Version

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PUBLIC HEALTH PREPAREDNESS (PHP)
TRAINING PROGRAM

Training Course Materials

The Foundations of Public Health Series:

The Public Health 'Toolbox' Training Course

PUBLIC HEALTH PREPAREDNESS TRAINING COURSE MATERIALS

Handbook for the *Public Health 'Toolbox' Training Course*

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    a. Handbook for the *'Chain-of-Infection' Training Course*

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4. Points of Contact:

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Welcome to the Online *'Public Health Toolbox'* Training Course

This online accessible training course is intended to be done at the trainee's own pace. The intent of this course is to create a common foundation of knowledge to build off of during future trainings, exercises and real-world activations of the public health system.

In this ongoing grant climate of '*do more with less'*, we here at the Nevada Division of Public and Behavioral Health's (DPBH), Public Health Preparedness (PHP) training and exercise program, are working on ways to continue bringing you training opportunities, but with little to no travel expenses associated with those trainings.

One of the strategies we have come up with is to provide training opportunities through an online format using a internet-accessible system called **Prezi**. For those of you who have never heard of Prezi, it is basically a more dynamic version of the old standby: *Microsoft (MS) Power Point.* Rather than transitioning from slide-to-slide like we have in the past on MS Power Point; with Prezi you *'fly'* through the transitions seamlessly. You'll see what I mean in a few moments.

Today's online training course should take about 15 minutes to complete.

System Requirements to Run Today's Training Course

Basic Computers Will Work Fine: The technical support team at Prezi has posted the following on their Prezi Basics web page:

The Prezi editor runs well on most contemporary computers, even netbooks. You can easily determine if your computer meets system requirements to watch prezis by:

1. *Checking out any prezi from www.Prezi.com/explore to see if it plays back smoothly on your computer.*

2. *Checking if you can play back YouTube videos while in full screen mode when in any prezi.*

High End Usage: If you would like to play a very large prezi (with many videos, animations, high resolution images, etc.), Prezi uses Adobe Flash technology to render prezis in real time, therefore you can create very high resolution presentations, but your playback performance will rely on the hardware. Here are some hardware recommendations:

1. *Fast processors and lots of memory will help more than a strong graphics card.*

2. *It can help to play a prezi through once, it will play more smoothly the second time (do not restart the prezi).*

Website: The www.Prezi.com website supports all major modern browsers (Internet Explorer 9 and above, Mozilla Firefox 3 and above, Google Chrome, Safari) but for the best experience we recommend using the most standard compliant browsers available (Firefox 3.6+, Chrome 4+, Safari 4+). Flash version 11.1 is required.

Prezi for Windows / Mac: For users who would like to access Prezi through Microsoft Windows:

- *2.33GHz or faster x86-compatible processor, or Intel Atom™ 1.6GHz or faster processor for netbook class devices*

- *Microsoft® Windows® XP, Windows Server 2003, Windows Server 2008, Windows Vista® Home Premium, Business, Ultimate, or Enterprise (including 64 bit editions) with Service Pack 2, Windows 7, or Windows 8 Classic*

- *512MB of RAM (1GB recommended)*

For users who would like to access Prezi through a Mac Operating System (OS):

- *Intel® Core™ Duo 1.83GHz of faster processor*

- *Mac OS X v10.6, v10.7, or v10.8*

- *512 MB of RAM (1GB recommended)*

High-Speed Internet Connection: In order to access today's training course, you will need access to a computer with a high-speed internet connection. We realize that for many of you in our rural counties, such a connection may be an issue. So in an effort to ensure that you can at least read along with what the audio recordings for each transition, we have provided a complete transcript of what those audio recordings cover.

Software Requirements: In addition to this internet connection requirement, we ask that your computer also have *Windows Player* installed. This will allow your personal computer (PC) to run the audio portions of the Prezi presentation.

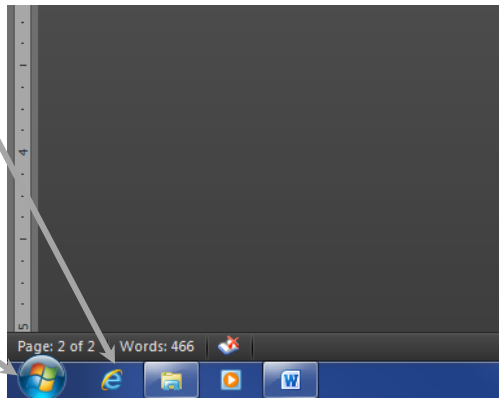
Sound Speaker(s): In order to listen to the presenter's recordings for each transition in today's course, please ensure that your PC has a speaker (or speakers) that are working, and as basic as this sounds: make sure the volume is turned on and up. If your system does not have a speaker, then you can follow along in this course handbook and read through each recording's content.

How to Access, Open and Watch the Prezi Presentation: Open the internet browser for your PC by double clicking on that browser's icon in the bottom-left corner of your screen like this:

If your computer is setup with a shortcut to your browser, like this, then click here:

If your computer does not have that shortcut, then click here:

When that opens, look for the Internet browser and double click on that.



Once your internet browser opens, you will need to copy/paste this web address into your browser. Please ensure that each letter/digit/symbol is copied into your browser; otherwise the presentation will not open for you.

By clicking on this **hyperlinked** web address below, it should automatically open the *Prezi* presentation for you. If not, then please copy and paste this web address into your PC's internet browser.

http://prezi.com/k9tkkae9oyl2/?utm_campaign=share&utm_medium=copy&rc=ex0share

Depending on your computer and the strength of its internet connection, it may take up to a minute for the online presentation to fully load; so please be patient while the website loads the online course.

Depending on your internet connection, this presentation may take a few seconds, to a few minutes, to load; so please be patient. Once the presentation does load, you can watch the course as it displays, on a portion of your PC's screen; or, you can expand it to fill your computer's entire screen by clicking on this symbol in the bottom-right corner of your screen:

Either way you choose to watch the Prezi presentation, in full screen mode or not, you will be advancing the presentation at your own pace, one transition at a time, by clicking the right-arrow at the bottom of the screen (circled above).

If you would rather watch and listen to this course like a movie, you can also click on this "Play" button in the bottom-left corner of the window, as indicated by this arrow.

Note: If you opt to watch the course in the full-screen mode, the software will pop-up a question about "*Allow full screen with keyboard controls?*" Just click on the Allow button.

From that point on, you will watch and listen at your own pace. If you need to go back and redo a previous slide (or as Prezi calls them: Path), then simply click that left-facing arrow at the bottom of your screen. Adjust your PC's volume and enjoy the course.

Chapter 1

Full-Transcript to the *Public Health 'Toolbox'* Training Course

The U.S. Centers for Disease Control and Prevention (CDC) have created 10 essential public health services that public health systems throughout the country should be capable of. The eighth essential service is: "Assure a competent public and personal health workforce."

—Taken from the CDC website http://www.cdc.gov/nphpsp/essentialservices.html

In this next installment of the '*Foundations of Public Health Series*', we will look at the interventions that public health could use to help break the Chain-of-Infection. In order to achieve that, public health within Nevada would turn to something we call the public health 'Toolbox.'

If you are taking this course at your own pace from your computer, then please allocate at least 20 minutes to complete this presentation. Each of the courses within this series are designed to build upon the knowledge gained in previous courses, so please do not jump from course to course out-of-sequence.

As with each of the courses within this series, here is the transcript of what was recorded for this course.

Path #1: Before we get going, please adjust your computer's volume control so you can hear the audio component of this training course. You can advance the presentation at your own pace, by clicking that right-facing arrow at the bottom of your screen, or by clicking that 'Play' button in the bottom-left corner of the screen.

Path #2: Hello, and welcome to today's presentation titled: *"The Foundations of Public Health Series: the Public Health 'Toolbox'."* My name is **Doctor Tracey Green** and I am the Chief Medical Officer for the State of Nevada. I will be presenting

today's material for this online-accessible training course. This series of online accessible training courses are intended for both public health and its partner agencies, so that we may all be speaking the same language when it comes to large-scale responses to infectious disease.

Path #3: In this second course, we will look at the types of interventions that public health could bring to bear, against an infectious agent, during a large-scale outbreak. In order to achieve that, public health within Nevada would turn to something that we call: the public health '*Toolbox*.'

Path #4: In the previous course I covered the processes these agents need to go through, in order to gain access into a body. In this second course, I will discuss what public health intends to do to **prevent those processes from happening**, or as you saw in the previous course's diagram: to break the Chain-of-Infection. As I have listed here, in the aftermath of a large-scale event involving a biological agent, Nevada's public health partners would turn to its list of response options. That is something we call: the V-M-A-I-Q-H-S Model.

Path #5: It has been state public health's experience in previous exercises, that some of our partner agency's had difficulty understanding the differences between viruses and bacterium, vaccines and medications, etc. So in this training course, I will explain a corrective action that our state public health preparedness program (aka: PHP) took to alleviate those problems; which at their core, are basically training issues. After working with our training and exercise partners, the state PHP program came up with something that we call '*The Public Health Toolbox*.'

Path #6: The idea is rather basic: what interventions would public health '*bring to the fight*' in response to a large-scale biological event? In addition to the issues we experienced during previous exercises concerning virus versus bacterium; the state PHP program also learned that our partners were confused as to when certain public health interventions should be taken. For example: during one such exercise we had people asking about when we should employ isolation and quarantine plans for people exposed to anthrax. As we will learn later on in this course, anthrax cannot be passed from person-to-person, so there's no need for isolation and/or quarantine plans and procedures to be activated. To help prevent these sort of misunderstandings in the future, the public health toolbox was designed as a quick reference guide to ensure responders are literally on the '*same-sheet-of-paper*.' The idea behind this 'toolbox' is something called the V-M-A-I-Q-H-S Model…which you can probably tell, isn't an acronym that 'rolls off the tongue', hence the reason we call it the public health 'toolbox.' We list each of the seven components in an order of efficacy, which means: we put our most effective intervention first, and work our way down.

Path #7: The first tool in our toolbox would be **vaccination**. If we were to be hit with an agent that has been properly identified, the first question we, as public

health responders, would ask is: "*Do we have a vaccine against this agent*?" Vaccinations are one of public health's greatest achievements, for when vaccinations are done properly, they impart a prolonged protection against specific threats to our body. Since the late 1990s there has been a national debate concerning vaccines; if you are interested in hearing or learning more about this debate, I would point you toward a Frontline report done in 2010 by PBS called "*The Vaccine War*." For those of you following along in the course handbook, I have included the web address to the PBS website for that documentary: **http://www.pbs.org/wgbh/pages/frontline/vaccines/view/**

Path #8: We owe this triumph of public health to the founder of Immunology, an English physician named: **Dr. Edward Jenner**. Dr. Jenner noticed that milk maids (also known as dairymaids) did not appear to fall ill with smallpox at a rate he observed in the rest of the population. These milk maids would develop cowpox lesions on their hands, and upon closer inspection, he observed that milkmaids who had acquired cowpox in the course of their duties were now protected against infection by smallpox. Based off of these observations, he concluded that cowpox would not only protect against smallpox infection, but that if it was transmitted from one person to another as a "deliberate mechanism of protection", it would confer protection. Here is an excerpt on what happens next from an article in January 2005 by Dr. Stefan Riedel of Baylor University's Department of Pathology:"*In May 1796, Edward Jenner found a young dairymaid, Sarah Nelms, who had fresh cowpox lesions on her hands and arms. ON May 14, 1796, using matter from Nelms' lesions, he inoculated an eight-year-old boy, James Phipps. Subsequently, the boy developed mild fever and discomfort in the axillae. Nine days after the procedure he felt cold and had lost his appetite, but on the next day he was much better. In July 1796, Jenner inoculated the boy again, this time with matter from a fresh smallpox lesion. No disease developed, and Jenner concluded that protection was complete.*" This image depicts that fateful experiment with young James Phipps by Dr. Jenner. For those of you who are following along in the course handbook, I have included the web address to Dr. Riedel's article if you would like to learn more on this person: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1200696/pdf/bumc0018-0021.pdf

Path #9: The next tool in our toolbox would be **medications**. If we were hit with a biological agent, we would next ask: "Are there any medications available that we can give to either prevent disease, **or** treat the disease?" That first point about preventing disease is what we refer to as a post exposure prophylaxis or PEP. Later when we discuss the Threat Response Guides to anthrax and plague, PEP will figure heavily into our response options. For people who were exposed to an agent and became ill, then we would want to know if there are any medications available to treat or cure the disease.

Path #10: Although there are a wide range of medications available, within the scope of today's discussion, we would be most interested in antibiotics. These life-saving medications literally changed how we viewed disease overnight. Prior to their discovery, age old illnesses caused by various bacteria plagued humanity. But due to some sloppy housekeeping in a research laboratory, all that changed by this man: **Sir Alexander Fleming**. While studying and researching influenza virus in the lab, Dr. Fleming let the culture plates he had used in previous experiments pile up in the laboratory sink. He noticed that on one of them, a mold had developed on a plate with staphylococcus culture. Any place on that plate, where the mold came in contact with the staph culture, the staph died. This inspired him to look into this phenomenon further. He would dilute the mold culture 800 times, and yet it would still kill off the staph culture. These efforts became his discovery of penicillin, and to a Nobel Peace Prize in 1945 for his work. In the nearly ninety years since their discovery, this class of medications has nearly lost its supremacy over bacterial infections. If you are interested in learning more about this threat to global health, I would recommend you watch the PBS Frontline documentary called "*Hunting the Nightmare Bacteria*." For those of you following along in the course handbook, I have included the web address to the PBS website for that report: http://www.pbs.org/wgbh/pages/frontline/hunting-the-nightmare-bacteria/

Path #11: Although antivirals are a type of medication, we split them apart because this class of medications serves such a unique role. It seems that every time we learn of a new pandemic-strain influenza virus, everyone starts asking about antivirals. Over time people have developed an inflated sense of what these medications can do. For all the attention this class of medications has received, people view them as some sort of silver bullet. They are not a silver bullet. These meds must be taken at very specific time frames within a viral infection, and do not confer any sort of permanent protection against a viral illness. This means that: if we started providing these to a person who was exposed to a virus, and that person kept being exposed to the virus, then we would need to keep providing them with antivirals until a permanent protection (such as a vaccine) could be given.

Path #12: Here is a mini-lesson in how antivirals work. Remember in the Chain-of-Infection course when I discussed how viruses are incomplete life forms that require a host cell in order to replicate themselves? Here is where we will apply that lesson. To the left we have a square shaped object representing a host cell's outer layer. We also see an arrow penetrating through that outer layer; that is a virus trying to get inside the cell. That long word above the cell, pronounced hemagglutinin, is the name of surface proteins on the outside of a virus. There are 16 different types of hemagglutinin proteins, called H1 through H16 for short. If you can imagine these 16 different hemagglutinins as 16 different keys sticking up from a viruses outer layer, then you get an idea of how a host cell sees them. Antivirals are like stuffing a wad of bubble gum into some of the host cell's key

holes. When the virus tries to insert its 'keys' into these key holes, they are blocked. Antivirals that block an invading virus from fitting any of its keys into a host cell's outer key holes are referred to as "hemagglutinin inhibitors." When these are administered correctly, they prevent the virus from propagating and making millions of copies of itself within our body. In that diagram to the right we have a virus depicted as an arrow trying to exit a host cell. That word above, pronounced neuraminidase, is what we call another type of surface protein on the outside of a virus. If an invading virus has penetrated a cell and made millions of copies of itself by hijacking the host cell's reproduction machinery, now those new viruses need to exit their host and begin the process anew. To achieve this they must insert their keys called neuraminidase which are labeled N1 through N9 for short, into the host cell's inner keyholes. If they cannot find a way out, the host cell dies, but the infection stops dead in its tracks because those new viruses can't get out and infect new cells. Some antivirals work as neuraminidase inhibitors: they block some of the keyholes that the newly minted viruses try to open to get out. With sixteen different Hs and nine different Ns, now you understand what we're talking about when we say: H7N9 (that the seventh key to get in, and the ninth to get out of a host cell).

Path #13: We often hear people use the term isolation and quarantine in unison as if they stand for one thing; but in reality, they are quite different from each other, both in what they're expected to do, and the logistics that go along with each of them. Isolation is for people who are already sick with a contagious disease. This makes planning for isolation wards much easier from a logistical and planning point-of-view, because we can co-locate isolation ward patients in what we call 'shared air.'

Path #14: Here is an example of what I mean by 'shared air' from the 1918 Spanish Influenza pandemic. This military isolation ward has co-located a large number of its patients who already show the signs and symptoms of influenza infection into one big room: hence the shared air phrase we use. Since they're already sick, they can cough and wheeze on each other without creating a new sick person. Before we move on, here is a little exercise about the 1918 Spanish Influenza. In this photo of people who are clearly ill with that life threatening influenza virus, what percentage of these men died of that infection? 5% 10%, 20%, 30%, 60? Take a moment to select what choice you would select. Here's the answer, and it may come as a shock to you: based off of the data from that pandemic, we estimate that somewhere between **2 and 5 percent** of the people who fell ill with that strain of virus died from it. What made this pandemic so deadly was that it infected 25 to 30 percent of the population. Losing 2% of one thousand people is a MUCH different number than losing 2% of 500 million. This is what we in epidemiology refer to as an "**Attack Rate**." If you are interested in learning more, we will be covering that topic in another presentation within this online training series.

Path #15: Next we have **quarantine**, and as I stated previously: this is much different from isolation. Here is an interesting tidbit of information from the educators at the University of Hartford in Connecticut, on where this word originally came from: *Quarantine, from the Italian word **quarentina**, meaning forty days, was the amount of time for isolation of any ships entering a harbor that were thought to be carrying some form of contagion. This number of days, is based on no scientific reason, but rather on the number of days the bible said Christ spent in the wilderness*. Quarantine is for people who may have been exposed to an illness but are **not yet symptomatic** with that illness. From a planning and logistics point-of-view, this requires a higher degree of complexity: each patient must be housed separately, and have their own air. To help give you an idea of how that would play out during a response, I will explain how we here in Nevada look at this planning and logistical challenge. If we needed to house a extraordinary number of quarantine ward patients, we could perhaps use existing infrastructure here in our state to help in those efforts. With Nevada's economy tied to gaming and tourism, we have an abundance of hotels. Those hotels are accessible to all types of people (e.g. ADA compliant), they're centrally located, and they have their own cooking/cleaning systems onsite. If we could work with hotels interested in becoming quarantine wards, we could assign patients to alternating rooms and alternating floors. By this I mean: we could house one patient per even-numbered rooms, and on even-numbered floors, etc.

Path #16: The concept of quarantine goes back hundreds of years. Our counterparts in the nautical world have long used the yellow flag, as seen here, as an easy way to wave off other ships because this ship contained crew or passengers who were ill with contagious disease. If you ever notice that the U.S. Surgeon General wears a naval officers' uniform, this is in recognition of the historical fact that the navy once controlled quarantine of offshore ships. Ships trying to enter port were required to host a U.S. Navy health inspector who would verify if there was any outbreak already onboard an arriving ship.

Path #17: Unfortunately Hollywood has taken this concept and overinflated what it actually is. For any of you who were around in the 1980s, this scene from Steven Spielberg's hit movie, E.T., is a great example of what I'm talking about.

Path #18: Here's what it actually ends up looking like if a person who was initially in quarantine becomes ill. They are moved to a new space, and we disinfect the old space. This photo from Uganda's 2012 Ebola outbreak is a good example. When dealing with infectious disease, the idea is to not have porous surfaces for the virus to hide in while we clean and disinfect. So the walls and floor are covered with plastic that can be sprayed and soaked with a five percent or ten percent bleach solution that's spread through sprayers. We will talk more about this in another presentation that covers viral hemorrhagic fevers or VHFs.

Path #19: Next we have the oldie but goodie: **hygiene** which would include **decontamination**. That is just another way of saying that we would physically

remove an agent from the environment, or from the surface of our body. You'll notice that in the parenthesis I also have an acronym: **PPE**. That stands for Personal Protective Equipment which are physical barriers that prevent an agent from entering our body. These are great ways of breaking that middle link in the Chain-of-Infection called *Transmission*.

Path #20: The makers of those fancy hand sanitizers hate when people such as I say this, but good old fashioned soap and water work really well in combating infectious diseases. Our parents were right when they ordered us as kids to "*wash up before dinner!*" That simple act removes all sorts of agents from our hands, the same hands that carry food to our mouths; which if you remember from that *Chain-of-Infection* discussion, the mouth is a portal-of-entry, as is the gastrointestinal tract.

Step #21: This is an example of a wet decontamination station, during an anthrax exercise. It's pretty basic: park two fire trucks side-by-side, spread a ladder across them, and hang a fire hose off the middle of that bridge. I don't know about you, but when we used to play under fire hydrant water as kids, that water was incredibly cold! This poor guy was not only hit with anthrax spores, but now he has to run around the back parking lot in his skivvies, and get hosed down by freezing cold water! Yikes! Over the course of many exercises like this, we have learned to use warm water and shower stalls; we have also learned to capture that run-off water down on the concrete. The good folks over at environmental protection refer to this as '**grey water**.' Just because a spore was washed off does not necessary mean that same spore is dead. If left to flow down into the sewer system, it could come back later to haunt us.

Path #22: So now when we conduct exercises like this, we provide warm water, privacy screens, and if you notice, tubs to capture all that grey water I just mentioned.

Path #23: Here's an image of some various forms of PPE that I mentioned earlier in this module. It looks pretty basic, but for any of you who have had a friend or loved one in a hospital under what are called 'contact precautions', you know that we are required to put on a new set of these scrubs upon entering the patient's room, and removing that as we leave. From a planning and logistics point-of-view, we need to plan for one person to consume at least a box of this PPE per day/shift. Based off of our previous discussion about portals of entry, do you see any exposed portals if we were dealing with a biological agent? I'll give you a moment to look. The best I can come up with would be: she is wearing an absorbant top that needs to be covered with a non-porous smock; and the skin of her neck is exposed and would need to be covered.

Path #24: Last but not least, we have **Social Distancing**. For those of you in public health, you may also know this by another term: Non-pharmaceutical

interventions or NPI. This is often one of the most controversial interventions that public health can recommend because it cuts into people's business earnings. If we had an outbreak of a communicable disease here in Reno during the Hot August Nights event, and we told the city to cancel all public gatherings, that may be difficult for our private sector partners to understand. Businesses rely on the earnings from large events such as Hot August Nights to keep their budgets going. The best we can do is make an informed recommendation to our leadership, and let them make the decision.

Path #25: Here's a real-world example of a recommendation like that being made, and it not being carried through. In the Fall of 1918 as the full impact of that dreadful pandemic's second wave was being felt (particularly on the East coast), the City of Philadelphia opted to not cancel its Liberty Loan Parade scheduled for Saturday, September 28, 1918. In spite of reports that the virus was considered to be wide spread throughout Philadelphia's naval stations and army camps, as they saying goes: the show must go on; so the parade was not cancelled.

Path #26: Some of the best descriptions of what happened next come from this book by John Barry: *The Great Influenza*. In his exhaustive research, Mr. Barry's narrative on this little known chapter in humanity's story is replete with tragic stories about federal/state and local government not making the hard but right decision in the face of highly pathogenic influenza virus. One such story is that of the City of Philadelphia and its director of their health department. In spite of warning his leaders to cancel the Liberty Loan Parade, it appears he didn't make those recommendations with enough vigor, for as we just saw in that photo; the show certainly did go on.

Path #27: I will use this quote from John Barry's book to help capture and describe what happened next. I'll give you a moment to read the quote. That part about the epidemic "*assuming the type found in naval stations and cantonments*" is truly frightening because it's saying: this thing is loose within our city, and it's on a scale we cannot even come close to handling. The experience of Philadelphia in 1918 is now a case-study in how to not handle an epidemic or pandemic involving a highly pathogenic virus. As you can see at the bottom, most cities at that time had enough morgue capacity city-wide to store a few hundred bodies at once; Philly was losing five to eight thousand per day within two weeks of that photo of the Liberty Loan Parade being taken. Philadelphia is still digging up bodies from 1918 in all sorts of crazy places. People ran out of room to bury their dead, or were too weak themselves from the illness to move their dead out of town and bury them. The bodies were interred wherever survivors could find the space, or the energy.

Path #28: OK, so how we doing with this 'toolbox' concept? Does it make sense? This tiered system is how we at state and local public health departments would approach a large-scale biological event, such as a biological attack involving a Category-A agent.

Path #29: As great as all that 'toolbox' stuff sounds, how would it fit together for the really dangerous agents, such as bio weapons (called **Category-A** agents by the CDC) and pandemic strain viruses? Good question, and for that I will refer to another tool we came up with at state PHP to help both public health, and non-public health responders to 'connect-the-dots.'

Path #30: We took each component of that VMAIQHS Model (aka: the 'toolbox'), and listed those as column headers across the top of this table. From left-to-right you will see each of those interventions I just covered being listed as column headers (e.g. Vaccines, Medications, etc.). Next we took the Category-A agents and pandemic strain viruses, then listed them to the left as row headers. As you make your way through the table, we have provided a succinct description on whether that intervention would work or not, and if it does, we give a basic idea of what we're talking about. Under the column for Hygiene, which you will remember also includes decontamination and PPE, we list which protective measures we are specifically recommending. For those details, look at the bottom of the page and each type of precaution is listed: standard precautions, contact precautions, etc. Remember my comments about people asking if we were going to isolate and/or quarantine patients following an aerosolized anthrax release scenario? The idea behind this table was to head off those misunderstandings we experienced during some previous exercises. This little table would literally get us all on the same sheet of paper. Do you notice how in each row, the interventions work in concert with the others as applicable. It's not one intervention by itself, but a combination of interventions.

Path #31: As great as that table looks, for any of us who have conducted real-world response operations: a table does not equal a plan. So in an effort to keep our own leadership within public health organized and focused, we borrowed an idea by our friends over at the New York City Department of Health (NYC DOH). In 2012 at the national public health preparedness summit in Anaheim, CA, the New York City DOH's Mitch Stripling presented a topic that he and his team came up with called **Threat Response Guides,** or TRGs for short. These are not plans in the classic sense, as the title says: they're guides. The guide allows our leadership to make key decisions in collaboration with key partners at key times in the first 48 to 72 hours of a large-scale response. We took what the New York City team had done, and applied our own Nevada-specific details to create a set of TRGs for this state. At the time of this presentation, we currently have a library of 22 separate scenarios that involve everything from each of the Category A agents, to earthquakes, floods, wild fires, industrial accidents, etc. That table we just looked at with the agents along the left column and the interventions along the top; that's included in each of the TRGs that cover biological agents. This is a screen shot of the TRG for aerosolized anthrax.

Path #32: As is this one for aerosolized plague. There are medical protocols and regimens listed in this TRG as well, as are other useful guides, such public messaging templates, etc.

Path #33: Here's an example of a Category-B agent: Glanders. We hope to add a TRG for Sarin, and a TRG for Ricin by Summer of 2015. With these TRGs, we took an incredible idea that our counterparts over at the New York City Department of Health came up with, and re-worked it to meet our own Nevada-specific realities. This give-and-take between public health colleagues is a great example of best practices being openly shared and improved upon.

Path #34: OK folks, that was a lot of information that I covered. For those of you who may be interested in learning more about Category-A agents and bioterrorism, I would recommend you take the "*Biological Threats to Homeland Security*" online training course. If you have any questions concerning what I've covered thus far, please contact Dan Mackie at 775-443-7919, or at his e-mail address: dmackie@health.nv.gov