

COMMENTARY

Combating silicosis in India: From compensation to prevention

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Abstract

Silicosis is a fibrotic lung disease with no curative remedy available. Largely affecting those in the vicinity of industrial sites, this branch of pneumoconiosis is one of the most pervasive occupational health hazards. Despite its ancient origins, little progress had been made towards devising a cohesive strategy to combat silicosis. However, at the turn of the 21st century, instrumentalities of the state as well as civil society began to gradually uncover the wide dragnet this disease had cast over unsuspecting workers. Demographically, silicosis patients comprise of unregistered, socio-economically vulnerable labourers in desperate need of state support. In the last decade, institutional response to combat silicosis has by and large remained limited to provision of compensation for silicosis patients. Through this paper, we seek to elaborate on how efforts must now evolve further towards establishing preventive mechanisms that limit the prevalence of silicosis.

Keywords: *Silicosis, healthcare regulation, preventive measures, occupational safety, government*

For decades, a striking anomaly has prevailed in the Indian states. While contributing richly to the nation's GDP, successive governments in mineral-rich states have failed to transfer the benefits of these resources to local people working within these spaces [1]. As enforcement of the law is relaxed to attract private capital investment in mineral-rich states, silent compromises are often made by regulators in the garb of "ease of doing business" [1].

As a consequence, a silent public health crisis has engulfed the Indian workforce. Silicosis is an irreversible lung disease, with no available medical cure, adversely impacting workers across India [2]. Workers have been found to be exposed to dangerous levels of silica across a range of processes in foundries, mines, factories engaged in quartz-crushing, glass manufacturing units, thermal power plants, colour gemstone units, ceramic and tile units, and imitation jewelry units, amongst other sectors [3].

Silicosis has become one of the most pervasive occupational health hazards in the category of pneumoconiosis. As industries expose labourers to dust pollutants over prolonged durations, workers are prone to inhaling granular dust particles that contaminate the air. Silica particles, in particular, are fine enough not to be detected by the naked eye, being roughly one-tenth the size of a hair-follicle. Their miniature structure enables dust molecules to remain suspended in the atmosphere for prolonged periods, eventually penetrating

through the alveoli of the lungs — causing inflammation of the organ tissue and severe difficulty in breathing [4]. Over time, fine silica particles cause scarring of lung tissues and impede functioning.

State response to silicosis

In the absence of any curative medical remedy, there are only two options for policymakers to combat silicosis. First, prevention, before any person falls prey to silicosis, and second, compensation, to support the livelihood and medical expenses for palliative care of those already affected. By and large, state efforts have been geared towards awarding compensation. In terms of healthcare provisions, the Mines Act, 1952, as well as the erstwhile Factories Act, 1948, acknowledged silicosis as a notified disease. This implies that once any worker contracts it, employers and medical practitioners are obliged to report the same [5: Sec 25]. These obligations were earlier enumerated under the Factories Act and now under the Occupational Health and Safety Code (OHSC). Moreover, Schedule II to the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act also recognises silicosis as a notified occupational disease. Even in the more recently enacted OHSC, silicosis has been acknowledged as a listed disease. Apart from this, the new OHSC prescribes annual health checkups of workers [6: Sec 6(1)(c)]. However, the scope of the OHSC remains limited, since its applicability is mandatory only for organisations that employ 20 or more workers. There are further enactments which register private establishments but fail to make provision for any preventive measures. For instance, in India, under the Shops and Establishments Act, 1948, while many commercial establishments are registered, they fail to provide any preventive mechanism for their employees, thereby making such registration redundant. Unfortunately, in India, industrial units can easily bypass OHSC provisions by resorting to contractual appointment of workers who are neither provided with identity cards nor included in any records by the regulators or business owners. Without any proof of employment, it becomes nearly impossible for workers to claim any benefits to which they are entitled. Furthermore, even those working regularly in duly registered industrial units are deprived of identity proofs, which makes it near impossible for them to file claims against employers.

Among states with substantial mining, Rajasthan allows workers to self-register, in order to avail benefits routed through the District Mineral Foundation (DMF), established

under Sec 9(b) of the Mines and Minerals [Development and Regulation] Act (MMDR) 2015. However, a few states have made provisions enabling self-registration, which makes it difficult for those impacted by silicosis to file legitimate claims. The District Mineral Foundations are pivotal non-profit statutory bodies through which funds are channelised in industrial areas, especially mines, across districts [7]. The DMFs are responsible for implementing important social projects funded by the Union Government through Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) [8]. Apart from social initiatives, DMFs have been used to channelise funding for silicosis patients as well. Unfortunately, as these bodies do not engage in data collection or active monitoring, their work does not have a significant impact at ground level. While DMFs have been created across hundreds of districts, so far these bodies do not coordinate amongst themselves to share data concerning labour registration or health information, which may be critical, especially for inter-state migrant workers who often find it difficult to claim benefits.

Thus, while legislative enactments provide for mandatory reporting of silicosis cases, the industrial units have seldom observed these in letter or spirit. The courts in India have made a belated effort to nudge both the government and private entities into action. By liberal interpretation of Part III (the Fundamental Rights Chapter) of the Indian Constitution, the Indian Supreme Court and the High Courts, as well as the National Human Rights Commission, have, in select cases, issued numerous directives to enforce government policies and safeguard the interests of workers [9]. However, implementation of their directives remains weak.

With the oversight of courts, certain states like Rajasthan and Haryana have been able to lay down elaborate mechanisms — including rules for financial assistance and rehabilitation of workers — such that thousands of workers have benefitted from policy interventions [10]. While these efforts are laudable, an overwhelming majority of those affected by silicosis have been left devoid of state support. In addition to this, business owners have avoided maintaining any records, as they may incur future liability if claims were to arise.

Another stark reality is the plight of the large number of silicosis patients who not only lose their occupation but must also resort to palliative care. The financial aid provided to patients is meagre and is only available to workers in a few states. Often, the sole bread winner is at risk of being declared medically unfit and rendered unemployed [11]. Due to this, many workers who fear loss of livelihood do not undergo regular medical testing and risk remaining outside the purview of the healthcare system. This practice not only burdens them with incremental out-of-pocket medical expenses but distorts the availability of accurate data regarding silicosis patients. Additionally, on-ground social movements relating to silicosis have hardly any impact. Other than the Mine Labor Protection Campaign (MLPC) in Rajasthan, or the Occupational Safety and Health Association

of Jharkhand (OSHAI), the participation of civil society in improving working conditions has been limited. Moreover, these organisations have tended to focus more on palliative measures such as granting compensation or arrangement of funding, rather than curative steps which would entail demanding an overhaul of the medico-legal system for better occupational healthcare. With lack of state support and weak civil society structures, businesses are given a virtual free pass to flout norms.

While a robust compensation scheme which provides financial aid to those affected and the provision of palliative healthcare are important, preventive measures are vital to ensure greater attention to limiting exposure to disease in the first place. This paper further argues for the need to scale up and widen the impact of actionable preventive measures necessary to combat silicosis. Unfortunately, once enough silica dust has been inhaled, no medical cure is available. It is therefore important for the state to ensure that adequate preventive measures, through enforcement of occupational safety regulations, are in place. Besides, the current provisions are not robust enough to cover the health conditions of most workers, who are left outside the ambit of the OHSC. While the Code may be commended for its efforts in integration of multiple laws, it fails to align with the ground realities and does not reach the most vulnerable and deprived social groups.

Preventive measures to combat silicosis

Revising permissible standards of exposure to dust at workplace

At present, Indian laws are not compatible with global best practices for prevention of silicosis. The current permissible limit in India for exposure to silica dust stands at 0.15 mg/m³ over a period of eight hours. This is three times greater than the maximum permissible limit in the United States. Moreover, there is widespread consensus over recommending that the exposure limit should be set at 0.025 mg/m³ [12].

The variance in permissible limit as prescribed by Indian regulations requires introspection and urgent revision of the current norms.

Another vital requirement is to ensure that data concerning dust-levels is continually monitored and relayed to the local authorities for compliance. While major urban centres now utilise the Air Quality Index (AQI) to maintain ambient air quality, this practice is yet to be replicated across the private sector. Pursuant to the Environment Protection Act, 1986, the state is empowered to issue directions as under Sec 5 of the legislation. This may allow further streamlining of regulation across a range of establishments.

The OHSC must make it mandatory for business owners to deploy air quality monitors whose data is readily made available to the local authorities for purposes of compliance

and further action. Access to real-time air quality data will also generate awareness amongst labourers who continually work for long hours without knowing the imminent risks. The Office of the Director General of Factory Advice Service & Labour Institutes (DG FASLI), under the Ministry of Labour, Government of India, works towards developing policies, generating standards and practices to ensure healthy and safe workplaces in ports and factories. Further, DG FASLI offers technical services and expertise to both state and central governments and formulates standards, legislation, guidelines and codes aligned with international standards or conventions on workplace safety, health and the environment. Seemingly, most government organisations lack adequate technical competence and resources to conduct monitoring exercises effectively, which leads to several deaths of workers each year. There remain serious budgetary constraints, as accepted by India's Labour Minister in an international forum [13]; this may lead to man-power shortages because of which government organisations may not be able to function effectively. To achieve a desirable outcome, it is necessary that DG FASLI regularly revises permissible standards of exposure to silica and continually monitors the compliance of such standards. This monitoring would entail DG FASLI deploying its own teams across districts to carry out randomised sampling across different sectors and to document data patterns to identify and target those entities that do not comply with the required standards. To achieve this, it is imperative that each state's Department of Labour be subjected to capacity-building measures as their performance is critical to ensure that environmental and occupational healthcare regulations are enforced in letter and spirit.

To seek compliance for legislative enactments such as the Motor Vehicles (Amendment) Act 2019 (eg Sec 177, Sec 185, Sec 194 and Sec 196) or the Environment (Protection) Act, 1986¹ the government has ushered in amendments to increase the quantum of penalty, thereby prosecuting negligent and non-compliant entities to bring about desirable behavioural change. Besides stringent penal measures, Information, Education and Communication (IEC) campaigns have aided in spreading greater awareness about these regulations. However, with regard to occupational health hazards, penal measures remain broadly defined and IEC campaigns are seldom undertaken. Even after the Bhopal Gas Tragedy case, the penal provisions added via amendments largely remain unenforced and have not been applied strictly by the authorities. A combined mix of extraordinary penalty and active engagement via IEC campaigns in the vernacular languages should be initiated to ensure proper dissemination of regulatory measures. Moreover, in the long run, it is important to build alternate avenues of employment for unskilled or semi-skilled workers such that they may not be forced to resort to the more dangerous occupations. This may have far reaching consequences in securing compliance from the mine owners

and generating awareness amongst the working population which is often unaware of the available redressal mechanisms.

Rectifying gaps in detection rates and misdiagnosis

Another major area of concern is that the official reporting rate for silicosis has been significantly lower than prevalence rates reported by independent studies. Sporadic studies have pegged the rate of prevalence to be anywhere between 30% to 55% across different industries [14]. Given that hundreds of millions are part of the workforce, which is exposed to silica daily, the prevalence rates are in stark contrast to government data on silicosis patients. In most jurisdictions, data concerning silicosis reporting is not made available. Even in states where active reporting is undertaken, reported figures diverge widely from the medical studies undertaken. For instance, in Rajasthan, more than 3 million workers are engaged in mining activities, however just around 25,000 have been identified for compensation, revealing a prevalence rate of less than 1%. This suggests that there is a sizeable number of unreported cases.

Multiple reasons could be attributed to this deviation. First, the majority of mining operations do not adhere to any standard procedure for health checkups or reporting. Second, most labourers are hired contractually on short term contracts and therefore keep on migrating for work across different industrial sites, even across different states, making it difficult to track their health status. Third, since these labourers are sourced from third-party contractors at minimal cost, they are almost never given any proof of employment or social security benefits. Thus, avoiding any obligation on the part of mine owners to provide any insurance benefit or subsidy for medical aid.

While under the Government of India's Ayushman Bharat Scheme, most workers would be covered for provision of basic healthcare services, the primary healthcare centres (PHCs) more often than not lack the required facilities to diagnose for silicosis. In most cases, workers suffering chronic chest pain have no recourse but to either visit private clinics, incurring out-of-pocket expenses, or the already overburdened district hospital, which is often hundreds of kilometres away. Even then, medical provisions are not always sufficient to diagnose for silicosis conclusively. In practice, a major hurdle in the way of silicosis detection has been the misdiagnosis of chest x-rays in government facilities, with silicosis patients being wrongly treated for tuberculosis (TB). It is also important to have dedicated institutions which specialise in occupational healthcare, such that PHCs as well as community healthcare centres (CHCs) are able to send critical cases to advanced health facilities.

From a policy standpoint, the current governance framework lacks real time mandatory reporting of silicosis cases by both private and public health facilities, unlike reporting of TB

incidence in India. The National TB Elimination Programme (NTEP) operates via a real-time case-based web-based surveillance system called Ni-kshay which aids with monitoring TB data on a national scale [15]. While examining radiological evidence for silicosis, the International Labour Organization (ILO) has laid out elaborate guidelines on how a chest X-ray must be interpreted to diagnose the prevalence of silicosis. Unfortunately, there is little awareness amongst medical personnel working at the grassroots level regarding this. The impetus to curb TB was a result of international pressure, as eradication of TB was a major health goal for the World Health Organization (WHO) and came to be articulated as a United Nations Sustainable Development Goal (UN SDG) (Goal 3). Unfortunately, in the case of silicosis the level of awareness has been disproportionately low and its global recognition as compared to tropical diseases, malaria and TB, has been much less pronounced.

Amending the Occupational Health & Safety Code towards reforms

Under Sec 1(3) of the OHS Code, “offices of the central government and state government” have been exempted from its provisions. While the legislative intention is to ensure lack of culpability of executive offices the government, the phraseology used is wide enough to even include public sector entities (PSU), as through previous judgments of the Supreme Court, the definition of phrases like “state”, “government offices” etc, have included PSUs such as ONGC, LIC, etc [16]. Therefore, for the sake of clarity, a specific exemption clause must be inserted to exclude government corporations, as often, under the garb of being government entities, PSUs claim immunity from being sued. Otherwise, in the future, the only recourse available against PSU’s would be writ jurisdiction across High Courts or the Supreme Court, wherein the cost of litigation is higher, and geographical reach is often a limitation.

Monitoring of key industrial sectors through interoperability of Aadhar, DBT and Ayushman Bharat platforms

The unorganised workforce faces polycentric health challenges which may be attributed to the nature of their day-to-day operations [14]. Integrating Aadhar, Direct-Benefit-Transfer Schemes (DBT) and Ayushman Bharat to facilitate periodic monitoring and informing the current policy framework may prove to be a more viable policy option.

Interoperability of public welfare platforms can ensure greater transparency in reporting public health information and responding promptly to the situation. It is important for the government to connect data patterns illustrating public health crises with necessary enabling mechanisms.

At the macro-level, health monitoring must include collection of essential health parameters of workers such as heart rate monitoring, oxygen levels and digitised X-rays. Digital initiatives under Ayushman Bharat can enable collection of data necessary to identify abnormalities, medical conditions

and/or psychological stressors amongst workers. This would allow regulators to geographically map sites with deviations from standard heart rate, pulse rate, blood pressure ranges, oxygen levels in blood etc [17, 18]. These metrics may be used to further track and analyse the status of at-risk workers. It may further aid in designing suitable policy interventions where necessary.

The data collected may be deployed in creating a standard model to monitor the larger picture of occupational health status. This can be done by assigning suitable weightage to various factors involved in identifying risk-prone areas such as types of industrial activity with historical incidence of silicosis, previous instances of government action on business owners etc [19]. Further, these models may also be used, not only to enforce regulatory mandates on-ground, but also evolve predictive insights for regulators to forecast deviant practices [20]. The analysis of data must inform the ongoing interventions to mitigate silica dust exposure and associated risks. As more data is gathered, government models maybe calibrated over time to enable greater efficacy in policy outcomes.

The way forward

In conclusion, the current policy response to combat silicosis has remained limited to scrutiny of compensatory schemes and filing of compliance reports by various state governments before constitutional courts, as and when public interest litigation proceedings are initiated. Nearly a decade ago, when state-run compensation programmes emerged, they were a welcome step in addressing the pressing medico-legal issues of silicosis. However, these initiatives are by no means sufficient to address the current situation.

Industries in India are expected to employ a vast number of workers, who are entitled to little or no social security benefits. Moreover, the wages provided barely equate with the minimum rate for daily work [21]. In this scenario, it is difficult for labourers to secure access to medical aid or preventive gear for themselves. Without enforcement of preventive healthcare measures, mining activities are a ticking time bomb for the workers who are exposed to silica dust. Preventive healthcare safeguards can not only assist in early detection of biomarkers for silicosis but also help regulators to continually monitor responsible conduct on the part of corporations. They can provide useful macro-indicators to assess the scope of compliance and limit the prevalence of silicosis through continued availability of data points regarding new patients and occupational health parameters across different geographies. This, in turn, will not only provide an accurate assessment of the on-ground situation but also facilitate greater precision in effective enforcement of future policies. The measures in place currently fail for lack of adequate resources and continual monitoring. Despite the largescale impact of silicosis, lack of mandatory reporting creates a gap between evidence on

ground and executive decision-making. In the future, for any concrete impact to be made, it is imperative for decision-making to be informed by credible evidence and accurate field data, not viable without mandatory reporting. This has been repeatedly flagged by policy makers [22]. Unfortunately, lapses in the process have led to a need for systemic response. More recently, the Supreme Court of India has highlighted the need for engagement of statutory organisations like the National Human Rights Commission (NHRC), Central Pollution Control Board (CPCB) and Employees State Insurance Corporation (ESIC) to review the situation and go beyond palliative measures to combat silicosis [23].

This requires the engagement of medical personnel, rather than administrative professionals, to assess the ground reality and act accordingly. The current policy drift has included administrative leadership and judges, however, the key to solving a public health crisis of this magnitude is the engagement of healthcare specialists in occupational health hazards. This missing block must be included in the puzzle to scale up preventive measures. Currently, major healthcare decisions are taken either in administrative offices or under court orders. Medical professionals engaged in government institutions are seldom consulted before legislative drafting or policy drafting.

It is important to develop institutional mechanisms with dedicated healthcare professionals at the forefront of continual managing and monitoring of occupational health incidents. The same would require bodies like State Pollution Control Boards, State Human Rights Commissions, and District Mineral Foundation Trusts to be staffed with medical experts who are not engaged on a deputation basis but remain on the regular payrolls of these bodies. In the case of Rajasthan, there is already a provision to set up state and district-level Pneumoconiosis Boards which would be staffed by medical professionals as well as administrative officers to continually monitor and implement occupational healthcare mandates [10, 24]. The worker suffering from silicosis is certified by the Pneumoconiosis Medical Board constituted under the Rajasthan Workmen's Compensation (Occupational Diseases) Rules, 1965 [25]. The medical boards have been formed vide a government notification across all districts by the Labour Department, Government of Rajasthan [26]. Unfortunately, in most states, this particular body is yet to be established, as a result of which the monitoring of occupational healthcare efforts remains centralised within state capitals. Moreover, for desirable healthcare outcomes, it is imperative that healthcare professionals be at the forefront of policy-making processes, especially in occupational health and safety issues. Induction of healthcare experts in institutional mechanisms such as state and district-level boards/commissions would go a long way towards effectively combating occupational health hazards such as silicosis. This would also imply that occupational healthcare professionals are actively recruited and engaged in State Pneumoconiosis Boards to provide

expert medical advice and guide the state entities with regard to actions required to be taken.

When it comes to large scale industrial activity, the state benefits from royalties and taxes while windfall gains are realised by private-sector entities that operate large scale enterprises by sourcing labour at minimal cost. In this wealth creation chain, workers obliged to perform physical labour form the weakest link. They must not only endure the risk of undertaking challenging tasks in the harshest of conditions for meagre pay but also accept circumstances that guarantee little to no social security. The Constitution of India, through its chapter on Directive Principles envisions the working of an economic system that does not subject any social group to "common detriment" [27]. In order to realise this, it is imperative that we devise institutional mechanisms that protect the interests of the weakest.

Note: *The Environment (Protection) Amendment Rules, 2023, have notified emission standards for particulate matter in industrial boilers.*

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