



Twelve Eighty-Two

Summer Issue: Volume 4 Issue 2

*The Public Health Preparedness Community
Newsletter from the Bucks County
Department Of Health*



Inside This Issue

- ◇ We Need You!
- ◇ CRISPR: The Future of Gene Editing
- ◇ Out Loud: Public Health Podcasts to Stimulate Your Day
- ◇ Upcoming Training Offerings
- ◇ A Virus on the Rise
- ◇ Organization Spotlight : Three Organizations, Three Religions, One Mission!

**Bucks County
Commissioners**

**Charles H. Martin,
Chairman**

**Robert G. Loughery,
Vice-Chairman**

Diane M. Ellis-Marseglia, LCSW

We Need You!

In the event of a major public health emergency in Bucks County, whether it be a pandemic or a bioterrorism event, the Health Department is set to lead the response and protect the county. However, the Department's limited staff complement is an ever present concern. This challenge can be overcome by dedicated volunteers who step in to help their neighbors when we are at our greatest need. Our volunteers may help in mass clinics and with mass care. You can be one of these heroic volunteers!

How you can volunteer?

Community Volunteers

Being part of the Health Department's community volunteers is ideal for individuals who want a minimal level of commitment, but are interested in potentially helping in an emergency response. As a community volunteer you will only be asked to participate in quarterly call down drills, which require the simple confirmation of receiving the message (responding "yes" in a text or clicking an email link). If you would like to be added to our community volunteer list please email ddyucus@buckscounty.org with the subject line 'community volunteer'. If you are already a part of our community volunteer list, please be on the lookout for an email in the coming weeks confirming your continued participation.



Medical Reserve Corps Volunteers

In addition to the community volunteer program we also maintain a second group of volunteers as our Medical Reserve Corps. Volunteers in this group are asked for a slightly higher level of commitment with a handful of required trainings. These are the first volunteers we will call upon, and the most likely to fill leadership roles. You do not need to have any medical experience to be a member of either our community volunteers or our Medical Reserve Corps. If you would like to become a member of our Medical Reserve Corps or would like more information, please email fpmaggio@buckscounty.org or scredington@buckscounty.org. You can also get more information by visiting the Bucks County Medical Reserve Corps website at : <http://www.buckscounty.org/medicalreservecorps>

If an emergency is to occur, neither our community volunteers nor our Medical Reserve Corps volunteers are under any obligation to respond. We also do not deploy any volunteers without the proper training and safety considerations.

CRISPR: The Future of Gene Editing

What is CRISPR?

Everyday news articles are published heralding major scientific health breakthroughs, and at the heart of many of these articles is the same technology: CRISPR-Cas9. This emerging technology has been proclaimed by the MIS Technology Review as the "the biggest biotech discovery of the century". This accolade stems from the seemingly endless application of this technology, with possibilities ranging from curing various cancers to re-creating the woolly mammoth.

What is CRISPR-CAS9 and where did it come from?

In 1987, researchers at the Osaka University in Japan stumbled upon repeated identical segments of DNA separated by sequences of DNA "spacers". At the time this discovery was recognized as something wholly unique, but the significance of these repeating sequence was a mystery. Over the decade the ability to sequence DNA improved dramatically resulting in multitudes of new DNA being sequenced, and in all of this newly sequenced DNA, the CRISPR sequence kept appearing.

In 2005, scientists looking at segments in the CRISPR sequences noticed that DNA appeared to match the DNA of viruses. And then it all made sense, CRISPR was acting as a defense against viruses. What researchers had discovered was an advanced immune system that bacteria used against viruses. This discovery was fascinating, but the full value of CRISPR had yet to be realized.

What the is the value of CRISPR?

Answered in one sentence, CRISPR is the most advanced form of gene editing in existence. To understand what this means and what the value of CRISPR is, think of the 'find and replace function' on your computer. For a refresher, this editing tool lets you search for a word in a document and the tool automatically replaces the search word with a new entry of your choosing. In the same way, the CRISPR can be used to selectively edit the DNA of nearly any organism.

Continued on pg. 4

Some astute readers will be aware that gene editing existed well before the discovery of CRISPR and in turn, may question the importance of the discovery. The short answer to this question is that CRISPR is significantly faster, cheaper and importantly the most accurate and reliable form of gene editing. What was done in the past at a cost of thousands of dollars, across months if not years of work, with repeated attempts can now be accomplished in hours, on the first try, at a fraction of the cost.

This has led to a continued stream of articles with titles like: CRISPR Eliminates HIV in Live Animals, CRISPR gene-editing tool targets cancer's "command center", and China Is Surging Ahead In The Race To Beat Cancer With CRISPR (note that all of these articles came out on the same day, and by no means was this a unique day for the progress made possible by CRISPR). Late last year, China conducted its first human trial using CRISPR technology and researchers are expected to begin trials in the United States this year. Put differently, this is not a technology that will be used on future generations- this is one that is already being used today.

Keep reading below for a link to a fantastic podcast about CRISPR

or

For new updates about advances in the medical field as a result of CRISPR, just Google CRISPR. I guarantee something new from the last few days will be there.

Out Loud: Public Health Podcasts to Stimulate Your Day



RADIOLAB

Update CRISPR

From Radiolab comes a Podcast about the revolutionary bio-engineering technology known as CRISPR. This update from a prior episode looks at a “ninja-assassin-meets-DNA-editing-tool” that has been billed as one of the most powerful, and potentially controversial, technologies ever discovered by scientists.

<http://99percentinvisible.org/episode/the-grand-dame-of-broad-street/>

The Grand Dame of Broad Street

In 1976, Philadelphia's Bellevue-Stratford found itself at the epicenter of a series of mysterious deaths that terrified the country and stumped everyone trying to find answers. This podcast from 99% Invisible looks at one of the most memorable epidemiology investigations in history.

<http://99percentinvisible.org/episode/the-grand-dame-of-broad-street/>

Zika

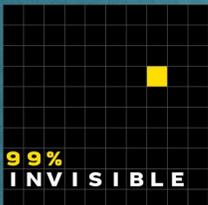
This Science VS episode from last year takes on the latest public health crisis. Answering questions of: where did Zika come from? What happens when you get infected? How worried should you be? And why has Zika become such a problem recently?

<https://gimletmedia.com/episode/8-zika/>

The Origins of Tuberculosis

In this episode of Origin Stories, Dr. Anne Stone of Arizona State University discusses her investigation of a mysterious case of tuberculosis in ancient Peruvian mummies and finds surprising new evidence in the search for the origins of the disease.

<https://soundcloud.com/origin-stories/episode-12-the-origins-of>



Upcoming Training Offerings

July 18th	6:30 pm to 8:30 pm	Fundamental Mental Health Techniques	Open to all community members
August 22nd	6:30 pm to 8:30 pm	Introduction to Disaster Preparedness	Open to all community members
September 16th	9:00 am to 12 pm	CPR/AED & First Aid	MRC volunteers only

All trainings held at
1282 Almshouse Rd. Doylestown, PA 18901

These trainings are presented as part of the Medical Reserve Corps ongoing training series. To learn more about the Medical Reserve Corps or to join follow this link:
<http://www.buckscounty.org/medicalreservecorps> or contact the MRC at
HDbcmrc@buckscounty.org

A Virus on the Rise

On May 30, 2011 an elderly woman from the small town Aitkin, Minnesota sought care at the local hospital reporting flu like symptoms (fever, nausea, chills, malaise). In addition to the typical flu-like symptoms, she also reported dizziness and occasional confusion accompanied with slurred speech. She reported no respiratory symptoms (i.e cough) or gastrointestinal symptoms. The woman had no recent history of travel and reported no illness in her close contacts (friends and family). Her environmental exposures were minimal, reporting hiking and gardening exposing her to mosquito and tick bites. The woman had recently completed over a year of chemotherapy for colon cancer. Upon admission to the hospital, she had mild neck tenderness and a moderate fever. She was alert and a battery of tests came back with normal results. Partially suspecting Lyme's disease, she was given doxycycline and the broad spectrum antibiotic, piperacillin/tazobactam.

The next day her conditions rapidly deteriorated and she was much less responsive. She was then immediately transported to Minneapolis to the better equipped Abbott Northwestern Hospital. Upon arrival her fever spiked, her breathing was labored, and she became unresponsive. Over the next few days a number of neurological symptoms emerged whilst her condition showed no improvement. Two weeks after symptom onset she passed away. After a battery of tests, results came back from the Minnesota Department of Health and the Centers for Disease Control confirming Powassan Virus infection.

With the arrival of spring Powassan Virus has been making headlines as disease experts have been raising alarm over this potential deadly virus. Continue reading on page four to find out more about this emerging illness.

What is Powassan virus and how do people get it?

Powassan virus is transmitted through the bite of an infected tick. The virus was first identified in 1958 after a young boy contracted the virus in Powassan, Ontario. Both Lyme disease and Powassan virus are spread by the deer tick. This results in both diseases being

common in the same regions, most notably in the Upper Midwest and Northeast of the United State. However, unlike Lyme disease, Powassan virus only requires that the tick be attached for a few minutes for virus transmission to occur. Whereas, the tick must be attached for 36 to 48 hours or more before the Lyme disease bacterium can be transmitted.

What are the symptoms?

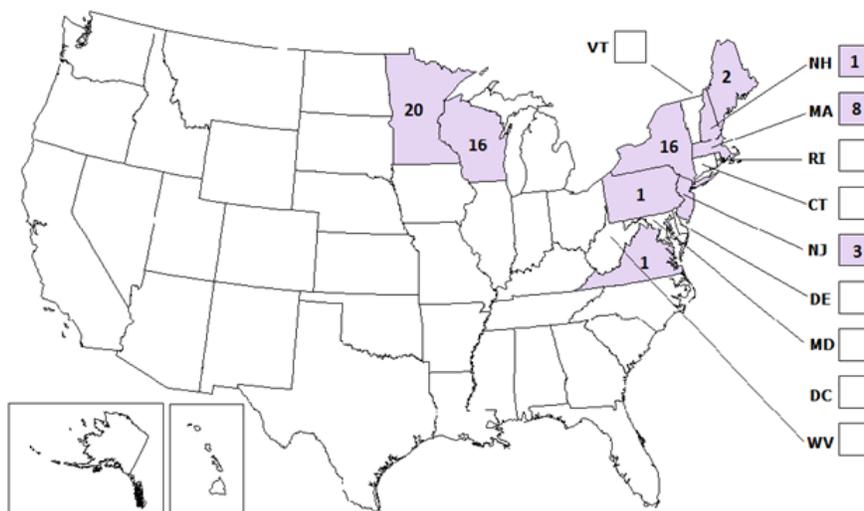
Many people who are infected will have no symptoms, while others will have a severe infection infecting the central nervous system resulting in symptoms that can be potentially fatal. Individuals who develop a serious infection may experience symptoms including fever, headache, vomiting, weakness, confusion, loss of coordination, speech difficulties, and seizures. About half of the individuals who survive will develop permanent neurological conditions.

How common is it?

Fortunately the disease has been rare, with an average of 7 cases a year over the last decade. However, two ecological factors are changing the distribution of this disease. There has been a shift in the ticks that carry the disease with the deer tick recently becoming

infected. Prior to this change, the disease was only in a species of tick that rarely bites humans. At the same time the geographic range of the deer tick has been increasing resulting in Powassan, as well as Lyme disease, appearing in new areas. Together, these two changes could signal a dramatic increase in the number of human cases.

Powassan virus neuroinvasive disease cases reported by state, 2006–2015



Source: ArboNET, Arboviral Disease Branch, Centers for Disease Control and Prevention

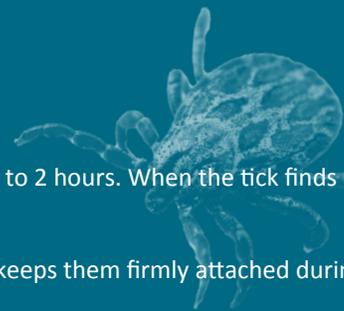
Can it be treated?

There is currently no treatment for Powassan

virus, however, supportive care can reduce the severity of the symptoms and can increase the probability of survival. Because there is no treatment for the virus, it is highly important to prevent tick bites from occurring. This can be done by protecting yourself, your pets, and your yard from ticks.

How ticks spread Disease

- ◆ Ticks transmit pathogens that cause disease through the process of feeding.
- ◆ Depending on the tick species and its stage of life, preparing to feed can take from 10 minutes to 2 hours. When the tick finds a feeding spot, it grasps the skin and cuts into the surface.
- ◆ The tick then inserts its feeding tube. Many species also secrete a cement-like substance that keeps them firmly attached during the meal. The feeding tube can have barbs which help keep the tick in place.
- ◆ Ticks also can secrete small amounts of saliva with anesthetic properties so that the animal or person can not feel that the tick has attached itself. If the tick is in a sheltered spot, it can go unnoticed.
- ◆ A tick will suck the blood slowly for several days. If the host animal has a bloodborne infection, the tick will ingest the pathogens with the blood (note that ticks can only transmit certain disease and different ticks transmit different diseases).
- ◆ Small amounts of saliva from the tick may also enter the skin of the host animal during the feeding process. If the tick contains a pathogen, the organism may be transmitted to the host animal in this way.
- ◆ After feeding, most ticks will drop off and prepare for the next life stage. At its next feeding, it can then transmit an acquired disease to the new host.



Organization Spotlight : Three Organizations, Three Religions, One Mission!

Humans have a particular propensity for empathy that crosses cultural values and beliefs. This natural drive to help other is most apparent after disaster when people are in greatest need. In this issue we are spotlighting organizations from the three major world religions who organize teams of volunteers to respond to emergencies.

NECHAMA is a voluntary organization that provides natural disaster preparedness, response, and recovery services nationwide. Through the years NECHAMA has brought comfort to disaster survivors by training and mobilizing thousands of volunteers to help communities after floods, tornadoes, and other natural disasters. Their work is rooted in the Jewish value of Tik-kun Olam ("repairing the world through acts of kindness"). NECHAMA offers help to all people affected by disaster on the basis of need regardless of religious affiliation. They also welcome anyone willing to volunteer and serve others to join us. NECHAMA's collective work is not done in an effort to proselytize; rather they train, equip, and lead volunteers that assist disaster survivors in the spirit of goodwill and creating mutual respect among all people.



NECHAMA
JEWISH RESPONSE
TO DISASTER

NECHAMA welcomes volunteers of all faiths to collaborate and provide assistance to disaster survivors regardless of their religious affiliation. NECHAMA's work creates a lasting positive impact on the lives of those affected and brings them comfort and hope.

To learn more about our response program or to learn how you can become a volunteer and support a current or upcoming response deployment go to: <https://www.nechama.org/response>

In 1993, **Islamic Relief USA** became an independent (and legally separate) member of a global family of collaborating relief organizations that share a common vision, mission and family identity—connected through the use of the "Islamic Relief" name. Islamic Relief USA provides relief and development in a dignified manner regardless of gender, race, or religion, and works to empower individuals in their communities and give them a voice in the world.



**ISLAMIC
RELIEF
USA**

IRUSA is a member of the National Voluntary Organizations Active in Disaster (VOAD), which serves as a voice for nonprofit organizations and volunteers that work in all phases of disaster. IRUSA's Disaster Response Team is the first Muslim organization to partner with the American Red Cross. Its team members are certified in disaster response training from both American Red Cross as well as IRUSA's original programming.

Connect with our Disaster Response Team staff via drt@irusa.org or by calling 1-855-447-1001.

Lutheran Disaster Response brings God's hope, healing and renewal to people whose lives have been disrupted by disasters in the United States and around the world. When the dust settles and the headlines change, they stay to provide ongoing assistance to those in need.



**DISASTER
RESPONSE**

"We are a church that is a catalyst, convener and bridge builder." Lutheran Disaster Response collaborates with other disaster response organizations and religious entities in the United States and around the world. This enables the greatest stewardship of resources and maximum impact of response. They recognize that every disaster is local. Because of this, they believe every response needs to be rooted in the community; they work to accompany that community from immediate relief through long-term recovery. In our international work we partner closely with companion churches and other Lutheran and ecumenical relief agencies to make sure local needs are being addressed and met. In the United States, Lutheran Disaster Response works through our extensive affiliate network and other partners to address these same concerns.

To find out more and to learn how or how you can help visit: <http://www.elca.org/Our-Work/Relief-and-Development/Lutheran-Disaster->

For questions or to update your contact information, please contact:

Drew Dycus, MPH, MA
ddycus@buckscounty.org
Phone: 215-345-3832

Suzanne Redington, MPH
scredington@buckscounty.org
Phone: 215-345-3321

Fallon Maggio, BS
fpmaggio@buckscounty.org
Phone: 215-345-3325

Public Health
Prevent. Promote. Protect.



www.facebook.com/buckshealthdept/

<https://twitter.com/buckshealthdept>

