

58th Bauer Lecture

"Globalization, Mitigation, and Emerging Infectious Diseases: Tales from the Crypt"

Martin Cetron, M.D., Director of the Division of Global Migration & Quarantine at the Centers for Disease Control (CDC), delivered the 58th Louis H. Bauer Lecture on May 14, 2012, during Opening Ceremonies of the 83rd Annual AsMA Scientific Meeting in Atlanta, GA. At the start of the lecture, he stated that "Globalization means that global health issues are in your backyard, in your neighborhood; they're local; it's not just something across an ocean." He then discussed his division, which started as the Foreign Quarantine Service in the late 18th century dealing immigration health issues. It came to the CDC in 1967 with all its responsibilities to prevent the introduction and spread of disease in the U.S., which is done by monitoring and regulating animals, inanimate cargo, and humans. There is also a public health responsibility. The best way to ensure the control of diseases is to make sure that people in a globally mobile population don't pose a threat and are as healthy as possible. This means the program has a dual mission: to take care of the globally mobile population as it moves around the globe and to prevent the importation of infectious threats.

Dr. Centron demonstrated how, in this age of migration, there have been dramatic changes, resulting in high-speed and high-volume globalization and global migration. There is a greater volume of circular migration now. However, the patterns of infectious diseases moving through people haven't really changed. The manner and speed have changed, which gives the CDC new imperatives.

Dr. Centron also talked about the history of immigration and quarantine, which was born in Venice during the time of the Black Plague. The term comes from the Latin 'quarantina', meaning 40 days, which is how long ships were asked to stay outside a port before passengers or cargo could disembark. In that time period, travel took much longer, but in the 21st century, there has been a dramatic reduction in the length of time it takes to travel around the world (it is now 72 hours or less, depending on connections) and the fact that the world's population has exploded. Of the over 7 billion people now in the world, over 1 billion international arrivals occur every year. This speed and vol-

ume of movement present unique challenges to monitoring diseases, especially with the emergence of jet travel. As a result, there has been an over 400% increase in the web of traffic between and across continents. Also, movement patterns are circular: people who are living outside their country of birth often return to it.

This means that infectious diseases still create problems – for example, one-third of the world's population is infected with tuberculosis (TB). In the United States, there is a 3.6/100,000 rate as of 2010. To address this, regulations have changed to allow more screening, which has strengthened reduction and treatment of TB and reduced the import threat. Bed nets and large-scale drug treatments have rolled back malaria, and cases of parasite infections have been reduced. However, there are threats caused by the changing environment, vulnerable humans, and carrier animals, along with the rise of drug-resistant strains of diseases and the globalization of food. Where global diseases are concerned, it is a small world.

Dr. Centron ended his lecture with a discussion of what the CDC and his division currently do to try to keep people healthy. The CDC produces "The Yellow Book," which contains health information for international travelers. There is also a biomosaic program to try to visualize migration and demographics in order to predict emerging infectious diseases, as well as continued surveillance and regulation.

47th Armstrong Lecture

"Travel and the Movement of Infectious Diseases"

David O. Freedman, M.D., Professor of Medicine at the Gorgas Center for Geographic Medicine, Division of Infectious Diseases, University of Alabama, delivered the 47th Harry G. Armstrong Lecture on Thursday, May 17, 2012, during the AsMA 83rd Annual Scientific Meeting in Atlanta, GA. Dr. Freedman discussed trends in travel-related infectious diseases. Factors involved in the emergence or re-emergence of an infectious disease include microbial adaptation and change; human susceptibility, demographics, and behavior; climate and weather; economic development, land use, and international commerce; breakdown of public health measures; and war, famine, and harmful intent. The highly mobile society we have today gives opportunities for in-

fections such as SARS to spread rapidly.

Dr. Freedman talked about several different diseases that have emerged in the past. SARS emerged in China and was started by a traveller who infected everyone on his hotel floor. However, SARS only lasted a few months and it remains unknown whether it will emerge again. There was also H5N1, which is mainly a bird flu and doesn't do well in humans. The main form of transmission is from bird to human and the hosts seem to be non-migratory birds. The spread seemed to be mainly related to the illegal bird trade. Chikungunya was first identified in Africa and has mutated so that it is easier for it to be transmitted between humans. It causes fever and a rash and is carried by the *Aedes aegypti* mosquito. It was spread to Europe and the United States by travelers infected with it. Dengue fever is also spreading; it causes fever, rash, joint pain, and mucosal bleeding. It is difficult to diagnose because tests can take several days.

Dr. Freedman described the GeoSentinal project, which is a surveillance system of international travelers and migrants by frontline providers and tropical travel clinics. This project does not monitor local populations as travelers are a key element in the spread of emerging infectious diseases. GeoSentinal can detect points of emergence and rapidly alert public health people about possible infections (for example, the Leptospirosis outbreak in 2000 after the Eco-Challenge). The program collects basic information from patients: demographics, travel history, illness. The illnesses are only ones that involve a visit to a specialist and the patients tend to be tourists, business travelers, aid workers, students, and missionaries.

Dr. Freedman discussed how GeoSentinal's database is useful for diagnosing ill travelers, guiding therapy, and prioritizing prevention strategies. He showed a breakdown of diagnoses in ill travelers who returned to the developing world and talked about the differences and similarities between travelers. For example, skin disease is very common in travelers, but older travelers differ from younger ones in what they become ill with. Flu continues to be an issue, so if travelling, getting a flu vaccine should be considered. Geosentinal can help advise travelers what vaccines to get and what areas are at risk.

Dr. Freedman finished his lecture with an update on prevention and the possible emergence of two new threats related to air travel: Lassa Fever and the norovirus. He talked about the various vaccines available, including the one for yellow fever, which is only given if absolutely necessary due to the rare side effects. He also discussed the cholera epidemic in Haiti and the Dominican Republic. The final slide showed a map of the criss-crossing lines of air travel across the world to illustrate there is nowhere in the world that is not at risk.



BAUER LECTURE--Martin Cetron, M.D. (center), receives a certificate and honorarium from William Ercoline (right), representing the sponsor, Wyle, while Fanancy L. Anzalone, President of AsMA, looks on.



ARMSTRONG LECTURE--David Freedman, M.D. (right), accepts a certificate and honorarium from George K. Anderson (left), representing the sponsor ETC.

Both lectures are available for download from IntelliQuest Media, Inc. at <http://www.intelliquest-media.com/library/AerospaceMed2012>.