

Calculation of compensation<sup>1</sup>

WHO adopted strategy of the burden of disease essentially looks into the new metric of the Disability Adjusted Life Year (DALY) lost due to the disease. The DALY is a summary measure of population health that combines in a single indicator years of life lost from premature death and years of life lived with disabilities. One DALY can be thought of as one lost year of 'healthy' life and the burden of disease as a measurement of the gap between current health status and an ideal situation where everyone lives into old age free of diseases and disability. DALYs for a disease or health condition are calculated as the sum of the years of life lost (YLL) due to premature mortality in the population and the years lost due to disability (YLD) for incident cases of the health condition.

With due consideration of different estimates, it might be possible to arrive at DALY values associated to the silicosis. As a hypothetical example, a calculation to arrive at the DALY values for silicosis, some observations of NIOH studies are shown herewith. During the period from 1981 to 2004, 12 studies have been conducted at NIOH and different work processes such as slate pencil workers, agate workers, quarry

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<sup>1</sup> It is a model calculation. Wherever possible the data for the local population should be used.

workers, ceramic and pottery workers. The prevalence of silicosis has been reported in the range of 12 to 54% in different occupational groups. The average age of workers ranged from 27 to 43 with the duration of exposure varied from 5 to 19 years.

Let us consider that the total number of workers exposed to silica in India with potential risk to contract with silicosis is ~30 lakhs and the onset of silicosis is at the age of 27 years and the duration of exposure when silicosis reported is 8 years. The survival time data regarding silicosis patients in India after diagnosis of the disease are not available. The literature reported mean survival time (Lou and Zhou, 1989) of silicosis patients after diagnosis is 12.2 years. With the detailed calculation method available for DALY one can arrive at average age of death of silicosis patient of around ~40 yrs. The life expectancy at the age of 40 yrs is 31.5 yrs and taking discount of 3% into consideration, the life expectancy at the age of 40 yrs becomes 21.82 yrs. Taking the prevalence of silicosis at 32%, the total workers that might have contracted silicosis ~9.6 lakhs. Current data regarding mortality due to silicosis in India are not available. For the purpose of the calculation the mortality due to silicosis is taken as 2.3% (Nakagawa, et.al 1985). That means the mortality number is ~twenty two thousand. The summated YLL and YLD yielded the DALY value as ~520262 yrs., and accordingly the total number of years lost per silicosis patient can be arrived at ~23

years. With minimum income of a worker of Rs.36, 000/- per annum, the estimated amount of compensation to a silicosis patient might be arrived at Rs. ~13 lakhs due to disability adjusted life year lost of ~23 years.

### Limitations

This approach of estimation of compensation has certain limitations due to the non-availability of some basic estimates such as the total exposed population, prevalence estimate based on large scale study, survival time of silicosis patient after diagnosis, disability weights, etc. In the above hypothetical calculation the disability weight for silicosis patients is taken as 0.006.

### Abbreviation

DALY	Disability Adjusted Life Year
ESI	Employee State Insurance
NIOH	National Institute of Occupational Health
OHSC	Occupational Health and Safety
Committees	
YLD	Years Lost due to Disability
YLL	Years of Life Lost