# Closing The Schools: Lessons From The 1918–19 U.S. Influenza Pandemic

Ninety-one years later, the evidence shows that there are positive and negative ways to do it.

**by Alexandra M. Stern, Martin S. Cetron, and Howard Markel**

**ABSTRACT:** When the novel strain of A/H1N1 influenza first appeared in spring 2009, closing schools was initially a common and often challenging strategy implemented in many communities. Arguments for and against closing schools are likely to arise anew if influenza spikes in the fall of 2009. Policymakers and community officials considering this and other nonpharmaceutical responses can learn from the experiences of ninety-one years ago, during the 1918–19 influenza pandemic that killed thousands of Americans. Analysis of the school closure policies of forty-three U.S. cities during that pandemic shows that smooth implementation was associated with clear lines of authority among agencies and with transparent communication between health officials and the public. [Health Aff (Millwood). 2009;28(6):w1066–78 (published online 29 September 2009; 10.1377/hlthaff.28.6.w1066)]

WHEN CASES OF A NEW STRAIN OF INFLUENZA (A/H1N1) mounted in spring 2009, one of the first actions taken by many U.S. communities was to close schools where one or more students had confirmed or probable infection. Individual schools and school districts responded to a single case or cluster of cases by closing for as briefly as one day or as long as two weeks. At the peak of school closures, 5 May 2009, 726 U.S. schools were closed, affecting 468,282 students.[1]

Looking forward to the 2009–10 school year, recently issued Centers for Disease Control and Prevention (CDC) guidelines for state and local public health officials and school administrators (in grades K–12) place most of the decision-making responsibilities at the local level. Based on current information about the

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severity of the circulating virus, the CDC recommends that the primary responses should be to send sick and feverish children home, allowing them to return to school twenty-four hours after the resolution of fever without fever-reducing medicine; to separate ill students and staff; and to promote regular hand washing and "respiratory etiquette" (using a tissue when coughing or sneezing). In addition, the CDC recommends that school districts consider closure if they have high numbers of medically vulnerable students or if A/H1N1 acquires greater severity.[2]

Nine decades before our current encounter with a novel strain of influenza virus, the deadly second wave of the 1918–19 influenza pandemic struck the United States. In response, most urban communities closed K–12 public schools for an extended period of time, in some locations for as long as fifteen weeks. Typically, the order to close schools came late in the epidemic curves of cities—weeks if not days after deaths from influenza and pneumonia mounted. School closure orders almost always were issued in concert with additional nonpharmaceutical interventions, such as quarantine, isolation, bans on public gatherings, staggered business hours, and orders to use facemasks.

The U.S. historical record demonstrates that on multiple occasions, when faced with a contagious crisis that affects children, school dismissal and voluntary absenteeism are common responses. Past experiences also reveal that school dismissal tends to be applied by a particular community as a reaction, if not a demand, only after a contagious disease has spread through a community and not as a preemptive public health measure.

## Objectives And Background

The aim of this paper is not to measure quantitatively whether school closures during the 1918–19 influenza pandemic did or did not mitigate or control influenza transmission. Rather, we seek to establish useful criteria for evaluating which social, political, and organizational factors facilitated or hindered the implementation of school closure during that pandemic. We present our qualitative findings against the backdrop of an expanding body of studies by historians, statisticians, and modelers that suggest that the sustained, layered, and early implementation of several nonpharmaceutical interventions—including school closure—can have beneficial effects in terms of lowering the peak mortality burden during pandemic or seasonal influenza.[3–13] Studies that have examined the outcomes of school dismissals in response to seasonal influenza and that have modeled large-scale epidemic simulations have found that school closures may lessen peak mortality but are less likely to change the overall mortality rate.[14–18] A recent review of the literature on school closure proposes that closing schools during the midst of a pandemic may contribute to as much as a 15 percent reduction in cases and up to a 40 percent reduction in peak attack rates.[19] Most optimistically, these studies suggest that in the advent of a flu pandemic, school dismissals might help communities buy precious time during which antivirals can be distributed and

vaccines manufactured for mass distribution.[20, 21]

Nevertheless, finding the right balance between reducing viral transmission through nonpharmaceutical interventions such as school closure and reducing the social disruption incurred by these interventions is a tricky task. By exploring the 1918–19 experiences, we hope to present nuanced historical insights for contemporary pandemic preparedness and community mitigation planning.

## Study Methods And Scope

Our qualitative study was based on systematic historical research into the experiences of forty-three of the most populous U.S. cities during the twenty-four-week period of the second and third waves of the 1918–19 pandemic (1 September 1918 to 31 March 1919). These cities encompassed all U.S. urban communities with standardized weekly pneumonia and influenza mortality data as contained in the most reliable source of the era, the *Weekly Health Index* of the U.S. Census Bureau. These forty-three cities' populations ranged from 104,000 to 5.6 million, accounting for 23 million people, or approximately 22 percent of the total population, per the 1920 census.

We consulted extensive primary sources and publications from the scientific, medical, and educational literature of the era. In addition, we visited more than 140 archival repositories in all of these cities, including local historical societies, public libraries, and city archives, and we captured original sources that document the social, cultural, and economic aspects of school closure. We also performed a literature review of all of the recent scientific and social science scholarship on nonpharmaceutical interventions, pandemic preparedness, and the legal and social aspects of school closure and social distancing measures.[22]

## Study Findings

■ **Categories of experience.** Our qualitative analysis determined that there were four salient categories of city experiences with school closure: (1) cities that kept schools open and relied heavily on the daily medical inspections of students; (2) cities that closed schools and experienced interagency conflict and low compliance with nonpharmaceutical interventions; (3) cities that closed schools and experienced inconsistent and sporadic interagency cooperation and mixed compliance with nonpharmaceutical interventions; and (4) cities that closed schools and experienced interagency cooperation and high compliance with nonpharmaceutical interventions.

We placed cities in one of these categories based on a careful evaluation of the degree of cooperation or friction among key agencies, including health, education, and government, on the city, county, state, and, when applicable, federal levels. Additionally, we evaluated the degree of public acceptance or rejection of school closure and of nonpharmaceutical interventions more broadly, based on viewpoints expressed in newspaper editorials, municipal reports, the legal arena, and

meeting minutes. Although many factors contributed to the varying outcomes of U.S. cities, we suggest that the smooth implementation of school closure was consistently associated both with a clear delineation of authority among municipal and governmental agencies and with existing trust and transparent communication between health officials and the population at large.

■ **Schools kept open.** Two of America's largest cities in 1918, New York City and Chicago, kept schools open and relied on enhanced medical surveillance of students (Exhibit 1). The health commissioners of these cities were guided by the philosophy that children were "better off in school, under supervision, than playing about in the streets."[23] The strong faith that these cities placed in the medical inspection of students reflected their leadership in the early-twentieth-century school hygiene movement and major investment in a health infrastructure that included physicians and nurses. In these cities, school medical corps were charged with carefully inspecting classrooms and pupils, and sometimes with extending services to homes.

Nevertheless, many classrooms in these cities emptied out because of high rates of absenteeism. In Chicago these rates hovered around 30 percent in mid-October 1918 and spiked to nearly 50 percent by the end of the month. If a more severe variant of A/H1N1 returns in fall 2009, it is likely that parents in communities where schools remain open might decide to keep their children home. With that scenario in mind, today's health and education experts can improve on the actions of their predecessors by developing special curricular and organizational plans that can be used in case of high absenteeism or mandated school closure.

■ **Closed schools and interagency friction.** Nine cities experienced interagency friction, above all between boards of health and of education, and myriad dif-

**EXHIBIT 1**
**Cities That Kept Schools Open And Relied Heavily On Daily Medical Inspections Of Students During The Influenza Pandemic, 1918–19**

| City | Weeks closed | Days closed (including weekends and holidays) | Population | Other nonpharmaceutical interventions | Other important community factors |
|---|---|---|---|---|---|
| Chicago (IL) | 0 | 0 | 2,701,705 | Quarantine and isolation, facemasks at hospitals, ventilation of public venues | High absenteeism; focused on medical inspections |
| New Haven (CT) | 0 | 0 | 162,537 | Quarantine and isolation, public gathering bans, ban on public dances and flu-death funerals | High absenteeism; students medically certified for reentry |
| New York (NY) | 0 | 0 | 5,620,048 | Quarantine and isolation, staggered business hours | Moderate absenteeism; focused on medical inspections |

**SOURCES:** City newspapers, health and education reports and bulletins, archival materials. For a full list for all forty-three cities, see the bibliographic supplement, online at http://content.healthaffairs.org/cgi/content/full/hlthaff.28.6.w1066/DC2.
**NOTE:** Three of the forty-three cities studied (6.9 percent).

ficulties with the acceptance of nonpharmaceutical interventions among local residents (Exhibit 2). Furthermore, no adjudicating mechanism, whether a strong local leader or an appropriately designed emergency advisory council, emerged to quell these conflicts. The situation in Minneapolis was particularly rancorous and unfolded in noisy debates between school and health officials at special meetings. Moreover, local residents did not hesitate to chide municipal agencies. For example, one parent, incensed that the health department overruled the education board in forcing school dismissal, wrote to the Minneapolis school superintendent: "I take great pleasure, in endorsing your courageous stand, in protesting strongly against the arbitrary, and unfair closing of our public schools, and if an object to injure is shown, they ought to be prosecuted and punished."[24] There were also conflicts in Baltimore but in the reverse direction: the school board acted in defiance of the health department's orders to keep schools open, abruptly sending students home at the height of the pandemic.

■ **Inconsistent cooperation and conflict.** Eleven cities fell in the middle of the spectrum of school closure experiences, encountering inconsistent cooperation, sporadic conflict, and mixed compliance with nonpharmaceutical interventions (Exhibit 3). These cities appeared to have suffered from one or two weak links that complicated a potentially smoother rollout of school dismissal. For the most part, these problems emanated from preexisting conditions in the political and social environment that fostered suspicion and miscommunication among leaders and community members. This set of cities illustrates the importance of trust and transparency to public health interventions and communication.

For example, Portland, Oregon, and Grand Rapids, Michigan, were subject to state-mandated nonpharmaceutical interventions, and in both instances local officials disagreed with these policies. In Denver, Colorado, and Pittsburgh, Pennsylvania, pushback against other nonpharmaceutical interventions, including, respectively, a facemask order and an alcohol ban, spilled over into the broader dynamics of community mitigation and hampered school closure efforts. In Denver, health officials initially responded by scapegoating Italian immigrants for spreading influenza, in one of the few instances of ethnic discrimination during the 1918–19 U.S. influenza pandemic that we have been able to document.

Even as these eleven cities encountered organizational and legal obstacles to the smooth implementation of school closure, they nevertheless exhibited some positive elements. For example, in Lowell, Massachusetts, and Richmond, Virginia, teachers readily volunteered to conduct neighborhood health inspections and work to help their cities cope with the influenza crisis.

■ **Positive interagency relations and cooperation.** One of the most intriguing lessons from the 1918–19 influenza pandemic is that twenty of the forty-three cities experienced relatively high degrees of interagency cooperation and compliance with nonpharmaceutical interventions (Exhibit 4). The positive outcomes shared by these cities appear to be the result of good coordination among local, state, and,

## EXHIBIT 2
## Cities That Closed Schools And Experienced Interagency Conflict And Low Compliance With Nonpharmaceutical Interventions During The Influenza Pandemic, 1918–19

| City | Weeks closed | Days closed (including weekends and holidays) | Population | Other nonpharmaceutical interventions | Other important community factors |
|---|---|---|---|---|---|
| Baltimore (MD) | 4 | 27 | 733,826 | Public gathering bans, staggered business hours, partial facemask use | School board preempted health officer to close schools |
| Columbus (OH) | 11 | 72 | 237,031 | Public gathering bans, restricted business hours, saloon windows open, streetcars ventilated | Indecisive health officer |
| Minneapolis (MN) | 9 (10 for some schools) | 57 (64 for some schools) | 380,582 | Public gathering bans, ventilated streetcars and "skip-stop," some facemask use, funeral restrictions | Parents expressed dissatisfaction with health department and school closure |
| Newark (NJ) | 3 | 19 | 414,524 | Public gathering bans, ventilated businesses, some facemask use | School nurses required to volunteer |
| Omaha (NE) | 4 | 25 | 191,601 | Quarantine and isolation, public gathering bans, altered business hours, business and transportation restrictions | Teachers, school nurses volunteered |
| Philadelphia (PA) | 4 | 24 | 1,823,779 | Public gathering bans | Interagency and direct city/state conflict; teachers volunteered; schools used as canteens, hospitals; students, teachers medically certified for reentry |
| Providence (RI) | 4 | 23 | 237,595 | Public gathering bans, restricted business hours, ventilated streetcars | High absenteeism forced school closure decision; school nurse department understaffed; in 1919, city bought thermometers for school nurses |
| Seattle (WA) | 5 | 39 | 315,312 | Public gathering bans, ventilated streetcars and restricted capacity | Mandatory masks; nonpharmaceutical intervention compliance pushback; student restrictions during December recrudescence |
| Worcester (MA) | 4 | 24 | 179,754 | Quarantine and isolation, public gathering bans | Principals closed 15 schools to force a broad closure order |

**SOURCES:** City newspapers, health and education reports and bulletins, archival materials. For a full list for all forty-three cities, see the bibliographic supplement, online at http://content.healthaffairs.org/cgi/content/full/hlthaff.28.6.w1066/DC2.
**NOTE:** Nine of the forty-three cities studied (20.9 percent).

## EXHIBIT 3
## Cities That Closed Schools And Experienced Inconsistent And Sporadic Interagency Cooperation And Mixed Compliance With Nonpharmaceutical Interventions During The Influenza Pandemic, 1918–19

| City | Weeks closed | Days closed (including weekends and holidays) | Population | Other nonpharmaceutical interventions | Other important community factors |
|---|---|---|---|---|---|
| Boston (MA) | 4 | 26 | 748,060 | Public gathering bans, restricted business hours | Sporadic municipal conflict; health commissioner wrote instructive hygiene poem for students |
| Cincinnati (OH) | 9 | 65 | 401,247 | Quarantine and isolation, public gathering bans, restricted business hours, hotel lobbies cleared, warnings at movies, some facemask use | Ineffective municipal leadership; schools used to feed the poor |
| Denver (CO) | 12 | 84 | 256,491 | Quarantine and isolation, public gathering bans, staggered business hours | Officials briefly scapegoated Italians as disease vectors; poor nonpharmaceutical intervention compliance on facemasks; city organized outdoor activities for children |
| Grand Rapids (MI) | 2 | 13 | 137,634 | Quarantine and isolation, public gathering bans | Health officer energetically resisted demands for strict measures; only school closure: December 17–30 |
| Kansas City (MO) | 11 | 73 | 324,410 | Quarantine and isolation, public gathering bans, fumigated streetcars with limited seating capacity, restricted business hours, some facemask use | Friction among subagencies in underfunded health department |
| Lowell (MA) | 4 | 31 | 112,759 | Public gathering bans, restricted business hours | Teachers conducted neighborhood health inspections |
| Oakland (CA) | 9 | 65 | 216,261 | Quarantine and isolation, public gathering bans, business regulations, mandatory facemask use | Public unhappy about mandatory facemasks; teachers volunteered as nurses, ambulance attendants, cooks |
| Pittsburgh (PA) | 4 | 25 | 588,343 | Public gathering bans, children warned not to gather in groups | Poor nonpharmaceutical intervention compliance with alcohol ban; teachers volunteered; schools used as clinics; students medically certified for reentry |
| Portland (OR) | 5 | 38 | 258,288 | Quarantine and isolation, public gathering bans, restricted business hours, voluntary facemask use, anticrowding measures, ventilation requirements | State-mandated closure; teachers deputized to serve as health officers; some older (college bound?) students studied at home |
| Richmond (VA) | 4 | 31 | 171,667 | Public gathering bans, voluntary facemask use, tobacco warehouses closed | Teachers volunteered; schools used as hospitals |

**EXHIBIT 3**
**Cities That Closed Schools And Experienced Inconsistent And Sporadic Interagency Cooperation And Mixed Compliance With Nonpharmaceutical Interventions During The Influenza Pandemic, 1918–19 (cont.)**

| City | Weeks closed | Days closed (including weekends and holidays) | Population | Other nonpharmaceutical interventions | Other important community factors |
|---|---|---|---|---|---|
| San Francisco (CA) | 5 | 38 | 506,676 | Public gathering bans, restricted business hours, limited streetcar capacity | Mandatory facemasks; nonpharmaceutical intervention compliance pushback; teachers volunteered; schools used as emergency hospitals |

**SOURCES:** City newspapers, health and education reports and bulletins, archival materials. For a full list for all forty-three cities, see the bibliographic supplement, online at http://content.healthaffairs.org/cgi/content/full/hlthaff.28.6.w1066/DC2.
**NOTE:** Eleven of the forty-three cities studied (25.6 percent).

when applicable, federal levels of government; effective local leadership; robust volunteerism especially from teachers and nurses; and other social, economic, and cultural factors. For example, Milwaukee, Wisconsin, benefited from a long tradition of collaboration among various municipal agencies and the health department, which had worked hard over the years to acquire the trust of the city's diverse immigrant populace.[25] In St. Louis, Missouri, the bold leadership of the health commissioner was instrumental to the smooth implementation of a menu of nonpharmaceutical interventions including extended school closures. Rochester, New York, instituted what appears to have been a successful health campaign to reach ethnic communities, which may have contributed positively to school dismissal policies.

## Sui Generis: Innovative Approaches To School Closure

In addition to experiencing positive interagency cooperation, Cleveland, Ohio, and Los Angeles, California, devised innovative approaches to weeks-long school dismissal. These two examples are helpful for today's policymakers, public health practitioners, and local leaders who wish to design creative programs calibrated to meet the particularities and needs of their communities.

■ **Close monitoring.** In Cleveland, school and health officials reached a workable compromise for school closure. Cleveland's government devised what it called the "unit system": if absenteeism rose above 20 percent in an individual school or 10 percent in the school district as a whole, students would be dismissed.[26] This policy meant both that children were being closely monitored individually and that broader public health measures were being implemented based on case reporting in schools. This combination was well received in Cleveland insofar as it granted teachers sufficient autonomy to decide how to run their own schools and districts.

■ **Mail-in correspondence course.** Los Angeles stood alone in establishing mail-in correspondence courses for students in higher grade levels. In that city, pub-

## EXHIBIT 4
## Cities That Closed Schools And Experienced Interagency Cooperation And High Compliance With Nonpharmaceutical Interventions During The Influenza Pandemic, 1918–19

| City | Weeks closed | Days closed (including weekends and holidays) | Population | Other nonpharmaceutical interventions implemented | Other important community factors |
|---|---|---|---|---|---|
| Albany (NY) | 5 | 33 | 113,344 | Public gathering bans, streetcars ventilated and cleaned | School nurses volunteered; newspaper published weekly high school lessons |
| Birmingham (AL) | 4 | 26 | 178,806 | Public gathering bans, coal mines closed, facemasks recommended | Schools used as emergency hospitals for both races; teachers voiced need for revised curriculum; school officials submitted data daily to health department |
| Buffalo (NY) | 4 | 28 | 506,775 | Public gathering bans, quarantine and isolation, health department must wear facemasks | Teachers conducted neighborhood health inspections |
| Cambridge (MA) | 4 | 26 | 109,694 | Public gathering bans | Teachers volunteered |
| Cleveland (OH) | 5 | 33 (some schools closed for longer, on a case-by-case basis) | 796,841 | Quarantine and isolation, public gathering bans, partial facemask use, restricted business hours | "Unit system" and focus on medical inspections |
| Dayton (OH) | 5 (9 for grade schools) | 33 (60 for grade schools) | 152,559 | Quarantine and isolation, public gathering bans | Students medically certified for reentry |
| Fall River (MA) | 4 | 33 | 120,485 | Quarantine and isolation, public gathering bans, cleaned streetcars, partial facemask use | Schools began monitoring for flu early; schools used as emergency hospitals, diet kitchens; teachers volunteered |
| Indianapolis (IN) | 6 | 42 | 314,194 | Quarantine and isolation, public gathering bans, voluntary facemask use, mandatory facemask use, staggered business hours | County and city school closures had differing start/stop times, leading to public complaints |
| Los Angeles (CA) | 15 (19 for some schools) | 82 (114 for some schools) | 576,698 | Public gathering bans, staggered business hours, partial facemask use, no mob scenes in movies | Creative responses to school closure included correspondence courses for students |
| Louisville (KY) | 8 | 53 | 234,891 | Quarantine and isolation, public gathering bans, business restrictions, streetcars with limited seating capacity | City-state-federal cooperation; school nurses volunteered |
| Milwaukee (WI) | 8 | 47 | 457,147 | Quarantine and isolation, public gathering bans, extra streetcars | Teachers conducted neighborhood health inspections |
| Nashville (TN) | 4 | 26 | 118,342 | Public gathering bans | Teachers volunteered |

**EXHIBIT 4**
**Cities That Closed Schools And Experienced Interagency Cooperation And High Compliance With Nonpharmaceutical Interventions During The Influenza Pandemic, 1918–19 (cont.)**

| City | Weeks closed | Days closed (including weekends and holidays) | Population | Other nonpharmaceutical interventions implemented | Other important community factors |
|---|---|---|---|---|---|
| New Orleans (LA) | 6 | 39 | 387,219 | Quarantine and isolation, public gathering bans, anticrowding measures on streetcars, staggered business hours | Schools used as emergency hospitals |
| Rochester (NY) | 4 | 27 | 295,750 | Public gathering bans, staggered business hours | Teachers volunteered in hospitals, sent prevention information home with students prior to closure |
| Spokane (WA) | 11 | 66 | 104,437 | Quarantine and isolation, public gathering bans, ventilated and "uncrowded" streetcars, partial facemask use | Teachers volunteered |
| St. Louis (MO) | 10 | 72 (53 for high schools) | 772,897 | Public gathering bans, restricted business hours, streetcars with limited capacity | High absenteeism |
| St. Paul (MN) | 2 | 12 | 234,698 | Public gathering bans, ventilated streetcars with limited capacity | Bans enacted only after public pressure; teachers, nurses volunteered; teachers conducted neighborhood health inspections; schools used as hospitals |
| Syracuse (NY) | 3 | 23 | 171,717 | Public gathering bans | School diet kitchens prepared food for the sick; school physicians, teachers volunteered |
| Toledo (OH) | 8 | 53 | 243,164 | Public gathering bans, ventilated streetcars, restricted business hours | Student vaccination advised prior to reentry; controversy on efficacy of teacher home visits as health checks |
| Washington (DC) | 4 | 32 | 437,571 | Public gathering bans, staggered business hours | Mixed nonpharmaceutical intervention compliance |

**SOURCES:** City newspapers, health and education reports and bulletins, archival materials. For a full list for all forty-three cities, see the bibliographic supplement, online at http://content.healthaffairs.org/cgi/content/full/hlthaff.28.6.w1066/DC2.
**NOTE:** Twenty of the forty-three cities studied (46.5 percent).

lic educators appeared to work well with other officials, in large part because they were given leeway to design approaches to municipally mandated school closures. The city created mail-in homework modules for high school students so that they could complete assignments at home. In addition, during this "enforced vacation," teacher courses were set up at the State Normal School, and approximately 1,500 teachers took classes to expand their subject knowledge and pedagogical skills. Thus, Los Angeles offers an interesting model for contemporary schools interested in creating Internet-ready study materials or valuable professional activities for instructors in the advent of school closure.

## Discussion

The critical epidemiological metric that will guide decisions about implementing nonpharmaceutical interventions such as school dismissal is the severity of the circulating virus. If we face a 1918-like or worse scenario, where tens of thousands of Americans are dying, the public might more readily agree to sweeping nonpharmaceutical interventions. In contrast, in a situation that mirrors seasonal or slightly worse influenza rates, such public acceptance might not be so forthcoming, given the inherent consequences of social and economic disruption.

■ **School systems now and then.** There is no question that schools and school systems are markedly different institutions in 2009 than they were in 1918. Today, most public schools do not have the health infrastructure that had become commonplace in U.S. educational institutions during the Progressive era. Financial cutbacks to public education over the past several decades have severely affected health programs, reducing the number of school nurses and resources for activities such as physical education. In addition, the diseases—such as smallpox, whooping cough, measles, and diphtheria—that were of great concern in the early twentieth century are no longer major killers in the United States. Because of a combination of laudable advances in medicine and health, complacency toward the threat of infectious diseases, and reticence among public officials to implement measures that could be interpreted as violating individual rights, the perceived need for school hygiene has diminished during the past ninety years. Even with these changes, school closure remains controversial for many of the same reasons as it was in 1918.

■ **Key problem: delineation of authority.** One of the most pressing questions is who has the authority to close schools and in accordance with what legal mechanisms. A 2009 U.S. Department of Health and Human Services report found that "the authorities for closing schools or dismissing students vary widely among States and localities and a patchwork of laws and regulations govern these authorities."[26] It notes that of fifty-six states and U.S. territories, twenty-two are inadequately prepared for the potentiality of school closure, and only six states are completely prepared.[21, 27] Although our study did not address decision making on the municipal level, the lack of clear delineation of authority is as serious a problem today as it was ninety years ago. Indeed, this paper shows that ill-defined lines of authority among governmental branches contributed to the eruption of interagency conflict in U.S. cities during the 1918–19 pandemic. Then as today, confusion about authority and jurisdiction helped lead to distrust in health officials and political leaders, and it likely resulted in poorer health outcomes for children and communities at large.

■ **Current resistance.** In the contemporary policy arena, agreement is lacking on whether school closure would do more harm than good to the overall population and whether the repercussions would outweigh possible benefits for children and surrounding adult communities. Legal scholars and others have emphasized the multiple secondary and tertiary social, economic, and cultural ramifications that

could result from extended weeks of familial disruption, the interruption of welfare services such as school meal programs, and problems arising from single parents or hourly workers who cannot afford to miss work.[28, 29]

■ **CDC guidance.** The current CDC guidance for health and school officials takes into account the potential negative affects of these cascading factors and, based on epidemiological intelligence about the severity of the circulating A/H1N1 virus, does not recommended school dismissal as the first line of community mitigation, with the possible exception of selective and medically vulnerable student groups. If the virus acquires greater virulence, federal and other health officials undoubtedly will reevaluate this guidance and carefully weigh the costs and benefits of any school dismissal recommendations.

OUR QUALITATIVE ANALYSIS SUGGESTS that if the scenario arises again in which U.S. health officials decide to dismiss students from schools, smoother implementation will be realized by a clear delineation of legal authority and municipal organization as well as existing patterns of trust and transparency between public health officials and the populace. Furthermore, communities that emphasize public health risk communication, particularly to underserved minority and immigrant populations, will likely experience higher degrees of compliance with nonpharmaceutical interventions. Finally, preparedness and dialogue are keys to smooth implementation; as per the recent CDC guidance, advance planning that brings public health, education officials, and political leaders together to work out decision-making processes and resolve differences will be crucial to success.

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