National Programme on Elimination of Silicosis in India: The Lessons Learnt

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100 years in the service of Nation

Directorate General of Mines Safety
Inquiry about Silicosis

- Occupational Lung Diseases mentioned in ancient texts
  - 4th Century AD

- Royal Commission of Indian Labour (1929 - 31)
  - did not find existence of Silicosis

  - First to confirm cases of Silicosis in India
Silicosis Survey in Kolar Gold Fields (1940 – 1946)

Of the 7653 workers examined in Kolar Gold Fields, 3402 (43.7%) cases of silicosis were detected.
<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Mines</th>
<th>Organisation</th>
<th>Year</th>
<th>No of persons Examined</th>
<th>Cases of silicosis</th>
<th>% of silicosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kolar Gold Fields</td>
<td>Chief Advisor of Factories</td>
<td>1940-1946</td>
<td>7643</td>
<td>3402</td>
<td>43.7</td>
</tr>
<tr>
<td>2.</td>
<td>Mica</td>
<td>Chief Advisor of Factories</td>
<td>1953</td>
<td>329</td>
<td>112</td>
<td>34.1</td>
</tr>
<tr>
<td>4.</td>
<td>Lead &amp; Zinc</td>
<td>Chief Advisor of Factories</td>
<td>1961</td>
<td>171</td>
<td>52</td>
<td>30.4</td>
</tr>
<tr>
<td>5.</td>
<td>Lead &amp; Zinc</td>
<td>Chief Advisor of Factories</td>
<td>1962</td>
<td>273</td>
<td>71</td>
<td>26.0</td>
</tr>
</tbody>
</table>
# Is silicosis a Problem in India - Factories

<table>
<thead>
<tr>
<th>Industry</th>
<th>No. of persons Examined</th>
<th>Cases of Silicosis</th>
<th>% of Silicosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slate Pencil</td>
<td>593</td>
<td>354</td>
<td>54.7</td>
</tr>
<tr>
<td>Ceramic</td>
<td>292</td>
<td>44</td>
<td>15.1</td>
</tr>
<tr>
<td>Agate Grinding</td>
<td>468</td>
<td>136</td>
<td>29.1</td>
</tr>
<tr>
<td>Stone Cutting</td>
<td>89</td>
<td>17</td>
<td>19.1</td>
</tr>
<tr>
<td>Quartz Grinding</td>
<td>218</td>
<td>91</td>
<td>41.7</td>
</tr>
</tbody>
</table>
Silicosis in Mica Mines (1968)
Total number examined: 593
Silicosis: 354 (54%)
PMF: 105 (17%)

The follow up examination of the workers after an interval of 16 months showed development of new cases of silicosis and rapid progression in the existing cases of silicosis.

Twenty three slate pencil workers died during the intervening period. Their mean age at death was 37 (18 - 54) years.

A young man of 22 years from slate pencil industry. These two X rays were taken at an interval of only 16 months. Died shortly after 2nd X ray.

Courtesy, Dr. Saiyed, Director, NIOH
Silicosis in Tungsten Mine
(1991)
Silicosis in Zinc Mine (2001)
Silicosis in Gold Mine
(2002)
Dry Drilling in Small Stone Mines

Courtesy, Dr. Saiyed, Director, NIOH
Why prevent Silicosis

- Prevention of silicosis is a constitutional obligation of the government
- Silicosis is responsible for substantial morbidity and mortality
- Silicosis causes enormous economic loss to the nation as a whole and industry in particular.
- Silicosis is a preventable disease and can be totally eliminated
- Many countries have reduced incidence of silicosis by appropriate measures
Under Article 246, Union List - Entry 55 of Constitution of India, Safety, Welfare & Health of persons employed in mines is concern of Central Governments and of factories is the concern of State Government.

The objective is regulated by the Mines Act, 1952 and Factories Act, 1948 and rules & regulations made thereunder.

Statutory Provisions for Detection of Silicosis

- Employment of Occupational Health Physician
- Training of Physician in use of ILO Classification
- Certification of Pneumoconiosis by Medical Board
- Disability Evaluation and Compensation
- Pre Placement Examination
- Periodic Medical Examination
- Medical Examination includes
  - General Physical Examination
  - Full Size Chest X-ray
  - Lung Function Test (Spirometry)
Statutory Provisions for Prevention of Silicosis

- Comprehensive Health Surveillance Programme
- Establishment of Occupational Health Centre
- Silicosis is a notified and compensable disease
- Monitoring of Airborne Respirable Dust level at Workplace
- Permissible Limit for Respirable Silica - 15 / % of Quartz
Population at Occupational Risk of Silicosis

<table>
<thead>
<tr>
<th>Industry</th>
<th>No. of Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mines &amp; Quarries</td>
<td>1,700,000</td>
</tr>
<tr>
<td>Manufacturing of basic metals &amp; alloys (Steel, Copper, Ferro- alloys, etc.)</td>
<td>629,000</td>
</tr>
<tr>
<td>Manufacturing of products (Refractory, Glass, Mica, etc.)</td>
<td>671,000</td>
</tr>
<tr>
<td>Total</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

- does not include 7,000,000 workers in construction industry
- does not include workers in unorganized and self employed sector
What is Extent of problem of Silicosis in India

- Official statistics on morbidity and mortality not available
- Cases notified to enforcement agencies reflect only tip of Ice-berg
- No large scale recent epidemiological studies
- Conjectures-
  - 5-10% of workers in coal mines
  - 15 to 20% workers in manufacturing industry and Metal Mines
Notified Cases of Silicosis in Mines (1954-1968)
Notified Cases of Silicosis in Mines (1980-2004)

Year

Cases of Silicosis

2000 2001 2002 2003 2004
Why people do not report Silicosis

- suits everybody not to report

- Worker
- Employer
- Academic and Research Institutions
- Health Care Institutions
- Enforcement Agency
How does the system of Detection, Prevention and Control of Silicosis Work

- Occupational Health and Safety are the responsibility of the industry
- The compliance with legislation is overseen by the enforcement agencies
- Health surveillance of persons at risk is carried out by the industry
- Silicosis cases detected by industry are notified to enforcement agencies
- Compensation and rehabilitation is the responsibility of industry
- Failure to detect silicosis does not constitute an offence under statute
Organizations involved in Detection, Prevention and Control of Silicosis

- Federal and State Governments - Enforcement Agencies
- Industrial Enterprises
- Research and Academic Institutions
- Health Care Institutions
- Compensation Commissioner
- Non-Governmental Organizations
Shortcomings of Present System and Lessons - I

- Absence of National Policy on Prevention and Elimination of Silicosis
- Absence of central authority to coordinate activities of various agencies
- Inadequate enforcement of legislation
- No central registry for cases of silicosis
- Lack of accountability on part of enforcement agencies and industry
- Poor quality or absence of health surveillance programme in industry
Shortcomings of Present System and Lessons - II

- Lack of awareness among workers, employers and doctors
- Inadequate infrastructure for diagnosis and management
- Small scale and unorganized sector not covered by legislation
- Non-reporting of cases of silicosis by industry
- Misdiagnosis and treatment of silicosis as tuberculosis
- Lack of coordination among stake holders for elimination of silicosis
Issues and Priorities

- Comprehensive National Policy on Prevention of Silicosis
- Strengthening of present programmes on Elimination of Silicosis
- Collaboration and cooperation among various stakeholders
- Active participation in “The ILO/WHO Global Programme on the Elimination of Silicosis (GPES)”
Strengthening of Programmes on Elimination of Silicosis

- National workshop on elimination of silicosis for stake holders
  - in collaboration with ILO and WHO
- “White Paper” on silicosis defining the extent of problem and strategy for elimination.
- Constitute a National Task Force under Chairmanship of Union Minister of Labour
- National Task Force may have representation from
  - Ministry of Labour
  - Ministry of Health
  - Ministry of industry
  - Ministry of Mines
  - State Governments
Formulate short term and long term objectives for National Plans on Elimination of Silicosis.

Provide adequate financial resources for national programme

Identify and designate Nodal Agency for implementation of national programme

Assign responsibilities for implementation of programme to stakeholders

Formulate collaborative programmes with ILO, WHO and other international agencies.

Constitute Task Force Working Groups with specific responsibilities
National Programme on Elimination of Silicosis - Objectives

- To conduct epidemiological surveys to determine reliable estimates of prevalence of silicosis
- Updating and upgrading legislation from prescriptive to “Goal Setting”
- Improve enforcement and accountability of enforcement agencies
- Creation of facilities for research in treatment and management of silicosis
- Education and awareness programme for workers, trade unions, employers, medical professionals, government agencies
- Development of control and prevention technologies based on local needs and resources
Institutions for implementation of National Programme

- Indian Council of Medical Research
- Council for Scientific and Industrial Research
- Directorate General of Mines Safety
- Directorate General of Factory Advice Service
- State Factory Inspectorates
- National Institute of Occupational Health
- National Institute of Miners’ Health
- National Environmental Engineering Research Institute
- Central Mining Research Institute
- Indian Bureau of Mines
- Industrial Toxicology Research Centre
- Others
Implementation of National Programme for Elimination of Silicosis – Priority Areas

- Strengthening of Enforcement Agencies
- Creation and strengthening of epidemiological research facilities
- Creation of training facilities for inspectors
- Training of Medical Officer in Diagnosis of Silicosis
- Creation and strengthening of occupational hygiene facility
- Creation of facilities for Treatment and Management of Silicosis
Networking of National Agencies for Prevention and Elimination of Silicosis

- All Concerned Ministries
- All State Government
- Directorate General of Mines Safety
- Directorate General of Factory Advice Service
- Indian Council of Medical Research
- Council for Scientific and Industrial Research
- National Environmental Engineering Research Institute
- National Institute of Occupational Health
- National Institute of Miners' Health
- Medical Colleges
- Trade Unions
- Employers Organization
- Non-Government Organisations
Networking with International Agencies for Prevention and Elimination of Silicosis

- International Labour Organization
- World Health Organisation
- Non-Government Organisations
- Other countries: USA, Australia, China, Thailand, South Africa, Vietnam
End Note

- Silicosis remains the most important occupational lung disease and a major occupational health problem in India.
- No reliable estimates of extent and severity of silicosis are available in the country.
- Cases notified to enforcement agencies do not reflect actual incidence of silicosis.
- Inadequate enforcement of legislation.
- Lack of awareness among workers, employees, medical professionals, and government agencies.
- Lack of coordinated and concerted effort for prevention and elimination of silicosis.
End Note

- Silicosis affects all sectors of economy but small scale and unorganized sector is possibly the worst effected.
- Silicosis causes enormous economic loss to the industry and the nation.
- There should be a documented national policy on prevention and elimination of silicosis.
- There is urgent need to formulate National Programme on Elimination of Silicosis with long term objectives.
- The treatment and management of silicosis may be integrated with National Tuberculosis Control Programme.
- Indian national programme should be integrated with of “The ILO/WHO Global Programme for the Elimination of Silicosis (GPES)”
“The health authorities ignore the existence of silicosis in their published reports and it is probable that many deaths resulting from it lie hidden in the unsorted block of respiratory diseases, which occupy an imposing place in Indian vital statistics.”

Dr. V.R. Khanolkar
Memorandum to Labour Investigation Committee on Coal Mines (1944)