to make a living, even in a precarious environment contributed to this incidence.

Objectives The objectives of this study are:

- To provide capacity building to help this group of workers learn concepts for improving work conditions and understand the risks in mining;
- To provide awareness on various approaches of workplace health and safety promotion as regards mining.

Methods One hundred and seventy four(74) participants were randomly selected for this training.

Modules

- Hazard identification and risk assessment.
- First aid
- Mercury Exposure and related risks
- lead exposure and related risks
- Safer mining practice
- Personal Hygiene
- Personal protective equipment (PPE) used in mining

Results The Health and safety knowledge of the ASGM workers were increased. The capacity building process enabled the workers to recognise risks associated with mining and therefore know how to implement safety measures by using PPE and by learning about safety improvement concepts.

Discussion Our findings suggest that positive attitudes toward promoting safe working conditions and practices can be fostered among the ASGM workers.

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STATUS OF REGULATIONS ON HEALTH AND SAFETY IN MINING IN KENYA SINCE ENACTMENT OF THE OCCUPATIONAL HEALTH AND SAFETY ACT,2007

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10.1136/oemed-2018-ICOHabstracts.714

Introduction Large and small scale Mining in Kenya has been in practice for close to 100 years. This includes mining of minerals like soda ash, gold, flourspar, gemstones, quarrying. As an occupation with varied risks, regulation has been used in many countries to ensure the health, safety and welfare of workers is taken care of. There have been various regulations governing some aspects of mining in Kenya including health and safety. Such laws were enacted as early as 1940 for the Mining Act CAP 306 and 1951 for the Factories Act CAP 514 whose purpose was to make provision for health, safety and welfare of persons employed in factories and other places.

Methods A systematic review was conducted after setting the research questions. Online databases and sources were identified to conduct the review. The articles under review were limited to law provisions on health and safety in mining in Kenya. Online sources used include Kenya law reports database, the Extractives Baraza, the Ministry of Labour Website and Ministry of Mining Website.

Results Laws and Regulations that touch on health and safety in mines which were enacted before the Occupational Health and Safety Act,2007 have since been repealed. The Mining Act of 2016 replaced Mining Act CAP 306 where small scale mining has been recognised as a legal activity. However, there are no specific regulations on the health and safety provisions for this group of workers. Kenya has not ratified a number of International Labour Organisation(ILO) conventions on health and safety.

Conclusion Kenya has taken notable steps in ensuring mining industry has regulations that govern its operations. Having artisanal and small scale mines recognised as a legal activity are indicative of these steps among others. The findings also indicate the need to have rules that are specific to the industry.

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ASSESSMENT OF THE IMPACT OF MINING ON THE ENVIRONMENT AND HEALTH IN DRC (DEMOCRATIC REPUBLIC OF CONGO)

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10.1136/oemed-2018-ICOHabstracts.715

Introduction DRC is endowed with enormous mining potential, the exploitation of which promises great hope of economic development. However, the various activities carried out during several years of operation have led to negative environmental and social impacts. The exploitation of mineral deposits has had deleterious effects on the biophysical, socio-economic and health aspects of the surrounding populations.

Methods Systematic and impartial assessment of mining activities was conducted in terms of environmental impacts, waste management, implementation of environmental control mitigation measures, and emergency plan, according to national regulations and requirements of The World Bank. Field study required visits to the sites in the Provinces of Katanga, Kasai Oriental and Kasai Occidental, collection of samples of water and soil, collection of health data, and interviews with key personnel including representatives of mining companies, miners and surrounding populations.

Result Samples of surface water, groundwater and soil were collected and analysed along with surveys on occupational health and safety issues including noise and observations carried out by the group of experts on the basis of literature in the field. The contaminants that were above the standard included Silver, Arsenic, Copper, Molybdenum, Chromium, Zinc, Manganese, Mercury, Potassium and Sulphur, Nitrites and Nitrates, and suspended organic matter. Resulting population displacements had quite disruptive social effects and serious risks of impoverishment on aboriginal families and residents and damage to the environment.

Discussion Issues of waste management, liquid effluents, especially acid mine drainage, and the enormous excavation holes were quite noticeable. The analysis revealed exceedance of the current standards of DRC, WHO or Quebec, concerning the quality of surface and ground water, and soil quality. This mission laid the groundwork for an awareness of the dangers that threaten the environment in general, and especially the populations living in the vicinity of explored mining sites along with mitigation measures.

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OVERCOMING THE LEGACY OF OCCUPATIONAL LUNG DISEASES IN MINeworkers in Southern Africa – Health Services and Compensation

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10.1136/oemed-2018-ICOHabstracts.716

Introduction The mining sector that has driven the South African economy for over 100 years left a legacy of occupational lung diseases in mineworkers, their families and communities in Southern Africa not comparable with any other working populations and compounded by the migrant labour system. The 33 000 mineworkers compensated for silicosis, 109 000 for tuberculosis and 14 000 for asbestos-related disease amongst other occupational lung diseases over the past 30 years is thought to be only the tip of the iceberg. This study aimed to document progress towards ameliorating this situation and identifying residual challenges.

Methods A review was conducted of relevant policy and legislation and epidemiological studies showing the size, shape and scope of occupational lung diseases and access of current and ex-mineworkers to prevention interventions, health services and compensation. This was supplemented by 12 semi-structured interviews and data analysis.

Result The approach to the occupational lung disease challenges within the Southern African mining sector included the development of a database of 600 000 files, outreach services including fixed and mobile health units and financial services, tracking and tracing ex-mineworkers using geospatial mapping tools and increased compensation payments. Multi-stakeholder participation involving governments in the Southern Africa region, trade unions, the Chamber of Mines, ex-mineworker associations and multi-lateral agencies assisted with financial, infrastructural and technical resources.

Discussion The challenges in the post-apartheid era have meant that vast numbers of mineworkers who have fallen ill or became disabled as they worked to produce South Africa's mineral wealth were not receiving health services and compensation. Progress is now being made to address the problems identified. Despite these efforts there are barriers to access services including socio-cultural factors, distance and lack of knowledge amongst ex-mineworkers about occupational lung diseases and compensation.

98 LIFE EXPECTANCY AT AN OPEN PIT COAL MINE IN COLOMBIA

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10.1136/oemed-2018-ICOHabstracts.717

Introduction Several studies have shown that life expectancy of miners in underground mines is greatly reduced. The complex working conditions to which they are subjected and the associated social conditions explain this reduction. However, few studies have come forward to show whether life expectancy is also reduced in miners working in open pit mining. This study aims to determine the life expectancy of miners who have worked in an open pit coal mine in Colombia.

Methods 15 153 people who worked at the Mine from 1982 to 2015 were included in the study: 6133 were active and 9040 had retired. The applied statistical methods estimate the survival function based on mortality tables and the Kaplan-Meier estimator. It also contains inference methods and an adjusted Cox regression model (1972) to determine some explanatory factors for mortality at La Mina.

Result Compared with the risk of dying by means of a log-rank test among those who have worked in the mine against the risk of people from other parts in the country and from the area of influence of the mine, it has been found that they are significantly different (p-val <0.001). The direction of this difference indicates that life expectancy for workers who have worked in this mine is greater than that of their zone of influence and that of the country.

Discussion The possible explanations for the higher life expectancy in these workers may be associated with the living conditions that they have access to due to high salary levels and the occupational control measures established in the company. The longevity characteristic of adult inhabitants of the region where this mine operates also contributes to higher life expectancy found in these workers.

Musculoskeletal Disorders

1045 MUSCULOSKELETAL DISORDERS AMONG NURSES: EPIDEMIOLOGICAL AND SEMI-QUANTITATIVE STUDY

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10.1136/oemed-2018-ICOHabstracts.718

Introduction This study aimed to identify biomechanical risk factors of musculoskeletal disorders (MSD) among nurses.

Methods A cross sectional survey-structured by the Nordic MSDs questionnaire- was conducted through a representative sample of the 1179 paramedics providing nursing care in two university hospital in Tunisia (n=301). A representative work period in each department was identified. A multidisciplinary working group, according to estimated usual physical load, divided theses departments into four homogeneous groups. Semi quantitative biomechanical constraints based on 56 direct observations with encoding software and over 2 hours each one was conducted, in accordance with the homogeneous exposure group sampling table. Physical load scores were elaborated according to the posture adopted, gestures performed and characteristic of handling (type, assistance, weight and autonomy of the patient) and assessed on the Chamoux physical strain scale.

Results The prevalence of the back MSDs was equal to 70.3%. Variable prevalence of the upper limbs MSDs was noted according to the anatomical area (43.68% for neck, 40.27% for shoulders, 15.01% for elbows and 29.35% for wrists). Observational study concluded that handling activity, as well as type and duration of constraining postures, were variable in function of the department of assignment. According to Chamoux scale the average physical load score was variable from 7.76 in departments with 'heavy physical requirement' to 7.25 in those associated to 'low' physical requirement. Multivariate analysis showed a significant difference concerning the thrust and the traction of light and heavy load, the activity of handling and the characteristics of the handled patients. It also concluded that paramedics affected to