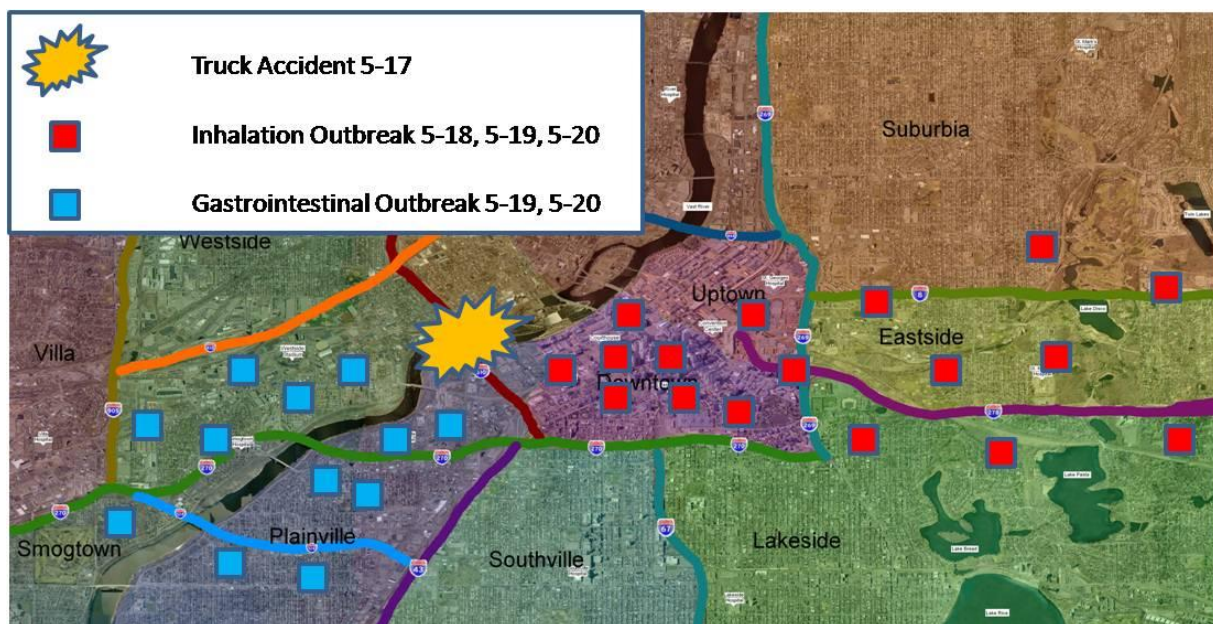


VAST 2011 Mini Challenge 1 Answer Guide

Mini-Challenge 1 - Characterization of an Epidemic Spread

EXPLANATION:



From 5/16 to 5/19, the wind is blowing from West to East. Microblog posts with symptoms that are largely flu-like in nature originate near the I-610 Bridge on 5/18 and disperse over a large cone shaped area in the direction of the wind. The density varies in high population areas. Transmission type is airborne.

The water current of the VAST river flows South (Southwest) at 3 mph. Microblog posts with symptoms that are largely gastrointestinal in nature originate near the I-610 Bridge on 5/19 and disperse along the river in the direction of the water current. The VAST River is part of a distributed water system and is used for obtaining drinking water. Transmission type is waterborne.

MAY 17:

On 5/17, the truck accident occurs on the I-610 Bridge over the VAST River (centered at 42.22655N, 93.42752W). The truck accident is reported in 500 microblogs that day. The wind is blowing at an average of 8 mph from West to East throughout the day.

MAY 18:

From about 8 a.m. on 5/18 through 6 p.m. on 5/18, 9735 inhalation cases are posted and follow the wind track recorded from 5/16 – 5/19.

From about 6 p.m. on 5/18 through 8 a.m. on 5/19, the same numbers of inhalation cases repost. Approximately 60% of the individuals repost from the same location. Approximately 40% of the posts are randomly distributed throughout the map due to commuting.

There are also 5400 additional posts by reporters throughout the day (individuals who are not infected, but are posting about others who are).

MAY 19:

From about 8 a.m. on 5/19 through 6 p.m. on 5/19, 9735 inhalation cases are reposted and follow the same wind track. The symptoms increase in severity.

From about 6 p.m. on 5/19 through 8 a.m. on 5/20, the same numbers of inhalation cases repost. Approximately 60% of the individuals repost from the same location. Approximately 40% of the posts are randomly distributed throughout the map to account for commuting. The symptoms increase in severity.

There are 5405 gastrointestinal cases posted that are caused by ingestion of spores. The cases follow the direction of the water current, and density decreases farther away from the VAST River.

There are also 10300 additional posts by reporters throughout the day (individuals who are not infected, but are posting about others who are). This is an increase from the previous day.

MAY 20:

From about 8 a.m. on 5/20 to midnight on 5/20, 9735 inhalation cases are reposted with about 50% of them located around area hospitals. Infected individuals choose random hospitals for treatment (distance to the hospital is not a factor). The list of hospitals includes Plainville Hospital, Southville Hospital, Lakeside Hospital, Vastopolis City Hospital, St. Georges Hospital, St. Kristin's Hospital, St. Mark's Hospital, River Hospital, Northside Hospital, Corner Hospital, Westside Hospital, Villa Hospital, and Smogtown Hospital.

5405 gastrointestinal cases are reposted and this is unchanged from the previous day. The cases follow the direction of the water current with density decreasing farther away from the VAST River.

There are also 14300 additional posts by reporters throughout the day (individuals who are not infected, but are posting about others who are). This is an increase from the previous day.

NOTES:

The number of infected individuals remains the same on all three days. There is no person-to-person transmission.

Except for local hospitals and the affected area drawn during the day on 5/18 and 5/19, there is no need to deliver treatment resources anywhere else.