidence observations. Over a range of different parameter fits, the density projects a median elimination year of 2063 among the US-born population. The model supports a continuation of current trends of declines of 5.9% per year in the US-born population. The situation is different among the foreign-born population. The model indicates that TB elimination is generally not achievable for the foreign-born population. The median range of TB incidence in the foreign-born population in the year 2100 is 119 cases per million. According to this model, current trends in the foreign-born population are not likely to lead to TB elimination among the foreign-born population. The overall incidence rate is projected to be 21 per million in the long-term.

The model considered scenarios with different TB interventions in the US- and foreign-born populations. The baseline projection assumes no changes in treatment or screening and yields a median incidence rate of 100 to 150 cases per million in 2050 for the foreign-born population. Various scenarios were considered for the foreign-born population. One scenario assumed instantaneous reduction of transmission so that all TB incidence results from reactivated TB. That scenario yields a median of approximately 100 cases per million in 2050. The next scenario assumed persisting transmission, but doubled the treatment rate for LTBI. This approach shows more promise, with a median rate of approximately 80 cases per million, but is still well above the elimination target of 1 case per million. A scenario that both doubles the LTBI treatment rate and reduces by 50% the latent infection of people arriving in the US yields better results, with a median rate of approximately 50 cases per million. Adding reduction of transmission to that scenario results in an even lower rate. Dr. Hill emphasized that it is not possible to cut transmission instantly, but the model asks "what if" and assesses the likely impacts. Even with a range of strategies, the model suggests that it will be difficult to achieve TB elimination in the foreign-born population.

Dr. Hill presented graphic time-series curves of a range of incidence projections to 2060 from best-fit parameter sets that assume doubling the treatment of LTBI. Even with doubling treatment, the range of incidence among the foreign-born population is reduced from approximately 150 cases per million to 100 cases per million. The rates are still far above the elimination target. Projections for the US-born population are more optimistic. If LTBI treatment rates are doubled, then the elimination target could be achieved 20 years sooner than if no changes are made.

A sensitivity analysis tested the results of the model projections and determined which parameters had the most effect on model projections of incidence. The projected year of elimination for the US-born population is sensitive to the treatment rate of LTBI; the assumed level of contact between US-born and foreign-born populations; and the annual risk of infection. The projected long-term incidence in the foreign-born population is sensitive to the LTBI treatment rate; the reactivation progression rate among the foreign-born, which was calibrated separately from the US-born; and the level of importation of LTBI among new arrivals.

If current TB control efforts are maintained, then elimination of TB among the US-born population can be expected by the end of the 21st century, perhaps as early as 2060. Elimination of TB among the foreign-born population is unlikely by 2100, even with higher rates of targeted testing and treatment of LTBI. Cutting transmission as an interim step could hasten elimination among the US-born population, but foreign-born incidence rates would remain high.

The results of this work were published online and in the *Journal of Epidemiology and Infection*, and Dr. Hill thanked his co-authors, Drs. J. E. Becerra and Ken Castro. He acknowledged his other CDC colleagues who contributed to the effort.

Discussion Points

ACET thanked Dr. Hill for the presentation and agreed that the results of the modeling projections are sobering. Nevertheless, they should remain optimistic in setting goals for TB elimination.

ACET observed that increasing treatment of LTBI depends on a number of operational elements of TB control, which are understandable to people who work "on the front lines" of TB control. These elements include the speed or delay of contact investigations; the thoroughness of

contact investigations; the proportion of infected people who start isoniazid and the proportion who complete treatment with isoniazid; and efficacy. Including these elements in the model would help front-line personnel understand why it is important to do what they are doing.

Dr. Hill agreed and hoped that those elements of LTBI treatment could be included in a Web-based, interactive model utilizing a different model paradigm that will allow for new parameters to be introduced. The differential equation model is commonly used in infectious disease models, but it has a "sledgehammer approach" in that it assumes constant parameters. He said that the software used for the modeling is called "R." It has differential equation capability as well as the capability to take into account a range of densities and projections.

ACET requested a link to the paper published in the *Journal of Epidemiology and Infection*, or a copy of the paper. Dr. Hill indicated that he would provide that information.

There was discussion among ACET regarding how to apply the results of this modeling to policy, perhaps by encouraging public health programs to place more emphasis on LTBI in light of limited resources, or whether other areas of focus will have more impact. CDC or ACET could utilize the model projections to create practical recommendations for public health.

One of the assumptions in the model was an immediate cutoff of transmission. Given decreased resources and the scale-back of services for TB control at the state level, diagnoses of TB are made later and later. Further, TB control personnel are seeing pediatric TB, which is a marker of community transmission. ACET asked how a longer duration of infectiousness might change the model, given that the period of transmission in communities is prolonged.

Dr. Hill replied that the direct effect of increasing the duration of infectiousness will be an increase in the number of secondary cases arising from a single-source case. Incidence rates will increase, and the declines in incidence rates will slow down. This effect is generally true for all infectious disease models.

ACET cautioned that the estimates of new MDR-TB cases in almost every country are likely to be underestimated.

The term "re-activation" may mean different things to different people, and ACET inquired about the most common causes of reactivation of LTBI in the US and whether the cause might be re-infection, a result of individuals becoming immunocompromised, or as a result of the natural aging of the population.

Dr. Hill replied that the chief cause of reactivation is likely to be aging of the population. This model cannot address that question directly. There are different progression rates for reactivated TB in different age groups. According to the model, re-infection is "at the bottom of the list."

ACET expressed concern regarding the rapidly increasing number of patients, particularly those with arthritis, who are being treated with immunocompromising drugs that are known to increase re-activation of TB. ACET hoped that this phenomenon is being tracked so that the field may learn about its impact on the larger community and about how efficiently and rapidly TB is diagnosed in these patients.

In response to a question from ACET regarding the effect of interaction between the foreign-born and US-born populations on the model, Dr. Hill said that early versions of the model assumed no interaction between the two populations. This approach is not realistic. Cross-contact was added to the model with the assumption of preferential mixing; that is, most contacts occurred within the foreign-born populations and the US-born populations. The model allowed for random mixing in the background and assumed a certain amount of preferential mixing. In the absence of good data about mixing, the researchers employed a model-fitting process, allowing the numbers to vary.

Dr. Edward A. Nardell, a liaison representative to ACET from the International Union Against TB and Lung Disease, commented that the mathematical model approach to TB had been important to the field for some time and that Dr. Hill's approach was refined and very good. He noted the importance of re-infection among the foreign-born returning to their countries of origin. Re-infection plays a large role in the active TB disease process in high-burden countries and has an impact on the prospects of LTBI and vaccination. US-born populations are then exposed as well. Additionally, he asked about a scenario in which the infection to which these populations are exposed is increasingly multi-drug resistant or drug resistant. This scenario is likely to occur internationally, as treatment for multi-drug resistant TB (MDR-TB) is not well-handled. He predicted that the impact of MDR-TB will be "bad."

Dr. Hill replied that they are considering other modeling paradigms, such as an individual-based model, which will allow for more flexibility than the differential equation models and should allow for the incorporation of persons who leave the US, become re-infected, and then return to the US. He and his colleagues conducted an exercise to examine the effect that MDR-TB might have on incidence rates in the US. The results appear in the online supplement to their paper in the *Journal of Epidemiology and Infection*. If MDR-TB increases in the US as in other countries, the elimination projections will be worse. In the sensitivity tests for MDR-TB, they assumed that MDR-TB in the foreign-born population increased from 1.2% of new cases, as reported in 2008, to 20% of new cases by the end of the 21st Century. They assumed that the MDR-TB rates remained constant at the 2008 level for the US-born population. Their exercise allowed for a reduction in the effectiveness of treatment of TB due to MDR-TB. The resulting densities did not differ significantly for the US-born population, but the long-term incidence levels in the year 2100 were worse in the foreign-born population. Their modeling initially operated under optimistic assumptions by excluding MDR-TB and not modeling re-infection from the country of origin. Even under these optimistic assumptions, the conclusions are pessimistic.

Dr. Charles E. Wallace, an ACET liaison representative from the National Tuberculosis Controllers Association (NCTA), asked about the potential impact of shorter treatment regimens or the development of a vaccine.

Dr. Hill answered that shorter treatment regimens and/or a vaccine would have an impact on the model. He referred to models published by Dr. Christopher Dye and others in WHO. CDC's model is based on a publication by Dr. Dye that focused on global incidence levels outside sub-Saharan Africa and that considered the impact of a vaccine. In terms of the model, the development of a vaccine would remove individuals from a susceptible state to a recovered state. Dr. Dye's model indicated that combinations of vaccination of susceptible people and treatment of LTBI had a synergizing effect in addressing incidence rates. Separately, the two approaches did not have as strong of an effect as the combination of the two. If vaccines become available, then the projections will improve.

Dr. Andrew Vernon, DTBE, NCHHSTP, CDC, commented that several recent estimates suggest that the progression of LTBI is slower than the 5% to 10% estimate that has been used for some time. He wondered how a change in the estimated progression of LTBI could affect the outcome of the model. Further, he asked how curtailment of transmission in Mexico could influence the model.

Dr. Hill responded that modeling the progression rate of LTBI is a challenge. He recalled a detailed examination of LTBI progression in the US that was published approximately 15 years ago. That research noted that progression is age-specific, but did not take into account the time since infection. Thus far, models do not easily allow for the incorporation of how long a person has been infected or for assessing the likelihood of progression based on the time of infection. This issue needs to be addressed, and an individual-based model could incorporate the issue.

Dr. Hill said that curtailing transmission in Mexico would likely have a considerable impact on the model and improve projections.

Roll Call

At 12:32 p.m. EDT, Dr. Hazel Dean called roll of ACET members, *ex officio* members, and liaison representatives. She established a quorum for the meeting to continue.

TB Outbreaks in Special Populations

Thomas R. Navin, MD
Chief, Surveillance, Epidemiology, Outbreak Investigation Branch
Division of TB Elimination / NCHHSTP
Centers for Disease Control and Prevention

Dr. Navin reported to ACET progress on CDC's work to predict TB disease outbreaks, which emphasizes the importance of special populations.

Previously, Dr. Navin presented to ACET CDC's work on running their prediction models against TB outbreaks which CDC had been involved in investigating. The former presentation described the use of SaTScan and the county-based log likelihood ratio as well as CUSUM approaches to predicting outbreaks. This work showed that 8 of 10 of the outbreaks could have been predicted, sometimes before the local program identified the outbreak, using these methods. The next steps in this work focus on predicting TB outbreaks when they are still small clusters, utilizing routinely-collected surveillance data from CDC to predict future outbreaks.

Dr. Navin explained that SaTScan is a freeware program used to detect spatial disease clusters. The program requires that the user input the geographic unit. CDC collects Zip codes of collected TB cases with the TB genotype of interest as well as the Zip code of all other TB cases as comparison. SaTScan also requires a search radius. CDC has found that a search radius of 50 kilometers works well, although it will not capture all cases in an outbreak. SaTScan outputs include the Zip codes involved in the TB genotype cluster that is detected; the TB cases in the cluster; and the log-likelihood ratio and *p* value of the cluster.

The analytic cohort for the study was clusters identified by SaTScan during the period 2006 through 2010. The study included significant as well as non-significant SaTScan clusters, and

the analysis used significance as a potential predictor. This approach ensured that the study was not limited to significant clusters. The analysis was restricted to clusters with at least 3 TB cases with the same genotype. It will eventually be important to determine whether outbreaks can be predicted when only 2 cases are identified, but at this stage of the research, the 2-case model was somewhat unstable. Further, it would be difficult to generate guidelines for TB controllers to investigate a TB cluster with a size of 2. Significant resources are required to conduct a full outbreak investigation, and only a small portion of 2-case clusters grow. When a third case is identified, however, a full outbreak investigation may be warranted.

The study also limited findings to counties where genotyping coverage was at least 75%. This limitation was placed on the study because the timeframe began in 2006, when many states had not yet started genotyping. When a state starts genotyping, new clusters are identified, but it is not possible to determine whether the clusters are actually new, or whether they appear to be new because the state has just begun genotyping. Further, the study focused on incident clusters that were just beginning so that the first 3 cases of the cluster could be defined. Therefore, the researchers eliminated clusters that had had cases in the previous 24 months.

The observation period began on January 1, 2006, and ended on December 31, 2010. An "outbreak" was defined as clusters that grew from 3 cases to 6 or more cases within 24 months of the third case. Additionally, the outbreaks were confirmed by local TB controllers.

SaTScan identified 3375 genotype clusters during the observation period. Almost half of those clusters were located in counties that did not meet the inclusion criteria of at least 75% genotype coverage and were eliminated. Of the 1513 that remained, 586 clusters were eliminated because their initial case was not preceded by a 24-month period of no reported cases of that genotype. A total of 927 incident clusters with at least 2 cases remained. Of those, 659 clusters were eliminated because they did not grow beyond 2 cases during the observation period. Because of insufficient follow-up time, 120 of the 268 remaining clusters were eliminated. The observation period for an outbreak, defined as the period between discovery of the third case and the next case, was 24 months. The standard follow-up time was 24 months, and it was sufficient to identify clusters that became outbreaks. Ultimately, 148 clusters sized 3 or more with 24 months of follow-up were identified, and 146 of them were included in the study cohort, as the outcomes of 2 clusters were not identified.

Dr. Navin shared the study's remarkable finding that many clusters do not grow beyond 2 cases. In the past, examinations of recent transmission made no distinction between clusters of size 2 and clusters of size 20: all clusters are considered to be recent transmission. This study showed, however, a dramatic difference in the sizes of clusters. Next, Dr. Navin showed the data of clusters sized 6 or greater stratified by which cases were identified as outbreaks by local TB controllers. As clusters grow in size, the size definition is a better predictor of an outbreak.

Of the final cohort of 146 clusters greater than 3, 72 did not grow during the observation period. Some growth was seen in 52 of the clusters, which grew to 4 or 5 cases. Six clusters grew to six or greater, but were not confirmed to be outbreaks. Finally, 16 clusters, 11% of the cohort, grew to 6 or more cases and were confirmed to be outbreaks.

The analysis of which clusters would become outbreaks yielded several predictors. Numerous predictors were considered among the first 3 cases in the cluster, and the researchers determined that at least one of the first 3 cases should have one of the predictors, unless indicated otherwise. The results of the study include a relative risk table and a decision tree analysis.

The group of patient characteristics with the highest relative risk, 17.7, was a combination termed "marginalized." This characteristic includes homelessness, reported excess alcohol use, reported drug abuse, or incarceration at diagnosis. The next-highest relative risk was a combination of homelessness or alcohol or drug use. The third-highest relative risk was drug use alone; the fourth was alcohol use alone; the fifth was homelessness or alcohol use; the sixth was homelessness and alcohol use; the seventh was incarceration; and the eighth was homelessness. These results emphasize the importance of the "marginalized" characteristics in predicting outbreaks.

The relative risk of having a significant log-likelihood ratio at the third case was 3.5. The time between the first to the third case was important as well. If the time was less than 5.3 months, then the relative risk is 3.2. The number of 5.3 months comes from a decision tree analysis and indicates the optimal cut point.

The decision tree analysis was created by software called JMP, an SAS predictive modeling software. The program uses recursive partitioning to systematically analyze binary partitions of the data to identify the one with the best discrimination, based on the analysis of the negative log of the *p* value. Once a partition is made, the program moved to each of 2 subordinate data groups to identify the best partition. JMP can handle continuous values by evaluating all possible cuts or groupings.

The JMP analysis began with the cohort of 146 clusters, 11% of which were identified as outbreaks. JMP determined that the best first split was whether at least 1 of the first 3 cluster cases was part of the marginalized group: 67 of the 146 clusters had that characteristic, and of those, 15, or 22.4%, became outbreaks. The predictive value is not high, but in the 79 clusters in which none of the first 3 cases were from the marginalized group, only 1 became an outbreak.

Of the 67 clusters with at least 1 case in the marginalized group, JMP selected rapid growth as the next cut point. In 17 of the 67 clusters, the third patient in a cluster was identified less than 5.3 months after the first case was identified. Nine of those cases, or 52.9%, became outbreaks. The remaining 50 clusters had third cases identified more than 5.3 months after the first case, and 6 of them, or 12%, became outbreaks.

Dr. Navin divided the decision tree into 3 outcomes: high risk, medium risk, and low risk. The high risk group, which includes the 9 clusters that became outbreaks that included cases with marginalized characteristics and showed rapid growth, should be considered targets for intervention. Intervening early in these clusters could result in half of the outbreaks being prevented. The predictive value of this approach is 53%. The specificity is 94%, and the algorithm is successful at identifying clusters that are at low risk for becoming outbreaks. The sensitivity is 56%, indicating that the algorithm would miss a number of outbreaks. However, the sensitivity ratio does a disservice to the approach, as it the algorithm is based on clusters sized three or greater. If a cluster in the medium-risk group grew to 4 cases, then there would be an opportunity to intervene.

The 24-month time period of follow-up after the third case was reasonable, based on data on the survival distribution function of all of the clusters in the study after they grew to 3 cases. The data show transition to 6 cases or more, and the last transition occurred within 24 months. After that time, none of the clusters grew to 6 or more cases.

This approach has several limitations. It is based on surveillance data, which is not collected for the purpose of doing these types of analyses. However, this limitation could be perceived as a strength, because the data used in the algorithm is reported routinely to CDC. As genotyping techniques improve and as the field transitions from MIRU-12 to MIRU-24, more data will be collected to refine and extend the analysis. Another limitation of the approach is that the observation period was only 5 years, with a 2-year follow-up. In coming years, they hope to repeat and extend the analysis over a longer period. Additionally, the requirement of 75% genotyping coverage at the county level resulted in the elimination of over half of the clusters that were initially identified. As of 2011, genotyping coverage is well over 90%, so future analyses will likely be able to eliminate that restriction. Finally, the data for this analysis is based on MIRU-12, and in the coming years, data from the more specific MIRU-24 will be available.

With this methodology, it is possible to identify high-risk clusters that have a 53% chance of becoming outbreaks. This provides an approach to prioritizing clusters for early intervention. With that, Dr. Navin thanked his colleagues at DTBE.

Discussion Points

ACET commended Dr. Navin on the excellent presentation.

ACET noted that in order to evaluate the analysis, it would be ideal to determine whether all information regarding the patients is available. For instance, information about chronic disease, smear positivity, and HIV status would be helpful. Additionally, laryngeal TB can be extremely transmissible.

Dr. Navin answered that information about patients' HIV status and smear status, as well as all of the data reported as part of the RVCT surveillance data set. The traditional predictors of infectiousness, including cavitary disease and smear-positive disease, are also predictors of outbreak growth. Interestingly, the decision tree analysis chose the social risk factors and time factors significantly before the traditional infectiousness categories. The surveillance data may not capture those variables accurately, but it is also possible that there is a difference between infectiousness and rapid-growth outbreaks. It is remarkable how many outbreak investigations focus on homeless shelters, jails, and other unstable populations. Outbreaks include highly infectious source cases, but they also include a population with poor access to healthcare among persons who live in a confined environment and who experience delays in TB diagnosis.

ACET asked whether this analysis would be possible without the follow-up cutoff of 24 months. Dr. Navin said that the easiest way to address this limitation will be to conduct more analysis to determine the influence of longer observation periods. It is interesting that the data for this analysis indicate that outbreaks develop quickly.

In response to a question from ACET, Dr. Navin said that the analysis considered US-born versus foreign-born populations in many different ways. In general, having at least 1 of the first 3 cases in the cluster be U.S. born was more predictive of an outbreak than when all cases were foreign-born. Many outbreaks in the US and in this data set included mostly Hispanic

persons, although not all were foreign-born. It is important to analyze more data to tease out differences between the two populations. A foreign-born person can be infectious and can serve as the source case for an outbreak; however, in the US today, the large and rapidly growing outbreaks are often almost exclusively among the US-born.

ACET commented that a few types of transmission mechanisms can cause TB outbreaks. For instance, TB is highly infectious among the vulnerable populations of HIV-positive individuals, which can lead to multiple infectious cases and ongoing transmission. Assessment of the environment is important in addition to understanding the characteristics of the patients.

Dr. Navin agreed that such factors are important, but the model is limited because some of the factors are not captured by the RVCT surveillance data.

Dr. Nardell asked about the role of the TB controllers' opinion of whether an outbreak had occurred. He also asked about recent observations regarding the variability of human transmission of TB, which reinforces the idea that smear positivity, coughing, and cavitation are not sufficient. He agreed that the environment and the host play a role, as does the specific strain of TB. Certain strains are associated with outbreaks, which presents an opportunity to combine the collection of "fingerprints" to determine the impact of the TB strain.

Dr. Navin said that outbreaks were defined by a two-step, sequential process. First, they used surveillance data to define clusters that grew to at least 6 cases. Next, that information was sent to the pertinent TB controller, who was asked to review their data on the clusters and to report whether they were aware of the cluster; whether it had been investigated; and whether the cluster represented an outbreak, in their opinion. The process included substantial back-and-forth dialogue regarding the definition of what constitutes a TB outbreak and reiterated the difficulty in coming to consensus about a TB outbreak. Further, the process emphasized the need to create a reasonable definition of a TB outbreak for surveillance purposes, which included confirmation by a local TB health official. The TB controllers invested time in considering the clusters. Save in two cases, the controllers were able to state which clusters were outbreaks. He acknowledged a risk for circularity. For instance, if one of the clusters was not investigated and no epidemiologic links were made, then the cluster might have been an outbreak, but unknown. Regarding strains, he said that one of the limitations of this approach to modeling is its inherent crudeness. The decision tree was stopped after two decision points because of the low number of clusters available for analysis. Every year, more data will be available, so it may be possible to address specific strains.

Dr. Susan M. Ray, an ACET liaison representative from the Infectious Disease Society of America, asked about the model's exclusion of genotypes that are known to be endemic. Excluding these genotypes may result in the model "missing" some important outbreaks that start in a population of people with a number of risk factors for TB and that spread within a community, becoming amplified in a short period of time.

Dr. Navin answered that the researchers debated this point a great deal. Their approach was logical because they wanted first to assess clusters in which they could be fairly certain that they were seeing the first few cases. He had been surprised that even this approach indicated rapid growth as a predictor of an outbreak. That finding of rapid growth, which does not require identifying the first case, can be used to search the surveillance data for any cluster with rapid growth between cases. Sudden growth of endemic clusters will be important to identify and predict, he agreed, and could be a next step for the work.

Dr. Ray noted that the marginalized population identified in the model was highly likely to have been recently incarcerated, but this risk factor is not captured by the RBCT surveillance. Recent incarceration is a strong risk factor, and it is one of the main reasons for continued transmission. Local health departments are aware of this factor and note which patients have been recently incarcerated. She suggested including recent incarceration in the discussion.

Dr. Vernon observed that censoring the follow-up period is likely to have an impact on what is observed and what is allowed to grow to a certain size. As genotyping expands, he encouraged Dr. Navin to look beyond that data point. By eliminating cases that have had the genotype in the prior 24 months, outbreaks are defined as events that have to occur within a set period of time. TB works on a long timeframe, as it is a slow-growing infection that has a slow transmission time. The definition of an outbreak could be "more than what is expected." In addition to the marginalized population as a risk factor, he noted that little is known about household size. In effect, the marginalized populations have "very large households." If the analysis were stratified by household size, he predicted that small households would be unlikely to grow clusters, where households of 10 or more would be more likely to grow clusters.

Dr. Navin agreed and added that they were eager to address these ideas as more data are gathered.

TRUST – How to Manage Budget Cuts

Tuberculosis Elimination in the United States: Future Directions and Challenges
RADM Kenneth G. Castro, MD
Director, Division of Tuberculosis Elimination / NCHHSTP
Centers for Disease Control and Prevention

Dr. Castro reminded ACET that the presentations they had heard would frame their discussion of thinking strategically about ACET's focus in the coming years. He presented ACET with an overview of DTBE's missions, priorities, recent progress, funds, and anticipated funds and distribution.

The mission statement of DTBE is "to promote health and quality of life by preventing, controlling, and eventually eliminating tuberculosis from the United States, and by collaborating with other countries and international partners in controlling global tuberculosis." In 1989, the definition of elimination was established as having no more than 1 case of TB disease per million population. DTBE's role is primarily domestic, but epidemiology from the Institute of Medicine (IOM) in 2000 reinforced the need to engage in the global fight against tuberculosis. Key partnerships for DTBE include state and local health departments and laboratories; NTCA and Stop TB USA; several professional organizations such as the Association of Public Health Laboratories (APHL), the American Thoracic Society (ATS), and others; the Federal TB Task Force; WHO; Stop TB Partnership; and Ministries of Health and National TB Programs.

DTBE has articulated 5 priorities:

- Prevent new cases of infection and disease with *Mycobacterium tuberculosis* and find and cure all persons with TB;
- Reduce TB in foreign-born persons residing in, or traveling to, the US;
- Reduce TB in US racial and ethnic minority populations and measure and address social determinants of health;

- Reduce the impact of MDR-TB and extensively drug-resistant (XDR) TB in the US and globally; and
- Reduce HIV-associated TB in the US and globally.

Following the resurgence in TB that occurred from 1985 through 1992, the TB trends have declined. As of 2011, the case rate is 3.4 per 100,000, or 10,521 TB cases. Most successful programs suffer the consequence of being perceived as less necessary: the annual CDC TB budget has dropped slightly, and is projected to drop in 2013, adjusting the dollars to the 1990 Consumer Price Index (CPI) for Medical Care shows a 50% drop in purchasing power from 1994 to the present.

DTBE's challenges include making the best use of these resources. The largest portion of the TB budget supports program activities through cooperative agreements. Dr. Castro explained to ACET DTBE's plans, created with their partners' input, for how best to utilize these resources. Approximately 10-13% of the TB budget is focused on research activities, including TB epidemiologic studies and the TB Trials Consortium (TBTC).

The funding formula was changed in 2005. Under the new formula, 20% of the cooperative agreement funds were redistributed based on a need-based formula. This formula includes morbidity and "the complexity of cases," such as whether the cases were HIV-infected, MDR-TB, or in the foreign-born or recent arrivals. After 3 years, DBTE increased the redistributed funds to 35%. DTBE aims to redistribute 60% of the cooperative agreement funds based on the new formula in 2013. Also in 2013, the formula will incorporate a performance-based component, which will incentivize completion of therapy and obtaining drug susceptibility test results for all culture-positive individuals. In 2014, 80% of the resources will be distributed on the basis of the formula, and by 2015, DTBE plans for all cooperative agreements to be distributed exclusively on the basis of the needs-based and performance-based formula. The current plans are to limit the performance-based component to 20% of the funds, but the division will determine over time if the approach needs to be adjusted. This approach allows them to focus their limited resources on need and on performance. DTBE has worked with its partners as well as with PGO to ensure that these changes can be made. The Request for Applications (RFA) does not provide details of the funding formula, enabling DTBE to work within the spirit of the cooperative agreement to revise the formula as the epidemiology evolves over time.

Ultimately, DTBE aims to sustain the commitment to eliminating TB by focusing on the core public health functions of prevention, control, evaluation, and laboratory support to state and local health departments. The division will continue to provide preparedness and outbreak response and program-relevant research for new tools and efficiencies. The division also ensures workforce expertise through training and education and expert medical consultation. Further, DTBE will continue to provide technical support for global response.

Dr. Castro described several challenges that the division faces. The proportion of disenfranchised persons with TB is growing. The global burden and the proportion of foreign-born persons with TB are also growing. Sporadic outbreaks continue to occur, despite declining TB trends, most commonly due to drug-susceptible and drug-resistant TB. Other challenges include evolving technologies and the perception of a lack of profit margin in the US, which limit potential applications for Food and Drug Administration (FDA) approval. ACET has helped DTBE draw attention to the challenge of second-line drug shortages.

Dr. Castro presented questions for ACET to consider, with the presentations in mind:

- ❑ Do you agree with the core public health functions identified by CDC?
- ❑ What is missing?
- ❑ What could be stopped?

Discussion Points

ACET commented on the additional challenge of the loss of experienced public health workforce, which is combined with a loss of expertise in the private sector community regarding recognition, diagnosis, care, and management of TB patients. These challenges could factor into the prevention and control funding formula. For instance, the loss of experienced public health workforce could support slowing the progression from the pre-formula distribution to the needs- and performance-based formula. Alternatively, it may not be a good use of resources to train workforce in areas where they may never see a TB case.

Dr. Castro responded that these concerns are captured as part of the core public health function of workforce expertise. The work of the regional training and medical consultation centers is justified and could be a mechanism for focusing training efforts and not expecting the whole country to be proficient in TB management. Providers should be expected to be mindful of TB, however, in a manner analogous to the expectation that a general practitioner would consider leukemia in a patient with anemia and other symptoms, and refer that patient appropriately. The impact of delays in diagnosis is significant, resulting in transmission of the disease as well as advanced disease in the patient.

ACET requested details regarding how the limited resources could be divided among the core public health functions, all of which are extremely important for TB control in the US. Dr. Castro offered to obtain the allocations for ACET. Most of the funds are devoted to prevention and control, evaluation, and laboratory support.

The ACET working group that focuses on TB control has discussed focusing aggressive attention on intervening in high-risk clusters and on the extent of TB in the detainee and incarcerated populations. New technologies for detection of latent infection, in particular, could have a rapid impact in these populations.

Dr. Castro agreed that those populations require a high level of attention. DTBE will continue to refine the modeling structure to determine the relative value of interventions.

Regarding the challenge of evolving technologies and the perception of lack of profit, Dr. Castro said that while the rest of the world has access to GeneXpert, it has not been FDA-approved for use in the US. Globally, GeneXpert has been used to achieve TB diagnosis in the pediatric population. Second-line drug shortages are another challenge. For instance, no kanamycin is available in the US. CDC will work with FDA in hopes of obtaining waivers for drugs that are manufactured elsewhere under good manufacturing practices.

Regarding what is missing, ACET observed that many discussions of programs and systems focus on what the taxpayer wants. It is assumed that the taxpayer does not want to be exposed to TB. Activities tend to focus on active response, but TB prevention may need to be addressed and promoted more strongly, especially among high-risk populations.

Dr. Castro agreed and noted that prevention is an important element of TB elimination. The recent recommendations for a 12-dose regimen among contacts can be applied to readily accessible high-risk subpopulations, such as recent immigrants and refugees with a B1 or B2 classification.

ACET referred to the education of healthcare workers and to the example of a practitioner screening for leukemia. Leukemia is considered to be a relatively rare diagnosis, but the incidence of leukemia in the US is approximately 12.5 per 100,000. This incidence is 4 times the amount of active TB that is diagnosed. Internists can diagnose leukemia with a routine test that detects a large variety of diseases. TB presents an even rarer disease that requires a specific test.

Dr. Castro agreed. The Union and WHO worked with the Practical Approach to Lung Health (PAL) in a global setting. This case-funding tool for a rare disease could be useful in the US as well and for evaluation of contacts. He supported a focused approach to educating practitioners. For instance, a person with HIV infection and other co-morbidities that have a high risk of being associated with TB should have a pre-test. New diagnostics may play a role in this work. In the future, polymerase chain reaction (PCR) technology could be relied upon for diagnosis of a variety of infectious pulmonary agents. Adding TB to that approach would eliminate the need to order a new test. He acknowledged that TB requires a good sputum specimen, but in an ideal scenario, a multiplex assay would be able to diagnose TB and other respiratory infections. The PAL concept could be revisited in light of new technologies.

ACET commented on the performance indicator of completion of treatment. At the recent US-México Border TB Consortium meeting, there was discussion regarding whether that requirement extends to a requirement to report completion of treatment, even for patients that have moved outside the US. That requirement would place a responsibility on TB programs that they cannot control. There are issues surrounding how completion of treatment information will be obtained. TB programs in other countries may or may not be responsive, especially if they are being contacted by multiple entities in the US. The requirement may place additional burdens on entities such as the Cure TB Program and TB Net that are not funded to fulfill the requirement. Border states are particularly concerned about this issue, and a centralized approach to getting the information, perhaps through CDC, would be preferable.

Dr. Castro replied that those details are being finalized. He expected to see a concerted effort to collect information about completion therapy status for anyone who moves from one jurisdiction in the US to another. The challenges are greater when a person moves outside the US; however, a systematic effort has not been made to reach out to national TB programs overseas. He agreed that working with Cure TB or TB Net to collect information on people who go to Mexico would be beneficial. A potential approach would include a per capita bonus when outcomes are defined reliably, but penalties would apply for not knowing therapy completion status. He noted that he had received information from the Canada TB program, which he passes to the relevant jurisdiction. He agreed that CDC should be a full partner in this enterprise.

ACET recommended that the list of DTBE priorities, which includes racial and ethnic priorities, should also include the incarcerated population. Primary care, emergency room personnel, and prison health personnel in communities often are not familiar with TB.

ACET wondered whether it is fair to use the CPI for inflationary characteristics, as opposed to using the Gross National Product (GNP) deflator. Dr. Castro answered that the graph he provided is also available using the Biomedical Research and Development Price Index (BRDPI), which is what NIH traditionally uses. The graphs are very similar, however.

ACET asked about reducing funding to successful programs that may not demonstrate need. Dr. Castro answered that the performance-based aspects of the program are intended to address this issue. Successful programs are likely to lose resources, but if they continue to perform well, then they will be able to retain federal resources.

Dr. Nardell agreed that taking funds from successful programs may reinforce the U-shaped curve, but the performance-based aspect of the formula addresses this issue. Additionally, he noted that the last case will be the most expensive to eliminate, and he wondered whether consideration had been given to the fact that as cases decrease, costs do not proportionally decrease.

Dr. Castro replied that no less than $100,000 will be provided to jurisdictions to ensure that at least one person is hired to conduct TB surveillance and some aspect of TB control. He agreed that as time goes on, the interventions are not cost-effective. The TB community needs to better make the argument that responding to a disaster costs more than if the original investment had been maintained. CDC Director Dr. Frieden and others wrote a paper in *The New England Journal of Medicine* in the 1990s to this effect, titled "Turning the Tide." A $1 billion investment was required order to recover from resurgent TB in New York alone.

ACET asked about the implications that Program Collaboration Service Integration (PCSI) has had for TB programs at local levels, and any expected implications for the future. Dr. Castro answered that the implications of PCSI remain to be seen. He expected that in very low-morbidity areas, PCSI is likely to secure some level of infrastructure where some individuals in public health departments are cross-trained in necessary functions, such as TB contact investigations as well as STD case tracing. In the discussions regarding the Affordable Care Act (ACA), he has been impressed to hear that policymakers understand that TB control is different from other health concerns, and expansion of health insurance coverage is not likely to be the solution for TB, particularly given the nature of the populations affected by TB.

Given the current fiscal austerity at most state and local health departments, ACET asked about the likelihood that TB will become even less of a priority there. Dr. Castro replied that TB is already of relatively low priority at most health departments.

ACET commented on the NHAS and the Viral Hepatitis Plan and asked whether the administration has lost track of TB and the TB Elimination plan. Dr. Castro felt that TB had been lost and said that ACET could play a role in rectifying the situation. Mr. Jones, ACET Chair, recently met with Dr. Howard Koh. That meeting offered opportunities for follow-up. ACET can pursue a report outlining needs regarding TB and a clear "ask" of HHS.

Dr. Wallace commented on the lack of a strong, committed approach to controlling TB in the 10 US states that border México. He emphasized the need for action and a global response focused on México as opposed to other countries. The state of Texas makes a heavy investment in bi-national, second-line drug projects. CDC's focus on TB in the African American population has decreased, and he suggested increasing focus on this population that continues to get TB. Immediate action is needed in this area.

It was clarified that the funding for TB prevention and control in different countries comes from different funding streams.

With that, Mr. Jones closed the discussion and dismissed the group for a break at 2:11 pm. The meeting resumed at 2:33 pm. Dr. Dean called roll and established a quorum.

Developing a 3 – 5 Year Strategic Plan for ACET

Shannon Jones III
Acting Director of Public Health and Community Services,
City of Austin / Travis County
Texas Health and Human Services Department
ACET Chair

Mr. Jones explained that the next session would focus on ACET's efforts to assess where the committee stands and how the committee can support DTBE. He observed ebb and flow over the years in ACET's efforts to communicate with HHS and the CDC administration. He asked ACET members, *ex officio* members, and liaison representatives to reflect on ACET's priority initiatives. ACET's biannual report will be presented to the Secretary of HHS at the end of June 2012. That report will include ACET's resolutions and recommendations and their statuses. The report will also touch on "big picture" goals for ACET's future. Mr. Jones added that comments would be welcome via email.

ACET's observations included the following:

- TB prevention and control is a "victim of its own success," as incidence rates have reduced for 18 years to 3 cases per 100,000. TB could "drop out of sight" in budgets as well as in the perception of colleagues in the medical and public health worlds.
- New Commissioners of Health or Public Health Directors may not have a sense of the history of TB, or of what may happen in the future with TB or MDR-TB if certain capabilities are not maintained.
- Every message from ACET to the Secretary of HHS and to the administration at CDC should drive home the point that TB elimination and further control will be difficult with current resources, and future cuts will jeopardize the enterprise. To paraphrase Dr. Castro, "You can pay now, or you can pay more later."
- CDC should be clearly involved in issues of drug supply, possibly serving as a central housing source for ensuring adequate supplies of TB drugs in the US.
- CDC can contribute to the education of human resources in TB prevention and control within the US.
- Scientific priorities in TB include shorter regimens and new drugs.
- ACET can evaluate the impact that changes in healthcare in the US, including cuts in funding to public health, is impacting and will impact TB control.
- The foreign-born population is important, and working with high-incidence countries is an important part of that effort.
- ACET should help DTBE determine how best to utilize reduced funds. ACET can help communicate challenges, but a main duty is this prioritization to reduce TB in the US.

- It will be challenging to eliminate TB in next few decades. As ACET's charter is to advise CDC and the CDC Director, the committee should support additional resources for TB control and elimination; however, given the reality of the current economy, ACET should also discuss priorities.
- In the face of dwindling resources, it will be important for ACET to create approaches that allow for the ensuring of appropriate medical management of TB cases and LTBI so that they do not become drug-resistant TB cases. This work involves working with access to second-line drugs, access to first-line drugs, and working through the ACA to ensure that TB services are appropriately and adequately covered. An intervention is needed when the private sector is mismanaging a TB case, especially a drug-resistant TB case. This work includes medication, toxicity monitoring, infection control, isolation, returning to work, and more.
- The TB Elimination Plan is archaic compared to national plans for HIV and viral hepatitis. The TB plan needs outsiders' points of view that can provide perspectives from local, state, and international public health interests. The viral hepatitis strategy brought that disease to "center stage," and TB needs a similar effort, which begins with "reinventing ourselves."
- While the case rate of TB in the US is relatively low, most people in the US are probably unaware that TB still exists, and that it is a deadly disease. ACET can address issues of global funding and its impact on foreign-born cases in the US and the need for new drugs and new regimens.
- ACET should take advantage of the successful meeting with Dr. Koh and of his interest in learning more. Dr. Koh was instrumental in the viral hepatitis strategy and is also involved in a task force on adult immunizations as well as efforts concerning seasonal flu. His support for the TB issue could be very important. Perhaps he could address ACET, or another meeting could be arranged with him and ACET to talk about TB issues and next steps.
- People may be confused because TB rates are declining, but the disparity issues in TB are still serious. The disparity issues in TB parallel disparity issues in other diseases that are linked to TB, such as HIV, hepatitis C, and others. The field does not have a good understanding of how many diabetics have latent infection.
- ACET should consider new partners, such as the Centers for Medicare and Medicaid Services (CMS) and the Innovation Center, which focuses on ways to decrease adverse health outcomes for a number of different diseases.

Dr. Nardell observed tension regarding resources that are devoted to global TB control versus domestic TB control. Most domestic TB cases are in the foreign-born, and the global TB epidemic is raging. A unified view is needed so that domestic efforts are viewed as a necessary part of a global epidemic. The US is vulnerable to increasing rates of drug-resistant TB.

Dr. Lornel Tompkins, an ACET liaison representative from the National Medical Association (NMA), appreciated the concept of including the local perspective as part of a global approach to TB. She related her experience with active TB in a small community, in which the emergency room personnel reacted quickly to place the cases in isolation. Because fewer cases are seen, healthcare personnel do not know how to diagnose TB, or do not think to diagnose TB. The populations that are most at risk for TB, including immunosuppressed patients, can be missed because of a concentration on the foreign-born. An inclusive approach is needed.

Dr. Wallace encouraged ACET to develop "a voice." ACET should support CDC in the battle for funding, helping to reach out to groups that can advocate for them. A Senate Appropriations Committee will vote on TB funding on June 12, 2012, and it is important to help legislators understand the importance of TB funding. Any cut to DTBE is a cut to the states, and many states cannot absorb these cuts.

Mr. Jones asked ACET members, ex officio members, and liaison representatives to forward additional comments via email no later than June 15, 2012. The ideas will be incorporated in the report to the Secretary of HHS.

Mr. Jones suggested charging one of ACET's working groups with examining the major points raised in the discussion and presenting ACET with coordinated action steps for the future. The major areas suggested for ACET include:

- ❑ Educating the HHS Secretary and CDC Administration
- ❑ Making recommendations regarding funding priorities
- ❑ Collaborating on domestic and global TB efforts
- ❑ Addressing drug shortages, working with the private sector in specific ways
- ❑ Engaging and addressing disparity issues

It will be important for the group to suggest a specific "hook" and a specific "ask" to bring attention to the priority areas within TB.

ACET suggested building substantive time into the ACET meeting to engage in dialogue regarding priorities and action steps to define ACET.

Dr. Castro appreciated the priority areas that ACET had identified and particularly appreciated the need to continue to educate leadership within HHS.

Business Section

Shannon Jones III
Acting Director of Public Health and Community Services,
City of Austin / Travis County
Texas Health and Human Services Department

Topic 1
A motion was properly placed on the floor by Dr. Masahiro Narita and seconded by Dr. Jane Carter to approve the minutes from the March 6 – 7, 2012 ACET meeting in Atlanta, Georgia.
ACET unanimously approved the motion.

Topic 2
Mr. Jones asked ACET to discuss potential topics for the next ACET meeting and asked the chairs of the ACET Work Groups to indicate whether they would present updates.

Dr. Cassell said that the TB Control Work Group has engaged in productive discussions with individuals within and outside the TB field. A subgroup of the Work Group has met via conference call to examine specific opportunities to focus on Texas to identify best approaches to TB control. The group will provide an update at the next ACET meeting.

Dr. Carter said that the Corrections Work Group would provide a report at the next ACET meeting.

At the next meeting, ACET will discuss whether the work of the Affordable Care Act Work Group and the Second-Line Drug Work Group has been accomplished and whether the Work Groups will be continued. If so, then ACET will discuss their focus and structure, including identifying ACET members and liaison members who participate on the group. In the meantime, the Work Groups will hold conference calls regarding their ideas for the future of the groups.

Topic 3
Regarding the bacille Calmette-Guerin (BCG) vaccine document, Dr. Dean clarified that ACET and the BCG Work Group have two options: 1) to publish the document as an ACET document, which would not go through CDC clearance; or 2) to turn the document over to CDC for publication, which would require CDC clearance. Dr. Castro added a third option, to format and post the document on the DTBE webpage as ACET recommendations. The document includes a summary of the literature and expert recommendations, on which ACET and CDC collaborated.

In view of the time that has gone by, ACET determined that with some updating, the document should be reclaimed by ACET and published in a journal. CDC personnel who contributed to the document can be acknowledged as subject matter experts, but the voice of ACET prevails in the document.

Dr. Dean called roll to re-establish a quorum. A quorum was present, so the meeting continued.

A motion was properly placed on the floor by Dr. Jane Carter and seconded by Dr. Masahiro Narita to empower the BCG Document Work Group to choose to pursue publication of the BCG document as an ACET product. Additionally, the BCG Document Work Group is empowered to pursue posting the BCG document on the DTBE website as a product of ACET. **ACET unanimously approved the motion.**

Topic 4
ACET members, *ex officio* members, and liaison representatives will be sent a summary of all of the resolutions and recommendations that have been approved by ACET over the last 2 – 3 years. ACET is asked to make comments on the recommendations, and those comments will be included in the biannual ACET report to the HHS Secretary. Feedback from ACET should be sent no later than June 15, 2012. The report will be distributed to ACET members, ex officio members, and liaison representatives and will be public information.

Topic 5
The following ACET members volunteered to participate on the DTBE Health Equity Work Group: Dr. Masahiro Narita and Mr. Shannon Jones. Dr. Warren Hewitt, ACET ex officio member, also volunteered to participate.

Public Comment

Mr. Jones opened the floor for public comment at 3:36 p.m. EDT. Hearing none, the meeting proceeded.

Roll Call

Dr. Dean conducted a roll call and established a quorum.

Meeting Adjourned

Dr. Castro noted that conducting the ACET meeting via teleconference as opposed to in person saved approximately $28,000. He thanked the participants for their time and said that he would pursue a brief survey of meeting participants to inform future use of the format.

Mr. Jones noted that the next ACET meeting is scheduled for December 4 – 5, 2012.

With that, the meeting adjourned at 3:39 pm.

Certification

I hereby certify that, to the best of my knowledge and ability, the foregoing minutes of the June 5, 2012, meeting of the Advisory Committee for the Elimination of Tuberculosis, CDC are accurate and complete.

_____ _____

Date

Shannon Jones III
Chair, Advisory Committee for the
Elimination of Tuberculosis, CDC

Attachment #1: Attendance

Note: Dr. Hazel Dean, ACET Designated Federal Official, conducted five roll calls on June 5, 2012. She verified the presence of a quorum of ACET voting members and *ex officio* members sufficient for ACET to conduct its business throughout the course of the teleconference.

ACET Members
Mr. Shannon Jones III, Chair
Dr. Iram Bakhtawar
Dr. Eric Brenner
Dr. Marcos Burgos
Dr. Jane Carter
Dr. Gail Cassell
Dr. Christine Hahn
Dr. Masahiro Narita
Dr. Barbara Seaworth

ACET Designated Federal Official
Dr. Hazel Dean, NCHHSTP Deputy Director

ACET *ex officio* Members
Dr. Naomi Aronson (Department of Defense)
Dr. William B. Baine (Agency for Healthcare Research and Quality)
Dr. Amy S. Bloom (US Agency for International Development)
Ms. Sarah Bur (Federal Bureau of Prisons)
Ms. Nadine J. Garcia (Office of Minority Health)
Dr. Warren W. Hewitt, Jr. (Substance Abuse and Mental Health Administration)
Dr. Mamodikoe Makhene (National Institute of Allergy and Infectious Diseases)
Ms. Tiffany Moore (US Marshals Service)
Dr. Sheldon Morris (Food and Drug Administration)
Dr. Thomas Nerad (for Caroline Freeman, Occupational Safety and Health Administration)
Dr. Gary Roselle (Department of Veterans Affairs)
Dr. Diana Schneider (US Immigration and Customs Enforcement)
Dr. Theresa Watkins-Bryant (Health Resources and Services Administration)

ACET Liaison Representatives
Dr. Frances P. Downes (Association of Public Health Laboratories)
Ms. Cornelia Jervis (Treatment Action Group)
Dr. Edward A. Nardell (International Union Against TB and Lung Disease)
Dr. Susan M. Ray (Infectious Disease Society of America)
Dr. Lornel Tompkins (National Medical Association)
Dr. Charles E. Wallace (National Tuberculosis Controllers Association) (via telephone)

CDC Representatives
Dr. Kenneth Castro, Director, Division of Tuberculosis Elimination, NCHHSTP
Dr. Suzanne Beavers
Dr. Jose Becerra
Dr. Sapna Bamrah
Dr. Terence Chorba

Dr. John Douglas
Ms. Teresa Durden
Ms. Maria Fraire
Ms. Demetria Gardner
Dr. Denise Garrett
Ms. Smita Ghosh
Mr. Andrew Heetderks
Dr. Andrew Hill
Dr. Awal Khan
Ms. Ann Lanner
Dr. Robert Luo
Dr. Suzanne Marks
Dr. Thomas Navin
Ms. Bonnie Plikaytis
Dr. Krista Powell
Mr. Robert Scott
Ms. Margie Scott-Cseh
Mr. Philip Talboy
Dr. Andrew Vernon
Dr. Wanda Walton
Ms. Kai Young

Members of the Public

Ms. Kendra Cox (Cambridge Communications)
Mr. John Seggerson (Stop TB USA)
Ms. Elizabeth Stoller

Attachment #2: Acronyms Used in This Document

Acronym	Expansion
ACA	Affordable Care Act
ACET	Advisory Council for the Elimination of Tuberculosis
APHL	Association of Public Health Laboratories
ATS	American Thoracic Society
BCG	Bacille Calmette-Guerin (vaccination)
BRDPI	Biomedical Research and Development Price Index
CDC	Centers for Disease Control and Prevention
CMO	Committee Management Office
CMS	Centers for Medicare and Medicaid Services
CPI	Consumer Price Index
DTBE	Division of Tuberculosis Elimination
FDA	Food and Drug Administration
HHS	(Department of) Health and Human Services
HIV	Human Immunodeficiency Virus
IOM	Institute of Medicine
LTBI	Latent Tuberculosis Infection
MDR-TB	Multidrug-Resistant Tuberculosis
NEJM	*New England Journal of Medicine*
NHANES	National Health and Nutrition Examination Survey
NHAS	National HIV/AIDS Strategy
NIH	National Institutes of Health
NMA	National Medical Association
NTCA	National Tuberculosis Controllers Association
OGA	Office of Global Affairs
OMH	Office of Minority Health
PAL	Practical Approach to Lung Health
PCR	Polymerase Chain Reaction
PCSI	Program Collaboration Service Integration
PEPFAR	President's Emergency Plan for AIDS Relief
PGO	Procurement and Grants Office
RFA	Request for Applications
RVCT	Report Verified Case of TB
STD	Sexually Transmitted Disease
TB	Tuberculosis
TBTC	Tuberculosis Trials Consortium
US	United States
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant Tuberculosis