

TORNADO EMERGENCY OPERATIONS PLAN

NATIONWIDE CHILDREN'S HOSPITAL

COLUMBUS, OHIO, UNITED STATES OF AMERICA

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**GPH-GU 5150 EMERGENCY PREPAREDNESS FOR HEALTHCARE ORGANIZATIONS
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PREFACE

Introduction to Nationwide Children's Hospital

Nationwide Children's Hospital is a pediatric acute teaching hospital located in Columbus, Ohio. This hospital provides a wide range of clinical services to children aged 0 to 21 throughout Ohio and the surrounding regions. They are one of four ACS-designated Level One Pediatric Trauma Centers in the state and ranked the 7th best overall Children's Hospital in the United States. The hospital has 673 pediatric beds, around 1,379 staff that are medically trained, and over 11,909 employees in total. The hospital has 12 stories, 750,000–square–foot main downtown campus. It continues to grow as more of the campus is being built upon. In addition, 34 outpatient care centers that provide diagnostic and therapeutic care for patients in surrounding areas. This is the hospital that is loved by the community and valued.

Tornadoes in the Ohio Region

Tornadoes have always been a problem in Ohio, and this is because Ohio lies on the eastern edge of the maximum frequency belt for tornadoes in the US. There is, however, a wide range in the annual frequency of tornadoes in Ohio, with a high of about 32 tornadoes in a single year to as low as zero in a year. In 2020, there were a confirmed 19 tornadoes, and in 2023 the number of tornadoes tripled, from six in 2022 to 19 to date in the first half of 2023. One of the most destructive tornadoes in Ohio was an F5 on the Fujita scale of potential damage that occurred in Xenia in 1974. It caused 39 deaths, 1,340 injuries and \$250 million worth of property damage. As climate change increases, the number and severity of tornadoes is increasing. This underscores the importance of hospital preparedness for tornado events in the parts of the US where tornadoes are reported.

Tornadoes in Columbus, Ohio/ Franklin County

In 2018, two tornadoes hit Grove City in April, and in September, one hit in Bexley; both areas are very close to homes and hospitals. Thankfully the tornadoes did not injure anyone, but many properties were damaged. There have been a total of 33 confirmed tornadoes in Franklin County. Tornado warnings occur regularly every year during May, June and July. However, looking at the current data, there has been a steady increase in the number of tornadoes in Ohio and specifically in Columbus, Ohio. Warmer winters create favourable conditions for the formation of tornadoes, therefore leading to an increase in frequency and intensity. Thus, leading to extensive damage to the environment and people.



Potential Impact of Tornadoes on Nationwide Children's Hospital, Columbus, Ohio

Hospitals must be well-equipped and prepared for tornadoes in Columbus, Ohio. A tornado in the vicinity of the hospital will adversely impact a significant number of lives and cause damage to the hospitals and surrounding community. As Nationwide Children's Hospital is a level-one pediatric trauma center, the hospital must account for a potential patient surge. In addition, the hospital must ensure a safe environment for its staff, patients and visitors present during the event. Thus, it is critical for Nationwide Children's Hospital to create and implement an operable disaster plan to prevent, protect and act during a tornado.



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LETTER OF APPROVAL/SIGNATURE PAGE

The undersigned staff have reviewed and approved all aspects for implementing the following Tornado disaster plan for Nationwide Children’s Hospital.

Nationwide Children’s Hospital

_____ Timothy Robinson- CEO	_____ Date
_____ Richard Miller – President & COO	_____ Date
_____ Luke Brown- CFO	_____ Date
_____ Rustin Morse- Chief Medical Officer	_____ Date
_____ Patty McClimon - Senior Vice President of Strategic and Facilities Planning	_____ Date

Franklin County Public Health

_____ Richard Hicks – Director	_____ Date
_____ Mysheika Williams Roberts- Health Commissioner	_____ Date
_____ Anne M. Vogel- Director of Environmental Protection Agency	_____ Date
_____ Ohio Emergency Management Agency	_____ Date
_____ Franklin County Fire Chief	_____ Date
_____ Franklin County Police Chief	_____ Dat

Mission Statement and Purpose

Mission Statement

Nationwide Children's Hospital is committed to the possible best outcomes and health equity for all children, ensuring every child has access to the best care regardless of their ability to pay. Upon this fundamental belief, Nationwide Children's is committed to providing the highest quality:

- **Care** for patients and whole child wellness
- **Advocacy** for children and families
- **Research** discoveries
- **Education** of patients, families, team members and the community

Purpose

The purpose of Nationwide Children's is to lead the transformation of children's health so they have the best possible outcomes. This will be accomplished by: doing the right thing, prioritizing quality and safety, being agile and innovative, getting results and promoting health and well-being.

Authorities: Hospital Leadership

The Administrative Staff will execute the Tornado Emergency Operations Plan. The President and Chief Operating Officer will serve as the Incident Commander. The rest of the administrative staff will either have a lead or supporting role in managing the Tornado event. Hospitals operate on a shift system, and administration typically works during daytime hours. Therefore, delegating the authority of the Incident Commander to a nurse manager or attending will be necessary.

Board of Directors – Chairpersons

- Kirt Walker – Chair
- Nationwide Children's Hospital, Inc./Nationwide Children's Hospital
- George Barrett – Chair
- The Research Institute at Nationwide Children's Hospital
- Libby Germain – Chair
- Nationwide Children's Hospital Foundation
- Abigail S. Wexner – Chair
- The Center for Family Safety and Healing

Administrative Staff

- Timothy C. Robinson – Chief Executive Officer
- Dennis Durbin, MD – President, the Abigail Wexner Research Institute at Nationwide Children's Hospital

- Rustin Morse, MD – Chief Medical Officer
- Catherine Krawczeski, MD – Chief of the Department of Pediatrics
- Oluyinka O. Olutoye, MD, PhD – Chief of Surgical Services
- Rhonda Comer – Senior Vice President, Legal Services
- Patty McClimon – Senior Vice President of Strategic and Facilities Planning
- Richard J. Miller – President and Chief Operating Officer
- Luke Brown – Chief Financial Officer
- Lee Ann Wallace, MBA, BSN, RN, NEA-BC – Chief Nursing Officer
- Donna Teach – Chief Marketing and Communications Officer
- Stephen Testa – President, Nationwide Children's Hospital Foundation

- Olivia Thomas, MD – Chief Diversity and Health Equity Officer
- Lorina Wise, JD – Chief Human Resources Officer
- **Medical Staff Officers**

- Robert W. Snyder, MD – Medical Staff President
- Gregory Pearson, MD – Medical Staff Vice President
- Meredith Lind, DO – Medical Staff Past President

Plan Objectives

The primary objectives of this plan are to:

1. Identify people responsible for activating an emergency response to Nationwide Children's Hospital in the event of a tornado.
2. Describe an Internal and External Communication Plan to Activate Response.

Authorities and Their Public Health Functions

During a Tornado, the authority will be delegated following the existing departmental hierarchy of Nationwide Children's Hospital. Under emergencies, staff may be required to perform activities outside of their official designations by hospital leadership. If a staff member is absent, the Hospital Leadership will delegate authority to other trained personnel. However, as there are 34 Outpatient centers in addition to the main campus, each center will have an Incident Command System that will report to the main center.

Local

1. Incident Commander (President and Chief Operating Officer)

- I. Enacts the emergency operations plan and leads the hospital incident management team and any other plans in place.
- II. Evaluate the hospital's ability to provide a safe environment for continuity of care. Thereby determining evacuation is required.
- III. Establishes a regular briefing schedule and initial documentation of the tornado.
- IV. Determines the timeline for non-essential services and procedures.
- V. Notifies the hospital CEO, board of directors and any other officials that need to be notified.

2. Public Information Officer (Chief Marketing and Communications Officer)

- I. Formation and regular updates to the staff in the hospital, patients, families of patients and visitors.
- II. Update social media, Internet, and other technology services with the hospital's status and any ongoing changes due to the tornado.
- III. Monitors the Internet and media for any updates and impacts that have occurred and could occur to the hospital.
- IV. Communicates with the media and any other external sources requiring status updates

3. **Liaison Officer** (Senior Vice President of Strategic and Facilities Planning)

- I. Notify partners and national level officials, local officials, and any resources to determine what is occurring, how the community is, casualties, supplies, etc.
- II. Obtaining current information and communicating it to the team.
- III. Communicating to hospitals and health officials about patients and their needs, especially if the hospital needs to evacuate.

4. **Safety Officer** (Chief Medical Officer)

- I. Knowing, recommending and implementing safe areas for patients, families, visitors, and workers in the hospital.
- II. Evaluate and Monitor the safety of staff, patients, families, visitors, and persons seeking shelter within the hospital. Report any incidences to the Incident Commander
- III. Monitor the weather reports and conditions

National

1. FEMA

- i. Assess building damages.
- ii. Development of sharing of health promotion materials.
- iii. Funds research on safe room design and construction standards.
- iv. Develops best practices on safe rooms and community shelters.

2. American Red Cross

- i. Conduct damage assessments.
- ii. Provide mental health support.
- iii. Distribute supplies to help clean up
- iv. Provide Human resource capital, for example, during evacuations



Partners

1. Nationwide Children's Hospital: Community-Based Surveillance, Technical Advisors and Logistical Support
2. Centers for Disease Control: Technical Advisors
3. Franklin County Public Health- Technical Advisor at Local Level
4. Ohio Emergency Management Agency
5. First Responders: Fire, Police, Emergency Management
6. Local community and Faith-Based organizations
7. World Health Organization: Technical Advisor at Local and National Level

Definitions

TERM	DEFINITION
Watch	<i>A weather watch means the potential or conditions exist for a dangerous weather event.</i>
Warning	<i>A weather warning means that a dangerous weather event is imminent. Immediate action must be taken to protect life and property.</i>
Tornado	<i>A mobile, destructive vortex of violently rotating winds appearing like a funnel-shaped cloud and advancing beneath a large storm system. *In Ohio, many tornadoes are obscured by hills, trees or heavy rain.</i>
Advisory	<i>A weather advisory means weather conditions less serious than a warning are imminent. These events may cause a significant inconvenience, and if caution is not exercised, it could lead to a situation that may threaten life and property.</i>
Tornado Warning	<i>A tornado warning is issued when a tornado is imminent or occurring. The warning may be issued when a tornado is either indicated by Doppler radar or sighted by trained spotters. Action: Seek shelter immediately, preferably below ground in a substantial building.</i>
Tornado Emergency	<i>An exceedingly rare warning or statement is issued when there is a severe threat to human life and catastrophic damage from an imminent or ongoing tornado. This warning is reserved for situations when a reliable source confirms a tornado or there is clear radar evidence of a strong, damaging tornado, such as the observation of debris. Action: Seek shelter immediately, preferably below ground in a substantial building.</i>

Table 1: Definition of Tornado Warning Terminology courtesy Ohio Emergency Management (Additional Definitions in [Annex 3](#))

Agency Communication Plans

There will be a tornado watch/warning issued by the National Weather Service. When this occurs, the hospital will issue a tornado watch/warning. The hospital will monitor weather conditions and to communicate with other hospitals and health professionals in the area for updates on the tornado watch/warning. Every worker in the hospital will assist with patient care, within their level of expertise, in the hospital operations during this turbulent time. The patients, families and workers will be sheltered in a predetermined safe location within the hospital or the next best possible alternative. Depending on the floor or unit, patients will be away from windows and placed in areas like bathrooms and other rooms that will protect them. Employees will attend to patients and persons seeking shelter based on availability, space and patient needs.

Communication Methods

Nationwide Children's Hospital has access to a satellite phone, Internet, notifications due to The National Weather System, etc. Within the hospital, they have Voiceras, which are updated pagers where the hospital workers can communicate among themselves. Mobile phones will be used to communicate with families, outside personnel and other medical professionals for information and communication. As soon as the tornado warning/watch is issued, an announcement can be made along with alerts to the pagers. Health professionals will communicate this with surrounding hospitals to ensure safety. Electronic mail will be used to share reporting documents post-event.

Mutual Aid Agreement

The agreement is entered into between Nationwide Children's Hospital and relevant local private and government agencies is entered into. National Weather Service is responsible for issuing a tornado watch and warning. When this occurs, the proper professionals within the administration will issue a code in the hospital. As the employees are committed to patient care, they will ensure their safety and communicate within their capabilities with the patients and their families within their capabilities. Nationwide Children's Hospital has a mutual aid agreement with the CDC, Franklin County Public Health. They will provide support and materials to help educate on how to proceed through this crisis.

The Children's Hospital (Ohio) Disaster Plan for Tornadoes is illustrative in guiding the facility's preparedness and response efforts in the face of catastrophic events. With a focus on protecting lives, minimizing accidents and property damage, keeping essential operations, and facilitating a

coordinated response, this plan ensures the safety and well-being of the hospital's patients, staff, and visitors.

Introduction to the Concept of Operations

The main objective of this plan is to protect the lives of all individuals within the Children's Hospital. It offers clear strategies and evacuation methods, ensuring that patients, staff, and traffic can be safely relocated to precise, secure areas inside the facility or identified refuge places in the event of a tornado warning. Particular interest is given to persons with special needs, making sure their secure evacuation or sheltering in a manner that meets their unique requirements. A coordinated response is crucial throughout a tornado event, and this plan enables positive communication and collaboration. It establishes conversation protocols for staff, patients, their families, stakeholders, emergency administration agencies, neighboring hospitals, and community organizations.

Legal authorities and emergency management regulations

The Children's Hospital (Ohio) Disaster Plan for Tornadoes operates within Ohio's legal authorities and emergency management regulations. Adhering to these authorities ensures compliance with federal, state, and local laws, regulations, and guidelines, providing a solid foundation for the plan's implementation. At the federal level, the plan aligns with the laws and regulations stipulated by the Federal Emergency Management Agency. Compliance with FEMA guidelines, which include the Stafford Act, ensures the hospital's eligibility for federal help and assets at some stage in and after a catastrophic event. In addition, state legal guidelines and rules set forth using the Ohio Emergency Management Agency (OEMA) are also adhered to in this plan. These guidelines govern emergency management practices inside the state. By complying with them, the Children's Hospital ensures a regular and coordinated method in their preparedness and response efforts.

Major Local Public Health Official Functions

Facility

Facility: Nationwide Children's Hospital

The hospital administrative staff's role is to support the emergency response team, including funding for training and materials as outlined in [Annex 2](#). The Incident Command Team will consist of personnel from the Hospital Leadership who will manage the Tornado response and communicate with any external partners. **President and Chief Operating Officer** serve as the **Incident Commander**, **not** the Chief Executive Officer (CEO). However, the CEO will be involved in the development of the plan.

Municipal

Ohio Emergency Management Agency

The agency is the point of contact for coordinating any response to and recovery from disasters. Therefore, they will ensure a practical response to the event.

Ohio Department of Health

The Department of Health's role is to safeguard the health and well-being of the state residents. Therefore, the Office of Health Preparedness, one of the Ohio Department of Health departments, will assist with the Disaster Preparedness and Response.

Fire Department

The fire department will respond and perform their expected job functions as the hospital needs. This includes managing first responders and ambulance service providers.

Police Department

The police department will conduct regular job duties to ensure the safety and security of the hospital personnel, patients and visitors.

OPERATIONS

Assessing the Needs of Disaster-Affected Populations

The impact of a disaster can be expected to have wide-ranging effects. Physical damage to structures can be expected, and injury and death may occur to National Children's Hospital's customers, guests and employees. Longer-term psychological and emotional impacts must also be considered.

Assessment of injuries/ Injury triage process

The National Children's Hospital is a medical facility staffed by multiple medical providers. In a disaster, the Incident Commander will coordinate triage and response efforts within the incident

command structure. The Incident Commander will have the authority to establish criteria for triage, personnel assignments, and distribution of supplies. The lowest floor of the building is a designated tornado shelter. Patients who can safely ambulate or be moved may be taken to this sheltered area.

Triage will follow standard medical protocols. The Medical Director will specify the determination of responses. Evaluation will be made as soon as is safely possible. Emergent needs will be managed on-site when possible, with transport for the most grievously injured when available. Advanced imaging (CT, MR, Ultrasound) will be performed on-site if facilities are functional to lessen the burden on other medical facilities. Less severe injuries may be managed on-site with discharge home when deemed safe to reduce the hospital burden.

Long-term response/recovery

The Incident Commander will determine if the environment is safe to provide continuity of care; if not, evacuation is required. When deemed safe and shelter is required, the Safety Officer recommends designated safe areas for all those at the hospital, including staff, patients, families, and visitors, as well as allocation of food and water. Long-term health impacts will be the responsibility of the injured parties, but Nationwide Children's Hospital will assist in finding providers. Employees can have internal medical support, psychological evaluation, and treatment.

Vulnerable populations

Accounting for vulnerable populations, such as patients, persons with disabilities or non-English speakers, must be accounted for in the triage process. If there is the need for evacuation to a safe shelter, understanding and accounting for the needs of this population must be considered in the planning process. Since the basement is a commonly used shelter during a tornado, alternative measures, for example, rooms on the lowest floors away from the windows, may need to be considered. Any decision must be made with the Incident Commander or authorised personnel.

Medical provider resource list

The provider list will be available through the Incident Commander obtained by the Chief Operating Officer using Nationwide's Children's Hospital personnel files.

Impacts on Infrastructures

During the immediate response period, the infrastructure evaluation will be made by facility staff under the direction of the Safety Officer. Current structural records of the hospital campus are available on-site. Once the immediate response has been completed, City engineering officials will be engaged in the long-term structure evaluation. FEMA will be notified to assess building damages.

Local public health contacts

The Liason officer will contact the local public health professionals listed as a resource. In keeping with the other lists, regular updates are required.

Communication

When an event is threatening or imminent, the facility's public address (PA) system provides the most rapid method of communication. Facility Wi-Fi and waiting room monitors also are in place and provide alternate methods of warning broadcast. Physicians will be updated via pagers, and In the aftermath of an event, these same resources will be utilized but may not be available in the case of a power outage. In that case, command structure and caregivers will use cell phones if functional. If all other forms of communication are rendered unusable, word of mouth/personal contact will facilitate the transfer of information between hospital personnel.

Matching Available Resources to the Needs

In response to a Tornado, many critical factors must be accounted for during the planning stage. As a children's hospital, many critically ill patients are connected to life-saving equipment and patients with limited mobility. Furthermore, the hospital needs to account for visitors and the surge that may occur due to the tornado.

Material Resources

Medical, Pharmaceutical and Food Supply

- Maintenance of inventory: Ensuring that the supply is adequate and current.
- If supplies are destroyed: knowledge of the activation process for the National Stockpile will be critical to ensuring the continuation of patient care for existing and injured patients.
- Pre-determined agreements with hospitals within proximity to assist with supplies and human resources as needed.

Staff Resources

The Incident Command team must maintain a list of current staff and develop an emergency plan to ensure an efficient and effective response to the tornado event. Training and practice for staff on the emergency plan are vital to comprehend their roles and responsibilities during the event, as they may be tasked with jobs that are outside their current job description. Furthermore:

- A cheat sheet on what to do in the event of a Tornado in visible locations.
- Job Action Sheet
- A tornado can cause cascading emergencies, as illustrated in the Threat and Hazards Assessment Table (THIRA) in [Annex 1](#)
 - ◆ Loss of water supply which impedes sanitary conditions.
 - ◆ Hazardous conditions due to debris, spills of hazardous waste materials, sharp objects (broken glass and other materials)
 - ◆ Power outages: Back up plan for the patients whose equipment does not have backup power sources in the safe shelter locations. Impact on Continuity of standard operations: Patient care, Sanitary conditions.
 - ◆ Safety with the use of portable generators.
- On-duty personnel must remain on-site, and off-duty personnel must report to the hospital. It may benefit the hospital to assist personnel in developing contingency plans for loved ones. It may be challenging to increase hospital capacity, but allowing immediate household family members to join or redirect them to a designated safe location will increase the likelihood of personnel's performance.
- External partners: Due to the size and number of locations, partners, such as the American Red Cross, can assist with evacuations.
- Developing a system to account for all personnel, visitors, and patients in the building at a given time and the ability to cross-reference in the event's aftermath.
- Ensuring warning systems are in place and linked to the Ohio State Office of Emergency Management Agency

Outside Resources

The Incident Command maintains a consistently updated list of private and public partners. Updated versions of the Memorandum of Understanding for any of these partners will consist of clear expectations of the needed resources. Additionally, any need for local, state, and federal resources will be included on the list. A written request for assistance will be maintained along with the lists.

Evaluation of the Effectiveness of the Disaster Response



Evaluation Criteria

Assessment of the Disaster Response is required to determine the effectiveness of Nationwide the plan. The Hospital Leadership of Nationwide Children's Hospital will select the evaluation criteria. The evaluation will look at different metrics, such as if the staff were adequately trained to execute their responsibilities, safety and overall management of the response, detailed examples can be found in [Annex 4](#). During the disaster response, any prominent areas with noticeable gaps should have contingency plans to counteract them. Indicating that there should be built-in mechanisms to adapt the process immediately. Surveys are an option to use for the evaluation process. The survey will be administered to staff, patients (over 18), families, partners, community organizations and any other relevant organizations involved in the event. The Incident Commander and team will conduct personal assessments before conducting the organizational evaluations and meeting with other task force members. Although the evaluation should occur within a reasonable time frame. Yet, consideration must be given to any trauma that may have occurred during the event.

After Action Report

Once the information is received and compiled, the Incident Commander and the team will prepare the After-Action Review. At this stage, the Incident Commander must verify that all relevant stakeholders were sent the survey for completion or through other methods. Upon completion, Hospital Leadership must review the report before dissemination to the hospital personnel and private and public sector partners. Stakeholders, for example, the Chief of the Fire Department, and the Department of Health, will receive a copy for review. The review meeting will occur with Incident Command Center to collect information for Lessons learned to continue to improve on response and recovery efforts. The staff and general public will receive debriefs.

Deactivation of the Incident Command Center

In conjunction with the Safety Officer, the Incident Commander will determine when to return "to business as normal" and begin the recovery process. However, the infrastructure and weather must be cleared by relevant authorities before doing so. After the deactivation process occurs, the Incident Command Center will conduct a debrief session or sessions to highlight the strengths and developmental areas to make improvements for future events.

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Annex 1: Threat and Hazards Assessment Table (THIRA)

Nationwide Children’s Hospital 700 Children’s Drive, Columbus, Ohio 43205

Natural	Technological	Human-caused
Resulting from acts of nature	Involves accidents or the failures of systems and structures	Caused by the intentional actions of an adversary
<p>Tornadoes²: Ohio is ranked 17th in the US for tornado risk, averaging 22 tornadoes per year. It has not experienced an F5 tornado but has already had four F4 tornadoes.</p> <p>Flooding²: Heavy rainfall can cause swelling of Ohio's 29,000 miles of rivers and streams. Columbus is listed as a city at risk for flooding. There is also the potential for Flash flooding to occur.</p> <p>Earthquakes²: Ohio is located on the New Madrid Seismic Zone (NMSZ). There have not been any significant earthquakes. However, approximately once every 18 months, an earthquake of a minimum of 4.0 magnitude occurs. Or, every ten years, one of a 5.0 magnitude. The southern area is most at risk for earthquakes. Potential for earthquake-related damage as the hospital is in the Southern region.</p> <p>Heavy Snowfall, Winter Storms, and Freezing Rain²: Winters are generally mild. However, vehicle accidents can happen when snowfall occurs, as many people are not used to driving in snow and</p>	<p>Power Outages¹: During catastrophic events: Snowstorms, Freezing rain, and Heat waves. Patients rely on medical equipment and all the other resources that are powered by electricity. This can also impact internal or external communications during life-threatening events such as tornadoes or earthquakes.</p> <p>Utility Failures¹: Utilities such as water, electricity, sanitation, and other medical systems can be impacted by natural or human-made disasters. This can increase exposure to disease and safety risks for patients.</p> <p>Technological Systems¹: Hospitals rely heavily on electronic medical records, laboratory and imaging systems, surgery equipment etc. Therefore, these systems must be updated to prevent any data breaches or cyberattacks.</p>	<p>Cyberattack¹: Places stored patients’ and hospitals’ information at risk. It also has the potential to create cascading disasters, such as utility and communication failures (phone, computer, and emergency responder dispatch).</p> <p>Intentional Acts of Mass Violence¹: Biological. Chemical, radiological, Mass shootings in the community and hospital</p> <p>Acts of Violence: Towards staff from internal (patients) and external threats (Active assailants).</p> <p>Abductions, especially infants.</p> <p>Financial Costs: With personnel cuts, security risks and error rates can increase.</p> <p>Human Error: Inadequate preparation: lead to miscommunication, panic and errors that could result in poor health outcomes. This can also lead to insufficient medical supplies and stock of essential medical items needed in an emergency.</p> <p>Medical errors: due to the circumstance, this can occur and harm a patient's life.</p>

ice. Ohio is ranked fourth in the US for fatal winter accidents.

Heat Waves, Droughts and Wildfires²: Ohio does experience heatwaves (at least five days per year of temperatures over 103F. This can lead to droughts and wildfires. Overall, the vulnerability of children and infants increases. Heat exposure increases the risk of heat-related conditions, especially in vulnerable populations. Furthermore, the extreme conditions exacerbate existing respiratory and cardiovascular conditions. Therefore, potential to increase hospital occupancy. Climate Change will increase the risk of heat waves.

Human Infectious Diseases:
E.g. COVID-19. Any pandemic-like disease can potentially place an increased demand on the healthcare system and its employees. Demands are as follows:
A. Physical and mental health of the employees.
B. Healthcare system: Beds, personnel, infectious waste management and disposal, infection control practices, decontamination service, personal protective equipment. Additional resources may be required, but demand may exceed the supply.

Annex 2: Tornado Training Seminar

Training Seminar Title: Tornado Safety for Nationwide Children's Hospital	
Objectives of your Training Seminar (What mitigation strategy are you advocating?)	Tornado Emergency Preparedness and Response
Estimate Length of Training	Internal: 2 - 3 hours, which will include simulations in various roles External 1 - 1 ½ hours
Target Audience and max size of the audience.	Target Audience: <ul style="list-style-type: none"> - Internal: Hospital Personnel - External: School Administration/Personnel, Key Community Leaders and Community Max Size of Audience: Department Heads It may be possible to conduct a Train the Trainer Programme for faster dissemination within the organisations.
Who would be a good candidate (e.g., structural engineer, health dept. official, first responder?) as Facilitator of this session? Why?	Facilitator: Ohio Emergency Management Agency Why: <ul style="list-style-type: none"> - The Agency is responsible for the overall preparedness of the state for emergencies. In addition, the hospital will most likely be one of the partner agencies in the response. So the EMA will have a broad overview of how to handle the disaster and Nationwide Children's Hospital's role.
What do you want community members to do as a result of their attending this session?	By attending this session, the attendees need to gain a comprehensive understanding of the risks and potential hazards of a tornado. Internal: Hospital Personnel <ol style="list-style-type: none"> 1. What to do and the processes involved for other evolving emergencies. 2. Understand the Emergency Plan of Action for the hospital. External: Community Members, School Administration/Personnel <ol style="list-style-type: none"> 1. Develop Emergency Action Plans for their locations. Essential to keep children safe during the event to minimise the surge to the hospital. 2. Train and Practice Emergency Plans with Personnel, including children
Strategies to increase community uptake of your mitigation	<ol style="list-style-type: none"> 1. Sample emergency action plans, especially for Individuals. Provide as much detail since this may be new to many. 2. Emergency Contact List 3. Basic Disaster Supplies Kit 4. Red Cross: Tornado Preparedness Checklist: What to do Before, during and after a tornado with examples 5. Practice Plans 6. Sign up for Emergency Alerts

Annex 3: Definitions of Weather Terms

TERM	DEFINITION
Cold Air Funnels	<i>A funnel cloud or (rarely) a small, relatively weak tornado that can develop from a small shower or thunderstorm when the air aloft is unusually cold (hence the name). They are much less violent than other types of tornados.</i>
Derecho	<i>A widespread, fast-moving windstorm associated with convection. Derechos are typically produced by a thunderstorm complex, where the thunderstorms become organized on a scale larger than the individual storms and form a convective system. Derechos can produce damaging straight-line winds over areas hundreds of miles long and more than 100 miles across.</i>
Downburst	<i>A strong downdraft current of air from a thunderstorm, often associated with intense thunderstorms. Downbursts may produce damaging winds at the surface.</i>
Flash Flood	<i>A rapid and extreme flow of high water into a normally dry area, or a rapid rise in a stream or creek above a predetermined flood level, beginning in a short period of time from the causative event. Flash floods typically occur as the result of very heavy rainfall in a short period of time over a relatively small area. It may also be caused by a dam break.</i>
Flood	<i>A condition that occurs when water overflows the natural or artificial confines of a stream or body of water or accumulates by drainage over low-lying areas. This flood is any high flow of water, overflow, or inundation by water which causes or threatens damage.</i>
Funnel Cloud	<i>A condensation funnel extending from the base of a towering cumulus cloud associated with a rotating column of air that is not in contact with the ground – and hence, different from a tornado. A condensation funnel is a tornado, not a funnel cloud if: a.) it is in contact with the ground; b.) a debris cloud or dust whirl is visible beneath it.</i>
Gust Front	<i>The leading edge of gusty surface winds caused by thunderstorms. Sometimes these winds occur with a roll cloud or shelf cloud and can be quite distant from the originating thunderstorm.</i>
Lightning	<i>A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, or between a cloud and the ground.</i>
Severe Thunderstorm	<i>A thunderstorm producing a tornado and/or damaging winds of 58 mph or higher and/or hail 1 inch in diameter or larger. Structural wind damage may imply the occurrence of a severe thunderstorm.</i>

Squall Line	<i>A line of active thunderstorms, either continuous or with breaks, including contiguous precipitation areas resulting from the existence of thunderstorms.</i>
Straight-Line Winds	<i>Generally, any wind that is not associated with rotation is used mainly to differentiate them from tornadic winds. See downburst.</i>
Thunderstorm	<i>A local storm produced by a cumulonimbus cloud, and accompanied by thunder and lightning, strong wind gusts, heavy rain and sometimes hail. A cumulonimbus cloud is a cauliflower-shaped cloud that usually has a height taller than or equal to its width.</i>
Hazardous Weather Outlook	<i>Issued daily, a hazardous weather outlook highlights any significant weather conditions that may develop. It is intended to provide information on the potential of significant weather over the next week.</i>
Special Weather Statement	<i>Provides the public with information concerning ongoing weather hazards, including strong storms that may become severe.</i>
Short-Term Forecast	<i>A short-term forecast describes the weather in the local area and includes a short-range forecast (usually not more than six hours). This product will be updated more frequently when used during the weather. A short-term forecast is sometimes referred to as a "NOW-cast."</i>

Definitions of Weather Terms courtesy Ohio Emergency Management

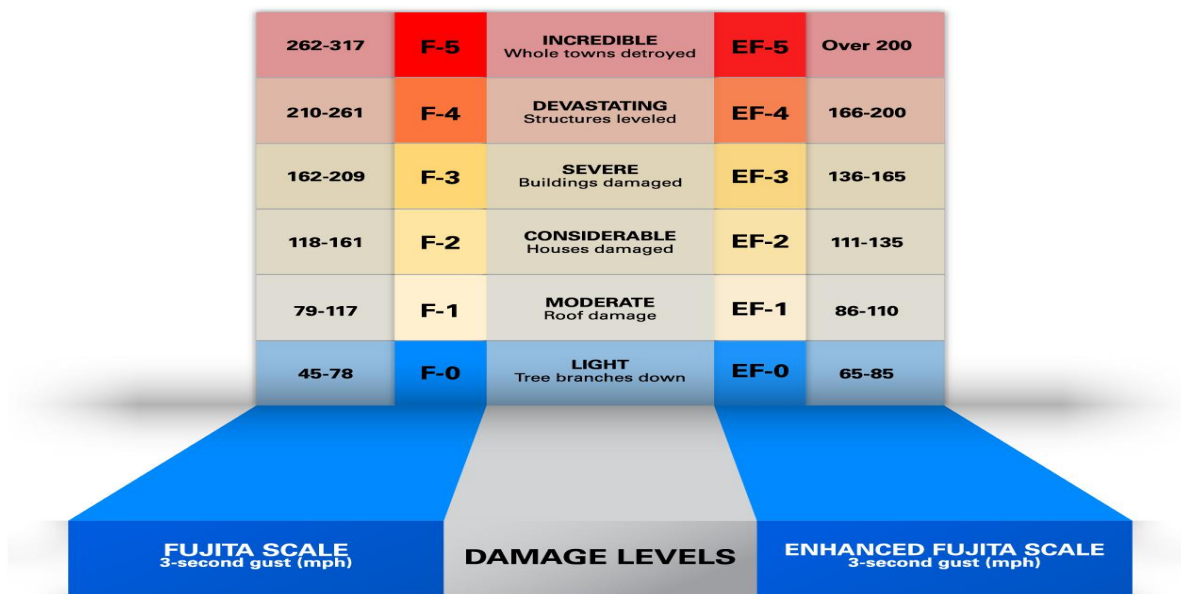


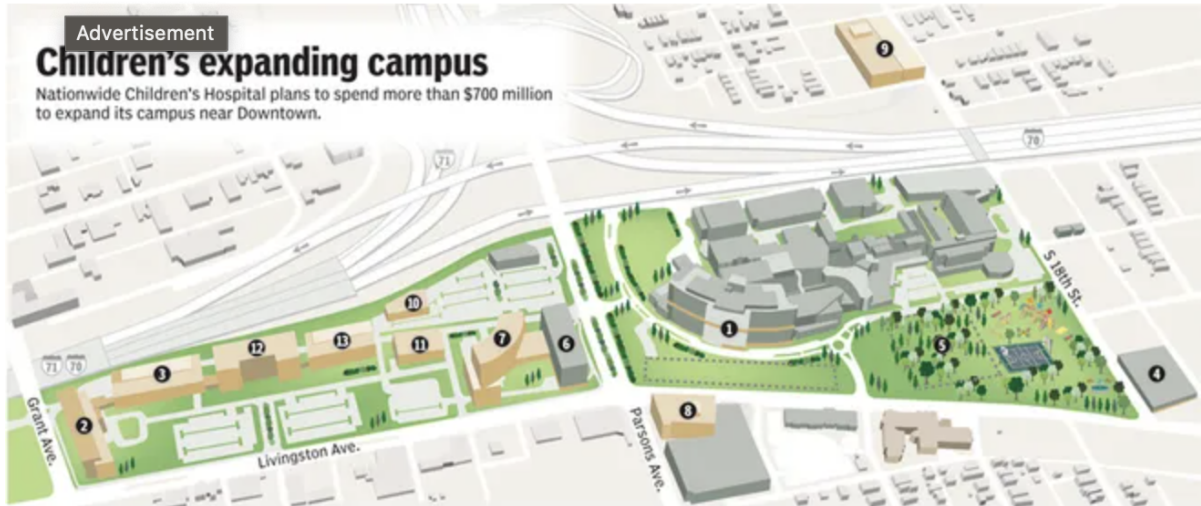
Figure 1: Fujita Scale and Enhanced Fujita Scale courtesy Ohio Emergency Management Agency

Annex 4: Evaluation Criteria

Evaluation Criteria to include in the analyses:

1. Timeliness of Personnel
 - a. Number of lives saved
 - b. Length of time taken for personnel to react after the warning (if there were any)
 - c. Length of time taken for off-duty personnel to resort to work.
 - i. Were there any unforeseen circumstances or technical difficulties?
 - ii. How effective or convenient were the contingency plans for the immediate families of the hospital personnel?
 - d. Execution of roles and responsibilities
 - i. The efficiency of the process: Did everyone understand their roles and know what to do
 - ii. Was there adequate personnel available?
 - iii. How comfortable were the staff in executing Emergency Plan?
2. Warning Systems
 - a. How long did the personnel have to respond after the warning? Was the warning provided in a timely manner?
 - b. How effective was the alert throughout the entire hospital?
3. Safe Shelter Locations
 - a. How did the hospital personnel transfer patients and visitors to safe locations?
 - b. The number of persons who were able to access the safe shelters
 - c. Accessibility for persons with disabilities
 - d. Were there adequate supplies for identified populations within the hospital?
 - e. Were there adequate supplies available to accommodate the surge in patients and anyone seeking safe shelter?
4. Communication
 - a. Communication Flow
 - i. Internal
 1. Staff to Staff
 2. Staff to Patients, Families and Visitors
 3. Incident Command Center
 - ii. External
 1. Partner Organizations
 2. Government: Local, State and Federal
 3. Other Hospitals
 4. Community

Appendix 1: Map of Nationwide Children's Hospital



Advertisement

Children's expanding campus

Nationwide Children's Hospital plans to spend more than \$700 million to expand its campus near Downtown.

Health services

- 1. Hospital, building out levels two and seven
- 2. Livingston Ambulatory Center
- 3. Parking garage for Livingston Ambulatory Center
- 4. Child care center, renovation
- 5. Livingston Park enhancements

Source: Nationwide Children's Hospital

Research

- 6. Research building III, building out levels two and three
- 7. Research building IV

Infrastructure

- 8. Faculty office building
- 9. Near East office building and garage
- 10. Energy plant
- 11. Data center

Behavioral Health Pavilion

- 12. Behavioral Health Pavilion
- 13. Parking garage for Behavioral Health

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