Epi-Aid 2018-025: Increase in youth suicides — Stark County, Ohio, 2018

FINAL REPORT

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Final Report

Prepared by:
Elizabeth Swedo, MD, MPH[1,2]
Jennifer Beauregard, PhD, MPH[1,3,4]
Martha Montgomery, MD, MHS[1,5]
Erica Billig Rose, PhD[1,3,6]
Steven Sumner, MD, MSc[2,3]

Submitted to:
Sietske de Fijter, MS
Jolene Defiore-Hyrmer, MPH
Luke Werhan, MPA

Affiliations:
[1]Epidemic Intelligence Service
[2]Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention
[3]U.S. Public Health Service Commissioned Corps
[4]Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention
[5]Ohio Department of Health
[6]Division of Viral Diseases, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention

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Abbreviations

ACEs	Adverse childhood experiences
AOR	Adjusted Odds Ratio
ASQ	Ask Suicide-Screening Questions
CALM	Counseling on Access to Lethal Means
CAST	Coping and Support Training
CDC	Centers for Disease Control and Prevention
CDF	Cumulative Distribution Function
CEHRT	Certified Electronic Health Record Technology Systems
CI	Confidence Interval
CIRC	Crisis Intervention and Recovery Center
CPSC	Consumer Product Safety Commission
C-SSRS	Columbia Suicide Severity Rating Scale
ED	Emergency Department
EIS	Epidemic Intelligence Service
HOPE	Heroin and Opioid Prevention Education
ICD-9-CM	International Classification of Diseases, Ninth Revision Clinical Modification
ICD-10-CM	International Classification of Diseases, Tenth Revision Clinical Modification
IQR	Interquartile Range
IRB	Institutional Review Board
ODH	Ohio Department of Health
Ohio MHAS	Ohio Mental Health & Addiction Services
OH-VDRS	Ohio Violent Death Reporting System
OHYES!	Ohio Healthy Youth Environments Survey
MST	Multi-Systemic Therapy
NCHS	National Center for Health Statistics
NCIPC	National Center for Injury Prevention and Control
NEISS	National Electronic Injury Surveillance System
NEISS-AIP	National Electronic Injury Surveillance System-All Injury Program
NIDA	National Institute on Drug Abuse
NOYHS	Northeast Ohio Youth Health Survey
NREPP	National Registry of Evidence-based Programs and Practices
NVDRS	National Violent Death Reporting System
QPR	Question Persuade Refer
SAMHSA	Substance Abuse and Mental Health Services Administration
SBQ-R	Suicidal Behaviors Questionnaire-Revised
SCESC	Stark County Educational Service Center
SCHD	Stark County Health Department
SCSPC	Stark County Suicide Prevention Coalition
SEL	Social-Emotional Learning
SNOMED CT	Systematized Nomenclature of Medicine - Clinical Terms
SOS	Signs of Suicide
SPRC	Suicide Prevention Resource Center
SRO	Security Resource Officer
Stark MHAR	Stark County Mental Health & Addiction Recovery
WATOES	We Are Troubled On Every Side
WISQARS	Web-based Injury Statistics Query and Reporting System
WHO	World Health Organization

YRBS Youth Risk Behaviors Survey

Executive Summary

Background

Between August 2017 and March 2018, the community of Stark County, Ohio experienced a rapid increase in youth suicides. During this timeframe, the suicide rate in Stark County among youth aged 10–19 years rose to 20 deaths per 100,000 persons per year, more than 7 times the U.S. national rate and 11 times the Stark County rate for previous years. In March 2018, Ohio Department of Health (ODH) requested assistance from the Centers for Disease Control and Prevention (CDC) to examine factors contributing to increased suicidal behaviors among Stark County youth. ODH requested that CDC conduct an Epi-Aid with the following objectives:

1. Rapidly determine the population in need of prevention services at all affected and at-risk middle- and high-schools in Stark County through a comprehensive school-based risk screen.
2. Identify precipitating factors for youth suicide that may contribute to ongoing suicidal behaviors among Stark County youth population to prevent further suicide attempts and suicides.
3. Ascertain the activities, social supports, and other factors among the Stark County youth population that are most protective against suicide risk in order to guide immediate prevention activities.
4. Inventory and catalogue existing suicide prevention initiatives in Stark County and make recommendations on evidence-based suicide prevention programs.

Methods

The following data sources and activities were used to address the objectives of the investigation:

1. Northeast Ohio Youth Health Survey (NOYHS)
2. CDC's Web-Based Injury Statistics Query and Reporting System (WISQARS)
3. Ohio Violent Death Reporting System (OH-VDRS)
4. EpiCenter
5. Media Scan
6. Prevention Initiatives Inventory

Key Findings by Data Source

NORTHEAST OHIO YOUTH HEALTH SURVEY (NOYHS)

Among Stark County youth participating in the Northeast Ohio Youth Health Survey in Spring 2018:

- 10.7% of youth had suicidal ideation with plan and 5.6% attempted suicide during the 2017–2018 school year.
- Lifetime prevalence of suicidal ideation with plan was 15.3%.
- Lifetime prevalence of suicide attempt was 8.9%.
- Protective factors for suicidal ideation and/or suicide attempt during the 2017–2018 school year included: participation in any school activities, participation in any sports, closeness to peers or family, positive parental engagement, access to medical care when needed, and high resilience.
- Risk factors for suicidal ideation and/or suicide attempt during the 2017–2018 school year included: Hispanic ethnicity, female sex, 3+ adverse childhood experiences, opioid misuse (lifetime use of prescription pain medicine without a doctor's prescription or heroin), losing a loved one to suicide during the 2017–2018 school year, posting on social media about suicide, and having a strong emotional response to Stark County suicide deaths.
- Nearly 60% of Stark County youth felt lonely and 30% of students felt hopeless.
- Nearly 1 in 4 Stark County youth experienced 3+ adverse childhood experiences, including parental separation/divorce, verbal and emotional abuse, depression and substance use in the home.
- Odds of suicidal behaviors were 90% lower for youth who had high resilience.
- Nearly 70% of youth saw posts related to Stark County suicides on social media. Posting to social media about Stark County suicide deaths was independently associated with higher odds of suicidal behaviors.
- Nearly fourteen percent of youth who have attempted suicide have access to a firearm in Stark County.

CDC'S WEB-BASED INJURY STATISTICS QUERY AND REPORTING SYSTEM (WISQARS)

- Between 2011 and 2016, the suicide rate for Stark County youth aged 10-19 years was 5.4 suicide deaths per 100,000 persons.

- During this time period, suicide rates among youth aged 10-19 years were comparable in Ohio (5.5 suicide deaths per 100,000 person years) and the United States (5.4 suicide deaths per 100,000 person years).

OHIO VIOLENT DEATH REPORTING SYSTEM (OH-VDRS)

- During 2017–2018, the suicide rate for Stark County youth aged 10-19 years rose to 20 deaths per 100,000 person years.
- Statistically significant temporal clustering of suicides among youth aged 10-19 years occurred between August 2017 and March 2018 in Stark County.

EPICENTER SYNDROMIC SURVEILLANCE SYSTEM

- Prior to 2018, ≤1% of acute care visits among Stark County youth aged 10-19 years were related to suicidal behaviors.
- In 2018, 2.2% of acute care visits among Stark County youth aged 10-19 years were related to suicidal behaviors.
- Between 2016 and 2018, the percent of emergency department visits related to suicidal behaviors increased 181% in Stark County and 100% in Ohio.

MEDIA SCAN

- Overall, media coverage of 2017–2018 suicide deaths in Stark County deviated from accepted safe suicide reporting guidelines.
- The most common violations included sensationalized headlines, negative imagery, descriptions of the location and method of suicide, and naming of the suicide decedent.
- Generally, local news sources better adhered to safe suicide reporting guidelines than regional Ohio or internet news sources.
- Only 38% of articles included information on where to get help for suicidal thoughts or behaviors.

PREVENTION INITIATIVES INVENTORY

- Among the prevention initiatives highlighted by key informant interviews with stakeholders at Stark County Health Department, Stark Mental Health and Addiction Recovery, and the Stark County Mobile Response Team, 25 suicide prevention initiatives were identified. About thirty percent of these suicide prevention initiatives are

specific to youth; the majority of Stark County prevention initiatives target all ages.

- The majority of suicide prevention initiatives in Stark County (92%) are focused on prevention activities or programs.
- Many of Stark County's programs are aligned with the CDC's Suicide Prevention Technical Package.
- Based on Stark County youth's protective factor profile, there is a lack of initiatives increasing access to medical or psychological care and resilience-building when needed.

Recommendations

Based on the key findings across data sources, the following recommendations are presented to ODH and SCHD. These recommendations highlight opportunities to address suicide risk and protective factors among youth and support prevention activities in Stark County.

Advance Integrated Approach to Suicide Prevention at the Community Level

- Develop a youth specific strategic plan for Stark County suicide prevention.
- Collect youth-specific data for qualitative and quantitative evaluation of suicide prevention efforts.

Strengthen Access and Delivery of Suicide Care

- Increase access to health and psychological care for youth, particularly evidence-based mental health services.

Create Protective Environments

- Reduce access to lethal means among youth at risk for suicide.
- Implement evidence-based, community-based strategies to reduce youth substance use.

Promote Connectedness

- Engage community members, parents, and families in youth's life through participation in school and community activities.
- Promote youth connectedness at individual, interpersonal, organizational, and community levels.

Teach Coping and Problem-Solving Skills

- Integrate upstream suicide prevention strategies into school curriculum through social-emotional learning programs.
- Encourage development of resilience among youth through evidence-based programming in schools and community.

Identify and Support People at Risk

- Train community members to identify people who may be at risk of suicide and to respond effectively through Gatekeeper Training.
- Prevent and reduce the negative effects of childhood adversity.

Lessen Harms and Prevent Future Risk

- Refer persons substantially affected by suicide for further counseling or other services as needed.
- Implement postvention activities throughout a community, not just at an affected school or institution.
- Develop suicide response plans before a death occurs and follow suicide response guidelines in the wake of an event.
- Collaborate with local and regional news sources to promote safe suicide reporting guidelines.
- Use safe suicide reporting guidelines to direct social media messaging.

Administer Ongoing Youth Health and Behavior Surveys

- Regularly assess the health and wellbeing of students through ongoing youth health and behavior surveys.

Target both Female and Male Students

- Plan sex-specific interventions to more effectively prevent suicidal behaviors.

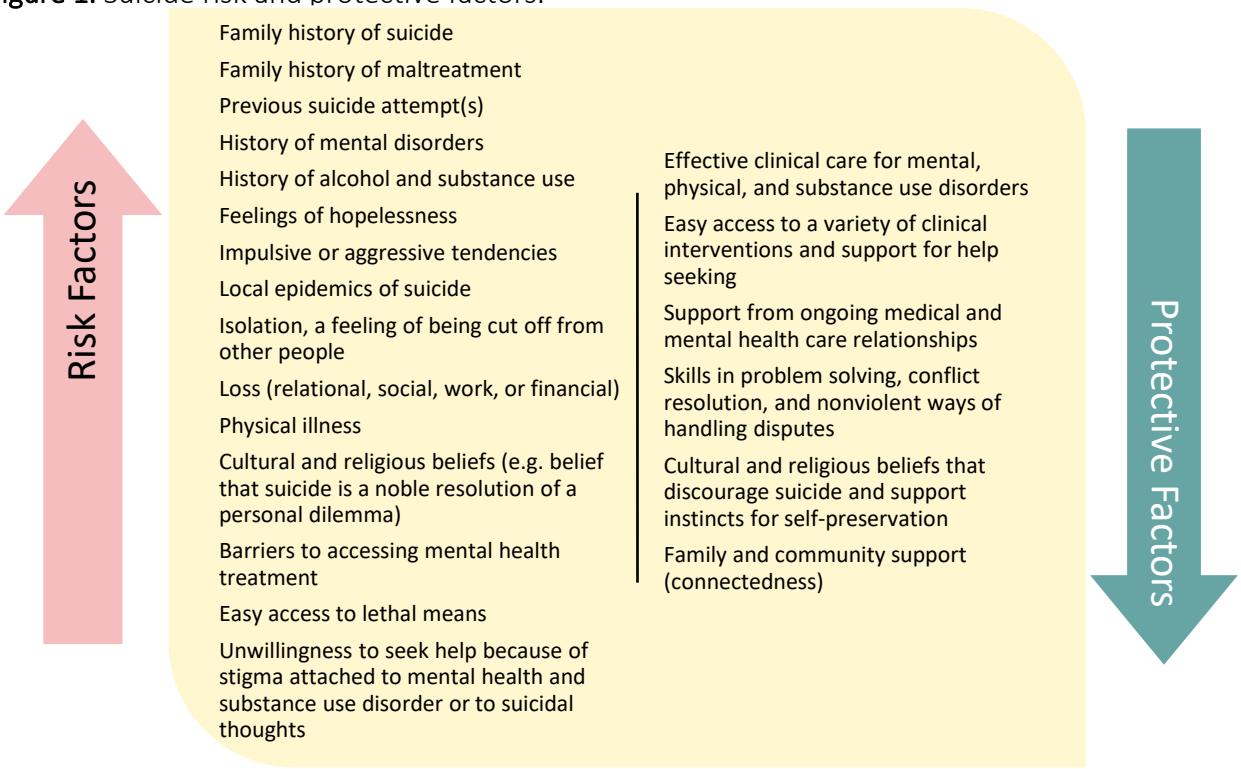
Background

Between August 2017 and March 2018, the community of Stark County, Ohio experienced 12 suicides among middle and high school students. During this timeframe, the suicide rate among youth aged 10–19 years rose to 20 deaths per 100,000 persons per year, nearly 4 times the U.S. national rate of 5.5 deaths per 100,000 persons per year and the 2011–2016 Stark County rate of 5.4 deaths per 100,000 persons per year. In response to the rapid rise in suicides among adolescents in their community, Stark County Health Department (SCHD) and Ohio Department of Health (ODH) requested assistance from the Centers for Disease Control and Prevention (CDC) to examine factors contributing to increased suicidal behaviors among Stark County youth.

Suicide

Suicide is a serious and growing public health problem. Between 1999 and 2016, suicide rates among person ≥10 years of age increased by 36% in Ohio and 25.4% across the United States.[1] Nationally, in 2016, suicide was the second leading cause of death for people 10 to 34 years of age.[2] Suicide and suicidal behavior are associated with several risk and protective factors, are connected to other forms of injury and violence, and can cause serious health and economic consequences. Fortunately, suicide is preventable.[3] There is no single cause for a death by suicide; suicide is caused by a convergence of individual, relationship, cultural, and societal risk factors (Figure 1).[4] Risk factors are characteristics associated with suicide—they may not be direct causes of suicide.[4] Protective factors buffer individuals from suicidal thoughts and behaviors.[5] Identifying and understanding protective factors is critical for the prevention of suicide.[3,6]

Figure 1. Suicide risk and protective factors.



Suicide Clusters

Suicide clusters account for 1-5% of all youth suicides.[7] A suicide cluster is defined as a group of suicides or suicide attempts that occur closer together in time and space than would normally be expected in a given community. Suicide clusters are usually identified by communities, rather than through epidemiologic detection.[8] Suicide, whether occurring in a cluster or in isolation, is a multi-determined event with numerous causes.[9] Knowledge about the mechanisms underlying clustering of suicides is still emerging; imitation and identification are two factors hypothesized to increase the likelihood of suicide clusters.[10] Imitation has been defined as initiation of a behavior after observation of a similar behavior in others.[11] In terms of suicidal behavior, this is often colloquially referred to as "copycat" suicidal acts.[10] Identification is a psychological phenomenon where an individual self-identifies or empathizes with a suicide. Internalization of these feelings may lead to suicidal behavior.[12] These processes are thought to contribute to suicide "contagion": the manner by which one suicide facilitates the occurrence of a subsequent suicide.[9] Among vulnerable persons, direct or indirect exposure to suicide may increase risk of subsequent suicide. Known harmful direct exposures include close relationship with a person who died by suicide or observing a suicidal act.[13,14] Known indirect harmful exposures include watching television news coverage of a celebrity suicide or hearing about a suicide by word of mouth.[15-17]

In 1988, the *CDC Recommendations for a Community Plan for the Prevention and Containment of Suicide Clusters* was published, providing an overview for communities responding or planning a response to a suicide cluster.[18]

Box 1. Recommendations for a Community Plan for the Prevention and Containment of Suicide Clusters include:

- Development of a response plan before the onset of a suicide cluster
- Response to a suicide cluster involving all concerned sectors of the community and coordinated by a Coordinating Committee and a Host Agency
- Identification of relevant community resources
- Implementation of crisis response plan: a) when a suicide cluster occurs in the community, or b) when one or more deaths from trauma occur in the community, as these events may potentially influence others to attempt or die by suicide
- Contact all relevant parties when the crisis plan is being implemented
- Implementation of crisis response in a manner that avoids glorification of the suicide victims and minimizes sensationalism
- Identification of persons at high risk of suicide with subsequent screening interview(s) with a trained counselor
- Referral of high risk persons for further counseling or other services as needed
- Timely flow of accurate, appropriate information to the media
- Identification and change of elements in the environment that might increase the likelihood of further suicides or suicide attempts
- Investigation of long-term issues suggested by the nature of the suicide cluster

Source: O'Carroll, Mercy & Steward, 1988[18]

Background on Stark County

Stark County is located in northeastern Ohio. According to the U.S. Census, the estimated population of Stark County in July 2017 was 372,542 persons.[19] Approximately 21.6% of the population of Stark County was under the age of 18 years in July 2017. The county is predominantly White (88.2% of the population); other racial/ethnic groups include Black or African American (7.9%), Asian (1%), Hispanic or Latino (2.1%), and Native American (0.3%).[19] Approximately 13% of Stark County residents live below the federal poverty limit.[19]

Stark County Coordinating Committee

In January 2018, leaders from public health, mental health, education, law enforcement, and other key groups formed a multisectoral task force to coordinate community response to the suicide cluster. In April 2018, this group partnered with Stark County Health Department, Ohio Department of Health, and Centers for Disease Control and Prevention to collect epidemiologic data to inform the prevention of further youth suicides through an Epi-Aid.

Epi-Aid Investigations

Epi-Aid investigations are rapid, short-term investigations of urgent or emergent public health problems.[20] By making a formal request for epidemiologic assistance (Epi-Aid) from CDC, public health authorities can receive rapid, short-term, onsite technical assistance from Epidemic Intelligence Service (EIS) officers and other CDC subject matter experts to assist in a rapid response to public health problems. The goal of an Epi-Aid investigation is to provide specific, actionable public health recommendations that can be used by community stakeholders to mitigate the public health problem. Epi-Aid investigations cover both communicable and non-communicable health problems, as well as natural and manmade disasters. Previous Epi-Aid investigations of youth suicide clusters have been conducted throughout the United States.[21-27] Each Epi-Aid uses unique methods, approaches, and strategies to meet investigation objectives, informed by the specific public health problem, local context, available data sources, and epidemiological data.

Epi-Aid Objectives

CDC collaborated with Ohio Department of Health and Stark County Health Department to meet the following Epi-Aid objectives:

1. Rapidly determine the population in need of prevention services at all affected and at-risk middle- and high-schools in Stark County through a comprehensive school-based risk screen.
2. Identify precipitating factors for youth suicide that may contribute to ongoing suicidal behaviors among the Stark County youth population to prevent further suicide attempts and suicides.
3. Ascertain the activities, social supports, and other factors among the Stark County youth population that are most protective against suicide risk in order to guide immediate prevention activities.
4. Inventory and catalogue existing suicide prevention initiatives in Stark County and make recommendations on evidence-based suicide prevention programs.

Methods

The investigation involved collection and analysis of data from both primary and secondary data sources.

Data Sources & Methodology

NORTHEAST OHIO YOUTH HEALTH SURVEY (NOYHS)

Background. The Northeast Ohio Youth Health Survey (NOYHS) is a rapid, school-based suicide assessment tool created by SCHD, ODH, and CDC staff in Spring 2018. NOYHS was administered as an online, anonymous, cross-sectional survey of 7th-12th grade students attending participating public middle- and high-schools affiliated with Stark County Educational Service Center (SCESC) in April–May 2018.

Survey Methodology. NOYHS was administered under the guidance of school administrators and teachers using school-specific web links hosted by ODH's REDCap online survey software. Survey administration began on Wednesday, April 11, 2018 and continued through the end of May 2018. Survey administration methods varied among schools, with some administering the survey during a specific class period (e.g., math class) and others administering the survey at a single clock time. School districts were given the option of omitting any survey modules they did not want to include. Survey modules included demographics, school performance and activities, loneliness and hopelessness, social media, health, adverse childhood experiences, suicide memorials and social exposures, parental connectedness, access to lethal means, sexual minority status, substance use, depression, suicidality, and resilience.

The survey adopted a passive consent model, notifying parents and guardians of the survey in advance via phone and mail. Students could opt out of survey participation prior to or at any time during the survey. All participating students were given a list of locally available mental health resources. Additional mental health counselors were available onsite at each school during and after survey administration. Students who were absent from school or otherwise not present in the classroom at the time of the survey were not able to participate. Students were included in analyses if they completed and submitted the survey. Response rates were calculated as the number of completed and submitted surveys divided by the number of opened surveys.

Measures. Suicidal ideation and attempts were measured using the Ask Suicide-Screening Questions (ASQ)[28] and the Suicidal Behaviors Questionnaire-Revised (SBQ-R).[29] The ASQ is a set of screening questions frequently used in medical settings to identify youth at risk of suicide. According to a 2012 study, a "yes" response to one or more questions identified 97% of youth at risk for suicide.[28] Those who answered "yes" to any of the ASQ items were categorized as having recent suicidal ideation.

Box 2. NOYHS questions from the Ask Suicide-Screening Questions (ASQ) tool:

> In the past few weeks, have you wished you were dead?
> In the past few weeks, have you felt that you or your family would be better off if you were dead?
> In the past week, have you been having thoughts about killing yourself?

Students were asked ASQ items to assess prevalence of suicidal ideation among students at the time of the survey. SBQ-R questions were asked to assess prevalence of suicidal ideation before the start of the suicide cluster (before August 2017). SBQ-R questions also assessed prevalence of suicide attempts for two separate time points: at any time before the 2017-2018 school year (prior to the first suicide cluster death) and during the 2017-2018 school year (after the first suicide cluster death).

Box 3. NOYHS questions adapted from the Suicidal Behaviors Questionnaire-Revised (SBQ-R):

- Before this school year (before August 2017), had you ever thought about killing yourself?
- Before this school year (before August 2017), had you ever attempted to kill yourself?
- During this school year (2017–2018), have you ever attempted to kill yourself?

Past suicidal ideation was measured by asking students to report whether they ever thought about killing themselves before the 2017–2018 school year. Those who answered "I have had a plan at least once to kill myself but did not try to do it" or "I have had a plan at least once to kill myself and really wanted to die" were categorized as having past suicidal ideation. Those who answered "never" or "it was just a brief passing thought" were categorized as not having past suicidal ideation. Suicide attempts were measured by asking students to report whether they had ever attempted to kill themselves, both before August 2017 and during the 2017–2018 school year. Those who responded "I have attempted to kill myself at least once, but did not really want to die" or "I have attempted to kill myself at least once, and really wanted to die" for either question were categorized as having a suicide attempt for the respective timeframes. Those who responded "never" were categorized as not having a suicide attempt for the respective timeframes.

NOYHS measured a number of potential risk and protective factors, which were categorized into two groups: baseline factors and suicide cluster-related factors. All survey questions are provided in Appendix 5.

Box 4. Baseline risk and protective factors included in NOYHS:

- Race/ethnicity
- Sex
- Age
- School grade
- Commitment to school and academic achievement
- Engagement in anti-social behaviors
- Extracurricular involvement
- Screen time
- Access to healthcare
- Mental health
- Supportive family environment & community connectedness
- Hopelessness
- Loneliness

Box 4. Baseline risk and protective factors included in NOYHS *(continued)*:

- Resiliency
- History of bullying victimization
- Safety
- Access to firearms
- Recent stressors
- Adverse childhood experiences
- Sexual minority status
- Student substance use, including opioids
- Household substance use
- Having a friend or significant other die by suicide during the 2017-2018 school year
- Having a family member die by suicide during the 2017-2018 school year
- Having a history of suicidal ideation and/or attempt prior to the 2017-2018 school year

Box 5. Suicide cluster-related factors included in NOYHS:

- Exposure to vigils or moments of silence for teenagers who died by suicide during the 2017-2018 school year
- Seeing social media posts related to suicide
- Posting on social media about suicide
- Seeing news related to suicide online on a news site
- Seeing memorials for suicide victims
- Seeing any episodes of the Netflix show *Thirteen Reasons Why*
- Emotional reaction to community suicides
- Being a student at a school that experienced a cluster-related suicide death
- Being friends with a student at a school that experienced a cluster-related suicide death

Substance use by students was assessed using questions adapted from the Youth Risk Behaviors Survey (YRBS).[30] Substance use was assessed for lifetime and past 30 days. Opioid misuse was defined as using heroin or a prescription pain medication without a doctor's prescription.

Students' feelings of loneliness were measured using a 3-item scale called the Children's Loneliness Scale.[31] Students were asked how often they felt alone, left out, or isolated from others. For each items, students could respond: "hardly ever," "some of the time," "often," or "prefer not to say." A score of 1–3 was assigned for each item, with higher scores reflecting having the feeling more frequently. Item scores were summed, and students with a total score of 5–9 were categorized as "lonely." Students with scores of 3–4 were categorized as "not lonely." Students who were missing any of the individual loneliness items were categorized as missing.

Feelings of hope and hopelessness were measured using a scale modified from the Brief-H-Neg and Flourishing Children Positive Indicators Project.[32,33] Students were asked how much they agreed with the following statements:

- "I feel that it is impossible to reach the goals I would like to strive for."

- "The future seems to me to be hopeless and I can't believe that things are changing for the better."
- "I expect good things to happen to me."
- "I trust my future will turn out well."
- "I feel excited about my future."

A score of 1–5 was assigned for each item, with higher scores reflecting higher levels of disagreement. The statements about whether the student feels that it is impossible to reach goals he/she would like to strive for and whether the future seems hopeless were reverse coded. Item scores were summed, and students with scores of 13–25 were categorized as feeling hopeless. Students with scores of 5–12 were categorized as not feeling hopeless. Students who were missing any of the individual hopelessness items were categorized as missing.

Studies demonstrate that qualities of resiliency can protect against suicide and buffer effects of suicide risk factors.[34] Resiliency was measured using an adapted version of the Child and Youth Resilience Measure.[35] Students were asked to rate, on a 5-point scale, how much they agreed with a series of 28 statements. Higher scores indicated higher level of agreement. These statements covered topics including relationships with parents/caregivers, family, and friends; feelings of support, safety, and fair treatment; and participation in their communities. These items are intended to evaluate students' individual, caregiver, and contextual resiliency through assessments of personal skills, peer support, social skills, relationships with primary caregiver(s), and spiritual, educational, and cultural context of their lives. Below are example statements:

- "I have people I look up to."
- "I cooperate with people around me."
- "Getting an education is important to me."
- "I am proud of my ethnic background."
- "People think that I am fun to be with."
- "I talk to my family/caregivers about how I feel."
- "My best friend is a positive role model."

Students were asked about their feelings of depression around the time of spring break during the previous school year (April 2017) and during the past two weeks (April 2018). The purpose of asking about these two time-periods was to see whether students had experienced a change in feelings of depression since the onset of recent suicides in their community. Depression was measured using a 2-item scale that is commonly used in clinical practice as a first-step depression screener:[36]

<u>In April 2017/over the past 2 weeks</u>, how often were you bothered by any of the following problems?

- Little interest or pleasure in doing things
- Feeling down, depressed, or hopeless

For the purposes of this survey, the 2-item scale was used as a proxy for symptoms of depression. Following the survey, this information was provided to school districts to help them understand what proportion of their student population may benefit from further depression screening. Individual students were not referred based on results, as the survey was anonymous. Based on students' responses, students were categorized as having or not having symptoms of depression.

A strong predictor of future death by suicide is a previous attempt.[34] Students with recent suicidal behaviors are at higher risk of death from suicide. Students were asked a series of questions about suicide ideation and attempts before the suicide cluster (before August 2017) and during the suicide cluster (August 2017 - May 2018). Possible responses to the question "Before/during this school year, [had/have] you ever thought about killing yourself?" included:

- "Never"
- "It was just a brief passing thought."
- "I had a plan at least once to kill myself but did not try to do it."
- "I had a plan at least once to kill myself and really wanted to die."

Possible responses to the question, "Before/during this school year, [had/have] you ever attempted to kill yourself?" included:

- "Never"
- "Yes, I have attempted to kill myself at least once, but did not want to die."
- "I have attempted to kill myself at least once, and really wanted to die."

To understand the severity of suicide symptoms at the time of the Epi-Aid, a series of validated suicide items—Ask Suicide Questions (ASQ)—was posed to participating students. Answers to the following questions clarified the prevalence of suicidal behaviors among Stark County students at the time of the Epi-Aid:

- "In the past few weeks, have you wished you were dead?"
- "In the past few weeks, have you felt that you or your family would be better off if you were dead?"
- "In the past week, have you been having thoughts about killing yourself?"

Participation. Participation in NOYHS was offered to all 50 schools represented by the SCESC in Spring 2018. In total, 15,083 students from 34 schools, 18 school districts, and 3 counties participated, representing 50% of all Stark County public middle- and high-school students (n=30,083) and 73% of all participating schools' students (n=20,655).[i] In this report, only results of surveys from 14 school districts that: 1) completed all survey modules, and 2) were located in Stark County were included (n=13,796). Data are not available for students attending non-participating public schools; students attending schools that did not include all survey modules;

[i] This data represents a headcount of students in attendance during the first full week of classes in October 2017 and was obtained from the Ohio Department of Education website.[37]

those at private, alternate, online, or home schools; students absent from school; or those who opted out of participating.[ii] Among students who opened the survey link, 90.2% completed the survey (n=12,448). Students were able to skip individual questions by choosing the response, 'Prefer not to say', and still complete the survey. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Analyses. Analyses were conducted using SAS v9.4 (Cary, NC) and R v3.4.0 (Vienna, Austria). Univariate counts and percentages were calculated for all survey domains to describe the distribution of potential risk and protective factors among participating Stark County students. Bivariate analyses (chi-square, t-tests) were performed for all survey domains using the outcome of recent suicidality (defined as answering "yes" to one or more ASQ questions or endorsing ≥1 suicide attempt during the 2017–2018 school year).

Multivariable analyses were computed using generalized estimating equations based on the logistic distribution in order to estimate odds ratios for associations between risk and protective factors and recent suicidality, accounting for clustering of students within schools using an exchangeable correlation structure. First, unadjusted odds ratios for the independent association of each risk or protective factor and recent suicidality were calculated. Next, potential risk or protective factors were included in the same model to estimate mutually adjusted odds ratios for the associations of all potential risk or protective factors and recent suicidality.

Social network theory has been applied to individuals in populations to better understand how behaviors, ideas, diseases, and control measures spread. Analyses of social networks between students were performed using R v3.4.0 (Vienna, Austria) and Gephi v0.9.2.[39] Students were asked to identify what schools their friends attended. Although students were provided with a list of all public middle- and high-schools in Stark County, only schools participating in the survey were included in the network mapping. Social network analyses were used to determine and characterize:

- Connections between students at different schools in Stark and surrounding counties
- Changes in suicidal behavior associated with social network connections between students at schools affected/unaffected by a suicide death

A social network diagram was created with each circle representing a school and each line (connection between 2 circles) representing friendships between students at the connected schools. Each circle represents an individual school. Only schools with ≥25% of students endorsing friendships were shown for ease of interpretability. Unidirectional lines were depicted

[ii] The U.S. census estimates 47,262 youth aged 10-19 years lived in Stark County in 2016.[38] This census estimate includes individuals aged 10-11 years who were not offered participation in NOYHS. An exact number of non-participants for the entire county is not available.

with a one-way arrow, indicating that ≥25% students, for example, at School A endorsed friendships with students at School B but ≤25% students at School B endorsed friendships with students at School A. Bidirectional lines were depicted with a two-way arrow, indicating reciprocal endorsements of friendship between ≥25% students, for example, at both Schools A and B. Circle sizes were proportional to the centrality of the school in the network. Circles that appear closer together on the social network diagram represent schools with a higher proportion of students endorsing friendships. Circles that are far apart on the social network diagram represent schools with a lower proportion of students endorsing friendships. Schools towards the center of the social network diagram have more connections than schools on the periphery. Color indicates the percentage of students reporting suicide attempt during the 2017–2018 school year, varying from light grey (lower prevalence of suicide attempts) to blue (higher prevalence of suicide attempts).

Limitations.

NOYHS data are subject to some limitations. First, given the cross-sectional nature of the survey, the quality of information collected is dependent on participant recall. The survey was anonymous to preserve students' privacy; however, despite the anonymity of the survey, it is possible that some at-risk students did not feel comfortable answering certain questions, which would result in an underreporting of certain factors. Additionally, cross-sectional surveys present associations between factors and do not establish causality. The presence of an association between a risk factor and suicidal ideation cannot be interpreted as the risk factor directly causing suicidal ideation. Next, only students attending participating schools in the 14 school districts that: 1) completed all survey modules, and 2) are located in Stark County were included. Students at non-participating school districts, school districts in other counties, or school districts that did not use all survey modules may differ from analyzed school districts. Additionally, students attending private, alternate, online, or home schools; students absent on the day of the survey; and students who opted out of participating are not represented by the survey. It is possible that the prevalence of risk and protective factors are different for these populations. Next, this survey represents risk factors among those with suicidal ideation and suicide attempts. The risk factors among this population may be different from those who die by suicide. Lastly, the survey used best available, validated screening questions to evaluate complex concepts like hopelessness, loneliness, and resiliency when available. As these are complicated constructs, it is possible that the brief nature of the survey questions did not adequately capture these factors, limiting the ability to make conclusions about specific factors of interest. For example, to assess feelings of depression prior to the start of the suicide cluster, we adapted depression screening questions to inquire about students' past feelings of depression during Spring Break 2017. As these depression questions are not validated for retrospective use, it is possible that we did not accurately capture previous feelings of depression. Additionally, students with incomplete responses to the hopelessness and loneliness modules were classified as missing for these items; it is possible that students feeling lonely or hopeless were omitted because they were missing one or more items.

CDC's WEB-BASED INJURY STATISTICS QUERY AND REPORTING SYSTEM (WISQARS)

Background. CDC's WISQARS is an interactive, online database that provides fatal and nonfatal injury, violent death, and cost of injury data from a variety of sources.[2] Data from WISQARS were used to calculate suicide rates for Ohio and the United States (U.S.) for youth aged 10–19 years from 2010 through 2016. Additionally, WISQARS was used to calculate national rates of nonfatal self-injurious behaviors among youth aged 10 to 19 years reporting to U.S. emergency departments (ED) with intentional self-injury (self-harm, attempted suicide) for the years 2010 to 2016.

Fatal injury case definition. To be included in analyses of WISQARS fatal data, the following case definition was used:

- Decedent 10 to 19 years of age
- Cause of death indicated with ICD-10 code of X60-X84 (Intentional self-harm)

Nonfatal injury case definition. To be included in analyses of WISQARS nonfatal data, the following case definition was used:

- Aged 10 to 19 years at time of ED visit
- Intent of injury coded in NEISS-AIP database as self-harm, defined as an injury or poisoning resulting from a deliberate violent act inflicted on oneself with the intent to take one's own life or with the intent to harm oneself

Data sources. WISQARS' fatal data comes from the National Center for Health Statistics (NCHS). NCHS compiles mortality data annually from information reported on death certificates in all 50 states and the District of Columbia. Causes of death are processed in accordance with the *International Classification of Diseases, Tenth Revision Clinical Modification* (ICD-10-CM). WISQARS' nonfatal data comes from the National Electronic Injury Surveillance System-All Injury Program (NEISS-AIP), an expansion of the National Electronic Injury Surveillance System (NEISS) operated by the U.S. Consumer Product Safety Commission (CPSC). NEISS-AIP began on July 1, 2000 as a collaboration between the National Center for Injury Prevention and Control (NCIPC) and CPSC to collect data about all types and external causes of non-fatal injuries and poisonings treated in U.S. hospital emergency departments (EDs). The NEISS hospitals are a stratified probability sample of all U.S. hospitals (including U.S. territories) that have at least six beds and provide 24-hour emergency services. The NEISS-AIP data are collected at 66 of the 100 NEISS hospitals, which represent the nation's range of hospital settings. NEISS and NEISS-AIP hospitals include very large inner-city hospitals with trauma centers as well as large urban, suburban, rural, and children's hospitals.[2]

Analyses. Suicide rates of youth aged 10–19 years at the state and national levels were calculated through WISQARS and reported as deaths per 100,000 persons per year. In accordance with NCHS data reporting standards, WISQARS does not calculate rates when the numerator is less than 20 due to instability of the estimate. To overcome the unreliability/instability of rates calculated with less than 20 cases, data were combined across years where applicable.

National rates of nonfatal self-injurious behaviors for youth aged 10-19 years were calculated using WISQARS. Crude rates were calculated as number of injuries per 100,000 persons per year. Statistical differences between rates were determined using Fisher's exact test.

Limitations. CDC's WISQARS data are limited to the type of information provided. Due to the relatively rare event of suicide, county level suicide counts are not available for much of Ohio for the years examined in this Epi-Aid. To supplement this information, data from Ohio Violent Death Reporting System (OH-VDRS) were extracted for Stark County; this process is described in the Ohio Violent Death Reporting System section of the report. Additionally, WISQARS data through 2016 were available during the Epi-Aid, limiting state and national context for the timeframe of the Stark County suicide cluster.

Data for suicidal ideation without self-harm are not available in WISQARS. WISQARS definition of self-harm includes self-harm with the intent to take one's own life or with the intent to harm oneself; interpretation of rates should include acknowledgement that not all self-harm injuries are suicidal in nature. WISQARS' reliance on NEISS-AIP for nonfatal injury data means that state level data cannot be generated, as NEISS-AIP uses a stratified, probability sampling method to generate national estimates.

OHIO VIOLENT DEATH REPORTING SYSTEM (OH-VDRS)

Background. Ohio's Violent Death Reporting System (OH-VDRS), established in 2009, is a state-based active surveillance system that collects information about violent deaths. OH-VDRS uses data from vital records, medical examiners, coroners, and law enforcement to characterize demographics and precipitating circumstances of violent deaths. OH-VDRS is funded through a cooperative agreement with the CDC and is a part of a larger, national system called the National Violent Death Reporting System (NVDRS), which supports participating states using a standardized protocol.[40] The purpose of OH-VDRS is to assist in the prevention of violent deaths, including suicide, through the provision of comprehensive data on violent deaths in Ohio.

Case definition. OH-VDRS data from 2011 through March 30, 2018 were used. Cases were defined as:

- Aged 10 to 19 years at time of death
- Cause of death coded as suicide in OH-VDRS
- Stark County recorded as county of residence

Analyses. Descriptive statistics were extrapolated from OH-VDRS to characterize Stark County suicide decedents based on age, race/ethnicity, biological sex, and method of suicide. Number of suicides per year among Stark County residents aged 10–19 years were obtained from OH-VDRS to calculate rates of suicide per 100,000 persons per year for every year individually and pre- and post-cluster time periods (2011–2016 and 2017–2018). Stark County census population estimates from 2015 were used as the denominator for all Stark County rate calculations.

Multiple years were combined in order to achieve a count of at least 10 events, out of respect for decedents' confidentiality and National Center for Health Statistics' data suppression rules.

Based on counts extrapolated from historic OH-VDRS data, a statistical test was performed to determine the statistical likelihood of temporal clustering of suicides in Stark County. If suicides are not temporally clustered, they follow a homogenous Poisson distribution with intervals between suicides occurring randomly in time with a probability that is independent of previous suicides.[41] To determine how well the distribution of time between suicides fit a homogenous Poisson process, the Anderson-Darling (A^2) statistic was used. For all cluster analyses, a p-value of less than 0.05 was considered statistically significant.

Limitations. Based on the small number of cases per year, the years 2011–2016 (pre-cluster) and 2017–2018 (cluster) were aggregated to protect the confidentiality of decedents. Stark County deaths with suicide listed as cause of death were prioritized by OH-VDRS prior to the start of the Epi-Aid. As a result, basic information was available for review on all youth suicides taking place before March 2018. However, it may take up to a year and a half after the close of a data year for data to be finalized. As such, causes of death and other variables may change for 2017 and 2018. Analysis of these data should be considered preliminary and subject to change. Additionally, counts of suicide depend on death certificate data; in circumstances where the intent of death is unclear, suicides may be undercounted.

EPICENTER SYNDROMIC SURVEILLANCE SYSTEM

Background. EpiCenter is a syndromic surveillance system used by ODH to analyze real time healthcare data for the purpose of detecting anomalies suggestive of public health threats, such as disease outbreaks or bioterrorism attacks. EpiCenter provides automatic notification to designated health department personnel when anomalies are detected. In recent years, syndromic surveillance data have been used to track patterns and trends over time for specific syndromes. EpiCenter data from 2013–2018 were used to track patterns in nonfatal suicidal behaviors for each county in Ohio among youth aged 10-19. Nonfatal suicidal behaviors were examined because suicide deaths reflect only a small percentage of suicide's impact.[42] For each death by suicide, there are many more emergency department visits, hospitalizations, and events that never present to medical care.

Data Sources. EpiCenter uses a number of data sources in its model, including acute care visits, poison control center call data, and reportable diseases. Data from EpiCenter were used to assess patterns in acute care visits for nonfatal suicidal behaviors. Acute care visit records typically include the following data elements:

- Sending facility
- Registration date and time
- Encrypted patient ID
- Visit number
- Patient date of birth
- Patient sex

- Patient home zip code
- Free text chief complaint
- Discharge diagnosis ICD-10-CM & SNOMED CT codes
- Discharge disposition

Search Terms. EpiCenter acute care visits from January 1, 2016 to March 30, 2018 were analyzed using SAS v9.4 (Cary, NC) and R v3.4.0 (Vienna, Austria). Free text fields were searched for language related to self-harm and suicide using terms defined by CDC subject matter experts (e.g. “suic”, “ideation”, “self-harm”, “self-mutilation”, “attempt”). Search terms used to identify acute care visits related to intentional self-harm can be found in Appendix 1.

Search excluded visits related to unintentional injury, homicide, or persons denying suicidal ideation or attempt. Discharge diagnosis codes were searched for ICD-10-CM and SNOMED CT codes indicating intentional self-injury.[43] Diagnosis codes used to identify acute care visits related to intentional self-harm are listed in Appendix 1.

Analyses. After identifying visits related to nonfatal suicide attempt or intentional self-injury, trends were plotted over time by county (as defined by patient’s home zip code of record at time of visit). In order to account for temporal changes in acute care visit volume and number of facilities reporting, trends were evaluated by calculating the percentage of acute care visits related to intentional self-harm out of all reported acute care visits. To smooth out short-term fluctuations in weekly averages and highlight longer-term trends, the percent of acute care visits in Figure 4 was calculated as a simple moving average of the previous 2 weeks data.

Limitations. The volume and quality of data transmitted to ODH change over time, as hospitals improve their reporting standards and additional facilities begin reporting. As a result, this change in data volume and quality should be taken into consideration when interpreting trends across years. Different certified electronic health record technology systems (CEHRT) provide varying levels of detail for chief complaint, free-text boxes, and discharge diagnoses. Detail for these items may vary from provider to provider and facility to facility, although this variation would apply to all acute care visits (not just visits related to self-harm). Data quality or volume may have been affected over time by facilities transitioning from paper to CEHRT, one CEHRT to another, or patch upgrades to CEHRT during the study timeframe. By report, some facilities have randomly dropped reporting diagnoses; transitioned from ICD-10-CM codes to SNOMED CT codes; stopped reporting; or started reporting all encounters from all locations, such as primary care, outpatient care, urgent care, and emergency care.[44] Additionally, geographic bias may be present, based on the number and type of facilities that choose to participate in EpiCenter. Counties with a high proportion of urgent care or clinic facilities submitting data may increase the denominator disproportionately, affecting the proportion of suicide-related visits. All of these factors limit the interpretability of data across years.

Every effort was made to capture all visits related to self-harm using an extensive list of ICD-10-CM codes, SNOMED CT codes, and search terms. However, it is possible that visits were

misclassified based on the search algorithm.

MEDIA SCAN

Background. Several studies have shown that media coverage of suicide can influence behavior, especially in vulnerable individuals such as youth.[16,45,46] In contrast, responsible reporting can provide an opportunity to increase awareness of suicide, debunk myths, inform people where to seek help, and reduce suicides.[47,48] Safe reporting guidelines have been developed and can be reviewed at http://www.reportingonsuicide.org.[49] Additionally, the American Association of Suicidology developed suicide reporting recommendations in conjunction with Ohio MHAS, Nationwide Children's Hospital, and Ohio University's E.W. Scripps School of Journalism.[50] Examples of recommendations include avoiding description of the method used, avoiding dramatic headlines or photos, and encouraging reporting suicide as a public health problem.

Objectives. The Epi-Aid media review compared articles published about youth suicides in Stark County with published safe reporting guidelines in order to: 1) categorize articles according to how closely they adhered to recommended guidelines, 2) compare adherence to guidelines by article type and media source, and 3) review how adherence to guidelines changed over time and with respect to the timing of deaths.

Article identification. A systematic, cross-sectional review of media published from August 13, 2017 to March 29, 2018 was conducted. Media included any written, audio, or video publications identified by a two-step process. First, a Google® search of "Stark County" + "suicide" was conducted for each week during the study period to identify all articles related to the Stark County youth suicides. Second, articles identified by this search were used to identify and further search individual media sources. The search was conducted on March 30, 2018.

Coding Methods. Using several sources, a protocol was developed to characterize articles that did and did not adhere to recommendations for safe reporting on suicide (http://www.reportingonsuicide.org).[48,49,51-53] Each source was reviewed and a list of established criteria was compiled. The list of criteria and sources are included in Appendices 2 and 3.

A standardized protocol for conducting reviews, including definitions for all variables, was developed. For the protocol and further description of definitions used, see Appendix 2. Reviews were conducted from April 13 to May 1, 2018. Six people reviewed articles. Because some criteria included subjective evaluation, training for reviewers was conducted. All reviewers reviewed the same five randomly selected articles. Responses for each variable were compared among all six reviewers, disagreements were settled by consensus, and the protocol was updated accordingly.

For each article, the publication date, media source (local, regional Ohio, regional elsewhere, national, international, or internet), media type (radio, television, newspaper, website, video, or school/community communications), and article title were recorded. Obituaries were included in school/community communications. Articles that also contained videos were reviewed as a single item.

Three main sections of the article were reviewed: headline or title, photo or video, and main

body of the text. Each section had multiple criteria, which were coded as single variables with a yes or no response. Headline criteria included use of sensationalized wording, mention of the death method, or mention of the death location. For the purpose of this evaluation, "sensationalized" included any strong language (e.g., 'epidemic' or 'crisis'), a graphic description of suicide, or stigmatizing language (e.g., "committed suicide"). Photos were reviewed for positive (e.g., school or family photos of the decedent) or negative (e.g., images of the method, location, grieving family or friends, memorial, funeral services) characteristics. If a video was present, the number of views as of the review date was recorded. The main body of the text was reviewed for description of the decedent, description of the method, description of the causes of suicide, inclusion of education or resources, interviews with law enforcement about the causes of suicide, advice from public health experts, use of strong or stigmatizing language, and reporting of myths.

Duplicate articles (e.g., reposts) were identified by individual reviewers during reviews. After all reviews were completed, a single reviewer evaluated all article titles and removed any additional duplicate articles.

Analysis. Data were entered in Microsoft® Excel® 2016 and analyzed in SAS (v9.4). ANOVA and t-tests were used for statistical comparisons. Interrater reliability of agreement was calculated using Fleiss' κ statistic.[54] The degree of interrater agreement based on the κ statistic may be interpreted with the following scale: <0, poor agreement; 0 to 0.20, slight agreement; 0.21 to 0.40, fair agreement; 0.41 to 0.60, moderate agreement; .61 to 0.80, substantial agreement; and 0.81 to 1.00, almost perfect agreement.[55] Interrater agreement was highly significant ($p<0.001$) with a κ statistic of 0.6609, indicating substantial agreement between raters.

Limitations. First, several article characteristics could be considered subjective (e.g., sensationalized headline). This effect was mitigated by the development of a standardized review protocol with definitions for subjective terms and by conducting training for reviewers. Second, the influence of each criterion on risk of promoting contagion is not well established. Summing the cumulative number of negative criteria artificially assigns equal weight to each criterion. However, this limitation applies to all media sources equally; therefore, the cumulative number of negative criteria is less important than the comparison across media sources.

PREVENTION INITIATIVES INVENTORY

Background. Prior to and during the youth suicide cluster, many suicide prevention initiatives were started in Stark County. One of the objectives of the Epi-Aid was to inventory and catalogue existing suicide prevention initiatives in Stark County in order to document the work being done at the county level and make recommendations on evidence-based suicide prevention programs that could be applied to other counties in Ohio.

Data sources. Existing suicide prevention initiatives were inventoried through key informant interviews with stakeholders at SCHD, Stark County Mental Health & Addiction Recovery (Stark MHAR), and the Mobile Response Team. All types of suicide prevention, including youth suicide prevention, were included in the inventory. Additional prevention initiatives were identified

using a systematic internet search for programs related to suicide prevention in Stark County. A list of programs identified is found in Appendix 4.

Methods. Programs, policies, and activities were catalogued in an Excel spreadsheet. Each initiative was examined for the following characteristics: implementing agency, type (e.g., policy, activity, or program), and focus/content (e.g., education, gatekeeper training, community engagement activity).

Analyses. After identifying suicide prevention resources in Stark County, initiatives were examined based on their website content or materials provided by stakeholders to the Epi-Aid team. Prevention initiatives were examined relative to the CDC's Suicide Prevention Technical Package, *Preventing Suicide: A Technical Package of Policy, Programs, and Practices*.[3] This technical package highlights strategies, approaches, and example programs to help states and communities prevent suicide using the best available evidence.

Box 6. Suicide prevention strategies and approaches from CDC's *Preventing Suicide: A Technical Package of Policy, Programs, and Practices.*

Strategy	Approach
Strengthen economic supports	• Strengthen household financial security • Housing stabilization policies
Strengthen access and delivery of suicide care	• Coverage of mental health conditions in health insurance policies • Reduce provider shortages in underserved areas • Safer suicide care through systems change
Create protective environments	• Reduce access to lethal means among persons at risk of suicide • Organizational policies and culture • Community-based policies to reduce excessive alcohol use
Promote connectedness	• Peer norm programs • Community engagement activities
Teach coping and problem-solving skills	• Social-emotional learning programs • Parenting skills and family relationship programs
Identify and support people at risk	• Gatekeeper training • Crisis intervention • Treatment for people at risk of suicide • Treatment to prevent re-attempts
Lessen harms and prevent future risks	• Postvention

- Safe reporting and messaging about suicide

Limitations. Multiple sources were used to identify suicide prevention initiatives in Stark County; despite this effort, it is possible that initiatives were missed by the review. All available program materials were comprehensively reviewed, but the Epi-Aid team was unable to examine the actual implementation of these strategies and approaches. Determination of initiatives' alignment with technical package strategies and approaches was based solely on the documentation the team was provided; it is possible that some initiatives were not being implemented with fidelity according to the documentation and, therefore, their alignment with the technical package may vary.

Ethical Considerations

The Northeast Ohio Youth Health Survey (NOYHS) was conducted by ODH as a component of its urgent public health response to the youth suicide cluster, with the purpose of preventing further suicide deaths and self-inflicted injuries among youth. As the purpose of this investigation was not research but public health practice, Institutional Review Board (IRB) approval was not required. Parents/guardians were informed of the survey's purpose and methods in advance and could refuse their child's participation; students could opt out prior to or at any time during survey administration. All data collected from participants was anonymous. Upon completion of the survey, all participants were provided with a list of services, including services for mental health and violence prevention. Counseling was immediately provided to those who became upset during the survey or requested help.

All secondary data sources including EpiCenter syndromic surveillance, vital statistics, OH-VDRS, and WISQARS were deidentified prior to analysis. To ensure confidentiality and limit the possibility of identification of an individual, data were suppressed when a cell size was less than 10 individuals. Per the *2005 CDC-ATSDR Data Release Guidelines and Procedures for Re-release of State-Provided Data*, certain data were not presented even with a cell size larger than 10 individuals depending on topic sensitivity, variable format (e.g., categorical or continuous), geographic level of detail, and population/subgroup denominator size. For all analyses, efforts have been made to ensure data are presented in a way that would not lead to the identification of an individual.

Results

Trends in Fatal and Non-Fatal Suicidal Behaviors among Youth

In order to understand the patterns of fatal and non-fatal suicidal behaviors among Stark County youth, descriptive epidemiologic analyses were performed to contextualize trends in Stark County with state and national estimates.

Suicide Death Rates. Data were used to calculate suicide rates before the start of the suicide cluster (2011–2016) in Stark County, Ohio, and nationally (Table 1); and after the start of the cluster (2017–2018) in Stark County. Prior to the start of the suicide cluster (2011–2016), suicide rates were comparable between Stark County (5.4 suicide deaths per 100,000 person years), Ohio (5.5 suicide deaths per 100,000 person years), and the United States (5.4 suicide deaths per 100,000 person years). In 2017, the suicide rate rose to 8.3 deaths per 100,000 person years. In the first 3 months of 2018, the suicide rate increased to 66.8 deaths per 100,000 person years in Stark County. From January 1, 2017 through March 30, 2018, the suicide rate rose to 20 suicide deaths per 100,000 person years in Stark County (Table 1), a statistically significant increase in suicide deaths (p=0.002). Violent death data were not yet available for 2017–2018 at the state or national level at the time of this Epi-Aid investigation.

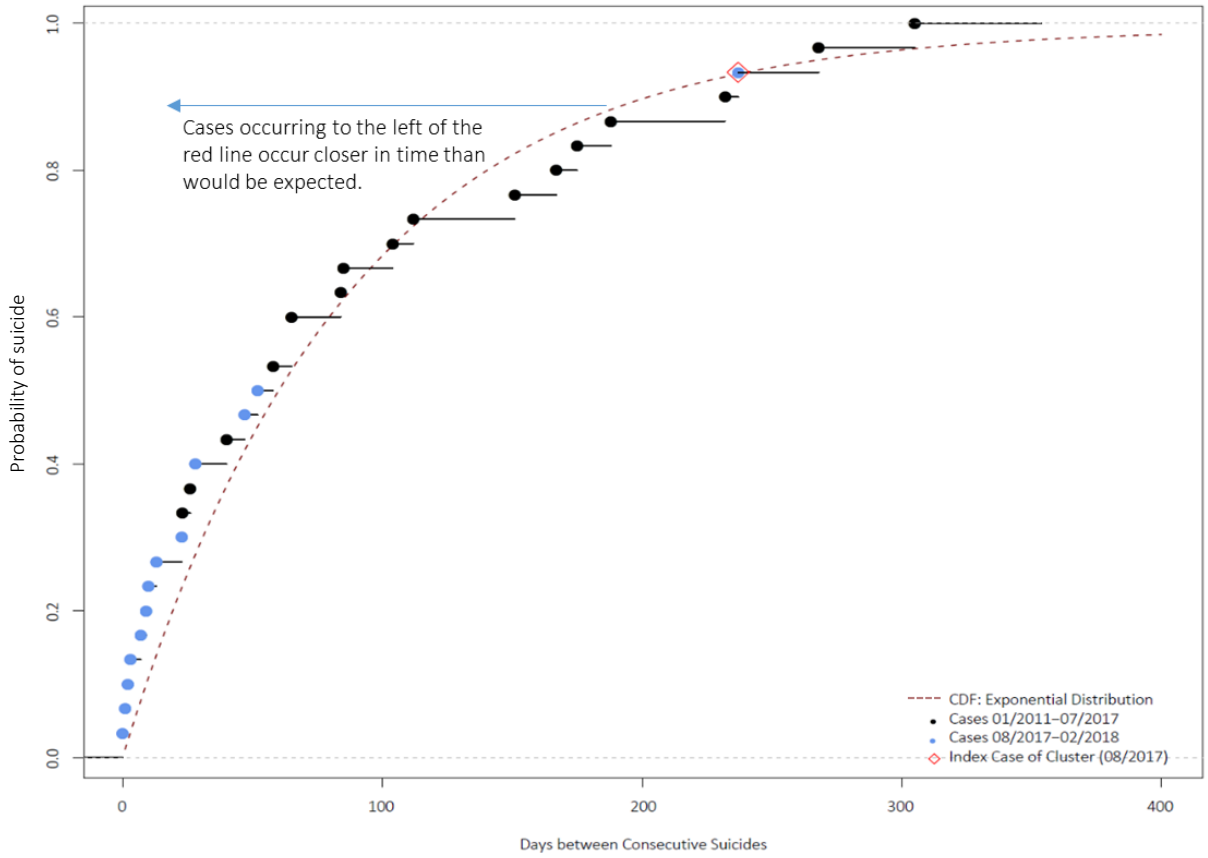
Table 1. Suicide rates (per 100,000 person years) for Stark County, Ohio, and the United States among 10-19 year olds, 2011–2018.

Year	Stark County	Ohio	U.S.
2011–2016	5.4	5.5	5.4
2017–2018*	20	---	---

*Data for 2017–2018 were not available at the state or national level during the Epi-Aid. Data for 2017–2018 for Stark County reflect deaths occurring between January 1, 2017 and March 30, 2018.

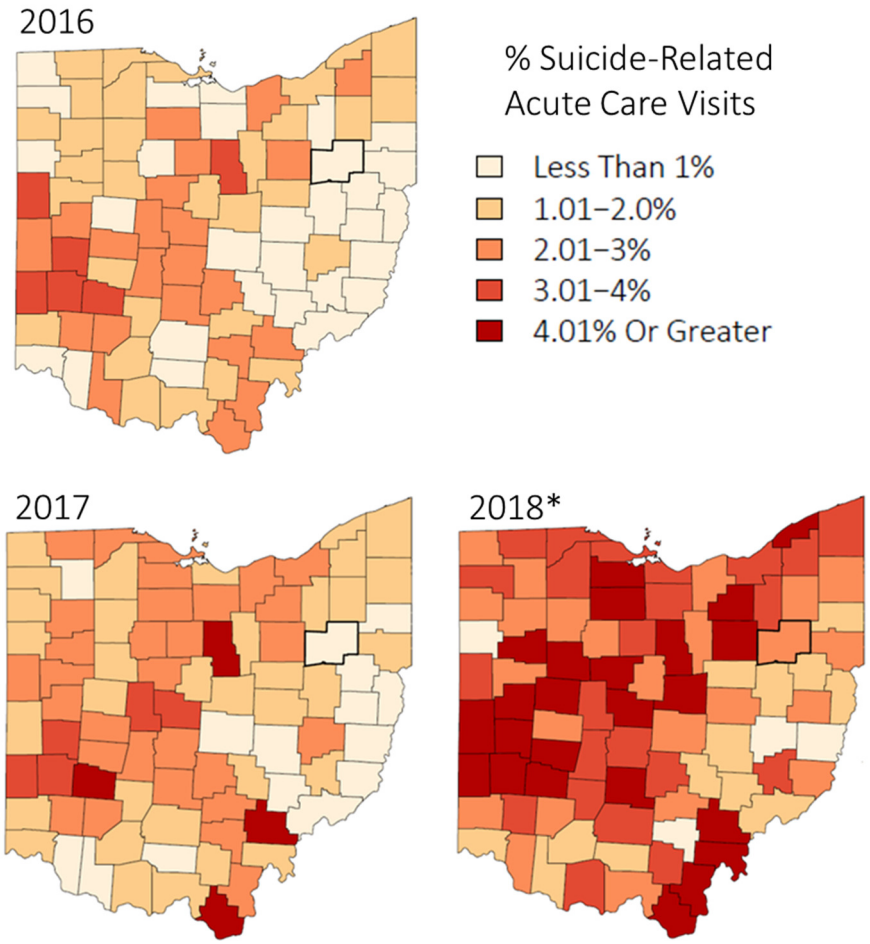
Temporal Clustering. Figure 2 depicts the distribution of time intervals between suicides in Stark County in 2011-2018. Analysis of all Stark County youth suicides between 2011 and 2018 indicates a statistically significant cluster of youth suicides took place in Stark County between August 2017 and February 2018. All cases related to the Stark County youth suicide cluster occurred closer together in time than would be expected if the suicides occurred randomly and independently of each other.

Figure 2. Statistically significant temporal clustering of youth suicides in Stark County (August 2017–February 2018) when compared with previous Stark County youth suicides (January 2011–July 2017).



Acute care visits related to non-fatal suicidal behaviors. In order to account for temporal changes in acute care visit volume and number of facilities reporting to EpiCenter, trends were evaluated by calculating the percentage of acute care visits related to suicidal behaviors out of all reported acute care visits among children and adolescents aged 10-19 years. Results are presented as the percentage of acute care visits related to suicidal behaviors among children and adolescents aged 10-19 years, rather than as a rate. Figure 3 depicts the percentage of emergency department visits related to suicidal ideation or suicide attempts between January 2016 and March 2018, among children and adolescents aged 10-19 years. In general, the percent of acute care visits related to suicide among youth increased substantially for many counties in Ohio. Stark County (outlined in black in Figure 3) had a relatively low proportion of <1% of acute care visits related to youth suicidal behaviors in 2016–2017 (Figure 3). However, in 2018, Stark County's proportion of acute care visits related to youth suicidal behaviors rose to 2.2%. Furthermore, Stark County's increase from 0.8% to 2.2% between 2016 and 2018 represented a significant percent increase (181%) in acute care visits among youth attributable to suicidal behaviors.

Figure 3. Percent of total acute care visits related to suicidal ideation or suicide attempts among children and adolescents aged 10-19 years in Ohio, January 2016–March 2018.



*Data for 2018 reflect acute care visits occurring between January 1, 2018 and March 30, 2018.

Table 2 presents the percent of acute care visits related to youth suicidal behaviors during 2016–2018. The percent of acute care visits was generally lower in Stark County than Ohio. Statistically significant increases in the proportion of acute care visits related to suicidal behaviors were observed for both Stark County and Ohio during 2016–2017 and 2017–2018. Between 2016 and 2018, the percent of acute care visits related to suicide increased by 181% in Stark County and 100% in Ohio. The proportion of acute care visits related to suicide increased by 42% during the suicide cluster in Stark County. Of note, only the first 3 months of 2018 were available for this analysis; results of Table 2 should be interpreted with this in mind.

Table 2. Proportion of acute care visits related to youth suicidal behaviors, 2016-2018.*							
Area	Proportion of acute care visits related to suicidal behaviors			Percent Change			
	2016	2017	2018†	2016 → 2017	2017 → 2018†	2016 → 2018†	Before Cluster → After Cluster
Stark County	0.8%	1.0%	2.2%	+25%	+125%	+181%	+42%
Ohio	1.7%	2.2%	3.4%	+34%	+50%	+100%	+36%

* Percent change compares mean proportion of ED visits in latter year to mean proportion of ED visits from earlier year. † Data for 2018 reflect acute care visits occurring between January 1, 2018 and March 30, 2018.

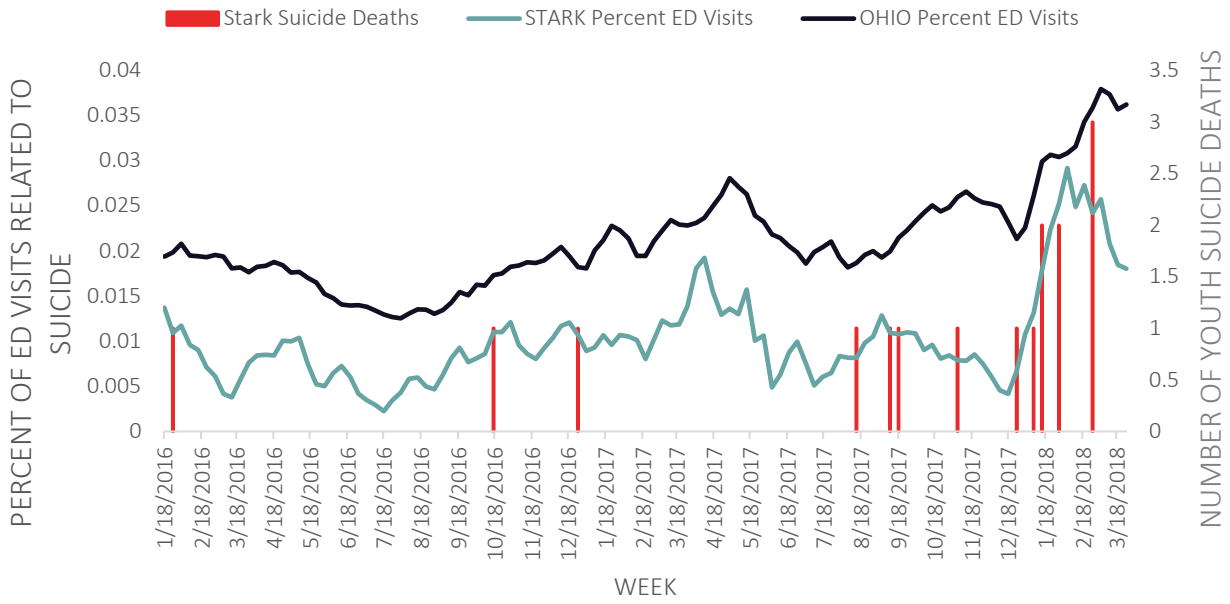
Table 3 depicts the percent of acute care visits related to suicidal behaviors during the first quarter of 2016, 2017, and 2018. A similar pattern of increasing proportion of ED visits related to suicidal behaviors are observed for the first quarters of 2016, 2017, and 2018 in both Stark County and Ohio.

Table 3. Proportion of acute care visits related to youth suicidal behaviors, First Quarter (January-March), 2016-2018.*						
Area	Proportion of acute care visits related to suicidal behaviors			Percent Change		
	Q1 2016	Q1 2017	Q1 2018	Q1 2016 → Q1 2017	Q1 2017 → Q1 2018	Q1 2016 → Q1 2018
Stark County	0.9%	1.1%	2.2%	+31%	+94%	+154%
Ohio	1.9%	2.2%	3.4%	+15%	+55%	+78%

* Percent change compares mean proportion of ED visits in latter year to mean proportion of ED visits from earlier year.

Figure 4 depicts both fatal and non-fatal behaviors in Stark County in 2016-2018. The left Y-axis shows the percent of suicidal behaviors among youth aged 10-19 years in Stark County; the right Y-axis demonstrates the number of suicide deaths among youth aged 10-19 years in Stark County. Emergency department visits for non-fatal behaviors generally mirror the trend of deaths, with more suicide-related acute care visits in 2018 coinciding with increased deaths from suicide in 2018.

Figure 4. Stark County Suicide Deaths & Percentage* of Acute Care Visits Related to Suicide Behaviors among 10-19 Year Olds in Stark County and Ohio, January 2016–March 2018.



*To smooth out short-term fluctuations in weekly averages and highlight longer-term trends, the percent of ED visits was calculated as a simple moving average of the previous 2 weeks data.

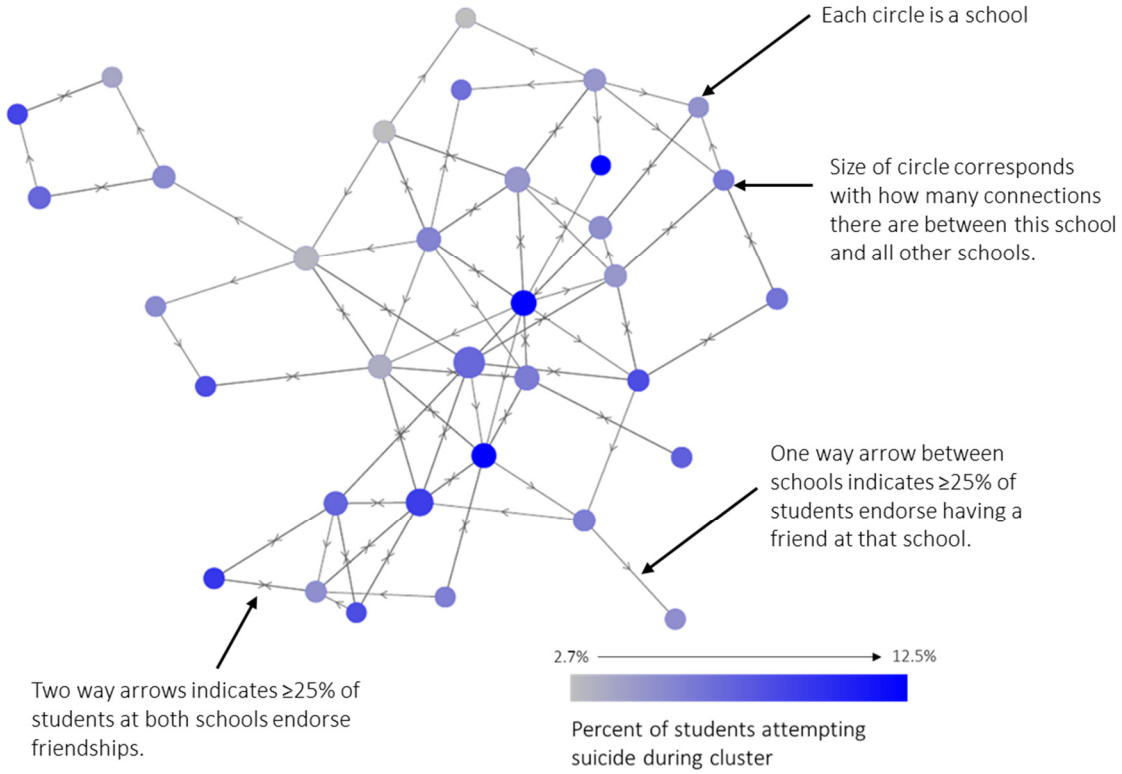
Northeast Ohio Youth Health Survey

This section contains the finalized results of the Northeast Ohio Youth Health Survey (NOYHS), providing an overview of risk and protective factors that exist among Stark County youth. Preliminary NOYHS results were published by ODH in September 2018.[56]

Social Networks. Social network theory has been applied to individuals in populations to understand how behaviors, ideas, diseases, and control measures spread. Figure 5 presents the distribution of friendships between students at different SCESC-affiliated schools. One-way arrows indicate that ≥25% of students, for example, at School A endorsed friendships with students at School B. Two-way arrows indicate that ≥25% of students, for example, at both Schools A and B reciprocally endorsed friendships.

Results show that schools are highly connected to one another. All schools have at least one connection to another school; many schools are connected to seven or more institutions through students' friendships. High prevalence of suicide attempts is present in schools at both the center and periphery of the social network. In the advent of social media and the internet, students make connections throughout a community. As such, a traumatic event at one school could easily affect students at another school, regardless of geographic proximity.

Figure 5. Social network of friendships between students at 27 different schools in Stark County, Ohio with percent of students reporting attempting suicide during the suicide cluster (August 2017–March 2018).



School Record. Table 4 shows the breakdown of students by grade point average. It also shows the percentage of students who reported skipping school during the 2017–2018 school year and the percentage of students who reported having specific types of disciplinary actions ever in their life. These percentages are reported for all participating students, as well as broken down by grade level and by sex.

Table 4. School record and disciplinary actions reported by Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Most recent grade point average									
4.0 or greater	24.1	25.3	23.9	23.0	24.6	23.4	23.9	18.8	29.5
3.5-3.9	32.8	40.5	36.1	29.8	31.6	28.7	29.8	30.4	35.2
3.0-3.49	23.2	20.3	22.9	23.8	21.9	25.7	25.6	25.9	20.5
2.5-2.9	12.2	8.7	10.4	14.4	12.9	13.8	13.5	15.3	9.3
2.0-2.49	5.1	3.2	4.5	6.2	6.1	5.4	5.2	6.4	3.8
Less than 2.0	2.5	2.0	2.2	2.9	2.9	3.0	2.0	3.4	1.6
Number of times skipped school in past year									
Never	63.0	66.7	65.9	62.3	64.8	60.9	55.1	64.6	61.6
1 or 2 times	23.5	22.1	22.1	24.5	24.0	23.8	25.1	22.1	24.9
3 to 10 times	10.7	9.0	10.0	10.7	8.6	12.3	14.9	10.4	11.0
More than 10 times	2.8	2.2	2.0	2.5	2.6	3.0	4.9	2.9	2.4
Disciplinary actions in lifetime									
In-school suspension	19.1	15.3	18.1	20.7	19.9	18.6	22.5	25.9	12
Out-of-school suspension	11.8	9.6	12.2	12.5	12.3	11.2	13.2	16.6	6.8
Expelled from school	1.1	0.9	1.3	1.4	0.8	0.8	1.0	1.5	0.6
Arrested	2.8	1.7	2.2	3.0	2.8	3.1	3.9	3.5	1.9
None of the above	77.1	81.8	78.2	74.7	76.3	78.3	72.8	69.3	85.4

* % represents the percentage of students reporting each response. For the question about disciplinary actions, students could provide multiple responses. The percentages of students who did not respond were 9.7% for the question about grade point average, 3% for the question about the number of times they had skipped school, and 2.3% for the question about disciplinary actions. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Participation in School and Community Activities. Studies demonstrate that participation in sports, school and community activities, and spiritual organizations reduce the probability of suicide and buffer the effects of suicide risk factors.[34] Students were asked about their participation in school and community extracurricular activities during the 2017–2018 school year. Table 5 shows the percentage of students who participated in each type of activity. It also shows the percentage of students who participated in any school or community activities versus no school or community activities. These percentages are reported for all participating students, as well as broken down by grade level and sex.

Table 5. Percentages of Stark County, Ohio students participating in school and community extracurricular activities during the 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

Type of Activity	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
School Activities									
Participated in any school activity	84.5	89.9	86.1	87.1	84.9	80.2	76.3	81.8	87.2
Any sport	57.3	63.7	62.7	60.9	58.4	49.9	44.6	61.0	54.2
Music/arts	40.1	58.6	47.1	41.4	33.1	28.2	28.3	32.8	47.2
Leadership/academic/ yearbook	16.4	15.5	11.3	14.8	16.2	19.5	22.7	12.3	20.5
Other	25.8	21.1	21.6	25.4	27.9	29.9	30.5	20.7	30.8
Did not participate in any school activity	15.5	10.1	13.9	12.9	15.1	19.8	23.7	18.2	12.8
Community Activities									
Participated in any community activity	74.5	71.6	70.6	69.8	73.0	81.2	83.4	72.5	76.6
Church/religious organization	40.0	45.4	42.0	41.8	38.2	36.3	35.2	38.4	41.9
Volunteer organization	24.6	14.2	20.7	22.7	24.9	32.1	36.0	18.2	30.9
Organized sport/team outside of school	28.2	38.2	35.3	26.7	24.2	23.5	18.9	28.4	28.3
Paid employment	23.8	3.9	6.8	11.8	25.8	45.6	58.5	24.7	22.6
Other	17.9	18.9	17.5	19.3	16.4	18.0	16.6	15.1	20.4
Did not participate in any community activity	25.5	28.4	29.4	30.2	27.0	18.8	16.6	27.5	23.4
School and Community Activities									
Participated in at least 1 school or community activity	92.4	93.6	91.8	91.8	92.3	92.9	92.2	91.0	93.9
Did not participate in any school or community activities	7.2	6.1	7.8	7.8	7.4	6.9	7.6	8.6	5.9

* 1.9% of students did not respond to the question about participation in school activities. 5.2% of students did not respond to the question about participation in community activities. For both questions, students could provide multiple responses. 'Any sport' includes basketball, baseball/softball, soccer, track/cross country, football, tennis, golf, wrestling, cheerleading, dance, or other school sport. 'Music/arts' includes band/orchestra and art. 'Leadership/academic/yearbook' includes student government, newspaper/journalism, yearbook, debate/speech, and academic clubs (e.g., math, science, literature). Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: School & Community Activities

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Surveillance Survey (YRBS):

> 54.3% of U.S. high school students (9^{th}–12^{th}) played on at least one sports team in the past year

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Surveillance Survey (YRBS):

> 62.2% of Ohio high school students (9^{th}–12^{th}) played on at least one sports team in the past year

Feelings of Closeness and Connectedness. Protective factors against suicide include closeness to friends and family, positive school experiences, being part of a close school community, and a sense of connectedness to school.[34,57,58] Students were asked whether or not they agreed with a series of statements about school, friends, and family. Table 6 shows the percentage of students who agreed with each statement. These percentages are reported for all participating students, as well as broken down by grade level and by sex.

Table 6. Percentages of Stark County, Ohio students agreeing with statements about school, friends, and family, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Statement		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
I feel close to people at school.	55.8	62.5	59.9	54.7	54.6	52.4	48.9	59.9	52.5
I feel like I am part of my school.	49.5	55.7	50.5	47.2	48.5	48.2	46.3	52.5	47.3
I am happy to be at my school.	47.5	56.3	49.8	45.6	45.3	44.7	42.2	51.8	44.2
The teachers at my school treat students fairly.	52.8	56.0	52.9	49.9	51.7	52.2	55.0	55.1	51.2
I feel safe in my school.	50.3	56.2	49.6	47.9	48.5	48.4	51.2	55.3	46.1
My friends care about me.	78.5	82.2	79.0	76.2	77.3	79.4	77.4	77.6	80.1
My family cares about me.	85.8	88.4	87.1	84.3	85.4	84.1	85.5	86.5	85.9
None of the above	3.8	2.5	3.5	4.4	4.7	3.9	3.8	3.3	4.0

* % represents the percentage of students agreeing with each statement. Students could provide multiple responses. 3.3% did not respond to this question. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

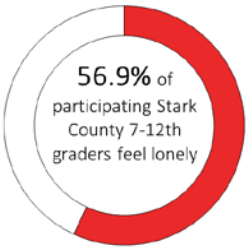
Family Support and Parental Supervision. Adolescents with family support and close parental supervision are at lower risk of suicide.[34] Students were asked about their interactions with their parents or guardians over the past month. Students were asked whether they had done specific activities with a parent or guardian (such as going shopping or to a movie) and whether they had certain types of interactions with a parent or guardian (such as talking about a significant other or about a personal problem) in the past month. Table 7 shows the percentage of students who reported experiences or interactions with a parent or guardian in the past month. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 7. Percentages of Stark County, Ohio students who reported specific types of activities or interactions with parents or caregivers over the past month, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

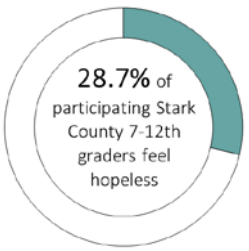
Type of Activity	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Activities with parent or guardian									
Went shopping together	79.4	83.2	80.3	79.4	80	76.2	75.9	73.2	85.9
Played a sport together	30.5	45.2	38.3	30.6	26.2	21.7	16.7	35.3	26.2
Attended a religious service or event together	40.5	43.9	41.2	41.7	40.4	38.0	36.6	39.3	42.1
Went to a movie/play/ museum/concert/ sporting event together	60.3	68.6	66.0	60.6	58.2	54.4	51.4	58.5	62.5
Worked on a project for school together	22.9	33.6	27.0	22.3	19.4	16.1	16.9	21.0	25.1
Interactions with parent or guardian									
Talked about someone student was dating	38.5	23.5	27.7	38.4	42.5	51.2	52.8	33.0	44.2
Talked about a party student was going to	29.9	26.6	29.5	30.6	30.5	29.9	32.8	28.8	31.4
Talked about a personal problem student was having	44.2	37.8	37.8	42.8	47.1	51.1	50.9	33.0	55.5
Talked about student's school work or grades	79.0	78.6	80.1	78.3	80.3	80.9	75.5	76.4	82.2
Seriously argued about student's behavior	27.4	25.8	26.2	30.5	29	27.8	24.4	24.3	30.3
No activities or interactions	3.1	2.5	2.8	2.8	2.5	3.3	4.9	4.0	2.0

* % represents the percentage of students who reported specific activities of types of interactions. 2.2% did not respond to this question. Students could provide multiple responses. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

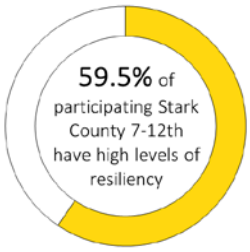
Feelings of Loneliness, Hopelessness, and Resiliency. Studies demonstrate that feeling lonely or isolated can increase risk of suicide.[59] Students' general feelings of loneliness were measured using a 3-item scale called the Children's Loneliness Scale.[31] Based on these questions, 56.9% of students endorsed feelings of loneliness; 4.3% of students did not answer the loneliness questions.



Feeling hopeless is a risk factor for suicide.[60] General feelings of hope and hopelessness were measured using a scale modified from the Brief-H-Neg and Flourishing Children Positive Indicators Project.[32,33], with higher scores reflecting higher levels of disagreement. Based on these questions, 28.7% of participating Stark County students endorsed feelings of hopelessness; 5.4% did not answer the questions about hopelessness.



Studies demonstrate that qualities of resiliency can protect against suicide and buffer effects of suicide risk factors.[34] Resiliency was measured using an adapted version of the Child and Youth Resilience Measure.[35] Among respondents, 59.5% of students were identified as having a high level of resiliency skills, 30.7% of students were identified as having a medium level of resiliency skills, and 9.8% of students were identified as having a low level of resiliency skills. Resilience questions were not completed by 14.5% of students.



Social Media, Gaming, Computer Use, and Unsupervised Time. Research suggests that the use of digital media offers both benefits and risks to the health of children and teenagers.[61] Benefits of digital media use include exposure to new ideas and knowledge acquisition, increased opportunities for social contact and support, and new opportunities to access health-promotion messages and information. Risks of digital media include negative health effects on weight and sleep; exposure to inaccurate, inappropriate, or unsafe content and contacts; and compromised privacy and confidentiality.[61] Research has suggested a U-shaped relationship between time spent online and depression, with increased risk of depression at both the high and low ends of internet use.[62,63] Risk of suicide is significantly higher among adolescents who use social media for 2 hours or more each day.[64] One study found that adolescents who use social media passively (e.g., viewing others' photos) report declines in life satisfaction, whereas those who use social media actively (e.g., interacted with others and posted content) do not experience declines in life satisfaction.[63] Both the number of hours spent on social media, and how social media is used, are key factors in determining the impact of social media on adolescent mental health.[61]

Students were asked how many hours they spend on social media and how many hours they spend playing video or computer games, or using a computer for something that is not school related on an average school day. Students were also asked how many hours they spend on their own without a parent or guardian at home on an average school day. Table 8 shows the number of hours spent on each type of activity. These amounts are reported for all participating students, as well as broken down by grade level and by sex.

Table 8. Time spent on social media and video games on the average school day, and time spent unsupervised by an adult on the average school day, Stark County, Ohio - Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Hours per average school day	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Time spent on social media									
Less than 1 hour	27.7	39.9	33.2	28.2	23.5	19.9	19.0	38.5	17.1
1-2 hours	32.7	30.1	30.1	29.4	35.1	35.7	37.2	34.8	30.8
3-4 hours	24.4	18.1	20.7	25.4	26.0	28.6	28.7	17.2	31.6
5 hours or more	15.3	11.9	16.0	17.0	15.4	15.8	15.1	9.6	20.5
Time spent on video games									
Less than 1 hour	41.6	33.9	35.5	42.5	46.5	46.7	47.0	27.8	55.9
1-2 hours	27.6	29.9	28.7	28.0	24.8	28.1	25.2	30.8	24.6
3-4 hours	18.6	22.0	20.2	17.6	17.1	16.3	18.0	24.4	12.8
5 hours or more	12.2	14.1	15.6	11.9	11.7	8.9	9.8	17.0	6.7
Time spent unsupervised									
Less than 1 hour	43.5	54.7	50.3	45.4	42.4	34.7	30.1	44.3	43.3
1-2 hours	31.8	28.1	30.8	33.0	32.6	33.1	33.7	32.4	31.2
3-4 hours	14.5	10.2	11.0	12.8	14.9	19.6	20.3	13.1	15.8
5 hours or more	10.1	7.1	7.9	8.8	10.0	12.5	15.9	10.3	9.7

* % represents the percentage of students who responded. The percentages of students who did not respond were 4.4% for the question on time spent on social media, 4.4% for the question on time spent on video games, and 5.9% for the question on time spent unsupervised. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Social Media, Gaming, and Other Computer Use

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Surveillance Survey (YRBS):

> 43.0% of U.S. high school students (9^{th}–12^{th}) spent more than 3 hours per day on Xbox, PlayStation, an iPad or other tablet, a smartphone, texting, YouTube, Instagram, Facebook, or other social media, for something that was not schoolwork on an average school day.

> 20.7% of U.S. high school students (9^{th}–12^{th}) watch more than 3 hours of television per day on an average school day.

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Surveillance Survey (YRBS):

> 37.3% of Ohio high school students (9^{th}–12^{th}) spent more than 3 hours per day on Xbox, PlayStation, an iPad or other tablet, a smartphone, texting, YouTube, Instagram, Facebook, or other social media, for something that was not school work on an average school day.

> 28.2% of Ohio high school students (9^{th}–12^{th}) watch more than 3 hours of television per day on an average school day.

Access to Medical and Psychological Care. Limited access to healthcare is a known risk factor for suicide.[34] Students were asked: "During this school year (2017–2018), have you always been able to get medical or psychological care when you thought you needed to?" If students answered no, they were asked to report all the reasons why they could not get the care they thought they needed. Table 9 shows the percentage of students reporting that they could versus could not always get medical or psychological care when they thought they needed to, as well as reasons

for not being able to access care. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 9. Stark County, Ohio students' access to medical or psychological care during this school year (2017–2018), Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Hours per average school day	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Always able to get medical or psychological care when needed									
Yes	84.3	88.2	85.8	83.7	83.8	80.8	82.8	88.8	80.6
No	15.7	11.8	14.2	16.3	16.2	19.2	17.2	11.2	19.4
Reasons for not being able to get medical or psychological care when needed									
Didn't know whom to go see	33.6	31.2	31.0	32.6	35.2	34.0	37.7	28.7	35.8
Didn't have transportation	13.4	11.8	11.4	16.1	13.5	11.7	14.5	11.6	13.1
My parent or guardian would not go with me	14.2	14.5	12.2	16.1	12.0	13.8	16.7	8.7	16.2
Didn't want my parents to know	47.5	45.7	49.3	50.5	50.9	42.2	45.6	33.3	54.4
I was afraid of what my doctor would say or do	28.0	24.7	31.9	33.3	26.6	21.6	29.4	20.9	30.7
I thought the problem would go away	47.5	37.1	52.8	50.2	46.8	49.3	46.1	34.7	53.8
I couldn't pay	16.7	11.3	6.6	16.8	17.2	21.3	25.0	10.5	19.1
I didn't have insurance	10.7	9.7	6.6	10.5	9.7	12.4	15.4	7.6	11.6
Another reason	40.1	50.0	43.2	44.9	35.6	33.0	36.8	47.7	35.6

* % represents the percentage of students who reported each response. For the question about reasons for not being able to get medical or psychological care when needed, % reported is among students who responded that they were not always able to get medical or psychological care when needed. For the question about reasons why students could not access medical or psychological care when needed, students could provide multiple responses. 13.7% of students did not respond to the question about being able to get medical or psychological care when needed. Among students who reported that they could not always get medical or psychological care when needed, 8.4% did not answer the question asking about reasons why they could not get care. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Negative Life Experiences during 2017–2018 School Year.

Negative events and stressors can increase risk of suicidality among vulnerable persons.[34] Students were asked whether they had a series of negative life experiences during the school year. Table 10 shows the percentage of students who said they had each type of experience. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 10. Stark County, Ohio students' negative life experiences during the 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

Experience	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
My close family member died or became very sick.	43.3	49.7	47.5	46.1	40.3	37.7	36.1	38.9	47.4
My close friend died or became very sick.	10.4	9.2	8.5	11.2	11.7	11.9	10.0	8.7	11.9
I went through the break-up of a romantic relationship or friendship.	38.3	30.3	35.5	42.8	39.2	42.3	40.4	30.9	45.4
I was in a physical fight with someone at school.	7.8	11.9	10.0	7.7	6.5	5.3	3.5	11.3	3.9
I had a serious argument or disagreement with a family member, including a parent or guardian.	45.3	39.8	42.7	48.2	47.8	48.9	44.9	40.7	49.8
I had a serious argument or disagreement with a friend.	43.5	43.5	44	44.6	43.4	43.6	41.3	36.6	50.1
My parent or guardian took away my phone, computer, or tablet as punishment.	42.7	58.5	56	47.4	38.8	29.5	18.2	43.4	41.9
I got a bad grade on a test.	75.7	68.4	73	78.3	79.2	81.7	74.1	74.7	76.7
My parent or caregiver lost their job.	10.4	10.0	10.3	10.7	11.2	10.7	8.7	9.4	11
I moved to a new city or school district.	9.3	12.3	10.3	10.5	7.6	8.0	5.7	9.6	8.9

* % represents the percentage of students reporting that they had the experience. Students could provide multiple responses. The percentages of students who did not respond ranged from 2.6% to 3.4% for specific types of experiences. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Adverse Childhood Experiences. Childhood experiences, both positive and negative, have an enormous impact on lifelong health and opportunities, including mental health and suicidality.[65] Adverse childhood experiences (ACEs) are often measured through a standardized set of questions known as the ACEs Scale.[66] Students were asked whether they had a series of adverse childhood experiences at any point during their life. Upon completion of the survey, all participants were provided with a list of services, including services for mental health and violence. Counseling was immediately provided to those who became upset during the survey or requested help.

Table 11 shows the percentage of students who said they had each type of experience. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 11. Lifetime adverse childhood experiences among Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

Experience	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
My parents separated or divorced.	38.8	36.3	41.0	38.4	39.6	39.0	38.4	37.3	40.1
I lived with someone who was depressed, mentally ill, or suicidal.	23.0	15.2	19.2	24.5	25.1	27.9	27.6	16.2	29.1
I lived with someone who was a problem drinker, alcoholic, used illegal street drugs, or abused prescription medications.	18.5	14.0	17.0	19.2	19.9	21.0	20.5	14.9	21.6
I lived with someone who went to jail or prison.	18.5	18.4	19.8	20.0	18.5	18.0	15.6	17.1	19.6
My parents or adults in my home slapped, hit, kicked, punched, or beat each other up.	6.4	5.8	6.3	6.8	6.8	7.0	5.6	9.2	7.4
A parent or adult in my home pushed, grabbed, slapped, hit, beat, kicked, or physically hurt me. (Not including spanking)	9.4	8.1	9.7	10.3	9.7	9.2	9.2	7.4	11.2
A parent or adult in my home swore at me, insulted me, humiliated me, put me down, or acted in a way that made me afraid I might be physically hurt.	22.4	19.7	21.9	23.9	23.8	23.5	21.4	17.5	27
A parent or person at least 5 years older than me sexually touched me, made me sexually touch them, attempted to have sex with me, or actually had sex with me.	3.9	3.0	3.0	4.3	4.8	4.1	4.1	1.4	6.1

Table 11. Lifetime adverse childhood experiences among Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).* *(continued)*

Experience	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
I often felt that no one in my family loved me or thought I was important or special.	19.2	18.0	19.5	20.8	18.4	19.7	18.4	11.9	26.0
I often felt that I didn't have enough to eat, I had to wear dirty clothes, I had no one to protect me, or my parents were too drunk or high to take care of me.	3.5	3.2	3.5	4	3.3	3.4	3.2	2.5	4.2

* % represents the percentage of students reporting that they had the experience. Students could provide multiple responses. The percentages of students who did not respond ranged from 3.2% to 4.5% for specific types of experiences. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Adverse childhood experiences

Among U.S. children* (0–17 years) represented in the 2016 National Survey on Children's Health:

> 25% of U.S. children aged 0–17 years ever lived with a parent or guardian who became divorced or separated
> 7.8% of U.S. children aged 0–17 years ever lived with someone who was severely depressed, mentally ill, or suicidal
> 9% of U.S. children aged 0–17 years ever lived with someone who had a problem with alcohol or drugs
> 8.2% of U.S. children aged 0–17 years ever lived with someone who served time in jail or prison
> 5.7% of U.S. children aged 0–17 years ever saw or heard parents or other adults slap, hit, kick, or punch each other

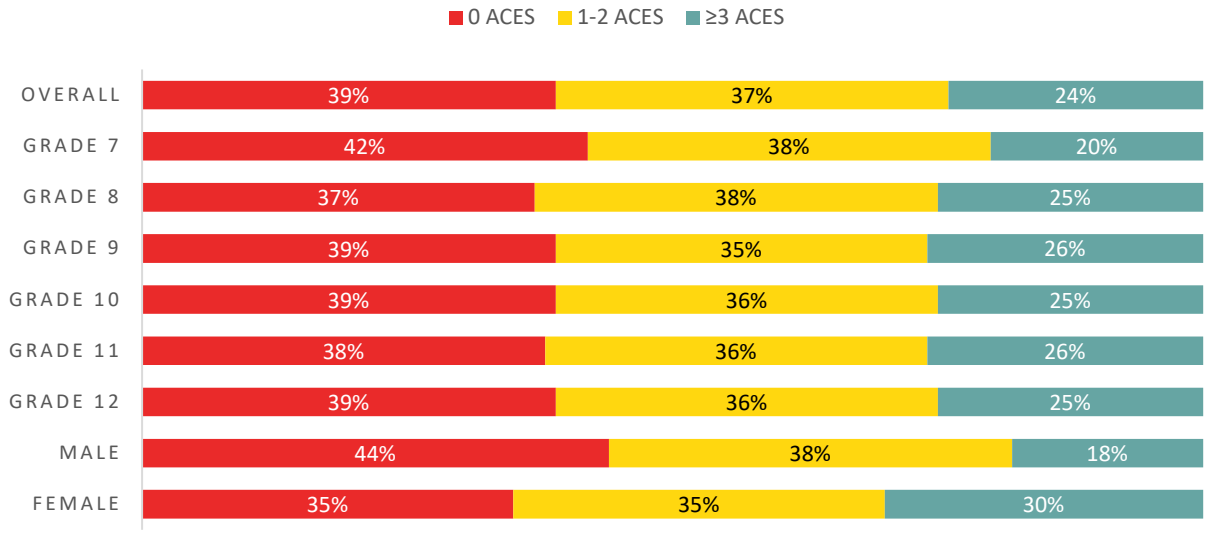
Among Ohio children* (0–17 years) represented in the 2016 National Survey on Children's Health:

> 27.7% of Ohio children aged 0–17 years ever lived with a parent or guardian who became divorced or separated
> 9.3% of Ohio children aged 0–17 years ever lived with someone who was severely depressed, mentally ill, or suicidal
> 10.7% of Ohio children aged 0–17 years ever lived with someone who had a problem with alcohol or drugs
> 11.1% of Ohio children aged 0–17 years ever lived with someone who served time in jail or prison
> 8.1% of Ohio children aged 0–17 years ever saw or heard parents or other adults slap, hit, kick, or punch each other

*Questions were asked of children's parents.

Students were also categorized into groups according to how many adverse childhood experiences they said they had experienced. The three groups were zero adverse childhood experiences, 1–2 adverse childhood experiences, and three or more adverse childhood experiences in one's lifetime. Figure 6 shows percentages of students in each group. These percentages are reported for all participating students as well as broken down by grade level and sex.

Figure 6. Number of lifetime adverse childhood experiences (ACEs) among Stark County, Ohio students, Spring 2018 (n=12,448).



PUTTING STARK COUNTY INTO CONTEXT: Adverse childhood experiences

Among U.S. children* (0–17 years) represented in the 2016 National Survey on Children's Health,

> 55% of U.S. children experienced 0 adverse childhood experiences in their lifetime
> 35% of U.S. children experienced 1–2 adverse childhood experiences in their lifetime
> 10% of U.S. children experienced 3 or more adverse childhood experiences in their lifetime

Among Ohio children* (0–17 years) represented in the 2016 National Survey on Children's Health,

> 51% of Ohio children experienced 0 adverse childhood experiences in their lifetime
> 35% of Ohio children experienced 1–2 adverse childhood experiences in their lifetime
> 15% of Ohio children experienced 3 or more adverse childhood experiences in their lifetime

*Questions were asked of children's parents.

Substance Use. Alcohol and other substance use are known risk factors for increased risk of death by suicide.[34] Students were asked whether they had used substances ever in their life as well as at least once during the past 30 days. "Any substance" was based on an aggregation of the individual substances included in the survey. Table 12 shows the percentage of students who said whether or not they used substances ever in their life and whether or not they used substances at least once in the past 30 days. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 12. Substance use ever in Stark County, Ohio students' lifetime and in the past 30 days, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

Substance	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Used at any time in their life									
Any substance	45.6	23.2	33.6	44.3	52.9	60.5	66.1	44.6	46.4
Alcohol	44.8	21.8	32.7	43.6	51.8	60.2	65.6	43.6	46
Prescription pain medicine without a doctor's prescription	6.3	3.7	5.2	5.8	7.2	7.8	8.9	6.1	6.2
Prescription muscle relaxer or anxiety medication without a doctor's prescription	5.2	2.4	3.3	4.5	5.9	7.5	8.4	4.7	5.2
Heroin	0.5	0.4	0.5	0.4	0.7	0.2	0.6	0.7	0.2
Marijuana	17.7	4.3	8.2	15.3	22.5	28.2	32.9	17.7	17.7
Cocaine	1.5	0.5	1.0	0.9	1.8	1.9	2.8	1.6	1.0
Sniffed glue/huffed	2.0	1.7	1.4	2.1	2.6	2.1	2.0	2.1	1.6
Methamphetamines	0.9	0.6	0.5	0.6	1.2	0.9	1.7	1.0	0.6
Ecstasy	1.6	0.5	0.8	1.3	1.6	2.6	3.1	1.7	1.2
Synthetic marijuana	2.6	1.3	1.5	3.0	3.3	3.2	3.7	2.7	2.3
Used at least once in past 30 days									
Any substance	19	7.1	11.3	18.1	21.8	25.6	34.1	19.2	18.2
Alcohol	15.2	5.3	8.8	14.1	17.4	20.1	29.6	15.5	14.6
Prescription pain medicine without a doctor's prescription	2.1	1.4	1.9	2.2	2.6	2.1	2.1	1.8	2.1
Prescription muscle relaxer or anxiety medication without a doctor's prescription	1.5	1.2	0.7	1.3	2.0	1.8	2.1	1.3	1.4
Heroin	0.5	0.3	0.2	0.2	0.6	0.6	0.6	0.4	0.2
Marijuana	8.7	2.2	4.1	7.6	10.9	13.9	16.2	8.9	8.3
Cocaine	0.7	0.3	0.3	0.3	0.9	0.9	1.3	0.6	0.4
Sniffed glue/huffed	0.6	0.5	0.4	0.3	1.0	0.8	0.6	0.6	0.4
Methamphetamines	0.5	0.3	0.2	0.2	0.6	0.6	0.7	0.4	0.2
Ecstasy	0.7	0.4	0.2	0.5	1.0	1.1	1.1	0.7	0.5
Synthetic marijuana	1.0	0.4	0.5	1.1	1.5	1.1	1.2	1.0	0.7

* % represents the percentage of students reporting use of each type of substance. Students could provide multiple responses. The percentage of students who did not respond to questions about their use of substances ever in their lifetime was 2.3%. 4.4% of students did not respond to the question about substance use in the past 30 days. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Students' Substance Use

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Survey (YRBS),

> 60.4% of U.S. 9th–12th graders have used alcohol at least once in their lifetime
> 14.0% of U.S. 9th–12th graders have taken prescription pain medications (without a doctor's prescription) at least once in their lifetime
> 1.7% of U.S. 9th–12th graders have used heroin at least once in their lifetime
> 35.6% of U.S. 9th–12th graders have used marijuana at least once in their lifetime
> 4.8% of U.S. 9th–12th graders have used cocaine at least once in their lifetime
> 6.2% of U.S. 9th–12th graders have used inhalants at least once in their lifetime
> 2.5% of U.S. 9th–12th graders have used methamphetamines at least once in their lifetime
> 4% of U.S. 9th–12th graders have used ecstasy at least once in their lifetime
> 6.9% of U.S. 9th–12th graders have used synthetic marijuana at least once in their lifetime

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Survey (YRBS),

> 58.2% of Ohio 9th–12th graders have used alcohol at least once in their lifetime
> 12.8% of Ohio 9th–12th graders have used prescription pain medications (without a doctor's prescription) at least once in their lifetime
> 2% of Ohio 9th–12th graders have used heroin at least once in their lifetime
> 35.7% of Ohio 9th–12th graders have used marijuana at least once in their lifetime
> 3.8% of Ohio 9th–12th graders have used cocaine at least once in their lifetime
> 8.8% of Ohio 9th–12th graders have used inhalants at least once in their lifetime

Students were asked how many days they engaged in binge drinking during the past 30 days. Students were provided the following definition of binge drinking to aid in responding to this question: '5 or more drinks of alcohol in a row, that is, within a couple of hours.' Table 13 shows how students responded for all participating students as well as by grade level and by sex.

Table 13. Number of days of binge drinking in last 30 days, Stark County, Ohio, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Number of days		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
0 days	92.2	97.3	96.2	93.4	91.4	89	83.1	91.8	92.8
1 or 2 days	4.9	1.3	2.3	4.3	5.5	6.4	11.1	5.0	4.8
3 to 5 days	1.2	0.4	0.3	0.8	1.5	1.9	3.2	1.2	1.2
6 to 9 days	0.5	0.1	0.2	0.5	0.3	1.0	0.9	0.6	0.4
10 to 19 days	0.4	0.1	0.1	0.3	0.3	0.5	0.8	0.5	0.2
20 days or more	0.9	0.6	0.8	0.6	1.1	1.1	1.0	1.0	0.6

* % represents the percentage of students reporting that they had the experience. The percentages of students who did not respond ranged from 2.6% to 3.4% for specific types of experiences. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Binge Drinking

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Survey (YRBS),

> 13.5% of U.S. 9th–12th graders engaged in binge drinking* at least once in the past 30 days

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Survey (YRBS),

> 16.1% of Ohio 9th–12th graders engaged in binge drinking* at least once in the past 30 days

*In YRBS, binge drinking is defined as four or more drinks of alcohol in a row (if female) or five or more drinks of alcohol in a row (if male), within a couple of hours, on at least 1 day during the 30 days before the survey.

Students were asked whether someone they lived with had used substances during the 2017–2018 school year. Living with someone who uses illicit drugs or is a problem drinker is a known adverse childhood experience.[66] For each type of substance, Table 14 shows the percentage of students who said they lived with someone who used that substance during this school year. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 14. Substance use by others in the Stark County, Ohio student's household during 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Substance		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Used any substance (other than alcohol) during this school year	24.1	17.3	21.8	26.2	26.4	26.9	26.6	22.5	25.3
Prescription pain medicine without a doctor's prescription	6.8	5.4	5.7	7.4	8.0	7.5	6.5	6.1	7.2
Prescription muscle relaxer or anxiety medication without a doctor's prescription	6.5	5.0	5.4	7.6	7.0	7.0	6.8	5.1	7.5
Heroin	2.6	2.9	2.9	3.0	2.2	2.2	1.7	2.1	2.7
Marijuana	20.2	12.8	17.9	21.6	22.9	23.7	23.2	18.8	21.3
Cocaine	3.6	3.4	3.3	3.5	3.5	4	3.7	2.9	4.0
Sniffed glue/huffed	2.2	2.0	2.4	2.8	2.2	1.9	1.6	2.0	2.1
Methamphetamines	2.3	1.9	2.8	2.1	2.6	2.0	1.9	1.8	2.5
Ecstasy	2.2	1.1	2.1	2.4	2.6	2.0	2.8	2.0	2.1
Synthetic marijuana	3.7	2.5	3.7	4.4	4.9	3.0	3.6	3.3	4.0

* % represents the percentage of students reporting use of each type of substance. Students could provide multiple responses. The percentage of students who did not respond to questions about use of substances by others in their households was 2.6%. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

History of Mental Health Problems. In order to identify the baseline level of mental health needs prior to the start of the suicide cluster, students were asked whether they had ever been told by a health professional that they had depression, anxiety, attention deficit/hyperactivity disorder, Autism Spectrum Disorder or Asperger's syndrome, or another mental health problem before

the 2017–2018 school year. Table 15 shows the percentage of students who reported that they had each type of mental health problem. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 15. History of mental health problems before 2017–2018 school year among Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Prior diagnosis	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Any mental health problem	29.9	25.1	27.6	31.2	31.0	32.2	32.3	25.0	33.7
Depression	14.3	7.9	11.4	14.7	17.3	17.6	17.5	8.5	19.2
Anxiety	17.8	12.0	14.9	18.4	19.8	21.0	21.2	9.6	25.1
Attention deficit/hyperactivity disorder	12.4	13.3	12.2	12.7	12.1	11.3	12.0	15.0	9.3
Autism Spectrum Disorder or Asperger's syndrome	1.6	1.2	1.4	1.7	2.1	1.3	2.0	2.2	0.8
Another mental health problem	6.3	4.9	5.2	6.3	6.4	7.6	7.5	3.9	8.1
No history of mental health problem	70.1	74.9	72.4	68.8	69.0	67.8	67.7	75.0	66.3

* % represents the percentage of students reporting each response. Students could provide multiple responses. 8.1% of students did not respond to this question. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: History of Mental Health Problems

An estimated 49.5% of U.S. adolescents have been diagnosed with a mental health problem in their lifetime.[67]

Exposure to Suicide-Related Content at School, Online, and in the Community. Certain types of exposure at home, online, and in the community can contribute to contagion of suicidal behaviors among adolescents, especially among vulnerable youth.[34] These exposures include memorials for victims of suicide, social media posts, and conventional media. It is not yet known how much each of these exposures contribute to risk of suicidality.[10,68,69] Students were asked a series of questions about exposure to vigils or moments of silence at school, social media, conventional news articles, memorials, and graffiti focused on recent teen suicides in their communities, as well as whether they had seen the Netflix show *Thirteen Reasons Why*. Table 16 shows the percentage of students reporting each exposure. These percentages are reported for all participating students as well as broken down by grade level and by sex.

Table 16. Percentage of Stark County, Ohio students reporting exposure to school, social media, conventional news, and community programming related to suicide during the 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

Type of exposure	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Vigils or moments of silence for teenagers who died by suicide									
Yes	35.4	28.3	25.6	39.0	41.5	40.7	39.6	34.9	36.4
No	35.4	35.7	42.8	31.6	33.8	33.7	33.6	34.1	36.4
Not sure	29.2	36.0	31.6	29.5	24.6	25.6	26.8	31.0	27.2
Seen posts about recent teen suicides in your community									
Twitter	26.9	8.2	11.8	23.9	33.6	44.6	45.9	21.9	31.9
Instagram	46.3	35.2	43.9	51.4	50.4	50.1	47.8	37.2	55.2
YouTube	13.8	18.3	15.8	15.7	11.6	9.8	10.2	13.7	13.5
Facebook	24.6	14.7	16.7	23.0	27.2	31.8	38.3	18.0	31.1
Snapchat	49.3	35.1	44.9	56.1	56.8	53.5	50.4	40.7	58.0
Tumblr	1.9	1.9	1.7	2.3	1.9	1.8	1.8	1.3	2.2
Other chat apps (WhatsApp, WeChat, Marco Polo, House Party, FireChat, etc.)	2.1	3.2	2.1	2.6	1.7	1.5	1.3	1.8	2.2
Other anonymous apps (Sarahah, SayAt.Me, Monkey, Ask.Fm, etc.)	8.4	9.2	9.7	10.4	9.1	6.2	4.7	5.7	10.7
Other app or website	7.1	11.6	6.7	6.8	6.6	4.9	5.5	6.7	7.2
None of the above	33.2	45.4	39.7	30.0	28.6	26.5	26.7	41.8	24.6
Posted about recent teen suicides in your community									
Twitter	2.9	0.7	0.9	2.1	3.4	5.6	5.6	1.7	4.0
Instagram	3.9	3.4	3.5	4.5	4.5	3.6	3.5	2.6	4.9
YouTube	0.6	0.6	0.6	0.4	0.9	0.4	0.3	0.7	0.2
Facebook	2.7	1.0	1.5	2.6	3.3	3.7	4.6	1.5	3.7
Snapchat	8.4	8.3	10.0	10.0	7.8	7.6	5.6	5.8	10.8
Tumblr	0.4	0.3	0.2	0.6	0.5	0.3	0.3	0.3	0.3
Other chat apps (WhatsApp, WeChat, Marco Polo, House Party, FireChat, etc.)	0.5	0.5	0.4	0.4	0.2	0.4	0.6	0.4	0.3
Other anonymous apps (Sarahah, SayAt.Me, Monkey, Ask.Fm, etc.)	0.4	0.6	0.2	0.6	0.4	0.1	0.3	0.3	0.4
Other app or website	0.5	0.9	0.6	0.6	0.5	0.1	0.3	0.4	0.5
None of the above	87.4	89.6	87.3	86.5	87.6	86.7	87.0	91.5	83.7

* % represents the percentage of students reporting each response. For questions about social media, conventional news, memorials, and graffiti in community, and viewing of the Netflix show *Thirteen Reasons Why*, students could provide multiple responses. The percentages of students who did not respond ranged from 2.1% to 5.6%. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Table 16. Percentage of Stark County, Ohio students reporting exposure to school, social media, conventional news, and community programming related to suicide during the 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).**(continued)*

Type of exposure	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Seen news articles about recent teen suicides in your community									
Online on a news site	50.1	40.4	44.1	49.2	54.7	57.8	58.0	44.2	56.5
In a paper newspaper	25.1	22.7	22.4	24.2	25.9	26.9	30.3	24.2	26.1
On TV	42.7	47.4	45.8	42.9	39.8	40.1	39.4	41.8	44
On radio	17.6	19.3	18.5	17.3	15.0	17.6	18.4	16.4	18.9
None of the above	29.2	30.8	31.7	30.6	28.4	26.7	25.8	32.5	25.5
Seen memorials for teens who died by suicide in your community									
On YouTube	5.1	9.2	7.0	5.2	3.1	2.7	2.5	5.1	5.0
On the side of the road	7.9	7.5	6.7	7.7	8.4	9.1	7.8	6.2	9.4
At their house	4.1	3.4	3.7	3.9	4.4	4.9	4.4	3.7	4.4
Online memorial site	9.4	8.0	8.3	9.0	10.0	11.5	10.1	6.1	12.7
At another location	18.1	16.0	16.2	19.1	19.1	19.7	18.9	14.9	21.3
None of the above	63.6	67.0	68.2	62.4	62.1	59.9	60.9	69.4	57.8
Seen the following types of graffiti in your community									
Graffiti related to recent suicide deaths	4.3	4.5	3.6	4.7	4.4	4.5	4.1	3.5	5.0
Graffiti related to hopelessness	9.3	11.1	9.9	11.3	8.3	7.7	6.8	7.1	11.2
None of the above	88.8	87.0	88.9	86.8	89.3	90.3	91.0	91.3	86.7
Viewing of the Netflix show Thirteen Reasons Why									
Yes, seen any episodes	47.5	34.6	46.0	51.0	52.8	52.1	49.8	29.3	65.5
Yes, during this school year (after August 2017)	13.8	14	15.6	14.3	13.7	13.2	11.2	8.7	18.5
Yes, before this school year (before August 2017)	37.0	23.5	34.1	40.4	42.6	41.9	40.9	22.0	51.9
No, never watched it	52.5	65.4	54.0	49.0	47.2	47.9	50.2	70.7	34.5

* % represents the percentage of students reporting each response. For questions about social media, conventional news, memorials, and graffiti in community, and viewing of the Netflix show *Thirteen Reasons Why*, students could provide multiple responses. The percentages of students who did not respond ranged from 2.1% to 5.6%. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Reaction to Recent Teen Suicides in the Community. Students were asked how the recent teen suicides in their community had affected them emotionally. Table 17 shows the percentage of students reporting each level of emotional response. Percentages are reported for all participating students, as well as broken down by grade level and by sex.

Table 17. Emotional reaction to recent teen suicides among Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Reaction	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Very strongly affected	7.6	8.1	6.7	7.2	7.8	7.9	7.6	3.7	11.0
Strongly affected	16.4	16.0	16.2	16.7	16.2	16.5	17.0	10.1	22.4
Somewhat affected	26.1	24.9	25.0	26.6	26.1	26.6	28.0	21.3	30.8
A little affected	24.2	25.4	24.7	23.7	24.7	24.1	21.9	26.0	22.7
Not at all	25.8	25.5	27.3	25.8	25.1	24.9	25.5	38.9	13.0

* % represents the percentage of students reporting each response. The percentage of students who did not respond ranged from 4.6% to 7.4%. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Students' Exposure to Others' Suicidal Ideation, Attempts, and Deaths. Previous studies have demonstrated that knowledge of a friend's suicidal behaviors can significantly increase a teen's own risk for suicide. In one study, exposure to suicidal behavior in a friend or family member posed the same risk of suicide as that conferred by being severely depressed.[70] Teens are more likely to disclose suicidal feelings to a peer, rather than an adult.[34] Students were asked about whether their friends, significant others, or peers revealed that they had thought about, planned, or attempted suicide during this school year. Students were also asked whether any of their friends, significant others, or family members had attempted or died by suicide during this school year. Table 18 shows the percentage of students who reported each type of experience. These percentages are reported for all participating students, as well as broken down by grade level and sex.

Table 18. Percentages of Stark County, Ohio students who reported that their friends, significant others, peers, and family members had disclosed suicide ideation, attempts, and deaths during the 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

Type of experience	Overall	Grade						Sex	
		7	8	9	10	11	12	M	F
	% n=12,448	% n=2,295	% n=2,319	% n=2,164	% n=2,114	% n=1,927	% n=1,537	% n=6,008	% n=6,160
Suicidal ideation and attempts among friends, significant others, and peers									
Thought about suicide	31.4	29.2	30.1	33.3	31.6	32.7	31.4	22.2	39.8
Planned suicide	11.1	11.3	11.3	12.3	11.6	10.1	9.9	7.8	14.1
Attempted suicide	26.8	24.5	26.3	29.5	27.0	26.5	27.1	18.5	34.8
None of the above	59.0	61.9	59.9	57.6	58.1	58.5	58.1	69.6	49.0
Suicide attempt of friend, significant others or family member									
Friend from my school	15.0	16.0	13.6	15.7	16.5	13.6	14.3	10.4	19.3
Friend from another school	10.1	8.9	10.2	12.4	10.2	9.8	8.5	6.5	13.2
Significant other from my school	2.1	1.9	1.5	2.7	2.1	2.2	2.1	2.1	2.0
Significant other from another school	2.0	2.1	2.1	2.1	2.1	1.9	1.3	1.6	2.1
Family member	9.7	7.7	9.7	10.7	11.1	9.7	9.1	7.0	12.0
None of the above	72.1	72.5	73.6	69.8	70.6	72.6	73.9	79.3	65.4
Death by suicide of friend, significant other, or family member									
Friend from my school	5.1	3.4	2.9	4.6	8.6	5.9	5.7	4.5	5.6
Friend from another school	5.5	5.3	4.8	6.2	5.7	6.1	4.6	3.6	7.2
Significant other from my school	0.5	0.8	0.4	0.6	0.4	0.4	0.3	0.6	0.3
Significant other from another school	0.6	0.8	0.6	0.7	0.5	0.4	0.6	0.7	0.4
Family member	7.1	6.3	7.5	7.7	7.2	7.1	6.7	5.7	8.3
None of the above	84.2	85.8	86.4	83.0	81.5	83.2	85.0	87.0	81.8

* % represents the percentage of students who reported having each type of experience. For all questions, students could provide multiple responses. The percentages of students who did not respond was 6.5% for the question about suicide ideation and attempts among friends, significant others, and peers; 8.4% for the question about suicide attempts among friends, significant others, or family members; and 6.7% for the question about deaths by suicide among friends, significant others, or family members. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Bullying, Safety, and Access to Guns. There is mixed research about the associations between bullying and suicide.[71-73] Bullying may be one of many identified risk factors for suicide in vulnerable adolescents.[34] Students were asked about their experiences of bullying during the 2017–2018 school year. Students were asked whether they had been bullied in a series of specific locations or ways. Students were provided the following definition of bullying to aid in responding to this question: "Bullying is when 1 or more people tease, threaten, spread rumors about, hit, shove, or hurt another person over and over again. It is not bullying when 2 people of about the same strength or power argue or fight or tease each other in a friendly way."

Table 19 shows the percentage of students who reported each type of bullying experience. These percentages are reported for all participating students, as well as broken down by grade level and sex.

Table 19. Percentages of Stark County, Ohio students who reported experiencing bullying during the 2017–2018 school year, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Type of experience	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Yes, have been bullied during this school year	30.9	35.6	34.2	33.6	29.9	26.3	23.0	23.8	37.2
On school property	22.6	27.1	26.3	24.2	21.8	18.5	15.3	18.3	26.2
Around my neighborhood	3.9	5.9	3.7	4.0	4.1	2.5	2.2	3.5	3.9
Online/social media	16.5	16.9	16.8	20.3	17.1	14.3	12.2	9.7	22.6
Text messaging	12.5	12.7	12.1	14.5	13.4	12.1	9.5	6.5	18.1
Other place	6.1	7.2	6.5	6.4	6.5	4.6	4.5	5.2	6.7
No, have not been bullied during this school year	69.1	64.4	65.8	66.4	70.1	73.7	77.0	76.2	62.8

* % represents the percentage of students who reported each type of experience. Students could provide multiple responses about the location where they experienced bullying. 6.8% of students did not respond to this question. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Bullying

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Survey (YRBS),

> 19% of U.S. 9th–12th graders were bullied on school property in the previous year
> 14.9% of U.S. 9th–12th graders were electronically bullied in the previous year

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Survey (YRBS),

> 20.8% of Ohio 9th–12th graders were bullied on school property in the previous year
> 15.1% of Ohio 9thi12th graders were electronically bullied in the previous year

Firearms were the second most common method of suicide among U.S. children aged 10–19 years between 2010 and 2016.[2] Access to means of suicide increases risk of completing suicide.[5,34] Students were asked about whether they could access a gun if they wanted to. Among those who said that they would be able to access a gun if they wanted to, participants were asked where they could access a gun. Table 20 shows reported gun access, as well as specific locations where students would be able to access a gun. These percentages are reported for all participating students, as well as broken down by grade level and sex. Additionally, the percentage of students who ever attempted suicide and endorsed access to a firearm was calculated. Nearly 14% of Stark County students who have ever attempted suicide had access to a gun at the time of the survey in spring 2018 (13.9%).

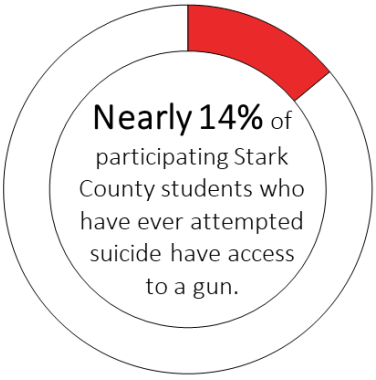


Table 20. Gun access among Stark County, Ohio students and locations where students reported being able to access a gun, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Gun access	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Ability to access a gun if wanted, among all participating Stark County students									
Yes, could get it	25.5	16.2	20.5	25.3	27.9	30.9	35.7	30.5	20.6
Could maybe get it with great effort	15.6	14.2	13.7	16.7	16.3	16.2	16.4	15.5	15.4
No, could not get it	58.9	69.7	65.8	58.0	55.8	52.9	47.9	53.9	64.1
Location of gun access, among students with possible or definite access to a gun									
At my home	77.6	79.2	82.1	78.0	77.4	76.3	74.1	76.3	79.4
At my friend's home	13.8	9.8	11.2	13.9	14.5	14.8	17.1	15.0	11.9
At my neighbor's home	8.8	9.2	8.2	9.5	9.5	8.3	7.8	8.9	8.1
Somewhere else	29.2	27.7	25.4	28.4	28.8	30.8	32.3	30.6	26.8

* % represents the percentage of students who reported each response. Only students who answered 'yes' or 'maybe' on the question asking about ability to access a gun if wanted were asked about the location where they could access a gun. Students could provide multiple responses about the location where they could access a gun. 12.5% of students did not respond to the question about ability to access a gun if wanted. Among students who answered 'yes' or 'maybe' on the question asking about ability to access a gun if wanted, 11% did not respond to the question about the location where they could access a gun. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Firearms

An estimated 12.6% of U.S. adolescents aged 13–18 years old can access a gun at home.[74]

One school safety measure being considered by many schools across the country is the use of School Resource Officers. Students were asked how the presence of a police officer or school resource officer (SRO) would make them feel. Table 21 shows responses for all participating students, as well as responses by grade level and by sex.

Table 21. Students' feelings of safety if a police officer or school resource officer (SRO) were present at their schools, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Overall	Grade						Sex	
Feelings of safety	% n=12,448	7 % n=2,295	8 % n=2,319	9 % n=2,164	10 % n=2,114	11 % n=1,927	12 % n=1,537	M % n=6,008	F % n=6,160
Much more safe	23.0	30.4	24.0	22.1	19.8	19.0	21.2	23.6	22.6
A bit more safe	34.7	35.7	35.0	32.7	35.3	35.6	34.0	34.9	35.1
Neither more nor less safe	36.1	27.3	34.7	38.8	38.8	40.2	38.8	34.9	37.0
A bit less safe	2.8	3.2	2.5	3.5	2.7	1.8	2.8	2.8	2.6
Much less safe	3.4	3.4	3.8	3.0	3.4	3.4	3.0	3.7	2.7

* % represents the percentage of students reporting each response. 3.8% did not respond to this question. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Depression. Students were asked about their feelings of depression around the time of spring break during the previous school year (April 2017) and during the past two weeks (April 2018).

The purpose of asking about these two time-periods was to see whether students had experienced a change in feelings of depression since the onset of recent suicides in their community.

Depression was measured using a 2-item scale that is commonly used in clinical practice as a first-step depression screener.[36] Results of questions asking about depression symptoms are shown in Table 22. When students were asked to think about *this time last year*, 24.2% of students had symptoms of depression. When students were asked about *the past two weeks*, 21.1% of students had symptoms of depression. An estimated 16.9% of students had symptoms of depression at both time points. 7.1% of students were missing data on one or both of the measures.

Table 22. Symptoms of depression among Stark County, Ohio students in Spring 2017 and during the two weeks preceding the survey in Spring 2018, Northeast Ohio Youth Health Survey (n=12,448).*

	Overall	Grade						Sex	
Symptoms of Depression	**%** n=12,448	**7**	**8**	**9**	**10**	**11**	**12**	**M**	**F**
		% n=2,295	**%** n=2,319	**%** n=2,164	**%** n=2,114	**%** n=1,927	**%** n=1,537	**%** n=6,008	**%** n=6,160
Symptoms of depression during Spring 2017	24.2	19.7	21.6	26.7	25.3	26.3	26.9	17.2	30.3
Symptoms of depression during the two weeks preceding the survey, Spring 2018	21.1	17.3	18.8	17.3	17.2	15.7	12.5	14.4	27.1

* % represents the percentage of students reporting each response. The percentage of students who did not respond ranged from 4.7% to 7.4%. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

PUTTING STARK COUNTY INTO CONTEXT: Symptoms of Depression

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Survey (YRBS),

> 31.5% of U.S. 9th–12th graders had experienced persistent feelings of sadness or hopelessness in the past year

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Survey (YRBS),

> 25.8% of Ohio 9th–12th graders had experienced persistent feelings of sadness or hopelessness in the past year

Objective 1. Rapidly determine the population in need of prevention services at all affected and at-risk middle- and high-schools in Stark County through a comprehensive school-based risk screen.

A strong predictor of future death by suicide is a previous attempt.[34] Students with recent suicidal behaviors are at higher risk of death from suicide. Students were asked a series of questions about suicide ideation and attempts before the suicide cluster (before August 2017) and during the suicide cluster (August 2017 - May 2018). Table 23 shows responses for all participating students. Among all participating Stark County students, lifetime prevalence of suicidal ideation with a plan was 15.3%. Nearly 11% of students had suicidal ideation with plan during the 2017–2018 school year. Lifetime prevalence of suicide attempt was 8.9% among participating 7-12th grade Stark County students. Over 5% of students had attempted suicide at least once in the 2017–2018 school year.

Table 23. Suicidal ideation and attempts among participating Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=12,448).*

	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among all participating Stark County students			
Never	69.2	71.7	64.0
Yes, just a brief passing thought	18.0	17.6	20.7
Yes, had a plan	12.7	10.7	15.3
Attempted to kill oneself, among all participating Stark County students			
Never	92.0	94.4	91.1
Yes, attempted at least once	8.0	5.6	8.9

* % represents the percentage of students who reported each response. Students were asked to select only one option for each question. The percentages of students who did not respond were: 5% for the question about suicide ideation before this school year, 5% for the question about suicide ideation during this school year, 5.9% for the question about suicide ideation during lifetime, 5.2% for the question about suicide attempts before this school year, 5.1% for the question about suicide attempts during this school year, and 6.1% for the question about suicide ideation during lifetime.

PUTTING STARK COUNTY INTO CONTEXT: Suicide

Among U.S. adolescents participating in the 2017 Youth Risk Behavior Survey (YRBS),

> 17.2% of U.S. 9th–12th graders seriously considered attempting suicide during the 12 months before the survey
> 13.6% of U.S. 9th–12th graders made a plan about how they would attempt suicide during the 12 months before the survey
> 7.4% of U.S. 9th-12th graders attempted suicide one or more times during the 12 months before the survey

Among Ohio adolescents participating in the 2013 Youth Risk Behavior Survey (YRBS),

> 14.3% of Ohio 9th–12th graders seriously considered attempting suicide during the 12 months before the survey
> 11.1% of Ohio 9th–12th graders made a plan about how they would attempt suicide during the 12 months before the survey
> 6.2% of Ohio 9th-12th graders attempted suicide one or more times during the 12 months before the survey

Tables 24 and 25 show responses broken down by sex. Among all participating male Stark County students, lifetime prevalence of suicidal ideation with a plan was 9%. Over 6% of male students had suicidal ideation with plan during the 2017–2018 school year. Lifetime prevalence of suicide attempt was 5.2% among male 7-12th grade Stark County students. Three percent of male Stark County students attempted suicide at least once in the 2017–2018 school year.

Table 24. Suicidal ideation and attempts among participating male Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=6,008).*

	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating male Stark County students			
Never	77.7	80.0	73.3
Yes, just a brief passing thought	15.0	13.9	17.7
Yes, had a plan	7.3	6.2	9.0
Attempted to kill oneself, among participating male Stark County students			
Never	95.3	96.9	94.8
Yes, attempted at least once	4.7	3.1	5.2

* Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Among female participating Stark County students, lifetime prevalence of suicidal ideation with a plan was 21%. Nearly 15% of female students had suicidal ideation with plan during the 2017–2018 school year. Lifetime prevalence of suicide attempt was 12.3% among participating female Stark County students. Nearly 8% of female students attempted suicide at least once in the 2017–2018 school year.

Table 25. Suicidal ideation and attempts among participating female Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=6,160).*

	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating female Stark County students			
Never	61.2	64.0	55.2
Yes, just a brief passing thought	21.1	21.2	23.8
Yes, had a plan	17.7	14.7	21.0
Attempted to kill oneself, among participating female Stark County students			
Never	88.9	92.3	87.7
Yes, attempted at least once	11.1	7.7	12.3

* Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Tables 26 through 31 show responses broken down by grade level. Prevalence of lifetime suicidal

ideation with plan varied by grade, from 11.9% among 7th graders to 17.1% among 11th and 12th graders. Suicidal ideation with plan during the 2017–2018 school year varied from 9.6% among 11th graders to 11.8% among 9th graders. Lifetime prevalence of suicide attempt ranged from 6.4% among 7th graders to 10% among 11th graders. Suicide attempts during the past school year were highest among 9th grade Stark County students.

Table 26. Suicidal ideation and attempts among participating 7th grade Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=2,295).*

	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating 7th grade Stark County students			
Never	78.7	75.8	71.5
Yes, just a brief passing thought	12.4	14.4	16.6
Yes, had a plan	8.9	9.9	11.9
Attempted to kill oneself, among participating 7th grade Stark County students			
Never	94.9	94.7	93.6
Yes, attempted at least once	5.1	5.3	6.4

* Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results.

Table 27. Suicidal ideation and attempts among participating 8th grade Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=2,319).*

	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating 8th grade Stark County students			
Never	73.7	73.7	67.8
Yes, just a brief passing thought	15.7	16.5	19.1
Yes, had a plan	10.5	9.8	13.1
Attempted to kill oneself, among participating 8th grade Stark County students			
Never	92.6	93.6	91.6
Yes, attempted at least once	7.4	6.4	8.4

* Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results.

Table 28. Suicidal ideation and attempts among participating 9th grade Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=2,164).			
	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating 9th grade Stark County students			
Never	66.0	69.2	60.2
Yes, just a brief passing thought	20.5	19.0	24.0
Yes, had a plan	13.5	11.8	15.8
Attempted to kill oneself, among participating 9th grade Stark County students			
Never	91.7	93.4	90.9
Yes, attempted at least once	8.3	6.6	9.1

* Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results.

Table 29. Suicidal ideation and attempts among participating 10th grade Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=2,114).			
	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating 10th grade Stark County students			
Never	66.2	69.1	61.5
Yes, just a brief passing thought	19.5	19.2	21.5
Yes, had a plan	14.4	11.7	17.1
Attempted to kill oneself, among participating 10th grade Stark County students			
Never	90.7	94.8	90.2
Yes, attempted at least once	9.3	5.2	9.8

* Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results.

Table 30. Suicidal ideation and attempts among participating 11th grade Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=1,927).			
	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating 11th grade Stark County students			
Never	65.2	70.9	61.7
Yes, just a brief passing thought	19.8	19.5	21.2
Yes, had a plan	15.0	9.6	17.1
Attempted to kill oneself, among participating 11th grade Stark County students			
Never	90.8	95.4	90.0
Yes, attempted at least once	9.2	4.6	10.0

* Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results.

Table 31. Suicidal ideation and attempts among participating 12th grade Stark County, Ohio students, Northeast Ohio Youth Health Survey, Spring 2018 (n=1,537).			
	Before 2017–2018 school year (before August 2017)	During 2017–2018 school year	Lifetime
Type of suicidal ideation or attempt	**%**	**%**	**%**
Thought about killing oneself, among participating 12th grade Stark County students			
Never	62.2	71.2	58.6
Yes, just a brief passing thought	23.4	18.9	24.9
Yes, had a plan	14.4	9.9	16.5
Attempted to kill oneself, among participating 12th grade Stark County students			
Never	90.5	95.8	90.2
Yes, attempted at least once	9.5	4.2	9.8

***** Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results.

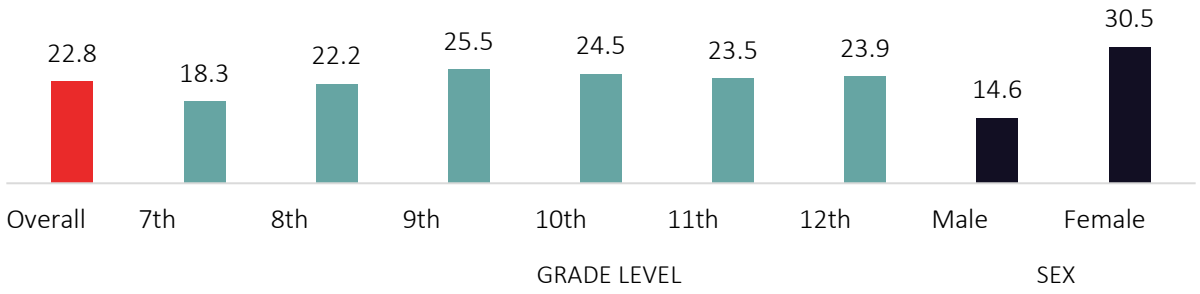
To understand the severity of symptoms at the time of the Epi-Aid, a series of validated suicide items, Ask Suicide Questions (ASQ), were posed to participating students. Table 32 shows the percentage of students who responded "yes" to each Ask Suicide Question. These percentages are reported for all participating students, as well as broken down by grade level and sex. Overall, 13.8% of Stark County students felt they or their family would be better off if they were dead, 15.1% of students wished they were dead, and 9.4% of students had thoughts about killing themselves in the past few weeks. Overall, these thoughts were most prevalent among 9th graders and female students.

Table 32. Stark County, Ohio students' thoughts about death and suicide in Spring 2018, Northeast Ohio Youth Health Survey (n=12,448).*									
	Overall	Grade						Sex	
Type of thought	**%** n=12,448	**7**	**8**	**9**	**10**	**11**	**12**	**M**	**F**
		% n=2,295	**%** n=2,319	**%** n=2,164	**%** n=2,114	**%** n=1,927	**%** n=1,537	**%** n=6,008	**%** n=6,160
Felt that you or your family would be better off if you were dead	13.8	11.8	14.5	16.2	14.2	12.8	12.9	8.3	18.8
Wished you were dead	15.1	11.8	14.2	17.9	16	15.5	14.8	9.2	20.4
Had thoughts about killing yourself	9.4	8.9	8.5	11.3	9.9	8.9	8.4	6.2	12.1

* % represents the percentage of students who responded 'yes'. The percentages of students who did not respond were 7.1% for the question about feeling that you or your family would be better off if you were dead; 6.9% for the question about wishing you were dead; and 6.5% for the question about having thoughts about killing yourself. Multiple responses possible. Students who completed the survey but did not report their grade level (0.7%) were excluded from the grade-stratified results. Students who completed the survey but did not report their sex (2.2%) were excluded from the sex-stratified results.

Answering 'yes' to at least one of the ASQ items connotes a higher risk of suicide.[28] Figure 7 demonstrates the percentage of students who answered 'yes' to one or more of these questions by grade, sex, and for the overall school district. Understanding this information can help schools guide allocation of counseling and support resources. Nearly 1 in 4 Stark County students answered 'yes' to at least one ASQ item. 'Yes' answers were highest among female students in Stark County (30.5%).

Figure 7. Percentage of Stark County, Ohio students answering 'yes' to a suicide risk question during Spring 2018, Northeast Ohio Youth Health Survey (n=12,448).



Objective 2. Identify precipitating factors for youth suicide that may contribute to ongoing suicidal behaviors among Stark County youth population to prevent further suicide attempts and suicides.

In total, 12,448 Stark County students completed all modules of the NOYHS survey. Cohort characteristics of NOYHS participants for key suicide risk factors are shown in Table 33.

Table 33. Stark County, Ohio cohort characteristics, Northeast Ohio Youth Health Survey, 2018.

	All students who completed survey	
Characteristic	**n**	**%***
Total	12,448	100
Race/ethnicity		
Black or African American, Non-Hispanic	737	6
Hispanic	551	5
Other, Non-Hispanic†	788	6
White, Non-Hispanic	10,142	83
Missing	230	
School grade		
7	2,295	19
8	2,319	19
9	2,164	18
10	2,114	17
11	1,927	16
12	1,537	12
Missing	92	
Sex		
Male	6,008	49
Female	6,160	51
Missing	280	
Adverse childhood experiences, lifetime		
0	4,786	39
1 to 2	4,449	36
3 or more	2,984	24
Missing	229	
Misused opioids (prescription pain medicine without a doctor's prescription, or heroin) in lifetime		
Yes	721	6
No	11,477	94
Missing	250	
Friend or significant other died by suicide during 2017–2018 school year		
Yes	1,255	11
No	10,407	89
Missing	732	
Family member died by suicide during 2017–2018 school year		
Yes	800	7
No	10,862	93
Missing	786	

Table 33. Stark County, Ohio cohort characteristics, Northeast Ohio Youth Health Survey, 2018. *(continued)*		
	All students who completed survey	
Characteristic	n	%*
Exposed to any vigils or moments of silence for teenagers who died by suicide during 2017–2018 school year		
Yes	4,700	39
No	7,458	61
Missing	290	
Seen any social media posts related to Stark County youth suicide deaths during 2017–2018 school year		
Yes	8,061	68
No	3,749	32
Missing	638	
Posted on social media about Stark County youth suicide deaths during 2017–2018 school year		
Yes	1,535	13
No	10,330	87
Missing	583	
Seen any news online on a news site related to Stark County youth suicide deaths during 2017–2018 school year		
Yes	6,267	52
No	5,803	48
Missing	378	
Seen any memorials related to Stark County youth suicide deaths during 2017–2018 school year		
Yes	4,470	38
No	7,297	62
Missing	681	
Seen any episodes of *Thirteen Reasons Why*, lifetime		
Yes	5,824	48
No	6,392	52
Missing	232	
Strongly emotionally affected by recent suicides during 2017–2018 school year		
Yes	2,793	24
No	8,871	76
Missing	784	
Student at school with suicide death in cluster during 2017–2018 school year		
Yes	2,012	16
No	10,436	84
Missing	0	
Reported suicidal ideation or attempt before 2017–2018 school year		
Yes	1,680	14
No	10,086	86
Missing	682	
Elevated risk of suicide at the time of the survey†		
Yes	2,614	23
No	8,837	77
Missing	997	

* % does not include missing in the denominator. †Students answering 'yes' to one or more Ask Suicide-Screening Questions (ASQ) items were categorized as having elevated risk of suicide at the time of the survey.[28] † Other, Non-Hispanic designation includes Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or other racial/ethnic group.

The ASQ is a set of screening questions frequently used in medical settings to identify youth at risk of suicide. ASQ items measure suicidal ideation in the previous 'few weeks'; students answering 'yes' to one or more ASQ items were categorized as having elevated risk of suicide at the time of the survey. Results examining the prevalence of elevated risk of suicide at the time of the survey by various risk factors are presented in Table 34.

Elevated risk of suicide at the time of the survey was more common among:

- Racial and ethnic minorities
- 9th graders
- Females
- Students with a history of 1+ adverse childhood experiences (compared to no adverse childhood experiences)
- Students who misused opioids
- Students who experienced the death of a loved one by suicide in the 2017–2018 school year
- Students who were exposed to any vigils or moments of silence for teenagers who died by suicide during the 2017–2018 school year
- Students who saw or posted about Stark County youth suicides on social media
- Students who had seen any news about the Stark County suicide cluster online on a news site
- Students who saw memorials for victims of suicide in Stark County
- Students who had seen any episodes of *Thirteen Reasons Why*
- Students who had a strong emotional response to the Stark County suicide cluster deaths

Table 34. Prevalence of suicide risk at time of survey (Spring 2018) by risk factors, Stark County, Ohio - Northeast Ohio Youth Health Survey, 2018.*

	Answered yes to suicide risk question (at risk of suicide at time of survey)			
Characteristic	**Cases**	**Total**	**%†**	***p*-value‡**
Total	2,614	11,451	23	
Race/ethnicity				
Black or African American, Non-Hispanic	145	524	28	<.0001
Hispanic	137	405	34	
White, Non-Hispanic	1,613	7,927	20	
Other, Non-Hispanic§	146	606	24	
School grade				
7	273	1,684	16	<.0001
8	374	1,788	21	
9	386	1,622	24	
10	382	1,645	23	
11	342	1,497	23	
12	284	1,226	23	
Sex				
Male	652	4,674	14	<.0001
Female	1,389	4,788	29	

* Elevated risk of suicide at the time of the survey (Spring 2018) was assessed using the Ask Suicide-Screening Questions (ASQ).[28] Those who answered "yes" to any of the ASQ items were categorized as having elevated risk of suicide at the time of the survey. † % does not include missing in the denominator. ‡ Chi-square test for independence. § Other, Non-Hispanic designation includes Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or other racial/ethnic group.

Table 34. Prevalence of suicide risk at time of survey (Spring 2018) by risk factors, Stark County, Ohio - Northeast Ohio Youth Health Survey, 2018.* *(continued)*

	Answered yes to suicide risk question (at risk of suicide at time of survey)			
Characteristic	**Cases**	**Total**	**%†**	***p*-value‡**
Adverse childhood experiences, lifetime				
0	244	3,899	6	<.0001
1 to 2	675	3,424	20	
3 or more	1,122	2,139	52	
Misused opioids (prescription pain medicine without a doctor's prescription, or heroin) in lifetime				
Yes	311	514	61	<.0001
No	1,730	8,948	19	
Friend or significant other died by suicide during 2017–2018 school year				
Yes	438	959	46	<.0001
No	1,603	8,503	19	
Family member died by suicide during 2017–2018 school year				
Yes	258	600	43	<.0001
No	1,783	8,862	20	
Exposed to any vigils or moments of silence for teenagers who died by suicide during 2017–2018 school year				
Yes	851	3,718	23	0.0121
No	1,190	5,744	21	
Seen any social media posts related to Stark County youth suicide deaths during 2017–2018 school year				
Yes	1,640	6,477	25	<.0001
No	401	2,985	13	
Posted on social about Stark County youth suicide deaths during 2017–2018 school year				
Yes	543	1,162	47	<.0001
No	1,498	8,300	18	
Seen any news online (on a news site) related to Stark County youth suicide deaths during 2017–2018 school year				
Yes	1,221	5,063	24	<.0001
No	820	4,399	19	
Seen any memorials related to Stark County youth suicide deaths during 2017–2018 school year				
Yes	935	3,586	26	<.0001
No	1,106	5,876	19	
Seen any episodes of *Thirteen Reasons Why,* lifetime				
Yes	1,246	4,517	28	<.0001
No	795	4,945	16	
Strongly emotionally affected by recent suicides during 2017–2018 school year				
Yes	824	2,169	38	<.0001
No	1,217	7,293	17	
Student at school with suicide death in cluster during 2017–2018 school year				
Yes	342	1,586	22	0.9942
No	1,699	7,876	22	

* Elevated risk of suicide at the time of the survey (Spring 2018) was assessed using the Ask Suicide-Screening Questions (ASQ).[28] Those who answered "yes" to any of the ASQ items were categorized as having elevated risk of suicide at the time of the survey. † % does not include missing in the denominator. ‡ Chi-square test for independence.

The following variables were included in the multivariate models examining risk factors for suicidal behaviors: race, sex, grade, ACEs, opioid misuse, death of a loved one by suicide in the 2017–2018 school year, exposure to any vigils or moments of silence for teenagers who died by

suicide during the 2017–2018 school year, suicide-related social media exposure, online suicide cluster news exposure, memorials, viewing *Thirteen Reasons Why*, strong emotional response to suicide cluster deaths, and attending the same school as a suicide cluster victim.

The results of the risk factor multivariate model are shown in Table 35. Factors independently associated with elevated risk of suicide at the time of the survey:

- Hispanic ethnicity
- Female sex
- 3+ adverse childhood experiences
- Students who misused opioids
- Having lost a loved one to suicide during the 2017–2018 school year
- Posting on social media about suicide
- Having a strong emotional response to suicide cluster deaths

Table 35. Associations between risk factors and elevated risk of suicide* at the time of the Northeast Ohio Youth Health Survey, Stark County, Ohio, Spring 2018.

	Unadjusted				Adjusted†			
Characteristic	OR‡	95% CI		*p*-value§	AOR‖	95% CI		*p*-value
Race/ethnicity								
Black or African American, Non-Hispanic	1.5	1.2	1.8	<.0001	1.1	0.9	1.4	0.30
Hispanic	2.0	1.6	2.6	<.0001	1.6	1.2	2.2	0.00
White, Non-Hispanic	1.0	Reference			1.0	Reference		
Other, Non-Hispanic¶	1.3	1.1	1.5	0.00	1.3	1.0	1.7	0.09
School grade								
7	0.7	0.5	0.9	0.01	0.8	0.6	1.0	0.08
8	0.9	0.7	1.1	0.38	0.9	0.7	1.1	0.40
9	1.0	0.8	1.3	0.73	1.1	0.8	1.4	0.67
10	1.0	Reference			1.0	Reference		
11	1.0	0.8	1.2	0.71	0.9	0.7	1.2	0.37
12	1.0	0.7	1.3	0.81	1.0	0.7	1.3	0.77
Sex								
Male	1.0	Reference			1.0	Reference		
Female	2.5	2.2	2.8	<.0001	1.8	1.6	2.1	<.0001
Adverse childhood experiences, lifetime								
0	1.0	Reference			1.0	Reference		
1 to 2	0.9	0.9	1.0	0.12	1.0	0.9	1.1	0.79
3 or more	4.2	3.8	4.5	<.0001	3.2	3.0	3.6	<.0001
Misused opioids (prescription pain medicine without a doctor's prescription, or heroin) in lifetime								
Yes	6.1	5.0	7.5	<.0001	3.5	2.9	4.2	<.0001
No	1.0	Reference			1.0	Reference		
Friend or significant other died by suicide during 2017–2018 school year								
Yes	3.6	3.2	3.9	<.0001	1.5	1.3	1.7	<.0001
No	1.0	Reference			1.0	Reference		

* Students answering 'yes' to one or more Ask Suicide Questions were categorized as having elevated risk of suicide at the time of the survey. † Adjusted for all variables in table. ‡ OR: Odds Ratio. § Chi-square test for independence. ‖ AOR: Adjusted Odds Ratio. ¶ Other, Non-Hispanic designation includes Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or other racial/ethnic group.

Table 35. Associations between risk factors and elevated risk of suicide* at the time of the Northeast Ohio Youth Health Survey, Stark County, Ohio, Spring 2018. *(continued)*								
	Unadjusted				Adjusted†			
Characteristic	OR‡	95% CI		*p*-value§	AOR¶	95% CI		*p*-value
Family member died by suicide during 2017–2018 school year								
Yes	2.9	2.5	3.4	<.0001	1.5	1.3	1.8	<.0001
No	1.0	Reference			1.0	Reference		
Exposed to any vigils or moments of silence for teenagers who died by suicide during this school year								
Yes	1.1	1.0	1.2	0.11	0.9	0.8	1.1	0.24
No	1.0	Reference			1.0	Reference		
Seen any social media posts related to suicide								
Yes	2.1	1.9	2.5	<.0001	1.1	0.9	1.3	0.23
No	1.0	Reference			1.0	Reference		
Posted on social media about Stark County youth suicide deaths during 2017–2018 school year								
Yes	3.9	3.3	4.5	<.0001	1.7	1.5	2.0	<.0001
No	1.0	Reference			1.0	Reference		
Seen any news online (on a news site) related to Stark County youth suicide deaths during 2017–2018 school year								
Yes	1.4	1.3	1.6	<.0001	1.0	0.9	1.1	0.58
No	1.0	Reference			1.0	Reference		
Seen any memorials related to Stark County youth suicide deaths during 2017–2018 school year								
Yes	1.5	1.3	1.6	<.0001	0.9	0.8	1.0	0.13
No	1.0	Reference			1.0	Reference		
Seen any episodes of *Thirteen Reasons Why,* lifetime								
Yes	1.9	1.7	2.2	<.0001	1.0	0.9	1.1	0.86
No	1.0	Reference			1.0	Reference		
Strongly emotionally affected by recent suicides during 2017–2018 school year								
Yes	3.0	2.7	3.4	<.0001	1.7	1.5	2.0	<.0001
No	1.0	Reference			1.0	Reference		
Student at school with suicide death in cluster during 2017–2018 school year								
Yes	1.0	0.7	1.4	0.92	1.0	0.9	1.2	0.70
No	1.0	Reference			1.0	Reference		

* Students answering 'yes' to one or more Ask Suicide Questions were categorized as having elevated risk of suicide at the time of the survey. † Adjusted for all variables in table. ‡ OR: Odds Ratio. § Chi-square test for independence. ‖ AOR: Adjusted Odds Ratio. ¶ Other, Non-Hispanic designation includes Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or other racial/ethnic group.

Objective 3. Ascertain the activities, social supports, and other factors among the Stark County youth population that are most protective against suicide risk in order to guide immediate prevention activities.

Protective factors buffer individuals from suicidal thoughts and behaviors.[5] Identifying and understanding protective factors is critical for the prevention of suicide.[6] Cohort characteristics of NOYHS participants for key protective indicators are shown in Table 36.

Table 36. Stark County, Ohio cohort characteristics, Northeast Ohio Youth Health Survey, 2018.

	All students who completed survey	
Characteristic	**n**	**%***
Total	12,448	100
Participated in any school activity during the 2017–2018 school year		
Yes	10,331	84
No	1,915	16
Missing	222	
Participated in any sport during the 2017–2018 school year		
Yes	6,862	56
No	5,364	44
Missing	222	
Participated in any community activity during the 2017–2018 school year		
Yes	8,805	74
No	3,031	26
Missing	612	
Endorsed feeling close/connected to friends, family, school, community at time of survey, Spring 2018†		
Yes	7,198	60
No	4,868	40
Missing	382	
Reported ≥1 positive interaction(s) with a parent or guardian in the past month, Spring 2018		
Yes	11,757	97
No	364	3
Missing	327	
Always able access to medical or psychological care when needed during the 2017–2018 school year		
Yes	9,148	85
No	1,647	15
Missing	1,653	
Level of resilience at time of survey, Spring 2018‡		
High	6,489	53
Medium	3,989	33
Low	1,706	14
Missing	264	

* % does not include missing in the denominator. † Students were asked whether they agreed with a series of statements about school, friends, and family. Students who agreed with 1 or more statement were categorized as endorsing feelings of closeness/connectedness. ‡ Resiliency was measured using an adapted version of the Child and Youth Resilience Measure.[35] Students were asked to rate, on a 5-point scale, how much they agreed with a series of 28 statements. Based on their responses to these statements, participants were categorized as having high, medium, or low levels of resilience.

Table 37 depicts the prevalence answering 'yes' to a suicide risk question by various protective factors.

Suicide risk was **less** common among students who:

- > Participated in any school activities during the 2017–2018 school year
- > Participated in any sports during the 2017–2018 school year
- > Participated in any community activities during the 2017–2018 school year
- > Endorsed closeness to peers or family
- > Endorsed positive parental engagement in the month prior to the survey
- > Had access to medical care when needed during the 2017–2018 school year
- > Endorsed higher levels of resilience

Table 37. Risk of suicide by cohort characteristics, Stark County, Ohio - Northeast Ohio Youth Health Survey, 2018.

	Answered yes to suicide risk question (at risk of suicide at time of survey)			
Characteristic	**Cases**	**Total**	**%***	***p*-value†**
Total	2,084	12,448	17	
Participated in any school activity during the 2017–2018 school year				
Yes	1689	7,986	21	<0.0001
No	395	1,386	28	
Participated in any sport during the 2017–2018 school year				
Yes	945	5,464	17	<0.0001
No	1,139	3,908	29	
Participated in any community activity during the 2017–2018 school year				
Yes	1,477	7,134	21	<0.0001
No	607	2,238	27	
Endorsed feeling close/connected to friends, family, school, community at time of survey, Spring 2018‡				
Yes	782	6,040	13	<0.0001
No	1,302	3,332	39	
Reported ≥1 positive interaction(s) with a parent or guardian in the past month, Spring 2018				
Yes	1,987	9,164	22	<0.0001
No	97	208	47	
Always able access to medical or psychological care when needed during the 2017–2018 school year				
Yes	1,340	8,077	17	<0.0001
No	744	1,295	57	
Level of resilience at time of survey, Spring 2018§				
High	488	5,562	9	<0.0001
Medium	967	2,852	34	
Low	629	958	66	

* % does not include missing in the denominator. † Chi-square test for independence. ‡ Students were asked whether they agreed with a series of statements about school, friends, and family. Students who agreed with 1 or more statement were categorized as endorsing feelings of closeness/connectedness. § Resiliency was measured using an adapted version of the Child and Youth Resilience Measure.[35] Students were asked to rate, on a 5-point scale, how much they agreed with a series of 28 statements. Based on their responses to these statements, participants were categorized as having high, medium, or low levels of resilience.

The following variables were included in the multivariate models examining protective factors against suicidal behaviors: race; sex; grade; participation in school activities, sports, or community activities; closeness; access to medical care; and resilience.

The results of the protective factor multivariate model are shown in Table 38.

Factors independently associated with lower suicide risk:

- Closeness to friends, family, and loved ones
- Access to medical care when needed
- High or medium levels of resilience

In the protective factor multivariate model, participating in any community activity conferred mildly elevated odds of suicidal behavior (adjusted odds ratio [AOR]: 1.2, 95% Confidence Interval [CI]: 1.1-1.4) when controlling for participation in school activities and sports.

Table 38. Associations between protective factors and answering yes to at least one suicide risk question, Stark County, Ohio - Northeast Ohio Youth Health Survey, 2018.

	Unadjusted				Adjusted*			
Characteristic	**OR†**	**95% CI**		***p*-value‡**	**AOR§**	**95% CI**		***p*-value**
Any School Activity								
Yes	0.7	0.6	0.8	<0.0001	1.1	0.9	1.3	0.30
No	1.0	Reference			1.0	Reference		
Any Sport								
Yes	0.5	0.5	0.6	<0.0001	0.8	0.7	1.0	0.08
No	1.0	Reference			1.0	Reference		
Any Community Activity								
Yes	0.7	0.7	0.8	<0.0001	1.2	1.1	1.4	0.00
No	1.0	Reference			1.0	Reference		
Closeness								
Yes	0.2	0.2	0.3	<0.0001	0.6	0.5	0.6	<0.0001
No	1.0	Reference			1.0	Reference		
Any Positive Parent Events								
Yes	0.3	0.2	0.5	<0.0001	0.9	0.6	1.3	0.51
No	1.0	Reference			1.0	Reference		
Access to Medical Care When Needed								
Yes	0.2	0.1	0.2	<0.0001	0.4	0.3	0.4	<0.0001
No	1.0	Reference			1.0	Reference		
Resilient								
High	0.1	0.0	0.1	<0.0001	0.1	0.1	0.1	<0.0001
Medium	0.3	0.2	0.3	<0.0001	0.4	0.3	0.5	
Low	1.0	Reference			1.0	Reference		

* Adjusted for all variables in table. † OR: Odds Ratio. ‡ Chi-square test for independence. § AOR: Adjusted Odds Ratio.

Objective 4. Inventory and catalogue existing suicide prevention initiatives in Stark County and make recommendations on evidence-based suicide prevention programs.

Prior to the suicide cluster, Stark County was actively engaged in suicide prevention through several initiatives. In response to the cluster, Stark County increased suicide prevention efforts, particularly in the areas of coalition building, engagement of community partners, and youth involvement. In general, Stark MHAR plays the role of central coordinator for suicide prevention in Stark County, facilitating collaboration and coordination between suicide prevention initiatives taking place in the community, outlining priorities, setting goals, developing strategies, tracking progress, and identifying barriers. The characteristics of Stark County's suicide prevention initiatives are described below. All types of suicide prevention initiatives (n=28), including youth suicide prevention, were featured in the inventory. As some risk and protective factors are not unique to suicide, the inventory was expanded to include additional initiatives with a broader scope (n=26) in order to identify programs, policies, or activities addressing these risk factors. In total, 54 prevention initiatives were evaluated.

Stark County Suicide Prevention Initiatives. Among the 54 prevention initiatives identified by key informant interviews and systematic search, 28 initiatives focused on suicide prevention (Appendix 4). Overall, suicide prevention programs, activities, and policies were predominantly implemented by Stark MHAR (54%, n=15), followed by individual school districts (14%, n=4), Coleman Professional Services (11%, n=3), SCESC (4%, n=1), Stark County Health Department (4%, n=1), Stark County Suicide Prevention Coalition (4%, n=1), Stark County local government (4%, n=1), and system-wide partnerships (4%, n=1)

The majority of the 28 suicide prevention initiatives were activities or programs (82%, n=23). Activities and programs that used multiple approaches were categorized to more than one classification. Suicide prevention activities or programs included gatekeeper training (52%, n=12), crisis intervention and postvention (22%, n=5), organizational culture change (22%, n=5), treatment for people at risk of suicide (9%, n=2), community engagement (4%, n=1), safer suicide care through systems change (4%, n=1), and reducing access to lethal means among people at risk of suicide (4%, n=1).

Examples of gatekeeper training programs identified by the inventory include: Stark MHAR's Counseling on Access to Lethal Means (CALM) training, Youth Mental Health First Aid curriculum, Crisis Intervention Team trainings, Columbia Suicide Severity Rating Scale trainings (C-SSRS), Question Persuade Refer (QPR) trainings, and Lifelines Postvention trainings; SCESC's gatekeeper teacher trainings; and individual school districts' Signs of Suicide (SOS), Kognito, and Jason Foundation programming.

Crisis intervention and postvention programs included initiatives like Coleman Professional Services' youth crisis mobile response team and behavioral health program, Stark MHAR's crisis text line and hotline, and a collaborative Care Team with representation from Stark MHAR and SCESC. Organizational policies and culture change programs included Stark MHAR's Crisis

Intervention Team trainings and Lifelines Postvention trainings, and individual school district's SOS programming. Educational programs included Coping and Support Training (CAST) programming implemented by behavioral health provider agencies within individual school districts.

Fourteen percent of Stark County suicide prevention initiatives were related to policy (n=4). These included an overarching Stark County Community Health Improvement Plan and a Stark MHAR initiative to improve inpatient to outpatient transitions through improved provider communication.

Of the 28 suicide prevention initiatives evaluated, 12 focus specifically on youth (43%). The majority of youth suicide prevention initiatives are based in schools (67%, n=8). Many of the youth suicide prevention initiatives in Stark County center around identification and support of young people at risk of suicide (67%, n=8), through gatekeeper training (58%, n=7) and crisis intervention (8%, n=1). Other youth-specific suicide prevention strategies in Stark County include organizational policies and culture (17%, n=2), postvention activities (17%, n=2), teaching coping and problem solving skills through social-emotional learning programs (8%, n=1), and reducing access to lethal means (8%, n=1). Drug Free Stark County and Stark MHAR regularly involve youth in prevention planning through Youth Led Prevention Meetings to promote youth engagement in mental health initiatives.

Initiatives Addressing Stark County Youth's Unique Risk and Protective Factors. The Epi-Aid identified several independent risk factors for suicide among Stark County youth: adverse childhood experiences, opioid misuse, death of a loved one by suicide in the past year, posting on social media about the suicide cluster deaths, and having a strong emotional reaction to the Stark County youth suicide cluster. Table 39 depicts prevention initiatives that align with Stark County's unique constellation of risk factors. Multiple prevention initiatives exist in the community to address adverse childhood experiences, opioid misuse, loss of a friend or loved one to suicide, and strong emotional response to youth suicide cluster deaths. These prevention initiatives are not limited to youth. At present, only one program addresses social media as a risk factor for Stark County youth: the *Say Something* program from Sandy Hook Promise. New and ongoing suicide prevention efforts in Stark County may benefit from increasing activities related to these risk factors.

Table 39. Presence or absence of prevention initiatives addressing Stark County, Ohio youth suicide **risk factors** identified by Epi-Aid, Spring 2018.

Risk Factor	Addressed by Prevention Initiative in Stark County?	Prevention Initiatives
Adverse Childhood Experiences	Yes	CAST (Coping and Support Training) Reconnecting Youth Traumatized Child Task Force Multi-Systemic Therapy (MST) Early Childhood Mental Health Services Positive Action Red Flags Nurturing Parenting Training OhioGuidestone Parenting Classes
Posting to Social Media about Suicide Cluster	Yes	Sandy Hook Promise *Say Something*
Recent Death of a Loved One by Suicide	Yes	Youth Mental Health First Aid SOS Signs of Suicide Survivors' Walk Crisis Text Line Crisis Hot Line Question Persuade Refer Kognito Postvention Training/Lifelines Community Response Team
Strong Emotional Response to Stark County Youth Suicide Cluster Deaths	Yes	Youth Mental Health First Aid SOS Signs of Suicide Jason Foundation JED Foundation Red Flags Survivors' Walk Crisis Text Line Crisis Hot Line Question Persuade Refer Counseling on Access to Lethal Means (CALM) Kognito Care Teams SCESC Teacher Trainings Crisis Intervention Team Trainings
Opioid Misuse	Yes	Opiate Prevention Toolkit Project DAWN Opiate Task Force Heroin and Opioid Prevention Education (HOPE) Drug Free Stark County LifeSkills Training Positive Action All Stars KidSummit Street Addiction Program CAST (Coping and Support Training) Reconnecting Youth

The Epi-Aid characterized several factors providing protection against suicide among Stark County youth. Table 40 highlights these protective factors and lists initiatives promoting such factors in Stark County. Suicide prevention efforts in Stark County may capitalize on youth's protective factors through initiatives that strengthen buffering elements. In November 2018—based on preliminary results from the NOYHS survey—Stark MHAR put out a request for proposals to fund youth-led prevention programming. Stark MHAR awarded eight $2,500 contracts directly to Stark County school districts for youth-led prevention programming in an effort to help schools implement strategies and programs to increase resilience, feelings of connectedness and ultimately reduce feelings of isolation and loneliness. These funds will be utilized by grantees to implement new youth-led prevention programming or expand existing programs before the end of the 2018–2019 school year. Although initiatives exist for each of the three protective factors identified by the Epi-Aid, activities to promote protective factors could be expanded. For example, Stark County youth's protective factor profile suggests a need for additional initiatives that provide access to medical or psychological care and resilience-building, when such services are needed.

Table 40. Presence or absence of Stark County, Ohio prevention initiatives addressing youth suicide **protective factors** identified by Epi-Aid, Spring 2018.

Protective Factor	Addressed by Prevention Initiative in Stark County?	Prevention Initiatives
Closeness to Friends or Family	Yes	All Stars Positive Action Nurturing Parenting Training OhioGuidestone Parenting Classes Strong African American Families
Access to Medical or Psychological Care When Needed	Yes	Youth Crisis Mobile Response Crisis Text Line Crisis Hotline Care Teams Community Health Improvement Plan Coleman Behavioral Health Zero Suicide Academy Stark MHAR Care Network Columbia Suicide Severity Rating Scale Training Improved handoff inpatient to outpatient
High or Medium Levels of Resilience	Yes	Childhood Resiliency Project Transition to Independence Process (TIP) LifeSkills Training Early Childhood Mental Health Services Transitional Age Youth Programs School Resiliency Contracts

Alignment with CDC Suicide Prevention Technical Package. In 2017, the CDC released a Suicide Prevention Technical Package highlighting a core set of strategies to be considered for use by communities to reduce suicide and associated risk factors for suicide.[3] These strategies include

strengthening economic supports, strengthening access and delivery of suicide care, creating protective environments, promoting connectedness, teaching coping and problem-solving skills, identifying and supporting people at risk, and lessening harms and preventing future risks. For each strategy, the CDC technical package also includes approaches—specific ways to advance the strategies. The evidence-based and evidence-informed approaches and strategies outlined in the suicide technical package are not intended to be a comprehensive checklist for a community, but rather to serve as an evidence-based reference for communities planning a comprehensive approach to suicide prevention. Suicide prevention initiatives that are tailored to a community's unique needs, risks, and protective factors may increase the likelihood of removing barriers to care and providing opportunities to develop individual and community resilience.[3]

Overall, Stark County is engaged in efforts addressing many of the approaches outlined by the Suicide Prevention Technical Package (Table 41). For example, multiple Stark County programs focus on identifying and assisting persons at risk for suicide and creating protective environments. Table 41 shows the number of Stark County initiatives aligned with the strategies and approaches included in CDC's Suicide Prevention Technical Package. Evidence-based suicide prevention approaches without current policy or programming in Stark County that are associated with identified risk factors include: improved mental health coverage in health insurance policies, community-based policies to reduce excessive alcohol use, and treatment to prevent re-attempts. These prevention approaches may be considered when advancing a comprehensive approach to suicide prevention.

Table 41. Stark County, Ohio programs and initiatives aligned with CDC's Suicide Prevention Technical Package.

Strategy	Approach	Count
Strengthen economic supports		
	Strengthen household financial security	1
	Housing and stabilization policies	2
Strengthen access and delivery of suicide care		
	MH coverage in health insurance policies	0
	Reduce provider shortages in underserved areas	1
	Safer suicide care through systems change	2
Create protective environments		
	Reduce access to lethal means among persons at risk of suicide	2
	Organizational policies and culture	5
	Community-based policies to reduce excessive alcohol use	0
Promote connectedness		
	Peer norm programs	3
	Community engagement activities	1
Teach coping and problem-solving skills		
	Social-emotional learning programs	8
	Parenting skills and family relationship programs	2
Identify and support people at risk		
	Gatekeeper training	12
	Crisis intervention	6
	Treatment for people at risk of suicide	7
	Treatment to prevent re-attempts	0

Table 41. Stark County, Ohio programs and initiatives aligned with CDC's Suicide Prevention Technical Package. *(continued)*		
Strategy	**Approach**	**Count**
Lessen harms and prevent future risks		
	Postvention	2
	Safe reporting and messaging about suicide	1

Strategic Planning. The CDC's Suicide Prevention Technical Package and the Suicide Prevention Resource Center (SPRC) advise that community stakeholders and groups develop a strategic plan to guide the selection, implementation, and coordination of suicide prevention activities.[3,75] The strategic plan comprises four iterative steps: 1) use data to describe suicide in the community, 2) select long-term goals based on the available data, 3) prioritize risk and protective factors on which to target programs and policies, and 4) select a combination of evidence-based strategies and approaches.

The Stark County Suicide Prevention Coalition (SCSPC) and Stark MHAR are incorporating many of these suggested steps.[76] SCSPC, founded in 2003, is a partnership of representatives from more than 25 local community organizations.[76] Representatives from community advocacy, behavioral health organizations, survivors of suicide loss, social service organizations, human service agencies, government organizations, medical facilities and educational institutions meet monthly to discuss ways to promote suicide prevention activities, reduce stigma around suicide and mental illness, and empower individuals to get involved in saving lives.

In addition, SCSPC regularly engages with a range of stakeholders to identify community-identified priorities and needs. SCSPC adopted strategies highlighted by the Ohio Suicide Prevention Foundation 2013-16 Strategic Plan to advance its goal of zero suicides.[77] These strategies include:

- "Push " suicide prevention upstream through its life cycle
- Foster the use of public health approaches for suicide prevention
- Strengthen the local coalitions
- Enhance professional education and development
- Prioritize work with military personnel
- Increase the use of social media, technology, and targeted communications to advance social marketing

These strategies parallel many of the risk and protective factors highlighted by the results of the Epi-Aid. "Pushing" suicide prevention upstream through initiatives that increase resilience and coping skills among young people is a worthwhile priority, based on the importance of these protective factors among Stark County youth. SCSPC's goal to increase use of social media, technology, and targeted communications should be implemented with safe suicide reporting guidelines in mind, as social media can be a potential risk factor if not used thoughtfully.

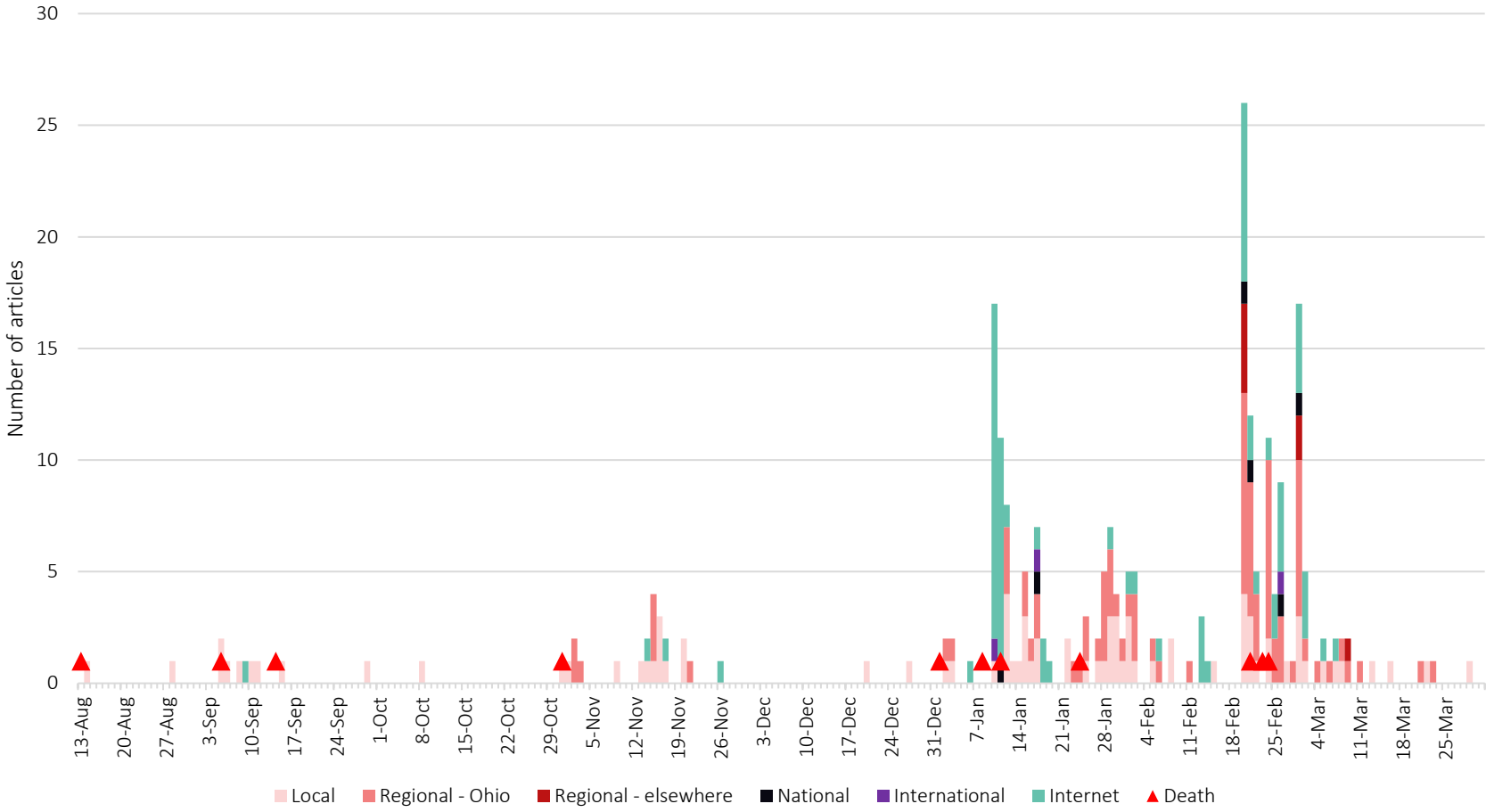
At present, SCSPC has one activity aimed at youth: placement of resource baskets at various youth-centric locations across the county. As SCSPC develops future Strategic Plans, additional youth-specific strategies are recommended.

Evidence-Based Evaluation. An important aspect of public health interventions is monitoring and evaluation. Monitoring and evaluation provide information on what a program, policy, or activity is doing, how well it is performing, and whether it is achieving its aims and objectives. Such evaluation provides guidance for future intervention activities and provides accountability to stakeholders. Collecting data regularly about project activities is integral to tracking project success. Stark County uses suicide data to guide mental health strategies outlined in their Community Health Improvement Plan.[78] Stark MHAR tracks multiple data points related to suicide (e.g. suicide deaths, crisis hotline call volume, crisis text line volume, average time spent on wait list for mental health service) and shares progress towards goals with the community via Community Plan Updates.[79] Additionally, Stark MHAR monitors outcomes for all funded programming, including prevention, on a quarterly basis. Visibility of quantitative and qualitative evaluation of suicide prevention efforts in Stark County is an essential activity.

Media Coverage & Adherence to Safe Suicide Reporting Guidelines

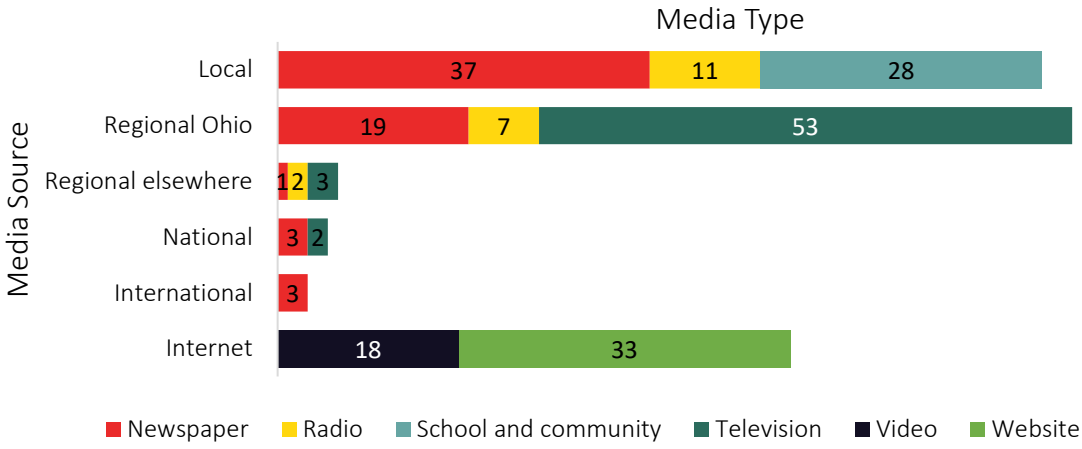
A total of 247 news articles related to youth suicides in Stark County were identified between August 2017 and March 2018. A timeline of article publication by type and correlation to deaths is depicted in Figure 8.

Figure 8. Number of News Articles Related to Stark County, Ohio Youth Suicides by Geographic Audience and Publication Day, August 2017–March 2018.



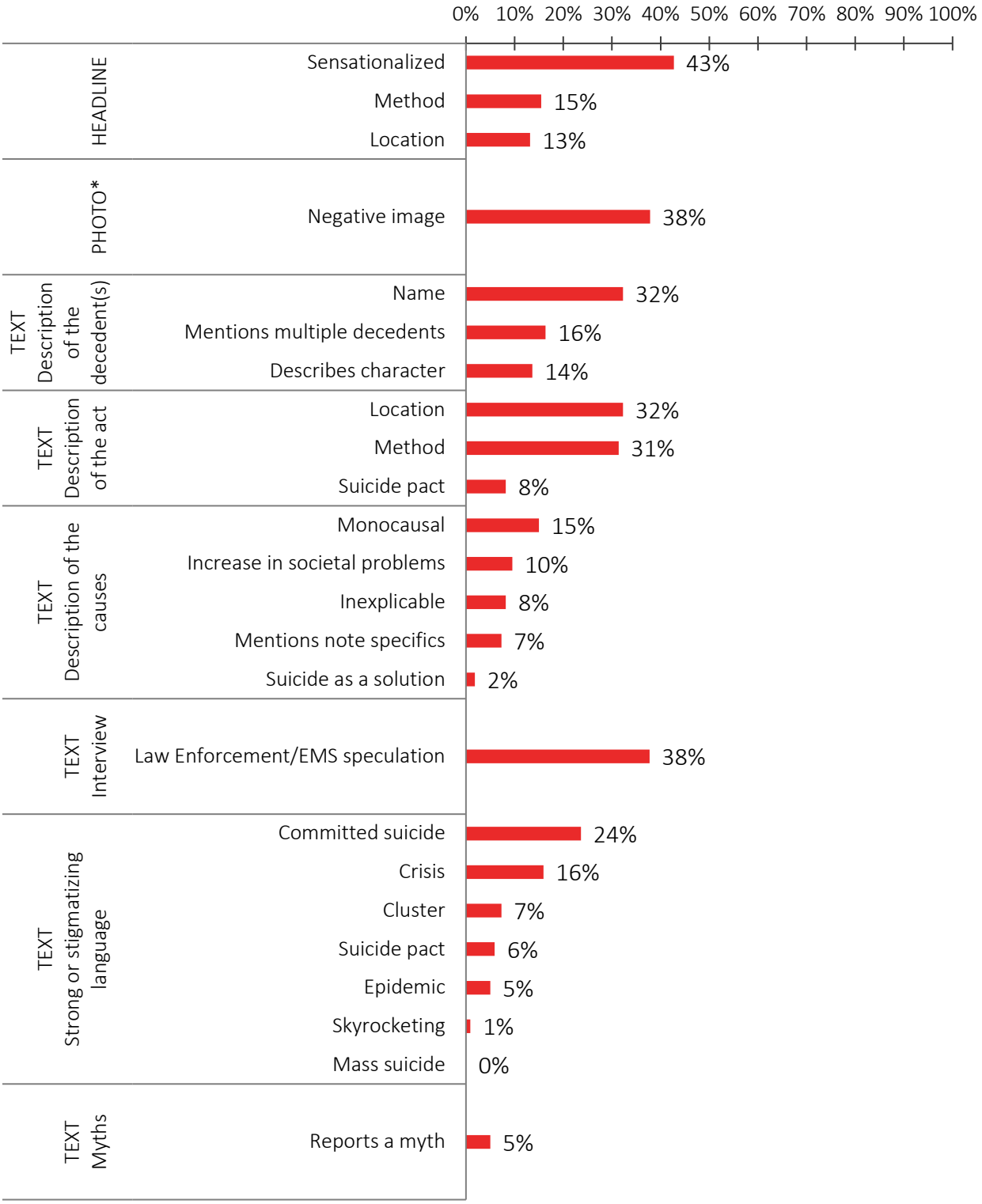
After excluding 27 duplicates, 220 articles were included in the analysis. Among the 220 articles reviewed, the three most common media sources were local (n=76, 35%), regional Ohio (n=79, 36%), and internet (n=51, 23%) (Figure 9). Over half of article types were either newspaper (n=63, 29%) or television (n=58, 26%) but varied according to media source. Internet sources were either websites (n=33) or videos (n=18). Local sources also included school and community communications (n=28).

Figure 9. Number of Stark County, Ohio Youth Suicide-Related Articles Reviewed, by Media Source and Type (N = 220).



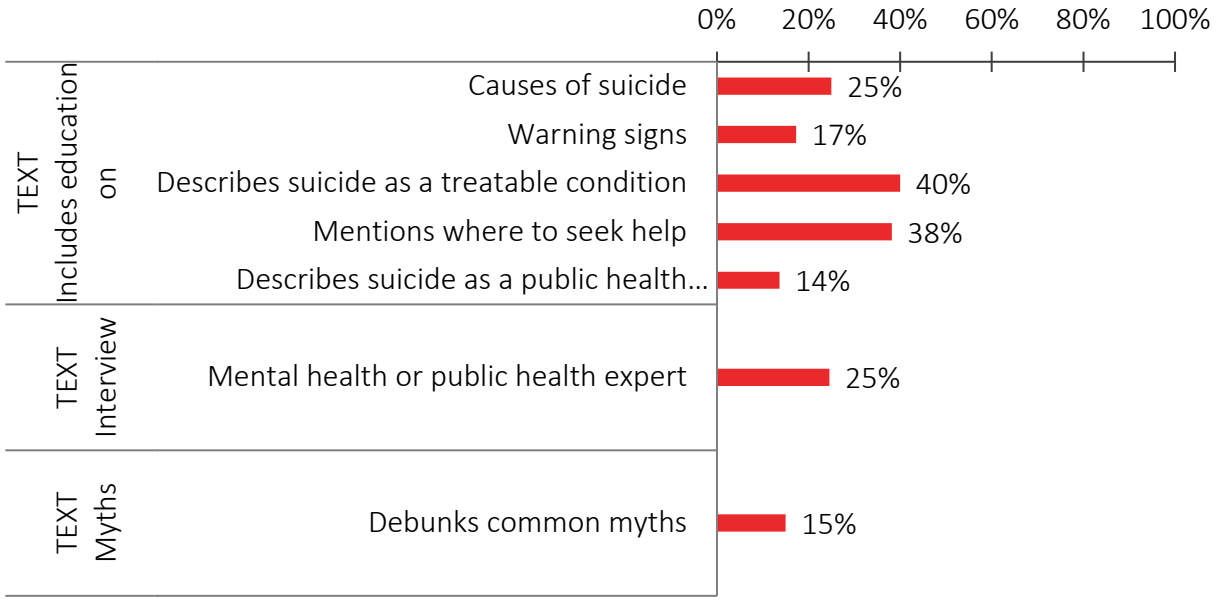
The frequency of individual negative and positive criteria are shown in Figures 10 and 11. The most common negative characteristics included sensationalized headline (43%), negative images (38%), describing the decedent's name (32%) or the location (32%) or method (31%) of suicide, and interviewing law enforcement about the causes of suicide (38%). The most common positive characteristics included describing suicide as preventable (40%), and mentioning where to seek help (38%). Positive characteristics infrequently mentioned in articles were describing suicide as a public health problem (14%), debunking common suicide myths (15%), and presenting warning signs of suicide (17%).

Figure 10. Frequency of Negative Characteristics in 220 Articles Reviewed.



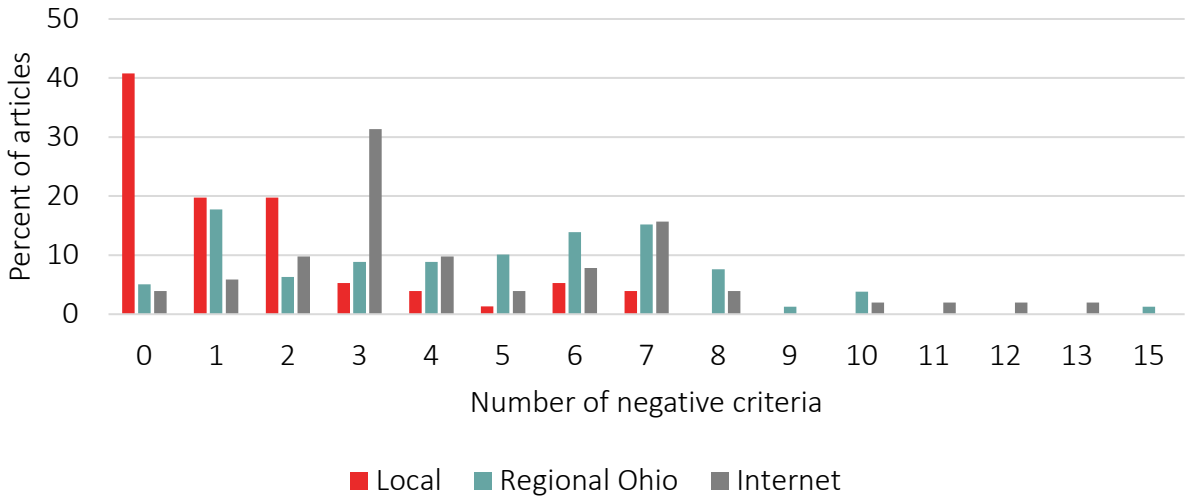
* Excludes 72 articles with no photograph

Figure 11. Frequency of Positive Characteristics in 220 Articles Reviewed.



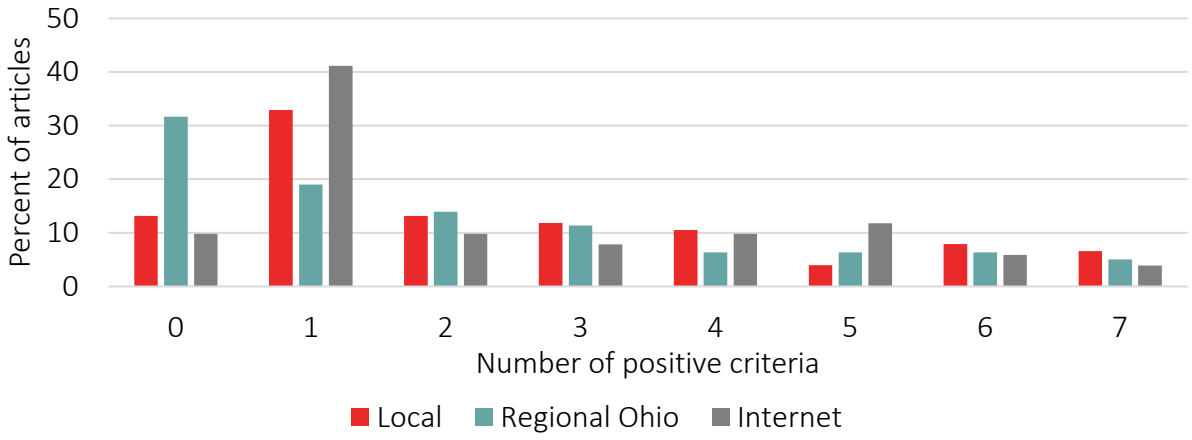
The cumulative number of negative characteristics per article was summed. There were 24 total negative criteria reviewed. Overall, cumulative negative criteria per article ranged from 0 to 15 with a median of 3 (interquartile range, IQR, 1 to 6). The cumulative negative criteria varied by media source (Figure 12). The median negative criteria for media sources was 1 (IQR: 0-2) for local news sources, 5 (IQR: 2-7) for regional Ohio news sources, and 3 (IQR: 3-7) for internet articles. Regional elsewhere, national, and international media sources were excluded due to small sample sizes. The mean cumulative negative criteria was significantly lower for local articles (1.6) than regional Ohio (4.6, p <.0001) and internet sources (4.6, p <.0001). There was no significant difference in the cumulative number of negative criteria between regional Ohio and internet sources (p = 0.92).

Figure 12. Percent of Articles with Negative Suicide Reporting Criteria, by Media Source and Number of Negative Criteria (N=220).



Cumulative number of positive characteristics per article was summed. There were 7 total positive criteria reviewed. Overall, cumulative positive criteria per article ranged from 0 to 7 with a median of 1.5 (IQR: 1-4). The cumulative positive criteria varied by media source (Figure 13). The median positive criteria for media sources was 2 (IQR: 1-4) for local news sources, 1 (IQR: 0-3) for regional Ohio news sources, and 1 (IQR: 1-4) for internet articles. Regional elsewhere, national, and international media sources were excluded due to small sample sizes. The mean cumulative positive criteria was not significantly different between local articles, regional Ohio sources, or internet source

Figure 13. Percent of Articles with Positive Suicide Reporting Criteria, by Media Source and Number of Positive Criteria (N=220).



Conclusions and Recommendations

Key Findings

This report provides a cross-section of a community: prevalence of suicidal behaviors, key risk and protective factors among youth, media coverage of suicide, and suicide prevention initiatives taking place in Stark County. Below, key findings from the Epi-Aid investigation and potential opportunities for prevention—based on the examined data—are outlined.

- The rapid increase in the proportion of ED visits related to suicidal behaviors, observed in both Stark County and Ohio, is reflective of nationwide trends: suicidal behaviors resulting in emergency department visits and hospitalizations are on the rise across the country.[80,81] Since 2016, the proportion of non-fatal suicidal behaviors have increased by 181% in Stark County and 100% in Ohio. These findings underscore the increasing prevalence of suicide risks among youth and the growing burden of non-fatal suicidal behaviors on emergency departments. Acute care facilities, emergency departments, and children's hospitals may need to expand behavioral health care resources and staffing to manage and treat the increasing number of youth with suicidal behaviors. Additionally, these data suggest the need for collaboration on prevention initiatives for youths' non-fatal suicidal behaviors.
- Social network analysis demonstrates a highly connected social system in Stark County: all schools have at least one connection to another school and many schools are connected to seven or more institutions through students' friendships. These connections are representative of 21st century friendships—in the advent of social media and the internet, students make connections throughout a community. A traumatic event at one school could easily affect students at another school, regardless of geographic proximity. All schools should have a crisis response plan in place prior to the occurrence of an event like suicide.[82] Schools may consider activating their crisis response plan and postvention resources for traumatic events occurring at other schools or the community.
- Based on responses to Ask Suicide Questions, nearly 1 in 4 Stark County youth were at elevated risk of suicide in Spring 2018 (22.8%). Ongoing surveillance and interventions to prevent youth suicide are merited. Future prevention initiatives may choose to include strategies addressing Stark County youth's unique risk factors (e.g., 3+ adverse childhood experiences, opioid misuse (lifetime use of prescription pain medicine without a doctor's prescription or heroin), losing a loved one to suicide in the past year, posting on social media about suicide) and protective factors (e.g., closeness to friends and family, access to medical and psychological care when needed, higher resilience)
- The Stark County community is actively engaged in suicide prevention, through programs, policies and strong partnerships. Youth specific suicide prevention initiatives could be expanded.

Stakeholders may use these data to guide future prevention strategies and direct resources to areas of greatest need. Multi-sectoral action is needed to make prevention possible. With timely

and effective evidence-based interventions, treatment and support, both suicides and suicide attempts can be prevented.

Recommendations

The results from this Epi-Aid, as well as the recommendations informed by these results, may be used as a tool for ongoing stakeholder discussions to guide local level prevention initiatives. The following recommendations are guided by the data examined in this investigation and informed by the best available evidence about prevention strategies, particularly CDC's *Preventing Suicide: A Technical Package of Policy, Program, and Practices*. This technical package provides a core set of strategies to achieve and sustain substantial reduction in suicide, helping communities sharpen their focus on prevention activities with the greatest potential to prevent suicide.

Advance Integrated Approaches to Suicide Prevention at the Community Level

The most effective way to prevent suicide is to use a comprehensive approach with a number of complementary strategies addressing the risk and protective factors identified in a particular community.[3,82]

> **Develop a strategic plan for Stark County suicide prevention.** Youth suicide prevention activities, programs, and other efforts are most effective when they are guided by a strategic planning process.[75] At the time of the Epi-Aid, there was no youth-specific suicide prevention strategic plan. The work being conducted by the Stark County Suicide Prevention Coalition could be strengthened by development of a youth-specific Stark County Youth Suicide Prevention Strategic Plan to guide county level programming and policies. Development of youth-specific strategies would complement existing Stark County Suicide Prevention Coalition and Task Force activities and better target interventions for Stark County youth.

Strengthen Access and Delivery of Suicide Care

Mental illness is an important risk factor for suicide.[83,84] Analysis of Ohio acute care visits demonstrated significant increases in the proportion of acute care visits related to suicidal behaviors among both Stark County and Ohio youth between 2016 and 2018. Mental healthcare needs among Stark County youth are increasing rapidly; access to affordable, quality, timely mental healthcare is necessary to meet this evolving need.

> **Increase youth access to mental health care.** Access to medical or psychological care when needed was associated with lower odds of suicidal behaviors by 60% among Stark County youth. Nearly 16% of Stark County youth were not always able to get medical or psychological care when needed. Common reasons for not receiving care included not wanting one's parents to know (47.5%), thinking the problem would go away (47.5%), not knowing who to go see (33.6%), and fear of what the medical provider might do or say (28%). One in ten youth were unable to get medical or psychological care when needed because they did not have insurance, and one in six youth were unable to pay for needed healthcare. Increasing insurance coverage and engaging parents and community partners to improve healthcare access for youth may be a valuable strategy. Additionally, providing youth with information about confidential resources for mental healthcare may benefit youth at risk for stigmatization.

Create Protective Environments

Prevention efforts that focus not only on individual behavior change (e.g., help-seeking, treatment interventions) but on changes to the environment can increase the likelihood of positive behavioral and health outcomes.[85] Creating environments that address risk and protective factors where individuals live, work, and play can help prevent suicide.[34,86]

- **Reduce access to lethal means among persons at risk of suicide.** Over one quarter of Stark County students have access to a gun. Approximately 14% of Stark County students with a history of attempting suicide reported having access to a gun during Spring 2018. Safe storage of medications, firearms, and other household products can reduce the risk for suicide by separating vulnerable individuals from easy access to lethal means.[3,87] Such practices may include education and counseling around storing firearms locked in a secure place (e.g., in a gun safe or lock box), unloaded and separate from the ammunition; and keeping medicines in a locked cabinet or other secure location away from people who may be at risk or who have made prior attempts.[3,88]
- **Community-based strategies to reduce youth substance use.** Nearly half of Stark County youth have used a substance at least once. The most common substances used by Stark County youth in their lifetime were alcohol, marijuana, and prescription pain medications without a doctor's prescription. Based on NOYHS findings, Stark County youth were at higher risk for suicide if they reported opioid misuse (prescription pain medication without a doctor's prescription or heroin). Evidence-based programs, such as those outlined in the National Institute on Drug Abuse's (NIDA) *Preventing Drug Use among Children and Adolescents (In Brief)* and Spoth et al.'s "Longitudinal effects of universal preventive intervention on prescription drug misuse: three randomized controlled trials with late adolescents and young adults", may be effective in preventing adolescents from trying substances and protect against the adverse effects of substance use.[89,90] Some individual school districts are implementing the HOPE program to target opioid misuse; evidence-based programs to combat opioid misuse could be expanded to cover the entire county. Only one evidence-based program targeting excessive alcohol use was identified in the Stark County prevention initiative inventory; this is an area that could be increased. Substance use prevention resources specific to Ohio can be found at Start Talking!, a multi-pronged initiative from the Office of the Governor to fight drug abuse from all angles.

Promote Connectedness

Promoting connectedness among individuals and within communities through modeling peer norms and enhancing community engagement may protect against suicide.[91,92]

- **Community engagement activities.** Nearly one in 10 adolescents in Stark County is not involved in any school or community activities. Additionally, one in 10 Stark County youth spend 5 hours or more unsupervised each day. Participation in sports and school activities was associated with decreased risk of suicide among Stark County youth. Given the important role that participation in activities plays in preventing suicide, stakeholders may consider increasing outreach to students not actively involved in their school or community, or who report longer stretches of unsupervised time at home.

- **Promotion of connectedness.** Nearly 60% of Stark County youth reported loneliness and 30% of Stark County youth felt hopeless. Nearly one in five youth felt that "no one in [their] family loved [them] or thought [they were] important or special". Feeling connected to one's community was a protective factor against suicidal behaviors among Stark County youth. Events and activities that build students' and families' sense of community may benefit Stark County youth in a number of ways, including buffering against risk of suicide. For older youth, resources such as CDC's School Connectedness report and Ohio Mental Health and Addiction Services' Be Present campaign can be used to educate and empower families, schools, and communities to work together to create an environment that facilitates healthy development of children and adolescents.[93,94]
- **Parental engagement activities.** Parental involvement in youth life through activities and interactions is important for the prevention of suicide.[95,96] While 79% of students reported talking with a parent or caregiver about their schoolwork or grades in the past month, only 44.2% of students talked with a parent or caregiver about a personal problem they were having. These important parent-child relationships should be encouraged and strengthened where possible.

Teach Coping and Problem-Solving Skills

The inability to use adequate strategies to cope with acute stressors or identify and solve problems has been characterized among suicide attempters.[97] Teaching and providing youth with the skills to tackle every day challenges and stressors is an important component to preventing suicide.[3]

- **Social-emotional learning programs.** Social-emotional learning (SEL) programs teach children to effectively develop and apply the knowledge, skills, and attitudes necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions.[98] SEL programming reduces suicide risk by strengthening protective factors. In 2018, Ohio Department of Education announced its *Strategic Plan for Education: 2019-2024*. This plan includes SEL as one of the four key learning domains—on par with literacy, mathematics, and critical thinking.[99] Integration of SEL programming into Stark County students' education from a young age— through programs like the *Good Behavior Game*, *PlayWorks,* and *Second Step*—is an investment in upstream suicide prevention.[100,101] Ohio MHAS funds the *Good Behavior Game* at multiple sites throughout the state.
- **Increase youth resiliency.** One in ten Stark County youth have low resiliency. Stark County students with medium or high levels of resiliency had decreased risk of suicidal behaviors. The negative effects of adverse childhood experiences and other suicide risk factors can be buffered through programs that increase children's resiliency.[102,103] Stakeholders in Stark County may consider implementing programs that increase problem-solving and coping skills, promote healthy relationships, and develop mindfulness to reduce the effects of adverse childhood experiences. This may involve interventions for children of younger ages, directing action toward elementary school-aged children to build resiliency for future generations. One such evidence-based program is the *Good Behavior Game*, which uses

classroom behavior-management methods in early childhood to prevent a number of negative outcomes in adolescence and young adulthood, including suicidal ideation, drug and alcohol use disorders, regular smoking, antisocial personality disorder, delinquency, and incarceration for violent crimes.[100]

Identify and Support People at Risk

Attention to vulnerable populations is an important and necessary step in preventing suicide.[3] Such vulnerable populations include, but are not limited to, individuals with lower socio-economic status; youth living with a mental health problem; people who have previously attempted suicide; victims of violence; individuals of sexual minority status; and members of certain racial and ethnic minority groups.[30,104,105] Supporting people at risk requires proactive case finding, effective response, crisis intervention, and evidence-based treatment.

- Gatekeeper training. Over 40% of participating students were aware of a friend's, family member's, or significant other's suicidal ideation, suicide attempt or death by suicide. Over 60% of participating students would tell a friend if they were having suicidal ideation and over 50% of students would disclose suicidal ideation to a parent. These statistics represent the strong potential for close friends and family members in Stark County to act as "gatekeepers" for individuals at risk of suicide. Gatekeeper training is designed to train peers, teachers, coaches, clergy, emergency responders, primary and urgent care providers, and others in the community to identify people who may be at risk of suicide and to respond effectively, including facilitating treatment seeking and support services.[3] Gatekeeper training may be implemented in a variety of settings to identify and support people at risk.[106] Stark County has a number of gatekeeper training programs already in place; these important initiatives should be sustained and expanded.
- Prevent and reduce negative effects of childhood adversity. Over 60% of Stark County youth have experienced at least one adverse childhood experience in their lifetime. One in four Stark County youth have experienced 3+ adverse childhood experiences, significantly increasing their risk for suicidal behaviors. Adverse childhood experiences can be prevented through strategies like strengthened economic supports for struggling families and parenting programs like *Incredible Years, Families Matter,* and *Strengthening Families 10-14.*[3] Screening for adverse childhood experiences may be a helpful way to identify students at risk for numerous negative outcomes, including suicide.[107] Many prevention strategies that prevent child abuse, neglect and youth violence—such as creating protective environments, strengthening skills, and lessening of harms and prevention of future risk—overlap with suicide prevention. Communities that prevent adverse childhood experiences, including child abuse and neglect and youth violence, can also reduce the likelihood of suicide. Implementing violence prevention strategies, such as those outlined by CDC's *Preventing Child Abuse and Neglect: A Technical Package for Policy, Norm, and Programmatic Activities and A Comprehensive Technical Package for the Prevention of Youth Violence and Associated Risk Factors,* may have immediate and long-term benefits on the health and safety of youth.[108]

Lessen Harms and Prevent Future Risk

Thousands of Stark County youth were bereaved by suicide in 2017–2018. Risk of suicide has been shown to increase among people who have lost a friend/peer, family member, co-worker, or other close contact to suicide.[109] Care and attention to the bereaved is therefore of high importance.

- **Postvention.** Associates of decedents may be at increased risk of suicide: sixteen percent of Stark County youth lost a loved one to suicide in 2017–2018. Persons substantially affected by suicide should be referred for further counseling or other services as needed. Stark County students with access to medical or psychological care when needed were at significantly lower risk of suicidal behaviors. One in four Stark County youth had a strong or very strong emotional reaction to the Stark County suicides. In suicide clusters, persons have attempted suicide or died by suicide even though they did not personally know victims who died by suicide earlier in the cluster.[18] Social network analysis of Stark County youth demonstrates significant connections between students at all schools throughout the county. Education efforts to increase knowledge of the warning signs of suicide and encourage help-seeking behaviors may be beneficial to identify persons substantially affected by suicide.
- **Responding to a death.** Activities that glorify suicide victims or sensationalize suicide deaths have the potential to increase suicidal behaviors among youth exposed to these events.[110] Nearly 40% of Stark County youth attended a vigil or moment of silence for a teenager who died by suicide. These events, while intended to demonstrate sincere compassion, can potentially increase risk, particularly among vulnerable groups. Communities may consider following suicide response guidelines for all announcements to students. Resources for safe suicide response are included in the Additional Resources section of this report.
- **Safe reporting about suicide.** Despite good intentions, media and others responding to suicide may add to suicide risk (http://www.reportingonsuicide.org). Research suggests that exposure to sensationalized reporting on suicide heightens the risk of suicide among vulnerable individuals and can inadvertently contribute to suicide "contagion".[47,48] Three-quarters of students saw a news article about the Stark County youth suicides in the previous year. Unsafe suicide reporting criteria—such as sensational headlines, negative images, and details about the deaths—were present in 82% of media articles about the Stark County suicide cluster; local news sources were significantly less likely to include unsafe criteria in articles. Safe reporting approaches may *lower* suicide risk: over 80% of media sources included positive, safe reporting criteria in articles. More could be done to educate readers about the multiple causes of suicide, warning signs, and available resources. Engaging local and state media partners in suicide coalition planning and prevention efforts may be helpful to increase adherence to safe suicide reporting guidelines.
- **Safe messaging about suicide.** Thirteen percent of Stark County youth posted on social media and nearly 70% of Stark County youth saw posts on social media about the recent suicides among adolescents. Nearly 40% of Stark County youth spend 3+ hours on social media. Posting to social media about the suicide cluster deaths was independently associated with increased suicide risk among Stark County youth. It is important for school and county stakeholders to monitor social media channels regularly and respond to any disclosures of

suicidal thoughts or behaviors. Social media posts could include links to online crisis resources, such as the National Suicide Prevention Lifeline (1-800-273-TALK/8255). School and county stakeholders could use safe reporting guidance (http://www.reportingonsuicide.org) to refine the information they share about suicide and inform how to address posted information that may be inaccurate or harmful. Social media posts that promote hope, connectedness, social support, resiliency, help seeking, and provide ways to connect to support resources are most beneficial.

- Treatment to prevent re-attempts. Nearly 9% of Stark County youth have attempted suicide in their lifetime. Suicide attempt survivors are at high risk for re-attempt.[111] Approaches to prevent suicide re-attempts often involve follow-up contact and diverse modalities, including home visits, mail, telephone, and email, to engage recent suicide attempt survivors in continued treatment.[3] Strengthening partnerships with organizations like Stark MHAR and the Mobile Response Team may expand stakeholders' ability to track and treat survivors of suicide attempts. Treatment for suicide survivors in Stark County may focus on unique protective factors identified by the Epi-Aid: improved connectedness, access to medical and psychological care, and building resilience. Approaches that engage and connect young people who have attempted to peers and providers are especially important because many attempters do not present to aftercare.[112]

Administer Ongoing Youth Health and Behavior Surveys

Some school districts may wish to regularly assess the health and wellbeing of their students. Following this practice on an annual or biennial basis can provide key information, such as effectiveness of interventions and prevention strategies; assessment of new and emerging risk and protective factors; assessment of differences and changes between grades, sexes, districts and other subpopulations to inform how to implement prevention strategies. There are multiple existing surveys for potential use:

- Ohio Youth Risk Behavior Survey (YRBS). The Ohio YRBS is part of a national survey conducted in high schools (grades 9-12) every two years. Ohio first started administering the survey in 1993. A random sample of high schools are approached to take the survey, and if the participation rate is sufficiently high, the results can be generalized to all Ohio students. Topics surveyed include unintentional injury and violence, tobacco use, alcohol and other drug use, sexual behaviors that contribute to unintended pregnancy and disease, dietary behaviors, and physical inactivity.
- Ohio Healthy Youth Environments Survey (OHYES!). OHYES! is a youth survey designed to measure the health risk behaviors and environmental factors that impact youth health and safety. The survey gathers information on issues like alcohol, tobacco, and other drug use, unintentional and intentional injuries, physical health, activity and well-being, and related environmental risk and protective factors.
- Northeast Ohio Youth Health Survey (NOYHS). The NOYHS survey that was administered in Stark County in 2018 can be utilized for future assessments. The Ohio Department of Health can assist with electronic dissemination of the survey and provide raw data to participating districts.

Target both Female and Male Students

Findings from this survey highlight sex differences among several suicide risk factors and behaviors.

> **Tailored Interventions.** Over 11% of female students reported at least one suicide attempt in their lifetime compared to nearly 5% of male students. Sex disparities between suicide attempts and suicide deaths are well documented in the literature: while females are more likely to attempt suicide, males die by suicide at nearly four times the rate of females.[113] Gender bias present in universal suicide prevention programs may partially explain the sex differences observed for attempts and fatalities.[114] Adolescent females are more likely than males to seek help for emotional issues, making certain types of interventions more effective for females than males.[115-117] Targeting interventions to specific sexes may prove more effective than universal interventions for suicide prevention. For example, health classes could offer different suicide prevention activities for males and females, guided by research on gendered learning preferences.

Strengthen Economic Supports

Economic strain, such as job loss, long periods of unemployment, reduced income, difficulty covering expenses, and the anticipation of financial stress can increase an individuals' risk for suicide.[118]

> **Strengthen economic supports.** Over 10% of youth indicated that their parent or caregiver lost their job during the 2017–2018 school year. Although this factor was not found to be associated with increased risk for suicide in this investigation, the psychological cost of parental unemployment is emerging as a risk factor for behavioral and emotional problems in children in other analyses.[119] Strengthening household financial security can potentially buffer the risk of suicide by providing individuals with the financial means to lessen the stress and hardship associated with a job loss or other unanticipated financial problems. Examples of policies enacted by communities to strengthen economic supports include unemployment benefits, livable wages, medical benefits, and disability insurance to offset costs in the event of job loss or disability.[3]

Additional Resources

Suicide Prevention

Evidence-Based Prevention

Search tool from Suicide Prevention Resource Center to help partners make decisions about the programs and practices that will be a part of a comprehensive approach to suicide prevention.
http://www.sprc.org/keys-success/evidence-based-prevention

Los Angeles County Youth Suicide Prevention Project

Website with separate sections for school administrators, school staff, parents, and students. Each section contains information sheets, videos, and other helpful resources. The website also has links to resources on a variety of at-risk populations and special issues in suicide prevention.
http://preventsuicide.lacoe.edu

Preventing Suicide: A Toolkit for High Schools

Toolkit helps high schools, school districts, and their partners design and implement strategies to prevent suicide and promote behavioral health among their students. It describes the steps necessary to implement all the components of a comprehensive school-based suicide prevention program and contains numerous tools to help carry out the steps.
http://store.samhsa.gov/product/Preventing-Suicide-A-Toolkit-for-High-Schools/SMA12-4669?WT

The Trevor Project

The Trevor Project is a national organization with a focus on crisis and suicide prevention among lesbian, gay, bisexual, transgender, and questioning (LGBTQ) youth. It provides a toll-free crisis phone line, an online social networking community for LGBTQ youth and their friends and allies, educational programs for schools, and advocacy initiatives.
http://www.thetrevorproject.org

Crisis Planning

Practical Information on Crisis Planning

Guide for schools and communities to navigate crisis planning. Provides overview of critical concepts and components of crisis planning with examples of promising practices.
https://rems.ed.gov/docs/PracticalInformationonCrisisPlanning.pdf

Gatekeeper Training

Mental Health First Aid

https://www.mentalhealthfirstaid.org/

Question, Persuade, Refer (QPR)

https://qprinstitute.com/

Crisis Response

Crisis Text Line

Crisis Text Line provides free emotional support and information to teens in any type of crisis, including feeling suicidal. Individuals can text with a trained specialist 24 hours a day. Text "HOME" to 741741.
http://www.crisistextline.org/

Crisis Response Protocol – Example from Madison, WI

Madison Metropolitan School District's crisis response plan for sudden deaths, suicides, or critical incidents. Concrete example of how one school district incorporated suicide into their crisis response procedure.
http://www.mhawisconsin.org/Data/Sites/1/media/gls/gls_madisoncrisisplan.pdf

Manual for Schools: Managing Traumatic Events

Crisis planning guide from educational psychologists based in UK.
https://search3.openobjects.com/mediamanager/hackney/fsd/files/manual_for_managing_traumatic_incidents.pdf

Postvention Guidelines

Practical guide from Australia, designed to assist schools in responding to the tragic occurrence of suicide or attempted suicide within their student community. Includes actionable items and suggested timeline for schools in the process of responding to a suicide.
https://www.education.sa.gov.au/doc/suicide-postvention-guidelines

Postvention Manual

Guide for schools and communities to develop their own postvention procedures.
https://www.starcenter.pitt.edu/Files/PDF/Manuals/Postvention.pdf

Resources for Parents & Families

Children, Teens, and Suicide Loss

Plain language guide for parents & families on how to support youth through loss of a loved one to suicide.
https://afsp.org/find-support/ive-lost-someone/resources-loss-survivors/children-teens-suicide-loss/

Jason Foundation Parent Resource Program

Website containing basic information about suicide and how families can help prevent youth suicide. It also has a video of a parent and community seminar that includes basic information on suicide and provides awareness and suicide prevention strategies for parents and other adults.
http://jasonfoundation.com/get-involved/parent/parent-resource-program/

Society for the Prevention of Teen Suicide

Website's parent section provides information to help families talk with teens about suicide or the death of a friend by suicide. It includes a link to the video Not My Kid: What Every Parent Should Know, which features eight parents from culturally diverse backgrounds asking two experts common questions about youth suicide.
http://www.sptsusa.org/parents/

Social Media

Tips on Social Media from Riverside Trauma Center

Numerous resources from Riverside Trauma Center, including: talking to children about *13 Reasons Why*; responding to traumatic event; and tips on social media after a suicide loss for students, school administrators, and parents.
http://riversidetraumacenter.org/trauma-center-resources/

How to Use Social Media for Suicide Prevention

Resource from California Mental Health Services Authority to help organizations or communities evaluate if use of social media for suicide prevention is right for them, and if so, tips for how to implement safe, effective messages into organizations' social messaging.
http://eiconline.org/teamup/wp-content/files/13-CALM-0106-Socialmedia_Guide_FNL.pdf

Recommendations for Reporting on Suicide

Guidelines developed by leading experts in suicide prevention for safe media reporting on suicide.
http://www.reportingonsuicide.org

Action Alliance Framework for Successful Messaging

Research based resource to improve public messaging about suicide.
http://suicidepreventionmessaging.org/

Suicide Contagion

Suicide Clusters and Contagion

Journal article from *Principal Leadership* providing an overview of the concept of suicide contagion, factors driving suicide contagion, and how school leadership may prevent or disrupt contagion.
http://cdpsdocs.state.co.us/safeschools/Resources/Suicide%20Clusters/Suicide_Clusters_NASSP_Sept_%2009.pdf

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Appendices

Appendix 1: EpiCenter Search Strategy

Table A1. Free-text search strategy to identify ED visits related to intentional self-harm.*

Search terms included	Search terms excluded
Suic	Deny
Suicid	Denies
Suci	Denied
Susci	No + SI
Suisid	Flu
Ideat	Accident + Overdose
Ideation	Endo + Life
Self + Harm	Life + Hospice
Self + Hurt	Life + Care
Self + Hang	Accident
Self + Hung	Homicidal
Self + Inflict	Ology
Self + Lacera	Never
Self + Mutilat	Otolaryn
Self + Shoot	CPR
Self + Shot	Resuscit
Self + Stab	Unintentional
Self + Cut	
Want + Die	
Better + Dead	
Intention + Overdose	
Take + Life	
End + Life	
Attempt + Overdose	
End + It	
Intentional	

*Exclusion terms are only applied to certain inclusion terms (e.g., "Life+Hospice" is only used with "End+Life").

Table A2. Discharge diagnosis search strategy to identify ED visits related to intentional self-harm.		
Diagnosis or Finding	**ICD-10 code**	**SNOMED code**
Intentional self-harm due to drowning/submersion, firearm, explosive material, fire/flame, hot vapors/objects, sharp object, blunt object, jumping from a high place, jumping or lying in front of a moving object, crashing of motor vehicle, other specified means	X71-X83	
Intentional self-harm due to poisoning by drugs, medications and biological substances	T36–T50 with the 6th character of the code = 2 (except for T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9, which are included if the 5th character of the code = 2)	891003 274228002
Intentional self-harm due to toxic effects of nonmedicinal substances	T51–T65 with the 6th character of the code = 2 (except for T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64.0, T64.8, and T65.9, which are included if the 5th character of the code = 2)	86849004
Intentional self-harm due to Asphyxiation, suffocation, hanging	T71 with the 6th character of the code = 2	287181000 287182007 287190007
Suicide Attempt	T14.91	82313006 55554002 44301001 53846008 269725004
Homicidal and suicidal ideation	R45.85	
Personal history of self-harm	Z91.5	161474000
Suicidal ideation		6471006 304594002 247650009 225457007 41501003
Suicidal behavior		425104003
At risk for suicide		225444004

Appendix 2: Safe Suicide Reporting Evaluation Protocol

PROTOCOL STEPS

1. Print out the safe reporting rubric for a list and brief description of all variables.
2. For the purposes of this protocol, presence of a certain criterion equals positive or ”Yes” input in Excel file; absence of a certain criterion equals negative or ”No” input; criterion not applicable to the given media item equals ”N/A” input.
3. Select a media item to evaluate.
4. Enter the date the article was reviewed, the title/headline, and if the item has been reposted from another media source in the corresponding columns. Make a note of pertinent information such as the original source of the item or a video item’s views in the “other info” column.
5. Read the title/headline of the media item; evaluate the headline variables.
6. Scan media item for pictures; evaluate picture variables. For videos, picture variables must be assessed throughout the duration of the video.
7. For videos or radio items, turn on closed captioning and/or try to find a transcript.
8. For videos or radio items without an available transcript, carefully watch/listen to the item. Use the safe reporting rubric as a checklist; make a note of any “text” or “ID of decedent” variables that are mentioned and the value for that variable (+/-/N/A).
9. For articles, op-eds, transcripts, and other items that can be read, quickly skim through the text to familiarize yourself with it.
10. For articles, op-eds, transcripts, and other items that can be read, after skimming the piece go through each of the remaining variable groups (beginning with “ID of decedent” and going across) and evaluate each of the variables. Variables that look for the presence of a single word may be evaluated using the Control+F or Command+F keyboard shortcut; other variables may require another brief read-through of the entire media item (or small sections) to evaluate.
11. Repeat steps 3-10 for subsequent media items.

HEADLINE VARIABLES

- “Sensationalized” variable is subjective; things to look for include strong language (epidemic, crisis, etc.), graphic description of suicide, or key phrases listed in other variables such as “committed suicide”. “Sensationalized” variable is also present if headline is graphically designed/placed to draw more attention than a typical story.
- For media items without a “headline”, substitute title of video, communication, radio piece, etc.
- Method and/or location variables are present if method used and/or location of death are in the headline/title.

IDENTIFICATION OF DECEDENT VARIABLES

- If any decedent’s name is used, this variable is present.

- If background information relating to any decedent's character (i.e. good student, varsity athlete, etc.) is used, this variable is present.
- If multiple decedents are reported on as independent acts, the "several independent acts" variable is present (a double suicide would not qualify).

PICTURE VARIABLES

- If any image of the method used, location of death, grieving family and/or friends, memorial, or funeral services are shown in the media item this variable is present. This can be either generic or specific to the case (i.e. a picture of a hangman's knot not associated with the case would be considered present).
- If school and/or family photos of the decedent are used, this variable is present.
- In video items, any single instance of a photo as described above would make the variable present.

TEXT-METHOD VARIABLES

- If the media item mentions the method used or offers a step-by-step "guide" on how to use a particular suicide method, this variable is present.
- The location variable is present if the specific location of the suicide is reported.
- If there is any mention of a suicide pact or mass suicide, this variable is present.

TEXT-CAUSES VARIABLES

- If a single cause is listed or described as the precipitating factor in the decedent's suicide, this variable is present.
- If suicide is described as a "solution" to a problem, either in a general or specific context (i.e. "decedent saw suicide as their only option" or "some people may see suicide as a solution"), this variable is present.
- If the suicide is described as inexplicable, sudden, or without warning, this variable is present.
- If the media item mentions an increase in societal problems (i.e. higher crime rates, worsening economy, etc.), this variable is present.
- If the media item describes specific details of a suicide note, the "describes specifics" variable is present. If the media item objectively notes that a suicide note was discovered, the "objectively mentions" variable is present.

TEXT-EDUCATION VARIABLES

- If the media item provides education on the causes of suicide, this variable is present.
- If the media item provides examples of specific warning signs (i.e. change in mood or appetite, increased substance use), the "warning signs" variable is present.
- If suicide/suicidality is described as treatable or stories of survivors are told, the "treatment" variable is present. This variable has an element of subjectivity.
- If any specific organizations, treatment centers, hotlines, etc. that respond to suicidal behavior are mentioned, the "where to seek help" variable is present.
- If suicide is described as a public health issue then this variable is present.

TEXT-INTERVIEW VARIABLES

- If any interview mentions law enforcement, EMS, or other first responders' speculations about the causes of suicide, the "law enforcement speculation" variable is present.
- If any interview conducted with public health professionals or mental health professionals (including counselors, psychiatrists, suicide experts, etc.) is published/displayed this variable is present.

TEXT-SENSATIONALISM VARIABLES

- Use of any of the following words/phrases results in the corresponding variable being present: crisis, skyrocketing, epidemic, cluster, suicide pact, mass suicide, committed suicide.
- Non-sensationalized language may include the following: rise, higher, died by suicide, completed suicide, killed him/herself.

TEXT-MYTH VARIABLES

- If public myths about suicide are reported credulously (i.e. Blue Whale Game, talking about suicide causes suicide, etc.), the "reports" variable is present.
- If public myths about suicide are debunked, the "debunks" variable is present.

MISCELLANEOUS

- Many media websites have a video accompanying their articles. If a news article has a video on the page that is *directly related* to the article, evaluate the article and video together as one media item. Any present variable in either the video or article is present for the entire item (i.e. if there are no pictures of the location of the suicide in the article but there are pictures of the location in the video the first picture variable would be present). If the video is *not directly related* to the article, disregard the video and evaluate the article.
- Posts from social media websites such as Facebook or Reddit may simply be reposted or aggregated from other media websites. If possible, try to identify the original sourcing of the media item.
- Several of the variables being evaluated are necessarily subjective. If in doubt, go with best guess.

Appendix 3: Safe Suicide Reporting Evaluation Criteria

Table A3. Safe Suicide Reporting Rubric.

Section	Negative	Positive	Reference
Placement of article			
	Front page	Elsewhere	WHO[120] Reporting on Suicide[53]
Headline			
	Sensationalized Glamorized Dramatic Graphic		Mueller[52] Reporting on Suicide WHO
	"Committed suicide"	No mention	Williams[51]
	Method	No mention	Mueller WHO Williams
	Location	No mention	Mueller Williams
Identification of decedent			
	Reports name	No mention	Niederkrotenthaler[121]
	Reports on character	No mention	Mueller Niederkrotenthaler
Pictures			
	Method Location Grieving family/friends Memorials Funerals	None or school photos Family photos	Mueller WHO
Text			
	Mentions method	No mention	WHO Williams
	Step-by-step 'guide' (how to use a suicide method)	No mention	Niederkrotenthaler
	Location	No mention	Williams Niederkrotenthaler
	Suicide pact or mass suicide mentioned	No mention	
Causes of suicide			
	Mentions single cause as precipitating factor		Niederkrotenthaler

Table A3. Safe Suicide Reporting Rubric *(continued)*.			
Section	Negative	Positive	Reference
Causes of Suicide			
	Describes suicide as solution to a problem	No mention or lists of general warning signs	Mueller Williams
	Describes as inexplicable or without warning		Reporting on Suicide
	Societal problems reported as having increased		Niederkrotenthaler
	Specifics of a suicide note	Objectively mentions that note was found	Reporting on Suicide
Education			
	No mention or normalizes suicide	Educate about suicide - Causes	WHO
	No mention or normalizes suicide	Educate about suicide - Warning signs	WHO
	No mention or normalizes suicide	Educate about suicide - Treatment: mention treatable, stories of survivors	WHO
	No mention or normalizes suicide	Information on where to seek help	WHO
Sensationalism			
	Interview first responders, law enforcement about the causes of suicide	Interview suicide prevention experts	Reporting on Suicide
	Strong language (e.g. crisis, skyrocketing, epidemic, cluster, suicide pact, mass suicide)	Non-sensationalized words (e.g. Rise, higher)	Mueller WHO
	Stigmatizing terms (e.g. Successful, unsuccessful, failed attempt)	No mention or "died by suicide", "completed", "killed him/herself"	WHO Reporting on Suicide
	Several independent suicidal acts reported		Niederkrotenthaler
	Public myths reported	Debunk myths	Niederkrotenthaler
		Suicide as a public health problem	
Overall measurements			
Number of reports on single event			
Count of articles on given day			

Appendix 4: Prevention Initiative Inventory

Table A4. Suicide Prevention Initiatives in Stark County, Ohio.

Agency	Program, policy, activity	Focus of Initiative	Type	Strategy	Approach	NOYHS Risk or Protective Factor Addressed
Coleman Professional Services	Behavioral Health	General suicide prevention	Activity/program	At risk	Crisis intervention	Access to Medical or Psychological Care When Needed
				Economic	Housing and stabilization policies	—
Coleman Professional Services	Crisis Hotline	General suicide prevention	Activity/program	At risk	Crisis intervention	Access to Medical or Psychological Care When Needed Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Coleman Professional Services	Youth Crisis Mobile Response Team	Youth suicide prevention	Activity/program	At risk	Crisis intervention	Access to Medical or Psychological Care When Needed
				Prevention	Postvention	
County Government/Others	Community Health Improvement Plan - suicide reduction	General suicide prevention	Policy	Access	Reduce barriers to accessing health care for vulnerable populations	Access to Medical or Psychological Care When Needed
					Increase the number of mental health and substance use treatment and prevention programs and supports	
Individual districts	SOS	Youth suicide prevention	Activity/program	At risk	Gatekeeper training	Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
				Environments	Organizational policies and culture	
Individual districts	Jason Foundation	Youth suicide prevention	Activity/program	At risk	Gatekeeper training	Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Individual districts	Red flags (elementary schools)	Youth suicide prevention	Activity/program	At risk	Gatekeeper training	Adverse Childhood Experiences Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Individual districts	JED foundation (college age)	Youth suicide prevention	Activity/program	At risk	Gatekeeper training	Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Individual districts	Kognito	Youth suicide prevention	Activity/program	At risk	Gatekeeper training	Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths

Table A4. Suicide Prevention Initiatives in Stark County, Ohio *(continued).*

Agency	Program, policy, activity	Focus of Initiative	Type	Strategy	Approach	NOYHS Risk or Protective Factor Addressed
Stark County Educational Service Center (SCESC)	Teacher trainings	Youth suicide prevention	Activity/program	Environment	Organizational policies and culture	Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
				At risk	Gatekeeper training	
Stark County Health Department	Child Injury Prevention Grant	Youth suicide prevention	Activity/program	At risk	Treatment to prevent re-attempts	Access to Medical or Psychological Care When Needed Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark County Suicide Prevention Coalition	Resource baskets	Youth suicide prevention	Activity/program	At risk	Treatment for people at risk of suicide	Access to Medical or Psychological Care When Needed Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark MHAR	Counseling on Access to Lethal Means	General suicide prevention	Activity/program	At risk	Gatekeeper training	Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
				Environments	Reduce access to lethal means among persons at risk of suicide	—
Stark MHAR	Mental Health First Aid Trainings	General suicide prevention	Activity/program	At risk	Gatekeeper training	Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark MHAR	Crisis Intervention Team Trainings	General suicide prevention	Activity/program	At risk	Gatekeeper training	Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
				Environments	Organizational policies and culture	
Stark MHAR	Survivors' Walk	General suicide prevention	Activity/program	Connectedness	Community engagement activities	Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark MHAR	Care Network	General suicide prevention	Policy	Access	Connecting uninsured with care	Access to Medical or Psychological Care When Needed

Table A4. Suicide Prevention Initiatives in Stark County, Ohio *(continued).*

Agency	Program, policy, activity	Focus of Initiative	Type	Strategy	Approach	NOYHS Risk or Protective Factor Addressed
Stark MHAR	Crisis Text Line	General suicide prevention	Activity/program	At risk	Crisis intervention	Access to Medical or Psychological Care When Needed Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark MHAR	Columbia Suicide Severity Rating Scale Trainings	General suicide prevention	Activity/program	At risk	Gatekeeper training	Access to Medical or Psychological Care When Needed
Stark MHAR	Postvention training, Lifelines	Youth suicide prevention	Activity/program	At risk	Gatekeeper training	Recent Death of a Loved One by Suicide
				Environments	Organizational policies and culture	
Stark MHAR	Media Communications	General suicide prevention	Activity/program	Prevention	Safe reporting and messaging about suicide	—
Stark MHAR	Online Mental Health Screenings	General suicide prevention	Activity/program	At risk	Treatment for people at risk of suicide	—
Stark MHAR	Question Persuade Refer	General suicide prevention	Activity/program	At risk	Gatekeeper training	Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark MHAR	School Resiliency Contracts	Youth suicide prevention	Indirect	Coping	Social-emotional learning programs	High or Medium Levels of Resilience
Stark MHAR	Improved hand-off inpatient to outpatient	General suicide prevention	Policy	Access	Safer suicide care through systems change	Access to Medical or Psychological Care When Needed Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
Stark MHAR	Zero Suicide Academy	General suicide prevention	Activity/program	Environments	Organizational policies and culture	Access to Medical or Psychological Care When Needed Recent Death of a Loved One by Suicide Strong Emotional Response to Stark County Youth Suicide Cluster Deaths
				At risk	Treatment for people at risk of suicide	
				Access	Safer suicide care through systems change	

Table A4. Suicide Prevention Initiatives in Stark County, Ohio *(continued).*						
Agency	Agency	Agency	Agency	Agency	Agency	Agency
Stark MHAR	Strategic Plan	General suicide prevention	Policy	Access	Reduce provider shortages in underserved areas	Access to Medical or Psychological Care When Needed
				Economic	Strengthen household financial security	
System-wide Partnerships	Care teams	Youth suicide prevention	Activity/program	Prevention	Postvention	Access to Medical or Psychological Care When Needed Strong Emotional Response to Stark County Youth Suicide Cluster Deaths

Table A5. Other Prevention Initiatives in Stark County, Ohio.						
Agency	Program, policy, activity	Focus of Initiative	Type	Strategy	Approach	NOYHS Risk or Protective Factor Addressed
Canton Community KidSummit Against Drugs	KidSummit	Substance use prevention	Activity/program	Environments	—	Opioid Misuse
Child and Adolescent Behavioral Health	Multi-Systemic Therapy (MST)	At-risk youth	Indirect	At risk	Treatment for people at risk of suicide	Adverse Childhood Experiences
CommQuest	Childhood Resiliency Project	Resilience	Activity/program	Coping	Social-emotional learning programs	High or Medium Levels of Resilience
CommQuest	Intensive Home Based Therapy	At-risk youth	Activity/program	At risk	Treatment for people at risk of suicide	Adverse childhood experiences
Community Services of Stark County	Early Childhood Mental Health Services	Resilience	Activity/program	Coping	Social-emotional learning	High or Medium Levels of Resilience Adverse Childhood Experiences
Foundations	Transitional Age Youth Programs	Resilience	Activity/program	Coping	Social-emotional learning	High or Medium Levels of Resilience
ICAN Housing	ICAN Housing	Housing and Housing Support	Activity/program	Economic	Housing and stabilization policies	—
Individual Districts	All Stars	Substance use prevention	Indirect	Coping	Social-emotional learning	Closeness to friends or family Opioid Misuse
Individual Districts	HOPE: Heroin and Opioid Prevention Education	Substance use prevention	Activity/program	Environments	—	Opioid Misuse
Individual districts, Stark MHAR funded providers	LifeSkills	Substance use prevention	Indirect	Environments	—	High or Medium Levels of Resilience Opioid Misuse
OhioGuidestone	Nurturing Parenting trainings	Family relationships	Activity/program	Coping	Parenting skills and family relationship programs	Closeness to friends or family Adverse Childhood Experiences
OhioGuidestone	Parenting classes and support	Family relationships	Activity/program	Coping	Parenting skills and family relationship programs	Closeness to friends or family Adverse Childhood Experiences

Table A5. Other Prevention Initiatives in Stark County, Ohio *(continued).*						
Agency	**Program, policy, activity**	**Focus of Initiative**	**Type**	**Strategy**	**Approach**	**NOYHS Risk or Protective Factor Addressed**
Stark County Educational Service Center (SCESC)	Sandy Hook Promise *Say Something*	Social media	Activity/program	At risk	Crisis intervention	Posting to Social Media about Suicide Cluster
Stark County Family Council	High Fidelity Wraparound Program	At-risk youth	Activity/program	At risk	Treatment for people at risk of suicide	—
Stark County Treatment Accountability for Safer Communities Agency	Prime for Life Program	Substance abuse prevention	Activity/program	Environments	—	—
Stark County Treatment Accountability for Safer Communities Agency	Street Addiction Program	Substance use prevention	Activity/program	Environments	—	Opioid Misuse
Stark County Mental Health & Addiction Recovery (MHAR)	Drug Free Stark County	Substance use prevention	Indirect	Environments	—	Opioid Misuse
Stark MHAR	Opiate Prevention Toolkit	Substance use prevention	Report/toolkit	Environments	—	Opioid Misuse
Stark MHAR	Strong African American Families	At-risk youth	Activity/program	Coping	—	Closeness to Family Friends
Stark MHAR	Opiate Task Force	Substance use prevention	Indirect	Environments	—	Opioid Misuse
Stark MHAR	Project DAWN	Substance use prevention	Activity/program	Environments	—	Opioid Misuse
Stark MHAR funded providers	Coping and Support Training (CAST) / Reconnecting Youth	Substance use prevention	Activity/program	Coping	Social-emotional learning	Adverse childhood experiences Opioid Misuse
Stark MHAR funded providers	Positive Action	Youth violence prevention	Indirect	Coping	Social-emotional learning	Closeness to friends or family Adverse Childhood Experiences

Table A5. Other Prevention Initiatives in Stark County, Ohio *(continued).*						
Agency	Program, policy, activity	Focus of Initiative	Type	Strategy	Approach	NOYHS Risk or Protective Factor Addressed
Stark MHAR, Coleman Professional Services	Transition to Independence Process (TIP)	Resilience	Indirect	Coping	Social-emotional learning	High or Medium Levels of Resilience
System-wide Partnerships	Traumatized Child Task Force	At-risk youth	Indirect	At risk	Treatment for people at risk of suicide	Adverse Childhood Experiences
We Are Troubled On Every Side (WATOES), Stark Social Workers Network	Community Response Team	Post-traumatic stress disorder	Activity/program	At risk	Crisis intervention	Recent Death of a Loved One by Suicide

Appendix 5: Northeast Ohio Youth Health Survey Domains & Definitions

Construct	Survey Item	Response Options
Sex	What is your sex?	• Male • Female • Prefer not to say
Age	How old are you?	• 12 years old or younger • 13 years old • 14 years old • 15 years old • 16 years old • 17 years old • 18 years old or older • Prefer not to say
Grade	What grade are you in?	• 7 • 8 • 9 • 10 • 11 • 12 • Prefer not to say
Race/ethnicity	What is your race? *Please select all that apply.*	• White • Black or African American • Asian • Native Hawaiian or Other Pacific Islander • American Indian or Alaska Native • Other • Prefer not to say
	Are you Hispanic or Latino?	• Yes • No • Prefer not to say

Social network	What schools do your friends attend (including your own)? *Please select all that apply.*	• Altitude Career Tech & Wellness Academy • Alliance High School • Alliance Middle School • Arts Academy at Summit • Canton City Digital Academy • Canton South High School • Carrollton High School • Choices School at Compton • College & Career Readiness Academy at Lehman • Compton Learning Center • Connections Academy at Compton • Crenshaw Middle School • Dalton High School • Dalton Middle School • Digital Academy at Compton • Early College Academy @ Soeurs • East Canton High School • East Canton Middle School • Edison Middle School • Faircrest Memorial Middle School • Fairless High School • Fairless Middle School • Glenoak High School • Glenwood Intermediate School

Social network *(continued)*		• Green High School • Green Middle School • Hartford Middle School • Hoover High School • Jackson High School • Jackson Middle School • Lake High School • Lake Middle School • Lehman Middle School • Louisville High School • Louisville Middle School • Malvern High School • Malvern Middle School • Marlington High School • Marlington Middle School • Massillon Junior High School • McKinley High School – Main Campus • McKinley High School - Downtown • Minerva High School • Minerva Middle School • Multi-County Attention Center • North Canton Middle School • Northwest High School • Northwest Middle School • Oakwood Middle School • Passages School at Compton • Perry High School • R.G. Drage Career Education Center • Sandy Valley High School • Sandy Valley Middle School • STEAMM Academy at Hartford • Strasburg-Franklin High School • Strasburg-Franklin Middle School • Timken Early College High School • Tuslaw High School • Tuslaw Middle School • Washington High School • Other • Prefer not to say
Commitment to school and academic achievement	What was your most recent GPA?	• Yes • 4.0 or greater • 3.5-3.99 • 3.0-3.49 • 2.5-2.99 • 2.0-2.49 • Less than 2.0 • Prefer not to say

	During this school year (2017–2018), how many times have you skipped school for a full day without an excuse?	• Never • 1 or 2 times • 3 to 10 times • More than 10 times • Prefer not to say
Engagement in anti-social behaviors	In your lifetime, have you experienced any of the following? *Please select all that apply.*	• In-School Suspension • Out-of-School Suspension • Expelled from School • Arrested • None of the above • Prefer not to say
Extracurricular involvement	During this school year (2017–2018), have you regularly participated in any of the following at school? *Please select all that apply.*	• Band/Orchestra • Student Government • Newspaper/Journalism • Yearbook • Art • Debate/Speech • Academic Club (Math, Science, Literature, etc.) • Other • I do not participate in any activities at school • Prefer not to say
Extracurricular involvement *(continued)*	During this school year (2017–2018), have you regularly participated in any of the following in your community? *Please select all that apply.*	• Church/Religious organization • Volunteer organization • Organized sport/team outside of school • Paid employment • Other club or organization outside of school • I do not participate in any clubs or organizations outside of school • Prefer not to say
Connectedness	Which of the following statements do you agree with? *Please select all that apply.*	• I feel close to people at school. • I feel like I am a part of my school. • I am happy to be at my school. • The teachers at my school treat students fairly. • I feel safe in my school. • My friends care about me. • My family cares about me. • None of the above • Prefer not to say

Bullying and safety	Bullying is when 1 or more people tease, threaten, spread rumors about, hit, shove, or hurt another person over and over again. It is not bullying when 2 people of about the same strength or power argue or fight or tease each other in a friendly way. During this school year (2017–2018), have you been bullied in any of the following places/ways? *Please select all that apply.*	• On school property • Around my neighborhood • Online/Social media • Text messaging • Other place • I have not been bullied this school year • Prefer not to say
	How would the presence of a police officer or school resource officer (SRO) at your school make you feel?	• Much more safe • A bit more safe • Neither more or less safe • A bit less safe • Much less safe • Prefer not to say
	Could you access a gun if you wanted to?	• Yes, could get it • No, could not get it • Could maybe get it with great effort • Prefer not to say
	Where could you access a gun? *Please select all that apply.*	• At my home • At my friend's home • At my neighbor's home • Somewhere else • Prefer not to say
Supportive family environment	In the past month, which of the following things have you done with a parent or guardian? *Please select all that apply.*	• Gone shopping together • Played a sport together • Attended a religious service or event together • Talked about someone you're dating • Talked about a party you're going to • Went to a movie/play/museum/concert/sporting event together • Talked about a personal problem you were having • Talked about your school work or grades • Seriously argued about your behavior • Worked on a project for school together • None of the above • Prefer not to say
	On an average school day, how many hours are you on your own without a parent/guardian/adult at home?	• <1 hour • 1-2 hours • 3-4 hours • 5 hours or more • Prefer not to say

Sexual minority status	What is your sexual orientation?	• Straight/Heterosexual • Gay or Lesbian • Bisexual • Other • Unsure • Prefer not to say
	When a person's sex and gender do not match, they might think of themselves as transgender. Sex is what a person is born. Gender is how a person feels. Which one response best describes you?	• I am not transgender • I am transgender and identify as a boy or man • I am transgender and identify as a girl or woman • I am transgender and identify in some other way • I'm not sure • Prefer not to say
Loneliness	How often do you feel alone?	• Hardly ever • Some of the time • Often • Prefer not to say
	How often do you feel left out?	• Hardly ever • Some of the time • Often • Prefer not to say
Loneliness *(continued)*	How often do you feel isolated from others?	• Hardly ever • Some of the time • Often • Prefer not to say
Hopelessness	For each of the statements below, please choose the answer that best applies to you. • I feel that it is impossible to reach the goals I would like to strive for. • The future seems to me to be hopeless and I can't believe that things are changing for the better. • I expect good things to happen to me. • I trust my future will turn out well. • I feel excited about my future.	• Absolutely agree • Somewhat agree • Neither agree nor disagree • Somewhat disagree • Absolutely disagree • Prefer not to say

Resiliency	For each of the statements below, please choose the answer that best applies to you. • I have people I look up to. • I cooperate with people around me. • Getting an education is important to me. • I know how to behave in different social situations. • My parents or caregivers watch me closely. • My parents or caregivers know a lot about me. • If I am hungry, there is enough to eat. • I try to finish what I start. • Spiritual beliefs are a source of strength for me. • I am proud of my ethnic background. • People think that I am fun to be with. • I talk to my family/caregivers about how I feel. • I am able to solve problems without harming myself or others (for example, by using drugs and/or being violent). • I feel supported by my friends. • I know where to go in my community to get help. • I feel I belong at my school. • My family stands by me during difficult times. • My friends stand by me during difficult times. • I am treated fairly in my community. • I have opportunities to show others that I am becoming an adult and can act responsibly. • I am aware of my own strengths. • I participate in organized religious activities. • I think it is important to serve my community. • I feel safe when I am with my family/caregivers. • I have opportunities to develop skills that will be used later in life (like job skills and skills to care for others). • I enjoy my family's/caregiver's cultural and family traditions. • I enjoy my community's traditions. • I am proud to be a citizen of the United States. • My best friend is a positive role model. • One or more of my parents/caregivers is a positive role model. • I can resist peer pressure to make bad decisions.	• Not at all • A little • Somewhat • Quite a bit • A lot • Prefer not to say

Screen time	On an average school day, how many hours do you spend on social media? (Count time spent on things such as texting, Instagram, Facebook, Snapchat, or other social media).	• <1 hour • 1-2 hours • 3-4 hours • 5 hours or more • Prefer not to say
	On an average school day, how many hours do you play video or computer games, or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, iPad, YouTube, or other website).	• <1 hour • 1-2 hours • 3-4 hours • 5 hours or more • Prefer not to say
Healthcare access	During this school year (2017–2018), have you always been able to get medical or psychological care when you thought you needed to? *Please select all that apply.*	• Yes, I always got care • No, because I didn't know whom to go see • No, because I didn't have transportation • No, because my parent or guardian would not go with me • No, because I didn't want my parents to know • No, because I was afraid of what my doctor would say or do • No, because I thought the problem would go away • No, because I couldn't pay • No, because I didn't have insurance • No, because of another reason • Prefer not to say
Recent stressors	Please choose the response that best reflects your experiences DURING THIS SCHOOL YEAR (2017–2018) for the statements below. • My close family member died or became very sick. • My close friend died or became very sick. • I went through the break-up of a romantic relationship or friendship. • I was in a physical fight with someone at school. • I had a serious argument or disagreement with a family member, including a parent or guardian. • I had a serious argument or disagreement with a friend. • My parent or guardian took away my phone, computer, or tablet as punishment. • I got a bad grade on a test. • My parent or caregiver lost their job. • I moved to a new town or school district.	• Yes • No • Not sure • Prefer not to say

Adverse childhood experiences	Please choose the response that best reflects your experiences IN YOUR LIFETIME for the statements below. • My parents separated or divorced. • I lived with someone who was depressed, mentally ill, or suicidal. • I lived with someone who was a problem drinker, alcoholic, used illegal street drugs or abused prescription medications. • I lived with someone who went to jail or prison. • My parents or adults in my home slapped, hit, kicked, punched, or beat each other up. • A parent or adult in my home pushed, grabbed, slapped, hit, beat, kicked, or physically hurt me. (Not including spanking) • A person I was dating pushed, grabbed, slapped, hit, beat, kicked, or physically hurt me. (Not including spanking) • A parent or adult in my home swore at me, insulted me, humiliated me, put me down, or acted in a way that made me afraid I might be physically hurt. • A parent or person at least 5 years older than me sexually touched me, made me sexually touch them, attempted sex, or actually had sex with me. • A person I was dating sexually touched me, made me sexually touch them, attempted sex, or actually had sex with me when I didn't want to. • I often felt that no one in my family loved me or thought I was important or special. • I often felt that I didn't have enough to eat, I had to wear dirty clothes, I had no one to protect me, or my parents were too drunk or high to take care of me.	• Yes • No • Not sure • Prefer not to say

Student substance use	Please choose the response that best reflects your experiences IN YOUR LIFETIME for the statements below. • I've drunk alcohol at least once (liquor, wine, beer, etc.). • I've used a prescription pain medicine without a doctor's prescription (such as codeine, Vicodin, Oxycontin, hydrocodone, Fentanyl, Percocet) at least once. • I've used a prescription muscle relaxer or anxiety medicine without a doctor's prescription (such as Valium, Xanax, Benzos, Benzodiazepines) at least once. • I've used heroin at least once (Smack, Junk, China White). • I've used marijuana at least once (Grass, Pot, Weed). • I've used cocaine at least once (Powder, Crack, Freebase). • I've sniffed glue/huffed at least once. • I've used methamphetamines at least once (Meth, Speed, Crystal, Crank). • I've used ecstasy at least once (MDMA, Molly). • I've used synthetic marijuana at least once (K2, Spice, King Kong, Skunk).	• Yes • No • Not sure • Prefer not to say
	During the past 30 days, have you used any of the following substances at least once? *Please select all that apply.*	• Alcohol • Heroin • Marijuana • Cocaine • Ecstasy • Synthetic marijuana • Sniffed glue/huffed • Prescription pain medicines without a doctor's prescription • Prescription muscle relaxers or anxiety medicine without a doctor's prescription • Methamphetamines • None of the above • Prefer not to say
	During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?	• 0 days • 1 or 2 days • 3 to 5 days • 6 to 9 days • 10 to 19 days • 20+ days • Prefer not to say

Household substance use	Please choose the response that best reflects your experiences DURING THIS SCHOOL YEAR (2017–2018) for the statements below. • Someone I live with used a prescription pain medicine without a doctor's prescription (such as codeine, Vicodin, Oxycontin, hydrocodone, Fentanyl, Percocet) at least once. • Someone I live with used a prescription muscle relaxer or anxiety medicine without a doctor's prescription (such as Valium, Xanax, Benzos, Benzodiazepines) at least once. • Someone I live with used heroin at least once (Smack, Junk, China White, etc.). • Someone I live with used marijuana at least once (Grass, Pot, Weed, etc.). • Someone I live with used cocaine at least once (Powder, Crack, Freebase, etc. • Someone I live with sniffed glue/huffed at least once. • Someone I live with used methamphetamines at least once (Meth, Speed, Crystal, Crank). • Someone I live with used ecstasy at least once (MDMA, Molly). • Someone I live with used synthetic marijuana at least once (K2, Spice, King Kong, Skunk).	• Yes • No • Not sure • Prefer not to say
Mental health	Before this school year (2017–2018), were you ever told by a health professional that you had a mental health problem? *Please select all that apply.*	• Yes, depression • Yes, anxiety • Yes, ADHD • Yes, Autism Spectrum Disorder or Asperger's syndrome • Yes, another mental health problem • No, I was not told I had a mental health problem before August 2017 • Prefer not to say
	For the next 2 questions, we want you to think about <u>this time last year</u>. Think about how you were feeling in the weeks after spring break 2017. <u>In April 2017</u>, how often were you bothered by any of the following problems? • Little interest or pleasure in doing things • Feeling down, depressed, or hopeless	• Not at all • Several days • More than half the days • Nearly every day • Prefer not to say

Mental health *(continued)*	For the next 2 questions, we want you to think about the past two weeks. Think about how you have bene feeling lately. Over the past 2 weeks, how often were you bothered by any of the following problems? • Little interest or pleasure in doing things • Feeling down, depressed, or hopeless	• Not at all • Several days • More than half the days • Nearly every day • Prefer not to say
Help seeking	If you were having thoughts of suicide, who would you tell. *Please select all that apply.*	• A parent or caregiver • Another member of my family • An adult in the community • A friend • A teacher • A guidance counselor • Another adult at school • A religious official • A police officer • A medical professional • Other • No one • Prefer not to say
Exposures to vigils or memorials	During this school year (2017–2018), have there been any vigils or moments of silence at your school for teenagers who died by suicide?	• Yes • No • Not sure • Prefer not to say
	During this school year (2017–2018), have you seen any memorials for teenagers who died by suicide around your community? *Please select all that apply.*	• Yes, on their locker at school • Yes, elsewhere at school • Yes, on YouTube • Yes, on the side of the road • Yes, at their house • Yes, at another location • Yes, online memorial site • None of the above • Prefer not to say
	During this school year (2017–2018), have you seen any of the following in your community? *Please select all that apply.*	• Graffiti related to recent suicide deaths • Graffiti related to hopelessness • No • Prefer not to say

Suicide-related media exposures	During this school year (2017–2018), have you *seen* any posts about the teen suicides in your community on any of the following? *Please select all that apply.*	• Twitter • Instagram • YouTube • Facebook • Snapchat • Tumblr • Other chat apps (WhatsApp, WeChat, Marco Polo, House Party, FireChat, etc.) • Other anonymous apps like Sarahah, SayAt.Me, Monkey, Ask.Fm • None of the above • Prefer not to say
	During this school year (2017–2018), have you *posted* about the teen suicides in your community on any of the following? *Please select all that apply.*	• Twitter • Instagram • YouTube • Facebook • Snapchat • Tumblr • Other chat apps (WhatsApp, WeChat, Marco Polo, House Party, FireChat, etc.) • Other anonymous apps like Sarahah, SayAt.Me, Monkey, Ask.Fm • None of the above • Prefer not to say
	Have you seen any episodes of the Netflix show *Thirteen Reasons Why*? *Please select all that apply.*	• Yes, I watched it before this school year (before August 2017) • Yes, I watched it during this school year (after August 2017) • No, I've never watched it • Prefer not to say
	During this school year (2017–2018), have you seen any news articles about teenagers who died by suicide in your community? *Please select all that apply.*	• Yes, online on a news site • Yes, in a paper newspaper • Yes, on TV • Yes, on the radio • No • Prefer not to say
Emotional response to suicide cluster	How strongly have the recent teen suicides in your community affected you emotionally?	• Very strongly • Strongly • Somewhat • A little • Not at all • Prefer not to say

Exposure to others' suicidal behaviors	During this school year (2017–2018), have you experienced any of the following? *Please select all that apply.*	• A friend, significant other, or peer told me that they are thinking about suicide • A friend, significant other, or peer told me they are planning on suicide • A friend, significant other, or peer told me they have attempted suicide • None of the above • Prefer not to say
	During this school year (2017–2018), have any of your friends or family members attempted suicide? Please select all that apply.	• Yes, my friend from my school attempted suicide • Yes, my friend from another school attempted suicide • Yes, my significant other from my school attempted suicide • Yes, my significant other from another school attempted suicide • Yes, a member of my family attempted suicide • No, no one close to me has attempted suicide during this school year • Prefer not to say
	During this school year (2017–2018), have any of your friends, significant others, or family members died by suicide? Please select all that apply.	• Yes, my friend from my school died by suicide • Yes, my friend from another school died by suicide • Yes, my significant other from my school died by suicide • Yes, my significant other from another school died by suicide • Yes, a member of my family died by suicide • No, no one close to me died by suicide during this school year • Prefer not to say
Suicidal ideation	Before this school year (before August 2017), had you ever thought about killing yourself? Choose one.	• Never • It was just a brief passing thought • I had a plan at least once to kill myself but did not try to do it • I had a plan at least once to kill myself and really wanted to die • Prefer not to say
	During this school year (before August 2017), had you ever thought about killing yourself? Choose one.	• Never • It was just a brief passing thought • I had a plan at least once to kill myself but did not try to do it • I had a plan at least once to kill myself and really wanted to die • Prefer not to say

Suicidal ideation *(continued)*	In the past few weeks, have you felt that you or your family would be better off if you were dead?	• Yes • No • Prefer not to say
	In the past few weeks, have you wished you were dead?	• Yes • No • Prefer not to say
	In the past week, have you been having thoughts about killing yourself?	• Yes • No • Prefer not to say
Suicide attempt	Before this school year (before August 2017), had you ever attempted to kill yourself? Choose one.	• Never • Yes, I have attempted to kill myself at least once, but did not want to die. • I have attempted to kill myself at least once, and really wanted to die. • Prefer not to say
	During this school year (before August 2017), have you ever attempted to kill yourself? Choose one.	• Never • Yes, I have attempted to kill myself at least once, but did not want to die. • I have attempted to kill myself at least once, and really wanted to die. • Prefer not to say