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Public Health Interventions for Reducing Non-Communicable Diseases in Low-Income Settings

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Abstract:

Non-communicable diseases (NCDs), such as cardiovascular diseases, diabetes, and cancers, have become leading causes of morbidity and mortality worldwide. Low-income countries (LICs) are facing an escalating burden of NCDs, exacerbated by poor healthcare infrastructure, limited access to medical resources, and the growing prevalence of risk factors such as unhealthy diets, tobacco use, and physical inactivity. This article explores public health interventions designed to reduce the burden of NCDs in low-income settings. It emphasizes the importance of preventive strategies, health education, and policy reforms that focus on modifiable risk factors, early detection, and access to affordable care. The article outlines various interventions that have shown promise in improving public health outcomes, and it discusses challenges related to resource allocation and health system strengthening in these settings.

Keywords: *Non-communicable diseases, public health interventions, low-income settings, prevention, health education, healthcare access, risk factors, health policy.*

INTRODUCTION

Non-communicable diseases (NCDs) are a significant public health challenge worldwide, and their burden is increasingly felt in **low-income countries (LICs)**. While NCDs were once primarily associated with high-income countries, they now account for a large proportion of **morbidity** and **mortality** in LICs, placing a substantial strain on already overburdened health systems. The rise in NCDs in these regions is attributed to a combination of **modifiable risk factors**, including poor diet, tobacco use, lack of physical activity, and **unhealthy environmental conditions**.

Public health interventions are crucial for addressing the growing NCD burden in LICs. Effective strategies to reduce NCDs include **early detection, lifestyle modification programs, policy changes, and health promotion campaigns** that aim to reduce **behavioral risk factors**. However, the implementation of these interventions is often challenged by **financial constraints, limited healthcare infrastructure, and sociocultural factors**. This article aims to explore **public health strategies** that have been successful in reducing NCDs in low-resource settings and discuss how these approaches can be tailored and scaled up to fit the unique challenges of LICs.

Understanding the Burden of Non-Communicable Diseases in Low-Income Settings

Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, chronic respiratory diseases, and cancers, have emerged as significant public health challenges in low-income countries (LICs). These conditions not only contribute to high morbidity and mortality rates but also impose substantial economic burdens on individuals and healthcare systems.

Overview of NCD Prevalence in LICs

In LICs, NCDs account for a growing proportion of deaths and disabilities. For instance, in Ethiopia, NCDs are responsible for approximately 39% of all deaths, with cardiovascular diseases and cancers being the leading contributors [Wikipedia](#). Similarly, in Tajikistan, NCDs account for 62% of total deaths, with cardiovascular diseases comprising 38% of all deaths [Wikipedia](#). This trend is also evident in other LICs, where NCDs are increasingly recognized as a major health burden.

Major Risk Factors Contributing to NCDs in LICs

Several modifiable risk factors contribute to the high prevalence of NCDs in LICs:

Tobacco Use: Smoking is a significant risk factor for various NCDs, including lung cancer and cardiovascular diseases.

Unhealthy Diets: High intake of processed foods, excessive salt, and low consumption of fruits and vegetables increase the risk of hypertension, diabetes, and other NCDs.

Physical Inactivity: Sedentary lifestyles contribute to obesity and related conditions like type 2 diabetes and cardiovascular diseases.

Alcohol Consumption: Excessive alcohol intake is linked to liver diseases, cancers, and cardiovascular problems.

Air Pollution: Exposure to indoor and outdoor air pollutants increases the risk of respiratory diseases and cardiovascular conditions [World Health Organization](#).

Socioeconomic and Healthcare Challenges in Addressing NCDs

LICs face numerous challenges in combating the rising burden of NCDs:

Limited Healthcare Infrastructure: Inadequate healthcare facilities and a shortage of trained healthcare professionals hinder effective prevention, diagnosis, and treatment of NCDs.

Financial Constraints: Limited resources and competing health priorities often result in insufficient funding for NCD-related programs and services.

Lack of Public Awareness: Insufficient knowledge about NCD risk factors and prevention strategies among the general population and healthcare providers impedes effective intervention efforts.

Access to Medications and Treatments: High costs and limited availability of essential medications and treatments pose significant barriers to managing NCDs.

Cultural Beliefs and Stigma: Cultural perceptions and stigma associated with certain NCDs, such as epilepsy, can delay diagnosis and treatment [The Guardian](#).

Primary Prevention Strategies for Reducing Non-Communicable Diseases (NCDs)

Primary prevention focuses on **reducing risk factors** and **promoting healthy behaviors** before individuals develop non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, chronic respiratory diseases, and cancers. In **low-income settings**, where the burden of NCDs is rising rapidly, **primary prevention strategies** are essential to reduce the prevalence of these diseases and improve the overall health of the population.

The following section outlines **health education and awareness campaigns**, **policies to promote healthier environments**, and **community-based interventions** to address the **modifiable risk factors** for NCDs.

Health Education and Awareness Campaigns

Health education and awareness campaigns are fundamental in **primary prevention** strategies aimed at **reducing NCD risk factors**. These campaigns focus on educating the public about **healthy lifestyle choices**, the dangers of **tobacco use**, the importance of **physical activity**, the risks of **unhealthy diets**, and the benefits of **early detection**.

Raising Awareness about NCD Risk Factors

Hospital administrators and policymakers should invest in large-scale **health education campaigns** that address the major risk factors for NCDs, such as **smoking**, **poor diet**, **alcohol consumption**, and **physical inactivity**.

Launch **nationwide or regional campaigns** through mass media (e.g., **TV**, **radio**, **social media**) to provide information on the **dangers of tobacco use**, the importance of a **balanced diet**, and the need for **regular exercise**. These campaigns should also highlight the benefits of **regular health checkups** and **early screening** for conditions such as **high blood pressure**, **diabetes**, and **high cholesterol**.

The “**Tobacco-Free Initiative**” by the **World Health Organization (WHO)** has been successful in several countries in educating the public on the dangers of smoking through **advertisements**, **public health campaigns**, and **educational materials** distributed in **schools** and **health facilities**.

Engaging Schools and Youth in Health Education

Integrate health education programs in **schools** and **youth organizations** to target young people and influence their lifestyle choices early on.

Develop **curricula** and **workshops** in schools that teach students about **healthy eating habits**, **physical activity**, and the risks associated with smoking, alcohol, and unhealthy diets. Engaging young people in **healthy lifestyle programs** can create lifelong health habits and prevent NCDs later in life.

The “**Health Promoting Schools**” initiative in countries like **Thailand** and **Mexico** has helped increase awareness about **healthy nutrition, physical activity, and mental well-being** among school children and youth.

Public Health Messaging through Social Media and Digital Platforms

Leverage **social media** and **digital platforms** to promote **health education** and raise awareness about NCD prevention.

Use **Facebook, Instagram, YouTube**, and other platforms to engage a broader audience with messages about the importance of **exercise, balanced nutrition, and smoking cessation**. Digital health campaigns can reach remote and underserved populations, especially in **low-income settings**, where access to traditional media may be limited.

The “**#ThisFreeLife**” campaign by the **WHO** used **social media platforms** to target **young people** and raise awareness about the dangers of **tobacco use**, using **influencers** and **video content** to communicate the health risks.

Policies to Promote Healthier Environments

Policies play a crucial role in **creating healthier environments** that reduce the risk factors for NCDs. Governments, policymakers, and healthcare systems should enact and enforce policies that promote **healthy environments**, such as **tobacco control, food labeling, and restricting unhealthy products**.

Tobacco Control Policies

Recommendation: Enforce strict **tobacco control** policies to reduce tobacco use, one of the leading causes of NCDs, particularly cardiovascular diseases and cancers.

Adopt **comprehensive tobacco control laws** that include **taxation, advertisement bans, public smoking bans**, and **health warnings** on tobacco packaging. Implement **smoking cessation programs** and increase **taxes on tobacco products** to make them less affordable and accessible.

Australia’s Plain Packaging Laws have been effective in reducing smoking rates by making cigarette packaging plain and unattractive, alongside **high tobacco taxes** and **public smoking bans**.

Food Labeling and Nutrition Policies

Implement **nutrition labeling** on food products to provide consumers with information about the **caloric content, sugar, salt, and fat** content of foods, allowing them to make informed dietary choices.

Enforce **mandatory food labeling** regulations on packaged foods that display **nutritional information** in clear, simple terms. Promote the use of **front-of-package labels** that highlight high levels of unhealthy ingredients, such as **sugar, fat, and salt**.

Chile has implemented a **front-of-package nutrition label** that uses warning labels to indicate high levels of sugar, fat, and salt in foods. This has led to a reduction in **obesity rates** and an increased demand for healthier foods.

Promoting Healthy Urban and Rural Environments

Design **cities** and **communities** that encourage **physical activity**, such as providing **safe parks, bike lanes, and walking paths**. Promote the availability of **affordable healthy food** in local markets and community centers.

Urban planners and policymakers should prioritize **public spaces** and **infrastructure** that support an active lifestyle, such as **parks, sports facilities, and pedestrian-friendly streets**.

Rural areas should also have access to **local markets** selling **fresh fruits and vegetables** at affordable prices.

Bogotá, Colombia, has developed a network of **bike lanes** and **pedestrian paths** that encourage cycling and walking as part of the city's efforts to promote physical activity and reduce NCD risk factors.

Community-Based Interventions to Promote Physical Activity and Healthy Diets

Community-based interventions are essential in **primary prevention** strategies because they target **local populations** and create an environment that supports **healthy behaviors**. These interventions engage community members and healthcare providers in promoting **physical activity** and **healthy eating** habits.

Community Exercise Programs

Establish community-level exercise programs that provide free or low-cost opportunities for **physical activity** and encourage **active living**.

Organize **community fitness programs**, such as **group walking, cycling clubs, yoga classes**, and **sports leagues**, especially in areas with limited access to fitness centers or recreational facilities. These programs can be organized in **parks, community centers, or open spaces**.

In **Mexico**, the **Active Living Initiative** has implemented community **walking groups, sports activities**, and **fitness challenges** to engage people in regular physical activity, with a focus on **obesity prevention**.

Healthy Eating Campaigns and Local Food Initiatives

Promote **healthy eating** at the community level by offering **nutrition education** and facilitating access to **affordable healthy foods**.

Organize **nutrition workshops, healthy cooking classes**, and **community gardens** that empower individuals to grow their own food and learn about **nutrient-dense foods**. Additionally, support local **farmers' markets** and initiatives that bring fresh produce to underserved areas.

The **“Farmers’ Market” initiative** in **New York City** provides affordable access to **fresh produce** for low-income families. Community members can access a variety of **locally grown fruits and vegetables**, which helps address food insecurity and supports healthy eating habits.

School-Based Health Interventions

Implement **school-based health programs** to educate children about **healthy eating** and the importance of **physical activity**.

Schools should provide **nutritious meals**, promote **physical education**, and incorporate **health education** into the curriculum. Schools should also collaborate with parents and local health organizations to encourage **healthy lifestyles** both in and outside of school settings.

The **“Healthy Schools Program”** in **California** promotes **healthy eating** and **physical activity** by offering **nutritious meals**, integrating **physical activity breaks** into the school day, and involving **students and parents** in nutrition education.

Early Detection and Screening Programs for Non-Communicable Diseases (NCDs)

Early detection and screening programs are essential components of a comprehensive strategy to reduce the burden of **non-communicable diseases (NCDs)** such as **hypertension, diabetes, cancers**, and other chronic conditions. These programs are particularly important in **low-income countries (LICs)** where healthcare resources are limited, and the burden of NCDs is rising. Early detection allows for **timely intervention, prevention of complications**, and **improved health outcomes**. However, implementing screening programs in LICs faces

several challenges, and overcoming these barriers requires innovative solutions and strong healthcare system support.

International funding and **public-private partnerships** can also support these programs, and **scale-up efforts** can drive down costs.

Pap smear screening in **Kenya** has been implemented using **mobile screening units**, which visit rural areas, reducing travel costs for patients and ensuring that **low-resource populations** are screened for **cervical cancer**.

Lack of Trained Healthcare Workers

Challenge: Limited healthcare workforce capacity is a major barrier to effective screening, especially in rural and underserved regions. There may be insufficient numbers of trained personnel to conduct screenings, interpret results, and provide follow-up care.

Solution: Task-shifting strategies, such as training **community health workers (CHWs)** to conduct basic screenings and **refer patients** for follow-up, can help increase the reach of screening programs. **Telemedicine** can also be used to provide consultations and guidance from **specialists** remotely.

In **Tanzania**, **nurses** and **community health workers** have been trained to conduct **blood pressure screenings** and **glucose testing** in rural areas. These workers then refer high-risk individuals to clinics for further diagnosis and treatment.

Public Awareness and Cultural Barriers

Challenge: Lack of public awareness about the importance of screening and the stigma associated with certain diseases (e.g., **cancer** or **diabetes**) can prevent individuals from participating in screening programs.

Solution: Health campaigns should focus on **education** and **awareness**, using culturally sensitive messaging. Community involvement is key to addressing **misconceptions** and **stigma** around diseases like cancer or diabetes. **Peer educators** and **local leaders** can be engaged to help spread positive messages about the benefits of screening.

In **India**, **breast cancer awareness campaigns** have involved **local women's groups** and **community health workers** to address cultural barriers and promote **mammography screening**. This has resulted in greater participation and early detection.

Examples of Successful Early Detection Programs in Low-Resource Settings

Despite the challenges, several low-income countries have successfully implemented early detection programs for NCDs. These examples demonstrate how tailored interventions can overcome barriers and lead to positive health outcomes.

Cervical Cancer Screening in Kenya

Kenya has launched a nationwide **cervical cancer screening** program using **mobile screening units** to reach rural and underserved populations. This initiative offers **Pap smears** and **HPV testing** at community health centers and mobile clinics.

This program has **increased access** to screening for women in remote areas, significantly reducing cervical cancer mortality rates by enabling early detection and treatment.

Hypertension Screening in Ghana

In **Ghana**, a **hypertension screening program** has been implemented in rural areas using **community health workers** trained to measure blood pressure, educate patients, and refer individuals to local clinics for follow-up care.

This program has successfully raised awareness about **hypertension**, encouraged early diagnosis, and improved the management of high blood pressure in rural communities, reducing the incidence of **stroke** and **cardiovascular disease**.

Diabetes Screening in India

India has implemented a nationwide **diabetes screening program** targeting high-risk populations, such as individuals with a family history of diabetes or those who are overweight. The program uses **mobile clinics** and **community health workers** to screen and provide education on **preventing diabetes**.

The program has significantly increased the early detection of diabetes, leading to better management of the disease and a reduction in **diabetes-related complications**.

Breast Cancer Screening in Colombia

Colombia has implemented a **breast cancer screening program** that includes **mammography** for women over the age of 50 and a network of **healthcare workers** who educate women about breast health and early detection methods.

This program has led to an **increase in early-stage breast cancer diagnoses**, improving **survival rates** and reducing the need for **aggressive treatments**.

Policy Recommendations and Global Frameworks for Reducing NCDs in Low-Income Settings

The rise in **non-communicable diseases (NCDs)** in **low-income settings (LICs)** has prompted global and local efforts to implement **policy frameworks** and **interventions** aimed at **prevention, early detection, and treatment**. **International organizations**, such as the **World Health Organization (WHO)** and **United Nations (UN)**, play a critical role in supporting these efforts through technical assistance, funding, and the development of global health frameworks. At the same time, **national and local policies** tailored to **promote healthy lifestyles** are essential to reduce NCD risk factors and improve health outcomes in LICs. Additionally, addressing NCDs requires **multisectoral approaches** that engage multiple stakeholders, including health, education, agriculture, urban planning, and finance sectors, to create a **healthy environment** for all.

This section outlines **policy recommendations** and explores the **global frameworks** and **multisectoral strategies** for reducing NCDs in low-income settings.

Role of International Organizations in Supporting NCD Reduction Efforts

International organizations such as the **World Health Organization (WHO)**, **United Nations (UN)**, **World Bank**, and various non-governmental organizations (NGOs) play an important role in **supporting NCD reduction** in low-income countries through:

Technical Assistance and Guidance

WHO and other international bodies provide **technical assistance** to LICs by helping them develop and implement **national health policies** that focus on **NCD prevention, screening, and treatment**.

Implementation: WHO provides **guidelines** on **NCD prevention**, such as their **Global Action Plan for the Prevention and Control of NCDs 2013–2020**, which emphasizes **policy development, capacity building, and data collection** for **NCD surveillance**.

WHO's **Tobacco Free Initiative** supports countries in developing **comprehensive tobacco control policies** that include **smoking bans, advertisement restrictions, and public awareness campaigns**.

Providing Funding and Resources

International organizations can provide **financial support** and **resources** for NCD prevention programs. This funding often comes in the form of grants, loans, and development aid to strengthen health systems, implement public health campaigns, and provide essential medicines.

such as **China’s tobacco control efforts** and **Mexico’s nutrition interventions**.

National and Local Policy Frameworks to Promote Healthy Lifestyles

National and local policies play a central role in creating environments that support **healthy lifestyles** and reduce the risk factors associated with NCDs, such as **unhealthy diets, tobacco use, and physical inactivity**.

Implementing Public Health Campaigns

Governments should invest in **nationwide health campaigns** to raise public awareness about NCD risk factors and the benefits of healthy lifestyles. These campaigns should emphasize the importance of **regular physical activity, balanced nutrition, and tobacco cessation**.

Implementation: Governments can implement **mass media campaigns** through television, radio, social media, and billboards to educate the public about **healthy behavior** and encourage **preventive measures**.

Thailand’s “Health Promotion” Campaign promotes **smoking cessation, nutrition education, and physical activity** in schools, workplaces, and communities. The campaign uses **media and community outreach** to reach diverse populations.

Enacting Policies to Promote Healthy Food Environments

Governments should adopt policies that improve access to **affordable, nutritious food** and regulate the availability of **unhealthy food products** that contribute to obesity, diabetes, and other NCDs.

Implementation: This includes **taxing sugary drinks, restricting marketing of unhealthy foods** to children, and ensuring that **public health guidelines** for healthy eating are incorporated into **school cafeterias, workplaces, and community centers**.

Mexico introduced a **soda tax** to reduce sugary drink consumption and improved **food labeling** to encourage healthier dietary choices. These policies have led to a reduction in **obesity rates** and improved **public health outcomes**.

Promoting Physical Activity through Urban Planning

National and local governments should invest in **urban planning** that encourages **physical activity**. This includes building **walkable cities, safe parks, and recreational facilities** to increase opportunities for **exercise and social interaction**.

Implementation: Policies should promote the development of **pedestrian-friendly infrastructure** and ensure access to **community sports facilities**, especially in **underprivileged areas**.

Bogotá, Colombia implemented the **Ciclovía program**, which closes streets to cars on Sundays, encouraging people to **bike, walk, and run**. This program has increased **physical activity levels** among residents and has been adopted in other cities.

The Importance of Multisectoral Approaches in Addressing NCDs

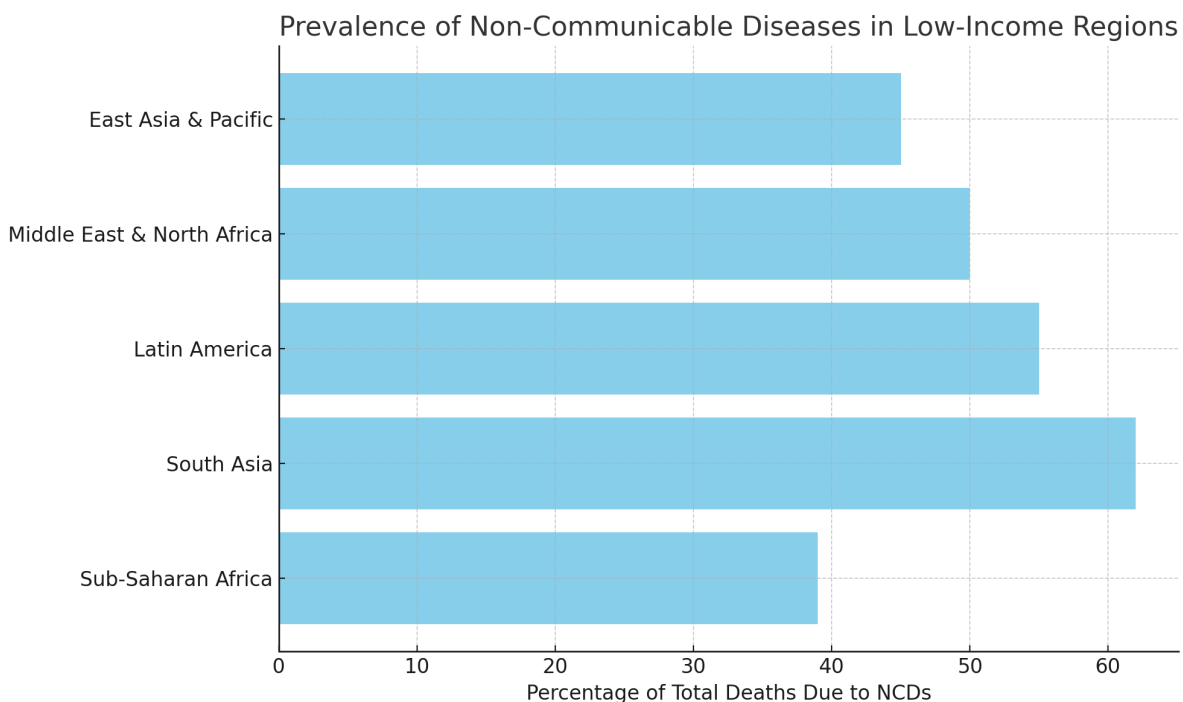
Addressing NCDs requires a **multisectoral approach** that goes beyond the healthcare sector and involves collaboration across **various sectors** such as **education, agriculture, transportation, urban planning, and finance**. A multisectoral approach ensures that NCD prevention and control are integrated into **broader development goals** and that all sectors contribute to improving health outcomes.

Collaboration Between Health and Education Sectors

Schools should become active participants in NCD prevention efforts by providing **health education**, promoting **physical activity**, and offering **healthy meals**. The health and education sectors must collaborate to create a **health-promoting school environment**.

Implementation: Incorporate **physical education** and **nutrition** education into school curricula and provide **healthy snacks** and **meals** through **school lunch programs**.

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Summary

Non-communicable diseases (NCDs) are a growing concern in **low-income settings**, where they contribute significantly to **morbidity** and **mortality**. While these countries face considerable challenges, including **resource constraints**, **healthcare disparities**, and **socioeconomic factors**, there are opportunities to implement **public health interventions** to curb the rise of NCDs.

Effective **primary prevention strategies**, such as **health education**, **environmental changes**, and **behavioral interventions**, can help reduce the prevalence of modifiable risk factors. Furthermore, **early detection** and **screening programs** are essential for identifying individuals at risk and providing timely treatment to prevent the progression of diseases. Strengthening **health systems**, integrating NCD care into **primary healthcare** services, and ensuring **affordable medications** are also crucial components of an effective public health approach.

Finally, **policy reforms**, supported by international and local stakeholders, are essential for creating a framework that supports **NCD prevention** and **treatment** in low-income countries. Multisectoral collaboration and global support can help LICs overcome the barriers to addressing NCDs and create a healthier, more sustainable future for their populations.

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