School Level and Urbanicity Differences in Written Plans for Pandemic Flu/Disease Scenarios: A National Analysis

American Journal of Social Sciences and Humanities
Vol. 7, No. 2, 166-177, 2022
e-ISSN: 2520-5382

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ABSTRACT

The purpose of this study was to determine the extent to which school level (i.e., elementary, middle, and high schools) and urbanicity (i.e., rural, town, suburb, city) were related to written school safety plans in the area of pandemic flu/disease threat scenarios. Through the use of a causal-comparative research design, archival data from a national survey in the United States for the 2007-2008, 2009-2010, 2015-2016, and 2017-2018 school years were analyzed. Inferential statistical analyses of nationwide survey data revealed the presence of statistically significant differences in the incidence of written plans for pandemic flu/disease threat scenarios by school level and by urbanicity. All school levels represented in the study did not have a written plan for how to address pandemic flu/disease threat scenarios 60% or more of the time. About 60% of schools within the urbanicity groupings did not have a written plan. Implications and recommendations for future research were discussed. Given the recent COVID-19 pandemic, these numbers are expected to show dramatic improvements in the years to come. Policymakers should develop policies mandating written school safety plans and the necessary funding for them to be generated. Future researchers, however, should continue to address this area.

Keywords: *Elementary, High school, Middle school, Pandemic, School safety, Urbanicity, Virus, COVID-19, Written plan.*

DOI: 10.55284/ajssh.v7i2.801
Citation | David Shaun McAlpin; Frederick C. Lunenburg; John R. Slate (2022). School Level and Urbanicity Differences in Written Plans for Pandemic Flu/Disease Scenarios: A National Analysis. American Journal of Social Sciences and Humanities, 7(2): 166-177.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.
History: Received: 30 September 2022/ Revised: 11 November 2022/ Accepted: 1 December 2022/ Published: 9 December 2022
Publisher: Online Science Publishing

Highlights of this paper

- Findings from this longitudinal analysis of national survey data provide an understanding of the level of written plans for dealing with a pandemic flu/disease threat.
- Limitations in the presence of such written plans were documented, both at the school level and by population.
- The need to improve the level of written plans for pandemic flu/disease was clearly established.

1. INTRODUCTION

Designers of school emergency operations plans consider a multitude of possible circumstances that could pose a threat to school safety. Educational leaders must consistently review, modify, implement, and practice safety strategies in efforts to prevent disasters from occurring. One such area, that of pandemic flu/disease preparation, should be included in school district safety plans. Dietz and Black (2012) stated that communicable diseases, those transmitted during a pandemic, can cause harm to everyone associated with the illness not only to those suffering from the sickness. Social and economic circumstances from the disease can have worldwide ramifications (Dietz & Black, 2012). Vessey, Sherwood, Warner, and Clark (2007) stated that communicable diseases account for approximately 70 to 164 million school days of absenteeism. Understanding the risks of pandemics has increased awareness for prevention and preparedness as a proactive measure (Mossad, 2009). Mossad (2009) stated that non-pharmaceutical methods such as personal hygiene and social distancing have been emphasized as potential control measures. Through the development and implementation of pandemic flu/disease written plans, educational leaders could help to ensure that their schools remain secure and operative during such events.

As would be expected, predicting a global disease outbreak can be futile even for the most experienced epidemiologist. This delay, in most situations, leads to diminished reaction time and a possible basis for the unique chain of events that could be the early stages of a pandemic. A pandemic could potentially affect all sectors of our civilization, placing extreme importance on planning for such an event (United States Department of Health and Human Services, 2006). According to the publication produced by the United States Health and Human Services, *Pandemic Influenza Planning: A Guide for Individuals and Families*, cancelation of school related activities and school closures may occur rapidly and without prior notice increasing the necessity for a pandemic plan. A relatively new viral disease, the novel coronavirus of COVID-19, was officially documented and reported by the World Health Organization in December 2019. Coronaviruses are common to animals (e.g., pangolins and bats) whose immune systems are resistant to such diseases and often remain dormant within these types of creatures (Maital & Barzani, 2020). Correspondingly, with this type of virus the probability exists of transferring this disease to human hosts potentially causing severe lung and respiratory complications that could affect other organs and body systems of the infected individual (Maital & Barzani, 2020). Viruses replicate and modify their genetic makeup in a remarkably expeditious rate spreading from host to host through bodily fluids and close contact like most communicable diseases (Maital & Barzani, 2020).

The aforementioned viral outbreak caused educational institutions worldwide to cease operations in response to this deadly illness. The coronavirus was and remains a global event exacerbated by lack of communication, preparedness, and most of all fear. As the disease permeated across the globe, death and devastation were left in its wake. Much of the initial response to this virus was reactionary thus creating vast amounts of confusion on how to minimize the circulation of this deadly respiratory disease. Unfortunately, the World Health Organization assisted by various disease control centers globally were unable, in a timely fashion, to provide world leaders with the vital information for dissemination among their countries population in an effort to reduce the propagation of COVID-19.

The educational community was affected by the viral outbreak once the disease reached a critical level. Responses to COVID-19 caused world financial markets to be suppressed along with commerce related services, nationally and

internationally, which subsided drastically through the duration of the health-related catastrophe. The collapse of the global economy due to the effects of COVID-19 in relation to the economies of the Group of Seven countries along with China who together create 60% of the international supply and demand, 65% of worldwide manufacturing, and 41% of global exports were devastated (Weder et al., 2020). Weder et al. (2020) asserted that during the COVID-19 health crisis employees were not able to work for various reasons according to (a) they contracted the disease, (b) caring for others who were ill, (c) staying home with children due to school closures, and (d) factory shutdowns. Additional prolonged factors of the pandemic were (a) minimal travel, (b) the rigors of the quarantine process, and (c) the mental exhaustion due to varying factors (Weder et al., 2020). Proactive measures must be employed by countries around the world to address the possibility of global pandemics through cooperation in the areas of public health and economic progression prior to the onslaught of a virus like COVID-19 (Weder et al., 2020). Similarly, educational leaders must communicate with local, state, and when possible, at the federal level through legislators and policymakers to ensure the needs of students, faculty, staff, and their local communities are prepared for pandemic events in the future.

Regrettably, school officials were forced to close the doors of their educational institutions affecting millions of students around the world due to lockdowns and quarantine practices associated with COVID-19. Similarly, as with most health crises, the unpredictability of the disease generated confusion among health officials and health care providers in relation to the appropriate response to this type of sickness. As the contagion infected individuals across the world, mainly the elderly and immune compromised, the death rates for these sectors of the population increased rapidly during the peak of the pandemic. Much of the global school age student population, who were not as susceptible to this tragic disease, were without the necessary supports that schools provide in the areas of mental, physical, and social well-being. School settings are often the most ideal locale to meet student needs, especially during an event such as the COVID-19 health emergency. Educational leaders who did not prepare in advance and who did not have a quality written pandemic plan present were at a substantial disadvantage as they attempted to respond to such an unyielding virus.

The United States Department of Health and Human Services Centers for Disease Control and Prevention provides an array of documents related to pandemic flu outbreaks for schools. Published in April 2017, the *Get Your School Ready for Pandemic Flu* document was designed to be used by educational leaders nationally as a baseline tool for pandemic plan design, implementation, and practice. Although this document could be modified based on the current COVID-19 pandemic, it includes practical disease prevention protocols that could be a first defense for the spread of many types of viruses not only the coronavirus. In addition, because flu vaccines require an enormous amount of time and resources to develop and distribute it may be necessary to utilize nonpharmaceutical interventions to prevent the spread of deadly diseases such as (a) not reporting to work or school when ill, (b) cover your nose and mouth when coughing, and (c) washing hands regularly with soap and water (United States Department of Health and Human Services Centers for Disease Control and Prevention, 2017). As implemented globally for schools during COVID-19, the United States Department of Health and Human Services Centers for Disease Control and Prevention suggested community nonpharmaceutical interventions such as (a) limited close contact, (b) creating distance between students at tables and desks, (c) modifying leave and attendance policies, (d) postponing or canceling large events, and (e) the possibility of school dismissal or closing. Additionally, school officials should establish quality cleaning protocols to prevent surface contact and cross contamination measures throughout their educational institutions if a disease manifestation is suspected (United States Department of Health and Human Services Centers for Disease Control and Prevention, 2017). Elementary school age children are targeted groups for the implementation of prevention methods such as hand washing programs and alcohol-free hand sanitizer effectiveness to decrease the

incidence and spread of communicable diseases (Cauchemez, Valleron, Boelle, Flahault, & Ferguson, 2008). Educational leaders should plan and be prepared to engage in practices suggested by the United States Department of Health and Human Services Centers for Disease Control and Prevention to ensure the overall mental, physical, and social well-being of students, faculty, and staff during a pandemic flu/disease type of occurrence.

Historically, the 20th century experienced three known pandemics, the Spanish Influenza of 1918, the Asian Flu (H2N2) of 1957, and the Hong Kong Flu (H3N2) of 1968 (Weder et al., 2020). Similarly, five pandemics have plagued the 21st century: the Severe Acute Respiratory Syndrome (SARS) in 2002, Avian Flu (N1H1) of 2009, Swine Flu (H1N1) of 2009, Middle East Respiratory Syndrome (MERS) of 2012, Ebola Virus Disease (EVD) of 2012-2014 in regions of Africa, and the Coronavirus (COVID-19) of 2019 (Weder et al., 2020). The increased incidence of known global pandemics in the last two centuries are cause for concern along with the possibility of additional outbreaks on the horizon. Educational leaders must coordinate, collaborate, and create effective pandemic flu/disease plans to ease health concerns, minimize the spread of disease, and mitigate student, faculty, staff, and their communities' concerns in relation to fears associated with these types of events.

1.1. Statement of the Problem

Dangerous diseases plague sectors of the global population on an annual basis causing increases in mortality rates, hospitalizations, and widespread fear. Scientists and epidemiologist serving at various health organizations worldwide proactively develop plans, strategize contingencies, and formulate educational materials for their communities in relation to the dangers of these potentially deadly illnesses that can lead to pandemics. December of 2019 the first recorded COVID-19 case was detected with seemingly inconsequential concern from general observers. Because scientist and global leaders' deficiencies in understanding this new virus was finite, the impending effects on the global populace would not be realized in adequate time. People of the world continued functioning unaware of the chaos slowly infusing across the earth. By March 2020 the first of many lockdowns were being enforced along with the implementation of nonpharmaceutical interventions such as face coverings, self-screen practices, and surface cleanings. Educational leaders, federal, and state officials reluctantly closed schools throughout the United States to flatten the curve in relation to minimizing the number of COVID-19 viral cases over a specific time period. The educational landscape was changing each day and school officials were challenged with the responsibility of mitigating disastrous events one after the other. Steeves, Metallo, Byrd, Erickson, and Gresham (2017) asserted that safety planning should occur not only for the obvious and common types of threats to school safety, but educators should include a multitude of prevention and preparation practices for a variety of circumstances. Prevention and preparation are crucial elements when addressing real-life crises in school settings. Moreover, legislators have voted in favor of laws at the national, state, and local levels to enhance awareness, develop security training, and produce security frameworks for schools to follow in relation to the most substantive safety issues affecting the field of education today. Unfortunately, current research in the area of school pandemic planning is insufficient and further investigations in this subject matter could provide school leaders with the necessary data to prepare for the continued threat of global pandemics. Correspondingly, educational leaders are challenged with the mission of creating a safe learning environment where the mental, physical, and social well-being of students, staff, and members of the learning community are safeguarded from deadly diseases that could lead to pandemic events.

1.2. Purpose of the Study

The purpose of this study was to examine the degree to which differences were present in pandemic flu/disease written plans as a function of school level (i.e., elementary, middle, and high schools), and school urbanicity (i.e., city,

suburb, town, and rural). Through the analysis of a nationwide dataset, the degree to which school level and school urbanicity differences were present in pandemic flu/disease scenario written plans was determined.

1.3. Significance of the Study

Creating an ethos of safety in schools that increases awareness, provides practical safety training, and improves the implementation of learned skills in the area of pandemic flu/disease plans is a leading concern for educational administrators and school board of trustees since the beginning of the COVID-19 pandemic. School safety is commonplace in media headlines and ultimately influences the perception of educational institutions positively or negatively. Schools are infrequently viewed as safe environments that were designed to augment the mental, physical, and social well-being of learners and educators alike. Safety training programs for schools have been developed to promote the importance of frequent, practical, and applicable written and drilled plans. Furthermore, plans that improve the response to unpredictable occurrences of diseases that could lead to pandemics could further enhance school officials' response times and overall success when encountering such threats to students and staff members' lives. Information collected in relation to school safety and pandemic flu/disease occurrences may contribute to prevention or possible survival if an outbreak was to occur. School district board of trustees and administrators should consider all options related to the safety of their students, faculty, and staff. Many factors contribute to the effectiveness of pandemic flu/disease written plans as it relates to school level and urbanicity. Therefore, a study in the area of pandemic flu/disease written policies by school level and school urbanicity for the 2007-2008, 2009-2010, 2015-2016, and 2017-2018 school years may perhaps be beneficial to current and future educational leaders.

1.4. Research Questions

The following research questions were addressed in this study: (a) What is the difference in pandemic scenario written plans in public schools as a function of school level?; (b) What is the difference in pandemic scenario written plans in public schools by school urbanicity?; (c) What is the degree to which trends are present in pandemic scenario written plans by school level?; and (d) What is the degree to which trends are present in pandemic scenario written plans by urbanicity? These four research questions were examined separately for the 2007-2008, 2009-2010, 2015-2016, and 2017-2018 school years.

2. METHOD

2.1. Research Design

The research design for this empirical investigation was non-experimental, causal comparative in nature. As such, this article constitutes a relationship study between independent variables and dependent variables where the independent variable is not influenced or manipulated (Johnson & Christensen, 2020). With this form of research extraneous variables must be considered as possible factors that influenced the dependent variables. Archival data were used in this study. In this investigation, the independent variables were school level (i.e., elementary, middle, and high schools), and school urbanicity (i.e., city, suburb, town, and rural). The dependent variables were pandemic flu/disease threat scenario written plans by school year.

2.2. Participants and Instrumentation

Participants in this study were principals by school level and school urbanicity who participated in a safety survey that inventoried schools with or without written plans for pandemic flu/disease threat scenarios along with other safety and security data from public schools. The School Survey on Crime and Safety gathers data from principals

from primary and secondary public schools as mandated by the federal government. Focused upon in the survey questions were a variety of school related safety and security questions that could assist school leaders in implementing effective safety measures and prevent or reduce loss of life, property, and incidence of crime in public schools documented by Diliberti, Jackson, Correa, and Padgett (2019). Respondents completed the survey by answering the questions with either a Yes or a No. For the purpose of this study, school level will be based on the standard school levels of elementary, middle, and high schools and school urbanicity. The National Center for Education Statistics in 2006 released new standards for determining urbanicity for the purposes of their research parameters. Based on these changes, 12 categories were derived from four specific locales (i.e., city, suburb, town, and rural) replacing the previous classification process of population density with a new standard utilizing proximity to urban centers across the U.S. The data that was analyzed herein were from the survey administrations in the 2007-2008, 2009-2010, 2015-2016, and the 2017-2018 school years. In addition, written plans were those school plans that were tangible and in a usable form that was not verbal or word of mouth.

3. RESULTS

Pearson chi-square procedures were used to answer the research questions previously discussed. Because both of the independent variables and the survey questions were categorical in nature, chi-squares were the statistical procedure of choice (Slate & Rojas-LeBouef, 2011). The sample size was more than the minimal number of five per cell. As such, the assumptions for using Pearson chi-square procedures were met.

3.1. Written Plan for Pandemic/Flu Disease by School Level

With respect to the 2007-2008 school year, a statistically significant difference was not revealed for school level, $\chi^2(2) = 4.09$, $p = 0.13$. Though not statistically significant, elementary schools were least likely to develop a plan for pandemic flu/disease just over one tenth of time than did middle schools. Readers should note that 60% or more of all school levels represented in the study did not have a written pandemic flu/disease plan. Descriptive statistics for this analysis are contained in Table 1.

Table 1. Descriptive statistics for written pandemic flu/disease scenario plans by school level for the 2007-2008 school year.

School level	Written plan	No written plan
	***n* and %age of total**	***n* and %age of total**
Elementary schools	($n = 215$) 34.80%	($n = 403$) 65.20%
Middle schools	($n = 355$) 39.60%	($n = 542$) 60.40%
High schools	($n = 366$) 39.10%	($n = 570$) 60.90%

Note. The *n* above represents the number of principals at each school level who completed the survey.

With respect to the 2009-2010 school year, the result was statistically significant, $\chi^2(2) = 12.31$, $p = 0.002$. The effect size for this finding, Cramer's V, was below small, 0.07 (Cohen, 1988). Elementary schools were one fourth less likely to have a written plan for pandemic flu/disease than were high schools. Both middle and high schools completed plans for pandemic flu/disease at a greater rate than did elementary schools. Delineated in Table 2 are the descriptive statistics for this analysis.

Table 2. Descriptive statistics for written pandemic flu/disease scenario plans by school level for the 2009-2010 school year.

School level	Written plan	No written plan
	n and %age of Total	*n* and %age of Total
Elementary schools	($n = 460$) 67.30%	($n = 224$) 32.70%
Middle schools	($n = 659$) 72.50%	($n = 250$) 27.50%
High schools	($n = 712$) 75.10%	($n = 236$) 24.90%

Note: The *n* above represents the number of principals at each school level who completed the survey.

Regarding written plans related to pandemic flu/disease for the 2015-2016 school year by school level, the result was not statistically significant, $\chi^2(2) = 0.94$, $p = 0.60$. Though not statistically significant, high schools were more likely to have a written plan for pandemic/flu disease than did elementary and middles schools. Each of the three school levels developed written pandemic flu/disease plans at a rate of just over 50%. Table 3 contains the descriptive statistics for this analysis.

Table 3. Descriptive statistics for written pandemic flu/disease scenario plans by school level for the 2015-2016 school year.

School level	Written plan *n* and %age of total	No written plan *n* and %age of total
Elementary schools	($n = 265$) 51.40%	($n = 251$) 48.60%
Middle schools	($n = 360$) 50.10%	($n = 359$) 49.90%
High schools	($n = 407$) 52.60%	($n = 367$) 47.40%

Note: The *n* above represents the number of principals at each school level who completed the survey.

Concerning the 2017-2018 school year, a statistically significant difference was yielded for school level, $\chi^2(2) = 7.37$, $p = 0.03$. The effect size for this finding, Cramer's V, was below small, 0.05 (Cohen, 1988). Both elementary and middle schools were less likely to have a written plan for pandemic flu/disease than were high schools. Written plans for all school levels were at 51% or below for pandemic flu/disease. Revealed in Table 4 are the descriptive statistics for this analysis.

Table 4. Descriptive statistics for written pandemic flu/disease scenario plans by school level for the 2017-2018 school year.

School level	Written plan *n* and %age of total	No written plan *n* and %age of total
Elementary schools	($n = 311$) 46.30%	($n = 360$) 53.70%
Middle schools	($n = 441$) 45.20%	($n = 534$) 54.80%
High schools	($n = 509$) 51.10%	($n = 488$) 48.90%

Note: The *n* above represents the number of principals at each school level who completed the survey.

3.2. Written Plan for Pandemic Flu/Disease by Urbanicity

With respect to the 2007-2008 school year, a statistically significant difference was present for pandemic flu/disease plans, $\chi^2(3) = 15.43$, $p < 0.001$. The effect size for this finding, Cramer's V, was below small, 0.08 (Cohen, 1988). Almost one seventh of schools located in a city did not have a written plan for pandemic flu/disease. Approximately 60% of schools within the select urbanicity groups did not have written pandemic flu/disease plans. Table 5 contains the descriptive statistics for this analysis.

Table 5. Descriptive statistics for written pandemic flu/disease scenario plans by urbanicity for the 2007-2008 school year.

Urbanicity	Written plan *n* and %age of total	No written plan *n* and %age of total
City	($n = 216$) 31.80%	($n = 463$) 68.20%
Suburb	($n = 332$) 40.80%	($n = 482$) 59.20%
Town	($n = 152$) 39.00%	($n = 238$) 61.00%
Rural	($n = 273$) 40.30%	($n = 404$) 59.70%

Note: The *n* above represents the number of principals at each school level who completed the survey.

Concerning the 2009-2010 school year, a statistically significant difference was not yielded, $\chi^2(3) = 2.83$, $p = 0.42$. Though not statistically significant, schools in rural settings were one tenth less likely to have written plans for pandemic flu/disease than were suburb schools. Three fourths of the urbanicity groups in the study completed written plans at a rate of 70% or greater. Delineated in Table 6 are the descriptive statistics for this analysis.

With respect to the 2015-2016 school year, a statistically significant difference was not yielded, $\chi^2(3) = 3.72$, $p = 0.29$. Schools within a city were one tenth less likely to have a written plan for pandemic flu/disease than did suburb

schools. Three fourths of the urbanicity groups developed written pandemic flu/disease plans at a rate of at least 50% or more. Revealed in Table 7 are the descriptive statistics for this analysis.

Table 6. Descriptive statistics for written pandemic flu/disease scenario plans by urbanicity for the 2009-2010 school year.

Urbanicity	Written plan *n* and %age of total	No written plan *n* and %age of total
City	(n = 505) 71.80%	(n = 198) 28.20%
Suburb	(n = 649) 73.70%	(n = 232) 26.30%
Town	(n = 279) 71.40%	(n = 112) 28.60%
Rural	(n = 470) 69.80%	(n = 203) 30.20%

Note: The *n* above represents the number of principals at each school level who completed the survey.

Table 7. Descriptive statistics for written pandemic flu/disease scenario plans by urbanicity for the 2015-2016 school year.

Urbanicity	Written plan *n* and %age of total	No written plan *n* and %age of total
City	(n = 270) 48.40%	(n = 288) 51.60%
Suburb	(n = 418) 53.50%	(n = 363) 46.50%
Town	(n = 150) 50.80%	(n = 145) 49.20%
Rural	(n = 241) 52.60%	(n = 217) 47.40%

Note: The *n* above represents the number of principals at each school level who completed the survey.

Concerning the 2017-2018 school year, a statistically significant difference was not revealed, $\chi^2(3) = 4.89$, $p = 0.18$. Though not statistically significant, schools located within cities and towns were less likely to have written plans for pandemic flu/disease than were suburb and rural school settings. Readers should note that all schools in each of the urbanicity categories had a written plan at a rate of less than a 50%. Table 8 contains the descriptive statistics for this analysis.

Table 8. Descriptive statistics for written pandemic flu/disease scenario plans by urbanicity for the 2017-2018 school year.

Urbanicity	Written plan *n* and %age of total	No written plan *n* and %age of total
City	(n = 321) 44.40%	(n = 402) 55.60%
Suburb	(n = 508) 49.10%	(n = 526) 50.90%
Town	(n = 177) 46.30%	(n = 205) 53.70%
Rural	(n = 307) 49.30%	(n = 316) 50.70%

Note: The *n* above represents the number of principals at each school level who completed the survey.

3.3. Trends for Pandemic Flu/Disease by Year and School Level

In analyzing the presence or absence of written pandemic flu/disease plans by school level for four school years of a national survey from the United States Department of Education that were examined, trends existed by school level. Development of written pandemic flu/disease plans for the 2007-2008 occurred on average less than 38% of the time for all school levels. Each school level in the study for 2009-2010 school year more than doubled in the incidence of written plans for pandemic flu/disease as compared to the 2007-2008 survey data. Written plans for all school levels were produced at an average rate of 72% for the 2009-2010 school year. For the 2015-2016 school year the average rate of written pandemic flu/disease plans by school level decreased just over 20% as compared to the 2009-2010 survey year. By the 2017-2018 school year an average of 52% of all school levels had no written plan for pandemic flu/disease. When comparing the 2007-2008 school year to the 2017-2018 school year the occurrence of written pandemic flu/disease plans increased by school level an average of 12%. These trends are revealed in Figure 1.

3.4. Trends for Pandemic Flu/Disease by Year and Urbanicity

By examining the presence or absence of written pandemic flu/disease plans using data from a national survey for four school years, trends were present by urbanicity. During 2007-2008, schools by all urbanicity levels had no written plan for pandemic flu/disease an average of 62% of the time. In the 2008-2009 school year written pandemic flu/disease plans for schools located in all urbanicity categories increased by an average of more than half as compared to the 2007-2008 year of study. Schools located within all urbanicity levels during the 2009-2010 school year produced written plans for pandemic flu/disease at an average rate of 72%. Written plans for pandemic flu/disease decreased in occurrence by an average of 21% for school settings in all urbanicity groups for the 2015-2016 school year as compared to 2008-2009. In comparison of the two survey years of 2007-2008 and 2017-2018, schools situated in each of the levels of urbanicity for this study had an increase of written plans for pandemic flu/disease by an average of 9%. Depicted in Figure 2 are the trends for this examination.

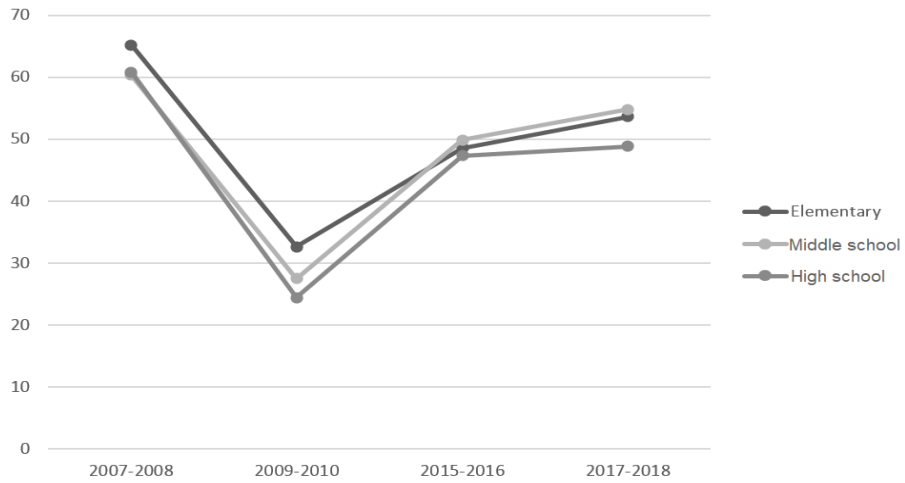

Figure 1. Percent of schools without a written plan for pandemic flu/disease by school level for the 2007-2008, 2009-2010, 2015-2016, and 2017-2018 School Years.

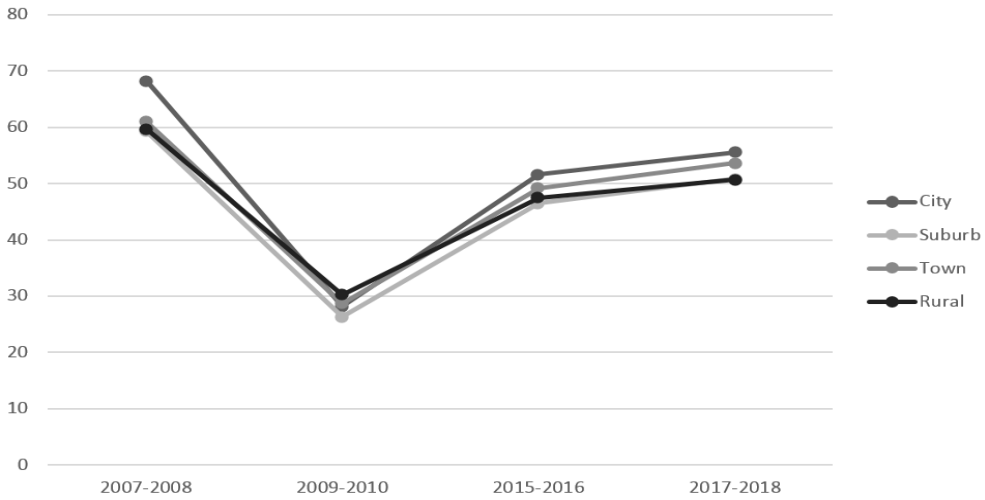

Figure 2. Percent of schools without a written plan for pandemic flu/disease by urbanicity for the 2007-2008, 2009-2010, 2015-2016, and 2017-2018 school years.

4. DISCUSSION

In this article, the extent to which differences were present regarding the presence of written safety plans for pandemic flu/disease among elementary, middle, and high schools and urbanicity in the United States was addressed. Using a nationwide dataset obtained from the United States Department of Education School Survey on Crime and

Safety, data for the 2007-2008, 2009-2010, 2015-2016, and 2017-2018 school years were analyzed. Upon completion of inferential statistical analyses, the extent to which trends were present for the written threat scenario school safety plans for pandemic flu/disease was determined. Statistically significant differences were revealed for pandemic flu/disease written plans by school level for the 2009-2010 and 2017-2018 school years. Differences for written pandemic flu/disease plans by urbanicity had fewer substantive results.

Written plans for elementary schools occurred less often than at the middle and high school levels for 2007-2008 and 2009-2010 school years. Middle schools were least likely to have a written plan for pandemic flu/disease during the 2015-2016 and 2017-2018 school years respectively. For the 2007-2008 school year, 60% or more of all school levels in the study had no written plan for pandemic flu/disease. High schools were more likely to have implemented written plans for pandemic flu/disease than were elementary and middle schools for the 2015-2016 year of study. During the same school year, all school levels in question developed written plans at a rate of just over 50%. In the 2017-2018 school year, on average elementary and middle schools were one tenth less likely to be prepared for pandemic flu/disease threats as were high schools. All schools represented in this analysis completed plans at a rate of 51% or less for a pandemic threat.

Urbanicity was a factor in the 2007-2008 school year for pandemic flu/disease written plans. A statistically significant difference in written plans was determined for schools within cities as compared to schools located in a suburb, town, or rural setting. Rural settings for schools were one tenth less likely to have a written plan than did schools within a suburb for the 2009-2010 year of study. Three fourths of the urbanicity groups developed written pandemic flu/disease plans at a rate of at least 50% or more for the 2015-2016 school year. Additionally, schools located within cities and towns were less likely to have a written plan than were suburb and rural school settings for 2017-2018.

4.1. Connections to Existing Literature

As documented in this empirical multiyear analysis, differences were present in written school safety plans by school level and urbanicity. Unfortunately, published research studies about written plans for pandemic flu/disease for the aforementioned variables were limited and this investigation was seminal in nature. Other researchers and leaders of global organizations (Cauchemez et al., 2008; Dietz & Black, 2012; Maital & Barzani, 2020; Mossad, 2009; United States Department of Health and Human Services Centers for Disease Control and Prevention, 2017; Weder et al., 2020) who emphasized the unpredictable and dangerous elements of a worldwide pandemic have documented the importance of understanding and being proactive in relation to such events. Educational leaders are challenged with preparing and mitigating for a plethora of school related disasters that affect the mental, physical, and social well-being of school communities.

4.2. Implications for Policy and for Practice

Based on the findings of this multiyear study, several implications for policy and practice are suggested. With respect to policy, the incorporation of prevention and mitigation techniques by school leaders in the form of written safety plans can be influential in reducing loss of life and property. Individuals and groups of influential policymakers are important role players who bring critical issues to the forefront for deliberation and legislation. School safety and security are issues of great importance and merit much attention. Through the creation of an organized method of safety plan development, local adoption, and reporting protocols to agencies of higher authority schools could become more proactive and prepared for disasters. In addition, a centralized management organization for school safety documents and procedures, preferably at state and/or regional levels, could be created to assist school leaders in

realizing their collaborative safety goals. By initiating the development of written plans for students, faculty, and staff, school officials can take the lead in protecting schools. Securing additional funding and furthering efforts to educate all members of the learning community in research-based health and hygiene practices are practical measures to assist in the prevention and response to school crises. Regarding implications for practice, school leaders' shortcomings in the area of implementation of vital written plans in preparation for a possible crisis must be bolstered. Adding additional well-trained staff members are possible approaches in improving safety concerns for schools. Correspondingly, social services agencies could be used to assist school officials with more challenging security susceptibilities and could intercede in situations that have the potential for more adverse consequences. Additionally, governing bodies could approve school safety plans for educational institutions to improve accountability.

4.3. Recommendations for Future Research

Several recommendations for future studies can be made based on the findings of this empirical, multiyear nationwide study. The survey data analyzed herein pertained only to written plans for pandemic flu/disease threat scenarios. Further research studies are encouraged for other written safety plans (e.g., active shooter, hostage, and bomb threats), drilled safety plans (e.g., evacuation, lockdown, and shelter-in-place), safety drill frequencies, and other similar related scenarios. Moreover, interviews using a qualitative approach through the use of sampling techniques for principals at each school or urbanicity level could provide useful information. Similarly, researchers could ask more specific questions of school leaders about community demography, proximity of health departments and hospitals, non-pharmaceutical interventions, or access to public services (e.g., fire safety and rescue, police services, and emergency medical services). Consequently, due to the inadequate development of pandemic flu/disease plans, a more focused study related to school safety planning legal requirements and accountability practices could complement this article.

5. CONCLUSION

The purpose of this research investigation was to determine the extent to which differences were present in written safety plans a function of school level and urbanicity. Analysis of four school years of nationwide survey data yielded statistically significant differences in pandemic flu/disease written plans by school level and urbanicity. Results discussed herein were interpreted that valid concerns exist related to the development of pandemic flu/disease written plans for elementary schools as compared to middle and high schools, and the overall development of such plans for all school levels for this analysis. About 60% of schools within all urbanicity groups did not have written pandemic written plans. Elementary schools were least likely to have a written plan for pandemic flu/disease, just over one tenth of time than did middle schools. Both elementary and middle schools were less likely to have a written plan for pandemic flu/disease than were high schools. Schools in rural settings were one tenth less likely to have written plans than were suburb schools. City and township schools were less likely to have written plans than were suburb and rural school settings. Regrettably like most threats to schools, health related concerns such as pandemics must be considered as a serious danger by educational leaders and greater efforts should be taken to ensure that schools are prepared in advance for such calamities.

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