



Conference Summary:

“Silica Hazards in Construction and Mining: Reducing Exposures and Preventing Disease”

**Held on December 11-12, 2009
New Delhi, India**

Organized by:

Occupational Knowledge International

www.okinternational.org

The Public Health Foundation of India

www.phfi.org

Silica Hazards in Construction and Mining: Reducing Exposures and Preventing Disease

Occupational Knowledge International (OK International) and the Public Health Foundation of India organized a two-day conference on silica hazards in India's construction and mining industries. Thousands of workers in these industries and those residing near these operations are exposed to airborne silica. When inhaled, this dust can cause silicosis, cancer and is a risk factor for Tuberculosis. In light of recent Supreme Court and National Human Rights Commission activities on silicosis, we convened this meeting to bring together public health experts, industry representatives, government, multilateral aid agencies, and NGOs. The meeting resulted in a call for a national plan to identify and compensate silicosis victims and to promote the use of silica dust controls in these industries.

Day 1: Friday, 11 December 2009

Keynote Address – Dr. David Rees, National Institute of Occupational Health, South Africa
Linking Silicosis, Tuberculosis, and HIV Infection: The Long-term Consequences for Workers and Communities.

- Clear relation between silica dust exposure and TB. Silica exposure creates a lifelong risk of TB even after exposure period.

The role of Migration and combined exposures:

- Mining and construction industries are associated with a migrating workforce. Migration and HIV are inextricably linked.
- Multiplicative reaction has been observed among HIV positive individuals with silicosis, who have a very high risk of contracting TB. Thus this is still an occupational disease.

Consequences:

- Economic burden of these diseases is transferred to poor communities. Gold mines and other workplaces with high silica exposures are located in rural areas with little outside exposure. Poor access to health services and little or no compensation, because very few are diagnosed.
- High burdens of disease, results in impairment and unemployment.
- Contribution to epidemics of TB and HIV in impacted communities.

The Way Forward

- The difficulty of controlling dust down to non hazardous levels is often underestimated.
- Occupational Health services must be improved so that we can diagnose these diseases accurately.
- Removal from the source of exposure is not always feasible and risks of unemployment are created.
- Isoniazid preventive therapy (IPT) can be used to prevent active TB.
- Intensive awareness and training is needed.

Discussion

-Cost of INH treatment?

Mr. Rees explained that it is covered by the national health insurance plan in South Africa, however in India it may be a question of getting the health services equipped with the capacity to address these issues.

-Nutritional status and Co-morbidity?

Dr. Rees explained that this is a huge problem, but not among the target population of workers in South Africa, where most miners are organized into work units, living in compounds where meals are provided and malnutrition is not an issue.

-Would training of company safety representatives effectively create awareness?

Dr. Rees says that more efforts must go toward empowering the workers to feel that they can do something about their situation. The role of media and “docudramas” may also be useful in creating public awareness.

Inauguration Ceremony – Dr. K.S. Reddy, Public Health Foundation of India; Mr. H. Rawat, Union Minister of Labor and Employment; Mr. Perry Gottesfeld, OK International; Dr. David Rees, National Institute of Occupational Health South Africa; and Dr. Salma Burton, World Health Organization.

Dr. Reddy

- Effective, multi-sector implementation is needed to reduce silicosis in these industries.
- We must work to turn advocacy into action.
- Ensure early detection of disease.

Mr. Rawat

Silicosis is an issue concerning large number of workers and is the number one occupational health disease in India. The reported number of occupational health cases is only a fraction of the real number. Ministry of Labor is working to address this situation through the following:

- By initiating preventative strategies including a 5 year plan;
- Enforcing the Factories act and Mines Act; and
- Qualifying medical officers from DGFASLI.

Despite current initiatives and programs, more action is needed. The medical community must be sensitized of their legal responsibility to report cases. Programs must be based on scientific deliberations, with an aim of total elimination. A national action plan must be innovative and include treatable prevention strategies, and innovation. It must encourage prevention at the corporate level but also include worker participation.

Mr. Perry Gottesfeld

Irving Selikoff, once said that “Silicosis is a social disease with medical aspects” and this lesson is especially true in India where we can’t ignore the social context. Relatively inexpensive, locally available solutions exist in India to greatly reduce exposures and the prevalence of silicosis.

Furthermore, reducing silica exposure will have other health, economic, and social benefits. The goals for this workshop include:

- Bring together public health community (occupational health & TB experts), and those working to build infrastructure with NGOs and others;
- Raise profile of Silica-related disease and the connection to TB;
- Highlight successful pilot projects that have been conducted in India;
- Make policy recommendations; and
- Establish an executive committee to take these proposals forward.

Plenary - Silica Exposures in India: Health and Regulatory Aspects –

The Health Effects of Silica Exposure - Dr. T.K. Joshi, Maulana Azad Medical College

Silicosis an occupational disease and is associated with many other diseases, including lung cancer, pulmonary tuberculosis, chronic obstructive pulmonary disease, and autoimmune diseases.

According to OSHA, silicosis is:

- Disabling
- Nonreversible
- Often fatal.

Silicosis, however, is 100% preventable if employers, workers, and health professionals work together to reduce exposures. Knowledge, enforcement of existing laws, industrial hygiene measures and compensation for the victims are all needed. Prevention by dust control measures and worker education are equally important.

A Review of the Legislative Provisions Related to Silica Exposure and Disease – Dr. P.K. Sishodiya, National Institute of Miners’ Health

Safety, welfare and health of workers is a constitutional obligation.

Why should the current legislation be reviewed?

- The present silica exposure limit does not take into account the carcinogenic potential of silica.
- Large number of silicosis cases are not notified to enforcement agencies.
- The present health surveillance and workplace monitoring provisions have not proved to be adequate.
- Guidelines for diagnosis and certification of silicosis need to be incorporated.
- Inadequate guidelines for compensation of silicosis.
- A large number of cases of silicosis fail to be detected and compensated.

- Mis-diagnosis of TB and use of the DOTs treatment are common among the workers.
- Prevalence data not available on silicosis.

Recommendations:

- The enforcement agencies need to be trained in monitoring of health surveillance and workplace surveillance programmes.
- A multi-agency task force should be established to adopt a national program for prevention and elimination of silicosis.
- Health and Safety legislation should cover all workplaces irrespective of the number and nature of employment.
- Awareness and training programmes on health hazards of silica should be organised for workers and employers
- Facilities need to be created for diagnosis and management of silicosis.
- Guidelines on diagnostic and certification criteria need to be established for silicosis
- Guidelines for compensation and rehabilitation of cases of silicosis need to be established.
- Intervention programmes should be carried out for industries with high potential for silica exposures.
- A central registry system must be established for all cases of silicosis.
- A concerted programme should be drawn for research on silica exposures, controls and silica-related disease.
- All industrial medical officers should be trained in ILO Classification for Pneumoconiosis.
- Every industry with potential silica hazard should have a comprehensive health surveillance programme for silica-related disease.
- Failure to detect and notify cases of silicosis should be made a punishable offence.

Discussion

-The Employee State Insurance Corporation (ESIC) has so far compensated only 1000 silicosis victims. The number of reported silicosis cases does not accurately convey the situation.

-If ESIC diagnoses cases and does not report them, this is an offense under the law.

Panel discussion: Link between Silica Exposure and Tuberculosis

Moderator: Dr. Richard Rinehart, National Institute of Occupational Safety and Health

TB in Silica Exposed Workers - Dr. R. Tiwari, National Institute of Occupational Health

The role of the informal sector

- The problem is not just limited to construction and mining workers. People employed in the small cottage industries are at risk.

- High rates of TB are found amongst those exposed to silica in glass sheet manufacturing industry, slate and pencil industry, stone crushing industry, agate grinding industry and ceramic industry. The TB prevalence is also much higher in these groups than national statistics

There is a need to address the following:

- Bacteriological confirmation of TB is rarely performed and silicosis is often not suspected.
- There is very little awareness among workers and doctors on preventative methods and the right to compensation.

Perspectives of the Revised National TB Control Programme - Dr. Sarabjit Chadha, Revised National Tuberculosis Programme

Many challenges exist in diagnosing for TB vs. silicosis. Treating for TB further has its risks, so it is critical that Doctors are not misdiagnosing/mistreating. From the perspective of RNTCP, we must move forward through prevention. We must do this by installing dust controls and initiatives to promote industrial hygiene. The highest risk population is in the unorganized sector, thus we must start our efforts here.

From RNTCP program perspective, next steps should include:

- identifying at-risk populations;
- creating awareness among owners, workers and health professionals;
- developing guidelines for case management, surveillance, and chemoprophylaxis;
- implementing these guidelines; and
- research to further guide these activities.

Discussion

-Are we over-diagnosing TB among silica-exposed workers and hence contributing to drug resistance? (Bobby Joseph, St. John's Medical College, Bangalore)

Dr. Chandha responded that currently no evidence for or against this hypothesis. The RNTCP is willing to fund proposals to generate evidence that can be used to exam these questions and revise policy.

-Are the RNTCP doctors trained in occupational health, so they can diagnose silicosis etc? (S.A. Azad, PRASAR)

Dr. Chadha says that currently, there is no special training of medical officers in occupational health under the RNTCP. This is an issue that must to be addressed by the State Health Systems.

-Dr. Rees commented:

- Reviving lymph node biopsy may be a useful a method for diagnosis of TB; and
- Role of smoking cessation programmes in workplaces can help in prevention.

Concluding remarks: Dr. Norbert Wagner concluded by discussing gaps in current medical programmes on competence, diagnosis and referral, which needs to be addressed through more collaborative and integrative action.

Plenary – Case Studies of Successful Silica Exposure Reduction Programs

Moderator: Richard Rinehart, National Institute of Occupational Safety and Health

NIOH Experience – Dr. R. Tiwari, National Institute of Occupational Health

Control Technology Initiative

- Pilot projects conducted by NIOH included installing dust controls in 10 to 15 different facilities where silica dust is a problem;
- Enclosure, dust control system with local exhaust ventilation were set up;
- NIOH concluded that this is an effective method for dust reduction if installed correctly and maintained.

National Productivity Council Pilot Studies – Mr. M. J. Pervez, National Productivity Council

Cleaner Production Implementation in Stone Crushers in Gujarat: NPC Initiatives & Efforts to Facilitate Demonstration

- Demonstration included the use of various water spray nozzles for dust suppression.
- Identified and arranged suppliers for supply of system components and facilitated relations between suppliers and stone crushing units.

In an earlier study published by NPC, an 88 percent reduction in suspended particulate matter was measured after the implementation of dust controlling water spray systems.

Jhansi Case Study – Dr. K. Mukhopadhyay, Sri Ramachandra University; Mr. G. Sharma, Development Alternatives

This pilot project took place in the Jhansi area. Air sampling was done both pre-and post dust suppression interventions.

Dust controls that were used included cyclone dust separators, bag filter assemblies, and dust collection chambers. The cost for these dry systems was approximately 7 lakhs rupees, for each.

Results after dry dust controls were installed:

- 48% reduction in PM₄
- 29% reduction in PM_{2.5}

Recommendations:

- Additional modifications are required to perfect low cost dry engineering control devices for dust abatement systems.
- Although the trial system reduced about 50% of dust concentration, further detailed quantitative measurements are required to measure efficacy of controls.
- Dry intervention engineering controls can be a sustainable alternative to water spray in locations with limited access to water.
- Participatory approach should be taken by stakeholders, State and Central Pollution Control Boards, Local and District Health Administration, Inspector of Factories, District Administration and Local Pancha as all play a crucial role for acceptable solution.
- Vegetation in the vicinity of each stone crushing and quarrying unit can be planted to reduce spreading of dust.

Orissa Stone Crushing Study – Perry Gottesfeld, OK International

Partnership model with Jeevan Rekha Parishad (JRP)

- Develop capacity in India to recognize, evaluate and control exposures to airborne silica from stone crushing operations.
- Encourage the adoption of pollution control equipment in stone crushing operations.
- Accurately measure respirable silica.

Activities:

- Conducted education and outreach to mill owners and workers.
- Provided health camps/primary care.
- Provide donated air sampling equipment and obtained donated laboratory sample analysis for respirable silica.
- Encourage mill owners to install Dust Controls including water spray systems.

Outcome: The wet systems could be installed for much less than one lakh rupees if water is available. The cost of drilling a bore well could increase the cost. Encouraged over 40 mill owners in Khurda District, Orissa to install water spray equipment. The post intervention air samples demonstrate the effectiveness of water spray systems. This project furthermore generated a “demand” for control technologies by educating owners.

Results after dust controls were installed:

- 80% reduction in respirable silica;
- Much greater reduction observed in wet season than in the dry season;
- Even after these measures were taken, average exposures were at the permissible exposure level.

NGO-Business Partnership to Reduce Silica Hazards – Mr. M. Mishra, Jeevan Rekha Parishad; Dr. B. Pattnaik

A memorandum of understanding was signed between Jeevan Rekha Parishad and Orissa Stone Crusher Federation to create awareness of silica hazards in the stone crushing industry, reduce silica exposures, implement medical screenings, encourage industrial hygiene, and install dust controls in stone crusher units.

Impact of intervention includes:

- Formation of State level Mining Network called “OM-Net”.
- Regular meetings have taken place between the OSCF, JRP & Orissa Government to discuss social and health issues in stone crusher areas.
- 25 Stone Crushers in this area were declared as “child labor free” stone crushers.
- Workers are generally provided with safety equipment and work clothing.
- An occupational health & safety committee has been formed in the project area to investigate and ensure safe working conditions.

Discussion

-How much water is needed to operate water spray dust control systems?

Perry Gottesfeld explained that relatively little water is needed if this is done correctly because it is a mist of water that is most effective.

-Have any of these projects brought dusts levels down below recommended levels?

Dr. R. Tiwari responded that NIOH has succeeded in reducing dust levels, but not to the necessary levels. Mr. Pervez commented that post intervention, you will observe greatly reduced emissions. The cheapest solution is water spray, however if there is no water, dry controls are the next best option.

Concluding remarks: Dr. Richard Rinehart concluded that these case studies demonstrate much success but that more than a technical response to the problem is needed. More activities and partnerships are necessary to implement solutions.

Panel Discussion - Strategies for Increasing Awareness and Dissemination Technological Improvements

Moderator: Dr. T.K. Joshi, Maulana Azad Medical College

Dr. Norbert Wagner, University of Illinois, University of South Florida

A manual was recently completed with support from IDRC with simple language and drawings, for use among the stone crusher owners and includes a checklist that may be used for audits and monitoring. The International Labor Organization is currently translating this into Hindi. It is intended for use not only in India, but worldwide and translation into Spanish, Chinese, and Arabic are being considered.

Dr. B. Pattnaik, Orissa Stone Crusher Federation

Initially, there was no awareness of this issue among the stone crusher community in Orissa. After numerous seminars, meetings, and outreach activities 40 stone crushers in this area have adopted dust control systems.

Jagdish Patel, Peoples' Training and Research Centre

Program for Jewelry Workers in Gujarat

Mr. Patel discussed awareness activities that PTRC has initiated in Gujarat around silica hazards including:

- Conducting free clinics for exposed workers and health fairs
- Organized street plays to convey the message of safer technologies
- Sponsored a meeting of all stakeholders
- Publicity through local media outlets

Despite the above awareness activities, at the conclusion of this two-year project, little local implementation had occurred. Thus a Silicosis Victim Association formed in 2006 to create advocacy.

The next stage of the program is to implement a demonstration project using dust control technology under hoods that is currently used in China's gem industry.

Swati Sircar, Uthnau

Ms. Sircar summarized the situation in the unorganized, illegal mining sector in West Bengal

Problems observed include:

- Absence of health care
- Lack of compensation to silicosis victims
- Misinformation
- Division between mine owners and villagers/workers
- Loss of agricultural land and water contamination due to dust generated from mining activities

Suggestions:

- Reduce the need for crushed stone through reuse and recycling programs;
- Alternative technologies for stone chips could be developed; and
- Need for monitoring and enforcement of mining and construction industries;

Discussion

-Richard Rinehart suggested partnering with the World Bank and other public programs that create demand for crushed stones to develop procurement programs that require dust controls to be in place. Dr. Norbert Wagner noted that Bank has strong statements on corporate social responsibility and social justice thus this is a realistic solution.

-Dr. T.K. Joshi commented that we must also consider compensation for those indirectly affected by silica dust including surrounding farmers, as per Swati Sircar's presentation.

-Dr. P.K. Sishodiya clarified the term illegal mining means any mine that is not covered by the Mines Act. The Mine Safety Act is not applicable to all mines and most small mines are not covered under this act.

Concluding remarks: Dr. T.K. Joshi concluded that awareness alone cannot solve these problems. In the case of mining, it is critical that we find a way to regulate and monitor those unlicensed mines.

Day 2: Saturday, 12 December 2009

Plenary – Recognizing Silicosis Victims

Moderator: Jagdish Patel, Peoples' Training and Research Centre

The Role of the National Human Rights Commission - Justice G.P. Mathur, National Human Rights Commission

From the perspective of NHRC, prevention is the solution. The most effective way to prevent exposure is to control the dust. The NHRC has established a committee that has sent questionnaires out to each state as a means to monitor the prevalence of silica-related disease and compensation of silicosis victims in each state. They are in the process of reviewing the responses received to date. This work to see that victims of silicosis are compensated will continue under the NHRC.

[Note: The Supreme Court has taken on the responsibility of monitoring the implementation of other preventative measures to reduce silica exposures.]

The Role of the Delhi Government - Dr. K.S. Baghotia, Delhi Government

The Delhi government stresses the use of respirators in those areas where dust cannot be controlled with water spray or ventilation. I also propose that warning signs should be posted in work and construction areas where silica dust is present.

For those already suffering from silicosis, the Delhi Government has initiated a long-term plan that includes:

- Development of a multipurpose hospital specializing in occupational medicine with an x-ray facility to identify silicosis cases near the affected areas.
- Continued clinical surveys by expert teams in areas where affected people reside.
- Mobile medical vans sent to distribute medication for victims.

Challenges in Developing Medical Surveillance Systems for Silicosis – Dr. H. Saiyed, World Health Organization

Accurate reporting of silicosis diagnosis is the key element in medical surveillance that is not being done. Government statistics report only a fraction of existing cases.

Recommendations to improve surveillance include:

- Use of existing legal instruments (Mines Act, Factories Act, ESIC Act)
- Political commitment
- Capacity building among medical professionals
- Future linkage with National TB Control Program

The Role of Medical Associations in Detection and Reporting of Silicosis – Dr. S. Pingle, Indian Association of Occupational Health

To effectively detect silicosis, there is a need for the following:

- Greater awareness of silica hazards among workers and employers;
- Knowledge to diagnose silica-related disease correctly;
- Accurate reporting; and
- Action oriented research.

The Indian Association of Occupational Health (IAOH) can play a positive role through advocacy, stakeholder awareness, dialogue with government and international organizations.

Discussion

-One of the attendees personally affected by silicosis raised the plight of the victims in the Lal Kuan area to Dr. Baghotia. He suggested she take her concerns to a higher level and the NHRC. He responded that the Delhi government is doing all possible to compensate victims and prevent the disease.

-Justice Mather added that it is important that all voices be heard and that we all need to listen to those impacted by silicosis.

Plenary – Strategies to Reduce Silica Exposures on Government Infrastructure

Moderator: Dr. Sanjay Zodpey, Public Health Foundation of India

The Role of the World Bank – Neha Vyas, The World Bank

One main strategy of World Bank transport projects is, in the planning and design phase, to identify that the suppliers of the material are licensed and implement best practices. On World Bank funded projects a medical examination system for workers is implemented, with basic diseases referred to the local hospital. Worker sensitization programs are conducted and a penalty system for supervisors and environmental officers is put into place to ensure the use of personal protective equipment and pollution controls. The road construction sites, crushers, and quarries are all monitored. Third party audits are conducted, with reports of these audits made available on the World Bank website.

Reducing Exposures in Stone Crushing – Dr. S. Waghe, Directorate General Factory Advise Services

Reducing occupational silica exposures requires greater awareness.

- Starting with primary education, school curriculums should mandate classes in health and safety. As occupational personal protection is not part of the work culture in India, education programs need to create a picture of the health consequences of silica dust inhalation and exposure.
- National workshops must be conducted to generate awareness among industry inspectors (DGFASLI has held one on silica in the past).
- Incentives must be used to spark physician interest in the field of occupational medicine.

Many constraints exist that do not enable government to take action on silica exposure issues. For example, many of these facilities where exposure occurs are not covered under the Factories Act. This creates a problem in the unorganized sector.

Innovative Strategies to Reduce Exposures – Perry Gottesfeld, OK International

Government, the World Bank, and other lenders play a key role in infrastructure projects. Thus these agencies can play a powerful role in reducing silica exposures and silica related disease in stone crushing and construction. The following are possible strategies WB and others may employ:

- Model specifications:
 - For use in tenders/ bidding or purchasing;
 - Should include dust control and occupational exposure provisions over and above minimum regulatory requirements;
- Preferred purchasing programs for stone crushers that meet minimum standards
- Certification for crushed stone
 - Simple system to incorporate complex specifications
 - Must be based on an industry specific performance standard (specification)
 - Site specific certification should be based on an annual inspection audit
 - Chain-of-custody for crushed stone similar to that used for FSC forestry products
- Mandatory training programs for contractors, suppliers, and employees
- Taxes on offending industries to pay for the cost of compensating victims to encourage them to improve pollution controls
- Positive economic incentives:
 - Subsidies or tax breaks to facilities that control silica exposures;
 - Premium prices for preferred purchasing programs;
 - Costs for such a programme can be based on expected reductions in incidence of silicosis, TB and associated costs.

Discussion

- Can DGFASLI give advice to engineers designing these pollution controls?

Dr. S. Waghe responds that DGFASLI cannot directly advise the engineers, but rather advises the government.

-Dr. Saiyed remarks, for clarification, that dust masks really have no place as a long-term solution in preventing silica exposures. It is meant for temporary or short-term use only in coordination with other dust control measures.

-Road building activities generate much dust. Do the WB projects account for these exposures that are not necessarily occupational, but affect surrounding communities?

Dr. Neha Vyas says, yes, these exposures are also controlled in WB projects.

Plenary – Strategies for Disease Prevention: Encouraging a Multi-Sector Approach

Moderator: Norbert Wagner, University of Illinois, University of South Florida

Judicial Efforts to Address Silicosis – M.C. Mehta, M.C. Mehta Foundation

Suggestions to strengthen efforts to address silicosis:

- Compliance mechanism must be reinforced;
- Enforcement mechanism must be strengthened;
- Increase accountability;
- Education of workers and general public (media education) is essential; and
- Union and state governments must simplify the compensation process (workers need to be informed where to go for treatment/compensation and how to file.)

NGO Perspective – Ravi Agarwal, Toxics Link

Worker Demographics – We cannot disassociate the socio-political-economic factors from silicosis.

Low wages, extreme poverty, high concentration of migrant labor, lack of rights leaves workers with zero negotiating power

- Most affected in stone crushing and construction are those in the informal sector, thus they are not covered under the Factories or Mining Acts and are not unionized.
- There are very few inspectors as compared to the number of units.
- There is a loss of mission objective in the institutions that have been created to remedy these problems.

This issue must not just be viewed as a technical problem. Many other social factors are at work and are thus also part of the solution.

NGO Perspective – S.A. Azad, PRASAR

NGOs have the ability to take action on these issues and give voice to the affected. Our actions include:

- Advice – technical, legal, medical
- Advocacy
- Representation

PRASAR has made demands and some positive action has resulted especially from the NHRC. Action from other sectors is also needed.

WHO Perspective – Dr. Saiyed, WHO speaking on behalf of Salma Burton, WHO

WHO/ILO Program on the Elimination of Silicosis

- Priority area in occupational health for member states.
- WHO targets countries that have demonstrated willingness to eliminate silicosis.

With dust control methods, we can significantly reduce silicosis.

Panel Discussion

-Why are criminal cases against employers not filed on silicosis cases in India?

Jagdish Patel responds that it is the victim themselves that has to file the case and must seek the government's approval to prosecute and it is a lengthy and expensive process. Dr. Sishodiya says health and safety violation does not allow you to launch criminal proceedings. In the Mines Act, the police cannot launch a complaint, it must instead come from the mines act in the quarries.

Dr. Pingle described one experience he had as a company physician, where he was asked to write a medical report, however after preparing the report, he was told not to submit. They had instead addressed these complaints by increasing the wages for each worker. Compensation must not be a means to an end in this struggle.

M.C. Mehta comments that industry and management will take action only when civil and criminal liabilities are filed.

Plenary – Policy Recommendations to Reduce Silica Related Disease

Moderator: Dr. S. Pingle, Indian Association of Occupational Health

Central Pollution Control Board (CPCB) Proposed Standards and Guidelines – Dr. P.K. Mishra, Central Pollution Control Board

CPCB has recently proposed standards for stone crushing operations that will update existing requirements and address the following:

- Fence line exposure standards;
- System hardware requirements (water tank, filter, pipe, nozzle and adequacy of dust control);
- Key location for dust suppression and dust extraction arrangement;
- Stack height regulation (for dry systems) and guidelines for siting criteria;
- Operation and maintenance guidelines;
- Guidelines for noise pollution; and
- Guidelines for routine health checks.

CPCB future plans include emission inventory, development of emission factor, air quality management in the cluster, technology transfer, international cooperation, research on new and clean alternatives and demonstration of good models, organizing regular training and awareness workshops.

Discussion of Policy Recommendations—

There was a consensus that a national action plan is needed to address silica exposures, identify and compensate silicosis victims, and to promote the use of silica dust controls in these industries.

The following recommendations were discussed on how to best develop and implement a national plan for the prevention, control, and elimination of silicosis:

1. Establishment of a multiagency taskforce
2. Increase resources to key enforcement agencies
3. Extend the Factories Act and Mines Act to cover all workplaces with fewer than 10 employees
4. Government contracts to require monitoring of sources of key materials to seek compliance with dust control standards
5. National TB Programme should initiate silica reduction activities
6. More awareness and training programs for employers and employees
7. Training on diagnostic techniques for silica related disease among physicians
8. Reform of current compensation system for victims of silicosis and silica related disease
9. Industries with high potential silica exposures to surrounding population targeted for greater intervention
10. Improve reporting of silica-related disease and a central registry
11. Research on silica exposures, controls, and silica-related disease should be a concerted program

Plenary – Strategies for the Prevention of Silica Related Disease in Mining

Rana Sengupta, Mine Labour Protection Campaign

Vicious cycle of illness and indebtedness is common among mine and quarry workers.

Mining in Rajasthan:

- Sandstone mines in Jodhpur and nearby areas are comprised of almost pure silica thus prevalence of silicosis is high.
- Mining is the second largest employment sector after to agriculture in Rajasthan.

Problems:

- Workers in the stone quarries do not have identity proof
- No records of laborers kept with any department
- Records of employers for consent for employment should be made mandatory to track exposure histories

Recommendations:

- More information on occupational health and safety should be distributed to workers and quarry owners;
- Records on employment status should be maintained by the State;
- Health check up and compensation to the victims of silicosis;
- Insurance coverage for all workers;
- Coverage under ESI for all workers; and
- Establish welfare board for mineworkers.

Discussion

Are males more prone to silicosis?

Rana Sengupta responds that perhaps the higher prevalence rates in men are due to the specific job activities. The work typically done by men may be associated with higher exposure levels.

Future Actions

Perry Gottesfeld, OK International

This conference should be viewed as a beginning to initiate greater coordination among key stakeholders in order to reduce exposures and decrease the number of silicosis cases in India. OK International will continue our work to conduct education, outreach and pilot projects in various locations around India. In addition, we intend to help organize and support a multi-stakeholder executive committee to take forward recommendations from this conference.

Concluding Remarks

Dr. Sanjay Zodpey, Public Health Foundation of India

Through advocacy, research, policy and training the Public Health Foundation of India is committed to building capacity in occupational medicine and health. Science gives us the tools to enhance knowledge. Through a multidisciplinary approach, we need to translate this scientific evidence into action. This conference is the beginning of the joint effort to reduce silicosis and silica related disease in India.

