Policy Notes

Statement on Establishment of Public Health Protection Guideline for Cold Spells — China

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Cold spells are extreme weather events characterized by the invasion of cold air from high latitudes into the middle and low latitudes, resulting in significant cooling. Cold spells have various adverse health effects, including epidermal damage, respiratory tract spasms, respiratory immune abnormalities, acute cardiopulmonary diseases, and exacerbation of urinary and endocrine disorders. In response to the frequent cold spells in recent years, the National Disease Control and Prevention Administration has issued the "Public Health Protection Guideline for Cold Spells" on December 13, 2023 (*1*). The Guideline aims to provide guidance to the public on how to cope with cold spells effectively, enhance self-protection awareness, and minimize health damage caused by cold spells. The Guideline consists of five parts, covering the basic concept of cold spells, the main health risks associated with them, the vulnerable groups, warning signals, and graded protection recommendations for different population groups. It emphasizes the definition of cold spells, their multi-system health effects (respiratory, cardiovascular, urological, etc.), prioritizes the groups that require comprehensive protection, provides scientific information on cold spell forecasts and warnings, and proposes targeted health protection recommendations for major sensitive groups.

BACKGROUND

The Global Burden of Disease, Injuries and Risk Factors Study (GBD) 2019 revealed that non-optimal temperatures ranked among the top 10 causes of death globally (*2*). A relevant study reported that there were 4,594,098 cold-related deaths per year worldwide between 2000 and 2019 (*3*). Cold spell, an extreme weather event resulting from climate change, have detrimental effects on public health. China, impacted by the Siberian cold stream, experiences frequent high-intensity cold spells during the cold season (*4*). From 2013 to 2019, China witnessed 57,783 excess deaths related to cold spells, with a 17.4% increase in the risk of non-accidental deaths on cold spell days in the south compared to non-cold spell days, and a 13.0% increase in the risk of non-accidental deaths on cold spell days in the north (*5*). Given this context, it is imperative to develop the "Public Health Protection Guideline for Cold Spells" to enhance the public's ability to cope with cold spells, increase awareness of the associated risks, and maximize protection of population health while reducing the health hazards associated with cold spells.

METHODS

The Guideline is a public health guideline aimed at providing protection during extreme weather events, specifically focusing on cold spells. Its primary objective is to scientifically guide the public in coping with cold spells. The core principles of the Guideline are universality, scientificity, and practicability. The main contents of the Guideline encompass basic knowledge, cold spell warning signals, health risks associated with cold spells, and protective measures.

The definition of cold spells in the Guideline is based on the "Grade of cold air" as defined in GB/T 20484-2017. Cold spell warning signals are categorized into four grades, as specified in the "Cold Spells Warning Signals and Defense Guideline" (*6*). The identification of the main health risks associated with cold spells, such as respiratory, cardiovascular, urinary, and endocrine system-related morbidity and mortality, is based on previous epidemiological evidence (*5*,*7*–*12*). Additionally, vulnerable groups during cold spells, including individuals sensitive to cold spells, patients with chronic diseases, and outdoor workers, were identified. The Guideline also provides graded recommendations for different groups to minimize the adverse health effects of cold spells.

RATIONALE AND EVIDENCE

This Guideline stands out for its ability to provide more precise protection strategies for key populations, based on the general protection recommendations applicable to populations categorized under the four levels of cold spell warning signals.

Previous epidemiological studies have identified populations that are vulnerable to cold spells. For example, Chen et al. (*7*) found that cold spells significantly increased the risk of cardiovascular, respiratory, and diabetes mortality in 31 Chinese capital cities. The pooled relative risks for these conditions were 1.37, 1.44, and 1.48, respectively. Additionally, the study found that the elderly aged ≥75 years were more vulnerable to cold spells than those aged 0–64 years, with pooled relative risks of 1.62 and 1.33, respectively. Based on epidemiological evidence (*5*,*7*,*9*–*11*,*13*–*14*), the Guideline has identified specific population groups that require priority protection during cold spells. These groups include sensitive populations such as infants, children, pregnant women, and the elderly, as well as individuals with chronic diseases and outdoor workers.

After conducting an extensive review of international guidelines (*6*,*15*–*17*), we developed a Graded Protective Recommendations Guideline for general and key populations during cold spells. This guideline offers specific guidance for outdoor activities, appropriate clothing, identification of discomfort or related illnesses, and necessary provisions such as materials and medications, based on the severity levels of cold spells.

The guideline provides graded protective recommendations for different groups of people:

General Populations

According to the guideline, it is recommended that the general population selects warmer hours for outdoor activities, avoids engaging in long-duration and high-intensity activities as much as possible during cold spell days, and places emphasis on maintaining warmth. This is particularly important during red-warning days, when it is advised that the general population refrains from participating in outdoor physical activities.

Sensitive Groups And Individuals With Chronic Diseases

According to the Guideline, it is recommended that individuals who are sensitive (eg. infants, children, pregnant women, and the elderly) or have chronic diseases should be mindful of the duration and intensity of outdoor activities. They should also take measures to stay warm during cold spells. Particularly on days with yellow, orange, and red warnings, individuals in these groups should limit outdoor activities to different degrees and prioritize their health.

Outdoor Workers

According to the Guideline, it is recommended that outdoor workers should appropriately schedule their working hours and select appropriate cold-weather or warm clothing based on scientific principles. This is particularly important during days with orange or red weather warnings. During such days, it is advised to minimize prolonged outdoor work and take necessary measures to keep warm.

PRESENTATION

On December 13, 2023, the Public Health Protection Guideline for Cold Spells (*1*) was officially released. The Guideline is applicable to individuals in the four grades of the cold spell warning signals, which are categorized as blue, yellow, orange, and red based on the "Cold Spells Warning Signals and Defense Guideline" (*6*). The Guideline not only applies to the general population but also address the health protection needs of three specific groups vulnerable to cold spells: sensitive groups (such as infants, children, pregnant women, and the elderly), individuals with chronic diseases (such as those with cardiovascular and cerebrovascular diseases, respiratory diseases, etc.), and outdoor workers (including traffic police, sanitation workers, construction workers, couriers, delivery workers, etc.).

The Guideline highlights the health risks associated with cold spells, as well as the vulnerable diseases and populations. It provides comprehensive recommendations for protective measures in various aspects such as environment, behavior, and individual health management. Building on these universal recommendations, the Guideline offers practical and effective health protection strategies specifically tailored for key populations. The recommendations cover preparation for cold weather (e.g., anti-skidding and anti-fall equipment, medicines, and vaccinations), measures to reduce cold exposure (e.g., selecting appropriate outdoor activity time, duration, and

intensity, wearing cold-protective clothing), and guidelines for personal health management and emergency treatments (e.g., addressing hypothermia, discomfort symptoms, and relevant diseases). These guidelines provide systematic and detailed recommendations to ensure the health and safety of individuals during cold spells.

DISCUSSION

The issuance of the Public Health Protection Guideline for Cold Spell demonstrates the Chinese government's commitment to addressing the challenges posed by climate change and safeguarding public health. This Guideline takes into account the specific needs of the Chinese public and considers the differences in health risks and protection requirements for various groups of people under different warning levels with respect to achievability, feasible implementation, and controllable costs. It provides both general protective recommendations and differentiated recommendations for sensitive individuals, those with chronic diseases, and outdoor workers, ensuring the effectiveness, applicability, and comprehensiveness of individual protective measures.

It is important for CDC agencies and healthcare institutions to actively promote the content of the Guideline on daily work and strengthen preparedness before a cold spell. This can be achieved through community health promotion and new media health promotion. Additionally, organizing and implementing public health protection measures during a cold spell is crucial. These efforts will help the public understand the cold spell warning signals issued by the Meteorological Bureau, guide them in responding to the cold spell correctly, increase their awareness of protection measures, assist them in selecting appropriate protective strategies, enhance their adaptive capacity to climate change, and alleviate the burden on healthcare facilities.

Conflicts of interest: No conflicts of interest.

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