

Measures to Prevent Disease Associated with Animals in Public Settings

Webinar Hosted by the Centers for Disease Control and Prevention

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Moderator: Loretta Jackson Brown

Presenters: Dr. Casey Barton Behravesh and Dr. John Dunn

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Operator

Welcome and thank you for standing by. At this time all participants are in listen only mode. During the question and answer session, please press "star 1" on your touchtone phone. Today's call is being recorded; if you have objections you may disconnect at this time. Now I would like to turn the call over to Ms. Loretta Jackson-Brown. Thank you, you may begin. (00:00:14)

Loretta Jackson-Brown

Thank you, Cindy. Good afternoon, I am Loretta Jackson-Brown and I am representing the Clinician Outreach and Communication Activity, COCA, with the Emergency Risk Communication branch at the Centers for Disease Control and Prevention. I am delighted to welcome you to today's COCA webinar, "Measures to Prevent Disease Associated with Animals in Public Settings." We are pleased to have with us today Dr. Barton Behravesh and Dr. Dunn, here to discuss disease associated with animals in public settings and recommendations to minimize associated disease and injury risk related to animal contact.

You may participate in today's presentation by audio only, via webinar, or you may download the slides if you are unable to access the webinar. The PowerPoint slide set and the webinar link can be found on our COCA web page at emergency.cdc.gov/COCA. Click on COCA calls. The webinar link and slide set can be found under the call-in number and call passcode.

Here to provide an end user introduction to navigating today's webinar is Ms. Callie Campbell.

Callie Campbell

My name is Callie and I will walk everyone through the procedures and tools available in the webinar. If you have a question for one of the presenters you may use the Q&A button located at the top left portion of your screen. Type in your question and then hit enter to send the question to the presenters. If you are addressing a specific presenter, please state that in your question. Presenters will read selected questions out loud to the group. At the top right-hand side of your screen you will see several tools available to you. The feedback tool has a colored square next to it. If you select the dropdown arrow next to the feedback, you can alert me if you are having trouble hearing or need help. This meeting is being recorded, if you technical difficulties at any time during this presentation, you may call our technical support line at 877-283-7062. Thank you all for coming. Loretta Jackson-Brown is your host and she will be taking over the presentation from here. (00:02:22)

Loretta Jackson-Brown

Thank you, Callie. At the conclusion of today's session, the participant will be able to describe outbreaks associated with animals in public settings, list common pathogens causing outbreaks associated with animals in public settings, identify

common animals associated with outbreaks of enteric infections involving public settings and discuss recommendations to minimize disease risks associated with animals in public settings. Following the presentation you will have an opportunity to ask our presenters questions. For audio questions, dialing “star 1” will put you into the queue for questions and you may submit questions via the webinar as indicated by Callie.

In compliance with continuing education requirements, all presenters must disclose any financial or other associations with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters, as well as any use of an unlabeled product or products under investigational use. CDC, our planners, and the presenters for this presentation do not have financial or other associations with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters. This presentation does not involve the unlabeled use of a product or products under investigational use. There was no commercial support for this activity.

Our first presenter, Dr. Casey Barton Behravesh is a Lieutenant Commander in the US Public Health Service and team lead outbreak response team outbreak response and branch CDC. She directs outbreaks of enteric pathogens caused by contaminated food or contact with infected animals. A former epidemic intelligence service officer assigned to CDC’s enteric disease epidemiology branch, Dr. Barton Behravesh investigated numerous zoonotic disease outbreaks. Since 2007, she has served as CDC’s consultant to the National Association of State Public Health Veterinarians Committee responsible for publishing the 2011 compendium of measures to prevent disease associated with animals in public settings. Dr. Barton Behravesh earned her doctorate of veterinary medicine from Texas A&M University and her doctorate of public health from the University of Texas Health Science Center at Houston. She is board-certified in the American College of Veterinarian’s Preventative Medicine. (00:05:03)

Our second presenter, Dr. John Dunn, is a former epidemic intelligence service officer assigned to CDC’s foodborne and diarrheal disease branch. In this role he investigated one of the largest E. coli O157 outbreaks associated with animals in public settings, as well as other zoonotic disease outbreaks. Dr. Dunn currently serves as a deputy state epidemiologist and state public health veterinarian in the communicable and environmental disease services section of the Tennessee Department of Health where he directs the foodborne, vectorborne, and zoonotic diseases section. In addition, he co-chairs the National Association of State Public Health Veterinarians Committee, publishing the 2011 compendium of measures to prevent disease associated with animals in public settings. Dr. Dunn earned his doctorate of veterinary medicine and doctorate of philosophy and epidemiology in community health from Louisiana State University.

Again the PowerPoint slide set and webinar link are available from our COCA Web page at emergency.cdc.gov/COCA. At this time, please welcome Dr. Barton Behravesh. Dr. Behravesh, you may be on mute, please check your line. (00:06:51)

Dr. Casey Barton Behravesh

Hi, can you hear me now?

Loretta Jackson-Brown

Yes, go ahead. (00:07:30)

Dr. Casey Barton Behravesh

Okay. Sorry about that, everyone. Good afternoon, everyone. So there are many different types of animals that are displayed in public settings, such as the little chicks pictured here, which are commonly displayed in the spring and around the Easter season. There are also farm animals, which are very common in petting zoos. There are also the more exotic animals, like reptiles and amphibians and pocket pets and parrots that are displayed. What’s important is that there are many positive benefits of human/animal contact and animals in public settings provide opportunities for both entertainment and education. There are many venues that encourage or permit the public to have contact with animals and these results in millions of human/animal interactions every year. Some examples of public setting include petting zoos, county or state fairs, zoological institutions, circuses, carnivals, pet stores, animal swap meets, farm tours, livestock birthing exhibits, even educational exhibits at zoos, or at schools, sorry, and wildlife photo opportunities. (00:08:41)

These pictures just show that there are many different types of animal contact. There’s both direct animal contact, as pictured here where the children are trying to pet or feed the animals. And there’s indirect animal contact, shown where the girl has her hand and mouth on the railing used outside of an animal exhibit. And you can see in the red circles there, animal feces on this bar. So that’s another route that can lead to illness. And you’ll hear more about transmission routes in Dr. Dunn’s presentation. (00:09:15)

There are some public health concerns with animals in public settings. There are infectious diseases, including multiple bacterial, viral, fungal, and parasitic agents. There are injuries, such as bites, kicks, falls, scratches, stings, and crushing of the hands or feet. Rabies is an important public health concern that can result from contact with rabid animals and potential rabies exposure require extensive investigations as well as administration of post exposure prophylaxis. There are other human health problems as well, such as allergies. (00:09:50)

I want to focus on zoonotic diseases spread between animals and humans. And I'm specifically going to focus on of the enteric pathogens, like E. coli O157:H7 and salmonella. For enteric diseases, there are illnesses and outbreaks that are well documented. Bacteria and parasites pose the highest risk for human disease. Many have a very low infectious dose, and there are some animals that are more commonly associated with enteric diseases, including farm animals like cattle, sheep, goats, poultry, also reptiles and amphibians and rodents. But there are others. (00:10:34)

In terms of the animal host, it is important to know that animals carrying enteric pathogens may not exhibit signs of illness. They can appear perfectly healthy and clean. Though these animals can shed the pathogens intermittently, stress is known to increase shedding of pathogens. So for example, when you're putting a group of animals in the middle of a petting zoo and a bunch of toddlers are coming at them, that can definitely increase stress and shedding. Some of the populations at highest risk for serious illness are children aged less than five years; people with weakened immune systems, people who are mentally impaired, pregnant women, and also the elderly. (00:11:16)

I want to give just a little bit of background on a couple of the enteric pathogens that we see most commonly associated with animals in public settings. First is salmonella infections. The incubation period for salmonella typically ranges from 12 to 72 hours. The illness may last from 4 to 7 days and typically causes acute gastroenteritis with symptoms like fever, diarrhea, abdominal cramps, vomiting, and sometimes bloody stools. However, it can result in serious illness, including meningitis, blood stream infections, and joint infections. Most salmonella infections don't require treatment other than oral fluids. The patient may require rehydration with intravenous fluids; however, antibiotics are not usually indicated. (00:12:06)

For E. coli O157:H7, the incubation period typically is 3 to 4 days; however, can range from 1 to 10 days. Illness duration is usually five days up to a week. Symptoms most commonly include fever, diarrhea, abdominal cramps, and bloody stools. About 5 to 10 percent of patients get hemolytic uremic syndrome or HUS. This typically develops about seven days after the first symptoms and usually when the diarrhea is improving, and it can lead to permanent kidney damage or death. Most of these illnesses won't require treatment other than oral fluids. Again, they may require rehydration with IV fluids. Antibiotics are not usually indicated and they may increase the risk of each HUS. (00:13:00)

For outbreaks in animal exhibits, during the last 10 years there have been an increasing number of enteric disease outbreaks reported to CDC. Since 1996, there have been 149 human infectious disease outbreaks involving animals in public settings reported. And these result in substantial medical, public health, legal, and economic effects. (00:13:26)

I want to tell you about how we've collected this information. Our outbreak criteria is two or more cases caused by a related source with a common pathogen. Exposure occurring in a public venue due to animal contact. We used our National Outbreak Reporting System, or NORS data, as well as conducted a survey of state public health veterinarians through the National Association of State Public Health Veterinarians. We did a literature search and an Internet search online and also collected information provided by state and local health departments. (00:14:04)

With our most recent survey, which was conducted in 2010, we had 56% of states provide us an update, and the majority of that came through our National Outbreak Reporting System. But we learned there are a total of 149 outbreaks since 1996, resulting in over 2,900 illnesses and over 360 hospitalizations. There were 46 new outbreaks reported. The majority of those were from the most recent years, 2008 to 2010. (00:14:39)

This just shows the number of outbreaks associated with animals in public settings by year. You can see that every year since 1996 we have had multiple outbreaks. And the numbers of outbreaks have been increasingly reported in more recent years. In terms of the number of outbreaks by pathogen, E. coli represents the largest number, which is shown in the blue, followed by salmonella, which is shown in green, and cryptosporidium, which is in the yellow. Basically, 78 percent of the outbreaks that have been reported to us have been caused by these three pathogens. When looking at the number of ill persons by pathogen, it's also E. coli, Salmonella, and cryptosporidium that are resulting in the largest numbers of illnesses. (00:15:33)

And when looking at the number of outbreaks by setting, we commonly see outbreaks associated with fairs, with farm visits, and with school settings including daycare schools and university settings. Also with petting zoos. There are several other types of outbreaks that have been reported, including contacting animals at feed stores, livestock birthing exhibits, at pet stores, at a boys' treatment facility, horse stables, hospitals, and other settings. Just to summarize, we have a total

of 149 outbreaks of animals in public settings reported to CDC. We added 46 new outbreaks during our last survey conducted in 2010. The primary update source was through NORS; however, this information is incomplete and many of it contains preliminary information reported from the states. Seventy-eight percent of illnesses are caused by three pathogens, E. coli, Salmonella, and cryptosporidium. Forty-nine percent of illnesses were associated specifically with visiting a fair, a farm visit, or a petting zoo. Thirteen percent of settings associated with outbreaks involved day cares, schools, and universities. So, how can we minimize the risk of diseases and injuries associated with animals in public settings? I will turn it over to Dr. Dunn who will tell us more. (00:17:12)

Dr. John Dunn

Great! Thank you, Dr. Barton Behravesh. So my names is Dr. John Dunn, I work in the Tennessee Department of Health and have been involved with this particular set of recommendations since 2003. So, I'd like to describe for you the compendium of measures to prevent disease associated with animals in public settings and its upcoming publication in the MMWR. So, as an overview, I will tell you a bit more about the background on these recommendations and the organization that writes them, the National Association of State Public Health Veterinarians and our committee makeup. Talk a bit more about transmission routes and then I'm gonna follow the structure of the compendium document itself, and talk about lessons from outbreaks. And then the recommendations themselves. And, of course, hand washing is the predominant recommendation. Hand hygiene. But also, important recommendations about education, managing public and animal contact, animal care and management. Some additional recommendations and then the appendices that are included, I'll mention briefly. (00:18:25)

So NASCHB and CDC are actually not the first to recognize this problem of disease transmission from animal in public settings. There have been recommendations written previously in the UK in 1995; in Canada in the year 2000; and following a large outbreak of E. coli O157 in Pennsylvania, CDC included recommendations in the MMWR article summarizing that outbreak in 2001. As I mentioned, I have been involved since 2003 when NASPHV drafted recommendations, more comprehensive recommendations by committee. So this is a snapshot of the upcoming issue, this is the proof that will be coming out shortly at the beginning of May. We are excited about the publication time because many venues that exhibit animals will be getting geared up in the spring and summertime. (00:19:34)

Just a bit about our committee structure, I am the current committee co-chair, along with Dr. Kirk Smith from the Minnesota Department of Health. Other NASPHV members include Carina Blackmore from Florida, Louisa Castrodale from Alaska, Ron Wohrle from Washington State, James Wright from Texas, and then we have a number of consultants on the committee. I really feel like the consultants are just an extremely important part of this process, because we have individuals with a lot of broad expertise and people from the industry that help the committee assess the recommendations as to whether or not they are going to be implemented and if they can be implemented. It is a very good makeup to our committee. So the consultants include Marianne Ash from the American Veterinary Medical Association representing AVMA, Dr. Barton Behravesh representing CDC, Dr. Karen Beck representing the North Carolina Department of Agriculture, Marla Calico, representing the International Association of Fairs and Expositions, Dr. Alan Hogue, from the US Department of Agriculture Animal Care Division, Carla Huston from the American Association of Extension Veterinarians, Dr. Tim Jones, a lone physician on the committee from the Council of State and Territorial Epidemiologists, and Dr. Tom Meehan from the Association of Zoos and Aquariums. So in revising the document, we met with CDC in September, September 15th through 17th, and went through the document in great detail. The revision included going through recent literature, updating the reported outbreaks, diseases, or injuries attributed to animal/human interactions. And then going through the recommendations and making revisions were appropriately based on new evidence or new published reports since the last publication in 2009. (00:21:43)

Just as a procedural note, the committee, if there are issues where we don't have a unanimous position on the greater committee, the NASPHV committee members, rather than the consultants, will vote if that's necessary. And again, we anticipate a publication date in early May. (00:22:06)

Dr. Barton Behravesh touched on transmission routes and the document describes in greater detail those routes and examples include waterborne transmission in settings where animals are exhibited; direct contact with animals and indirect contact with animals, and Dr. Barton Behravesh showed some images. And I thought those images are good and explain exactly what we mean by direct and indirect animal contact. So I think these pictures illustrate that; when someone is coming directly in contact with the animal's hair coat or perhaps has the animals lick them or places their hand in the animal's mouth like the picture on the right; there is the potential for transmission of enteric pathogens. Animals are living in an environment where the pathogens also exist, and it's well described, and enteric pathogens can contaminate the hair, coat, and mouth, particularly, of farm animals. (00:23:05)

Indirect transmission—and these...I hope these were also in Dr. Barton Behravesh's slides—is a bit more under the radar, so to speak. So the image on the left that Dr. Barton Behravesh highlighted, shows manure contaminating the fencing rails. So there is bedding, organic material, and certainly manure in animal environments. So the manure may not be present at a later time, but certainly the pathogenic organisms that can reside in the manure will be there. So these persons, the young children on the right, are at some risk if salmonella or cryptosporidium or E. coli O157 had been present on those fencing rails, and they are coming in contact with their hands and even their mouth on the railing. (00:24:03)

In the document we describe lessons from outbreaks and I wanted to just highlight a couple of those for you. The first is kind of the key message in the compendium docket about hygiene and that lesson is don't forget to wash your hands. We've taken some great efforts in the document to look at studies where we have some quantifiable information. So outbreaks for case-controlled studies or cohort studies have been done to assess risk factors. And it is clear, in cases where those types of analytic epidemiology studies have been done that hand hygiene has a protective effect. Two examples, one being the Denver zoo Komodo dragon exhibit outbreak where salmonella emeritus was transmitted to patrons visiting that exhibit and the risk factors studied show the protective effect of hand washing upon interviewing ill persons and well persons that had both visited the event. Also, a Minnesota children's farm day camp outbreak, this involved multiple pathogens isolated from humans, and from the animals. Their risk factor study showed that washing hands with soap after touching a calf and washing hands before going home were protective factors in that particular outbreak study. (00:25:35)

The second lesson that the compendium discusses that I would like to highlight here involves long-term contamination. A good illustration of this is an Ohio county fair outbreak of E. coli O157; in this case, the epidemiologic study implicated going to a barn dance, handling sawdust, and eating or drinking in the barn. It's notable that no animals were present. There had been animals exhibited in the previous week during a fair, but during the barn dance no animals were present. Nevertheless, transmission occurred by the indirect route because the pathogens remained in the environment and remained viable and infectious. (00:26:25)

In fact, pathogens were still isolated months later and even from the rafters in the barn. A second example of long-term contamination is from a very large outbreak at the North Carolina State Fair of E. coli O157:H7. In this case, there were well over 100 children or persons that were infected, and more than a dozen children with hemolytic uremic syndrome. The transmission was associated with one particular goat and sheep petting zoo. In that case, E. coli O157 was isolated from the soil five months after the animal bedding and topsoil were removed. There were some dramatic efforts to decontaminate that particular area of the fairgrounds that included using VERCON, actually, in a trial, in a decontamination trial using VERCON, Lyme, and a flame torch. All those methods failed to completely eliminate E. coli O157, although almost a year later, the site was culture negative. So, these organisms persist very well in the environment, particularly in an organic matrix like a barn where there is manure, bedding, and soil. Dr. Barton mentioned some additional health concerns which I won't touch on in-depth: injuries, of course, can be a concern, where people interact with animals in public settings, other infections, and rabies, of course. (00:28:07)

And Dr. Barton Behravesh mentioned that in rabies exposures there may be many persons who have concerns, and I think for this particular audience of clinicians or medical practitioners, that's an important thing to note. When these large exposures occur, many people, perhaps visiting a fair where an animal is noted at a later to have been rabid. There may be many persons coming and seeking post-exposure prophylaxis. I would just encourage clinicians to be in contact with their public health officials at the state and local level to help assess those persons who may need or may not need post-exposure prophylaxis. Your state and local public health officials have a very good handle on rabies epidemiology in your particular areas and can provide good consultation. (00:28:59)

Let me touch on the recommendations themselves that are in the document. Many of the recommendations are specifically for venue operators, venue staff, and persons visiting these types of exhibits. But I think they are relevant for clinicians and medical providers, public health officials to be aware of; persons who interact with the public. We do make recommendations for local, state, and federal agencies. So making recommendations basically for ourselves, those who write these types of documents, and our recommendations are that communication and cooperation between human and animal health agencies occur. We recommend that this report be distributed to venue operators and also recommend that we develop educational training materials for venue operators and other interested persons. That is what we are doing today is trying to provide some education about this particular set of recommendations. (00:30:04)

Many of the recommendations regard education and something that we highlight, in particular, in this year's version of the document relates to the first bullet: that visitors knowledgeable about potential risks are less likely to become ill. As I mentioned, there have been several analytic studies comparing ill persons and well persons. And we have documented

several times now that upon asking people, 'Were you aware of the risk of disease transmission from animals to people?' those who indicated they had prior knowledge before the outbreak, we recognize a protective effect of that knowledge. We feel like education is very important and have actually been able to quantify that in some of the outbreak settings through analytical studies. Other recommendations for education are that the venue operators—so those who run the fair or run the zoo—that they be familiar with these risk reduction recommendations; that they consult with state and local agencies and county extension agents on their implementation; assure that staff are appropriately trained; assure that visitors and exhibitors receive education and provide information to persons arranging special trips or classroom trips ahead of time. (00:31:28)

I think it is important for this group as well—you may be asked in your communities, or you yourselves may be involved with 4H or some other activity where animal exhibits are occurring—to be engaged with the operators and encourage them to be familiar with these recommendations. So, beneath the operators, we make recommendations for staff. That staff be trained and able to explain risk reduction recommendations to visitors. So if you are having the expectation that your staff is going to be requiring people to park their stroller before entering the petting zoo, we feel like it is a good idea for them to have a good explanation for the public as to why they need to do that. So they need to be trained and be able to explain these recommendations. Staff should encourage compliance with risk-reducing recommendations, especially hand washing, comply with local and state requirements for reporting animal bites, scratches, and other injuries, and this relates specifically to rabies. And assure that visitors receive educational messages. To educate visitors, we recommend both for venue operators and staff that they should provide information about disease risks and appropriate measures to reduce those risks; inform visitors which groups of people are at high risk and the precautions visitors should take; provide information before the event and at the animal contact area entrances and exits; provide information in a simple to understand format that is age and language appropriate; and provide information in multiple formats, which is signs, stickers, handouts, or perhaps verbal messages. (00:33:23)

That is a long list of objectives to educate the public visiting. I thought would just show you some examples I've seen of some signage that I think does a nice job of communicating multiple points that we recommend be communicated to the public. So here's the first example of a sign. I think it is an eye-catching; there are hands on the sign that says that this is important information. It is clear that you are entering an animal area. They have it designated as a critter area. And then some at-risk persons are addressed. That children should have special attention paid to them. The sign indicates what you should not do. Do not eat or drink while in animal barns. And what you should do: wash hands after leaving the barn and why, the information in yellow at the bottom, because bacteria and infections are carried by animals. I think this is a clever way of messaging that includes a lot of important points. This sign, with this K-N-O-W, KNOW how to be safe around animals also communicates multiple points. This particular sign is available in the document as a PDF. So different venues will be able to download this and utilize it in their animal exhibits. So know that animals carry germs and can make people sick. What not to do, never eat, drink, or put things in your mouth in animal areas. Who might be at increased risk, the O, "Older adults, pregnant women, and children should be extra careful around animals." And then what to do: Wash your hands with soap and water right after visiting the animal area. So again, multiple points communicated on this sign. (00:35:17)

I wanted to touch just briefly about some recommendations for managing public and animal contact. We feel like contact with animals should always occur in settings where measures are in place to reduce the potential for injuries and disease transmission. And our primary mechanism of doing that is through the design of the facility. I think we recognize that it may be difficult to get compliance sometimes through educational messages. People may just ignore what you are telling them to do. But there are some physical, structural elements that we feel can minimize risk in such venues. So through design, we think that we can minimize risky contacts, especially with manure, and facilitate hand washing. Double-barriers can be used to prevent contact directly with animals or contaminated surfaces. And designing venues, we've noted in several outbreaks that temporary exhibits have been problematic. We think that perhaps that's because not much thought has been given to preventing the disease transmission. (00:36:34)

Structurally, we think about three areas in the design of these animal contact areas. There are non-animal areas, animal areas, and transition areas. In the document we include an example of a design for animal contact settings. You can see my cursor, the areas outside, anywhere outside, would be considered the non-animal areas. You would enter into an animal area through a transition area where hopefully signage would be located. Enter the animal area where the things we talked about previously would be prohibited, like food, pacifiers, bottles. And then exit through a transition area where not only signage will be present but hand washing stations as well. (00:37:26)

To summarize that, in non-animal areas, animals are not permitted, except service animals. We recommend that food and beverages can be prepared, served, and consumed in the non-animal area. And that hand washing signs and facilities also be provided where food and beverages are served in a non-animal area. In the animal areas, the opposite would

occur. We recommend that food and beverages be excluded. Also exclude toys, pacifiers, sippy cups, baby bottles, and smoking in those areas. We recommend removal of manure and soiled animal bedding promptly and avoiding spillage. We recommend that children be supervised closely to discourage hand to mouth activities, contact with manure, and contact with soiled bedding. And also that children have, particularly young children, have their hand washing be supervised. We also recommend the use of barriers between the public and animals in petting zoo areas to reduce excessive contact and contamination of clothing. I have some images that illustrate this, and these are pictures from the North Carolina State Fair in which E. coli O157 caused over 100 illnesses and more than a dozen cases of hemolytic uremic syndrome. These are actually pictures of children in that fair setting in 2004 that parents were willing to share with us for public health educational purposes. So you see the girl, the small girl on the left, with then the left, with a handful of shavings, and probably goat manure as well. This young boy, right adjacent to a pile of goat manure. So there was a lot of very close contact, goats were raising up and putting their feet on the children. The children were able to sit down in the bedding and manure and have a lot of contact. So we see that this is a high risk group; there were a lot of children in this particular petting zoo, and a high risk setting, with the children in contact with the bedding, the animals, and the manure. So when we talk about contact across the barrier, I think this image illustrates that. That in this case, in this petting zoo, children are still able to interact with the goats, but it's across a barrier; so there is some direct animal contact, but the child is not in direct contact with the animals' bedding and not in direct contact with the manure in the animals' bedding. Thinking more about the animal areas and thinking back to earlier in the presentation when I talked about some of the lessons from outbreaks, we recommend that animal areas not be used for public events. In other words, that they not be treated like non-animal areas because of long-term contamination that we have described from outbreaks. (00:40:36)

So let me explain this idea of transition areas, I hope it's clear, but we recommend these transitional areas between non-animal and animal areas, that the transitional areas utilize one-way visitor flow, if possible, and that they be designated, so to think conceptually about entering the contaminated area and exiting the contaminated area. At the entrance areas, we would suggest that signs be posted informing visitors that they are entering an animal area, instruct visitors not to eat, drink, smoke, place their hands in their mouth, or use bottles or pacifiers while in the animal area. Exclude strollers, food and beverages, establish storage and holding areas for those items, and at the exit transition areas, post signage instructing visitors to wash their hands, provide accessible hand washing stations for all visitors, including children and persons with disabilities. (00:41:55)

We also suggest or recommend that staff be positioned near the exits to encourage compliance, specifically with hand washing. In Tennessee, we have conducted some observational studies of persons in animal contact venues and have observed on one occasion the fair organizer recognized that the health department was there making observations and had their staff encourage people to comply with hand washing. We were trying to do a natural experiment to see what proportion of people washed their hands or used hand hygiene upon exiting, but because the venue operator recognized our presence, they had their staff to encourage people to wash their hands, and we recognized quite a difference. I think in that case, it was clear that encouraging people as they exit to wash their hands does increase compliance. These are some examples that I picked out to demonstrate entrance transition area signage. So there is a lot of information that we discussed that we want to try to communicate and I think these signs do that fairly well. They talk about things that are not permitted in the animal contact area; suggest that children be accompanied or supervised; they also describe what not to do in terms of putting your hand in your mouth, and encourage hand washing upon exiting. (00:43:22)

In the exit transition, of course, the key message there is about hand washing. The two signs on the right are the same sign, in English and Spanish, encouraging people to always wash their hands with soap and water and how to do that. There is also a...in the upcoming publication, a hand washing sign that is available for venue operators to use that has very similar guidance developed by the CDC hand washing group with straightforward and simple messaging about the importance of hand washing and how to do it. I think one of my favorite signs is the sign on the left, which is very simplistic, it says if you touch animals, you wash your hands. It has the pictures of animals and pictures of hands and it is actually bilingual as well. Of course, the signage should be present, but we think about what else should be in the exit transition area and it should be hand washing stations, of course. So those can be fixed facilities. This can be a challenge in some particular animal contact settings or fairs. The picture on the left shows piped-in water, a fixed hand washing sink, but there are options for facilities that don't have fixed hand washing stations. There are portable stations, as depicted on the right, a portable hand washing station. The document does address some questions about hand sanitizers. We recommend washing hands with soap and water. However, if soap and water is not available, we certainly would recommend the use of hand sanitizer although the efficacy is reduced in the face of organic matter which would be present in an animal contact setting. (00:45:14)

So just a word on animal care and management. We do receive some questions about veterinary care for the animals on occasion. We don't recommend screening for diseases, because animals can shed pathogens intermittently. There are

limitations in laboratory tests, culturing fecal specimens or other attempts to identify, so there is no guarantee that an animal that tests negative today will not be shedding the pathogen in its feces tomorrow. Similarly, with antimicrobial treatment of animals, we cannot reliably eliminate infection or shedding of enteric pathogens or prevent re-infection. We feel these measures may lead people to place less emphasis on education, venue design, and hand washing. (00:46:10)

There are several appendices in the document. Appendix A is a guideline for venue operators and staff members. So basically, distilling the long narrative recommendations into more bulleted points that we hope will be kind of a user-friendly guide for those persons who operate these types of animal contact venues. Appendix B is a suggested sign or handout for visitors to petting zoos. That is the K-N-O-W know how to be safe around animals sign that I showed previously. And then hand washing recommendations to reduce disease transmission from animals in public settings. Both written instructions and a sign that can be used by venue operators downloaded from the document as a PDF for use in their facilities. And then lastly we have Appendix D, guidelines for visiting and resident animals in schools, which questions often come up about which species are appropriate and for what ages. This particular set of guidelines tried to address those questions.

Again, most of the recommendations are, as I said earlier, targeted to those venue operators and venue staff and to the public who visit. However, for this particular call, with clinicians and medical providers, I just want to provide some thoughts about what you can do with these recommendations. I think first is what you are doing today, just to become aware of the NASPHV compendium recommendations. In your practice, in seeing patients to consider transmission of infectious agents from animals to people. So zoonotic disease transmission certainly is well described as Dr. Barton-Behravesh showed us. In terms of outbreaks and certainly there are probably many more sporadic cases of infection that occur from animals to humans in public settings. I would also suggest that ordering a culture for diarrheal disease is a very important component that clinicians and medical providers can do that contributes hugely to our ability to detect outbreaks. We have some very sophisticated techniques in public health, both at the state and federal level, to look at genetic fingerprints of pathogens and be able to link cases across different jurisdictions that have a similar or the same source. (00:48:46)

I also encourage strongly as clinicians to consult state public health officials and report suspected transmission routes or outbreaks. In fact, many, many of the outbreaks that we described we first learned about through a very astute clinician who recognizes that one or more patients likely had transmission from a particular source. We very much depend on our interaction with clinicians and encourage you to think about transmission routes and to communicate any information or hypotheses that you might have to your local or state public health officials. We would be glad to follow up and evaluate if transmission might have occurred in that setting.

And lastly, you have the opportunity to provide direct patient education for your patients and parents regarding risks and preventative measures associated with animal contact. I would encourage you to do that as well in an effort to minimize risk and encourage people to enjoy animals and animal contact settings that use appropriate measures to minimize disease transmission risk.

That is the end of my slides. I will turn it back over to Loretta. I think we have a few minutes for questions. (00:50:08)

Loretta Jackson-Brown

Thank you Dr. Dunn and Dr. Barton-Behravesh. We will now open up the line for the question and answer session.

Operator

Thank you. If you do have a question, please press star 1. Please unmute your phone and record your name clearly when prompted. Your name is required to introduce your question. To withdraw your request, press star 2. One moment please, for the first question.

Loretta Jackson-Brown

And while we are waiting for the first question we will go to our webinar and take a question from that pool of questions and the first question actually is for Dr. Barton-Behravesh. It says, "how much of the increase is due to better reporting"?

Dr. Casey Barton Behravesh

Thank you for that question. There is definitely an increase in part due to better reporting. The national outbreak reporting system, or NORS, that I told you about has recently started collecting information on outbreak specifically involving animal contact and other zoonotic issues. That is something that is new. However, we also know that these animal exhibits are increasing in popularity as well. So, it's not completely due to enhanced reporting. (00:51:25)

Loretta Jackson-Brown

Let's take another question from the webinar while we're waiting for Cindy. This one is for Dr. Dunn. Is there any evidence of outbreaks arising from a laboratory setting? Like amphibian labs? Or that's may be for Dr. Barton-Behravesh as well.

Dr. John Dunn

Such as a laboratory setting?

Loretta Jackson-Brown

Correct.

Dr. John Dunn

Well, there have been outbreaks associated with laboratory settings. And, some that I can think of, in particular, and some that we have investigated here in Tennessee involve classes where there was a natural laboratory; people are being trained in animal husbandry; in various diagnostic procedures in animals we've seen outbreaks. I mentioned one in Minnesota. We've seen one in Tennessee involving the transmission of Cryptosporidium, usually from calves, young cattle, to humans. We have seen that occur among veterinary technicians being trained in wet labs in Tennessee. (00:52:39)

Loretta Jackson-Brown

OK, Cindy do we have any questions from the phone?

Cindy (Operator)

We certainly do. Our first question comes from Robert Gordon. Your line is open.

Robert Gordon

Thank you. I appreciated the presentation. My question, is in regard to the commonly and frequently available hand sanitizers that are distributed virtually everywhere. Occasionally a question will come up from an operator or a venue in lieu of a handwashing station. How effective are those Purell dispensers or similar products. (00:53:17)

Dr. John Dunn

This is Dr. Dunn, and the document does addresses, particularly with the handwashing recommendations. The fact that in some cases, although we highly recommend that soap and water be made available, in some cases it is not made available. The recommendation is to use, utilize those products. And I can't give you a specific number about the efficacy but it is well described that in the face of organic matter, so even in hospital settings, where there may be blood or other organic matter, the efficacy of those alcohol-based products is reduced. In fact in hospital settings the recommendation is to use soap and water and the alcohol-based products in combination. (00:54:10)

Robert Gordon

Thank you.

Cindy (Operator)

And our next question comes from Karen Streicher. Your line is open.

Karen Streicher

The question I had was, do any of the animals, in retrospect, show any signs or symptoms of disease before the transmission to the public.

Dr. John Dunn

I'm glad to take that question as well and if Dr. Barton-Behravesh wants to add, please do so.

So, for a number of these organisms you saw on Dr. Barton-Behravesh's slide that the majority are E. Coli 0157 and Salmonella. Animals are asymptomatic carriers so there is no clinical signs in the animals. The exception to that might be with Cryptosporidium in calves where calves may have diarrhea. Certainly the recommendation address animals with illness and the recommendation is not to exhibit any animals that are showing any clinical signs, whether or not you know what the pathogen is for that particular species. (00:55:24)

Loretta Jackson-Brown

Okay, and we'll take a couple more webinar questions. These in particular have to do with, I think the craze of pet therapy and they are questions relating to animals in healthcare facilities - if the recommendations address that? And also, a question related to a central place for animal vaccination records and should they be archived?

Dr. Dunn or Dr. Barton-Behravesh, do you want to address animals in health care settings? (00:56:02)

Dr. John Dunn

Well, I can do that, briefly. So, our document does not address that particular issue but we do reference some other, more comprehensive recommendations that do. So, I would encourage the person with that question to consult our documents and consult the reference that's included in regards to animals in healthcare settings.

Loretta Jackson-Brown

And we have linked that document on the COCA website, under the call-in additional resources for this call.

Another question is related to animals in emergency shelters. They want to know your thoughts on animal types in public settings where both people and pets are housed together. (00:56:52)

Dr. John Dunn

So Loretta, I will answer the previous question, the second part of their question, about consolidated rabies records.

Loretta Jackson-Brown

Okay.

Dr. John Dunn

Also, so, in most states, in many states rabies vaccinations are required for domestic species like dogs and cats. And your state public health office is typically the repository of those records so that would be the first place to stop and ask the question which would be with your local or state public health department.

Loretta Jackson-Brown

Operator, do we have any more questions on the phone?

Cindy (Operator)

We do, one moment please. And our next question comes from George Henning. Your line is open.

George Henning

Do you recommend any special precautions for those people who might be immunocompromised and a further question is do you recommend anything special for high-risk species with such as reptiles and amphibians which are known to be particularly highly infected with Salmonella? (00:58:06)

Dr. John Dunn

I will answer the first part and maybe ask Dr. Barton-Behravesh to address the issues related to reptiles, chicks and amphibians as well related to Salmonella, something that she's worked extensively on at CDC.

So, we do have recommendations for persons at high risk and we include those who immunocompromised, children less than 5 as well and there is a section of the document called additional recommendations and we do suggest that persons in those higher-risk categories may consider additional precautions. And one of those being simply not to be in the animal environment because we know that animals are shedding organisms that can potentially infect persons, so someone in a very immune compromised state, an additional recommendation from our committee would be that they not put themselves into that animal environment and not come in contact with animals when they are most susceptible to infection. (00:59:14)

Dr. Casey Barton Behravesh

This is Dr. Barton- Behravesh. Regarding reptiles, amphibians, and poultry and other high-risk species. CDC actually recommends as well in the compendium that reptiles such as turtles, snakes and lizards should not be kept in facilities with children younger than five years of age. So they should not be in schools or daycares. Also that, children under five years of age and other high-risk groups like pregnant women and immune compromised should try to avoid having direct

contact with reptiles and amphibians. Just for everyone's information, if you have not heard about this yet, there is an ongoing outbreak and multiple states across the country right now, linked to contaminated African door frogs which are a very small type of water frog. There are a large number of people getting ill, over 216 illnesses reported over the last couple of years and the majority of them are young children. That is just an important reminder that the young kids and others at high risk should not have direct contact with reptiles and amphibians. The same thing for baby poultry like chicks and ducklings. These animals are at higher risk for shedding Salmonella. And we recommend that they are not kept in facilities with children younger than five years and those people at high risk groups, try to avoid contact with those animals as well. On the CDC website we have a feature that is currently available on Salmonella. The risk of human Salmonella infections from live baby poultry, and this is put up because the Easter season brings chicks to the forefront and people want to start buying them as cute Easter gifts for their children. So we do have that website up right now that gives more details and more of our recommendations. (01:01:25)

Loretta Jackson-Brown

Comments from a participant on the webinar, also wants to know, while there are recommendations, are there any regulations to enforce animal operator to use and follow them?

Dr. John Dunn

This is Dr. Dunn. That is a great question. In the document we do discuss regulations. Our group has made recommendations, however there are several states, a notable one being North Carolina, following the larger outbreak in 2004, that have made regulations through their Department of Agriculture, in which facilities that exhibit animals are inspected and must comply with certain recommendations or certain requirements for handwashing and other things that we recommend in our document. So yes, there are some states that have instituted laws and rules and regulations. But that is done at the state and local level.

Loretta Jackson-Brown

And will those state and local level laws and regulations dictate - a participant wants to know - the amount of water that needs to be refilled in these hand sinks. Is that where they would find those guidelines?

Dr. John Dunn

I am not aware of the specific details of each of the states guidelines but they can reference those North Carolina guidelines in our document.

Loretta Jackson-Brown

Excellent. And we have two participants, Dr. Dunn and Dr. Barton-Bahravesh, that want you to really comment on animals in emergency shelters. That seems to be an interesting question here. Do you have anything else to add about that? They want to know your thoughts.

Dr. John Dunn

This is Dr. Dunn. I will just comment briefly. We recognize that certainly through our emergency preparedness activities that accounting for people's pets is very important. I know that a number of states are thinking through their emergency preparedness plans in developing animal friendly sheltering places that allow for people to bring their animals with them because in reality some people will not leave if they are told to evacuate because they won't leave their pets behind. It is something that we are working to address and are addressing in state health departments. (01:04:08)

Dr. Casey Barton Behravesh

And this is Casey. I agree, that is something that is very important to address with these emergency shelters. People are willing to risk their lives to save their pets.

Loretta Jackson-Brown

I invite participants to view our COCA call on all disasters big and small that we did related to this topic, July of 2010 [<http://emergency.cdc.gov/coca/calls/2010/>] and that is found on our COCA site and that is emergency.cdc.gov/COCA. And operator we have time for one more question on the phone.

Cindy (Operator)

And, I do not show any further questions at this time. (01:04:45)

Loretta Jackson-Brown

Okay. Excellent. For those who submitted webinar questions, if we have not addressed your questions, we will review these with the presenter and because you have provided your e-mail address we will be able to e-mail you a reply.

On behalf of COCA I would like to thank everyone for joining us today with a special thank you to our presenters, Dr. Dunn and Dr. Barton-Behravesh. If you have additional questions for today's presenters, please e-mail us at coca@cdc.gov. Put Dr. Dunn or Dr. Barton-Behravesh in the subject line of your email and we will ensure that your question is forwarded to them for a response. Again, the email address is COCA@cdc.gov. The recording of this call and a transcript will be posted to the COCA website at emergency.cdc.gov/COCA within the next few days.

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Thank you for being a part of today's COCA webinar. Have a great day.

This concludes today's conference. You may disconnect.