

INFECTIOUS DISEASE

An infectious disease is defined as an organism or matter that has the potential to spread or affect a population in adverse ways. Infectious diseases have the potential to affect any form of life at any time based on local conditions, living standards, basic hygiene, pasteurization and water treatment. Despite medical breakthroughs and technology, infectious diseases continue to pose an important public health problem. Today, the issue of emerging and re-emerging infectious diseases is at the forefront of public health concern. The very young, older adults and hospitalized and institutionalized patients are at increased risk for many infectious diseases. Changes in demographics, lifestyle, technology, land use practices, food production and distribution methods, and child care practices, as well as increasing poverty, have a role in emerging infections.

The primary infectious diseases identified by the Blue Earth County Health Department include:

Tuberculosis

Tuberculosis is a disease that is spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys or the spine. TB germs are put into the air when a person with TB of the lungs or throat coughs or sneezes. When a person inhales air that contains TB germs, he or she may become infected. People with TB infection do not feel sick and do not have any symptoms. However, they may develop TB at some time in the future. The general symptoms of TB include feeling sick or weak, weight loss, fever and night sweats. The symptoms of TB of the lungs include coughing, chest pain and coughing up blood. Other symptoms depend on the part of the body that is affected.

Hepatitis A

Hepatitis A is an enterically transmitted viral disease that causes fever, malaise, anorexia, nausea, and abdominal discomfort, followed within a few days by jaundice. The disease ranges in clinical severity from no symptoms to a mild illness lasting one and two weeks to a severely disabling disease lasting several months. In developing countries, hepatitis A virus is usually acquired during childhood, most frequently as an asymptomatic or mild infection. Transmission can occur by direct person-to-person contact; through exposure to contaminated water, ice or shellfish harvested from sewage-contaminated water; or from fruits, vegetables, or other foods that are eaten uncooked, and which can become contaminated during harvesting or subsequent handling.

West Nile Virus (WNV)

West Nile virus is a mosquito-transmitted virus that can cause encephalitis in some people. This virus usually circulates between mosquitoes and birds in Africa and Europe. However, in 1999, an outbreak of WN encephalitis was reported in New York City. Since then the virus has spread throughout much of the eastern United States, and was found as close as Madison, Wisconsin, and east-central Iowa in 2002. Unfortunately, there have been a few cases of the WNV in Blue Earth County in recent years.

Influenza

Influenza is a contagious disease that is caused by the influenza virus. It attacks the respiratory tract in humans (nose, throat and lungs). The flu is different from a cold. The flu usually comes on suddenly and may include these symptoms: fever, headache, tiredness (can be extreme), dry cough, sore throat, nasal congestion and body aches.

Blue Earth County Infectious Disease Hazard Assessment

Hazard:	All Infectious Diseases
Location	Countywide
Historic Events	Very limited instances of serious disease outbreaks over the past 50 years
Likely to happen now?	Unlikely
How often?	Infrequently
Where would event occur?	Any area within Blue Earth County, though likely to affect certain groups of people most vulnerable (the very young or the elderly, for example) or in places with high density of persons in a smaller area (such as nursing homes, apartment complexes, or college dormitories)
Severity of event?	Could be a major outbreak of life-threatening disease in a worst-case scenario
When would hazard likely occur?	Any time of year
What other hazards could occur at the same time?	Widespread panic, riots, etc.
Economic impacts	Loss or reduction of local business, costs incurred to deal with outbreak (medical personnel, medicine/vaccines, facilities)
Loss of life impacts	Potentially major if a large-scale outbreak occurs
Risk Level VH – Very High H – High L – Limited M – Minimal	Citizens/People: VH Animals/Livestock: VH Housing: M Critical Structures: M Infrastructure: M Total: H
Risk Assessment	
Unlikely – 1 Occasional – 2 Likely – 3 Highly Likely – 4	<u>Frequency of Occurrence</u> 1
More than 12 hours – 1 6-12 hours – 2 3-6 hours – 3 Minimal-None – 4	<u>Warning Time</u> 1
Limited – 1 Minor – 2 Major – 3 Substantial – 4	<u>Potential Severity</u> 4
Minimal – 1 Limited – 2 High – 3 Very High – 4	<u>Risk Level</u> 2
(Total divided by 4) Very Low – 1 Low – 2 Moderate – 3 High – 4	<u>Overall Priority</u> 2 Low

Vulnerability to Infectious Disease

Many infectious diseases are preventable and are controllable, limiting the vulnerability of Blue Earth County to an epidemic so long as measures are taken. Prevention and control of infectious diseases involve collection of accurate assessment data (such as surveillance data for specific conditions), outbreak detection and investigation, and development of appropriate control strategies (both short and long term) based on specific epidemiologic data. These activities require close collaboration between clinical providers (especially infection-control practitioners within hospitals), clinical laboratories, state and local health departments, and federal agencies. Furthermore, a need exists for continued education of industry (particularly food producers and food-service industries), health-care students and providers, along with research to improve immunizations, diagnostic methods, and therapeutic modalities. Thus, the prevention of infectious diseases requires multidisciplinary interventions involving public health professionals, medical practitioners, researchers, community-based organizations, volunteer and private groups, industrial representatives, and educational systems.

History of Infectious Disease

Minnesota has not had an infectious disease outbreak reach epidemic proportions in decades. Blue Earth County experienced individual cases of infectious diseases over the last 50 years that have been considered isolated occurrences or minor exposures. The chart below denotes these limited instances of serious infectious diseases in Blue Earth County.

Disease	Year(s)	Number of Cases	Comments
Tuberculosis	1989	13	Not Applicable
Hepatitis A (Viral)	2000, 2001, 2002	19, 7, 1	Region-wide Numbers
Meningitis (All Types)	Jan.-Feb. 1995	7	One Death
La Crosse Encephalitis	1985-2003	117	Region-wide Numbers
West Nile Virus	2003	5 Human, 1 Blood Donor, 1 Bird	Not Applicable.
Influenza	2001-2004	4	Only Lab-Confirmed.

Potential Impacts and Cascading Effects

Instances of an infectious disease can have very severe impacts in a worst-case scenario, including the possibility of a large loss of life. Infectious disease can also lead to long-term sickness and bodily impairment/disabilities as well. An outbreak or epidemic could feasibly impact the ability of resources, such as medical facilities, to meet the increased demand for services. Additionally, since southern Minnesota's economy is heavily impacted by the animal/livestock industry, which can also be susceptible to infectious disease, implications of such an outbreak can negatively affect the local economy. In the event of a large-scale epidemic, deaths, fears, and misinformation could also trigger public panic, lawlessness, and riots.

Infectious Disease Gaps and Deficiencies

- Several Blue Earth County communities have identified the possibility of a biological terrorist attack, which could take the form of an infectious disease incident.

ACTIONABLE MITIGATION STEPS:

Actionable Mitigation Steps are more elaborately explained with project, timeframe, responsible jurisdictions/staff, possible funding sources, and priority level in the Action Plan section of this document. Suggested areas of focus are denoted in parentheses.

1. Safe Animal/Livestock-Handling Processes and Facility Structure (Countywide) - Through zoning and inspections animal operations can be properly design and maintain that reduce risks of disease among livestock, which ultimately impact humans.
2. Media Outreach (Countywide) – In the event of an infectious disease outbreak, local radio, television, and print media should be utilized to ensure that proper and factual information regarding the disease event is being disseminated throughout Blue Earth County communities. This may assist in calming fears that may lead to negative secondary effects, as described earlier.
3. Health Education for Youth and Parents (Countywide) – The County and school public health nurses can provide educational material to young adults and parents on the impact of infectious diseases.
4. Health Education for Private Businesses (Countywide) – The county public health department will provide educational material, as well as, periodic site visits to aide food establishments in being educated on safe food handling processes.
5. Secure Water Systems and Eliminate Low Windows (Countywide)– City public works and police chiefs from all concerned Blue Earth County communities will assess water system safety and implement measures to maintain safety and protect equipment, including elimination of low windows that provide access to facilities.
6. Cooperation with State Health Department (Countywide) – Blue Earth County clinics and hospitals will continue to cooperate and share information regarding infectious disease occurrences with the Minnesota State Health Department, and information flow between the two will assist in alerting Blue Earth County agencies to the possibility of an outbreak event.
7. Participation in Vaccination Programs (Countywide) - All Blue Earth County residents (particularly children) should remain up-to-date with all required and recommended vaccinations. Programs assisting those who either do not have insurance or are unable to afford vaccinations should be identified and utilized in local jurisdictions.
8. Encourage Sick Employees to Stay Home (Countywide) – Businesses and organizations throughout Blue Earth County should encourage all personnel to stay home if at all possible for the duration of their illness if they believe they are sick. This will help mitigate the spread of the infectious disease that may be impacting the area.
9. Quarantine/Isolation Plan (Countywide) – If the need for an officially designated quarantine arises, the State is ultimately responsible for the designation and implementation of quarantine procedures.

PART FIVE: PRIMARY UNNATURAL HAZARDS

This section discusses human-made or technological hazards considered to be among the top three in Blue Earth County.

FIRE

Urban fires are blazes spreading through structures, posing danger and destruction to property. These fires include any instance of uncontrolled burning which results in structural damage to residential, commercial, industrial, institutional or other properties in developed areas. Fires can occur in any community, and pose a threat year round.

Generalized Vulnerability to Fires and Specific Areas of Concern

All structures and buildings of every nature (residential, commercial, industrial, etc.) throughout Blue Earth County are equally vulnerable to fire, and nearly every jurisdiction within the county has already experienced the effects that fire can have. Fires can occur at any time of the year, and can be particularly damaging to structures nearby or connected to one another, which makes the possibility of the fire spreading much more pronounced. Places that are frequented by the very young or the elderly are not necessarily more prone to fire, but can be more dangerous if a fire were to occur because these two groups of people are among the most frequent victims of fire.

In 2002, fire departments responded to 401,000 home fires in the United States, which claimed the lives of an estimated 2,670 people (not including firefighters) and injured another 14,050. Approximately 79% of all U.S. fire deaths occurred in homes (Karter 2003). In 2003, fires in Minnesota caused more than \$154.4 million in property damage and dollar loss in residential properties increased 13% from 2002. (2003 Preliminary Fire in Minnesota) Communities such as Eagle Lake, Madison Lake, and Pemberton have expressed concern about future fires and the impact it poses.

Blue Earth County History of Fire

Blue Earth County reported 258 fire runs in 2002. The fire rate in Blue Earth County was 1 fire for 233 people. The total county dollar loss was \$935,950.00 with an average dollar loss per fire of \$3,900.00. Residential fires account for a majority of fire calls where commercial and industrial fires account for a greater percent of the total dollar losses.



Blue Earth County Dollar Losses from Fire in 2002

City	Total Fire Runs	Total Other Runs	Dollar Loss
Amboy	9	47	\$140,000
Eagle Lake	16	50	\$0
Good Thunder	14	76	\$8,000
Lake Crystal	16	55	\$131,000
Madison Lake	11	61	\$200,500
Mankato	132	2,145	\$241,450
Mapleton	21	31	\$65,000
Pemberton	7	18	\$0
Skyline	0	0	\$0
South Bend	12	29	\$141,000
St. Clair	12	91	\$9,000
Vernon Center	8	14	\$0

Blue Earth County Fire Hazard Risk Assessment

Hazard:	Fire
Location	Buildings Countywide
Historic Events	258 fire calls in 2002
Likely to happen now?	Yes
How often?	Potential exists at all times
Where would event occur?	Any building/structure in Blue Earth County
Severity of event?	Fire could spread and damage/destroy multiple buildings, especially in dense areas such as downtown Mankato
When would hazard likely occur?	Any time of year
What other hazards could occur at the same time?	Exposure to hazardous materials, water system failure
Economic impacts	Could be harmful to business if damaging enough, could lead to total loss in worst-case scenario
Loss of life impacts	Particularly dangerous to the elderly or the very young and firefighters, compounded if exposure to hazardous materials were to occur
Risk Level VH – Very High H – High L – Limited M – Minimal	Citizens/People: H Animals/Livestock: H Housing: VH Critical Structures: H Infrastructure: L Total: H
Risk Assessment	
Unlikely – 1 Occasional – 2 Likely – 3 Highly Likely – 4	Frequency of Occurrence 3

More than 12 hours – 1 6-12 hours – 2 3-6 hours – 3 Minimal-None – 4	<u>Warning Time</u> 4
Limited – 1 Minor – 2 Major – 3 Substantial – 4	<u>Potential Severity</u> 1
Minimal – 1 Limited – 2 High – 3 Very High – 4	<u>Risk Level</u> 3
(Total divided by 4) Very Low – 1 Low – 2 Moderate – 3 High – 4	<u>Overall Priority</u> 2.75 Low/Moderate

Vulnerability to Fires and Specific Areas of Concern

The City of Eagle Lake has noted a high level of concern with the possibility of fire events in the city, particularly related to the possibility of a gas line explosion in the residential areas surrounding the pipeline. They are also concerned with the possibility of fires in the downtown area since there are many buildings in the area and a limited number of personnel that would be available to respond. The City of Good Thunder has indicated concern with the possibility of an explosion at the grain elevator and/or propane tanks located in the community. The City of Lake Crystal has indicated concern that a substantial, uncontrolled fire could destroy a lot of property and/or cause a substantial loss of life. They have also shown concern with the possibility of fire and explosion events at various businesses throughout the community, including Crystal Valley Cooperative, the Lake Crystal Electric Power Plant, the Northstar Ethanol Plant, Crysteel Manufacturing and Truck Accessories, and Industrial Services, Inc. The City of Madison Lake has noted that they may not have adequate water storage capacity to fight a large-level fire event, and that they have limited personnel available to deal with such an occurrence. The City of Pemberton has indicated that they also have limited personnel available to address a fire event, as well as limited water capacity and buildings located nearby to each other. The City of St. Clair has noted that they also have what they consider to be an inadequate amount of water storage available to address fire events. The City of Vernon Center has indicated concern with the possibility of dust explosion and/or natural gas explosion connected with facilities in the community. The chart below summarizes the fire concerns of Blue Earth County communities, as indicated by returned city questionnaires administered as part of this mitigation planning process.

Jurisdiction	Risk Assessment (Probability)	Impact Assessment	Top Three Priority?
Amboy	Medium	Low	Yes
Eagle Lake	High	High	Yes
Good Thunder	High	Medium	Yes
Lake Crystal	Medium	Medium	No
Madison Lake	High	High	Yes
Mapleton	Concerned	Unreported	No
Pemberton	High	High	Yes
Skyline	Medium	Medium	Yes
St. Clair	High	Low	No

Vernon Center	Low	Low	Yes
Blue Earth County	Low to High	Low to High	Yes

Probability: High – Annually to 2yrs, Medium - 5yrs, Low – 10yrs

Impact: High – Loss of life and \$500,000 plus property damage, Medium – bodily injuries and \$250,000 property damage, and Low – bodily discomfort and less than \$100,000 in property damage

Potential Impacts and Cascading Effects

Potential impacts due to fire include the loss of life, physical injuries, property and structural damage to any extent, toxicity from smoke and chemicals, and an increased strain on city water systems. Essential public facilities (such as city halls or police stations) may be damaged or destroyed, as well as critical utilities such as electric and gas lines. Damage to or destruction of community water systems may also pose a public health risk until they can be repaired or replaced.

Fire Gaps and Deficiencies

- It is common in Blue Earth County for buildings in downtown areas to share walls with other buildings, making the threat of a downtown fire very serious.
- The Minnesota State Building Code (Amboy, Mapleton, Pemberton, and Good Thunder) has yet to be adopted in some jurisdictions and without its adoption there may be buildings in Blue Earth structurally incapable of withstanding fire.
- Many cities are also concerned with explosions occurring in their community. For example in Good Thunder there could be an explosion of a grain elevator or propane tank.
- Some communities, most notably Madison Lake, do not have proper water storage capacities to deal with large fires that may occur.

ACTIONABLE MITIGATION STEPS:

Actionable Mitigation Steps are more elaborately explained with project, timeframe, responsible jurisdictions/staff, possible funding sources, and priority level in the Action Plan section of this document. Suggested areas of focus are denoted in parentheses.

1. Aggressively Train Fire Department Personnel (Amboy, Vernon Center, and Pemberton) – Cities can collaborate on efforts to train emergency response personnel and when appropriate equipment. Through mutual aide communities are more capable of reducing the damage of hazards.
2. Focus on Vulnerable Areas (Countywide) - Local officials and firefighters should identify and utilize ways to reduce the threat of fire on localized vulnerable areas, including the agricultural and industrial facilities, which could be fire hazards.
3. Maintain Building and Fire Codes – Building Inspectors working in communities that have adopted Minnesota building codes will be trained to maintain credentials for both the city and their personal license. As changes come about the inspectors will work with

city administrators, zoning administrators, planning commissions and city councils to update city ordinances and plans. The building codes will lessen the vulnerability of new buildings, because measures such as structure of walls and fire apparatuses may be addressed early.

4. Adopt Evacuation Plan (Madison Lake and Good Thunder) – The administration will work with all emergency response departments to develop an evacuation plan, which would be adopted by the city council. All relevant committees such as the planning commission shall review this plan. In addition, the plan will be shared with surrounding communities and the county for coordination purposes.
5. Inspect Vehicles to Make Sure they are in Good Operating Condition (Vernon Center) – The city will work with the State Department of Motor Vehicles and private entities to develop a vehicle inspection plan. State regulations already placed on certain vehicles will be used.
6. Consider Offering Specialized Training Classes (Countywide) – Fire departments could offer classes for residents regarding topics which often lead to fires, such as chimney cleaning and holiday hazards.
7. Build New Water Tower (Madison Lake) – Many communities in Blue Earth County do not have proper water storage capacities to fight large fires. New structures need to be built in case an emergency occurs.

HAZARDOUS MATERIALS

For mitigation planning, hazardous materials may be defined simply as any materials that may have negative impacts on human health. That is, exposure to hazardous materials may result in injury, sickness or death. The impacts of hazardous materials may be short-term with negative effects in seconds, minutes or hours or long-term with negative effects in days, weeks, or in some cases years after exposure.

Hazardous materials vary widely in their toxicity to humans. Some hazardous materials are highly toxic so that even brief exposure to small amounts may be dangerous or fatal. Other hazardous materials are much less toxic and negative effects may occur only after exposure to large amounts over longer time periods. The technical term “toxic”, which is widely used to describe hazardous materials, is simply a synonym for the more common terms “poison” and “poisonous.”

Hazardous chemicals are widely used in heavy industry, manufacturing, agriculture, mining, the oil and gas industry, forestry and transportation as well as in medical facilities and commercial, public and residential buildings. There are literally hundreds of thousands of chemicals that may be hazardous to human health at least to some extent. A typical single family home may contain dozens of potentially hazardous materials including fuels, paints, solvents, cleaning chemicals, pesticides, herbicides, medicines and others.

However, for mitigation planning purposes, small quantities of slightly or moderately hazardous materials being used by end users are rarely the focus of interest. Rather, interest is focused primarily on larger quantities of hazardous materials in industrial use and on hazardous materials being transported, where potential for accident spills are high. Situations involving extremely hazardous materials or large quantities of hazardous materials in locations where accidents may result in significant public health risk are of special concern for planning purposes.

For mitigation planning purposes, the toxicity of particular hazardous materials is an important measure of the potential impact of hazardous materials on affected communities, but not the only important measure. Other characteristics of hazardous materials, especially the quantity of material and the ease of dispersal of the material may be just as important, as or more important than toxicity, in governing the level of potential threat to a community. For example, a small quantity of a very toxic solid hazardous material in a research laboratory may pose a much smaller level of risk for a community than a large quantity of a less toxic gaseous material in an industrial site upwind from a populated area.

The severity of any hazardous material release incident for an affected community depends on several factors, including:

1. The toxicity of the hazard material,
2. The quantity of the hazardous material released,
3. The dispersal characteristics of the hazardous material,
4. The local conditions such as wind direction and topography, and the efficacy of response and recovery actions.

Blue Earth County Hazardous Material Risk Assessment

Hazard:	Hazardous Materials
Location	Specific locations throughout county
Historic Events	None on record
Likely to happen now?	Unlikely
How often?	Infrequently
Where would event occur?	Specific locations throughout county identified as having significant amounts of hazardous material, particularly agricultural chemical storage facilities, or on roads or railways within county used for transporting hazardous materials.
Severity of event?	A major event could have a significant impact on human and animal life
When would hazard likely occur?	Any time of year
What other hazards could occur at the same time?	Fire, storm, terrorist attack
Economic impacts	Potential evacuation/shut down of area where spill or accident occurred, costs incurred to mitigate damages
Loss of life impacts	Potential for loss of life depending on specific material and degree of exposure
Risk Level VH – Very High H – High L – Limited M – Minimal	Citizens/People: H Animals/Livestock: VH Housing: L Critical Structures: L Infrastructure: L Total: L/H
Risk Assessment	
Unlikely – 1 Occasional – 2 Likely – 3 Highly Likely – 4	<u>Frequency of Occurrence</u> 1
More than 12 hours – 1 6-12 hours – 2 3-6 hours – 3 Minimal-None – 4	<u>Warning Time</u> 4
Limited – 1 Minor – 2 Major – 3 Substantial – 4	<u>Potential Severity</u> 3
Minimal – 1 Limited – 2 High – 3 Very High – 4	<u>Risk Level</u> 2
(Total divided by 4) Very Low – 1 Low – 2 Moderate – 3 High – 4	<u>Overall Priority</u> 2.5 Low/Moderate

Vulnerability to Hazardous Materials and Specific Areas of Concern

The specific hazards created by a release are dependent on the hazardous characteristics of the material, the amount released, the location where the release occurs, and the weather and topographic conditions in the area. Identifying specific materials and those involved in transportation can provide a more specific assessment of the vulnerability.

The transport of hazardous materials in Blue Earth County is highly unpredictable. People and property on or immediately adjacent to transportation corridors throughout the county are at higher risk than those located one mile or more from a major county corridor. Blue Earth County assumes that the highest risk of an incident would be to areas in proximity to the rail line and major roads and from large quantities of hazardous materials moving into and out of the cities, especially Mankato.

The road system in Blue Earth County provides a network to transport both hazardous and non-hazardous material throughout the region and between local communities. Risk of hazardous materials events vary based on the classification of the road and its proximity to people and property. The risk of a major event is most severe in the City of Mankato, due to the concentrated population and location along highways 169 and 14. According to the most recent findings at the Minnesota Department of Transportation, more than half of all accidents involving hazardous materials have occurred on the state roadways. Roads are a major concern in Blue Earth County, due to the lack of information available regarding what is traveling on the

Hazardous materials are conveyed by road, rail, aircraft, and pipeline, each of which present differing levels of risk of unwanted release of the hazardous materials. Transported products include hazardous materials moving from producers to users, moving between storage and use facilities, and hazardous waste moving from generators to treatment and disposal facilities. Communities expressing concern such as Good Thunder, Lake Crystal, Madison Lake, Mapleton, and Pemberton have concern for the toxic chemical sites and transportation of these materials. For example, Lake Crystal is considered with Crystal Valley Cooperative farm chemicals that may cause explosions, fire, and air contamination. Also, the Northstar Ethanol Plant raises concern with the hazardous chemicals present.

The chart below summarizes Blue Earth County hazardous materials concerns, as reported by returned city questionnaires conducted as part of this planning process.

Jurisdiction	Risk Assessment (Probability)	Impact Assessment	Top Three Priority?
Amboy	Low	Low	No
Good Thunder	High	Medium	No
Lake Crystal	Medium	Medium	Yes
Madison Lake	Low	Unreported	No
Mankato	Medium	Low	No
Mapleton	Low	Unreported	No
Pemberton	High	High	Yes
St. Clair	High	Medium	No
Vernon Center	Low	Low	No
Blue Earth County	Low to High	Low to High	No

Probability: High – Annually to 2yrs, Medium - 5yrs, Low – 10yrs

Impact: High – Loss of life and \$500,000 plus property damage, Medium – bodily injuries and \$250,000 property damage, and Low – bodily discomfort and less than \$100,000 in property damage.