EL NIÑO IN THE AMERICAS: PROTECTING HEALTH AND INCREASING RESILIENCE - A SHORT COURSE

Session 6. Air quality

In the vast and diverse region of the Americas, the impacts of climate change, exacerbated by events like El Niño, present unique challenges to air quality and public health. From the dense urban centers of North America to the remote corners of South America, communities face respiratory and cardiovascular risks due to changing weather patterns, wildfires, and dust transport from distant deserts. Addressing these issues requires region-specific strategies and coordinated efforts. The following short-term actions focus on minimizing the immediate health impacts of poor air quality associated with El Niño events. It is crucial to combine short-term measures with long-term strategies to reduce air pollution and build resilience to climate-related health risks in the region.

Acute recommendations to address the impacts of El Niño on Air Quality

Early Warning Systems and Surveillance:

- Enhance air quality monitoring systems in regions affected by El Niño to provide real-time data on air pollution levels, especially particulate matter (PM2.5) and ground-level ozone.
- Establish a robust system for issuing air quality alerts and advisories to inform the public when air pollution levels are elevated. Ensure that populations such as children, the elderly, and those with respiratory conditions receive timely notifications.
- Coordinate with meteorological agencies to integrate climate data into air quality forecasting models. This can help predict changes in air quality linked to El Niño events.
- Encourage individuals to reduce outdoor activities during days with poor air quality. Provide guidance on limiting exposure to outdoor air pollutants.
- Promote indoor air quality measures, such as using air purifiers and N95 masks and keeping windows and doors closed during periods of high outdoor air pollution. Provide guidance on creating cleaner indoor environments.

Emergency Response:

- Ensure that healthcare facilities are prepared to handle an increase in patients with respiratory issues, including asthma exacerbations and respiratory infections. Stockpile necessary medications and medical supplies.
- Disseminate asthma action plans to individuals with asthma, detailing steps to manage their condition during periods of poor air quality. Encourage regular check-ins with healthcare providers.
- Provide guidance on the proper use of respiratory protection, such as N95 masks, for individuals who need to be outdoors during poor air quality days.

- Develop a clear communication plan for rapidly informing the public about air quality emergencies. Ensure access to real-time air quality information through various channels, including mobile apps and websites.

Strengthen Healthcare Service Delivery:

- Ensure healthcare facilities are prepared for a surge in patients with respiratory conditions during El Niño events. This includes sufficient staffing, medical supplies, and beds.
- Train healthcare professionals to recognize and manage health conditions linked to poor air quality and provide guidance on treating patients affected by such conditions.
- Pay special attention to populations, including the elderly, children, pregnant women, and those with preexisting health conditions. Ensure they have access to healthcare and support services.
- Establish and update contingency plans in healthcare facilities to ensure the uninterrupted operation of essential health services and strengthen the capacity to manage an influx of patients during El Niño-related health crises.
- Stockpile necessary medications and medical supplies, particularly in areas vulnerable to air quality-related health crises.

- Implement swift measures to safeguard the non-structural components of health infrastructure, ensuring the uninterrupted operation of essential health services during El Niño-related health crises.

Research, Capacity Building, and Communication:

- Research the specific links between El Niño patterns and air quality degradation in different regions. This will enhance predictive capabilities.
- Build the capacity of local experts in air quality management, especially in areas with recurring issues during El Niño events.
- Establish a system for issuing healthcare system and public alerts and advisories when air quality is compromised.
- Conduct public education campaigns on the health risks associated with poor air quality during El Niño events. Emphasize the importance of taking preventive measures.
- Conduct epidemiological research to assess the health impacts of El Niño-induced air quality issues. Gather data on respiratory and cardiovascular diseases and their association with changing air quality.
- Launch comprehensive public awareness campaigns on the health risks associated with poor air quality during El Niño events. Utilize diverse communication channels and languages to reach a broad audience.
- Collaborate with meteorological agencies, environmental authorities, and local government bodies to develop integrated response plans, ensuring swift action in the event of air quality deterioration.

Intersectoral coordination for action at all levels:

- Establish a well-coordinated communication network involving health departments, meteorological agencies, and other pertinent sectors.
- Collaborate with international health organizations to access valuable resources and expertise.
- Provide regular updates and briefings to keep all stakeholders informed and aligned with response efforts.
- Promote coordination among relevant sectors, including agriculture, health, water resources, climate change, and disaster management, to harmonize efforts to manage and respond to vector-borne diseases during El Niño events. For example:

1. Energy Sector: Cooperate to maintain a stable power supply for medical facilities and equipment with increased demand.
2. Water Resources Management: Collaborate to ensure access to safe drinking water, a critical factor in preventing waterborne diseases.
3. Transportation Sector: Guarantee the efficient movement of relief supplies and healthcare teams to affected areas during El Niño events.

Example

New York air quality

New York experienced an episode of bad air quality due to the influx of smoke from wildfires in eastern Canada. This situation led to the worst air quality of any major city in the world, as reported on June 7. The air quality alert was first issued on June 6 and remained in effect until June 8, with the possibility of an extension. The smoke from these wildfires carried fine particulate matter (PM2.5) that posed significant health risks. Short-term exposure to PM2.5 could cause respiratory issues, coughing, throat irritation, and shortness of breath, exacerbating conditions like asthma and heart disease. Long-term exposure was associated with chronic bronchitis, hospital admissions, and increased mortality in lung cancer and heart disease. The smoke's persistence was due to heat from the wildfires, propelling it high into the atmosphere, where it was less influenced by weather patterns. Due to upper air flows, smoke traveled more than 300 miles from southern Quebec to New York City. While such wildfire smoke is more common in the western U.S., it has become increasingly prevalent across the country and worldwide due to climate change. New York's air quality, which typically registered as "good," reached unprecedented levels during this episode. An air quality index (AQI) above 300 was recorded, equivalent to smoking 15 cigarettes in a day.

The following recommendations aimed to protect the public's health during periods of poor air quality caused by events like Canadian wildfires, which can have severe respiratory and cardiovascular effects.

Emergency response:

- All New Yorkers were advised to limit outdoor activity and stay indoors whenever possible. People with heart or breathing problems and children and older adults were particularly sensitive and encouraged to avoid outdoor activities during that time.

- For older adults or individuals with heart or breathing issues who had to be outdoors, wearing a high-quality mask (e.g. N95 or KN95) was recommended.

Recommendations

- Employers should also take steps to reduce the risks for vulnerable employees and consider allowing them to work indoors during periods of poor air quality.
- For those who must travel outdoors for significant periods, properly fitted, high-quality masks can help reduce exposure to polluted air.
- When the air quality is unhealthy, individuals should limit exertion outdoors if possible. In areas with poorer air quality, the population should keep windows closed or use air purifiers or air conditioners with high-efficiency filters, especially indoors.
- New Yorkers are encouraged to stay informed about the Air Quality Index (AQI) in their area. An AQI greater than 100 indicates poorer air quality, and individuals should take more precautions as the AQI increases.
- If anyone, especially those with symptoms of heart disease or respiratory irritation, experiences symptoms that worsen or have symptoms indicative of heart conditions, they should consult a physician or seek immediate medical help.
- Additional recommendations by U. S. Environmental Protection Agency here.

Relevant Resources

Early Warning, Alert and Response System (EWARS)

- Website and publications related to the WHO's Early Warning, Alert, and Response System (EWARS). EWARS is designed to improve disease outbreak detection in emergency settings, such as in countries in conflict or following a natural disaster. It is a simple, cost-effective way to set up a disease surveillance system rapidly.

Quality criteria for the evaluation of climate-informed early warning systems for infectious diseases

- This guide aims to outline key technical and operational criteria surrounding the performance, application, implementation, and effectiveness of EWS and to illustrate how an understanding of these issues can be used for the evaluation of EWS for multiple infectious disease outbreaks. This guidance is aimed at national authorities of infectious disease programs and health information systems of ministries of health (MoH).

Multi-Hazard Early Warning Systems: A Checklist

- The checklist, which is structured around the four key elements of early warning systems, aims to be a simple list of the main components and actions to which national governments, community organizations, and partners within and across all sectors can refer when developing or evaluating early warning systems. It is not intended to be a comprehensive design manual but a practical, non-technical reference tool to ensure that the major elements of an effective early warning system are in place.

Climate Change for Health Professionals: A Pocket Book

- Climate Change for Health Professionals is a pocketbook based on empirical data that offers essential information for medical personnel and other health professionals to realize the impacts

of climate change on their daily practice. With this quick reference guide, providers can easily recognize diseases and side effects related to climate change, implement appropriate management and provide guidance to exposed populations, provide up-to-date information on the relationship between the adverse effects of certain drugs and the worsening of climate-sensitive health conditions, and determine the possible consequences of climate change for health services. This book addresses key meteorological risks, as well as the health conditions which they may influence, grouped by specific clinical areas.

Protecting health from climate change: vulnerability and adaptation assessment

- This document provides guidance on how countries can prepare Vulnerability and Adaptation Assessments (V&As). These assessments identify and evaluate the vulnerability of different areas and populations within countries. By preparing V&As, countries can concentrate on climate change, health policies, and interventions to where they are most needed.

Global Consortium on Climate and Health Education (GCCHE)

- The GCCHE website houses several courses (recordings + upcoming courses) that PAHO has conducted with Columbia University and others about Climate Change and Health.

PAHO Main page for climate change and health

- The main webpage for PAHO climate change and health resources and information. This website provides infographics, news, upcoming events, and links to many PAHO/WHO climate change and health resources.

Quality Criteria for Health National Adaptation Plans

- The Quality Criteria for Health National Adaptation Plans (HNAPs) presents examples of good practices in HNAP development to assist countries in developing a comprehensive, feasible, and implementable plan. The criteria are also intended to guide countries in setting the foundation for a long-term iterative HNAP process. The proposed criteria are not prescriptive and should be adapted to dynamic country contexts, uncertain and changing climatic conditions, and new knowledge and technologies.

AirQ+: software tool for health risk assessment of air pollution

- AirQ+ includes methodologies to assess the impacts of short- and long-term exposure to ambient air pollution. The main methodologies use evidence generated by epidemiological cohort studies showing a relationship between average long-term air pollution concentration levels and mortality risks in exposed populations. Assessing the impact of air pollution is suggested when evaluating the consequences of policies and interventions or of hypothetical scenarios.

Carbon Reduction Benefits on Health (CaRBonH)

- The Carbon Reduction Benefits on Health (CaRBonH) calculation tool allows quantification of the physical and economic consequences for human health achieved through improvements in country-level air quality from domestic carbon reductions, specifically policy mitigation actions, and measures as reported in the NDCs submitted by the Conference of the Parties to the UNFCCC in support of the objectives as set out in Article 2 of the Convention.

Health Economic Assessment Tool (HEAT) for walking and cycling

- **HEAT for walking and cycling** is a user-friendly, web-based tool used to estimate the health and economic impacts of increased walking and cycling. In its **current version** the HEAT tool supports assessments of the health and economic impacts of walking and cycling on premature mortality in an integrated manner through changes in physical activity levels, exposure to air pollution while walking or cycling, and risk of fatal crashes in traffic. In addition, the tool also estimates the impacts on carbon emissions due to shifts between active and motorized travel modes.

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