

Outdoor Mass Gatherings in Kansas: An Examination of Local Health Department Awareness and Involvement

Bryna Horton

Kansas Department of Health and Environment

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Abstract

Many outbreaks have occurred during mass gathering events as a result of person-to-person transmission of disease, animal-to-human transmission, and foodborne transmission. The Kansas Department of Health and Environment (KDHE) developed an interest in these types of events, referred to within this study as Outdoor Mass Gatherings (OMGs). A survey was constructed to obtain a list of OMGs per Kansas county and determine the amount of participation the Local Health Departments (LHDs) have in planning these events. One hundred three out of 105 LHDs responded to the survey. A database containing 185 OMGs was created with information about the events such as time span and location. More than half of the LHDs (n=58, 56.3%) responded that they are never notified by the event organizers when an OMG is scheduled in their counties. The majority of the LHDs (69.9%) also responded that they are never involved with the planning of an OMG; however, 61% of respondents agreed that the LHD should be involved. Based on results from the survey, KDHE recommends implementing notification processes so that LHDs, food inspectors, and other public health entities are involved in the planning of OMGs, and creating guidelines to assist LHDs in planning for those events.

Background

Mass gathering events, especially those with outdoor settings and temporary facilities, can create a haven for communicable diseases. If proper planning, preparation, and safety measures are not implemented, then attendees of such events can be exposed to potential hazards. Many outbreaks have occurred during mass gathering events as a result of person-to-person transmission of disease, animal-to-human transmission, and foodborne transmission. Examples of each of these types of transmission are found in the following five mass gathering outbreaks.

1. July 1987: Rainbow Family of Living Light Annual Gathering — Nantahala National Forest, North Carolina

Four clusters of *Shigella sonnei* were propagated across several states due to the Rainbow Family Gathering (1). This event brings together many people to form a temporary camping community in a predetermined forest in the United States. Peak attendance occurred on July 4th and was estimated to be 12,700. This was also the first day that the United States Forest Service noted diarrhea in the community. The North Carolina Division of Health Services was notified a few days later. Surveys were conducted for individuals still in attendance at the campsite, and a survey was mailed to those who were not on site for the field survey. Ninety-two of the approximately 1,300 on site were interviewed; 54 reported diarrhea. The survey was mailed to 1,719 people; 185 of 317 respondents met the case definition. A case was defined as an attendee who experienced diarrhea or had a stool culture that was positive for *S. sonnei* with symptom onset during or within one week of leaving the event. In all, 88 stool samples were positive for *S. sonnei*. Twenty-seven cases were identified in people who had not personally attended the gathering, but had contact with someone who did attend. The infection was transmitted person-to-person via the fecal-oral route, and was linked to a general lack of sanitation at the campsites. Shallow, open trench latrines were found everywhere within the campsites, including near food preparation areas. Frequent rainfall contributed to the contamination of water sources from the trench latrines. Hand-washing facilities were scarce, and ill persons were not always excluded from food preparation (2).

2. October 2004: North Carolina State Fair — Raleigh, North Carolina

This state fair had many visitor attractions, including two petting zoos. Attendance was approximately 800,000 people over the course of the ten-day period. An outbreak of Shiga toxin-producing *Escherichia coli* (STEC) was linked to one of the petting zoos at the fair. Investigation by the North Carolina Division of Public Health revealed 108 attendees experienced diarrheal illness. Laboratory tests confirmed forty-one of these illnesses to be caused by STEC. Through investigation

and attendee surveys it was determined that the STEC was transmitted via the fecal-oral route, and was associated with animal feces and lack of hand-washing after being in contact with the petting zoo (3).

3. June 2006: Biking Across Kansas — Kansas

An outbreak of norovirus was associated with Biking Across Kansas (BAK), a weeklong bicycling event where approximately 870 participants traveled from one end of the state of Kansas to the other. During this week, the bicyclists camp together and share meals and snacks prepared by volunteers. An outbreak investigation was initiated by the Kansas Department of Health and Environment on June 16, after approximately 20 participants became ill with gastroenteritis, including eight participants who were hospitalized. A survey of the participants revealed 126 people who met the case definition. A case was defined as an individual associated with BAK who experienced diarrhea and/ or vomiting between June 9 and June 19, 2006. It is believed that norovirus was disseminated due to person- to- person transmission via the fecal-oral route. Investigators found a lack of hand-washing and bathroom facilities along the biking route and at the designated stops, where food and drink items were shared (4).

4. July 2007: Taste of Chicago — Chicago, Illinois

An outbreak of *Salmonella* Heidelberg occurred during one of the city of Chicago's largest events, the Taste of Chicago, an outdoor food festival held in Grant Park. Approximately 3.5 million people attended (5). After the initial cases were identified, the Chicago Department of Public Health issued a press release and conducted surveys to determine the scope of the outbreak. It was found that 802 people were ill with *Salmonella* symptoms, and 191 cases were laboratory-confirmed as *Salmonella* Heidelberg. The outbreak was traced to a single dish—hummus— from a single food booth. The cause of contamination for the hummus was not determined (6).

5. May 2010: Sasquatch Music Festival — Gorge Amphitheater in George, Washington

A small outbreak of *Salmonella* Enteritidis was associated with a sold-out, weekend-long music festival in the state of Washington (7). An estimated 20,000 people attended. Nine laboratory-confirmed cases of *S. Enteritidis* were reported to the Washington State Department of Health (WSDH) after seeking medical care. The Grant County Health District, in coordination with WSDH, conducted surveys of these nine individuals to determine the cause of the *Salmonella*. The most common factor among cases was eating chicken from festival food stands, but the source of transmission was not confirmed (8).

After assisting Local Health Departments (LHDs) in investigating the 2006 Biking Across Kansas outbreak, the Kansas Department of Health and Environment (KDHE) developed an interest in outdoor mass gatherings in the state, and the amount of public health involvement for the planning of these events. While no state laws or regulations empower KDHE or LHDs to oversee mass gatherings, it is in each agency's interest to prevent large outbreaks of communicable disease. Currently, the only state law that has any effect on outdoor mass gatherings targets food vendors, including those who operate portable food trucks and temporary food stands. This law states that any vendor that serves food more than six days within one calendar year must be licensed. To obtain a license, the vendor must submit an application and then be inspected by the Kansas Department of Agriculture (KDA) (9). KDA is responsible for inspections of all food vendors and restaurants, as well as other duties. If there is an outbreak of illness associated with food, KDA and KDHE coordinate closely to find the source of illness and ensure corrective actions are taken.

There is currently no commonly used definition for outdoor mass gatherings. One definition from the Northwest Center for Public Health Practice (NWCPHP) defines a mass gathering as "a preplanned event held at a specific location for a defined period of time that strains planning and response resources." In the same selection from the NWCPHP it is also stated that "Some people define a mass gathering as having more than 5,000 attendees... any event with more than 25,000 attendees is considered a mass gathering" in reference to the size of the event (10). The World Health Organization defines a mass gathering in a similar fashion: "more than 1,000, but usually about 25,000 people at a specific location, for a specific purpose, for a period of time" (11). Another source defines a temporary mass gathering as an "assembly of 500 or more people continuing for two or more hours per day at a site for a purpose different from the designed use and usual occupancy type...does not include an assembly of people at a location with permanent facilities..." (12). For the purpose of this study, KDHE defined an outdoor mass gathering (OMG) as an event that:

- Has a specifically defined outdoor location(s),
- Utilizes temporary facilities such as portable food vendors, hand-washing stations, portable restrooms, etc.,
- Is preplanned,
- Occurs over the course of 2 or more days, and
- Has a total attendance of 1,000 or more visitors, and staff.

Methods

A survey was created using SurveyMonkey, an online survey company. The survey was constructed to obtain a list of OMGs per Kansas county and determine the amount of participation LHDs have in planning these events. The survey consisted of thirteen questions. Local health departments were asked to answer whether or not their county hosts OMGs, and to list OMGs that are held in their county. The survey asked whether the LHDs are notified by the event organizers when an OMG is being held in their county, and if not, if they find out about OMGs through other sources. Local Health Departments who assisted with OMG planning were asked how they advised event organizers, and what reference documents were used when providing guidance. A notification and a link to the survey were e-mailed to every local health department administrator in Kansas. The notification requested that the survey be answered by the administrator or forwarded to the LHD employee best suited to answer it. If the survey remained unanswered after several weeks, a reminder e-mail was sent. If still no response was received, the LHD was contacted by telephone. At least four e-mail and four phone call attempts were made to the LHDs that had not completed the survey.

Outdoor mass gatherings listed by LHDs were transferred to a Microsoft Excel database. Additional OMGs were identified and added to the database through internet research, and by collaboration with the Kansas Department of Commerce (KDC), which maintains a database of events for the official state of Kansas tourism website, TravelKS.com. The name and site of each OMG was listed in the Excel database. When available, the dates of occurrence, length, and approximate size were also listed.

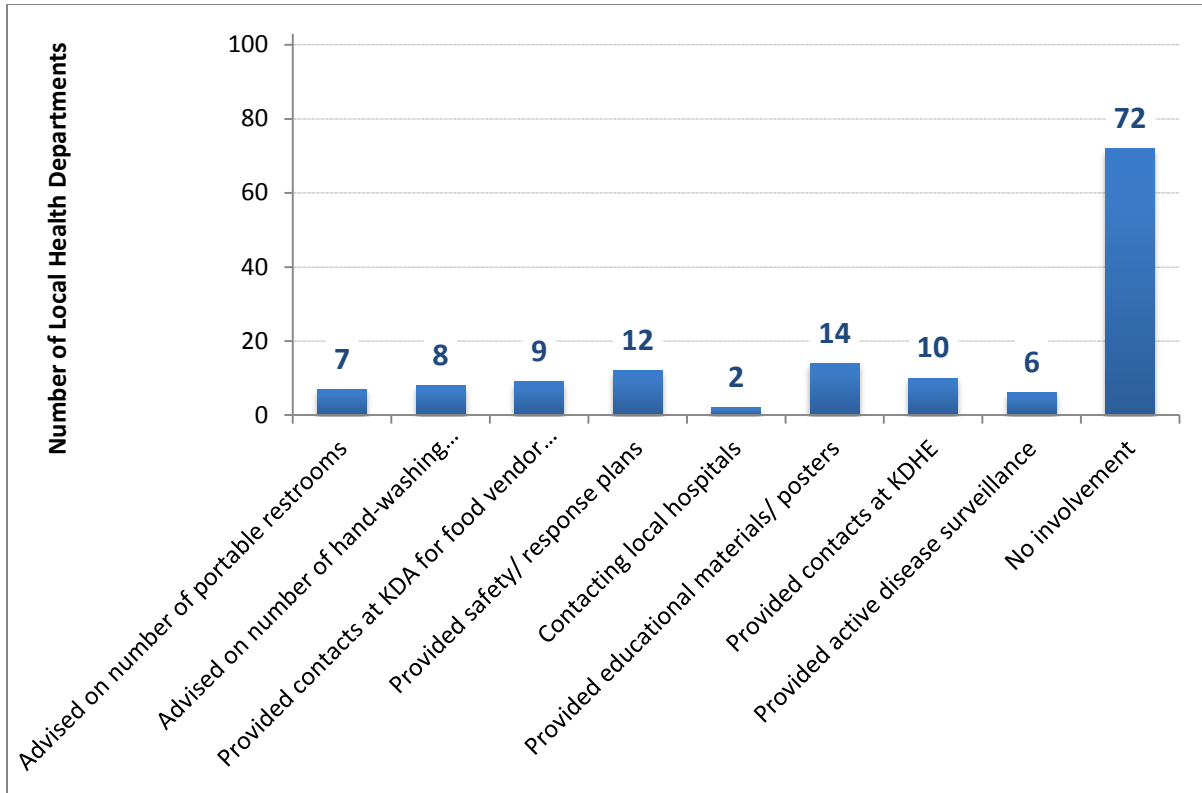
Results

One hundred three of 105 (98%) local health departments responded to the survey. Five surveys were conducted by telephone with a LHD representative; the remainder of the surveys were completed online. The Sheridan County Public Health Department and Wallace County Public Health Department did not submit responses to the survey despite four attempts to contact them via e-mail and four via telephone.

Overall, the survey showed that the majority of health departments in Kansas are not involved in the planning of OMGs. In fact, the majority of LHDs are not always informed when one is being hosted in their county. When asked if the LHD hosted any OMGs, 66 (64.1%) of the 103 LHDs answered yes, 30 (29.1%) no, and seven (6.8%) responded “unknown.” More than half of the LHDs (n=58, 56.3%) responded that they are never notified by the event organizers when an OMG is scheduled in their counties.

The majority of the LHDs (69.9%) also responded that they are never involved with the planning of an OMG. Of those that are never involved, nearly half (52.8%) responded that the event organizers are the party responsible for the public health issues related to OMGs. Thirty-one (30.1%) LHDs responded that they are involved in the planning of an OMG, 14 (46.7%) said they provide educational materials or posters, 12 (40%) said they help to provide safety or response plans, and ten (33.3%) said they advise organizers by referring them to contacts at KDHE. Fewer LHDs reported providing active disease surveillance (n=6, 20%), contacting local hospitals (n=2, 6.7%), and providing recommendations for the number of portable restrooms (n=7, 23.3%) or hand-washing stations (n=8, 26.7%). See Figure 1.

Figure 1. Number of local health departments involved in outdoor mass gathering planning, by type of planning involvement (N=103).



One survey question asked how the representative of the LHD felt about this statement: “It is important for my local health department to be involved in the planning of outdoor mass gatherings in my county.”, and to rate it as “Strongly Agree”, “Agree”, “Neither Agree or Disagree”, “Disagree”, or “Strongly Disagree.” Sixty-one percent of respondents agreed that it is important for LHDs to be involved in the planning of an OMG with 26% indicating that they strongly agreed. Thirty-five percent responded that they neither agree nor disagree, 4% disagreed, and no one strongly disagreed.

The final three survey questions prompted LHDs to list large events that could meet the KDHE definition of an OMG. Eighty-four OMGs were listed by LHDs. With the addition of the 59 events taken from the KDC database and 42 events identified through internet research, the Microsoft Excel database listed 185 total OMGs.

Estimations on attendance could be found for only 39 of the OMGs in the database. Of the OMGs for which an approximate attendance could be found, the Kansas State Fair, the Wichita Riverfest, and the Kansas City Renaissance Festival were the three largest. The Kansas State Fair is the largest, with approximately 350,000 attendees over its 10-day period in September; this OMG occurs in Reno County.

The Wichita Riverfest Music Festival, located in Sedgwick County, draws in about 275,000 attendees over 9 days in June. The Kansas City Renaissance Festival takes place in Wyandotte County throughout September and October, and attracts around 200,000 attendees. Over 60% (125) of the OMGs in the database take place in the summer season. See Table 1.

Table 1. Selected annual outdoor mass gatherings in Kansas.

Name of OMG	County	Attendance	Length	Month of Occurrence
Kansas State Fair	Reno	350,000	10 days	September
Riverfest	Sedgwick	275,000	9 days	June
KC Renaissance Festival	Wyandotte	200,000	20 days	September-October
Country Stampede	Pottawatomie	160,000	4 days	June
Dodge City Days	Ford	100,000	10 days	July-August
Neewollah	Montgomery	75,000	9 days	October
KanRocksUs	Wyandotte	60,000	2 days	August
Walnut Valley Festival	Cowley	20,000	4 days	September
Finney County Fair	Finney	10,000	5 days	July
Trego County Fair	Trego	6,000	5 days	August
Osborne County Fair	Osborne	2,700	4 days	July
Mitchell County Fair	Mitchell	1,400	7 days	August

Discussion

The primary objectives of this study were to define an OMG, build a database of OMGs in the state of Kansas, and determine the extent of LHD awareness of such events and their level of involvement. There are many OMGs held within the state of Kansas, but the majority of LHDs do not have any participation in the planning of such an event, though many LHDs agree that they should.

Preparations and precautions specific to the spread of disease are integral for safe outdoor mass gatherings. Much coordination is needed between those organizing the event, and those who can properly ensure a safe environment. With this in mind, KDHE offers the following recommendations to prevent the transfer of disease among OMG attendees.

Event organizers should be proactive in informing the LHD of the OMG so that the LHD can plan surveillance to monitor for an infectious disease outbreak. Many LHDs in the state of Kansas have a small work-forces and budgets, and cannot be fully devoted to event planning; however, they can serve as a public health resource for event organizers.

The event organizers should inform KDA when planning an OMG that includes food vendors in an ample amount of time for inspections to be completed before the event begins. Currently, KDA is not routinely alerted to OMGs; doing so could help to ensure that food vendors are properly licensed and inspected before they are allowed to serve food at these events. The current law dictates that a food vendor is inspected once a year, and only if that food vendor is selling food for more than six days in a year. It might be more beneficial to require food vendors to be inspected within a week or two prior to serving food at an OMG. In addition, notifying KDA would allow them to plan vendor inspections during the event to ensure food safety measures are being followed throughout the event.

Typically, event organizers have to obtain approval from the hosting city or county. Municipalities hosting an event should require notification of the LHD and KDA as part of the approval process for OMGs to ensure these entities are made aware of upcoming OMGs. It should also be considered that the municipality could alert the LHD and KDA of the event after it has been approved. This would also ensure that these important entities know of the OMG, and it would ensure communication between municipalities and LHDs. This type of communication contributes to safer OMGs, and it should be practiced no matter the situation in order to aid in keeping these public health entities abreast of all happenings in their communities.

Public health event planning guidelines should be available for LHDs, municipalities, and event organizers. A standard tool should include estimates for the correct number of hand-washing stations and portable restrooms. The lack of these facilities has been shown to contribute to the spread of disease at OMGs (e.g., the Rainbow Family Gathering and BAK). Creating a tool with standardized recommendations would help to ensure proper sanitation facilities for events. The tool should include citations to reputable sources (such as research that has been done on the number of restrooms and hand-washing stations per attendee) so the event organizer does not have to rely on a private company's estimates, as is often done when organizers rent supplies for OMGs. It would also be beneficial for the guidelines to include a complete list of organizations that should be notified of the OMG, including LHD, KDA, local police and fire departments, and the local emergency management office.

Many more OMGs occur in Kansas that do not meet the strict definition used in this study. While they were not included in the project database, they should still be considered important in the eyes of public health officials. The above recommendations should be considered for all mass gatherings, including those that occur over a shorter time frame, have a smaller attendance size, or even large events held at a site with permanent facilities.

There were some limitations to this study. Recall bias could be present due to responders answering the survey and listing mass gatherings based on memory. Attempts to adjust for bias to the list of mass gatherings were made through cross-referencing events with the list provided by KDC and internet research. Interview bias could be present due to the two different ways in which the survey was answered; online, directly by the responder, or via an interviewer-assisted telephone call. Another limitation could stem from not finding sizes for all the OMGs in the database. This means that the gatherings might be misclassified, and there might be some included in the database that do not actually meet the size requirement.

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