

Catching NCDs Before They Catch You: The Role of Early Detection

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Abstract

Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, cancer, and chronic respiratory conditions, account for a significant global health burden, particularly in low- and middle-income countries. With 74% of global deaths attributable to NCDs, early detection emerges as a vital strategy to mitigate their impact. This review underscores the importance of identifying innovative screening techniques and risk factors associated to non-communicable diseases. Programs like the National Programme for the Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) in India, and regional efforts in Tamil Nadu, illustrate the integration of early detection into health systems. By focusing on timely interventions, preventive strategies, and raising awareness, early detection not only reduces mortality but also alleviates the economic and emotional burden on individuals and healthcare systems. Emphasizing a collaborative approach among healthcare providers, policymakers, and communities can revolutionize the management of NCDs, transforming the silent epidemic into a manageable health challenge.

Keywords: Non-communicable Diseases, Early Detection, Screening, Prevention, Public Health

1. Introduction

Non-communicable diseases (NCDs) are chronic health conditions that are not caused by infectious agents and can be caused by factors such as genetics, lifestyle choices, and environmental factors. Examples of NCDs include cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases.(1) The socioeconomic consequences of NCDs make prevention and management a critical development need for the twenty-first century.(2) People of all age groups, regions and countries are affected by NCDs. These conditions are often associated with older age groups, but evidence shows that 17 million NCD deaths occur before the age of 70 years. Of these premature deaths, 86% are estimated to occur in low- and middle-income countries. Children, adults and the elderly are all vulnerable to the risk factors contributing to NCDs, whether from unhealthy diets, physical inactivity, exposure to tobacco smoke or the harmful use of alcohol or air pollution. These diseases are driven by forces that include rapid unplanned urbanization, globalization of unhealthy lifestyles and population ageing. Unhealthy diets and a lack of physical activity may show up in people as raised blood pressure, increased blood glucose, elevated blood lipids and obesity. These are called metabolic risk factors and can lead to cardiovascular disease, the leading NCD in terms of premature deaths.(3) Early detection plays a pivotal role in mitigating their impact by enabling timely interventions that can halt or reverse disease progression. Systematic early detection efforts can alleviate the economic burden on healthcare systems by preventing costly late-stage treatments(4).

Screening programs and public health initiatives targeting risk factors—like tobacco use, unhealthy diets, and physical inactivity—are essential for reducing premature mortality and improving quality of life. This approach aligns with global health priorities to address the silent epidemic of NCDs(5).

2. Prevalence of Non-Communicable Diseases

Non-communicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally. Each year, 17 million people die from a NCD before age 70; 86% of these premature deaths occur in low- and middle-income countries of all NCD deaths, 77% are in low- and middle-income countries(3). Over 5.8 million Indians lose their lives each year to NCDs like diabetes, cancer, heart disease, and stroke (WHO report, 2015). In other words, one out of four Indians has the highest probability of dying from NCDs before reaching the age of 70 years.(6) Non-communicable diseases (NCDs) pose a significant health challenge in Tamil Nadu, accounting for approximately 72.3% of the state's disease burden(7). The 2020 Tamil Nadu STEPS Survey reported a hypertension prevalence of 33.9% and diabetes prevalence of 17.6% among adults aged 18-69(8).

3. Importance of Early Detection

The early detection of non-communicable diseases (NCDs) is vital for improving health outcomes and reducing the burden on healthcare systems. NCDs, such as diabetes, cardiovascular diseases, cancer, and respiratory conditions, often progress silently, showing symptoms only in advanced stages when treatment becomes more challenging(4). Early detection allows for timely intervention, including lifestyle changes, preventive measures, and medical treatments, which can significantly slow disease progression and improve survival rates. According to the World Health Organization (WHO), early detection and effective management of NCDs can prevent millions of premature deaths annually(5).

4. Screening and Diagnostic Approaches

Screening and diagnostic strategies for non-communicable diseases (NCDs) play a crucial role in early identification and effective management. Common techniques include routine health examinations, blood analyses, imaging methods, and genetic testing. For example, tests for blood glucose and HbA1c levels are utilized to identify diabetes, while lipid profiles assess cardiovascular risk. Imaging techniques such as mammography and low-dose CT scans are used for the early detection of breast and lung cancers, respectively. These methods are frequently incorporated into public health initiatives to ensure they are accessible and affordable, particularly in low-resource environments(9). Additionally, the World Health Organization's guidelines advocate for the development of cost-effective diagnostic tools and capacity building in healthcare systems(10).

5. Screening Methods of Non-Communicable Diseases

Programmes for Non-communicable diseases early detection:

6. Programmes for Early Detection

Under the National Health Mission, the National Programme for the Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) is being implemented (NHM). The program's goals include health promotion activities and opportunistic free screening for common Non-Communicable Diseases (NCDs), such as cancer. Community-based risk assessment, screening, referral,

and follow-up of all adults aged 30 and up for prevalent NCDs are key components of population based screening. The effort will aid in early detection and raise awareness about NCD risk factors(11)

7. Spotting the Risks

cardiovascular diseases, risk factors such as hypertension, smoking, and obesity can lead to symptoms like exhaustion and chest pain. In order to avoid serious problems, early identification with blood pressure monitoring and ECG is essential.

8. Conclusion

The Non-Communicable disease are the leading cause of death globally, identifying risk factors, implementing timely screening programmes, and ensuring health care solutions can significantly improve health outcomes. Identifying non-communicable diseases at an early stage is essential for lowering the rate of illness, death and the financial impact linked to these diseases. Public Health campaigns, and policy initiatives could significantly improve early detection methods especially in low and middle income nations. Where the prevalence is greatest. In future, a teamwork that includes health care workers, government entities and local communities is essential to promote preventive strategies, boost awareness, and enhance health care system for the effective management of non-communicable diseases. By prioritizing early detection, we can mitigate the long –term impact of these disease and improve overall public health.

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