



**A Project Sponsored by  
American Industrial Hygiene Association (AIHA)  
Project Completion Report  
MLPC|2022**



## **Project Completion Report**

“Study out the hazardous effects of Silicosis among mineworkers and improving their quality of life with increasing their lifespan.”

Sponsored by  
**American Industrial Hygiene Association (AIHA)**

Facilitated by  
**Developing World Outreach Initiative (DWOI)**

**Mine Labour Protection Campaign (MLPC)**  
**Jodhpur**

**2022**

**Project Title**

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**Project starting Date:** 24.03.2022

**Project location**

Ghendero-ki-dhani and KaliBeri, Soorsagar,  
Jodhpur, Rajasthan

**Project Lead**

Ms. Somali Fouzdar

## Acknowledgement

We extend our sincere gratitude to Developing World Outreach Initiative (DWOI) for facilitating the Training project to Mine Labour Protection Campaign (MLPC) Trust for Training and Silicosis screening for Miners and grateful to American Industrial Hygiene Association (AIHA) for funding the project amounting to USD2500.00.



### **Background:**

Rajasthan has a 0.50% geographical area under mining. It has the highest number of mining leases in the country—189 for major minerals, 15245 for minor minerals, and 17688 quarry licenses—an altogether of 33122 mining leases. A majority of these are sandstone mines and quarries in unorganized and small scale sectors.

Sandstone is available in several districts. The major sandstone mining areas are located in Jodhpur, Bundi, Alwar, Bharatpur, Karauli, and Bhilwara districts. In 19 out of 33 districts, the mining and mineral processing industry is a major employer. It is estimated that the mining and mineral processing industries in Rajasthan provide direct and indirect employment to about 3 million people.

The majority of workers engaged in mining is exposed to various kinds of dust and are at the

risk of developing occupational disease due to dust exposure. Most of the dust related diseases are incurable and cause permanent disability.

There are about 29876 certified Silicosis patients in Rajasthan, and of these, more than 6448 patients have been identified in Jodhpur district. With Mines Labor Protection Campaign Trust (MLPC)'s continuous effort, the Government of Rajasthan created a Rajasthan Policy on Pneumoconiosis including Silicosis detection, prevention, control, and rehabilitation in 2019.

To address the rehabilitation objective of the policy, MLPC has initiated a pilot project to aid Silicosis patients in managing their difficulty breathing, improving endurance, improving quality of life, and extending their life span.

## **Project Goals**

The Project had three main Goals

Goal 1: Early detection of subjects with Silicosis by annual screening of all vulnerable population (with ICMR approved CC16 kit) by ASHA worker within her area of operation.

Goal 2: Capacity building of ASHA workers on early detection of Silicosis using CC16 kit since they are easily accessible in the locality of the occupational health victims, to ensure their best possible quality of lives due to Silicosis.

Goal 3: Sensitization and awareness building in the community about Silicosis prevention and ensuring pulmonary rehabilitation through Yoga and Physiotherapy through Accredited Social Health Activist (ASHA) workers



## **ActionTaken:**

The project had three main goals. Goals one and two had a mandate of training and capacity building of ASHA workers on early detection of Silicosis using the Club cell protein 16 (CC16) kit. To achieve this, seminars and awareness campaigns were conducted by the ICMR and NIOH teams to impart knowledge about the disease Silicosis and the usage of the CC16 kit. However, ASHA workers are not trained in using the CC 16 Kit due to government regulations. Due to

administrative complications within the government machinery, the CC 16 Kit for early diagnosis of Silicosis in Rajasthan has yet to be certified. The government of Rajasthan has awarded SMS Medical College in Jaipur a research project including validation testing for CC16 kits. MLPC is a member of the committee tasked with testing and approving the CC 16 Kit for the early diagnosis of Silicosis.

Hence, during this project period, major thrust was given to Goal three, which is to sensitization and awareness building in the community about Silicosis prevention and ensures pulmonary rehabilitation through Yoga and Physiotherapy through Accredited Social Health Activist (ASHA) workers.



### **Stage1: Conceptualizing and Designing**

A detailed module pertaining to yoga and physiotherapy has been designed to address health complications that Silicosis patients face. The module was designed with the help of a senior pulmonologist, Head of Community Medicine and Family Medicine, All India Institute of Medical Sciences (AIIMS), Jodhpur, and doctors from the Indian Council of Medical Research (ICMR), New Delhi, and the National Institute of Occupational Health, Ahmadabad (NIOH).

The module was developed, taking into consideration the physical conditions, disability of the lungs and age. This compressive rehabilitation module went through lots of review and consultations with doctors and social scientists. A 40-minute training program was created.

### **Stage2: Training and Exercising**

A 40-minute yoga and physiotherapy training program was conducted daily for a period of one month. In the first level, 42 ASHA workers were given pulmonary rehabilitation training on March 11th and 12th, 2022. They were educated about Silicosis and physiotherapy exercises and breathing techniques.

Training for 20 ASHA workers was held on May 7th, 2022 in Keru, which has a high incidence of Silicosis patients. ASHA workers are trained on how to use and manage oxygen

concentrators for patients when required in an emergency.

At level 2 of the project, with the help of trained ASHA workers, patients are identified at the mining locations in Ghendero-ki-Dhani and Kali Beri in Jodhpur District. Nineteen Silicosis patients have been identified for this pilot program.

To identify the patients, we created a model. In this we collect data from patients like X-ray, Respiratory Rate, SPO2, Pulse, 6 minute walk test, BMI, Blood Pressure, Dyspnoea, MMRc, The data is analyzed and patients are enrolled in the training sections. Apart from the medical history of patients, working and social history like duration of dust exposure, signs and symptoms before Silicosis detection, dyspnoea, smoking history, past history of disease and medications are all collected. This data is collected by ASHA workers.

Prior to the commencement of the free pulmonary rehabilitation training, patients were oriented about the programme and consent for their regular participation was taken. We started a free rehabilitation training camp on April 15, 2022. ASHA workers have monitored and ensured the regular participation and health status of the participants.

For 15 days, the training was conducted twice a day and the participants were advised to practice on their own at home or at a community centre.

During this period, following training, they practiced.

### **Yogic management**



The training started with the **Pawanuktasana Part 1 series** to loosen the joints and make the body flexible. The practices are done with awareness of movement, breath, mental counting, and stretching in the muscles. The combined effect of **standing and resting asana** in synchronization with breath ensures the removal of all back stiffness and improvement of breathing capacity as the breath becomes deep and regulated. The whole body, especially the brain, receives an extra supply of blood. Breathing techniques like **natural breathing** **develop understanding of** the breathing process and eventually lengthen the breath. Pranayama



practices of **alternate nostril psychic breathing** and **bhramari pranayama** improve BHT and PEFV as the bronchi become relaxed and dilated. In addition to this, Bhramari pranayama helps in the production of nitric oxide, aiding the diffusion process. **Prana mudra** encourages correct breathing and the supply of vital energy to the thoracic part and overcomes emotional suppression. **Shavasana** aims to bring deep physical relaxation and the removal of unconscious tensions.

### **Physiotherapy practice:**

**Abdominal breath/Diaphragmatic breath:** It is the most correct type of breathing a person should mostly have throughout the day. It enhances ventilation in the lower lungs for proper gas exchange. The diaphragm moves down, letting more air flow into the lower lobes of the lungs. The blood is purified more compared to normal breathing patterns.

This technique is commonly used for people with COPD, an interstitial lung disease. It is useful in understanding and building exercise capacity and body endurance. Patients were asked to walk for 2-3 minutes as per their ability and gradually improve the duration over time.

Considering the protein, mineral and vitamin requirements of Silicosis patients, we have included daily supplementary diets like eggs, milk, lentils, khichri, soya curry, seasonal fruits and vegetables.

The patients were well informed about the availability of oxygen concentrators in case of an emergency.

**Daily oxygen and pulse recording:** A pulse oximeter was used to record SPO<sub>2</sub> and pulse rate

before and at the end of the training programme.

**Others:** Patients are told to breathe through the nose and not the mouth. It is essential for the health of the lungs and brings balance to the body and mind.

### **Our Findings post: Yoga and Physiotherapy:**

- In some patients, remarkable changes were noticed with respect to the interest that they were showing during the training session.
- There were also some patients who were slow in understanding and absorbing the practices, but as they attended the training sessions regularly, a clear benefit from the same was observed in the patients.
- During the training, we have observed symptomatic relief in patients, as mentioned below :
  - Improved joint mobility
  - Body pain is reduced.
  - Ease in their breathing.
  - Oxygen- pulse recording showed an increase in oxygen saturation level by 2–3 points in some of the patients.
  - We also noted improvement in walking capacity by 30 m to 150 m in many patients who used to get breathless very easily. Two patients with high B Punder medication showed a significant reduction in systolic blood pressure of 26mmHG, and diastolic blood pressure was reduced by 9 mmHG, systolic blood pressure by 29 mmHG, and diastolic pressure reduced by 2 mmHG. The respiratory rate was reduced by 2-4 points in 8 patients.
  - No significant change in weight was found



We are constantly monitoring the patients for improvement in health. We have also started getting blood samples in collaboration with the State Hospital, Jodhpur, to analyze the oxygen and carbon dioxide content in the blood.

### International Yoga Day 21<sup>st</sup> June, 2022

To motivate the patients to continue the yoga practices and to update the ASHA workers, we have organized an International Yoga Day (21<sup>st</sup> June 2022) micro-conference by inviting yoga practitioners, physiotherapists, and doctors.



The event was organized at Ghendero ki Dhani Community Hall. The patients and participants took pledge not to consume tobacco and smoking. The Superintendent from Mathura Das Mathur State Government Hospital educated the patients about the Silicosis and tuberculosis. Medical staffs from AIIMS emphasized on the significance of Pulmonary Rehabilitation in promoting the exercise capacity of patients.

ABG test was taken from few patients with severe Silicosis.



We are now planning to organize more such micro-conferences every month to keep motivating

and stay connected with the ASHA workers and Silicosis patients.



## Occupational Health Day



National Consultant Meet on Occupational Health Day was organized on 8<sup>th</sup> July, 2022 that included a Seminar on “Role of Pulmonary Rehabilitation for Occupational Diseases”. The event was organized in collaboration with All India Institute of Medical Sciences, Jodhpur, Public Health Foundation of India and Mathura Das Mathur Hospital, Jodhpur. The main session was Occupational

Respiratory Diseases, Pneumoconiosis Rehabilitation and Occupational Health Activities. Updates on the Rajasthan Pneumoconiosis policy including Silicosis Detection, Prevention, Control and Rehabilitation and way forward in executing the events related to the policy was discussed. The highlight of the seminar was early detection of health impairment, prevention and work place wellness. Knowledge about availability of wet drilling and grinding machines were shared.

Main Highlights were-

- Comorbidities and complications associated with Silicosis
- Silico tuberculosis and lung cancer can be prevented if Silicosis is detected at sub radiological stage
- Provide safe and healthy work environment as preventive measure
- Need Human resource and more qualified nurses for Occupational Health activities.

**National Consultant Meet on Occupational Health Day**  
**Venue: Department of Community Medicine & Family Medicine, AIIMS, Jodhpur**  
**Date: 08<sup>th</sup> July 2022, Friday**

Registration of Participants & High Tea 10:00 AM – 10:20 AM		
Welcome by Dr. Pankaja Raghav (H.O.D Community Medicine & Family Medicine, AIIMS Jodhpur) 10:20 AM – 10:30 AM		
Session & Time	Speaker	Topic
<b>Session 1– Occupational Respiratory Diseases</b>		

10:30 AM – 10:45 AM	Dr. Shyam Pingle, Sr. Occupational Health Specialist-I, IIPHG, Gandhinagar	Occupational Health Day Theme and Overview of Occupational Respiratory Diseases
10:45 AM - 11:00 AM	Dr. K.C Agarwal Sr. Pulmonologist & Add. Principal, Sr. Professor & HOD Dept of Pulmonary medicine, Government medical college, Pali	Overview of Silicosis Including its Diagnosis and Prevention
11:00 AM – 11:15 AM	Dr. Kamalesh Sarkar, Director, ICMR-NIOH, Ahmedabad Temporarily attached to ICMR-NICED, Kolkata	Silicosis- Visible or Invisible? Looking through a Magnifying Glass
11:15 AM – 11:30 AM	Dr. C.R Choudhary Sr Pulmonologist, KN Chest Hospital & Prof & HOD, Dept of Pulmonary medicine, SN Medical College, Jodhpur Superintendent Infectious Disease Institute And Kamla Nehru Chest Hospital	Comorbidities and complications associated with Silicosis
<b>Tea Break- 11:30 AM - 11:45 AM</b>		
<b>Session 2 – Pneumoconiosis Rehabilitation</b>		
11:45- 12:00 Noon	Dr. Arpita Amin, Research Executive at Basic Health Care Services, Udaipur  Mr. Bharna Ram of Kotda Adivasi Sansthan	Experiences of Pulmonary exercises & home follow-up of patients with Silicosis
12:00 Noon – 12:15 PM	Somali Fouzdar, Yoga Expert, Rehabilitation consultant at MLPC Trust	Experiences from the Pulmonary Rehabilitation program in Jodhpur
<b>Session 3: Occupational Health Activities</b>		
12:15 PM - 12:30 PM	Dr. Pankaja Raghav, H.O.D, Dept of Community Medicine & Family Medicine, AIIMS, Jodhpur	Activities in Occupational Health by Department of Community Medicine and Family Medicine AIIMS Jodhpur
12:30 PM- 12:45 PM	Dr Mukund and Dr Vishal  Residents Dept of Community Medicine & Family Medicine, AIIMS, Jodhpur	Experience Sharing in the Field
<b>Session 4- Updates on Rajasthan Policy on Pneumoconiosis including Silicosis Detection, Prevention, Control &amp; Rehabilitation and Way Forward</b>		
12:45 PM – 1:30 PM	Dr Rana Sengupta (Co-Ordinator) Dr. Shyam Pingle Dr. K.C. Agarwal Dr. Kamalesh Sarkar Dr. Pankaja Raghav Dr. Vikas Rajpurohit Dr. C.R. Choudhary Dr. Ankit Rathi Dr. Arpita Amin Mr. Bharna Ram Mrs Somali Fauzdar	

**Future scope of work:**

The future scope of work is immense and important. In the pilot project we only covered the focus group of 62 ASHA workers and 19 Silicosis patients. This is less than one percent of the total number of Silicosis patients in Jodhpur alone. Now we have to share the experience and knowledge with the larger group of ASHA workers in all districts where there are Silicosis patients. We also need to enroll all the Silicosis patients in this training program.

As soon as the government authorizes the CC 16 kit for early detection of Silicosis, we must train ASHA personnel on the same.

To achieve this, we need to have a three-year focus project.

At the policy level, we plan to create and negotiate with the government to make rehabilitation training compulsory for all Silicosis patients apart from those getting the Monterey relief. We would also insist the government open up rehabilitation centers in all locations where Silicosis patient numbers are high.

We have started dialog with the state government medical colleges to send first year college students to be part of this training and volunteer so that we get informed doctors in the future. At the same time, we will have human resources to execute this mega project of training 30 thousand Silicosis patients in Rajasthan.

**Silicosis Patients in Kali Beri and Ghendero ki Dhani Started 15<sup>th</sup> April 2022 and continuing**

S.No	Name	MobileNo
1	Babulal	9571947656
2	Bhura Ram	9602041819
3	Dharma Ram	9145901459/9145901483
4	Dungar Ram	9829768367
5	Jassa Ram	9602214867
6	Kailash	6375868765
7	Khivraj	9602280893
8	Mala Ram	8890246043
9	Naina	9602834860
10	Narpath	9928043172
11	Pappu Ram	9784325395
12	Prema Ram	9928429826
13	Prema Ram	8769876877
14	Putu Ram	9602594744
15	Ramesh	9636310023
16	Shrvan	9799843328
17	Vishnu	9660537020
18	Madha Ram	9928426446
19	Pukh Raj	9928861894

Pulmonary Rehabilitation Training of ASHA workers in Community Health Center, Keru on 7<sup>th</sup> May, 2022

S.No	Name	Contact details
1	Namrata Solanki	8290208525
2	Hurmat	9660384976
3	Geeta	9530187805
4	SajuDevi	9799682019
5	BabyDevi	9602090856
6	Santosh	7727954933
7	Santosh	7568077109
8	RadhaDevi	9602704562
9	Mamta	8769262295
10	Rekha	9571580698
11	Hemlata	7023995847
12	Sharda	8290229317
13	Sheela	9001706647
14	kamla	8890954484
15	Premi	9664338714
16	RenuVerma	7300302184
17	PinkyGaur	9079916698
18	Santosh Sharma	9799684072
19	SarjuDevi	9799682019
20	Chandrakala	9413164542

**Pulmonary Rehabilitation Training Satellite Hospital, Pratapnagar, J odhpur on 12<sup>th</sup> March 2022**

S.No	Name	Mobile no.
1	ReenaSolanki	9887610701
2	LeelaGahlot	9602461686
3	PushpaOd	8279284966
4	ShobhaDevi	6378904930
5	SunitaMeghwal	8963021545
6	AnandKumari	9799671623
7	Geeta	9571613658
8	RenuPrajapat	8003816139
9	Dimple	8078659182
10	KusumlataKumari	8000119255
11	MamtaBhati	7742195914
12	AnjuLata	8764832854
13	SarojKunwar	9001429455
14	SajjanKawar	9680739673
15	HeeraLal	8947929498
16	DayalRam	9001908215
17	TaraChand	9929129263
18	MadhaRam	9928426446
19	SharvanKumar	8905797578
20	Sarita	9782763626
21	PushpaAsha	
22	Reena Prajapat	7891689766
23	ChainKunwar	9783623789
24	SarojArora	9783186599
25	Vandana	7300449634
26	SeemaPrajapat	9828645137
27	HumaKausar	9785915335
28	DeviTawar	
29	ManjuMagas	8696991917
30	Renuka	8875116434
31	Amina	8104110827
32	Geeta	9928036332
33	DevyaniHadavat	6375742213
34	Santosh	7014554283
35	SajjanKawar	9680739673
36	HeeraLal	8947929498
37	SharvanKumar	8905797578
38	DayalRam	9001908215
39	PushpaBarath	9460957004