

## ABSTRACT

**Background:** Noise Induced Hearing Loss (NIHL) is increasingly being regarded as one of the most important Occupational diseases, especially in the mining industry. As most mining houses have put systems in place to try and control this problem it remains to be seen if existing controls are effective in achieving the intended objective of preventing hearing loss. This study was conducted in one of the big South African Diamond mines, which has a well resourced Hearing Conservation Program.

**Objectives:** This study was conducted with the purpose of establishing if there has been additional incidence of NIHL in noise exposed workers during the observation period of five years. The other objective of this study was to determine the effect of age.

**Study design and method:** The population in this study was made up of permanent employees of the mine. They were divided into low risk and high risk groups according to the noise/acoustic zoning of their work areas by the mine's Occupation Hygiene Section, with the low exposure group acting as the control group. A retrospective record review was done using the Occupational Health records in the mine's Occupational Health Centre. The period of observation spanned 1 January 1999 – 31 December 2004 (inclusive). Trends of the collated data were used to compare the two exposure groups with regard to the various outcomes that are commonly associated with hazardous noise exposure.

**Results:** The outcomes that were analyzed in this study were: Incidence Rates for NIHL, Notching and Down-sloping. All these were observed to have occurred more among the exposed group during the period of observation. The incidence rates, in particular, were found to 92.8 per thousand person years in the high exposure group and 52.3 per thousand person years in the low exposure group. The statistical test that was used was the z-test and the results were  $z=5.844$  with a  $p<0.05$ . Having decided on a significance level of 5% for the statistical test, this result was found to be statistically significant. This can be regarded as some proof that the exposed group had a worse outcome than their non-exposed counterparts. Another observation that was made was that the incidence of NIHL was proportionately higher among the older study subjects.

**Conclusion:** Since the exposed group of workers was found to show statistically significant incidence of NIHL compared to the low exposure group it shows that the current Hearing Conservation Program (HCP) that is employed by the mine is not effective in preventing NIHL. However there were some limitations in the study design that preclude generalization of these results. Therefore a recommendation was made for a prospective cohort study to address these limitations.