LIFESTYLE DISEASES IN KERALA - BURDEN

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Proportion of global deaths under the age 70 years, by cause of death, comparable estimates, 2012
Age-standardized NCD death rates by WHO region

AFR = African Region, AMR = Region of the Americas,
SEAR = South-East Asia Region, EUR = European Region,
EMR = Eastern Mediterranean Region, WPR = Western Pacific Region
Probability of dying from the four main noncommunicable diseases between the ages of 30 and 70 years comparable estimates, 2012
NCD and risk factors

Social determinants and drivers
- Globalization
- Urbanization
- Ageing
- Income
- Education
- Housing

Behaviour risk factors
- Unhealthy diet
- Tobacco use
- Physical inactivity
- Harmful use of Alcohol

Metabolic risk factors
- High blood pressure
- Obesity
- Diabetes
- Raised blood lipids

Cardiovascular disease
- Heart attack
- Strokes
- Heart failure
(1) A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases

(2) At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context

(3) A 10% relative reduction in prevalence of insufficient physical activity

(4) A 30% relative reduction in mean population intake of salt/sodium

(5) A 30% relative reduction in prevalence of current tobacco use

(6) A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances

(7) Halt the rise in diabetes and obesity

(8) At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes

(9) An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases in both public and private facilities
Status of risk factors in Kerala
Tobacco use in Kerala

Tobacco use in Kerala

Smoking in Kerala over past 30 years

Current smoking

\[ y = -0.5286x + 1075.2 \]
\[ R^2 = 0.9748 \]

Current smoking in males

\[ y = -0.9053x + 1848.3 \]
\[ R^2 = 0.7959 \]
Alcohol use in Kerala

- Current use of alcohol (within one month) was seen in 20-23% of males aged above 15 years in Kerala.

- Annual Per capita alcohol consumption was 10.2 L which is comparable to national average (11.4 L).

ICMR. NON-COMMUNICABLE DISEASE RISK FACTORS SURVEY India Phase 1 2008-09. 2007.
Obesity

- The prevalence of overweight and obese (BMI $\geq 25$) in the state was estimated to around 30% and is showing an upward trend.

- Central obesity (based on waste circumference, WC) is more prevalent affecting as much as 40% of the population.

- Obesity/overweight was more common in females (BMI-38%, WC-52%) when compared to males (BMI-24%, WC-26%).
Hyper-cholestrolemia

<table>
<thead>
<tr>
<th>Study</th>
<th>All</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thankappan et al</td>
<td>57</td>
<td>51</td>
<td>62</td>
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<tr>
<td>Vijayakumar et al</td>
<td>37</td>
<td>30</td>
<td>41</td>
</tr>
<tr>
<td>INDIAB study</td>
<td></td>
<td></td>
<td>13.9</td>
</tr>
</tbody>
</table>
Dietary practice in Kerala

Major cooking oil

- Coconut oil: 87.9%
- Palm oil: 9.9%
- Oil rich in unsaturated fatty acid: 3.5%
Dietary practice in Kerala

<table>
<thead>
<tr>
<th>Specific Food Items</th>
<th>Kerala</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Cheese/Butter</td>
<td>0.9</td>
</tr>
<tr>
<td>Fried local foods</td>
<td>14.7</td>
</tr>
<tr>
<td>Red Meat</td>
<td>1.5</td>
</tr>
<tr>
<td>Eggs</td>
<td>6.2</td>
</tr>
<tr>
<td>Chicken</td>
<td>1.0</td>
</tr>
<tr>
<td>Fish</td>
<td>58.4</td>
</tr>
<tr>
<td>Aerated Soda</td>
<td>2.6</td>
</tr>
<tr>
<td>Sweetened drinks</td>
<td>4.2</td>
</tr>
<tr>
<td>Pizza/ burgers/ French fries etc.</td>
<td>0.3</td>
</tr>
<tr>
<td>Cakes, Pastries or other bakery items</td>
<td>4.9</td>
</tr>
<tr>
<td>Chips, Namkeen etc.</td>
<td>6.0</td>
</tr>
</tbody>
</table>
Physical inactivity

- Low level of physical activity was seen in 75% of the population as per the STEPS survey report.

- Lack of physical activity was more common in women when compared to men.

- The low level of physical activity was same in both urban and rural areas as well as across different age groups.
Diabetes
Age-standardized prevalence of diabetes, 2014
Comparison of current age standardized prevalence of diabetes in above 18 years

Age standardized prevalence of diabetes among >18 years

<table>
<thead>
<tr>
<th></th>
<th>Kerala</th>
<th>India</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence</td>
<td>14.8</td>
<td>9.5</td>
<td>9</td>
</tr>
</tbody>
</table>


Diabetes in Kerala over last 25 years

Prevalence of diabetes

\[ y = 1.0179x - 2023.9 \]

\[ R^2 = 0.6882 \]

<table>
<thead>
<tr>
<th>Year</th>
<th>Prevalence of diabetes (%)</th>
</tr>
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<tbody>
<tr>
<td>1990</td>
<td>4</td>
</tr>
<tr>
<td>1992</td>
<td>5.9</td>
</tr>
<tr>
<td>1994</td>
<td>16.3</td>
</tr>
<tr>
<td>1996</td>
<td>19.6</td>
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<tr>
<td>1998</td>
<td>16.2</td>
</tr>
<tr>
<td>2000</td>
<td>14.6</td>
</tr>
<tr>
<td>2002</td>
<td>16.3</td>
</tr>
<tr>
<td>2004</td>
<td>27.3</td>
</tr>
</tbody>
</table>

Graph showing the trend of diabetes prevalence from 1990 to 2012.
Prevalence of diabetes

Prevalence of diabetes

Prevalence of diabetes in age group 30-40 years


Detection, treatment and control of diabetes in Kerala

**Aware**
- All: 72
- Males: 73
- Females: 71

**Treated**
- All: 68
- Males: 65
- Females: 70

**Controled**
- All: 22
- Males: 31
- Females: 15
Hypertension
Age standardized prevalence of hypertension in above 18 years

- Kerala: 28%
- India: 23%
- World: 22%


Trend in prevalence of hypertension in Kerala (above 30 year of age)

Prevalence of hyper tension (%)
Burden of hypertension

- The prevalence was almost same in both genders as well as in urban and rural areas.

- The burden of hypertension increases with age
  - studies reports that 60-80% of people above age of 60 were hypertensive

- proportion of people in pre-hypertension stage is also very high (upto 40%).
Detection, treatment and control of hypertension in Kerala

![Graph showing detection, treatment, and control of hypertension in Kerala. The graph includes data for males and females.](chart.png)
Cardiovascular diseases
Cardiovascular diseases

- Cardiovascular diseases is the leading cause of mortality in Kerala contributing to as much as 40% of all deaths.

- The age adjusted death rate due to cardiovascular in the state is 490 per lakh for men and 231 per lakh for women every year.
Coronary artery diseases

- State reports a higher prevalence of coronary artery diseases when compared to other states in India
  - 7.4% in rural (in 1991)
  - 13.5% in urban (in 1995)

- The estimated prevalence of coronary artery disease in the age group 20-69 years for 2015 is 10.1%.(31)

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Death due to coronary artery disease in kerala

Acute coronary event in Kerala

- CAD in Kerala is both premature and malignant
  - Average age is 60 years (56 in males and 69 in females)
  - 60% of CAD deaths in men and 40% of CAD deaths in women occur before the age of 65 (USA-18%)
  - 1 month case fatality rate following STEMI- 8.5% (around 4 in developed countries)


Prevalence stroke among adults (>18 years) in the state was 0.3%.

The age adjusted annual incidence of stroke in Kerala in 2010 was 135 per 100,000. There were more in males (143) compared to females (128).

Ischemic stroke was the most common type of stroke (73 per 100,000).

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No urban rural difference in incidence

Average age of stroke patients was 67 years
- Stroke in the young (<40 years) only 4%

Case fatality rate within one month was 24.5% for urban and 37.1% for rural populations which is comparable to national figures

Cancer
Incidence of cancer in Kerala

Per 100,000

Kerala (1)
India (2)
World (2)

Trend in incidence of cancer in Kerala

Thiruvananthapuram

Kollam


Among males lung cancer (14.5%) was the leading site followed by cancer of oral cavity (14.2%).

Among females cancer of breast (29.8%) was the leading site of cancer followed by cancer of thyroid (12.5%).

Children (0-14 years) constituted 4.8% of all cancers and leukemia was the predominant cancer among them in both genders (males 57.5% and females 47.5%).
Change in cancer incidence in females from 1991-92 to 2009-11

Multiple myeloma etc.
Kidney etc.
Corpus uteri
Thyroid
Hodgkin lymphoma
Melanoma of skin
Bladder
Lung
Intestine and anal
Breast
NHL
Ovary etc.
Larynx
Pancreas
CNS
Liver
Leukaemia
Connective tissue
Bone
Stomach
Lip and oral cavity
Oesophagus
Other skin
Nose, sinuses etc.
Cervix uteri
Genital organs
Eye
Chronic Lung diseases
Chronic lung diseases

- Chronic obstructive pulmonary diseases (COPD) accounted for 5.2% of the total NCD burden and 12.2% of the NCD related mortality.

- In Kerala, 15.3% of the death were due to respiratory causes of which COPD was the main culprit
Prevalence of chronic respiratory disease in Kerala

![Bar chart showing prevalence of chronic bronchitis and asthma in Kerala and India](image_url)

Chronic bronchitis

Asthma

urban

rural

Males

Females

Chronic bronchitis

Asthma

5 4.5

13.5 1.9

11 9

2.5 3.7
Prevalence of chronic bronchitis

Kerala

<table>
<thead>
<tr>
<th>Age Group</th>
<th>% Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>35-44</td>
<td>6.2</td>
</tr>
<tr>
<td>45-54</td>
<td>9.4</td>
</tr>
<tr>
<td>55-64</td>
<td>14.6</td>
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<tr>
<td>65-74</td>
<td>18.7</td>
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<tr>
<td>75-84</td>
<td>27.0</td>
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<tr>
<td>&gt;84</td>
<td>37.5</td>
</tr>
</tbody>
</table>
Chronic Kidney disease

- Age-adjusted incidence rate of ESRD in India to be 22.9 per lakh population.
  - 7500 new chronic kidney diseases every year in Kerala
- Prevalence in hospitalized patients is 17 %
- 33 % in Kerala
- Main causes are diabetes nephropathy and hypertensive nephrosclerosis


Conclusion

- The current data shows that prevalence of major Non communicable diseases is showing an upward trend in the state.
- The high prevalence of these risk factors points to the fact that NCD burden would continue to rise in the coming years.
- There is an urgent need of intervention to overcome these risk factors using life course approach in order to contain these disease.
Thank you