

Introduction

The global spread of COVID-19 has shown that certain conditions contribute to the increased presence and severity of the disease amongst the population. One factor that has not yet been fully accounted for is the role that chronic exposure to firewood smoke plays as a risk factor. When used for cooking, firewood is mainly burned in open stoves that release pollutants, including suspended particles, carbon monoxide and others. The emissions from these stoves have a huge impact on air quality both indoors and outdoors, which have a detrimental effect on the population's health. Not only does exposure to these pollutants affect bodily defense mechanisms, but recent studies also suggest that the virus can likely be transported through air pollutant particles (Wu 2020, Zhu 2020).

In Mexico, it is estimated that 23% of the population, **28 million people**, use firewood or coal for cooking, whether exclusively or in combination with liquid petroleum gas (LPG). Although the use of gas has increased in rural areas, a majority of families have not completely abandoned the use of firewood due to economic and cultural reasons. It is therefore urgent that modern technology options be made available to communities to protect their health and reduce pressure on health services. Even where modern energy, such as LPG or NG, is not currently an option due to price and other reasons, technologies such as efficient stoves can have significant impacts. While this is a key concern in Mexico, where a substantial number of the population use firewood, this issue resonates across the Global South. Consequently, policy makers and government organizations around the globe must tackle this issue.

Key Findings

1. Indoor air pollution causes around half a million deaths annually, contributing to respiratory infections and pulmonary diseases that lower the body's defence mechanisms. COVID-19 exacerbates various associated illnesses which contributes to an increased pressure on health services.
2. Communities living at higher altitudes (c. 1,800 metres above sea level) present higher risk. Due to the relative lack of oxygen at these altitudes, respiratory illnesses that produce hypoxemia can be more severe.
3. Exposure to air pollutants in cities contributes to a higher level of risk in the presence and severity of COVID-19, suggesting that the virus can be transported through pollutant particles.
4. The economic impact of the Covid-19 crisis means that the number of firewood users is increasing, as many families cannot afford gas. Further, weakened distribution channels impact energy access in isolated areas. This is particularly rampant in the peri-urban areas of many cities across Mexico.
5. Women are more impacted by indoor air pollution. Depending on the region, women are exposed to between 3-8 times the recommended amount by the WHO.
6. Rural, Indigenous and other marginalised communities are the most at risk. These groups are the most likely to use firewood, particularly in the central and southern regions of Mexico, and are frequently disconnected from basic services. Access to health services are limited due to the difficulties in physical access, lack of entitlement, and scarcity of resources.

EXECUTIVE SUMMARY

Chronic exposure to indoor smoke must be considered when assessing population vulnerability to COVID-19. Currently 28 million Mexicans are exposed to dangerous levels of indoor air pollution as a result of firewood and coal use. Though this is more widespread in rural environments, smoke inhalation is an issue that persists in cities and peri-urban areas. The exposure to smoke from firewood and coal is associated with chronic illnesses as well as severe respiratory diseases. This disproportionately impacts rural, Indigenous and marginalized groups, while women and children, who typically spend more time indoors, are most at risk. While focused on Mexico, this brief has implications for energy policy across the Global South.

This brief identifies specific recommendations to mitigate the dangers of COVID-19. These actions refer to municipalities where the combination of intense usage of firewood in open stoves, poverty and altitude have created the conditions resulting in heightened vulnerability to COVID-19 and its complications. These recommendations include **a)** vigilance and the disposition of basic medical equipment in the rural clinics of the localities; **b)** reduce the concentration of interior pollution through programs of effective ecological stoves, and; **c)** ensure the supply and access of liquid petroleum gas (LPG) in peri-urban zones.

These actions will result in wider benefits by contributing to the United Nations Agenda for Sustainable Development. Specifically, they work towards **SDG 3**, to promote good health and well-being; **SDG 7**, to ensure access to modern energy for all; and **SDG 5**, which recognizes the need to empower women and girls.

Policy Recommendations

It is urgent that action is taken to reduce the vulnerability of groups that are chronically exposed to smoke from firewood. Specific recommendations include:

1. Evaluate and intervene into the respiratory health of communities in at-risk municipalities (see 34 areas identified in Suárez et al., 2020). This should include visits to the areas, training and distribution of basic support equipment (masks, gloves, protective gowns, oxygen, pulse oximeters, intubation equipment), as well as transporting patients to hospital where necessary.
2. Establish an educational campaign highlighting the dangers of inhaling firewood smoke and methods of mitigation, targeting rural and peri-urban communities.
3. For those who still use traditional open stoves, recommend that they improve ventilation or provide a substitute for more efficient stoves capable of safely burning firewood.
4. For those who use modern stoves, recommend a program of inspection, maintenance, repair and replacement to ensure they are fully operational.
5. Implement a general program for the adoption and sustained long term usage of efficient stoves. It is essential that any stoves comply with guidelines. The program should include a schedule for inspection and maintenance, as well as refurbishment. The long-term objective is to create a resilient and accessible system of for better cooking practices and so any program must involve the inhabitants in its design and implementation.
6. Reinforce access to liquid petroleum gas (LPG), establishing a support program for families who do not have the resources to acquire gas cylinders.

A policy brief for central governmental organizations in developing countries, sub-sovereign national bodies, universities and research institutes, community organizations, banks and private investors, aid donors, multilateral financial institutions, UN agencies and other international organizations.

Implications

1. Increasing access to modern stoves and LPG for domestic use will result in widespread improvements to the health of families across the country, in rural and peri-urban areas.
2. These actions will significantly benefit Indigenous and other marginalized communities that are less likely to be able to access central health services.
3. Improved health and well-being means that communities are less vulnerable to illness due to COVID-19 and less likely to develop serious complications.
4. Improved health and well-being also means that communities are less vulnerable to other infectious diseases and possible future epidemics.
5. Better health across the population will result in less pressure on national health services, lowering health costs, rates of hospitalization and deaths.
6. These actions will significantly improve the overall health of women and children, reducing rates of cancer, respiratory illness and premature death.
7. Supporting communities in the transition away from using firewood will help to achieve SDG7, bringing modern energy access to all.

Sources

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