ACE
(Assessment of Chemical Exposures)
Your Partner in Chemical Incident Response

Mary Anne Duncan, DVM, MPH
Surveillance and Registries Branch

National Toxic Substance Incidents Program (NTSIP) Webinar Series
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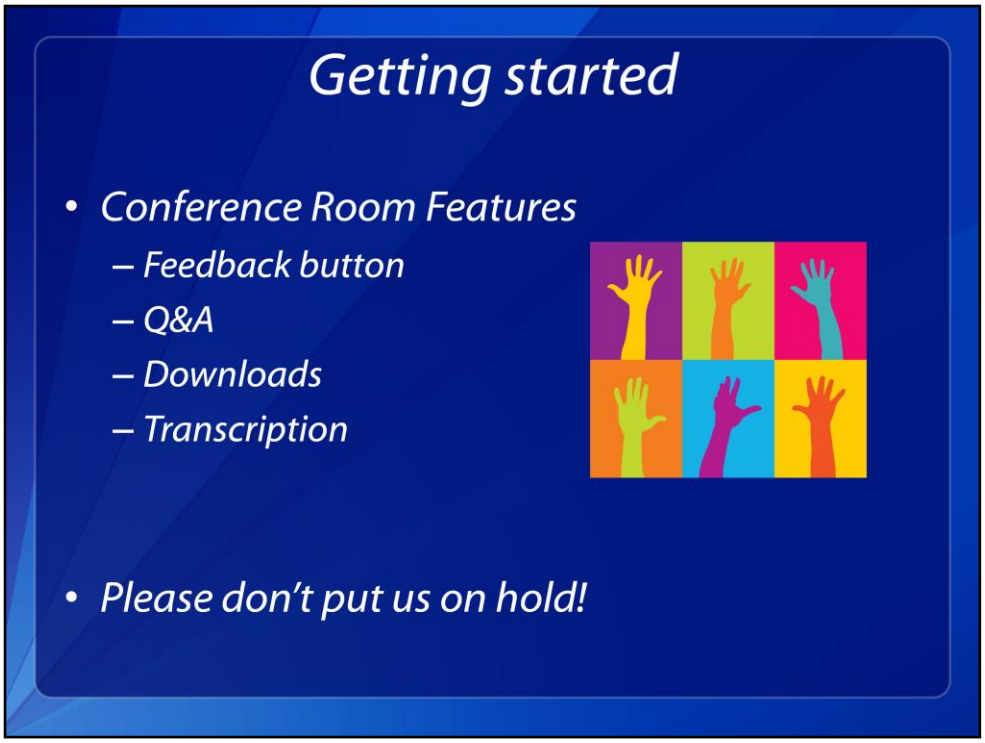
Agency for Toxic Substances and Disease Registry
Division of Health Studies

Good afternoon. Welcome to the first of three webinars through which we will be introducing the National Toxic Substances Incidents Program or NTSIP. My name is Mary Anne Duncan. I'm an epidemiologist in the Agency for Toxic Substances and Disease Registry / Division of Health Studies / Surveillance and Registries Branch. Maureen Orr and Perri Ruckart, who will be leading the other two Webinars are here with me. Today we will be discussing the incident investigation component of NTSIP, which is known as Assessment of Chemical Exposures or ACE.



This will be our first experience in holding a Webinar, so please bear with us if we have technical difficulties. Some of the features of this electronic classroom that we will be using are the download button and the question and answer feature.

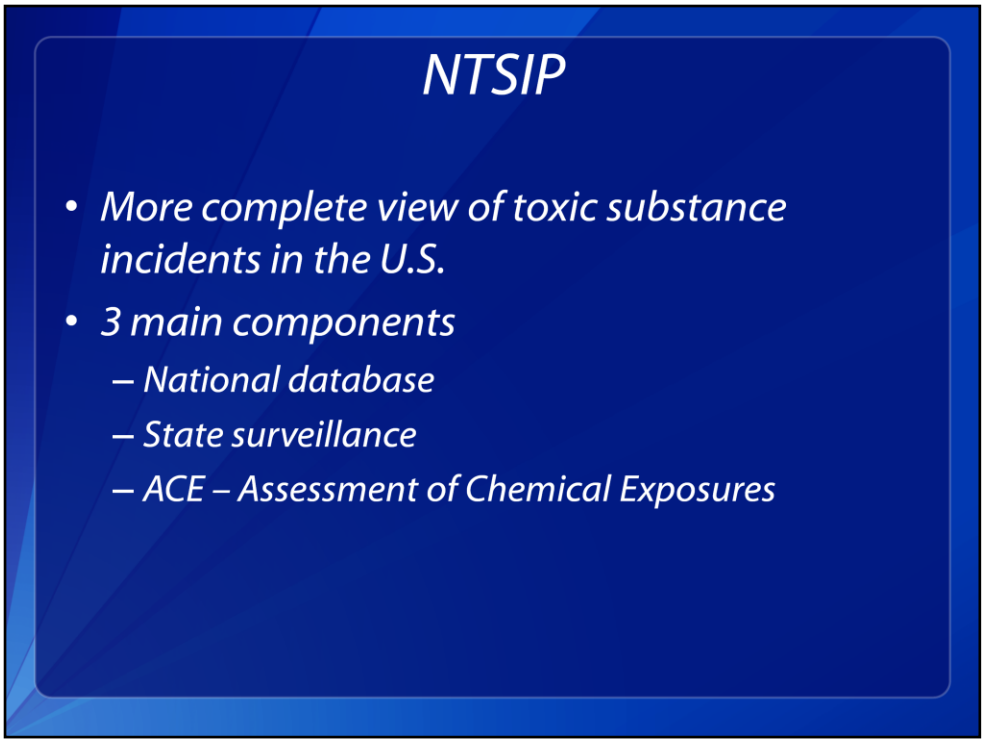
The download button is located on the top right of your screen. It is the 4th icon from the right that looks like 3 little sheets of paper. If you click on it, you can download our Assessment of Chemical Exposures fact sheet.

We will be answering questions at the end of the presentation. You may either ask them over the phone bridge or type them in to the Q & A window on the top left of your screen. To type in a question, click Q & A, then type your question in the top part of the box that appears, and click over the word Ask to send it to us.

We won't have anyone monitoring the feedback button, so if you can't hear or I'm going too fast, please speak up over the phone bridge.

The meeting is being transcribed, so please try to have only one person speaking at a time.

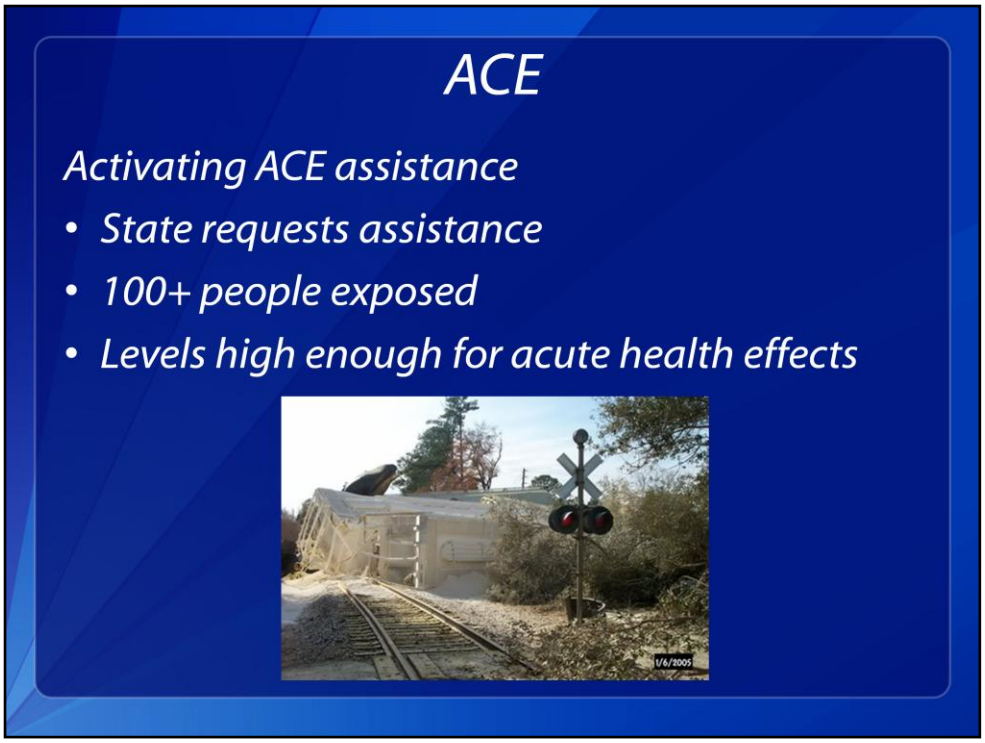
And, finally, please mute your phones unless you are speaking to me or the group, and please do not put us on hold.



For the past 20 years, our branch has had the Hazardous Substance Emergency Events Surveillance or HSEES program. Through HSEES, ATSDR had cooperative agreements with 19 states at varying times over the years. The state health departments collected detailed data on toxic substance incidents and entered it into the ATSDR database and performed prevention activities.

In response to feedback from stakeholders, it was decided to develop a program that could provide a more complete view of toxic substance incidents in the United States. NTSIP was developed and went live in January.

There are three main components to NTSIP. The first part is a national database of toxic substance incidents that combines data from existing databases into the Department of Transportation Hazmat Intelligence Portal. The second part of is similar to the state-based surveillance that was part of HSEES, but with a mapping component and an increased emphasis on prevention outreach. There currently are 7 states participating. The third part of is incident investigations after large-scale toxic substance releases also known as ACE investigations. In 2 weeks, Perri will introduce you to the state surveillance and in 4 weeks Maureen will describe the national database.



Through ACE, we respond to requests for assistance from state and local health agencies to register persons exposed to large-scale acute chemical incidents and characterize exposure and acute health effects. There is also a rapid needs assessment component to the investigation that provides the local health authorities the data they need to address the needs of the community where the release occurred.

We generally investigate incidents in which at least 100 persons are exposed to a toxic substance at levels that could produce acute health effects.

So, why should we investigate after a large scale release? Let me switch to a white board and you tell me. We can:

- Find out what exposure level and health effects to better direct aid to the community
- Find out what additional needs exist
- Learn impact to community and health care system
- Develop a cohort of exposed people that can be followed in time if necessary
- Develop a body of knowledge on the effects of toxic substances and recurring issues during response.

ACE

- *State is the lead*
- *Work as a team*
- *EPI-AID*

Rachel Roisman (California Department of Health) discusses surveys with Ekta Choudhary (ACE Team Member).

In ACE investigations, we are there to assist the state or local health department. Consequently, the state or local health department is the lead in the investigation and we work with them as a team.

The assistance we provide it through an Epi-Aid. The Epi-Aid is a mechanism that the CDC and ATSDR use to provide assistance to states to investigate public health problems of an acute nature that require primarily epidemiological methods in the investigation. In order to request an Epi-Aid, a request, usually an email, is sent either from the State Epidemiologist or with the approval of the State Epidemiologist to our group and the Epidemic Intelligence Service or EIS program.

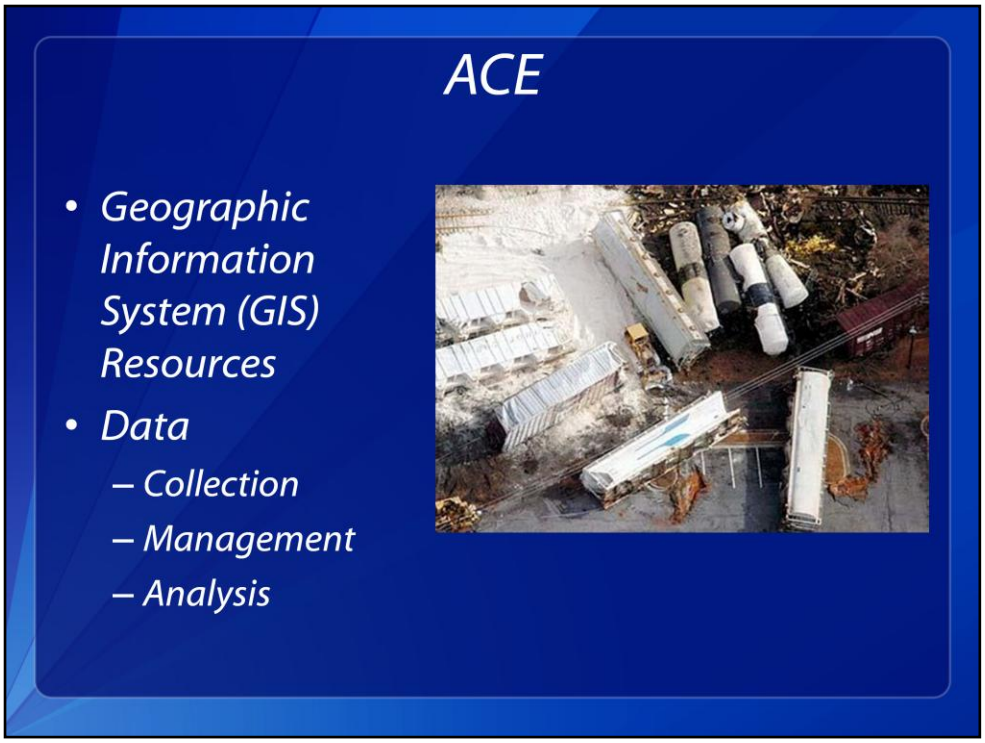
Many states have an EIS officer assigned to the state health department, and that officer is given a chance to take part in the investigation. The multidisciplinary ACE team will include 1 or 2 EIS officers from outside of the state, often a medical or veterinary student who is doing a fellowship at the CDC, and one or more ATSDR staff members. Depending on the needs of the investigation, the team may include members with backgrounds in epidemiology, medicine, statistics, veterinary medicine, industrial hygiene, toxicology, and/or data management. Since time is of the essence in conducting an investigation of this type, we are able to get the team to the field within 1-2 days of receiving a request from the state.

So, why might you request an Epi-Aid? For either chemical or infectious disease issues, Epi-Aids can be used to:

•Increase the manpower available to respond rapidly to a public health problem

•Streamline access to CDC subject matter expertise and laboratory resources

•Facilitate coordination of multi-state investigations



We are very fortunate to have the Geospacial Research, Analysis, and Services Program or GRASP group within our division. This branch is the group which provides the Geographic Information System or GIS support for the CDC Emergency Operation Center and they also support us on our field investigations.

GIS resources that GRASP can provide include:

•Global Positioning System or GPS units

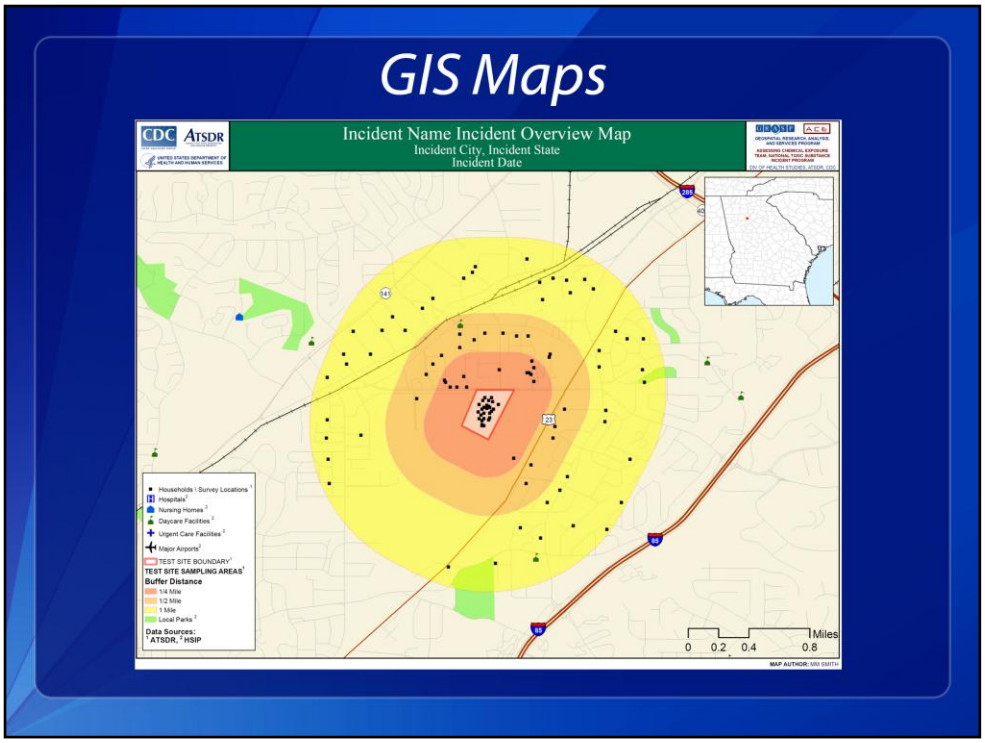
•Technical assistance

•Maps

•Possibly some modeling of the release

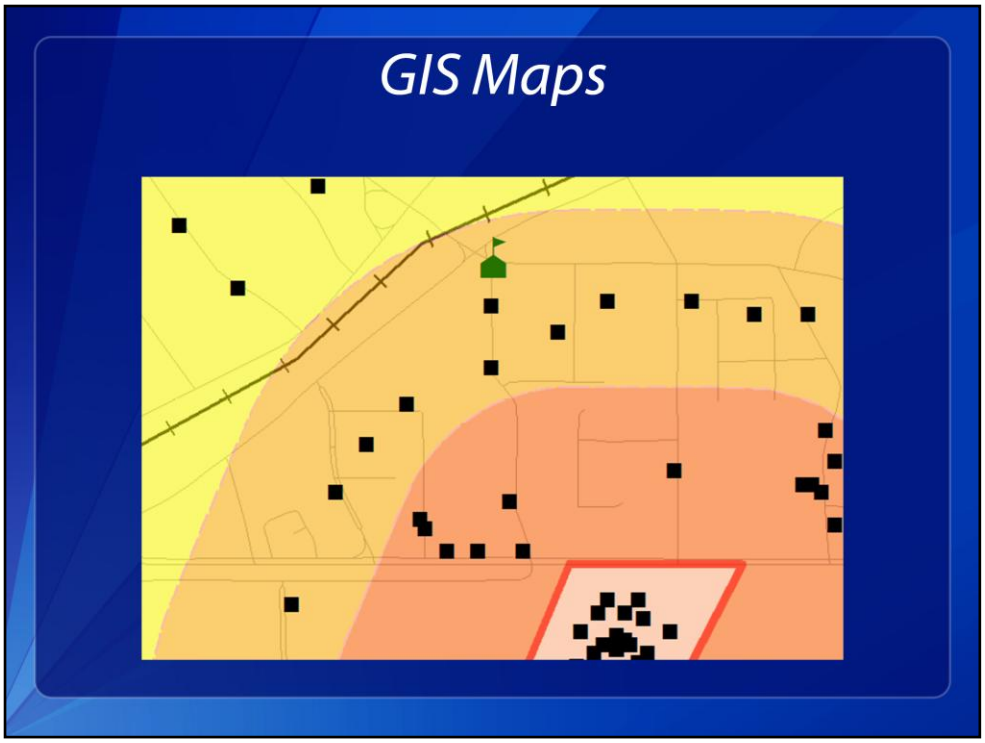
In our field investigations, we start with unstructured interviews with responders such as local fire department personnel or hazmat team members, environmental health officers, and hospital personnel. If the incident occurred at a business, we also interview the business owners or managers and also employees. These interviews provide us with a picture of what happened and the timeline. We then make any needed adjustments to the ACE questionnaires and decide which sections we should delete since they do not apply to the incident.

The bulk an ACE investigation involves interviewing exposed persons using the questionnaires and we may also perform medical chart reviews at facilities that treated patients for the chemical exposure. We then enter the data in databases and perform some of the analysis while still in the field in order to provide as much information to the requesting agency as quickly as possible.



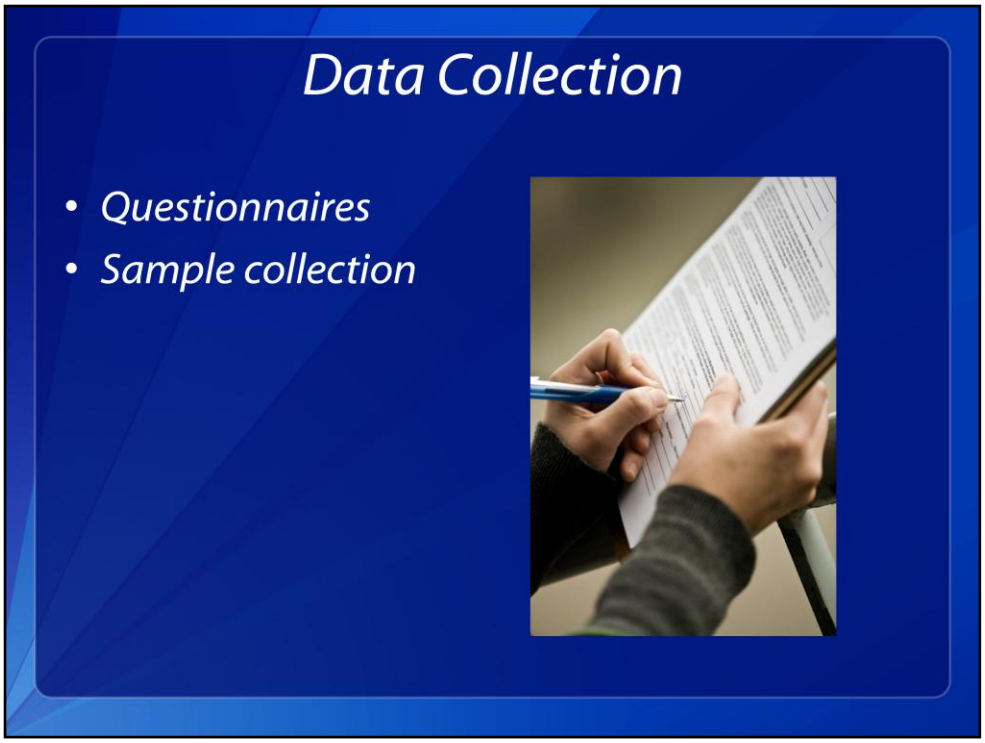
Ideally, we will try to interview all people exposed to the chemical during the release. However, if there are more people exposed to the chemical than could be interviewed by the available number of interviewers within 2-3 weeks, we will interview a sample of exposed individuals. We may use GIS to select the households for interview in large incidents.

This slide shows an example of some of the features that our colleagues in GRASP can include in maps they create for us. Here, they have included one quarter, one half, and 1 mile buffers around a facility where a pretend incident occurred. The black squares show locations to target for interviews. In this situation, they would also provide us with addresses for entry into GPS units and prepare street maps so that we could locate the households where we would like to interview.



The maps also can include details such as locations of daycare facilities as shown here in green, also schools, nursing homes, or other vulnerable populations.

On one ACE investigation, GRASP provided us with an aerial map of the facility where a release occurred with sufficient detail so that we could show it to the interviewees and ask the route they used to evacuate during the incident.



During ACE interviews, we are currently using pen and paper to capture the results of the surveys. In situations where an interview takes place over the telephone, the interviewer can record the results directly in the database using their computer. Our questionnaire includes a lot of free text answers that do not lend themselves to using computers or hand-held devices in the field. We try to keep up with data entry during the investigation so that the preliminary results are available quickly.

On some ACE investigations, there will also be samples collected—either blood or urine from exposed individuals or environmental sampling will take place.

During an ACE investigation, there are multiple survey instruments that may be used.

In some instances, the state or local health department may use the Rapid Response Registry or RRR to capture the names and contact information of exposed individuals before the ACE team arrives. The RRR is a quick survey form containing 38 questions covering contact information for the exposed person and two friends or relatives, exposure information, exposure-related health effects, and two event-specific questions. It takes that takes 5-6 minutes per interview.

Since we will be following up with a comprehensive interview, the abbreviated form of the RRR may be used. It asks just the 4 "critical" questions needed to establish an official registry record: name, sex, home address, and phone numbers. This will only require 1-1.5 minutes per person interviewed.

Once the ACE team arrives, the community survey is performed. Participants in the survey include community members, local business employees, responders, hospital personnel, and anyone else we identify as being in the area at the time of potential exposure. The general survey is used for adults and teenagers. There is a child survey that is used to interview parents about their children's experience. The survey questionnaire is adjusted to be specific for the incident, including questions about symptoms that may be caused by the chemical that was released. The surveys are also available in Spanish.

The Rapid Response Registry, that I mentioned earlier, is available in Spanish, Chinese, and Vietnamese (thanks to translations done by the CA Dept. of Public Health).

The community survey is designed to collect information on exposure history; symptoms experienced; health services use related to the incident; demographic information; medical history; other potential exposure sources such as jobs, lifestyle, habits, and hobbies; and needs resulting from the chemical release. The team members also ask how people were notified about the event and what were the most effective and accurate methods of communication.

Since pets are good sentinels for humans, we are also interested in them. If pets were present, we will ask their owners about health effects and any veterinary care required.

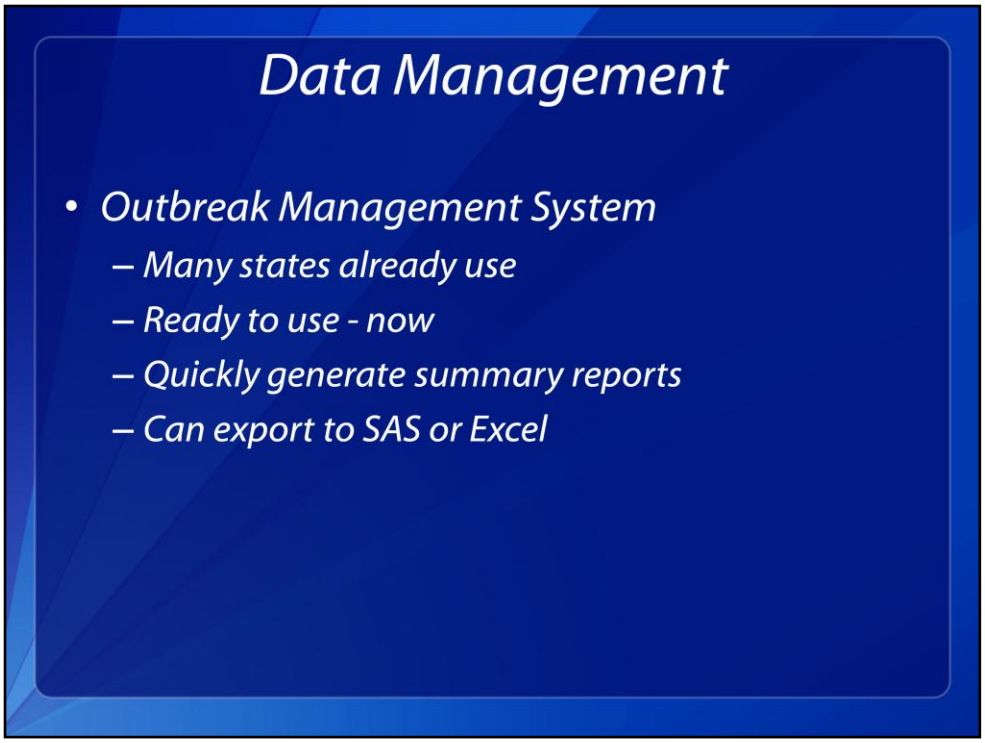
During many ACE investigations, we will also review medical records of those treated for the exposure and abstract data about health effects, transport for medical care, and treatment required.

Data Collection

- *Biological sampling*
  - *Types of testing suitable for this incident*
  - *Sample collection supplies*
- *Environmental Testing*
  - *Usually done before ACE team arrives*
  - *ATSDR may facilitate*

National Center for Environmental Health, Division of Laboratory Sciences or DLS will advise us on the availability of a test for the chemical that was released and the appropriate biological sample, either blood or urine, to collect. If there are multiple tests available, they will participate in discussions with the state public health laboratory about the most useful test to use in the particular situation. If the state public health laboratory is unable to do the testing, DLS will perform testing of samples collected from exposed individuals. If needed, sample collection supplies may be shipped from the lab for use in the field.

In most incidents, environmental sampling will be performed before the team arrives and we will work to obtain the results from the testing agency. If sampling is not being done and we can arrive quickly, ATSDR may facilitate environmental sampling of air, water, soil, or surfaces. Our protocol permits sampling to be done in homes or other buildings when a shelter-in-place has been ordered, so we can evaluate the effectiveness of this exposure reduction tactic.



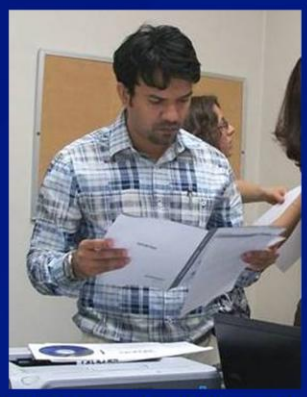
Our program is using the CDC Outbreak Management System for data management. Many states already use this system, so we can house the data at the state health department if desired. Or, we can house the data on laptops that we bring to the field.

Since we leave for an investigation with only a day or two notice, we needed to have the data management system set up in advance, and the OMS team has it ready to go—we just have to tell them which symptoms we will be asking about.

OMS can quickly generate summary reports, so we can provide a report to the state or local health department on a timely basis. We can do analysis with Excel pivot tables or Epi-Info within OMS. Or, the database can readily be exported to SAS or Excel.

Analysis

- Laboratory Support
- Technical support
  - Epidemiology
  - Toxicology
  - Industrial Hygiene
  - GIS
  - Modeling



Medical Toxicologist Rizwan Rivaz (ACE Team Member) reviews data gathered from the incident

Division of Laboratory Sciences can also assist the ACE team in interpreting laboratory findings.

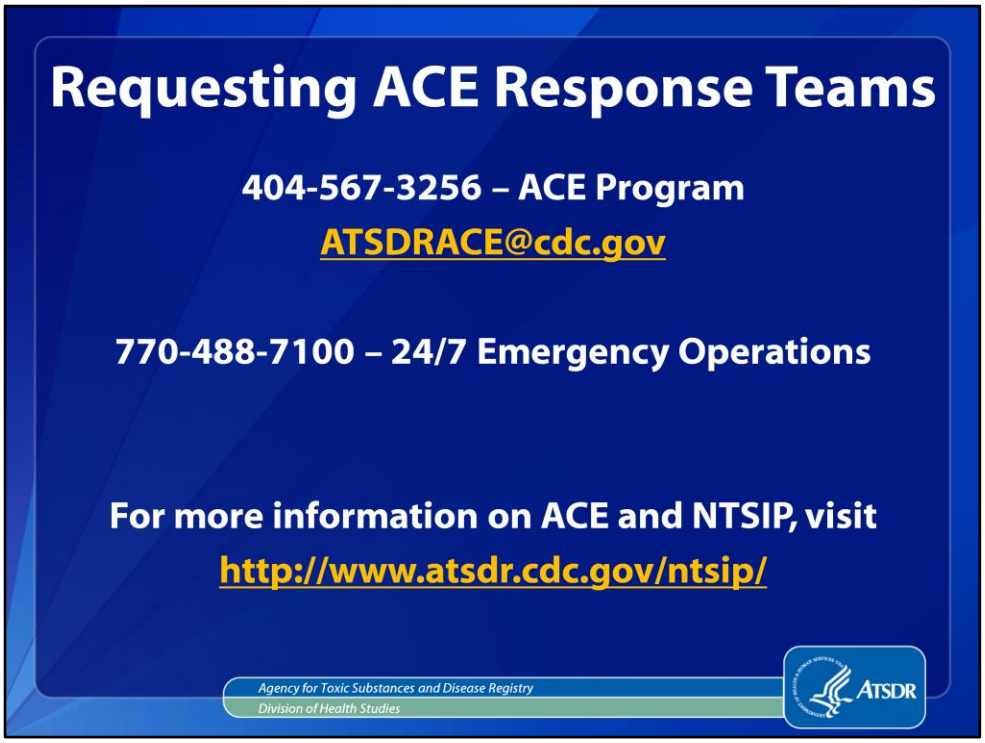
The ACE team can also provide whatever technical support the state needs to complement their available resources, either through team members who are deployed or support from Atlanta. This can include support in epidemiology, toxicology, or industrial hygiene or assistance through GRASP in GIS or modeling.

Generally, the ACE team will give a presentation to the state or local health department prior to departing the field that summarizes the initial findings and recommendations. In some cases, the report will be given over the telephone.

Within two weeks of returning from the field, the EIS Officers prepare an Epi-Aid trip report. This is a preliminary report of the investigation that includes the results of the initial analysis and recommendations. This report is given to the requesting agency and may serve as the foundation for a future manuscript.

Collaboration between the ACE team and the state or local health department will continue for months until the data is cleaned, analyzed, and final reports are prepared. The final report generally will take the form of a Morbidity and Mortality Weekly Report (MMWR) or article in a peer-reviewed journal. Presentations may also be made at scientific meetings.

Prevention outreach is also performed if it is identified that a particular industry or group would benefit from an educational message about prevention of releases or responses to releases. For example, if the incident occurs in an industrial setting, an alert may sent to industry groups educating them on ways to prevent future incidents.

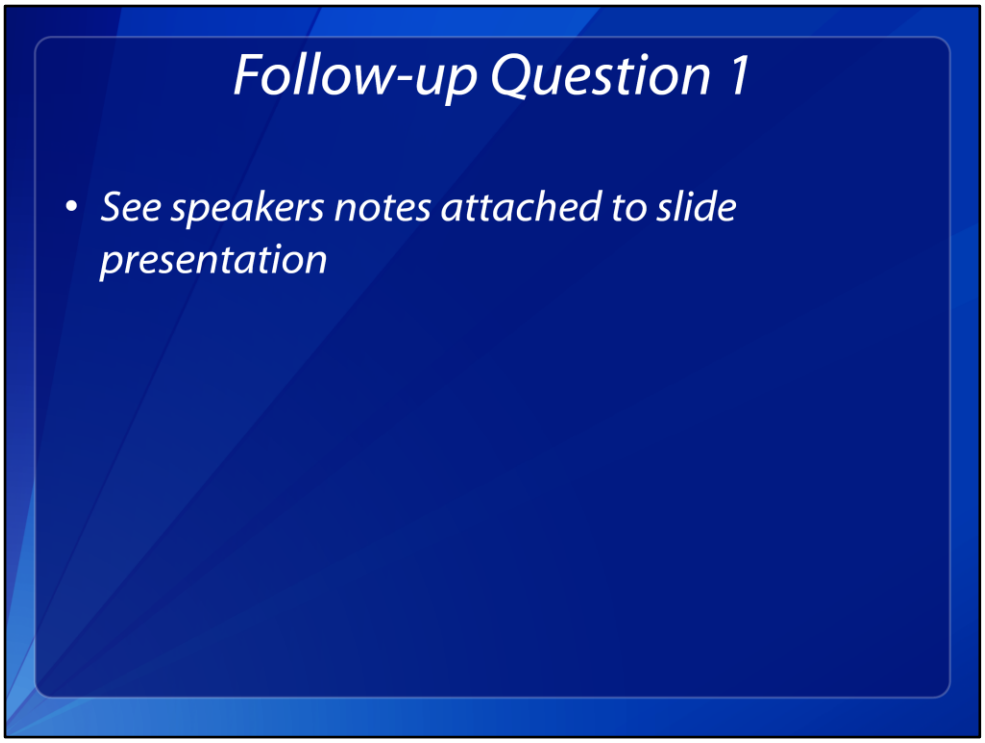


The ACE program can be reached through the email address and telephone number listed on the screen.

If you have a chemical release incident and would like to reach us to discuss an ACE investigation, and do not receive a prompt response to a telephone call at this number, the CDC Emergency Operations Center can assist you in reaching us. They are staffed 24 hours a day, 7 days a week.

We will now take questions from the telephone lines and also address those typed in to us through the web.

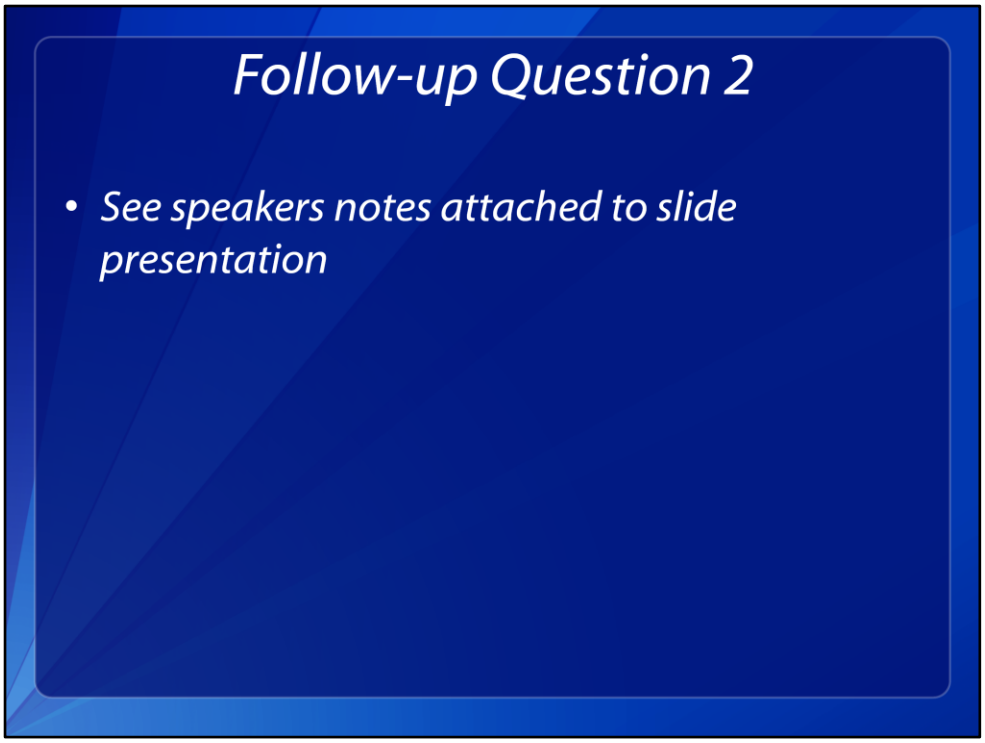
Thank you for joining us on this Webinar to introduce the National Toxic Substance Incidents Program. We hope you will join us in 2 weeks to hear about the state-based surveillance component.



Q: This is Martha from the Michigan Department of Community Health. I have two questions. Can you describe a situation where you have put this to the field and used it? And my second is, there are some similarities to the Casper program from NCEH and there are some differences also, but how does it tie together?

A: Both are excellent questions. At this point, we have had initial incident in June in California, where there was a chlorine release at a metal recycling facility, where we had a pilot test of the program. Then, we had a full scale ACE investigation in Alabama after an ammonia release the end of August. We have been in the field twice now.

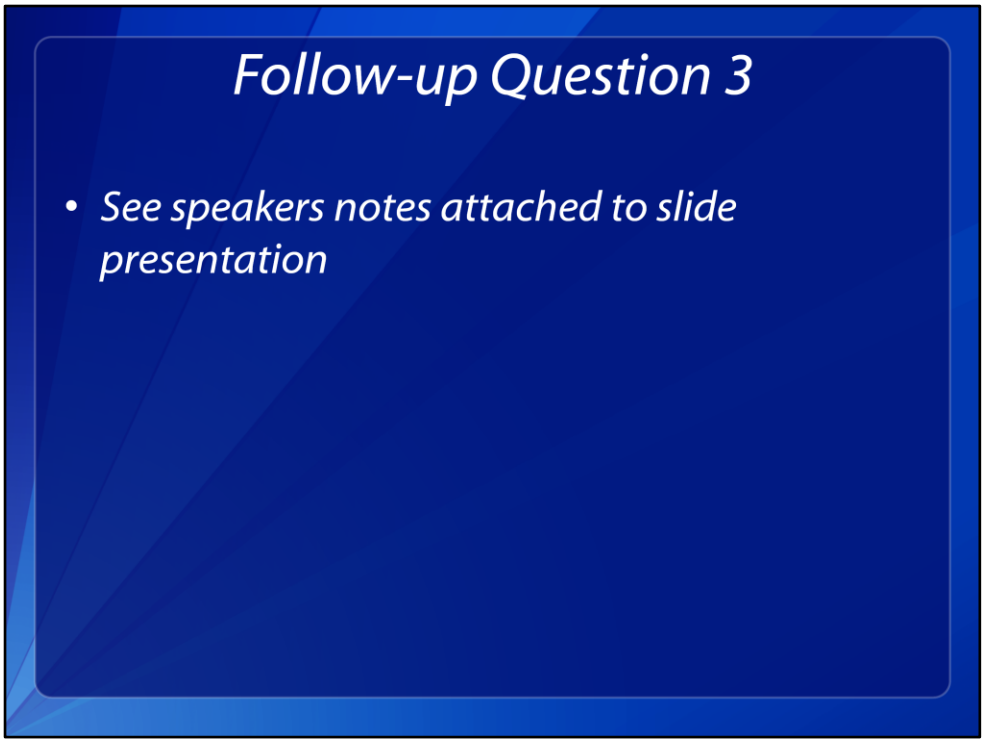
In regards to the Casper question, Casper means Community Assessment for Public Health Response. I guess it was created by colleagues at the National Center for Environmental Health. We worked with those colleagues as we were developing the ACE program. Ace has a different focus. CASPER was initially developed for natural disasters like hurricanes, where they would go in and find out what portion of the people needed electricity, needed food, needed tarps, and that sort of thing. In this case, we are getting more at what was the exposure people received to the chemical that was released, what it did to their health, and what kind of medical care they received. And also, in looking at that, we figure out the impact on the local healthcare facilities--which hospitals got slammed with 600 people, and that sort of thing. We do pick up needs to a degree--we have one question that asks some of the CASPER-type questions. But, we are trying to get a much broader picture of the effects of chemical releases and develop ways to address them, either preventing them from happening again or making the response better so less people are injured or injured less severely.



Q: This is Wanda. Can you tell us about the lessons learned from California and Alabama?

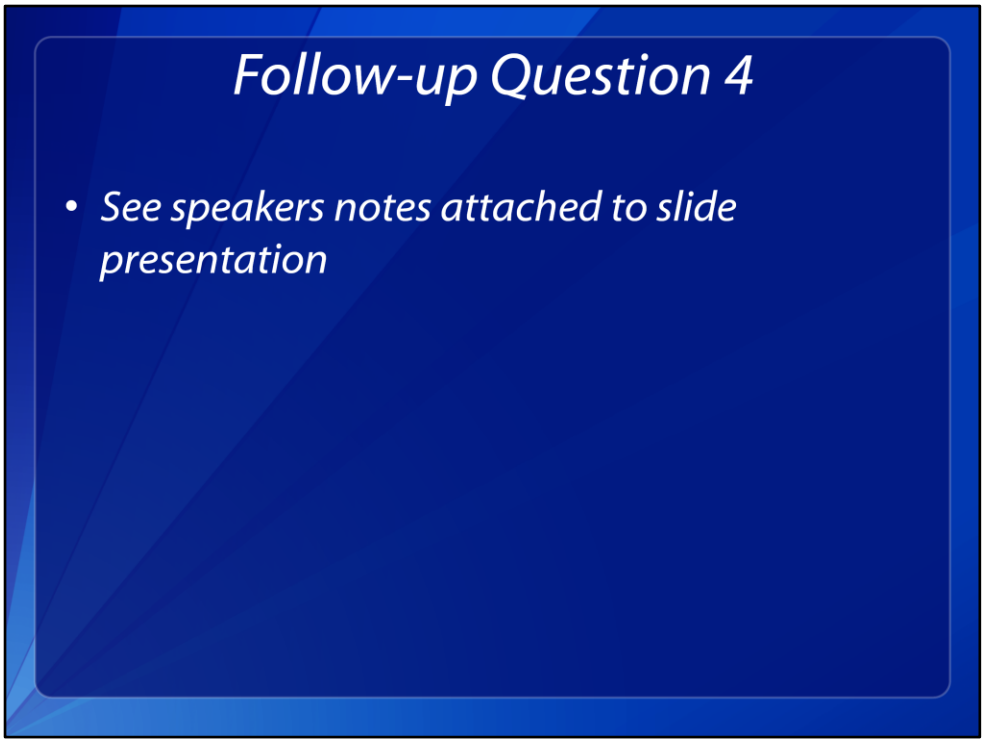
A: In California, the incident occurred because a tank, a very old tank that did not look like normal modern tanks, was sold for scrap metal and appeared to be empty--but it wasn't. So when it was cut by a machine that sheared into it, it released a cloud of chlorine, and ended up exposing 29 people to the chlorine. Twenty-three sought medical care and 6 were hospitalized. And as a result of the investigation, the California Department of Public Health developed an alert that, this week or last week, is being sent out to 1200 different metal recycling facilities. On the alert, they describe how to recognize the tanks; what to do if they end up with a closed tank--that they should recognize it as dangerous and considerate it hazardous--and don't cut into it; where they can find information about what to do with the tank. The alert also points out that they should practice what to do in the event of a chemical release. Like they have fire drills, they should have chemical release drills. Also they have to take into consideration wind direction-you want to evacuate in the direction the wind is not blowing. This release is going to hopefully reach 1200 facilities in California and many more around the country.

Alabama, that one was an ammonia release a refrigeration facility that affected a large number of people that were working on the BP oil spill. Over 800 people were outside directly downwind. At the moment, we are still developing recommendations and still working on the analysis.



Q: Presumably, these are a lot of occupational exposures. How did you deal with the OSHA program or NIOSH? And, in those two incidents?

A: We are in communication with colleagues in NIOSH. In California, we took a former NIOSH industrial hygienist with us. And in Alabama, we were in communication with NIOSH people, who did not play a role not investigation. OSHA was present in Alabama and they handled the investigation within the facility and we were outside of the facility.



Q: This is Curtis at the Oregon Public Health Division. I am wondering what the timeline is as far as when your expectation is to be contacted in relation to an incident, and who is that contact, and how does this all fit in with the incident command structures?

A: As soon as possible is the answer on that one, because it will take us a couple of days to get to the field. In the investigations I described, we weren't there in time to interview everyone in California. There were two people who were no longer in the area, so they could not be interviewed. In Alabama, there were some ships that were in the area that had exposed individuals, but they sailed before we could arrange to interview the crew members. So, we would like to get the field as soon as possible to truly be able to evaluate the impact.

As far as the ICS system, we are working through and in support of the state or local health department and we will feed into the ICS system through them. In most situations, the incident is over by the time we get there, so ICS is no longer in effect.

You had asked who could call to request assistance. Anyone can call, so we have had calls from different officers and things. We will discuss the situation with anyone but it would have to be the state health officer/ state epidemiologist to make the request. Anyone can call and discuss the situation and it would have to be elevated to the state epidemiologist in order to get the actual response.

Wrap-up:

We are also happy to share our materials with you if you have an incident that is too small for us to come out, or if you have sufficient people to do the investigation.

Okay. I think I have addressed all the questions. We will have another call in two weeks and we'll introduce the state surveillance portion of the National Toxic Substance Incidents Program. We look forward to talking with you then. Goodbye.