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Review Article

Burden of noncommunicable diseases and implementation challenges of National NCD Programmes in India



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ABSTRACT

Background: Out of the total deaths globally, noncommunicable diseases (NCDs) account for 72% of the deaths. In India, as per the global burden of disease 2016 estimates, NCDs contributed to 62% of the deaths and 55% of the disability-adjusted life years, thereby posing a huge burden. Before 2010, there was no integrated programme, which addresses these NCDs, but there were many programmes parallely running and catering to different aspects of these NCDs. Now almost 13 programmes are directly or indirectly contributing to the NCD prevention and control with many implementation challenges.

Methods: A review on the status of NCD burden estimates globally and nationally was undertaken. The National NCD Programme and other strategies associated with addressing the NCDs were searched using the search engines PubMed and Google Scholar along with the websites of national ministries, government portals and meeting proceedings.

Results: Health is a state subject, with National Health Mission (NRHM/NUHM) as a flagship programme of Ministry of Health and Family Welfare. There are 13 programmes contributing to NCD prevention and control directly or indirectly and the major one is the National Programme for prevention and control of cancer, diabetes, cardiovascular diseases and stroke (NPCDCS). The other initiatives taken for NCD prevention and control include the National Action Plan to achieve NCD targets by 2025 and development of Multisectoral Action Plan (2017–2022). The infrastructure for NPCDCS includes 524 district NCD cells, 565 district NCD clinics, 167 district cardiac care units, 164 district day care centres and 2759 Community Health Centre NCD clinics. The key challenges are with trained human resources for the screening of the NCDs, low budget allocation and utilisation, lack of access to diagnostics and regular supply of essential medicines. There is also poor focus on health promotion, multisectoral participation, surveillance, monitoring and evaluation of the programme at different levels of health care delivery.

Conclusion: The government has taken different initiatives for the prevention and control but effective implementation is the major challenge in India. A health system strengthening with focus on health promotion in different settings, robust surveillance and access to individual clinical services is required. Collaborations with ministries, multisectoral

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approach, strengthening of referral system along with involvement/training of grassroot level workers who efficiently implement are needed. Bolstering of screening, diagnostic and treatment service will be fruitful.

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Introduction

The four major noncommunicable diseases (NCDs) are cardiovascular diseases (CVDs), diabetes, cancer and chronic respiratory diseases. In the year 2016, more than three quarters of NCD deaths happened in low and middle-income countries with almost 46% of deaths occurring in those below the age of 70 years.¹ In India, also the burden of these diseases is rising; in 1990, the deaths due to NCDs contributed to 53.6% whereas these have increased to 61.8% in 2016.² In the age group of 40–69 years, 73.2% of the deaths are due to NCDs out of the total deaths in this particular age group.³ The major contributors for mortality in India among NCDs are CVDs, chronic respiratory diseases, cancer, diabetes and other endocrine disorders.³ With respect to the morbidity data due to NCDs, the Disability-Adjusted Life Years (DALYs) has been increased from 30.9% in 1990 to 55.4% in 2016 in India.³ The major contributors for the increased DALYs amongst NCDs are CVDs, chronic respiratory diseases, other NCDs, diabetes and other endocrine disorders in India.⁴ There has been an increase in the attributable risk to NCDs contributed by dietary risks, tobacco use, alcohol use, decreased physical activity, raised blood pressure, raised fasting plasma glucose, high total cholesterol and high body mass index.⁵

NCD risk factor surveys conducted in northern states of India, i.e., Punjab and Haryana, have also showed the high prevalence of the NCD risk factors.^{6,7}

Before 2010, there was no integrated NCD programme, which addresses these NCDs, but there were few programmes parallelly running and catering to different aspects of these NCDs, e.g., National Cancer Control Programme, National Mental Health Programme and National Tobacco Control Programme.⁸ This paper describes the burden, national initiatives and implementation challenges of National NCD Programmes in India.

Materials and methods

A review on the status of NCD burden estimates globally and nationally was undertaken. The National NCD Programme and other strategies associated with addressing the NCDs were reviewed. We searched the Internet using key words (((((((Challenges) AND Implementation) AND (National Programme for Prevention and Control of Cancer, Diabetes, CVD & Stroke)), OR NPCDCS) OR National Programme for NCDs) OR (National Programme for prevention and control of NCDs)) OR (National NCD Programme)) AND India for all publicly available national policies and actions related to NCD Programme

implementation and impact assessment of the implemented policies related to NCD prevention and control. The search was limited to India for the National NCD Programme. We searched open access websites of relevant national ministries, which are related to NCD prevention and control (i.e., ministry of health, public health) and government portals.

Results

Burden of NCDs: As per the Global Burden of Disease Study estimates conducted on the state wise analysis of the disease pattern in 2016, there was an increase in DALYs due to NCDs from 30% in 1990 to 55% in 2016, and of injuries from 9% to 12%.³ The states with highest epidemiological transition ratio are Goa, Himachal Pradesh, Kerala, Punjab and Tamil Nadu. The epidemiological transition has reflected wide variations among the different states from 48% to 75% for NCDs and 9% to 14% for injuries. The states of Kerala, Goa and Tamil Nadu had increased burden of NCDs and injuries in comparison to infectious and other associated diseases. The five leading causes of raised burden of disease in 2016 in India were NCDs with CVDs and chronic obstructive pulmonary disease (COPD) at top two and stroke at fifth place.⁵

The major risk factors such as unhealthy diet, raised blood pressure, raised blood sugar, increased cholesterol and overweight are mostly causing ischaemic heart disease, stroke and diabetes.³ In 2016, the combination of leading risk factors was highest in Punjab, Kerala, Maharashtra, Tamil Nadu and Andhra Pradesh, but in each, the contribution of these risks has increased since 1990.⁵ The other leading causes of CVDs, diabetes, cancers and some other diseases include tobacco use, responsible for 6% of the total disease burden in India in 2016. From a gender point of view, all these risks are more in males than in females.⁵

The state-wide NCD risk factor survey, i.e., STEPS survey, was conducted in the states of Punjab⁶ and Haryana⁷ in the year 2015 and 2018 respectively. The results showed the high prevalence of the NCD risk factors in both north Indian states as given in Table 1. However, organised NCD STEPs surveys in other states are lacking except for Kerala.

National initiatives for prevention and control of NCDs: National Health Mission with NRHM and NUHM under Ministry of Health and Family Welfare (MoHFW) has national NCD cells, state NCD cells besides other divisions, district NCD cells and district NCD clinics, community health centre (CHC) NCD clinics and primary health centres (PHCs), subcentre and health and wellness centres. As per the MoHFW data for 2018, the infrastructure includes 524 district NCD cells, 565 district

Table 1 – Prevalence of the noncommunicable disease risk factors in Punjab and Haryana.

State	Punjab			Haryana		
	Male*	Female*	Total*	Male*	Female*	Total*
<5 servings of fruit/vegetables per day	95.3	96.4	95.8	99.0	99.5	99.4
Low physical activity (<90 min)	22.4	41.3	31.1	20.1	10.9	16.0
Current alcohol users	27.4	0.3	14.9	18.8	0.2	10.5
Current tobacco users	13.1	0.3	7.2	38.9	4.3	23.5
Raised salt intake (>5 g/day)	90.7	81.2	86.7	94.5	86.4	91.3
High blood pressure (>140/90 mm of Hg)	47.4	31.5	40.1	29.5	22.1	26.2
Hyperglycaemia (>110 mm/dl)	14.0	14.6	14.3	14.2	17.6	15.5
Obesity (BMI > 30 kg/m ²)	11.3	14.6	12.8	6.2	13.4	9.4
Overweight (BMI > 25–29 kg/m ²)	27.5	29.9	28.6	26.8	24.5	25.7
Hypercholesterolaemia (>190 mg/dl)	16.9	15.1	16.1	30.6	33.3	31.6

* Figures are as percentages.

NCD clinics, 167 district cardiac care units, 164 district day care centres and 2759 CHC NCD clinics.⁹

The NCD Programmes in India that are directly and indirectly related with NCD prevention and control are given in the Table 2.⁸ The integrated programme dedicated to the NCD prevention and control, i.e., National Programme for Prevention and Control of cancer, diabetes, CVDs and stroke (NPCDCS), was initiated in the pilot phase in 10 districts of India; further in 2010, it was upscaled and launched in the 100 districts of 21 states and gradually all the districts of the India.¹⁰ The objectives of the NPCDCS are to prevent and control common NCDs through behaviour and lifestyle changes; provide early diagnosis and management of common NCDs; build capacity at various levels of health care for prevention, diagnosis and treatment of common NCDs; train human resource within the public health setup, viz., doctors, paramedics and nursing staff to cope with the increasing

burden of NCDs and to establish and develop capacity for palliative and rehabilitative care.¹¹

In NPCDCS, the services included preventive, promotive, curative and supportive services for cancer, diabetes, CVDs and stroke at various government health facilities with provisions to cover more diseases under the programmes such as chronic lung diseases and chronic renal diseases. According to the level of health facility, the package of services may vary from facility to facility. The services to be provided are health promotion, psycho-social counselling, indoor and outdoor patient management, home-based services, day care services and palliative care with referral for specialised services as per the need. Cohesion of district hospitals with private laboratories and NGOs will aid in providing the components of continuum of care and support for outreach services. For comprehensive care, the district will be linked to tertiary cancer care health facilities. Health education programmes that help in promoting exercise, weight reduction, screening and early diagnosis are the key interventions that need to be promoted at various levels of health facilities.

There are almost 21 documents or guidelines or manuals developed so far under NPCDCS and the major ones are the operational guidelines for the NPCDCS (Revised - 2013–17),¹¹ population-based NCD screening guidelines for prevention, screening and control of common NCDs for hypertension, diabetes and common cancers (oral, breast and cervix)¹² with screening algorithms for each disease at each level of healthcare delivery system introduced in 2016 and operational framework for management of common cancers¹³ in 2016 developed by MoHFW.

Furthermore, the newer components under the NPCDCS include integration of AYUSH with NPCDCS; in six districts of Krishna (AP), Darjeeling (WB), Gaya (Bihar) for Homeopathy (through Central Council for Research in Homeopathy); Surendranagar (Gujarat), Bhilwara (Rajasthan) for Ayurveda (through Central Council for Research in Ayurvedic Sciences) and Lakhimpur Kheri (UP) for Unani (through Central Council for Research in Unani Medicine).¹⁴ Guidelines for prevention and management of COPD and chronic kidney disease are also in process to be included under the programme. Prevention and control of rheumatic fever and rheumatic heart disease have already been initiated under the NPCDCS and RBSK (Rashtriya Bal Swasthya Karyakram), in

Table 2 – Main noncommunicable disease-related National Health Programmes in India.

National Programmes	
1	National Cancer Control Programme (1975) and now Integrated in NPCDCS in 2010–11
2	National Programme for Control of Blindness and Visual impairment (1976)
3	National Mental Health Programme (1982)
4	National Iodine Deficiency Disorders Control Programme (1986)
5	National Deafness Control Programme (2006–07)
6	National Tobacco Control Programme (2007)
7	National Programme for Prevention and Control of Fluorosis (2007–08)
8	National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke (2010)
9	National Programme for Healthcare of Elderly (2010–11)
10	Pilot Programme for Prevention and Management of Burn Injuries (2010–11)
11	National Organ Transplant Programme (2012)
12	National Program for Palliative Care (2012)
13	National Oral Health Programme (2014–15)
14	Capacity Building for Trauma Care Facilities in Government Hospitals on National Highways (2016)

Table 3 – National Monitoring Framework with Targets of NCD Prevention and Control in India until 2025.

Framework element	Outcome	Targets		
		2020	2025	
1	Premature mortality from NCDs	Relative reduction in overall mortality from CVDs, cancer, diabetes or chronic respiratory disease	10%	25%
2	Obesity and diabetes prevalence	Halt in rise in obesity and diabetes prevalence	No midterm target set	Halt in rise in obesity and diabetes prevalence
3	Physical inactivity	Relative reduction in prevalence of insufficient physical activity	5%	10%
4	Raised blood pressure	Relative reduction in the prevalence of raised blood pressure	10%	25%
5	Salt/sodium intake	Relative reduction in mean population intake of salt with the aim of achieving recommended level of less than 5g per day	20%	30%
6	Alcohol use	Relative reduction in alcohol use	5%	10%
7	Tobacco use	Relative reduction in prevalence of current tobacco use	15%	30%
8	Drug therapy to prevent heart attacks and strokes	Eligible people receive	30%	50%
9	Essential medicines and basic technologies to treat major NCDs	Availability of essential NCD medicines and basic technologies to treat major NCDs public/private facilities	60%	80%
10	Household indoor air pollution	Relative reduction in household use of solid fuel as primary source of energy	25%	50%

three selected districts (Gaya in Bihar, Firozabad in Uttar Pradesh and Hoshangabad in Madhya Pradesh) and integration of Revised National Tuberculosis Control Programme (RNTCP) with NPCDCS, wherein the “National Framework for Joint Tuberculosis-Diabetes Collaborative Activities” including bidirectional screening has been started, and media platforms are also being used to generate awareness on NCD prevention and control.¹⁵ In mobile technology, to generate awareness an application called mDiabetes has been launched.¹⁶

With respect to the NCD targets in May 2013, the World Health Assembly unanimously approved an Action Plan and Global Monitoring Framework for major NCDs. India was the first country to adopt this monitoring framework in 2013.¹⁷ The National NCD Monitoring Framework has 10 targets and 21 indicators to track and monitor the progress of actions designed to prevent and control NCDs by 2025 and is given in the Table 3.¹⁷

In addition, at the national level, the National Steering Committee on NCD Surveillance & Monitoring NCD Surveillance and Monitoring was constituted with members from MoHFW, ICMR, RGI, experts and WHO.¹⁸

In addition, for the effective implementation and integration of the programme with other sectors, a National Multi-sectoral Action Plan for prevention and control of common NCDs was developed for 2017–2022.¹⁹ The MSAP includes the partnership with a “Whole of Government” or “Health in All Government Policies” approach to influence public health policy that combines action of different stakeholders, by engaging different ministries such as Health, Finance, Home, Education, Women and Child Development, Commerce, Environment, Agriculture, Civil Supplies, Food Processing, Local self-government and Panchayati Raj, Urban and Rural Development, Transport and Information and Broadcasting. An international roundtable meeting during World NCD Congress 2017 was held for the extent of multisectoral participation for NCDs, which highlighted the lack of coordination in different sectors mainly affecting the success of any programme.²⁰ The outcomes of the roundtable meeting underlined the requirement of proper coordination mechanism, strengthening of surveillance, implementation, monitoring and evaluation of NCD programmes.²⁰

Implementation Challenges of NPCDCS: The implementation challenges are described in relation with the existing health system in terms of the six building blocks, i.e., health service delivery, health workforce, health information systems, access to essential medicines, financing and leadership/governance.²¹ Though the NCD cells are being developed at the district level coordinated by the state NCD cell, as such, the functioning of the same at the district level is still poor. The health workforce recruited is mainly of contractual staff and training under NPCDCS at all levels is still an issue. The State Nodal Officer appointed or designated has many additional charges, which is also a challenge in the NPCDCS. A study conducted in the southern India showed that the most important missing link in programme implementation is the unavailability of medical officers and other relevant staffs. As posts are vacant, and Medical Officers (MOs) who are present, are contractual recruitments. Also, the training under NPCDCS needs to be

more practical and robust with focus on development of skills.²²

The NPCDCS Management Information System is yet to be in place and also there is a need to develop ‘data-base of NCDs’ to understand landscape of NCDs and associated risk factors, so as to plan an evidence-based local response. Although a reporting system through standard forms is in place from the primary health care delivery system to the district and then to the state level, the consistency of the data is still lacking due to lack of proper health information system. In relation to finance and logistics, there is low central budget allocation, and on the other hand, there is under-utilisation of NPCDCS budget in many states as well as the irregular supply of drugs/consumables in NCD clinics. In the Punjab⁶ and Haryana⁷ STEPS survey, it was found that of all the known hypertensive cases in Punjab, 48.3% of the respondents were aware of their condition, 30.9% are on treatment, while only 18.3% of the cases of hypertension were controlled; of all known diabetes cases in Punjab, 34.2% of the respondents were aware of their condition, 28.2% are on treatment while only 14.2% of the cases of diabetes were controlled; of all the known hypertensive cases in Haryana, only 33.4% of the respondents were aware of their condition, 26.3% were on treatment, while only 12% of the cases were controlled; out of diabetes cases in Haryana, 29.5% of the respondents were aware of their condition, 22.4% were on treatment, while only 13.8% of the cases of diabetes are controlled. The population-based screening initiated under the programme is also challenging in terms of the referral and tracking system, a study revealed that follow-up treatment services for screened NCDs under NPCDCS must be made available at subcentres to higher centres for better compliance and follow-up.²² Also, follow-up rates of screening undertaken initially revealed high loss of suspected cases to follow.

Further, to raise public awareness and develop strategies to modify risk factors, health promotion and advocacy needed to be strengthened. A study conducted in the northern India to evaluate the budget on IEC/BCC in Punjab and Haryana for 2016–17 has found that Punjab is spending 0.62% and Haryana is spending 1.2% on IEC/BCC activities. Out of this IEC/BCC budget, three-fourths (75%) of budget for IEC/BCC go for printing of registers and newspaper advertisements. It was recommended that the same needs to be increased to 4–5% from the present budget at the state level.²³

For the smooth functioning of any programme, a robust monitoring and evaluation is required and is essential. In the NPCDCS, there is a lack of a regular supervision and monitoring system, though the programme was initiated in 2010. A study in India concluded that the monitoring and evaluation of programme needs to be done at all levels of health care delivery. The focus of monitoring and evaluation will vary with data for facility-level monitoring at lower levels and indicator-based data for higher levels for programme evaluation. Therefore, there is a need to identify a unit that can triangulate and coordinate evaluation activities.²⁴

Discussion

The key initiatives in the country for the prevention and control of NCDs include 13 programmes contributing to NCDs

with a major integrated programme (NPCDCS),¹¹ National Monitoring Framework with 10 targets and 21 indicators and a National Multisectoral Framework (2017–2022).¹⁷ However, implementation is generally poor as per the available data.^{6,7}

There is a poor focus on health promotion with a low allocated budget. A study carried out in the states of Punjab and Haryana has observed that Punjab (3.68/587 crores) and Haryana (4.8/404 crores) are spending only about 0.6–1% of their total budget available under NHM for IEC/BCC/health promotion activities for the year 2016–2017, respectively.²³ However, to reach community in the periphery and a population-level impact, NCD programme needs to provide adequate resources to mainstream health promotion. A systematic review done for the Low middle income countries (LMICs) for Community health workers (CHWs) in health programmes has the potential to be effective in LMICs, especially for diabetes, blood pressure control and tobacco cessation.²⁵ The important component of NPCDCS on population-based NCD screening for hypertension, diabetes and common cancers is also poorly functional.^{6,7} A study done in Karnataka for the assessment of implementation of NPCDCS showed that only 69% of Auxiliary nurse midwife (ANMs) had received training for NPCDCS.²² The multisectoral approach¹⁹ needs to be strengthened and should be an integral part of the programme. Food processing industry needs to reduce salt content in their products so as to reduce the risks for CVDs. Similarly, the urban planning departments and department of transport jointly need to replace existing infrastructure that promotes the use of private transport and provides enabling environment to promote the physical activity. The major challenges of the NCD programmes and policies lie in the fact that most governmental non-health departments lack ownership and understanding of their role in NCD prevention and think this as strictly a health sector's domain.²⁵ Also, the lack of resources (financial, physical and technical) and institutional arrangement to work under a multisectoral arrangement, weak and fragmented health system hampers to reach out disadvantaged and marginalised populations.²⁶ A critical shortage of the public health workforce in India hinders the evidence-based decision-making because of inappropriate health information systems.²⁷

The opportunities that should be incorporated under the programme should be innovative partnerships like involvement of local stakeholders, non-health sector corporates and NGOs. As of now, there is component of public–private partnership in the programme but the extent of implementation and the outcomes of the same need to be focused in terms of data or the population which got benefitted from such an initiative. Task force on tobacco control exists. Health promotion for NCD prevention and control is required to be broadened in the functions of task force. Government should be committed to raise funding for NCD prevention programmes as major NCDs are preventable. In health care costs, access to early screening and management needs to be improved with provision for diagnosis and essential medicine, in partnership with existing private sector. The catastrophic expenditure should be avoided. Models for health promotion in different settings are developed and are available in the country that can be upscaled in schools,^{28,29,30} workplaces³¹ and community.³²

A strong surveillance, monitoring and evaluation system is required for better implementation of the programmes. The important barrier for effective planning and implementation of NCD prevention and control programmes is lack of availability of robust surveillance data and research on NCDs. A strong surveillance system needs to be developed, which can provide reliable and timely data on NCD risk factors, morbidity, mortality, quality of healthcare and health expenditures. Strengthening of public health facilities for providing services of screening, early diagnosis and treatment within the public health care delivery system is required.

The country really needs to be geared up to face the challenge of NCD epidemic in India with the focus on implementation research. There is need for creating a central NCD division in MoHFW, which works for integrated and coordinated action with other sectors for prevention and control of NCDs. Health system strengthening with primary health care approach, health promotion in different settings, robust surveillance and access to essential medicines and technology is critical for success to address NCD epidemic in the country.

Disclosure of competing interest

The authors have none to declare

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