RISK REDUCTION GUIDANCE

COOLING CENTERS

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ABSTRACT

Cooling centers are cool public or private spaces that welcome people seeking shelter from heat. Ideally, cooling center interventions include communication plans to promote awareness and transportation plans to promote access. There are no studies on their effectiveness, though retrospective observational studies show a protective effect of visiting cool spaces during heat waves, and laboratory simulations show a protective effect while in the cool space that diminishes quickly after heat exposure resumes. Cooling centers leveraging existing spaces can be implemented quickly and cheaply, but more comprehensive planning and service provision requires additional costs. There are no estimates of the resources or timing required to implement a cooling center intervention.

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What is the intervention?

Cooling centers, also known as cooling shelters or refuges, are cool public or private spaces that welcome people seeking shelter from heat (Widerynski et al. 2017). Cooling centers are typically air conditioned and frequently also provide respite from other hazardous outdoor conditions (like high levels of air pollution) associated with heat.

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Cooling centers are both formal and informal. Formal cooling centers are sponsored by governments, while informal cooling centers are cooled spaces typically devoted to other activities (like shopping) that are open to the public. Public spaces such as libraries, community centers, and senior centers are frequently used as cooling centers, though privately owned spaces such as shopping malls, movie theaters, places of worship, and other settings with sufficient capacity are also frequently used. Cooling centers may solely offer respite from heat, or may also offer health services and entertainment.

While cooling centers are a standalone intervention, to be most effective, cooling center interventions should also be linked with outreach communicating their availability, locations, ways people can get help with cooling center access, and other services and opportunities that may be available, as well as any costs or other requirements for entry.

The literature suggests that best practices for cooling centers should hold that the intervention should include not only the cooling center site, but also communication plans to promote awareness and transportation plans to support access (Widerynski et al. 2017).

How effective is the intervention at protecting people's health?

Cooling centers protect people from exposure to extreme heat and to allow them to cool down and recover when exposed. There is limited literature on the treatment effect of cooling centers, specifically. There are no randomized controlled trials or observational studies of cooling centers available to estimate a cooling center treatment effect.

The exposure of visiting cool spaces may serve as a proxy. A systematic review and meta-analysis found that visiting an air conditioned space during a heat wave lowered risk of mortality during a heat event by 66% (OR 0.34; 95% CI, 0.2-0.5) (Bouchama et al. 2007), but noted that this effect is only generalizable to populations able to access such spaces.

Work examining a simulated cooling center visit in older subjects in a laboratory-based heat wave simulation found transient reductions in core temperature and heart rate (Meade et al. 2023). The effect diminished quickly when subjects were re-exposed to heat.

The available evidence suggests a clinically significant but brief treatment effect for those able to access cool environments, and it remains unknown how effective cooling centers may be at reducing acute heat illness; preventing emergency department visits, hospitalizations, and deaths; and the optimal duration of a cooling center stay (Foster 2023).

How long does the intervention take to implement?

The US Centers for Disease Control and Prevention (CDC) has recommendations for implementing a cooling center, including considerations for scoping, landscape assessment and partner identification, vulnerability assessment, planning, implementation, and evaluation (Widerynski et al. 2017). The best strategies for implementing cooling centers have not been established (Widerynski et al. 2017), and there is no literature describing the overall time required to conduct all the recommended steps in cooling center implementation.

Designating existing locations as cooling centers can happen quickly but this alone is not the most effective strategy for ensuring access. Cooling centers are commonly set up in existing locations that provide public services like community centers, senior centers, religious facilities, and a variety of other shelters, parks, and government buildings (Berisha et al. 2017). In such cases, implementation can be nearly instantaneous, and principally involves developing a communication plan to advertise the service and services to support access. However, work in Arizona found that lack of awareness and lack of transportation were the principal barriers to cooling center utilization (Mallen et al. 2022).

Relying on existing locations may not result in optimal access. Studies of existing cooling center locations have found widely variable coverage and generally inadequate coverage of vulnerable neighborhoods (Kim et al. 2021; Black-Ingersoll et al. 2022) and communities with larger proportions of elders (Adams et al. 2023).

How much does the intervention cost?

Designating existing service locations as cooling centers can come with minimal costs (62% of sites in one study reported no additional costs), though additional costs may be incurred related to staffing, provision of additional services (e.g., water distribution), and extending operational hours (particularly over weekends). Additional costs may include advertising and planning and delivering communications and providing transportation services (e.g., e.g. shuttles). There are no available cost estimates for the development, implementation, maintenance, and evaluation of a municipal or county-level cooling center program.

Are there downsides to consider?

The main unintended consequence related to cooling centers is the potential for increased heat exposure in the process of accessing the centers. Given that their protective effects are short lived, potential for heat exposure getting to and from cooling centers should be considered in the overall risk reduction calculus (Foster 2023).

What other strategies should be considered?

Cooling centers should ideally be part of a larger constellation of efforts to reduce heat hazard intensity and exposure in a given community, and should be coupled with heat early warning systems and action plans, energy assistance programs, and other protective efforts.

What are some good sources of additional information?

References from this review are good sources of additional information. The US CDC provided a comprehensive review of cooling centers, available here.

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