# Evidence Search Service Results of your search request

## School measures during/after pandemics, inc. COVID-19 [systematic reviews only search for EvidenceAid]

**ID of request:** 24194  
**Date of request:** 9th July, 2020  
**Date of completion:** 9th July, 2020

If you would like to request any articles or any further help, please contact:  Adam Tocock at [adam.tocock@nhs.net](mailto:adam.tocock@nhs.net)

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All searched on 28/6/20:

Medline (via NICE's HDAS platform): 308

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Total before deduplication: 1227

Total after deduplication in Mendeley: 1175

Total after title/abstract screening for relevance: 52

Strategies:

Cochrane Library:  
ID    Search    Hits  
#1    (covid\* OR corona OR coronavir\* OR "2019-nCoV" OR 2019nCoV OR SARSCoV\* OR MERSCoV\* OR cv19 OR (cv NEXT 19) OR (SARS NEXT CoV\*) OR (MERS NEXT CoV\*) OR "Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome" OR "Middle Eastern Respiratory Syndrome" OR SARS OR MERS OR ncov OR "2019-ncov" OR "novel betacov" OR "novel betacoronavirus"):ti,ab,kw (Word variations have been searched)    2172  
#2    MeSH descriptor: [Coronavirus] explode all trees    18  
#3    MeSH descriptor: [Coronavirus Infections] explode all trees    179  
#4    #1 or #2 or #3    2172  
#5    (pandemic\* OR "spanish flu" OR "spanish influenza" OR "bird flu" OR "avian flu" OR "H1N1"):ti,ab,kw (Word variations have been searched)    1882  
#6    (epidemic\*):ti,ab,kw (Word variations have been searched)    2789  
#7    (outbreak\* OR "out break" OR "out breaks" OR infect\* OR disease\* OR virus\* OR viral\*) AND (international\* OR multinational\* OR "multi-national" OR global\* OR worldwide\* OR "world wide"):ti,ab,kw (Word variations have been searched)    45016  
#8    MeSH descriptor: [Disease Outbreaks] explode all trees    274  
#9    #5 or #6 or #7 or #8    49074  
#10    #4 or #9    50924  
#11    (school\* OR classroom\* OR "class room" OR "class rooms" OR (education\* NEXT (institut\* OR facilit\*))):ti,ab,kw (Word variations have been searched)    33946  
#12    MeSH descriptor: [Schools] explode all trees    2889  
#13    #11 or #12    34741  
#14    #10 and #13    1548  
#15    (open\* OR reopen\* OR (re NEXT open\*) OR closure\* OR closing OR close\* OR "term time\*" OR "term times" OR measure\* OR strateg\* OR respon\* OR react\* OR manag\* OR plan OR plans OR planned OR planning):ti,ab,kw (Word variations have been searched)    849657  
#16    MeSH descriptor: [Disaster Planning] explode all trees    32  
#17    MeSH descriptor: [Civil Defense] explode all trees    4  
#18    MeSH descriptor: [Time Factors] explode all trees    63876  
#19    #15 or #16 or #17 or #18    873664  
#20    #14 and #19    1258

Epistemonikos:

(title:(covid\* OR corona OR coronavir\* OR "2019-nCoV" OR 2019nCoV OR SARSCoV\* OR MERSCoV\* OR cv19 OR (cv NEXT 19) OR (SARS NEXT CoV\*) OR (MERS NEXT CoV\*) OR "Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome" OR "Middle Eastern Respiratory Syndrome" OR SARS OR MERS OR ncov OR "2019-ncov" OR "novel betacov" OR "novel betacoronavirus" OR pandemic\* OR "spanish flu" OR "spanish influenza" OR "bird flu" OR "avian flu" OR "H1N1" OR epidemic\* OR ((outbreak\* OR "out break" OR "out breaks" OR infect\* OR disease\* OR virus\* OR viral\*) AND (international\* OR multinational\* OR "multi-national" OR global\* OR worldwide\* OR "world wide"))) OR abstract:(covid\* OR corona OR coronavir\* OR "2019-nCoV" OR 2019nCoV OR SARSCoV\* OR MERSCoV\* OR cv19 OR (cv NEXT 19) OR (SARS NEXT CoV\*) OR (MERS NEXT CoV\*) OR "Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome" OR "Middle Eastern Respiratory Syndrome" OR SARS OR MERS OR ncov OR "2019-ncov" OR "novel betacov" OR "novel betacoronavirus" OR pandemic\* OR "spanish flu" OR "spanish influenza" OR "bird flu" OR "avian flu" OR "H1N1" OR epidemic\* OR ((outbreak\* OR "out break" OR "out breaks" OR infect\* OR disease\* OR virus\* OR viral\*) AND (international\* OR multinational\* OR "multi-national" OR global\* OR worldwide\* OR "world wide")))) AND (title:(school\* OR classroom\* OR "class room" OR "class rooms" OR (education\* AND (institut\* OR facilit\*))) OR abstract:(school\* OR classroom\* OR "class room" OR "class rooms" OR (education\* AND (institut\* OR facilit\*)))) AND (title:(open\* OR reopen\* OR closure\* OR closing OR close\* OR "term time\*" OR "term times" OR measure\* OR strateg\* OR respon\* OR react\* OR manag\* OR plan OR plans OR planned OR planning) OR abstract:(open\* OR reopen\* OR closure\* OR closing OR close\* OR "term time\*" OR "term times" OR measure\* OR strateg\* OR respon\* OR react\* OR manag\* OR plan OR plans OR planned OR planning))

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## A. Original Research

1. **Assessing Characteristics of Unplanned School Closures that Occurred in the United States in Response to Hurricane Harvey in 2017.**  
   Jackson Ashley M. Disaster medicine and public health preparedness 2020;14(1):125-129.

OBJECTIVEHurricane Harvey, which made landfall in Texas on August 24, 2017, caused catastrophic damage that resulted in the closure of many schools and school districts across 4 states. We evaluated the underlying reasons and characteristics of the unplanned school closures to gain insight on how communities may cope with recommended preemptive closures as an intervention for pandemic influenza.METHODSInformation was extracted from news articles, school websites, and Twitter and Facebook posts previously collected through daily systematic searches of Google, Google News, and Lexis-Nexis. This information was sorted into predefined categories describing the characteristics that may be associated with unplanned school closures that occur during a natural disaster.RESULTSAcross Texas, Louisiana, Kentucky, and Tennessee, there were 3026 unplanned closures. Sixty-three percent of the closures occurred in Texas. The main reasons for the closures were flooding, power outages, and structural damage. The closed schools in Texas were sometimes used as shelters or as locations for providing food or other resources.CONCLUSIONSchool closures associated with Hurricane Harvey were attributed to both the effects of the hurricane and use for resource allocation. These findings can help inform preparedness planning and response for future hurricane seasons and other large-scale emergencies.

1. **Children are unlikely to be the main drivers of the COVID-19 pandemic - a systematic review.**  
   Ludvigsson Jonas F. Acta paediatrica (Oslo, Norway : 1992) 2020;:No page numbers.

AIM: Many countries have closed schools and kindergartens to minimise COVID-19, but the role that children play in disease transmission is unclear. METHODS: A systematic literature review of the MEDLINE and EMBASE databases and medRxiv/bioRxiv preprint servers to 11 May 2020 identified published and unpublished papers on COVID-19 transmission by children. RESULTS: We identified 700 scientific papers and letters and 47 full texts were studied in detail. Children accounted for a small fraction of COVID-19 cases and mostly had social contacts with peers or parents, rather than older people at risk of severe disease. Data on viral loads were scarce, but indicated that children may have lower levels than adults, partly because they often have fewer symptoms, and this should decrease the transmission risk. Household transmission studies showed that children were rarely the index case and case studies suggested that children with COVID-19 seldom caused outbreaks. However, it is highly likely that children can transmit the SARS-COV-2 virus, which causes COVID-19, and even asymptomatic children can have viral loads. CONCLUSION: Children are unlikely to be the main drivers of the pandemic. Opening up schools and kindergartens is unlikely to impact COVID-19 mortality rates in older people.

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1. **COVID-19-We urgently need to start developing an exit strategy.**  
   Petersen Eskild International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases 2020;96:233-239.

AIMThe purpose of this perspective is to review the options countries have to exit the draconian "lockdowns" in a carefully staged manner.METHODSExperts from different countries experiencing Corona Virus Infectious Disease 2019 (COVID-19) reviewed evidence and country-specific approaches and the results of their interventions.RESULTSThree factors are essential: 1. Reintroduction from countries with ongoing community transmission; 2. The need for extensive testing capacity and widespread community testing, and 3. An adequate supply of personal protective equipment, PPE, to protect health care workers. Discussed at length are lifting physical distancing, how to open manufacturing and construction, logistics, and the opening of higher educational institutions and schools. The use of electronic surveillance is considered.CONCLUSIONEach country should decide on the best path forward. However, we can learn from each other, and the approaches are, in reality, very similar.

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1. **Evidence based management guideline for the COVID-19 pandemic - Review article**  
   M. Nicola International Journal of SurgeryInternational Journal of Surgery 2020;77:206-216.

COVID-19 has now been declared a pandemic. To date, COVID-19 has affected over 2.5 million people worldwide, resulting in over 170,000 reported deaths. Numerous preventative strategies and non-pharmaceutical interventions have been employed to mitigate the spread of disease including careful infection control, the isolation of patients, and social distancing. Management is predominantly focused on the provision of supportive care, with oxygen therapy representing the major treatment intervention. Medical therapy involving corticosteroids and antivirals have also been encouraged as part of critical management schemes. However, there is at present no specific antiviral recommended for the treatment of COVID-19, and no vaccine is currently available. Despite the strategic implementation of these measures, the number of new reported cases continues to rise at a profoundly alarming rate. As new findings emerge, there is an urgent need for up-to-date management guidelines. In response to this call, we review what is currently known regarding the management of COVID-19, and offer an evidence-based review of current practice.<br/>Copyright &#xa9; 2020 IJS Publishing Group Ltd

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1. **Management and Treatment of COVID-19: The Chinese Experience.**  
   Peng Fujun The Canadian journal of cardiology 2020;36(6):915-930.

With more than 1,800,000 cases and 110,000 deaths globally, COVID-19 is one of worst infectious disease outbreaks in history. This paper provides a critical review of the available evidence regarding the lessons learned from the Chinese experience with COVID-19 prevention and management. The steps that have led to a near disappearance of new cases in China included rapid sequencing of the virus to establish testing kits, which allowed tracking of infected persons in and out of Wuhan. In addition, aggressive quarantine measures included the complete isolation of Wuhan and then later Hubei Province and the rest of the country, as well as closure of all schools and nonessential businesses. Other measures included the rapid construction of two new hospitals and the establishment of "Fangcang" shelter hospitals. In the absence of a vaccine, the management of COVID-19 included antivirals, high-flow oxygen, mechanical ventilation, corticosteroids, hydroxychloroquine, tocilizumab, interferons, intravenous immunoglobulin, and convalescent plasma infusions. These measures appeared to provide only moderate success. Although some measures have been supported by weak descriptive data, their effectiveness is still unclear pending well controlled clinical trials. In the end, it was the enforcement of drastic quarantine measures that stopped SARS-CoV-2 from spreading. The earlier the implementation, the less likely resources will be depleted. The most critical factors in stopping a pandemic are early recognition of infected individuals, carriers, and contacts and early implementation of quarantine measures with an organised, proactive, and unified strategy at a national level. Delays result in significantly higher death tolls.

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3883802e9a38ab7f6f4a57e49127a95d)

1. **Pandemic school closures: risks and opportunities**  
   Health The Lancet Child & Adolescent The Lancet Child and Adolescent Health 2020;4(5):341-341.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4306be33aa6d45e91774e17b6ae8c4e6)

1. **Quarantine alone or in combination with other public health measures to control COVID-19: a rapid review.**  
   Nussbaumer-Streit Barbara The Cochrane database of systematic reviews 2020;4:CD013574-CD013574.

BACKGROUNDCoronavirus disease 2019 (COVID-19) is a rapidly emerging disease that has been classified a pandemic by the World Health Organization (WHO). To support WHO with their recommendations on quarantine, we conducted a rapid review on the effectiveness of quarantine during severe coronavirus outbreaks.OBJECTIVESWe conducted a rapid review to assess the effects of quarantine (alone or in combination with other measures) of individuals who had contact with confirmed cases of COVID-19, who travelled from countries with a declared outbreak, or who live in regions with high transmission of the disease.SEARCH METHODSAn information specialist searched PubMed, Ovid MEDLINE, WHO Global Index Medicus, Embase, and CINAHL on 12 February 2020 and updated the search on 12 March 2020. WHO provided records from daily searches in Chinese databases up to 16 March 2020.SELECTION CRITERIACohort studies, case-control-studies, case series, time series, interrupted time series, and mathematical modelling studies that assessed the effect of any type of quarantine to control COVID-19. We also included studies on SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome) as indirect evidence for the current coronavirus outbreak.DATA COLLECTION AND ANALYSISTwo review authors independently screened 30% of records; a single review author screened the remaining 70%. Two review authors screened all potentially relevant full-text publications independently. One review author extracted data and assessed evidence quality with GRADE and a second review author checked the assessment. We rated the certainty of evidence for the four primary outcomes: incidence, onward transmission, mortality, and resource use.MAIN RESULTSWe included 29 studies; 10 modelling studies on COVID-19, four observational studies and 15 modelling studies on SARS and MERS. Because of the diverse methods of measurement and analysis across the outcomes of interest, we could not conduct a meta-analysis and conducted a narrative synthesis. Due to the type of evidence found for this review, GRADE rates the certainty of the evidence as low to very low. Modeling studies consistently reported a benefit of the simulated quarantine measures, for example, quarantine of people exposed to confirmed or suspected cases averted 44% to 81% incident cases and 31% to 63% of deaths compared to no measures based on different scenarios (incident cases: 4 modelling studies on COVID-19, SARS; mortality: 2 modelling studies on COVID-19, SARS, low-certainty evidence). Very low-certainty evidence suggests that the earlier quarantine measures are implemented, the greater the cost savings (2 modelling studies on SARS). Very low-certainty evidence indicated that the effect of quarantine of travellers from a country with a declared outbreak on reducing incidence and deaths was small (2 modelling studies on SARS). When the models combined quarantine with other prevention and control measures, including school closures, travel restrictions and social distancing, the models demonstrated a larger effect on the reduction of new cases, transmissions and deaths than individual measures alone (incident cases: 4 modelling studies on COVID-19; onward transmission: 2 modelling studies on COVID-19; mortality: 2 modelling studies on COVID-19; low-certainty evidence). Studies on SARS and MERS were consistent with findings from the studies on COVID-19.AUTHORS' CONCLUSIONSCurrent evidence for COVID-19 is limited to modelling studies that make parameter assumptions based on the current, fragmented knowledge. Findings consistently indicate that quarantine is important in reducing incidence and mortality during the COVID-19 pandemic. Early implementation of quarantine and combining quarantine with other public health measures is important to ensure effectiveness. In order to maintain the best possible balance of measures, decision makers must constantly monitor the outbreak situation and the impact of the measures implemented. Testing in representative samples in different settings could help assess the true prevalence of infection, and would reduce uncertainty of modelling assumptions. This review was commissioned by WHO and supported by Danube-University-Krems.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=7722d643a99d4a6b22bcfda1a400cb88)

1. **Rinse‐free hand wash for reducing absenteeism among preschool and school children**  
   Munn Z. Cochrane Database of Systematic Reviews 2020;(4):No page numbers.

Abstract - Background Illness‐related absenteeism is an important problem among preschool and school children for low‐, middle‐ and high‐ income countries. Appropriate hand hygiene is one commonly investigated and implemented strategy to reduce the spread of illness and subsequently the number of days spent absent. Most hand hygiene strategies involve washing hands with soap and water, however this is associated with a number of factors that act as a barrier to its use, such as requiring running water, and the need to dry hands after cleaning. An alternative method involves washing hands using rinse‐free hand wash. This technique has a number of benefits over traditional hand hygiene strategies and may prove to be beneficial in reducing illness‐related absenteeism in preschool and school children. Objectives 1. To assess the effectiveness of rinse‐free hand washing for reducing absenteeism due to illness in preschool and school children compared to no hand washing, conventional hand washing with soap and water or other hand hygiene strategies. 2. To determine which rinse‐free hand washing products are the most effective (if head‐to‐head comparisons exist), and what effect additional strategies in combination with rinse‐free hand washing have on the outcomes of interest. Search methods In February 2020 we searched CENTRAL, MEDLINE, Embase, CINAHL, 12 other databases and three clinical trial registries. We also reviewed the reference lists of included studies and made direct contact with lead authors of studies to collect additional information as required. No date or language restrictions were applied. Selection criteria Randomized controlled trials (RCTs), irrespective of publication status, comparing rinse‐free hand wash in any form (hand rub, hand sanitizer, gel, foam etc.) with conventional hand washing using soap and water, other hand hygiene programs (such as education alone), or no intervention. The population of interest was children aged between two and 18 years attending preschool (childcare, day care, kindergarten, etc.) or school (primary, secondary, elementary, etc.). Primary outcomes included child or student absenteeism for any reason, absenteeism due to any illness and adverse skin reactions. Data collection and analysis Following standard Cochrane methods, two review authors (out of ZM, CT, CL, CS, TB), independently selected studies for inclusion, assessed risk of bias and extracted relevant data. Absences were extracted as the number of student days absent out of total days. This was sometimes reported with the raw numbers and other times as an incidence rate ratio (IRR), which we also extracted. For adverse event data, we calculated effect sizes as risk ratios (RRs) and present these with 95% confidence intervals (CIs). We used standard methodological procedures expected by Cochrane for data analysis and followed the GRADE approach to establish certainty in the findings. Main results This review includes 19 studies with 30,747 participants. Most studies were conducted in the USA (eight studies), two were conducted in Spain, and one each in China, Colombia, Finland, France, Kenya, Bangladesh, New Zealand, Sweden, and Thailand. Six studies were conducted in preschools or day‐care centres (children aged from birth to < five years), with the remaining 13 conducted in elementary or primary schools (children aged five to 14 years). The included studies were judged to be at high risk of bias in several domains, most‐notably across the domains of performance and detection bias due to the difficulty to blind those delivering the intervention or those assessing the outcome. Additionally, every outcome of interest was graded as low or very low certainty of evidence, primarily due to high risk of bias, as well as imprecision of the effect estimates and inconsistency between pooled data. For the outcome of absenteeism for any reason, the pooled estimate for rinse‐free hand washing was an IRR of 0.91 (95% CI 0.82 to 1.01; 2 studies; very low‐certainty evidence), which indicates there may be little to no difference between groups. For absenteeism for any illness, the pooled IRR was 0.82 (95% CI 0.69 to 0.97; 6 studies; very low‐certainty evidence), which indicates that rinse‐free hand washing may reduce absenteeism (13 days absent per 1000) compared to those in the 'no rinse‐free' group (16 days absent per 1000). For the outcome of absenteeism for acute respiratory illness, the pooled IRR was 0.79 (95% CI 0.68 to 0.92; 6 studies; very low‐certainty evidence), which indicates that rinse‐free hand washing may reduce absenteeism (33 days absent per 1000) compared to those in the 'no rinse‐free' group (42 days absent per 1000). When evaluating absenteeism for acute gastrointestinal illness, the pooled estimate found an IRR of 0.79 (95% CI 0.73 to 0.85; 4 studies; low‐certainty evidence), which indicates rinse‐free hand washing may reduce absenteeism (six days absent per 1000) compared to those in the 'no rinse‐free' group (eight days absent per 1000). There may be little to no difference between rinse‐free hand washing and 'no rinse‐free' group regarding adverse skin reactions with a RR of 1.03 (95% CI 0.8 to 1.32; 3 studies, 4365 participants; very low‐certainty evidence). Broadly, compliance with the intervention appeared to range from moderate to high compliance (9 studies, 10,749 participants; very‐low certainty evidence); narrativley, no authors reported substantial issues with compliance. Overall, most studies that included data on perception reported that teachers and students perceived rinse‐free hand wash positively and were willing to continue its use (3 studies, 1229 participants; very‐low certainty evidence). Authors' conclusions The findings of this review may have identified a small yet potentially beneficial effect of rinse‐free hand washing regimes on illness‐related absenteeism. However, the certainty of the evidence that contributed to this conclusion was low or very low according to the GRADE approach and is therefore uncertain. Further research is required at all levels of schooling to evaluate rinse‐free hand washing regimens in order to provide more conclusive, higher‐certainty evidence regarding its impact. When considering the use of a rinse‐free hand washing program in a local setting, there needs to be consideration of the current rates of illness‐related absenteeism and whether the small beneficial effects seen here will translate into a meaningful reduction across their settings. Plain language summary Rinse‐free hand wash for reducing absenteeism among preschool and school children Background Absenteeism from schooling is costly to parents, schools and governments and sustained absence is detrimental to student learning. Illness‐related absenteeism is a significant contributor to absenteeism from school, but can also result in parents missing work due to catching the illness themselves or having to stay home to care for their children. There are several strategies currently used to reduce illness‐related absenteeism, a common method is the implementation of appropriate hand hygiene practices. However, hand hygiene using soap and water is not always practical, and alternatives may prove to be more effective in reducing the overall rate of illness‐related absenteeism. One such alternative is the use of rinse‐free hand wash. Review question This review was designed to investigate if the use of rinse‐free hand wash can reduce the number of days spent absent from school in preschool and school children compared to no rinse‐free hand wash usage. Study characteristics The searches returned 19 relevant studies with a total of 30,747 participants. Eight studies were conducted in the USA, two were conducted in Spain, and one each in China, Colombia, Finland, France, Kenya, Bangladesh, New Zealand, Sweden, and Thailand. Six studies were conducted in preschools or day‐care centres (children aged from birth to < five years), with the remaining 13 conducted in elementary or primary schools (children aged five to14 years). These studies were quite varied in the composition and application of the rinse‐free hand washing program. Only two studies included information on the primary outcome (absenteeism due to any reason), whilst for absenteeism for any illness there were six studies that provided information. The evidence presented is up to date to February 2020. Key results The application of, and adherence to a rinse‐free hand wash, hand hygiene program may be associated with small, but potentially beneficial effects in reducing the number of days students were absent from school due to illness compared to no rinse‐free hand wash, hygiene program. However rinse‐free hand washing may be no different to controls at reducing absenteeism for any reason. There may also be no difference in the number of skin irritations between students who received the rinse‐free hand wash compared to those who used soap and water. Most students and teachers responded favorably to using rinse‐free hand wash and complied relatively well with its use. Certainty of the evidence The certainty of the evidence included in this review was low or very low, mainly due to the included studies using poor methods, providing imprecise data, and being very inconsistent from one another. This means that we have low and very‐low certainty, or confidence, in these results.

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1. **School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review.**  
   RM Viner The Lancet. Child & adolescent health 2020;4(5):397-404.

In response to the coronavirus disease 2019 (COVID-19) pandemic, 107 countries had implemented national school closures by March 18, 2020. It is unknown whether school measures are effective in coronavirus outbreaks (eg, due to severe acute respiratory syndrome [SARS], Middle East respiratory syndrome, or COVID-19). We undertook a systematic review by searching three electronic databases to identify what is known about the effectiveness of school closures and other school social distancing practices during coronavirus outbreaks. We included 16 of 616 identified articles. School closures were deployed rapidly across mainland China and Hong Kong for COVID-19. However, there are no data on the relative contribution of school closures to transmission control. Data from the SARS outbreak in mainland China, Hong Kong, and Singapore suggest that school closures did not contribute to the control of the epidemic. Modelling studies of SARS produced conflicting results. Recent modelling studies of COVID-19 predict that school closures alone would prevent only 2-4% of deaths, much less than other social distancing interventions. Policy makers need to be aware of the equivocal evidence when considering school closures for COVID-19, and that combinations of social distancing measures should be considered. Other less disruptive social distancing interventions in schools require further consideration if restrictive social distancing policies are implemented for long periods.

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1. **Unplanned Closure of Public Schools in Michigan, 2015-2016: Cross-Sectional Study on Rurality and Digital Data Harvesting.**  
   Jackson Ashley M. The Journal of school health 2020;90(7):511-519.

BACKGROUNDFor pandemic preparedness, researchers used online systematic searches to track unplanned school closures (USCs). We determine if Twitter provides complementary data.METHODSTwitter handles of Michigan public schools and school districts were identified. All tweets associated with these handles were downloaded. USC-related tweets were identified using 5 keywords. Descriptive statistics and multivariable logistic regression were performed in R.RESULTSAmong 3469 Michigan public schools, 2003 maintained their own active Twitter accounts or belonged to school districts with active Twitter accounts. Of these 2003 schools, in 2015-2016 school year, at least 1 USC announcement was identified for 349 schools via the current method only, 678 schools via Twitter only, and 562 schools via both methods. No USC announcements were identified for 414 schools. Rural schools were less likely than city schools to have active Twitter coverage (adjusted relative risk [adjRR] = 0.3956, 95% confidence interval [CI] 0.3312-0.4671), and to announce USCs on Twitter (adjRR = 0.5692, 95% CI 0.4645-0.6823), but more likely to have USCs identified by the current method (adjRR = 1.4545, 95% CI 1.3545-1.5490).CONCLUSIONSEach method identified USCs that were missed by the other. Our results suggested that identifying USCs on Twitter is complementary to the current method.

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1. **Estimating age-stratified influenza-associated invasive pneumococcal disease in England: A time-series model based on population surveillance data.**  
   Chiavenna Chiara PLoS medicine 2019;16(6):e1002829-e1002829.

BACKGROUNDMeasures of the contribution of influenza to Streptococcus pneumoniae infections, both in the seasonal and pandemic setting, are needed to predict the burden of secondary bacterial infections in future pandemics to inform stockpiling. The magnitude of the interaction between these two pathogens has been difficult to quantify because both infections are mainly clinically diagnosed based on signs and symptoms; a combined viral-bacterial testing is rarely performed in routine clinical practice; and surveillance data suffer from confounding problems common to all ecological studies. We proposed a novel multivariate model for age-stratified disease incidence, incorporating contact patterns and estimating disease transmission within and across groups.METHODS AND FINDINGSWe used surveillance data from England over the years 2009 to 2017. Influenza infections were identified through the virological testing of samples taken from patients diagnosed with influenza-like illness (ILI) within the sentinel scheme run by the Royal College of General Practitioners (RCGP). Invasive pneumococcal disease (IPD) cases were routinely reported to Public Health England (PHE) by all the microbiology laboratories included in the national surveillance system. IPD counts at week t, conditional on the previous time point t-1, were assumed to be negative binomially distributed. Influenza counts were linearly included in the model for the mean IPD counts along with an endemic component describing some seasonal background and an autoregressive component mimicking pneumococcal transmission. Using age-specific counts, Akaike information criterion (AIC)-based model selection suggested that the best fit was obtained when the endemic component was expressed as a function of observed temperature and rainfall. Pneumococcal transmission within the same age group was estimated to explain 33.0% (confidence interval [CI] 24.9%-39.9%) of new cases in the elderly, whereas 50.7% (CI 38.8%-63.2%) of incidence in adults aged 15-44 years was attributed to transmission from another age group. The contribution of influenza on IPD during the 2009 pandemic also appeared to vary greatly across subgroups, being highest in school-age children and adults (18.3%, CI 9.4%-28.2%, and 6.07%, CI 2.83%-9.76%, respectively). Other viral infections, such as respiratory syncytial virus (RSV) and rhinovirus, also seemed to have an impact on IPD: RSV contributed 1.87% (CI 0.89%-3.08%) to pneumococcal infections in the 65+ group, whereas 2.14% (CI 0.87%-3.57%) of cases in the group of 45- to 64-year-olds were attributed to rhinovirus. The validity of this modelling strategy relies on the assumption that viral surveillance adequately represents the true incidence of influenza in the population, whereas the small numbers of IPD cases observed in the younger age groups led to significant uncertainty around some parameter estimates.CONCLUSIONSOur estimates suggested that a pandemic wave of influenza A/H1N1 with comparable severity to the 2009 pandemic could have a modest impact on school-age children and adults in terms of IPD and a small to negligible impact on infants and the elderly. The seasonal impact of other viruses such as RSV and rhinovirus was instead more important in the older population groups.

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1. **Fighting Back: Institutional Strategies to Combat the Opioid Epidemic: A Systematic Review.**  
   Lovecchio F. HSS journal : the musculoskeletal journal of Hospital for Special Surgery 2019;15(1):66-71.

BACKGROUND: Current research on opioid use within orthopedic surgery has focused on efforts to identify patients at risk for chronic opioid use. Studies addressing prevention of opioid misuse related to orthopedic care are lacking. Evidence-based interventions to reduce the reliance on opioids for post-operative pain relief will be a key component of any comprehensive institutional opioid policy. QUESTIONS/PURPOSES: The purpose of this systematic review was to evaluate institutional strategies that reduce opioid administration or consumption after orthopedic surgery. METHODS: Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist, a search was conducted of the PubMed database for English-language articles that analyzed interventions by physicians, nurses, pharmacists, physical therapists, or other hospital staff to reduce post-operative opioid use or narcotic prescription amounts after surgery. Studies that contained objective outcome measures (i.e., no expert opinion articles) were selected. Investigations on the effect of pharmacologic adjuvants, cryotherapy, or regional nerve blockades on opioid use were excluded. RESULTS: The initial search yielded 6598 titles, of which 13 full-text articles were ultimately selected for inclusion in this systematic review. The review identified two major categories of interventions-patient-focused and provider-focused (e.g., physicians, nurses, physical therapists, pharmacists). Formal patient education programs were most effective in reducing opioid use. On the provider side, prescribing guidelines appear to decrease the overall number of pills prescribed, often without changes in patient satisfaction or requests for refills. CONCLUSIONS: Researchers are just beginning to establish the most effective ways for institutions to reduce opioid use and promote responsible post-operative prescribing. Institutional prescribing guidelines, standardized bedside pain-management programs, and formal patient education curriculums are all evidence-based interventions that can achieve these goals. The available research also supports an interprofessional approach in any institutional opioid-reduction strategy.

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1. **Identifying opportunities to develop the science of implementation for community-based non-communicable disease prevention: A review of implementation trials.**  
   Wolfenden Luke Preventive medicine 2019;118:279-285.

Implementation of interventions in community organisations such as schools, childcare centres, and sporting clubs are recommended to target a range of modifiable risks of non-communicable diseases. Poor implementation, however, is common and has contributed to the failure of non-communicable disease interventions globally. This study aimed to characterise experimental research regarding strategies to improve implementation of chronic disease prevention programs in community settings. The review used data collected in three comprehensive systematic reviews undertaken between August 2015 and July 2017. Randomised controlled trials, including cluster design, and non-randomised trials with a parallel control group were included. The data were extracted to describe trial characteristics, implementation strategies employed, implementation outcomes and study quality. Of the 40 implementation trials included in the study, unhealthy diet was the most common risk factor targeted (n = 20). The most commonly reported implementation strategies were educational meetings (n = 38, 95%), educational materials (n = 36, 90%) and educational outreach visits (n = 29, 73%). Few trials were conducted 'at-scale' (n = 8, 20%) or reported adverse effects (n = 5, 13%). The reporting of implementation related outcomes; intervention adoption (n = 13, 33%); appropriateness (n = 11, 28%); acceptability (n = 8, 20%); feasibility (n = 8, 20%); cost (n = 3, 8%); and sustainability (n = 2, 5%); was limited. For the majority of trials, risk of bias was high for blinding of study personnel/participants and outcome assessors. Testing of strategies to improve implementation of non-communicable disease prevention strategies in community settings, delivered 'at-scale', utilising implementation frameworks, including a comprehensive range of implementation outcomes should be priority areas for future research in implementation science.

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1. **Scoping review of non-pharmacological interventions to control H1N1 in India**  
   J. Sharma Clinical Epidemiology and Global HealthClinical Epidemiology and Global Health 2019;7(3):504-508.

Background: A sudden increase in the estimated number of reported cases of patients infected with H1N1 virus and resultant number of deaths poses a challenging issue in the control and response to the disease. In the current study we sought to summarize a set of pre-defined measures and non-pharmacological interventions that can be employed to control the spread of H1N1 flu in India. The main purpose of this study is to document a basis for advice to health care providers on use of non-pharmacological treatments for patients and avoid further spread of this kind of illness. <br/>Method(s): Based on database search, some non-pharmacological interventions were identified and documented. The existing literature was scoped for this purpose to extract the relevant data for the analysis purpose. Studies with H1N1 outbreak and pandemic data of India were included and studies undertaken outside India were excluded. <br/>Result(s): The critical non-pharmacological measures to control H1N1 as identified from this review include closing schools, training of health care providers, timely vaccination of health care workers, creation of isolation wards, spreading awareness about the flu, regular disease surveillance and monitoring program, washing hands, following disinfection and sanitary practices, avoiding crowded areas, using tissues and other face masks while sneezing, allocation of separate trained staff, preparing region specific pandemic preparedness plans & surveillance strategies. <br/>Conclusion(s): The proposed recommendations should be clearly communicated to the target audience as a reference for preparation of health systems and providers for combating the H1N1 virus.<br/>Copyright &#xa9; 2018 INDIACLEN

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1. **Tuberculosis outbreaks among students in mainland China: a systematic review and meta-analysis.**  
   Bao Hongdan BMC infectious diseases 2019;19(1):972-972.

BACKGROUNDIn recent years, tuberculosis outbreaks in schools have occurred more frequently in China than in other parts of the world, and have posed a public health threat to students and their families. This systematic review aimed to understand the epidemiological characteristics of tuberculosis (TB) outbreaks and analyze the factors associated with TB outbreaks in schools in China.METHODSWe conducted this systematic review following the standard procedures of the Cochrane Collaboration and the Preferred Reporting Items for Systematic Review and Meta-Analysis statement. The meta-analysis was performed with STATA using a random effects model.RESULTSWe included 107 studies involving 1795 student patients with TB in mainland China. The results of the systematic analysis indicated that TB outbreaks were more frequently reported in senior middle schools and in Eastern China. The outbreaks mainly occurred during the winter and spring, and the median outbreak duration was 4 months. The meta-analysis showed that the total attack rate and the class attack rate of tuberculosis outbreaks among students were 4.60% (95% CI 3.80 to 5.70%) and 22.70% (95% CI 19.20 to 27.00%), respectively. Subgroup analysis showed that outbreaks that occurred at universities or colleges had a relatively higher attack rate than those occurred in senior middle schools. The prevalence of latent tuberculosis infection (LTBI) among close contacts was 23.70% (95% CI 19.50 to 28.90%). The median case-finding interval was 2 months, and 47.40% of the index cases had a case-finding delay.CONCLUSIONThe results of our review indicated that school TB outbreaks were reported most frequently in senior middle schools in China. The attack rates of outbreaks at universities or colleges were higher than those in senior middle schools. The TB outbreaks in schools usually occurred over prolonged periods. The case-finding delay in the index cases must be reduced to prevent transmission in classes and schools. Effective surveillance and screening of presumptive TB cases in schools should be strengthened to reduce outbreaks in schools.

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1. **Tuberculosis transmission among children and adolescents in schools and other congregate settings: a systematic review.**  
   Schepisi Monica Sañé The new microbiologica 2019;41(4):282-290.

Children, especially those aged <5 years, and adolescents are at increased risk of progression to active TB disease when infected. Management of childhood TB outbreaks is crucial for TB elimination especially in low burden countries. We searched the electronic databases MEDLINE-CINHAL-EMBASE up to July 2017 for primary studies reporting on TB incidents which involved teacher/child-caregiver, relative or students diagnosed with TB in a school/childcare setting or in other congregate settings attended by children and adolescents. Out of 10,481 citations, 74 studies, published mostly in low TB burden countries from 1950 to 2017, describing 128 incident investigations, were included. Overall 5025 (14.2%) LTBI and 811 (2.3%) TB cases were diagnosed among 35,331 screened individuals. Incidents occurred mainly in schools (89.1%) where index cases were more frequently students (63.3%) than teachers/caregivers; almost all of the incidents exposing children aged 2-5 were attributable to a teacher/caregiver index case. In 68 individual contact investigations the pooled proportions of TB and LTBI among those exposed were 0.03 (95%CI 0.02-0.04) and 0.15 (95%CI 0.13- 0.18). The overall risk of developing TB disease in school-congregate settings seems slightly lower than in high-income country household settings. Public health interventions targeting school-congregate settings may be critical to overall TB control and towards TB elimination in low-burden countries.

1. **Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review.**  
   Ahmed Faruque BMC public health 2018;18(1):518-518.

BACKGROUNDSocial distancing is one of the community mitigation measures that may be recommended during influenza pandemics. Social distancing can reduce virus transmission by increasing physical distance or reducing frequency of congregation in socially dense community settings, such as schools or workplaces. We conducted a systematic review to assess the evidence that social distancing in non-healthcare workplaces reduces or slows influenza transmission.METHODSElectronic searches were conducted using MEDLINE, Embase, Scopus, Cochrane Library, PsycINFO, CINAHL, NIOSHTIC-2, and EconLit to identify studies published in English from January 1, 2000, through May 3, 2017. Data extraction was done by two reviewers independently. A narrative synthesis was performed.RESULTSFifteen studies, representing 12 modeling and three epidemiological, met the eligibility criteria. The epidemiological studies showed that social distancing was associated with a reduction in influenza-like illness and seroconversion to 2009 influenza A (H1N1). However, the overall risk of bias in the epidemiological studies was serious. The modeling studies estimated that workplace social distancing measures alone produced a median reduction of 23% in the cumulative influenza attack rate in the general population. It also delayed and reduced the peak influenza attack rate. The reduction in the cumulative attack rate was more pronounced when workplace social distancing was combined with other nonpharmaceutical or pharmaceutical interventions. However, the effectiveness was estimated to decline with higher basic reproduction number values, delayed triggering of workplace social distancing, or lower compliance.CONCLUSIONSModeling studies support social distancing in non-healthcare workplaces, but there is a paucity of well-designed epidemiological studies.SYSTEMATIC REVIEW REGISTRATION NUMBERPROSPERO registration # CRD42017065310.

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1. **Point-Of-Care Testing Curriculum and Accreditation for Public Health-Enabling Preparedness, Response, and Higher Standards of Care at Points of Need.**  
   Kost Gerald J. Frontiers in public health 2018;6:385-385.

Objectives: To develop awareness of benefits of point-of-care testing (POCT) education in schools of public health, to identify learning objectives for teaching POCT, to enable public health professionals and emergency responders to perform evidence-based diagnosis and triage effectively and efficiently at points of need, and to better improve future standards of care for public health practice, including in limited-resource settings and crisis situations. Methods: We surveyed all U.S. schools of public health, colleges of public health, and public health schools accredited by the Council on Education in Public Health (CEPH). We included accredited public health programs, so that all states offering public health education were represented. We analyzed survey data, public health books, and board certification guidelines. We used PubMed to identify public health curriculum papers, and assessed 2019 CEPH accreditation requirements. We merged POCT knowledge bases to design a new curriculum for teaching public health students and practitioners the principles and practice of POCT. Results: Public health curricula, certification requirements, and textbooks generally do not include POCT instruction. Only one book, Global Point of Care: Strategies for Disasters, Emergencies, and Public Health Resilience, and one online course on public health preparedness address POCT and public health intervention issues. The topic, POC HIV/HCV ED testing, appeared in one course and POC diagnostics in local clinics, in another. Papers on public health curriculum have not incorporated POCT. No curriculum addresses POCT in isolation units during quarantine, despite evidence that recent Ebola virus disease cases in the U.S. and elsewhere proved unequivocally the need for POCT. The modular learning objectives identified in this paper were customized for public health students. Public health graduates can use boot camps, online credentialing, and self-study to acquire POCT skills. Conclusions: Enhancing accreditation requirements, academic training, board certification, and field experience will generate public health healthcare professionals who will rely upon evidence-based medical decision making at points of care, including during crises when time is of the essence. A POCT-enabled public health workforce can help prevent and stop outbreaks. Public health-based medical professionals urgently need the skills necessary to perform POCT and prepare America and other nations for threats portending significant adverse medical, economic, social, and cultural impact.

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1. **School closure during novel influenza: A systematic review.**  
   S Bin Nafisah Journal of infection and public health 2018;11(5):657-661.

BACKGROUND: School closure as a non-pharmaceutical measure appeared as an efficient strategy in previous epidemics. We investigated the impact of school closure on the epidemic peak whether implemented before or after the epidemic reaches its peak. We also investigated the optimal duration of closure. METHODS: Data sources included Medline-PubMed, ProQuest and Cochrane databases. The inclusion criteria were all articles that reported a quantified effect on school closure on an influenza epidemic. Exclusion criteria were non-English articles that have no translation and articles that only reported school closure effect as a combination with another measure. Out of 668 articles, we included 31 articles. RESULTS: The mean reduction of the peak of the epidemic was M=29.65%. Implementing school closure before or after the epidemic reaches its peak reduced the overall influenza epidemic. School closure reduced and delayed the epidemic peak especially if implemented earlier. The longer the duration of closure the more the epidemic peak delayed. Additionally, closure containment effect also correlated with organisms having high attack rate and longer infectiveness duration. CONCLUSION: We conclude with several implications for school closure taking into consideration the feasibility and the cost.

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1. **Impact of school policies on non-communicable disease risk factors - a systematic review.**  
   Singh Ankur BMC public health 2017;17(1):292-292.

BACKGROUNDGlobally, non-communicable diseases (NCDs) are identified as one of the leading causes of mortality. NCDs have several modifiable risk factors including unhealthy diet, physical inactivity, tobacco use and alcohol abuse. Schools provide ideal settings for health promotion, but the effectiveness of school policies in the reduction of risk factors for NCD is not clear. This study reviewed the literature on the impact of school policies on major NCD risk factors.METHODSA systematic review was conducted to identify, collate and synthesize evidence on the effectiveness of school policies on reduction of NCD risk factors. A search strategy was developed to identify the relevant studies on effectiveness of NCD policies in schools for children between the age of 6 to 18 years in Ovid Medline, EMBASE, and Web of Science. Data extraction was conducted using pre-piloted forms. Studies included in the review were assessed for methodological quality using the Effective Public Health Practice Project (EPHPP) quality assessment tool. A narrative synthesis according to the types of outcomes was conducted to present the evidence on the effectiveness of school policies.RESULTSOverall, 27 out of 2633 identified studies were included in the review. School policies were comparatively more effective in reducing unhealthy diet, tobacco use, physical inactivity and inflammatory biomarkers as opposed to anthropometric measures, overweight/obesity, and alcohol use. In total, for 103 outcomes independently evaluated within these studies, 48 outcomes (46%) had significant desirable changes when exposed to the school policies. Based on the quality assessment, 18 studies were categorized as weak, six as moderate and three as having strong methodological quality.CONCLUSIONMixed findings were observed concerning effectiveness of school policies in reducing NCD risk factors. The findings demonstrate that schools can be a good setting for initiating positive changes in reducing NCD risk factors, but more research is required with long-term follow up to study the sustainability of such changes.

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1. **Later school start times for supporting the education, health, and well‐being of high school students**  
   Marx R. Cochrane Database of Systematic Reviews 2017;(7):No page numbers.

Abstract - Background A number of school systems worldwide have proposed and implemented later school start times as a means of avoiding the potentially negative impacts that early morning schedules can have on adolescent students. Even mild sleep deprivation has been associated with significant health and educational concerns: increased risk for accidents and injuries, impaired learning, aggression, memory loss, poor self‐esteem, and changes in metabolism. Although researchers have begun to explore the effects of delayed school start time, no one has conducted a rigorous review of evidence to determine whether later school start times support adolescent health, education, and well‐being. Objectives We aimed to assess the effects of a later school start time for supporting health, education, and well‐being in high school students. Secondary objectives were to explore possible differential effects of later school start times in student subgroups and in different types of schools; to identify implementation practices, contextual factors, and delivery modes associated with positive and negative effects of later start times; and to assess the effects of later school start times on the broader community (high school faculty and staff, neighborhood, and families). Search methods We conducted the main search for this review on 28 October 2014 and updated it on 8 February 2016. We searched CENTRAL as well as 17 key electronic databases (including MEDLINE, Embase, ERIC, PsycINFO, and Sociological Abstracts), current editions of relevant journals and organizational websites, trial registries, and Google Scholar. Selection criteria We included any randomized controlled trials, controlled before‐and‐after studies, and interrupted time series studies with sufficient data points that pertained to students aged 13 to 19 years and that compared different school start times. Studies that reported either primary outcomes of interest (academic outcomes, amount or quality of sleep, mental health indicators, attendance, or alertness) or secondary outcomes (health behaviors, health and safety indicators, social outcomes, family outcomes, school outcomes, or community outcomes) were eligible. Data collection and analysis At least two review authors independently determined inclusion and exclusion decisions through screening titles, abstracts, and full‐text reports. Two review authors independently extracted data for all eligible studies. We presented findings through a narrative synthesis across all studies. When two or more study samples provided sufficient information to permit effect size calculations, we conducted random‐effects meta‐analyses to synthesize effects across studies. Main results Our search located 17 eligible records reporting on 11 unique studies with 297,994 participants; the studies examined academic outcomes, amount and quality of sleep, mental health indicators, attendance, and student alertness. Overall, the quality of the body of evidence was very low, as we rated most studies as being at high or unclear risk of bias with respect to allocation, attrition, absence of randomization, and the collection of baseline data. Therefore, we cannot be confident about the effects of later school start times. Preliminary evidence from the included studies indicated a potential association between later school start times and academic and psychosocial outcomes, but quality and comparability of these data were low and often precluded quantitative synthesis. Four studies examined the association between later school start times and academic outcomes, reporting mixed results. Six studies examined effects on total amount of sleep and reported significant, positive relationships between later school start times and amount of sleep. One study provided information concerning mental health outcomes, reporting an association between decreased depressive symptoms and later school start times. There were mixed results for the association between later school start times and absenteeism. Three studies reported mixed results concerning the association between later school start times and student alertness. There was limited indication of potential adverse effects on logistics, as the qualitative portions of one study reported less interaction between parents and children, and another reported staffing and scheduling difficulties. Because of the insufficient evidence, we cannot draw firm conclusions concerning adverse effects at this time. It is important to note the limitations of this evidence, especially as randomized controlled trials and high‐quality primary studies are difficult to conduct; school systems are often unwilling or unable to allow researchers the necessary control over scheduling and data collection. Moreover, this evidence does not speak to the process of implementing later school starts, as the included studies focused on reporting the effects rather than exploring the process. Authors' conclusions This systematic review on later school start times suggests several potential benefits for this intervention and points to the need for higher quality primary studies. However, as a result of the limited evidence base, we could not determine the effects of later school start times with any confidence. Plain language summary Later school start times for supporting the education, health, and well‐being of high school students Review aims This review aimed to examine the effects of later school start times for academic outcomes, amount and quality of sleep, mental health indicators, attendance, and alertness in high school students. Background High school students are at a greater risk of sleep deprivation than other groups, both due to their changing brain chemistry and the many demands on their time, including school start times. For this reason, we wanted to determine if delaying school start times was associated with academic benefits, greater sleep duration, better mental health, increased student attendance, or student alertness, as well as secondary outcomes such as diet and exercise, accidents, social aspects of school, changing family dynamics, school enrollment, or changes in the community. Study characteristics The evidence included in this review is current as of February 2016 and is based on 17 reports representing 11 unique studies in 297,994 high school students. The studies examined a range of changes to school time (for example, moving the start time fifteen minutes later, moving the start time an hour later) and a range of intervention durations (one as short as two weeks, others lasting a year), but all focused on natural settings (students already in schools, rather than in a laboratory setting). Although 5 of the 11 studies were funded, the funding sources were academic and research institutions, rather than agencies with a commercial interest in program evaluation results. Key results Because of the limited and very low‐quality evidence, we could not determine the effects of later school start times with any confidence. We found that later school start times may provide academic benefits, but results of four studies provided mixed findings. Later school starts were associated with an increase in school‐night sleep for students based on the synthesis of two studies, and evidence from six other studies also supported the relationship between later school starts and increased sleep duration. One study reported that students in later starting schools reported fewer depressive symptoms than their peers in earlier starting schools. Different studies reported mixed findings regarding the association between later school start times and increased attendance and student alertness. These interventions may also have potential adverse effects on logistics, as the qualitative portions of one study reported less interaction between parents and children, and another reported staffing and scheduling difficulties. Again, because of the limited and very low‐quality evidence, we cannot draw any firm conclusions about the adverse effects of later school start times. Quality of evidence The quality of this evidence was very low, and thus we cannot assume the findings reflect the true beneficial or adverse effects of later school start times.

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1. **School-based vaccination programmes: a systematic review of the evidence on organisation and delivery in high income countries.**  
   Perman Sarah BMC public health 2017;17(1):252-252.

BACKGROUNDMany countries have recently expanded their childhood immunisation programmes. Schools are an increasingly attractive setting for delivery of these new immunisations because of their ability to reach large numbers of children in a short period of time. However, there are organisational challenges to delivery of large-scale vaccination programmes in schools. Understanding the facilitators and barriers is important for improving the delivery of future school-based vaccination programmes.METHODSWe undertook a systematic review of evidence on school-based vaccination programmes in order to understand the influence of organisational factors on the delivery of programmes. Our eligibility criteria were studies that (1) focused on childhood or adolescent vaccination programmes delivered in schools; (2) considered organisational factors that influenced the preparation or delivery of programmes; (3) were conducted in a developed or high-income country; and (4) had been peer reviewed. We searched for articles published in English between 2000 and 2015 using MEDLINE and HMIC electronic databases. Additional studies were identified by searching the Cochrane Library and bibliographies. We extracted data from the studies, assessed quality and the risk of bias, and categorised findings using a thematic framework of eight organisational factors.RESULTSWe found that most of the recent published literature is from the United States and is concerned with the delivery of pandemic or seasonal flu vaccination programmes at a regional (state) or local level. We found that the literature is largely descriptive and not informed by the use of theory. Despite this, we identified common factors that influence the implementation of programmes. These factors included programme leadership and governance, organisational models and institutional relationships, workforce capacity and roles particularly concerning the school nurse, communication with parents and students, including methods for obtaining consent, and clinic organisation and delivery.CONCLUSIONSThis is the first time that information has been brought together on the organisational factors influencing the delivery of vaccination programmes in school-based settings. An understanding of these factors, underpinned by robust theory-informed research, may help policy-makers and managers design and deliver better programmes. We identified several gaps in the research literature to propose a future research agenda, informed by theories of implementation and organisational change.

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1. **Strategies for enhancing the implementation of school‐based policies or practices targeting risk factors for chronic disease**  
   Wolfenden L. Cochrane Database of Systematic Reviews 2017;(11):No page numbers.

Abstract - Background A number of school‐based policies or practices have been found to be effective in improving child diet and physical activity, and preventing excessive weight gain, tobacco or harmful alcohol use. Schools, however, frequently fail to implement such evidence‐based interventions. Objectives The primary aims of the review are to examine the effectiveness of strategies aiming to improve the implementation of school‐based policies, programs or practices to address child diet, physical activity, obesity, tobacco or alcohol use. Secondary objectives of the review are to: Examine the effectiveness of implementation strategies on health behaviour (e.g. fruit and vegetable consumption) and anthropometric outcomes (e.g. BMI, weight); describe the impact of such strategies on the knowledge, skills or attitudes of school staff involved in implementing health‐promoting policies, programs or practices; describe the cost or cost‐effectiveness of such strategies; and describe any unintended adverse effects of strategies on schools, school staff or children. Search methods All electronic databases were searched on 16 July 2017 for studies published up to 31 August 2016. We searched the following electronic databases: Cochrane Library including the Cochrane Central Register of Controlled Trials (CENTRAL); MEDLINE; MEDLINE In‐Process & Other Non‐Indexed Citations; Embase Classic and Embase; PsycINFO; Education Resource Information Center (ERIC); Cumulative Index to Nursing and Allied Health Literature (CINAHL); Dissertations and Theses; and SCOPUS. We screened reference lists of all included trials for citations of other potentially relevant trials. We handsearched all publications between 2011 and 2016 in two specialty journals ( Implementation Science and Journal of Translational Behavioral Medicine ) and conducted searches of the WHO International Clinical Trials Registry Platform (ICTRP) ( http://apps.who.int/trialsearch/ ) as well as the US National Institutes of Health registry ( https://clinicaltrials.gov ). We consulted with experts in the field to identify other relevant research. Selection criteria 'Implementation' was defined as the use of strategies to adopt and integrate evidence‐based health interventions and to change practice patterns within specific settings. We included any trial (randomised or non‐randomised) conducted at any scale, with a parallel control group that compared a strategy to implement policies or practices to address diet, physical activity, overweight or obesity, tobacco or alcohol use by school staff to 'no intervention', 'usual' practice or a different implementation strategy. Data collection and analysis Citation screening, data extraction and assessment of risk of bias was performed by review authors in pairs. Disagreements between review authors were resolved via consensus, or if required, by a third author. Considerable trial heterogeneity precluded meta‐analysis. We narratively synthesised trial findings by describing the effect size of the primary outcome measure for policy or practice implementation (or the median of such measures where a single primary outcome was not stated). Main results We included 27 trials, 18 of which were conducted in the USA. Nineteen studies employed randomised controlled trial (RCT) designs. Fifteen trials tested strategies to implement healthy eating policies, practice or programs; six trials tested strategies targeting physical activity policies or practices; and three trials targeted tobacco policies or practices. Three trials targeted a combination of risk factors. None of the included trials sought to increase the implementation of interventions to delay initiation or reduce the consumption of alcohol. All trials examined multi‐strategic implementation strategies and no two trials examined the same combinations of implementation strategies. The most common implementation strategies included educational materials, educational outreach and educational meetings. For all outcomes, the overall quality of evidence was very low and the risk of bias was high for the majority of trials for detection and performance bias. Among 13 trials reporting dichotomous implementation outcomes—the proportion of schools or school staff (e.g. classes) implementing a targeted policy or practice—the median unadjusted (improvement) effect sizes ranged from 8.5% to 66.6%. Of seven trials reporting the percentage of a practice, program or policy that had been implemented, the median unadjusted effect (improvement), relative to the control ranged from ‐8% to 43%. The effect, relative to control, reported in two trials assessing the impact of implementation strategies on the time per week teachers spent delivering targeted policies or practices ranged from 26.6 to 54.9 minutes per week. Among trials reporting other continuous implementation outcomes, findings were mixed. Four trials were conducted of strategies that sought to achieve implementation 'at scale', that is, across samples of at least 50 schools, of which improvements in implementation were reported in three trials. The impact of interventions on student health behaviour or weight status were mixed. Three of the eight trials with physical activity outcomes reported no significant improvements. Two trials reported reductions in tobacco use among intervention relative to control. Seven of nine trials reported no between‐group differences on student overweight, obesity or adiposity. Positive improvements in child dietary intake were generally reported among trials reporting these outcomes. Three trials assessed the impact of implementation strategies on the attitudes of school staff and found mixed effects. Two trials specified in the study methods an assessment of potential unintended adverse effects, of which, they reported none. One trial reported implementation support did not significantly increase school revenue or expenses and another, conducted a formal economic evaluation, reporting the intervention to be cost‐effective. Trial heterogeneity, and the lack of consistent terminology describing implementation strategies, were important limitations of the review. Authors' conclusions Given the very low quality of the available evidence, it is uncertain whether the strategies tested improve implementation of the targeted school‐based policies or practices, student health behaviours, or the knowledge or attitudes of school staff. It is also uncertain if strategies to improve implementation are cost‐effective or if they result in unintended adverse consequences. Further research is required to guide efforts to facilitate the translation of evidence into practice in this setting. Plain language summary Improving the implementation of school‐based policies and practices to improve student health The review question: The review sought to assess how effective strategies were in supporting the implementation of school‐based policies and practices to address student diet, physical activity, excessive weight gain, tobacco or alcohol use. We also assessed if these strategies led to improvements in these student health behaviours or weight status, enhanced school staff attitudes or knowledge regarding implementation, had any adverse effects, and were cost‐effective. Background: Research has identified a range of school‐based policies and practices that may be potentially effective in improving student health behaviours. Despite this, such policies and practices are often not implemented in schools, even in circumstances where it is mandatory to do so. Unless evidence‐based policies and practices are implemented, they can not benefit public health. Study characteristics: We included 27 trials, 18 of which were conducted in the USA. Fifeteen trials tested strategies to implement healthy eating policies, practice or programs; six trials tested strategies targeting physical activity policies or practices; and three trials targeted tobacco policies or practices. Three trials targeted a combination of health behaviours. None of the included trials sought to increase the implementation of interventions to delay initiation or reduce the consumption of alcohol. The trials tested a range of implementation support strategies, including educational materials, educational meetings, the use of opinion leaders, external funding, local consensus processes, and tailored interventions. Search date: The evidence is current to 31 August 2016. Key results: It is uncertain whether the strategies tested improve implementation of the targeted school‐based policies or practices, student health behaviours, or the knowledge or attitudes of school staff. It is also uncertain whether the strategies tested result in unintended adverse effects or whether they are cost‐effective. Limitations: Trial heterogeneity, and the lack of consistent terminology describing implementation strategies were important limitations of the review. Quality of evidence: We rated the overall quality of evidence as very low for all outcomes that included trial‐reported effects.

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1. **Value for Money in H1N1 Influenza: A Systematic Review of the Cost-Effectiveness of Pandemic Interventions.**  
   H. Pasquini-Descomps Value in Health 2017;20(6):819-827.

BACKGROUND: The 2009 A/H1N1 influenza pandemic generated additional data and triggered new studies that opened debate over the optimal strategy for handling a pandemic. The lessons-learned documents from the World Health Organization show the need for a cost estimation of the pandemic response during the risk-assessment phase. Several years after the crisis, what conclusions can we draw from this field of research? OBJECTIVE: The main objective of this article was to provide an analysis of the studies that present cost-effectiveness or cost-benefit analyses for A/H1N1 pandemic interventions since 2009 and to identify which measures seem most cost-effective. METHODS: We reviewed 18 academic articles that provide cost-effectiveness or cost-benefit analyses for A/H1N1 pandemic interventions since 2009. Our review converts the studies' results into a cost-utility measure (cost per disability-adjusted life-year or quality-adjusted life-year) and presents the contexts of severity and fatality. RESULTS: The existing studies suggest that hospital quarantine, vaccination, and usage of the antiviral stockpile are highly cost-effective, even for mild pandemics. However, school closures, antiviral treatments, and social distancing may not qualify as efficient measures, for a virus like 2009's H1N1 and a willingness-to-pay threshold of $45,000 per disability-adjusted life-year. Such interventions may become cost-effective for severe crises. CONCLUSIONS: This study helps to shed light on the cost-utility of various interventions, and may support decision making, among other criteria, for future pandemics. Nonetheless, one should consider these results carefully, considering these may not apply to a specific crisis or country, and a dedicated cost-effectiveness assessment should be conducted at the time.

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1. **The Relationship Between School Holidays and Transmission of Influenza in England and Wales.**  
   Jackson Charlotte American journal of epidemiology 2016;184(9):644-651.

School closure is often considered as an influenza control measure, but its effects on transmission are poorly understood. We used 2 approaches to estimate how school holidays affect the contact parameter (the per capita rate of contact sufficient for infection transmission) for influenza using primary care data from England and Wales (1967-2000). Firstly, we fitted an age-structured susceptible-infectious-recovered model to each year's data to estimate the proportional change in the contact parameter during school holidays as compared with termtime. Secondly, we calculated the percentage difference in the contact parameter between holidays and termtime from weekly values of the contact parameter, estimated directly from simple mass-action models. Estimates were combined using random-effects meta-analysis, where appropriate. From fitting to the data, the difference in the contact parameter among children aged 5-14 years during holidays as compared with termtime ranged from a 36% reduction to a 17% increase; estimates were too heterogeneous for meta-analysis. Based on the simple mass-action model, the contact parameter was 17% (95% confidence interval: 10, 25) lower during holidays than during termtime. Results were robust to the assumed proportions of infections that were reported and individuals who were susceptible when the influenza season started. We conclude that school closure may reduce transmission during influenza outbreaks.

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1. **Evidence compendium and advice on social distancing and other related measures for response to an influenza pandemic**  
   H. Rashid Paediatric Respiratory ReviewsPaediatric Respiratory Reviews 2015;16(2):119-126.

The role of social distancing measures in mitigating pandemic influenza is not precisely understood. To this end, we have conducted a systematised review, particularly in light of the 2009 pandemic influenza, to better inform the role of social distancing measures against pandemic influenza. Articles were identified from relevant databases and the data were synthesised to provide evidence on the role of school or work place-based interventions, case-based distancing (self-isolation, quarantine), and restriction of mobility and mass gatherings. School closure, whether proactive or reactive, appears to be moderately effective and acceptable in reducing the transmission of influenza and in delaying the peak of an epidemic but is associated with very high secondary costs. Voluntary home isolation and quarantine are also effective and acceptable measures but there is an increased risk of intra-household transmission from index cases to contacts. Work place-related interventions like work closure and home working are also modestly effective and are acceptable, but likely to be economically disruptive. Internal mobility restriction is effective only if prohibitively high (50% of travel) restrictions are applied and mass gatherings occurring within 10 days before the epidemic peak are likely to increase the risk of transmission of influenza.<br/>Copyright &#xa9; 2014 Elsevier Ltd.

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1. **Assessment of school wellness policies implementation by benchmarking against diffusion of innovation framework.**  
   Harriger Dinah The Journal of school health 2014;84(4):275-283.

BACKGROUNDThe School Wellness Policy (SWP) mandate marks one of the first innovative and extensive efforts of the US government to address the child obesity epidemic and the influence of the school environment on child health. However, no systematic review has been conducted to examine the implementation of the mandate. The study examines the literature on SWP implementation by using the Diffusion of Innovations Theory as a framework.METHODSEmpirically based literature on SWP was systematically searched and analyzed. A theory-driven approach was used to categorize the articles by 4 diffusion stages: restructuring/redefining, clarifying, routinizing, and multiple stages.RESULTSTwenty-one studies were identified, and 3 key characteristics of the reviewed literature were captured: (1) uniformity in methodology, (2) role of context in analyzing policy implementation, and (3) lack of information related to policy clarification. Over half of the studies were published by duplicate set of authors, and only 1 study employed a pure qualitative methodology. Only 2 articles include an explicit theoretical framework to study theory-driven constructs related to SWP implementation.CONCLUSIONSPolicy implementation research can inform the policy process. Therefore, it is essential that policy implementation is measured accurately. Failing to clearly define implementation constructs may result in misguided conclusion.

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1. **Impact of School Closures on an Influenza Pandemic: Scientific Evidence Base Review**  
   Mangtani P. Technical Report. Public Health England 2014;:No page numbers.

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1. **School closures during the 2009 influenza pandemic: national and local experiences.**  
   Cauchemez Simon BMC infectious diseases 2014;14:207-207.

BACKGROUNDSchool closure is a non-pharmaceutical intervention that was considered in many national pandemic plans developed prior to the start of the influenza A(H1N1)pdm09 pandemic, and received considerable attention during the event. Here, we retrospectively review and compare national and local experiences with school closures in several countries during the A(H1N1)pdm09 pandemic. Our intention is not to make a systematic review of country experiences; rather, it is to present the diversity of school closure experiences and provide examples from national and local perspectives.METHODSData were gathered during and following a meeting, organized by the European Centres for Disease Control, on school closures held in October 2010 in Stockholm, Sweden. A standard data collection form was developed and sent to all participants. The twelve participating countries and administrative regions (Bulgaria, China, France, Hong Kong Special Administrative Region (SAR), Italy, Japan, New Zealand, Serbia, South Africa, Thailand, United Kingdom, and United States) provided data.RESULTSOur review highlights the very diverse national and local experiences on school closures during the A(H1N1)pdm09 pandemic. The processes including who was in charge of making recommendations and who was in charge of making the decision to close, the school-based control strategies, the extent of school closures, the public health tradition of responses and expectations on school closure varied greatly between countries. Our review also discusses the many challenges associated with the implementation of this intervention and makes recommendations for further practical work in this area.CONCLUSIONSThe single most important factor to explain differences observed between countries may have been the different public health practises and public expectations concerning school closures and influenza in the selected countries.

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1. **The effects of school closures on influenza outbreaks and pandemics: systematic review of simulation studies.**  
   Jackson Charlotte PloS one 2014;9(5):e97297-e97297.

BACKGROUNDSchool closure is a potential intervention during an influenza pandemic and has been investigated in many modelling studies.OBJECTIVESTo systematically review the effects of school closure on influenza outbreaks as predicted by simulation studies.METHODSWe searched Medline and Embase for relevant modelling studies published by the end of October 2012, and handsearched key journals. We summarised the predicted effects of school closure on the peak and cumulative attack rates and the duration of the epidemic. We investigated how these predictions depended on the basic reproduction number, the timing and duration of closure and the assumed effects of school closures on contact patterns.RESULTSSchool closures were usually predicted to be most effective if they caused large reductions in contact, if transmissibility was low (e.g. a basic reproduction number <2), and if attack rates were higher in children than in adults. The cumulative attack rate was expected to change less than the peak, but quantitative predictions varied (e.g. reductions in the peak were frequently 20-60% but some studies predicted >90% reductions or even increases under certain assumptions). This partly reflected differences in model assumptions, such as those regarding population contact patterns.CONCLUSIONSSimulation studies suggest that school closure can be a useful control measure during an influenza pandemic, particularly for reducing peak demand on health services. However, it is difficult to accurately quantify the likely benefits. Further studies of the effects of reactive school closures on contact patterns are needed to improve the accuracy of model predictions.

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1. **The WHO Health Promoting School framework for improving the health and well‐being of students and their academic achievement**  
   Langford R. Cochrane Database of Systematic Reviews 2014;(4):No page numbers.

Abstract - Background The World Health Organization's (WHO’s) Health Promoting Schools (HPS) framework is an holistic, settings‐based approach to promoting health and educational attainment in school. The effectiveness of this approach has not been previously rigorously reviewed. Objectives To assess the effectiveness of the Health Promoting Schools (HPS) framework in improving the health and well‐being of students and their academic achievement. Search methods We searched the following electronic databases in January 2011 and again in March and April 2013: Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, PsycINFO, CINAHL, Campbell Library, ASSIA, BiblioMap, CAB Abstracts, IBSS, Social Science Citation Index, Sociological Abstracts, TRoPHI, Global Health Database, SIGLE, Australian Education Index, British Education Index, Education Resources Information Centre, Database of Education Research, Dissertation Express, Index to Theses in Great Britain and Ireland, ClinicalTrials.gov , Current controlled trials , and WHO International Clinical Trials Registry Platform . We also searched relevant websites, handsearched reference lists, and used citation tracking to identify other relevant articles. Selection criteria We included cluster‐randomised controlled trials where randomisation took place at the level of school, district or other geographical area. Participants were children and young people aged four to 18 years, attending schools or colleges. In this review, we define HPS interventions as comprising the following three elements: input to the curriculum; changes to the school’s ethos or environment or both; and engagement with families or communities, or both. We compared this intervention against schools that implemented either no intervention or continued with their usual practice, or any programme that included just one or two of the above mentioned HPS elements. Data collection and analysis At least two review authors identified relevant trials, extracted data, and assessed risk of bias in the trials. We grouped different types of interventions according to the health topic targeted or the approach used, or both. Where data permitted, we performed random‐effects meta‐analyses to provide a summary of results across studies. Main results We included 67 eligible cluster trials, randomising 1443 schools or districts. This is made up of 1345 schools and 98 districts. The studies tackled a range of health issues: physical activity (4), nutrition (12), physical activity and nutrition combined (18), bullying (7), tobacco (5), alcohol (2), sexual health (2), violence (2), mental health (2), hand‐washing (2), multiple risk behaviours (7), cycle‐helmet use (1), eating disorders (1), sun protection (1), and oral health (1). The quality of evidence overall was low to moderate as determined by the GRADE approach. 'Risk of bias' assessments identified methodological limitations, including heavy reliance on self‐reported data and high attrition rates for some studies. In addition, there was a lack of long‐term follow‐up data for most studies. We found positive effects for some interventions for: body mass index (BMI), physical activity, physical fitness, fruit and vegetable intake, tobacco use, and being bullied. Intervention effects were generally small but have the potential to produce public health benefits at the population level. We found little evidence of effectiveness for standardised body mass index (zBMI) and no evidence of effectiveness for fat intake, alcohol use, drug use, mental health, violence and bullying others; however, only a small number of studies focused on these latter outcomes. It was not possible to meta‐analyse data on other health outcomes due to lack of data. Few studies provided details on adverse events or outcomes related to the interventions. In addition, few studies included any academic, attendance or school‐related outcomes. We therefore cannot draw any clear conclusions as to the effectiveness of this approach for improving academic achievement. Authors' conclusions The results of this review provide evidence for the effectiveness of some interventions based on the HPS framework for improving certain health outcomes but not others. More well‐designed research is required to establish the effectiveness of this approach for other health topics and academic achievement. Plain language summary The WHO Health Promoting School framework for improving the health and well‐being of students and their academic achievement Background Health and education are strongly connected: healthy children achieve better results at school, which in turn are associated with improved health later in life. This relationship between health and education forms the basis of the World Health Organization's (WHO’s) Health Promoting Schools (HPS) framework, an approach to promoting health in schools that addresses the whole school environment. Although the HPS framework is used in many schools, we currently do not know if it is effective. This review aimed to assess whether the HPS framework can improve students’ health and well‐being and their performance at school. Study characteristics We searched 20 health, education, and social science databases, as well as trials registries and relevant websites, for cluster‐randomised controlled trials of school‐based interventions aiming to improve the health of young people aged four to 18 years. We only included trials of programmes that addressed all three points in the HPS framework: including health education in the curriculum; changing the school’s social or physical environment, or both; and involving students’ families or the local community, or both. Key results We found 67 trials, comprising 1345 schools and 98 districts, that fulfilled our criteria. These focused on a wide range of health topics, including physical activity, nutrition, substance use (tobacco, alcohol, and drugs), bullying, violence, mental health, sexual health, hand‐washing, cycle‐helmet use, sun protection, eating disorders, and oral health. For each study, two review authors independently extracted relevant data and assessed the risk of the study being biased. We grouped together studies according to the health topic(s) they focused on. We found that interventions using the HPS approach were able to reduce students’ body mass index (BMI), increase physical activity and fitness levels, improve fruit and vegetable consumption, decrease cigarette use, and reduce reports of being bullied. However, we found little evidence of an effect on BMI when age and gender were taken into account (zBMI), and no evidence of effectiveness on fat intake, alcohol and drug use, mental health, violence, and bullying others. We did not have enough data to draw conclusions about the effectiveness of the HPS approach for sexual health, hand‐washing, cycle‐helmet use, eating disorders, sun protection, oral health or academic outcomes. Few studies discussed whether the health promotion activities, or the collection of data relating to these, could have caused any harm to the students involved. Quality of the evidence Overall, the quality of evidence was low to moderate. We identified some problems with the way studies were conducted, which may have introduced bias, including many studies relying on students’ accounts of their own behaviours (rather than these being measured objectively) and high numbers of students dropping out of studies. These problems, and the small number of studies included in our analysis, limit our ability to draw clear conclusions about the effectiveness of the HPS framework in general. Conclusions Overall, we found some evidence to suggest the HPS approach can produce improvements in certain areas of health, but there are not enough data to draw conclusions about its effectiveness for others. We need more studies to find out if this approach can improve other aspects of health and how students perform at school.

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1. **Why is school closed today? Unplanned K-12 school closures in the United States, 2011-2013.**  
   Wong Karen K. PloS one 2014;9(12):e113755-e113755.

INTRODUCTIONWe describe characteristics of unplanned school closures (USCs) in the United States over two consecutive academic years during a non-pandemic period to provide context for implementation of school closures during a pandemic.METHODSFrom August 1, 2011 through June 30, 2013, daily systematic internet searches were conducted for publicly announced USCs lasting ≥ 1 day. The reason for closure and the closure dates were recorded. Information on school characteristics was obtained from the National Center for Education Statistics.RESULTSDuring the two-year study period, 20,723 USCs were identified affecting 27,066,426 students. Common causes of closure included weather (79%), natural disasters (14%), and problems with school buildings or utilities (4%). Only 771 (4%) USCs lasted ≥ 4 school days. Illness was the cause of 212 (1%) USCs; of these, 126 (59%) were related to respiratory illnesses and showed seasonal variation with peaks in February 2012 and January 2013.CONCLUSIONSUSCs are common events resulting in missed school days for millions of students. Illness causes few USCs compared with weather and natural disasters. Few communities have experience with prolonged closures for illness.

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1. **A sequential experimental design method to evaluate a combination of school closure and vaccination policies to control an H1N1-like pandemic.**  
   Luangkesorn Kiatikun Louis Journal of public health management and practice : JPHMP 2013;19:No page numbers.

CONTEXTDuring the 2009 H1N1 pandemic, computational agent-based models (ABMs) were extensively used to evaluate interventions to control the spread of emerging pathogens. However, evaluating different possible combinations of interventions using ABMs can be computationally very expensive and time-consuming. Therefore, most policy studies have examined the impact of a single policy decision.OBJECTIVETo apply a sequential experimental design method with an ABM to analyze policy alternatives composed of a combination of school closure and vaccination policies to provide a set of promising "optimal" combinations of policies to control an H1N1-type epidemic to policy makers.METHODSWe used an open-source agent-based modeling system, FRED (A Framework for Reconstructing Epidemiological Dynamic), to simulate the spread of an H1N1 epidemic in Alleghany County, Pennsylvania, with a census-based synthetic population. We used an approach called best subset selection method to evaluate 72 alternative policies consisting of a combination of options for school closure threshold, closure duration, Advisory Committee on Immunization Practices prioritization, and second-dose vaccination prioritization policies. Using the attack rate as a performance measure, best subset selection enabled us to eliminate inferior alternatives and identify a small group of alternative policies that could be further evaluated on the basis of other criteria.RESULTSOur sequential design approach to evaluate a combination of alternative mitigation policies leads to a savings in computational effort by a factor of 2 when examining combinations of school closure and vaccination policies.CONCLUSIONSBest subset selection demonstrates a substantial reduction in the computational burden of a large-scale ABM in evaluating several alternative policies. Our method also provides policy makers with a set of promising policy combinations for further evaluation based on implementation considerations or other criteria.

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1. **A systematic review of community-based interventions for emerging zoonotic infectious diseases in Southeast Asia.**  
   Halton Kate JBI Database of Systematic Reviews and Implementation Reports 2013;11(2):1-235.

BACKGROUND: Southeast Asia has been at the epicentre of recent epidemics of emerging and re‐emerging zoonotic diseases. Community‐based surveillance and control interventions have been heavily promoted but the most effective interventions have not been identified. OBJECTIVES: This review evaluated evidence for the effectiveness of community‐based surveillance interventions at monitoring and identifying emerging infectious disease; the effectiveness of community‐based control interventions at reducing rates of emerging infectious disease; and contextual factors that influence intervention effectiveness. INCLUSION CRITERIA: <strong>Participants</strong> Communities in Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam. <strong>Types of intervention(s)</strong> Non‐pharmaceutical, non‐vaccine, and community‐based surveillance or prevention and control interventions targeting rabies, Nipah virus, dengue, SARS or avian influenza. <strong>Types of outcomes</strong> Primary outcomes: measures: of infection or disease; secondary outcomes: measures of intervention function. <strong>Types of studies</strong> Original quantitative studies published in English.SEARCH STRATEGY: Databases searched (1980 to 2011): PubMed, CINAHL, ProQuest, EBSCOhost, Web of Science, Science Direct, Cochrane database of systematic reviews, WHOLIS, British Development Library, LILACS, World Bank (East Asia), Asian Development Bank. METHODOLOGICAL QUALITY: Two independent reviewers critically appraised studies using standard Joanna Briggs Institute instruments. Disagreements were resolved through discussion. DATA EXTRACTION: A customised tool was used to extract quantitative data on intervention(s), populations, study methods, and primary and secondary outcomes; and qualitative contextual information or narrative evidence about interventions. DATA SYNTHESIS: Data was synthesised in a narrative summary with the aid of tables. Meta‐analysis was used to statistically pool quantitative results. RESULTS: Fifty‐seven studies were included. Vector control interventions using copepods, environmental cleanup and education are effective and sustainable at reducing dengue in rural and urban communities, whilst insecticide spraying is effective in urban outbreak situations. Community‐based surveillance interventions can effectively identify avian influenza in backyard flocks, but have not been broadly applied. Outbreak control interventions for Nipah virus and SARS are effective but may not be suitable for ongoing control. Canine vaccination and education is more acceptable than culling, but still fails to reach coverage levels required to effectively control rabies. Contextual factors were identified that influence community engagement with, and ultimately effectiveness of, interventions. CONCLUSION: Despite investment in community‐based disease control and surveillance in Southeast Asia, published evidence evaluating interventions is limited in quantity and quality. Nonetheless this review identified a number of effective interventions, and several contextual factors influencing effectiveness. Identification of the best programs will require comparative evidence of effectiveness acceptability, cost‐effectiveness and sustainability. <strong>Implications for practice</strong> Interventions are more effective if there are high levels of community ownership and engagement. Linkages between veterinary and public health surveillance systems are essential. Interventions are not well accepted when they fail to acknowledge the importance of animals for economic activity in communities. <strong>Implications for research</strong> Evidence is needed on functioning and outcomes of current surveillance systems and novel low‐cost methods of surveillance. Evaluations of control interventions should control for confounding and report measures of disease, cost and sustainability. Translational research is needed to assess generalisability and evaluate roll‐out of effective interventions as regional or national programs.

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1. **Did advances in global surveillance and notification systems make a difference in the 2009 H1N1 pandemic?--a retrospective analysis.**  
   Zhang Ying PloS one 2013;8(4):e59893-e59893.

BACKGROUNDThe 2009 H1N1 outbreak provides an opportunity to identify strengths and weaknesses of disease surveillance and notification systems that have been implemented in the past decade.METHODSDrawing on a systematic review of the scientific literature, official documents, websites, and news reports, we constructed a timeline differentiating three kinds of events: (1) the emergence and spread of the pH1N1 virus, (2) local health officials' awareness and understanding of the outbreak, and (3) notifications about the events and their implications. We then conducted a "critical event" analysis of the surveillance process to ascertain when health officials became aware of the epidemiologic facts of the unfolding pandemic and whether advances in surveillance notification systems hastened detection.RESULTSThis analysis revealed three critical events. First, medical personnel identified pH1N1in California children because of an experimental surveillance program, leading to a novel viral strain being identified by CDC. Second, Mexican officials recognized that unconnected outbreaks represented a single phenomenon. Finally, the identification of a pH1N1 outbreak in a New York City high school was hastened by awareness of the emerging pandemic. Analysis of the timeline suggests that at best the global response could have been about one week earlier (which would not have stopped spread to other countries), and could have been much later.CONCLUSIONSThis analysis shows that investments in global surveillance and notification systems made an important difference in the 2009 H1N1 pandemic. In particular, enhanced laboratory capacity in the U.S. and Canada led to earlier detection and characterization of the 2009 H1N1. This includes enhanced capacity at the federal, state, and local levels in the U.S., as well as a trilateral agreement enabling collaboration among U.S., Canada, and Mexico. In addition, improved global notification systems contributed by helping health officials understand the relevance and importance of their own information.

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1. **Public health preparedness and response competency model methodology.**  
   Ablah Elizabeth American journal of disaster medicine 2013;8(1):49-56.

OBJECTIVEThe Pandemic and All-Hazards Preparedness Act calls for establishing a competency-based training program to train public health practitioners. To inform such training, the Centers for Disease Control and Prevention and the Association of Schools of Public Health managed groups of experts to produce a competency model which could function as a national standard of behaviorally based, observable skills for the public health workforce to prevent, protect against, respond to, and recover from all hazards.DESIGNA systematic review of existing competency models generated a competency model of proposed domains and competencies.PARTICIPANTSNational stakeholders were engaged to obtain consensus through a three-stage Delphi-like process.RESULTSThe Delphi-like process achieved 84 percent, 82 percent, and 79 percent response rates in its three stages. Three hundred sixty six unique individuals responded to the three-round process, with 45 percent (n = 166) responding to all three rounds. The resulting competency model features 18 competencies within four core learning domains targeted at midlevel public health workers.CONCLUSIONSPractitioners and academics have adopted the Public Health Preparedness and Response Core Competency Model, some of whom have formed workgroups to develop curricula based on the model. Efforts will be needed to develop evaluation materials for training and education programs to refine the model as well as for future training and education initiatives.

1. **School closures and influenza: systematic review of epidemiological studies.**  
   Jackson Charlotte BMJ open 2013;3(2):No page numbers.

OBJECTIVETo review the effects of school closures on pandemic and seasonal influenza outbreaks.DESIGNSystematic review.DATA SOURCESMEDLINE and EMBASE, reference lists of identified articles, hand searches of key journals and additional papers from the authors' collections.STUDY SELECTIONStudies were included if they reported on a seasonal or pandemic influenza outbreak coinciding with a planned or unplanned school closure.RESULTSOf 2579 papers identified through MEDLINE and EMBASE, 65 were eligible for inclusion in the review along with 14 identified from other sources. Influenza incidence frequently declined after school closure. The effect was sometimes reversed when schools reopened, supporting a causal role for school closure in reducing incidence. Any benefits associated with school closure appeared to be greatest among school-aged children. However, as schools often closed late in the outbreak or other interventions were used concurrently, it was sometimes unclear how much school closure contributed to the reductions in incidence.CONCLUSIONSSchool closures appear to have the potential to reduce influenza transmission, but the heterogeneity in the data available means that the optimum strategy (eg, the ideal length and timing of closure) remains unclear.

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1. **The epidemiological and public health research response to 2009 pandemic influenza A(H1N1): experiences from Hong Kong.**  
   Wu Peng Influenza and other respiratory viruses 2013;7(3):367-382.

In recent years, Hong Kong has invested in research infrastructure to appropriately respond to novel infectious disease epidemics. Research from Hong Kong made a strong contribution to the international response to the 2009 influenza A (H1N1) pandemic (pH1N1). Summarizing, describing, and reviewing Hong Kong's response to the 2009 pandemic, this article aimed to identify key elements of a real-time research response. A systematic search in PubMed and EMBASE for research into the infection dynamics and natural history, impact, or control of pH1N1 in Hong Kong. Eligible articles were analyzed according to their scope. Fifty-five articles were included in the review. Transmissibility of pH1N1 was similar in Hong Kong to elsewhere, and only a small fraction of infections were associated with severe disease. School closures were effective in reducing pH1N1 transmission, oseltamivir was effective for treatment of severe cases while convalescent plasma therapy has the potential to mitigate future pandemics. There was a rapid and comprehensive research response to pH1N1 in Hong Kong, providing important information on the epidemiology of the novel virus with relevance internationally as well as locally. The scientific knowledge gained through these detailed studies of pH1N1 is now being used to revise and update pandemic plans. The experiences of the research response in Hong Kong could provide a template for the research response to future emerging and reemerging disease epidemics.

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1. **[Effects of school closure during influenza A/H1N1 pandemic in 2009 in Japan].**  
   Uchida Mitsuo Nihon eiseigaku zasshi. Japanese journal of hygiene 2013;68(2):103-117.

Schools were closed worldwide during the 2009 influenza A/H1N1 pandemic to prevent the viral spread; however, to date, there has been insufficient evidence to conclude that the closures were beneficial. Therefore, in the present review, we evaluated the effects of school closure during the 2009 influenza A/H1N1 pandemic in Japan. A search of PubMed and Japanese journals identified 24 articles that evaluated the effects of school closure using the following methods: descriptive epidemiology, changes in absenteeism rate, a simulation model, and reproductive number. Almost all of the retrieved studies showed that school closure effectively reduced the number of new infections and thus subsequently suppressed the epidemic. On the other hand, two major sets of confounding variables were identified. First, the effect of school closure was confounded by the methods used to measure, viral infectivity, subject characteristics, increased immunization rates, nonpharmaceutical interventions, antiviral administration, student contact patterns during school closure, and individual household environments. Secondly, school closure implementation was affected by differences between proactive and reactive closures, differences between seasonal and pandemic influenza, decision factors regarding school closure, socioeconomic cost, and ethics of imposing restrictions on individuals. Therefore, a comprehensive, longitudinal study is necessary to clarify the effects of school closure during viral pandemics.

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1. **A systematic review to identify areas of enhancements of pandemic simulation models for operational use at provincial and local levels.**  
   Prieto Diana M. BMC public health 2012;12:251-251.

BACKGROUNDIn recent years, computer simulation models have supported development of pandemic influenza preparedness policies. However, U.S. policymakers have raised several concerns about the practical use of these models. In this review paper, we examine the extent to which the current literature already addresses these concerns and identify means of enhancing the current models for higher operational use.METHODSWe surveyed PubMed and other sources for published research literature on simulation models for influenza pandemic preparedness. We identified 23 models published between 1990 and 2010 that consider single-region (e.g., country, province, city) outbreaks and multi-pronged mitigation strategies. We developed a plan for examination of the literature based on the concerns raised by the policymakers.RESULTSWhile examining the concerns about the adequacy and validity of data, we found that though the epidemiological data supporting the models appears to be adequate, it should be validated through as many updates as possible during an outbreak. Demographical data must improve its interfaces for access, retrieval, and translation into model parameters. Regarding the concern about credibility and validity of modeling assumptions, we found that the models often simplify reality to reduce computational burden. Such simplifications may be permissible if they do not interfere with the performance assessment of the mitigation strategies. We also agreed with the concern that social behavior is inadequately represented in pandemic influenza models. Our review showed that the models consider only a few social-behavioral aspects including contact rates, withdrawal from work or school due to symptoms appearance or to care for sick relatives, and compliance to social distancing, vaccination, and antiviral prophylaxis. The concern about the degree of accessibility of the models is palpable, since we found three models that are currently accessible by the public while other models are seeking public accessibility. Policymakers would prefer models scalable to any population size that can be downloadable and operable in personal computers. But scaling models to larger populations would often require computational needs that cannot be handled with personal computers and laptops. As a limitation, we state that some existing models could not be included in our review due to their limited available documentation discussing the choice of relevant parameter values.CONCLUSIONSTo adequately address the concerns of the policymakers, we need continuing model enhancements in critical areas including: updating of epidemiological data during a pandemic, smooth handling of large demographical databases, incorporation of a broader spectrum of social-behavioral aspects, updating information for contact patterns, adaptation of recent methodologies for collecting human mobility data, and improvement of computational efficiency and accessibility.

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1. **Attack rates assessment of the 2009 pandemic H1N1 influenza A in children and their contacts: a systematic review and meta-analysis.**  
   Glatman-Freedman Aharona PloS one 2012;7(11):e50228-e50228.

BACKGROUNDThe recent H1N1 influenza A pandemic was marked by multiple reports of illness and hospitalization in children, suggesting that children may have played a major role in the propagation of the virus. A comprehensive detailed analysis of the attack rates among children as compared with their contacts in various settings is of great importance for understanding their unique role in influenza pandemics.METHODOLOGY/PRINCIPAL FINDINGSWe searched MEDLINE (PubMed) and Embase for published studies reporting outbreak investigations with direct measurements of attack rates of the 2009 pandemic H1N1 influenza A among children, and quantified how these compare with those of their contacts. We identified 50 articles suitable for review, which reported school, household, travel and social events. The selected reports and our meta-analysis indicated that children had significantly higher attack rates as compared to adults, and that this phenomenon was observed for both virologically confirmed and clinical cases, in various settings and locations around the world. The review also provided insight into some characteristics of transmission between children and their contacts in the various settings.CONCLUSION/SIGNIFICANCEThe consistently higher attack rates of the 2009 pandemic H1N1 influenza A among children, as compared to adults, as well as the magnitude of the difference is important for understanding the contribution of children to disease burden, for implementation of mitigation strategies directed towards children, as well as more precise mathematical modeling and simulation of future influenza pandemics.

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1. **Systematic review of economic evaluations of preparedness strategies and interventions against influenza pandemics.**  
   R P.érez Velasco PloS one 2012;7(2):e30333-e30333.

BACKGROUND: Although public health guidelines have implications for resource allocation, these issues were not explicitly considered in previous WHO pandemic preparedness and response guidance. In order to ensure a thorough and informed revision of this guidance following the H1N1 2009 pandemic, a systematic review of published and unpublished economic evaluations of preparedness strategies and interventions against influenza pandemics was conducted. METHODS: The search was performed in September 2011 using 10 electronic databases, 2 internet search engines, reference list screening, cited reference searching, and direct communication with relevant authors. Full and partial economic evaluations considering both costs and outcomes were included. Conversely, reviews, editorials, and studies on economic impact or complications were excluded. Studies were selected by 2 independent reviewers. RESULTS: 44 studies were included. Although most complied with the cost effectiveness guidelines, the quality of evidence was limited. However, the data sources used were of higher quality in economic evaluations conducted after the 2009 H1N1 pandemic. Vaccination and drug regimens were varied. Pharmaceutical plus non-pharmaceutical interventions are relatively cost effective in comparison to vaccines and/or antivirals alone. Pharmaceutical interventions vary from cost saving to high cost effectiveness ratios. According to ceiling thresholds (Gross National Income per capita), the reduction of non-essential contacts and the use of pharmaceutical prophylaxis plus the closure of schools are amongst the cost effective strategies for all countries. However, quarantine for household contacts is not cost effective even for low and middle income countries. CONCLUSION: The available evidence is generally inconclusive regarding the cost effectiveness of preparedness strategies and interventions against influenza pandemics. Studies on their effectiveness and cost effectiveness should be readily implemented in forthcoming events that also involve the developing world. Guidelines for assessing the impact of disease and interventions should be drawn up to facilitate these studies.

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1. **US university response to H1N1: a study of access to online preparedness and response information.**  
   Schwartz Rachel D. American journal of infection control 2012;40(2):170-174.

BACKGROUNDThe recent outbreaks of severe acute respiratory syndrome, H5N1 (avian influenza), and, most recently, the novel H1N1 influenza pandemic of 2009 have raised awareness of the danger of new and emerging infections. Preparedness and response plans for such outbreaks are crucial, and given the centrality of the Internet as a source of information on university and college campuses, such plans should be made available at pandemic-dedicated university Web sites. The information on these sites must be comprehensive, accessible, and tailored to the specific circumstances of individual schools.METHODSAn Internet-based search was conducted in September 2009 to evaluate university Web sites for influenza-specific information in a sample of 51 universities. Web sites were assessed by applying a set of key words and a list of 10 indicators used as measures of accessibility and comprehensiveness.RESULTSOf the 51 universities evaluated, only 9 (17.6%) either had no influenza Web site or had a university influenza preparedness plan with no dedicated Web site. Only 6 (14.3%) of the schools with influenza specific Web sites had information for parents, with 23 (54.8%) providing information specifically for faculty and staff, and 24 (57.1%) providing information specifically to students.CONCLUSIONWe found no guidelines for maximizing the access to and effectiveness of online pandemic communications at institutions of higher learning. Until such time as appropriate guidelines are developed, university authorities must carefully assess their needs, taking into account local, national, and international public health circumstances and resources; ease of access; comprehensiveness; and appropriately tailored strategies in their online communications.

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1. **Can public schools serve as communication networks for community disaster medical preparedness and recovery? A review**  
   G.L. Kreps World Medical and Health Policy 2011;3(3):No page numbers.

Objective: To assess the feasibility of using public schools as communication nodes in community medical disaster preparedness and recovery. <br/>Method(s): To identify prior work, literature searches were conducted, primarily focusing on disaster medical preparedness and public schools. The literature review focused on the preceding 17 years of English language publications (1995 to April 2011). Major medical electronic data bases, such as Medline (included PubMed), Cochrane Collaboration Library, Communication and Media Complete, Wiley Online Library, CINAHL (Cumulative Index to Nursing and Allied Health Literature) and U.S. states and federal government websites were queried, using MeSH terms. Relevant government and disaster response organizations websites were prescreened for their applicability to the research objectives. Based on established selection criteria, 33 publications and materials were selected and evaluated using a qualitative rating scale. <br/>Result(s): Adequate experimental or empirical information describing the incorporation of school communication networks in the planning, recovery, and response for community medical disaster was not found in the published literature. Information regarding individual school communication and response plans were primarily located in websites, guidelines and documents published by various agencies, including states, federal government and individual national or international education agencies. This may suggest that, while many have found that their own programmatic needs make it necessary for them to address the central question of this study, little systematic scholarly review or exchange between experts has taken place to date. Therefore, this article may help fill a longstanding need in the emergency medical planning and response community and, by extension, even among state and federal EOP (Emergency Operations Plans) planners and managers. The crisis communications model, developed by the Centers for Disease Control and Prevention, was applied to address communication networks used by schools and communities prior to an event. While not the only available method for disaster communication planning, this model provides a comprehensive understanding of networks and the associated challenges. The five phases of the lifecycle consist of 1) pre-crisis, 2) initial, 3) maintenance, 4) resolution, and 5) evaluation. Although transition through each of these phases varies depending on the nature of the disaster, the lifecycle model provides a useful template for communication guidelines when including public schools in outreach to the community. <br/>Discussion(s): Rapid, timely, and accurate communications across various governmental and state agencies, private sector and the public is challenging but essential. The paucity of information on schools and preparedness for disaster suggests the need for additional, focused research on specific health communication needs and challenges if the important communication nodes of schools are to be incorporated into community communication networks for disaster preparedness and recovery. Conclusions and Policy Implications: Schools should be considered key players in disaster mitigation. Local officials should make timely and accurate communications available to public schools participating in community disaster response and recovery. New policies should stress the importance of communication training for all school staff taking into consideration different student age groups, languages, and special needs. Such training should be tailored to disasters likely to occur in each geographic region as well as different population vulnerabilities; and it should be supported by government and private funding. <br/>Limitation(s): This review addressed primarily public schools and to some degree state universities within the Northern Virginia area in the vicinity of Washington, DC. Private schools and universities were not included because of the difficulty of acquiring information in time to complete this review. &#xa9; 2011 policy studies organization.

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1. **[Evidence-based public health for pandemic flu].**  
   Wada Koji Nihon rinsho. Japanese journal of clinical medicine 2010;68(9):1722-1726.

Various public health interventions for mitigating the effect of pandemic flu such as quarantine, school closures, and social distancing have been implemented in Japan for influenza A (H1N1) 2009. However, there has been arguments on the effectiveness of these interventions. Evidence for the effectiveness of public health interventions often does not meet the criteria used in evidence-based medicine (EBM) because of the study design used in evidence-based public health (EBPH). Public health experts in various fields try to find better solutions as a team, even though there is not always sufficient evidence for effectiveness of these strategies. In cases of the occurrence of emerging infectious diseases, prompt decision making is required. Thus, continuous efforts to review evidence and to establish the systems for decision making are necessary.

1. **H1N1 and institutions of higher education.**  
   Petinaux Bruno American journal of disaster medicine 2009;4(5):287-298.

OBJECTIVEInstitutions of Higher Education (IHE) have been preparing for the likely resurgence of Influenza A (H1N1) virus this Fall. Amongst the multitude of factors affecting their preparatory efforts, medical considerations and evidence serve to provide the foundation for many planning decisions.DESIGNThe authors reviewed the relevant medical literature for evidence of effective measures to mitigate the consequences of H1N1. Evidence was reviewed as it pertains to IHE. The authors opted to focus on vaccination, antiviral medications, masks, hand washing, environmental cleaning, and isolation and quarantine.RESULTSDespite the limited evidence found for the IHE setting, recommendations were made to encourage vaccination, deemphasize the role of antivirals in most IHE students, and provide surgical masks for ill students, as they may leave their living environment, while simultaneously stressing self isolation without quarantine. Additionally, frequent hand washing and high traffic fomite cleaning should be encouraged.CONCLUSIONPreparation for pandemic influenza in the IHE context is very complex and all decisions should be based on the best evidence available.

1. **School-based obesity interventions: a literature review.**  
   FT Shaya The Journal of school health 2008;78(4):189-196.

BACKGROUND: Childhood obesity is an impending epidemic. This article is an overview of different interventions conducted in school settings so as to guide efforts for an effective management of obesity in children, thus minimizing the risk of adult obesity and related cardiovascular risk. METHODS: PubMed and OVID Medline databases were searched for school-based obesity interventions with anthropometric measures in children and adolescents between the ages of 7 and 19 years from June 1986 to June 2006. Studies were reviewed by duration, type of intervention, and defined qualitative and quantitative measures, resulting in a yield of 51 intervention studies. RESULTS: The interventions ranged from 4 weeks in length to as long as 8 continuing years. In total, 15 of the intervention studies exclusively utilized physical activity programs, 16 studies exclusively utilized educational models and behavior modification strategies, and 20 studies utilized both. In addition, 31 studies utilized exclusively quantitative variables like body mass indices and waist-to-hip ratios to measure the efficacy of the intervention programs, and another 20 studies utilized a combination of quantitative and qualitative measures that included self-reported physical activity and attitude toward physical activity and the tested knowledge of nutrition, cardiovascular health, and physical fitness. A total of 40 studies achieved positive statistically significant results between the baseline and the follow-up quantitative measurements. CONCLUSIONS: No persistence of positive results in reducing obesity in school-age children has been observed. Studies employing long-term follow-up of quantitative and qualitative measurements of short-term interventions in particular are warranted.

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1. **Evidence-based practice guideline: increasing physical activity in schools--kindergarten through 8th grade.**  
   Bagby Karen The Journal of school nursing : the official publication of the National Association of School Nurses 2007;23(3):137-143.

Because of the growing obesity epidemic across all age groups in the United States, interventions to increase physical activity and reduce sedentary behaviors have become a priority. Evidence is growing that interventions to increase physical activity and reduce sedentary behaviors have positive results and are generally inexpensive to implement. National and international health organizations are calling for a comprehensive approach for reducing obesity in children that includes increasing physical activity in the school setting. Although the call to increase activity levels in schools is clear, little guidance has been given to schools on specific methods to accomplish this task. This article provides an overview of an evidence-based guideline developed by a physical education teacher and a school nurse to provide inexpensive, easy-to-implement, effective strategies to increase physical activity in students. Tools are also included in the guideline to measure the effectiveness of the intervention.

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1. **Infectious disease cases for educational purposes: open-access resources on the Internet.**  
   Falagas Matthew E. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 2007;45(4):495-500.

The use of medical cases in the problem-based learning approach has been increasing in medical schools worldwide. We collected information regarding the relevant World Wide Web resources with infectious diseases cases for educational purposes by searching frequently used Internet search engines (i.e., Google, AltaVista, and Yahoo), the PubMed database, and Current Contents, as well as the Web sites of each of the US medical schools and other major institutions and organizations. We compiled a list of Internet links of 25 English-language, open-access (free) World Wide Web resources of educational cases in the field of infectious diseases. We collected information regarding the case developers, the number of the presented cases, the types and modes of the case presentations, and the target groups of the Web pages. Although we did not aim to generate an exhaustive list of relevant Web sites, we believe that a readily available list of electronic resources of medical cases with a focus on infectious diseases will be useful to medical students and physicians in training and practice.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=8eb179f2046e3ac65bc7aab0318a0a01)

1. **Bioterrorism and catastrophe response: a quick-reference guide to resources.**  
   Han Susan Z. Journal of the American Dental Association (1939) 2003;134(6):745-752.

BACKGROUNDDentists' responses to catastrophe have been redefined by bioterrorism. Informed response requires accurate information about agents and diseases that have the potential to be used as weapons.METHODSThe authors reviewed information about the most probable bioterrorist weapons (those from the Center for Disease Control and Prevention's Category A) from the World Wide Web and print journals and distilled it into a resource list that is current, relevant to dentistry and noncommercial. The Web sites cited include those sponsored by federal agencies, academic institutions and professional organizations. The articles cited include those published in English within the last six years in refereed journals that are available in most higher education institutions.RESULTSThe authors present the information in a table that provides a quick-reference guide to resources describing agents and diseases with the greatest potential for use as weapons: anthrax, botulism, plague, smallpox, tularemia and viral hemorrhagic fevers. This article presents Web site and journal citations for background and patient-oriented information (fact sheets), signs and symptoms, and prophylactic measures and treatment for each of the agents and diseases. The table facilitates quick access to this information, especially in an emergency. This article also points out guidelines for response should a suspected attack occur.CONCLUSIONSArmed with information about biological weapons, dentists can provide faster diagnosis, inform their patients about risks, prophylaxis or treatment and rethink their own role in terrorism response.CLINICAL IMPLICATIONSFast, accurate diagnosis limits the spread of exceptionally contagious diseases. Providing accurate information to patients minimizes misinformation and the associated public fear and panic that, unchecked, could overwhelm health care systems.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e7c3cf76ee3819ca2b23327eb7ad23f3)

1. **Guidelines for the control of hepatitis A virus infection.**  
   Crowcroft N. S Communicable disease and public health 2001;4(3):213-227.

The PHLS Advisory Committee on Vaccination and Immunisation, following a review of the evidence on control measures for preventing hepatitis A virus (HAV) infection and widespread consultation, has prepared the following guidelines. They include a description of the current epidemiology of HAV infection in England and Wales, where most individuals are now susceptible to HAV. HAV infection is uncommon, with around 1000 infections notified per year in England and Wales. Clusters occur in families and in settings where potential for faecal/oral spread is high, e.g. day care centres, nurseries, primary schools. Larger outbreaks have been recorded in men who have sex with men and injecting drug users. Personal hygiene remains the cornerstone of measures for preventing HAV infection and its spread. Those with haemophilia, hepatitis B or C virus infection or liver cirrhosis, intravenous drug users and men who have sex with men should be offered HAV vaccination as a preventive measure. HAV vaccine should be used for preventing secondary cases and outbreaks provided that patients are informed that the latest date the vaccine is most likely to be effective in preventing disease in contacts is probably 7 days from onset of illness in the primary case. Human normal immunoglobulin (HNIG) should be offered in addition or in preference to vaccine for contacts who are more than 7 days from onset of illness in the primary case, and for those at risk of adverse outcome of HAV infection. Individuals at particular risk of an adverse outcome to infection include those more than 50 years old, with liver cirrhosis of any cause, or with pre-existing hepatitis B or C virus infection. HAV vaccine should be used to prevent infection for travellers to countries where HAV infection is a risk. HNIG is no longer indicated for travellers. Children travelling to such countries should be offered vaccine from 5 years and consideration should be given to vaccinating those aged 1-4 years.

1. **Influenza.**  
   Knight V. Disease-a-month : DM 1976;22(11):1-48.

The most universally employed measurement of the impact of epidemics and pandemics is the excess of mortality due to influenza and pneumonia. Other criteria are absenteeism from school and work, and all three will show positive indications when epidemics are of substantial size. During the 1974-1975 influenza season in Houston, school and industrial absenteeism and the increase in influenza and pneumonia deaths, despite a newly devised statistical procedure, did not signal an epidemic. However, a system of community surveillance of febrile respiratory illness with cultures for influenza virus during late January and early February 1975 gave unmistakable evidence of an influenza epidemic, with more than 600 virus isolations and an estimated occurrence of 50,000 cases of the disease. It is believed that this type of study can explore facets of the epidemiology of the disease not hitherto adequately examined. From this surveillance, which will continue through the summer months, it is hoped to gain further knowledge of the occurrence of antigenic drift and shift, and of the details of the early origin and progress of epidemics. Current speculation is that there will be another world pandemic before 1980 caused by a derivative of A strains presently circulating; in 1985-1991, a pandemic is predicted to be caused by a virus antigenically related to the swine agent of 1918. The purity of vaccines has been increased in recent years through ultracentrifugation and high-efficiency filtration, so that dosages can be increased while severity of reactions is reduced. The current level of dosage of vaccine for adults is 1200 chick cell agglutinating units, almost double what it was a dozen years ago. Recently, vaccines have been prepared more rapidly by the use of viral recombinants that incorporate the surface antigens of newly emerged epidemic strains into the core of older strains that grow well in embryonated eggs. This practical device greatly reduces the lead time in the preparation of new vaccines. The main problem in immunization against influenza is the need to reimmunize every 1-3 years. This creates an enormous requirement for vaccine and therefore a problem of selection of recipients. Currently, it is recommended that aged persons and those with cardiovascular, pulmonary and other chronic illnesses should receive the vaccine. Pregnant women are not more susceptible than others to the disease, and they should receive vaccine only if they have some other indications for immunization. Schoolchildren probably are important in transmission of the disease, but at present there is no special recommendation to immunize them. Young children occasionally have severe febrile convulsions when immunized against influenza, and those with this history probably should not be immunized. Amantadine is useful as a prophylactic agent in A(H3N2) influenza infections, and several reports suggest therapeutic benefits as well. Its benefits probably have not been fully utilized...

### Opening Internet Links

The links to internet sites in this document are 'live' and can be opened by holding down the CTRL key on your keyboard while clicking on the web address with your mouse

### Full text papers

Links are given to full text resources where available. For some of the papers, you will need an **NHS OpenAthens Account**. If you do not have an account you can [register online](https://openathens.nice.org.uk/).

You can then access the papers by simply entering your username and password. If you do not have easy access to the internet to gain access, please let us know and we can download the papers for you.

### Guidance on searching within online documents

Links are provided to the full text of each document. Relevant extracts have been copied and pasted into these results. Rather than browse through lengthy documents, you can search for specific words as follows:

**Portable Document Format / pdf / Adobe**  
Click on the Search button (illustrated with binoculars). This will open up a search window. Type in the term you need to find and links to all of the references to that term within the document will be displayed in the window. You can jump to each reference by clicking it.

**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## B. Search History

|  | **Source** | **Criteria** | **Results** |
| --- | --- | --- | --- |
| 3. | Medline | (covid\* OR corona OR coronavir\* OR "2019-nCoV" OR 2019nCoV OR SARSCoV\* OR MERSCoV\* OR cv19 OR "cv-19" OR "SARS-CoV\*" OR "MERS-CoV\*" OR "Severe Acute Respiratory Syndrome" OR "Middle East\* Respiratory Syndrome" OR SARS OR MERS OR ncov OR "2019-ncov" OR "novel betacov" OR "novel betacoronavirus").ti,ab | 53255 |
| 4. | Medline | exp CORONAVIRUS/ | 18060 |
| 5. | Medline | exp "CORONAVIRUS INFECTIONS"/ | 17637 |
| 6. | Medline | (3 OR 4 OR 5) | 58016 |
| 7. | Medline | (pandemic\* OR "spanish flu" OR "spanish influenza" OR "bird flu" OR "avian flu" OR "H1N1").ti,ab | 43599 |
| 8. | Medline | (epidemic\*).ti,ab | 102386 |
| 9. | Medline | ((outbreak\* OR "out break\*" OR infect\* OR disease\* OR virus\* OR viral\*) AND (international\* OR multinational\* OR "multi-national\*" OR global\* OR worldwide\* OR "world wide")).ti,ab | 288805 |
| 10. | Medline | exp "DISEASE OUTBREAKS"/ | 102027 |
| 11. | Medline | (7 OR 8 OR 9 OR 10) | 471022 |
| 12. | Medline | (6 OR 11) | 507360 |
| 13. | Medline | exp SCHOOLS/ | 117663 |
| 14. | Medline | (school\* OR classroom\* OR "class room\*" OR (education\* ADJ (institut\* OR facilit\*))).ti,ab | 281004 |
| 15. | Medline | (13 OR 14) | 344450 |
| 16. | Medline | (12 AND 15) | 9949 |
| 17. | Medline | (open\* OR reopen\* OR closure\* OR closing OR close\* OR "term time\*" OR measure\* OR strateg\* OR respon\* OR react\* OR manag\* OR plan OR plans OR planned OR planning).ti,ab | 10026358 |
| 18. | Medline | exp "DISASTER PLANNING"/ OR exp "CIVIL DEFENSE"/ | 16219 |
| 19. | Medline | exp "TIME FACTORS"/ | 1181617 |
| 20. | Medline | (17 OR 18 OR 19) | 10745440 |
| 21. | Medline | (16 AND 20) | 5413 |
| 23. | Medline | exp "SYSTEMATIC REVIEW"/ | 0 |
| 24. | Medline | exp "SYSTEMATIC REVIEWS AS TOPIC"/ | 3412 |
| 25. | Medline | (systematic\* ADJ3 (overview\* OR review\*)).ti,ab | 186577 |
| 26. | Medline | (evidence\* ADJ3 (overview\* OR review\*)).ti,ab | 68895 |
| 27. | Medline | (rapid\* ADJ3 review\*).ti,ab | 2666 |
| 28. | Medline | (scoping\* ADJ3 review\*).ti,ab | 6033 |
| 29. | Medline | (Pubmed OR MEDLINE OR Embase).ti,ab | 204628 |
| 30. | Medline | (search\* strateg\* OR search\* criteria OR systematic\* search\*).ti,ab | 183953 |
| 31. | Medline | (study selection OR selection of studies OR (data ADJ3 extract\*)).ti,ab | 243507 |
| 32. | Medline | exp "META-ANALYSIS"/ | 0 |
| 33. | Medline | exp "META-ANALYSIS AS TOPIC"/ | 19412 |
| 34. | Medline | (meta analy\*).ti,ab | 177981 |
| 35. | Medline | (metaanaly\*).ti,ab | 111071 |
| 36. | Medline | (handsearch\* OR hand-search\*).ti,ab | 9189 |
| 37. | Medline | (PRISMA OR preferred reporting).ti,ab | 16100 |
| 38. | Medline | (relevant journals).ti,ab | 5545 |
| 39. | Medline | (reference list\*).ti,ab | 23183 |
| 40. | Medline | (bibliograph\*).ti,ab | 25689 |
| 41. | Medline | (23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36 OR 37 OR 38 OR 39 OR 40) | 669589 |
| 42. | Medline | (21 AND 41) | 308 |
| 43. | EMBASE | (covid\* OR corona OR coronavir\* OR "2019-nCoV" OR 2019nCoV OR SARSCoV\* OR MERSCoV\* OR cv19 OR "cv-19" OR "SARS-CoV\*" OR "MERS-CoV\*" OR "Severe Acute Respiratory Syndrome" OR "Middle East\* Respiratory Syndrome" OR SARS OR MERS OR ncov OR "2019-ncov" OR "novel betacov" OR "novel betacoronavirus").ti,ab | 55466 |
| 44. | EMBASE | exp CORONAVIRINAE/ | 15047 |
| 45. | EMBASE | exp "CORONAVIRUS INFECTION"/ | 15054 |
| 46. | EMBASE | (43 OR 44 OR 45) | 62011 |
| 47. | EMBASE | (pandemic\* OR "spanish flu" OR "spanish influenza" OR "bird flu" OR "avian flu" OR "H1N1").ti,ab | 50253 |
| 48. | EMBASE | (epidemic\*).ti,ab | 112534 |
| 49. | EMBASE | ((outbreak\* OR "out break\*" OR infect\* OR disease\* OR virus\* OR viral\*) AND (international\* OR multinational\* OR "multi-national\*" OR global\* OR worldwide\* OR "world wide")).ti,ab | 472590 |
| 50. | EMBASE | exp PANDEMIC/ | 20392 |
| 51. | EMBASE | exp "PANDEMIC INFLUENZA"/ | 4781 |
| 52. | EMBASE | (47 OR 48 OR 49 OR 50 OR 51) | 610842 |
| 53. | EMBASE | (46 OR 52) | 654436 |
| 54. | EMBASE | exp SCHOOL/ | 353190 |
| 55. | EMBASE | (school\* OR classroom\* OR "class room\*" OR (education\* ADJ (institut\* OR facilit\*))).ti,ab | 355583 |
| 56. | EMBASE | (54 OR 55) | 598898 |
| 57. | EMBASE | (53 AND 56) | 20696 |
| 58. | EMBASE | (open\* OR reopen\* OR closure\* OR closing OR close\* OR "term time\*" OR measure\* OR strateg\* OR respon\* OR react\* OR manag\* OR plan OR plans OR planned OR planning).ti,ab | 12743738 |
| 59. | EMBASE | exp "DISASTER PLANNING"/ OR exp "TIME FACTOR"/ | 46550 |
| 60. | EMBASE | (58 OR 59) | 12766456 |
| 61. | EMBASE | (57 AND 60) | 12597 |
| 62. | EMBASE | exp "SYSTEMATIC REVIEW"/ | 249536 |
| 63. | EMBASE | exp "SYSTEMATIC REVIEW (TOPIC)"/ | 24967 |
| 64. | EMBASE | (systematic\* ADJ3 (overview\* OR review\*)).ti,ab | 234731 |
| 65. | EMBASE | (evidence\* ADJ3 (overview\* OR review\*)).ti,ab | 60663 |
| 66. | EMBASE | (rapid\* ADJ3 review\*).ti,ab | 2466 |
| 67. | EMBASE | (scoping\* ADJ3 review\*).ti,ab | 6381 |
| 68. | EMBASE | (Pubmed OR MEDLINE OR Embase).ti,ab | 259556 |
| 69. | EMBASE | (search\* strateg\* OR search\* criteria OR systematic\* search\*).ti,ab | 53521 |
| 70. | EMBASE | (study selection OR selection of studies OR (data ADJ3 extract\*)).ti,ab | 94507 |
| 71. | EMBASE | exp "META ANALYSIS"/ | 189882 |
| 72. | EMBASE | exp "META ANALYSIS (TOPIC)"/ | 42160 |
| 73. | EMBASE | (meta analy\*).ti,ab | 224559 |
| 74. | EMBASE | (metaanaly\*).ti,ab | 9945 |
| 75. | EMBASE | (handsearch\* OR hand-search\*).ti,ab | 11159 |
| 76. | EMBASE | (PRISMA OR preferred reporting).ti,ab | 18081 |
| 77. | EMBASE | (relevant journals).ti,ab | 1403 |
| 78. | EMBASE | (reference list\*).ti,ab | 21014 |
| 79. | EMBASE | (bibliograph\*).ti,ab | 29142 |
| 80. | EMBASE | (62 OR 63 OR 64 OR 65 OR 66 OR 67 OR 68 OR 69 OR 70 OR 71 OR 72 OR 73 OR 74 OR 75 OR 76 OR 77 OR 78 OR 79) | 667002 |
| 81. | EMBASE | (61 AND 80) | 590 |

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