HOW DOES EXTREME WEATHER IMPACT CHILDREN AND SCHOOLS?

Below is a brief synopsis of six studies that are examining the educational impact of various extreme weather events. This bibliography spotlights useful studies evaluating tools and techniques that are working to mitigate the effects and create more sustainable schools. Effective interventions include building hardening, scheduling shifts, and social/emotional supports.

Click here for a guide from one of our nonprofit partners, USGBC on creating climate resilient schools.

- LEARN Research Roundups -

These are annotated bibliographies created through our "Ask a Researcher" program at the request of a district leader to inform a specific initiative.

"Children and young people's wellbeing post-disaster: Safety and stability are critical"

Citation

Gibbs, L., Block, K., Harms, L., MacDougall, C., Baker, E., Ireton, G., Forbes, D., Richardson, J., & Waters, E. (2015). Children and young people's wellbeing post-disaster: Safety and stability are critical. International Journal of Disaster Risk Reduction, 14, 195–201. https://doi.org/10.1016/j.ijdrr.2015.06.006

Overview

How the present day members of the community perceive themselves in it.

Research Questions

How did those who experienced the wildfires find safety or stability in their communities?

Methodology

In-depth interviews according to preference (alone, with parent, with partner) while driving around the community to talk about locations of importance to the participant(s).

Analysis & Results

Interviews were audio recorded and photographs were taken of the important locations each participant showed and talked to the researcher about. They used these to go back and draw further conclusions from the participants' stories. Results showed that children often felt very unsafe after the wildfires, especially in cases where their pets, friends, or family members died in the fires, some bearing witness to the deceased in the aftermath. They were often tired due to large life changes, including housing, schooling, and family routines. Parents seemed to prefer making choices that kept things as familiar as possible (i.e. buying identical toys to those lost, walking instead of driving, staying in a school with the other kids in the age group) unless there were concerns about staying in the location (as some kids were clearly negatively impacted by the depressive environment and 'blackness' of everything).

Conclusions

The decision to either move away from or stay in a location varies by individual child needs and familial response to the traumatic situation. There is a lot of effort on the part of the parents to make things as smooth for their children as possible, and children seem to take a lot of comfort in staying in familiar places or with family members unless the case is more unique. The support is clearly noted and referred to positively in many of the quotes from children's interviews.

Action Step

For the functioning schools in the community, keeping routines and activities as similar as possible could be a good source of comfort, even if they may seem frivolous.

Source Link

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"Health effects of wildfire smoke in children and public health tools: a narrative review"

Citation

Holm, S. M., Miller, M. D., & Balmes, J. R. (2020). Health effects of wildfire smoke in children and public health tools: a narrative review. Journal of Exposure Science & Environmental Epidemiology, 31(1), 1–20. https://doi.org/10.1038/s41370-020-00267-4

Overview

Going over what the prior knowledge and preventative methods have been and how they are doing.

Research Questions

What is the proper public health response to reduce the negative impacts of wildfire smoke (and other air pollutants) on children?

Methodology

Literature review of the literature regarding air pollutants impact on children, including wildfire smoke.

Analysis & Results

The available and relevant literature was reviewed by the researchers. Results showed that the best possible option is to reduce exposure to wildfire smoke as much as possible, with the recommendation that schools be the primary targets for this intervention, as it will reach the most children. In order, the best solutions are: relocation away from smoke (though not practical in almost all cases) > staying indoors with closed windows and proper ventilation systems in place > small, properly worn N95 ventilator > surgical mask. A bandana or A scarf is not recommended, as the particles of wildfire smoke can pass through these materials.

Conclusions

Since it is well known that smoke has adverse health effects on vulnerable populations (of which children are a part) public precautions should be made to prevent this as much as possible.

Action Step

Schools in wildfire sensitive areas should invest in the best possible ventilation systems so that they continue to be a healthy and safe location for children even in perilous conditions.

Source Link

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"Climate changes reproductive and children's health: a review of risks, exposures, and impacts"

Citation

Anderko, L., Chalupka, S., Du, M., & Hauptman, M. (2019). Climate changes reproductive and children's health: a review of risks, exposures, and impacts. Pediatric Research, 87(2), 414–419. https://doi.org/10.1038/s41390-019-0654-7

Overview

Impacts of climate change on children's health.

Research Questions

How does climate change impact children's health?

Methodology

Literature review of the research on the impacts of various results of global warming on children's health.

Analysis & Results

Reviewing the existing literature regarding the health concerns of global warming on children.

Conclusions

Increased heat results in more pollen in the air, increasing air pollutants that are already known to be risk factors for developing asthma. Additionally, as temperatures get higher and environments more dry, the likelihood of wildfires also increases, which not only introduces air pollutants, but poses a danger to a child's family, school, and the community as a whole. Occurrences of heat related illness also increase with global warming, which children are more susceptible to.

Action Step

Schools should take care to keep spaces well ventilated to reduce as much exposure to air pollutants as possible, as well as be mindful of outdoor activities on particularly hot days in order to decrease chances of heat related illness.

Source Link

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"The Effects of Wildfires on the Mental and Physical Health of School-Age Children in North America: A Scoping Review"

Citation

Oerther, Sarah, et al. "The Effects of Wildfires on the Mental and Physical Health of School‐Age Children in North America: A Scoping Review." Journal of Child and Adolescent Psychiatric Nursing, vol. 37, no. 4, Wiley, Nov. 2024, https://doi.org/10.1111/jcap.70002.

Overview

Impact of wildfire on the health of children.

Research Questions

What are the direct and indirect results of experiencing wildfires on a child's physical and mental health?

Methodology

Literature review on the current data regarding the physical and mental health outcomes of children post-wildfire.

Analysis & Results

Arksey and O'Malley's scoping review approach to find literature, charting of all data for each paper, and discussion until consensus is reached on the topic.

Conclusions

As perfect conditions for wildfires increase in North America, so does the likelihood of a child developing a respiratory or mental health condition.

Action Step

Schools should be cautious of the potential uptick in mental health disorders in their students after experiencing a wildfire, and can be on the alert for students who do not seem to be readjusting well and can be recommended to further mental health counseling.

Source Link

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"The Relationship between Classroom Temperature and Children's Performance in School"

Citation

Wargocki, Pawel, et al. "The Relationship between Classroom Temperature and Children's Performance in School." Building and Environment, vol. 157, June 2019, pp. 197–204, https://doi.org/10.1016/j.buildenv.2019.04.046.

Overview

How classroom temperatures impact student learning and productivity.

Research Questions

What is the relationship between classroom temperatures and student productivity?

Methodology

Literature review of studies that included both a measure of classroom temperature as well as student productivity.

Analysis & Results

The relevant literature was reviewed, only including studies with confirmed predictors of academic performance and not subjective terms such as 'tired' or 'unfocused'. Data was charged using a specific formula.

Conclusions

The data from the literature suggested that for temperate climates, a productive classroom temperature is 68 degrees.

Action Step

Schools located in temperate climates should take this finding into consideration when looking at their own school temperature, especially around testing seasons, to insure students can be as comfortable and ready to learn as much as possible.

Source Link

Click

"Students' Perceived Heat-Health Symptoms Increased with Warmer Classroom Temperatures"

Citation

Bidassey-Manilal, Shalin, et al. "Students' Perceived Heat-Health Symptoms Increased with Warmer Classroom Temperatures." International Journal of Environmental Research and Public Health, vol. 13, no. 6, June 2016, p. 566, https://doi.org/10.3390/ijerph13060566. Accessed 27 Aug. 2019.

Overview

How rising temperatures impact student health and learning.

Research Questions

What are recurring classroom temperatures and how are they impacting students hourly?

Methodology

Temperature loggers and student questionnaires for a five day period.

Analysis & Results

Data was analyzed with computer programs and by the researchers reading over the qualitative survey data. Results showed that indoor temps between schools were around 69 degrees to 93 degrees, with an exception of one school being 104 degrees for two days. Faculty reported students were much more productive during wintertime, and students reported fatigue, sleepiness, difficulty concentrating, and higher than usual body temperatures.

Conclusions

Students struggle in higher temperature classrooms, and therefore schools ought to ensure the best ventilation possible, either by installing air conditioning, ceiling fans, or building classrooms out of materials that encourage cooler temperatures (i.e. brick).

Action Step

While this study is going over the regularly high temperatures of schools in South Africa, I feel this information also have implications for practice during heatwaves, especially in states where they can reach 104 degrees or higher regularly. Changing scheduled outdoor activities, keeping cold water available in classrooms, and keeping indoor spaces well ventilated.

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