

# African Newsletter on Occupational Health and Safety

---

Volume 15, number 3, December 2005



**OCCUPATIONAL HYGIENE**

# African Newsletter on Occupational Health and Safety

Volume 15, number 3, December 2005  
Occupational hygiene

Published by  
the Finnish Institute of Occupational Health  
Topeliuksenkatu 41 a A  
FIN-00250 Helsinki, Finland

Guest Editor in Chief  
Suvi Lehtinen

Guest Editor  
Marianne Joronen

Guest Linguistic Editor  
Sheryl S. Hinkkanen

Layout of the cover page  
Tuula Solasaari-Pekki

The Editorial Board is listed (as of 28 February 2005) on the back page.  
A list of contact persons in Africa is also on the back page.

This publication enjoys copyright under Protocol 2 of the Universal Copyright Convention. Nevertheless, short excerpts of articles may be reproduced without authorization, on condition that source is indicated. For rights of reproduction or translation, application should be made to the Finnish Institute of Occupational Health, Office of Information and International Affairs, Topeliuksenkatu 41 a A, FIN-00250 Helsinki, Finland.

The African Newsletter on Occupational Health and Safety homepage address is:  
<http://www.ttl.fi/AfricanNewsletter>

The next issue of the African Newsletter will come out at the end of April 2006. The theme of the issue 1/2006 is Health and safety culture.

Photograph of the cover page: M. Lintunen, Photo Gallery of the Department for Int. Development Cooperation, the Ministry of Foreign Affairs, Finland.

© Finnish Institute of Occupational Health, 2005

Printed publication: ISSN 0788-4877  
On-line publication: ISSN 1239-4386

## Contents

<b>Editorial</b>	55
D.W. Stanton, ASOSH/SAIOH	
<b>The ILO/WHO Global Programme for the Elimination of Silicosis (GPES)</b>	56
I.A. Fedotov, ILO	
<b>The practical application in developing countries</b>	58
G. Eijkemans, B. Goelzer, WHO	
<b>Occupational hygiene in Southern Africa</b>	61
Y. Gounden, R.N. Naidoo, SOUTH AFRICA	
<b>Planning occupational health within WHO – Planning committee of the WHO Collaborating Centres' Network, Johannesburg</b>	65
S. Lehtinen, FINLAND	
<b>Chrysotile asbestos fibre levels in cement-manufacturing in Zimbabwe</b>	66
M. Mutetwa, M. Chikonyora, R. Dozva, D. Mazibuko ZIMBABWE	
<b>Needs for pesticides safety outreach programmes in developing countries: a Tanzanian example</b>	68
J. Akhabuhaya, TANZANIA	
<b>Effects on chronic exposure to pesticides on the cardiopulmonary and cholinesterase values of farm workers in Ethiopia</b>	71
M.B. Abebe, Y. Mekonnen, ETHIOPIA	
<b>Occupational health hazards in the Nigerian cement workers – workers' awareness and perceptions</b>	73
F.C. Ezeonu, J.N. Ezeonu, O.C. Edeogu, NIGERIA	
<b>WAHSA Project</b>	76
S. Lehtinen, FINLAND	
<b>The 6th International Scientific Conference IOHA 2005</b>	77
D.W. Stanton	
<b>Some recommendations from the IOHA 2005 Workshop Sessions in September 2005</b>	78
D.W. Stanton	

The responsibility for opinions expressed in signed articles, studies and other contributions rests solely with their authors, and publication does not constitute an endorsement by the International Labour Office, World Health Organization or the Finnish Institute of Occupational Health of the opinions expressed in it.



# Occupational Hygiene in Africa

In the more than fifty countries of Africa currently there are only two occupational hygiene societies and both are in South Africa. These are the Southern African Institute for Occupational Hygiene (SAIOH) and the Mine Ventilation Society of South Africa (MVS). They were formed because of the occupational health problems in South Africa initially in mining and then in general industry and through the efforts of committed individuals with a passion for their discipline. The following is a short summary of how occupational hygiene developed in South Africa and gives some direction to how occupational hygiene societies may develop in other parts of Africa.

The organization I work for, the Chamber of Mines of South Africa, employed staff as far back as 1914 to carry out periodic airborne dust surveys of the mines and created a laboratory for accurately determining the dust samples.

By 1916, the Government had appointed a dust inspector to assist in the control of dust. In 1917, regulations were formulated making it compulsory to appoint dust inspectors for mines employing over 1000 workers. These inspectors were the forerunners of the modern ventilation officer and environmental engineer, and the creation of this post paved the way for the development of expertise and knowledge in an area which is now fully recognised as integral to the profession of mining.

## Mine Ventilation Society of South Africa (MVS)

While the experts continued to ponder over ways and means for improved dust determination and control, mines were becoming deeper and problems of heat were assuming greater importance. The problems of heat fell squarely on the shoulders of the dust inspector who was to become the ventilation officer. The original brief of the dust inspector had expanded into ensuring the workplaces were kept cool using the most cost-effective methods as well as reporting on conditions in the stopes. Besides reporting on dust concentrations, the ventilation officer was responsible for the collection of data on air quantity, air temperature and cooling power, and air velocity and gas concentrations.

Ventilation problems were thus becoming increasingly complex and in the early forties it was painfully clear that a forum was needed where experts could meet regularly and discuss the urgent issues at hand. The Chamber appointed specific bodies to deal with ventilation matters. This certainly eased some of the isolation experienced by ventilation men but attendance at these meetings was always as an official representative of a mining group.

In 1944, the mine ventilation society was formed and in 1948, the first issue of the Mine Ventilation Society Bulletin was distributed to members. An annual grant to assist with the publication of the Bulletin was made by the Chamber in 1956 and in 1957 the Bulletin changed its name to the Journal of the Mine Ventilation Society of South Africa.

The Society now has an international reputation for mine



ventilation with members from around the world. A history of the first 50 years of the Society was published in 2001.

## Southern African Institute for Occupational Hygiene (SAIOH)

The Commission of Enquiry on Occupational Health in 1974 (Erasmus Report 1976) focussed on the critical need to develop occupational hygiene in South Africa due to the extensive occupational health problems in general industry. This report stated that the situation with regard to industrial hygiene is acute and the training of industrial hygienists has been seriously neglected.

Discussions were started to form an occupational hygiene society and the Occupational Hygiene Association of South Africa (OHASA) was established in 1983 to create awareness and enhance occupational hygiene as a discipline.

The Institute of Occupational Hygienists of Southern Africa (IOHSA) was formed in 1992 to perform professional registration of occupational hygienists. At the International Occupational Hygiene Association (IOHA) meeting in Stockholm in September 1996, IOHSA was accepted as a member of IOHA. After some years of often-heated discussion, amalgamation of OHASA and IOHSA was finally completed when the Southern African Institute for Occupational Hygiene (SAIOH) with an independent Certification Board (SAIOH-CB) was finally formed in 2000.

SAIOH works to create awareness and enhance occupational hygiene as a discipline and through its Certification Board registers occupational hygienists that meet appropriate standards of formal education and practical experience.

In 2002, SAIOH was successful in its bid to host in South Africa in 2005 the International Occupational Hygiene Association (IOHA) 6th International Scientific Conference (The first IOHA International Conference in Africa). To ensure the success of this conference, SAIOH and the MVS jointly organized IOHA 2005 on behalf of IOHA. The theme of IOHA 2005 is The Development of Occupational Hygiene in Africa and Globally.

Additional occupational hygiene societies will be developed in other parts of Africa particularly where industrialization has created occupational health problems, where there are national institutes or organizations with a need for occupational hygiene personnel and where there are individuals committed to the discipline of occupational hygiene.

A handwritten signature in black ink that reads "DW Stanton". The signature is written in a cursive style and is underlined with a single horizontal line.

David W. Stanton  
Occupational Hygienist  
Chamber of Mines of South Africa  
davidws@asosh.org

# The ILO/WHO Global Programme for the Elimination of Silicosis (GPES)

Igor A. Fedotov  
ILO

**S**ilicosis is a well-known fibrogenic lung disease which is probably the most ancient occupational illness. Its prevention has a long history in the International Labour Organisation (ILO). The First International Conference on Silicosis was convened by the ILO 75 years ago in Johannesburg, South Africa, to discuss prevention of silicosis that was highly prevalent in miners. The following silicosis conferences organized by ILO during the last eight decades have greatly contributed to the advance of respiratory medicine around the world. They have always focused on important issues of the time, as reflected by the expanding conference themes and titles. In 1930, it was the International Conference on Silicosis; in 1950, it was the International Pneumoconiosis Conference. By 1992, it became the International Conference on Occupational Lung Diseases and by 1997, the International Conference on Occupational Respiratory Diseases (ICORD). The recent 10<sup>th</sup> ICORD (April 2005, China) has provided an excellent forum for deliberations on best practices for prevention and control of occupational respiratory hazards in the 21st century.

## Present

Despite all efforts to prevent it, silicosis is widely persistent worldwide. This incurable disease affects tens of millions of workers engaged in hazardous dusty occupations in many countries. In 1997, the International Agency for Research on Cancer (IARC) classified crystalline silica from occupational exposure as a carcinogen to humans (Group 1). With its potential to cause progressive physical disability, silicosis continues to be one of the most important occupational health illnesses in the world. Where prevention has been successful, the inci-

dence rate of silicosis is decreasing. Decrease is observed in the incidence of silicosis in many industrialized countries. Effective prevention has made it possible that three of the pneumoconioses – silicosis, coal-workers' pneumoconiosis (CWP), and asbestosis have been specifically targeted in many countries as occupational respiratory diseases that can and must be prevented. Some countries have made significant progress towards their elimination. Nevertheless, in most parts of the world silicosis is widely spread and millions of workers continue to be exposed to noxious dusts running an unacceptably high risk of developing the disease. Epidemiological studies show that up to 30–50% of workers in primary industries and high-risk sectors in developing countries may suffer from silicosis and other pneumoconioses (1). There is also a strong evidence of increased incidence of tuberculosis with the increasing severity of silicosis (2). It is estimated that 30,000

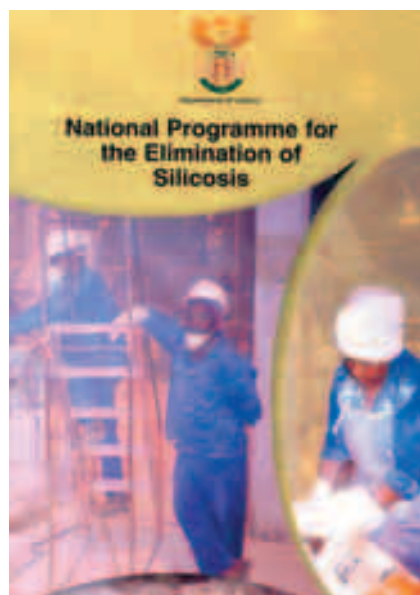
deaths occur from pneumoconioses annually, but the actual figure might be actually much higher as the under-diagnosis and under-reporting are quite common (3).

## Possibility of elimination

Experiences of some countries have convincingly demonstrated that it is possible to reduce significantly the incidence rate of silicosis with well-organized silicosis prevention programmes – Australia, Belgium, Canada, Finland, France, Germany, Switzerland, Sweden, UK and the United States. In the absence of effective specific treatment of silicosis, the only approach towards the protection of workers' health is the control of exposure to crystalline silica dusts. The effectiveness of prevention largely depends on a range of preventive measures.

**At the national level**, enforcement of laws and regulations, establishment of occupational exposure limits and technical standards, governmental advisory services, an effective system of inspection, a well-organized reporting system, and a national action programme involving governmental agencies, industry and trade unions – are the necessary elements of a sound infrastructure which is required to prevent silicosis successfully.

**At the enterprise level**, application of appropriate technologies to avoid the formation of silica-containing dust, use of engineering methods of dust control, compliance with prescribed exposure limits and technical standards, surveillance of the work environment to assess effectiveness of preventive measures, surveillance of workers' health for early detection of silicosis, use of personal protective equipment (as a temporary measure), as well as health education, information and training are all neces-



sary for successful prevention.

Technical knowledge, professional expertise, qualified personnel trained in using appropriate technologies and methods of dust control, as well as access to technical information are needed for everyday activities to prevent silicosis. The use of improved ventilation and local exhaust, process enclosure, wet techniques, personal protection and industrial substitution of less hazardous agents for silica – all these measures do reduce exposure. The responsibilities of governmental institutions include the development and enforcement of relevant legislation, establishment of exposure limits and technical standards, evaluation of technologies and methods of dust control, assessment of the efficiency of preventive programmes and recommendation of effective preventive strategies and safe work practices (4).

## Global action

The ILO/WHO Global Program for the Elimination of Silicosis (GPES) was established following the recommendation of the 12<sup>th</sup> Session of Joint ILO/WHO Committee on Occupational Health in 1995. The Committee identified the global elimination of silicosis as a priority area for action in occupational health, inviting countries to place it high on their technical agendas. The experts believed that the experience gained would provide a prevention model for other pneumoconioses and a proven system to manage exposure to mineral dusts. This goal was recently re-affirmed by the 13<sup>th</sup> Session of the ILO/WHO Joint Committee on Occupational Health (Dec. 2003), which strongly recommended that “special attention should be paid to the elimination of silicosis and asbestos-related diseases in future ILO/WHO co-operation.” (5)

The ILO/WHO GPES is targeting countries that have determined the elimination of silicosis among priority actions in occupational health and are willing to join it by establishing their national action programmes. To-date, Brazil, China, India, Thailand, Vietnam, and South Africa have established their National Programmes for the Elimination of Silicosis and take active part in the ILO/WHO GPES. Twenty-two countries have shown strong interest in participating in it and there are 47 major national projects being implemented within its framework, many of which are conducted by the WHO Collaborating Centres in Occupational Health ([http://www.who.int/occupational\\_health/topics/oehtf4.pdf](http://www.who.int/occupational_health/topics/oehtf4.pdf)).

The National Programme for the Elimination of Silicosis (NPES) in South Africa (<http://www.asosh.org/World-Links/TopicSpecific/silica.htm#ZA>) was launched under the leadership of the Department of Labour in June 2004. It unites governmental agencies such as the Department of Minerals and Energy, Department of Health, as well as Chamber of Mines (employers), three major trade union federations (COSATU, NACTU, FEDUSA), National Institute for Occupational Health, academic and research institutions. The implementation of the NPES is co-ordinated by the National Silicosis Working Group under the Department of Labour which has set up the Provincial Silicosis Working Groups for widely carrying out activities in the country in an efficient and co-ordinated manner.

By establishing the GPES, the ILO and WHO have shaped a policy perspective for their member States for a wide international co-operation that should be governed by a true partnership between industrialized and developing countries. Every effort should be made to promote the exchange of technical information and experience in order to attain a common goal of the elimination of silicosis.

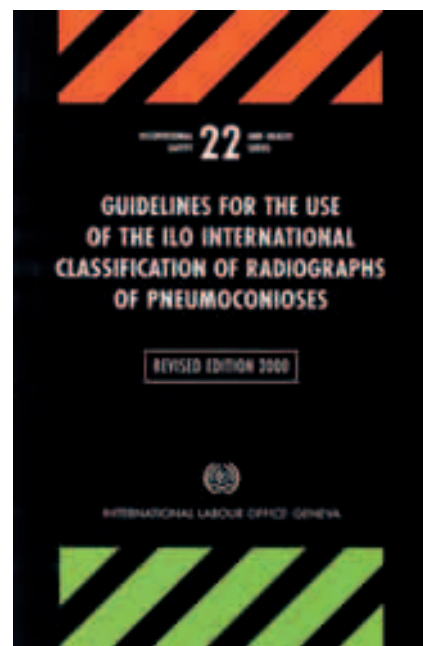
**The immediate objective** of the ILO/WHO GPES is to promote the establishment by countries of National Programmes for the Elimination of Silicosis (NPES) and to reduce significantly the incidence rate of silicosis by the year 2015.

**The development objective** of the ILO/WHO GPES is to establish long-term wide international cooperation on global elimination of silicosis and to eliminate it worldwide as an occupational health problem by the year 2030.

With due attention paid to the local conditions, it is recommended that a **National Programme for the Elimination of Silicosis (NPES)** should comprise the following main elements:

- (i) magnitude of the problem
- (ii) national silicosis profile
- (iii) definition of prevention strategy
- (iv) institutional framework and principal partners
- (v) programme implementation
- (vi) monitoring and evaluation of NPES
- (vii) national standards and international linkages
- (viii) relationship with the protection of the general environment.

([http://www.ilo.org/public/english/protection/safework/health/npes\\_outline.pdf](http://www.ilo.org/public/english/protection/safework/health/npes_outline.pdf))



## Future

The silicosis preventive strategy should be based on the **primary** and **secondary prevention** approaches. The former includes the control of silica hazard at source by the engineering methods of dust control. The latter includes the surveillance of the work environment to assess the adequacy of dust control measures, exposure evaluation to assess the health risk for workers, and surveillance of the workers' health for early detection of the disease. Under the ILO/WHO GPES, activities related to the secondary prevention have largely focused on the upgrading of skills of occupational health physicians in developing countries in using the ILO 2000 Classification of Radiographs of Pneumoconioses and strengthening national systems of workers' health surveillance. Activities to promote wider application of engineering controls and occupational hygiene methods (primary prevention) have been difficult because of low capacities in developing countries to use them due to limited expert advice and funds to be used for occupational hygiene measurements and controls. This gap is hopefully to be bridged with the development of the International Occupational Risk Management Toolbox ([http://www.ilo.org/public/english/protection/safework/ctrl\\_banding/index.htm](http://www.ilo.org/public/english/protection/safework/ctrl_banding/index.htm)).

It contains toolkits, such as the Silica Essentials Toolkit, where control guidance sheets propose low-cost simple solutions for hazard control in typical work situations in developing countries. This makes it especially valuable for developing countries where the majori-

ty of the workforce exposed to silica dusts is employed in the informal sector and small-scale industries. The necessity of wider control of silica hazard has been recently discussed at the 6<sup>th</sup> IOHA Scientific International Conference (19–23 September 2005, South Africa) and at the 3<sup>rd</sup> International Control Banding Workshop held within its framework. It was concluded that every effort should be made to promote application of primary preventive measures to control silica hazard in Africa and worldwide through joint efforts of ILO, WHO, IOHA and competent national bodies.

Despite many obstacles, the idea of global elimination of silicosis is technically feasible. Positive experience gained by many countries shows that it is possible to reduce significantly the incidence rate of silicosis by using appropriate technologies and methods of dust control. The use of these technologies and methods has proved to be effective and economically affordable. Assistance provided within the framework of the ILO/WHO GPES will contribute to the upgrading of national capacities to prevent silicosis. Countries will need to ensure that all necessary measures for the prevention of silicosis be taken at the national and enterprise levels and supported by multidisciplinary efforts of occupational safety and health professionals, employers and workers, as well as from all economic sectors concerned. It is strongly believed, that the global elimination of silicosis is a realistic goal that can be achieved through a very broad international collaboration supporting the im-

plementation of national programmes for the elimination of silicosis.

### Bibliography

1. Chiyotani K, Hosoda Y, Aizawa Y, editors. "Advances in the Prevention of Occupational Respiratory Diseases". Proceedings of the 9<sup>th</sup> International Conference on Occupational Respiratory Diseases, Kyoto, Japan, 13-16 October 1997. Excerpta Medica International Congress Series 1153, pp.1256, Elsevier 1998.
2. Health Effects of Occupational Exposure to Respirable Crystalline Silica. NIOSH Hazard Review. Department of Health and Human Services, CDC, NIOSH, 2002.
3. XVIIth World Congress on Safety and Health at Work. 18–22 September 2005, Orlando, USA. Introductory Report: Decent Work – Safe Work (<http://www.ilo.org/public/english/protection/safework/wdcongrs17/intrep.pdf>).
4. Fedotov I. Global Elimination of Silicosis: the ILO/WHO International Programme. Asian-Pacific Newslett on Occup Health and Safety 1997;(4)2;34–5.
5. Thirteenth Session of the Joint ILO/WHO Committee on Occupational Health. Report of the Committee, JCOH/XIII/D.4, ILO, Geneva, 2003 (<http://www.ilo.org/public/english/protection/safework/health/session13/index.htm>).

Igor Fedotov  
Senior Specialist on  
Occupational Health  
InFocus Programme SafeWork  
International Labour  
Organisation (ILO)  
4, route des Morillons  
CH-1211 Geneva 22  
SWITZERLAND  
Tel. (41 22) 799 7495  
Fax (41 22) 799 6878  
E-mail: fedotov@ilo.org

Gerry Eijkemans  
Berenice Goelzer  
WHO

There is scientific and technical knowledge available today that, if applied, could prevent and control most occupational risk factors. However, on a worldwide basis, "healthy" work environments are still the privilege of a few, as too many workers continue to be exposed to – often very serious – occupational hazards. The general environment continues to be polluted including through large-scale disasters.

Even in industrially developed countries, there is a "knowledge-application gap". Prevention fails more often due to an inability to apply existing knowledge, adapted to specific conditions, than to an absence of knowledge. The application of the available knowledge on hazard prevention and control into appropriate and effective solutions at the workplace level must be further promoted. The wide dissemination of such solutions is also essential.

Observations in many countries, particularly developing countries, reveal that common constraints to the effective implementation of adequate control strategies include insufficient awareness, education and political will, shortage of adequate human and financial resources, deficiencies in information/access to information, and in communication among professionals and institutions, inadequate preventive approaches (including too much reliance on quantitative evaluations, not enough source control and too complicated control solutions), as well as failure to involve workers and their representatives directly in problem-solving processes.

For many years the World Health Organization has promoted the prevention and control of occupational risk factors. The "Global Strategy on Occupational Health for All" recommends a number of key principles for international and national occupational health policies, which include the following:

- avoidance of hazards (primary prevention)
- safe technology
- optimization of working conditions
- integration of production with health

Photo by K. Rissa



Secondary prevention includes the surveillance of the work environment to assess the adequacy of dust control measures, exposure evaluation to assess the health risk for workers, and surveillance of the workers' health for early detection of the disease.

# The practical application in developing countries

and safety activities.

When the Health and Safety Executive (HSE, United Kingdom) developed COSHH Essentials, both the ILO and WHO decided to promote this tool internationally. The underlying concept for the COSHH Essentials has been called "control banding (now renamed "occupational risk management toolkit)." In the past, WHO has developed PACE (prevention and control exchange), and ILO has developed WISE (Work Improvement for Small Enterprises). The experiences learned from those initiatives were important for the implementation of the "control banding".

The key objective of the promotion of the International Chemical Toolkit is to support countries to focus their efforts on the control of hazards, instead of only focusing on the assessment of the hazards. An International Technical Group (ITG) was established with representatives from WHO, IPCS, ILO, IOHA, HSE, NIOSH and GTZ in 2004, and prepared a structure for the project, aiming at individual work plans and including twinning of organizations for mutual support, exchange of information and experiences thus strengthening the activities and avoiding duplication. One important aspect is capacity building and training.

Under the Strategy, a meeting was organized in Utrecht in June 2004, by the Occupational Health Team of WHO, together with the International Programme for Chemical Safety (IPCS). The objective of the meeting was to launch effective action in selected countries, including the elaboration of models and strategies for implementation at the country level. Representatives of (upcoming) WHO Collaborating Centres in four countries participated; from their experience, it was expected that the project will be expanded to include many more countries. International collaboration can appreciably strengthen national capabilities for the prevention and control of health hazards in the work environment, thus contributing to the protection of workers' health and of the

environment, worldwide. Sharing of knowledge and experiences will also contribute to avoiding duplication of efforts and waste of valuable resources.

The specific objectives of this meeting were:

- To plan pilot projects for the implementation of the chemical safety toolkit and occupational hygiene in four countries (Benin, Brazil, India, South Africa)
- To develop effective twinning strategies with the implementing agencies in the four pilot countries
- To plan the training activities on the chemical safety toolkit in the four selected countries
- To develop a network of experts that will support the implementation of the project in the selected countries.

Participants were from Benin (Université d'Abomey Calavi, Unité d'Enseignement et de Recherche en Santé au Travail et Environnement), Brazil (Fundacentro), India (National Institute of Occupational Health, Ahmedabad and Department of Environmental Health Engineering, Sri Ramachandra Medical College and Research Institute, Chennai), South Africa (National Centre for Occupational Health, Industrial Health Research Group and Occupational & Environmental Health, Faculty of Health Sciences, University of Cape Town), Belgium (Université Catholique de Louvain), The Netherlands (TNO), Switzerland (Institut Universitaire Romand de Santé au Travail (IST, Lausanne), Service Cantonal de Toxicologie Industrielle et de Protection contre les Pollutions Intérieures, Geneva), the United Kingdom (HSE), and the United States of America (NIOSH). Participants worked together for three days to work towards the development of strategies for effective intervention. Representatives of WHO, IOHA and UNITAR were also present.

During the first day of the meeting the concepts of Control Banding, the International Chemical Toolkit, the GTZ Chemical Management Toolkit and other similar tools were presented and discussed. The next days were spent on the

development of pilot projects in the four countries, taking into account their specific needs, capacities, legislation, culture and other relevant aspects.

The pilot projects that were developed included the following phases: plan, implement, evaluate and improve. The Pilot project also included awareness raising, training, and development or adaptation of practical and effective preventive solutions for specific jobs. It was discussed that this could be enhanced by a *Database of Control Solutions and Mechanisms* for continued exchange of experiences and information. In each country, an "intermediary" was identified. This would be the organization or institution that receives the training (train-the-trainers) and will support the selected workplaces in the implementation of the project. These could be national institutes, local/national governments, universities, nongovernmental organizations (NGOs) or other relevant stakeholders.

## Main outcomes and conclusions of the meeting

There was a general consensus (coming from earlier discussions internationally) that the title of the methodology had to be changed for a number of reasons. The title "Control Banding" is adequate for the method initially designed by the HSE and transformed into the "International Chemical Toolkit", for chemicals that are used, either in the liquid or powder form. However, the principle of acting (whenever appropriate) without, or before, carrying out quantitative evaluations opens wider possibilities that should not be overlooked and which do not exactly fit into the "banding" terminology. This is the case when specific guidance is given for specific risk factors, e.g., silica. For example, the HSE has developed much control guidance to avoid exposure to airborne dust containing silica; this is called "Silica Essentials". It is possible and desirable to expand the concept to other hazards and also to specific operations. Moreover, the translation of the term "Control Banding" into other languages has posed



Guidance for prevention of dust exposure is available in the CD-ROM produced in collaboration with the WHO, the National Institute for Working Life, Sweden and the Finnish Institute of Occupational Health. (Hazard Prevention and Control in the Work Environment, Arbetslivsinstitutet and WHO, 2004. Please contact: ing-marie.andersson@arbetslivsinstitutet.se or gunnar.rosen@arbetslivsinstitutet.se)

some problems. For these reasons, a broader title to indicate the use of this concept has been sought and the decision was to name it "Occupational Risk Management Toolbox". To avoid initial misunderstandings, the term "Occupational Risk Management Toolbox" will be accompanied by "Control Banding", in brackets. The Toolbox will contain a set of Toolkits (for example: ergonomics, noise, working conditions) that will be developed over time.

## Country projects

The participants divided into four sub-groups, one for each represented country. The objective was to develop an action plan for each country, after "brainstorming" on the following basic questions:

- What is needed for control banding to be useful in developing countries? Which tool to use?
- What is needed to implement it?
- How to reach the established targets?
- How to achieve sustainability?

Four pilot projects were developed. Each country made effective use of the available resources, twinning institutions and experts. For the detailed pilot projects please refer to the WHO Website, where the full report of the meeting will be posted ([www.who.int/oeh](http://www.who.int/oeh)).

Benin focused the pilot effort on the agricultural sector (cotton). The GTZ Chemical toolkit was selected as the first choice instrument for this intervention, since there is guidance available on pesticides.

Brazil decided to focus the effort on

small and medium enterprises (SMEs) that use chemicals, for example, furniture and shoe manufacturing and paint recycling.

India proposed the development of three pilot projects for medium to large enterprises in Western India, medium to large enterprises in Southern India, and a small enterprise test project (exploring the relations with ILO's International Programme on the Elimination of Child Labour).

South Africa decided to link the pilot project with the newly adopted (June 04) National Programme for the Elimination of Silicosis, focusing on quarries and foundries.

Some of the Initial draft proposals, which were prepared during the meeting, would form the basis for more detailed projects.

## Supporting activities

It was considered by all participants that education and training are of fundamental importance, as well as other aspects of capacity building such as facilities, equipment and access to information. It was also concluded that the impossibility of carrying out quantitative exposure assessment should never be a blockage to the implementation of obviously required control measures. Although exposure assessment is necessary in many cases, there are situations when much can be achieved without it. This does not mean that exposure assessment is not important.

A database containing control solutions for specific operations would be desirable. HSE, NIOSH and other institutions already have a sizeable collection of tested controls. An inventory of existing solutions should be elaborated, as well as guidance for its application, which may require adaptation (as some measures may not be feasible in all situations). It is necessary to develop solutions which are adequate for SMEs. Solutions designed or adapted for use in developing countries should also be part of this database. It should be kept in mind how important it is to search for source control solutions, including substitution, modification, and work practices. It should also be pointed out that, particularly concerning inhalation hazards, personal protective equipment should be regarded as a last resort.

It was considered important to create an interactive, annually updated CD-ROM of the International Chemical Toolkit. This has now been produced by HSE and ILO.

## Progress made so far

In Brazil, Fundacentro has translated an important part of the toolkit, and is implementing it in small enterprises with several partners. In South Africa, the National Programme on the Elimination of Silicosis has been established under the leadership of the Ministry of Labour, and the feasibility of the use of the silica essentials is being evaluated. A first report has been presented by the NIOH for this purpose. In Benin, the feasibility of applying in agriculture is being studied. Additionally, the international toolkit is being evaluated in Singapore by the Ministry of Manpower.

## Conclusions and the way forward

The usefulness of the toolkit for industrially developed countries has been effectively demonstrated in Europe, particularly in the UK. The use in developing countries will, however, be very different, with particular issues that have to be addressed, such as political will, scarce resources, language, just to mention a few.

The development of the pilot projects is a first step on the long way towards effective implementation of control strategies at a large scale in the South. They will permit to identify issues related to sustainability, bottlenecks, critical factors for success and the need for additional research and resources (materials, databases, translation, etc.). The (political) commitment of all participants, and the quality of the pilot projects developed, indicate that there is a good possibility for success. Support for those, and similar initiatives in other countries will be needed.

For further information please contact Dr Gerry Eijkemans at the World Health Organization.

### Websites for further information:

[www.coshh-essentials.org.uk](http://www.coshh-essentials.org.uk)  
[www.ilo.org/public/english/protection/safework/ctrl\\_banding/index.htm](http://www.ilo.org/public/english/protection/safework/ctrl_banding/index.htm)  
[www.unece.org/trans/danger/publi/ghs/ghs.htm](http://www.unece.org/trans/danger/publi/ghs/ghs.htm)  
[http://www.who.int/occupational\\_health/publications/newsletter/gohnet7e.pdf](http://www.who.int/occupational_health/publications/newsletter/gohnet7e.pdf)

Gerry Eijkemans  
 Berenice Goelzer  
 Occupational Health  
 World Health Organization  
 20, Avenue Appia  
 CH-1211 Geneva 27  
 Switzerland  
 E-mail: [eijkemansg@who.int](mailto:eijkemansg@who.int)

# Occupational hygiene in Southern Africa

Yoganathan Gounden, Rajen N. Naidoo  
SOUTH AFRICA

## Introduction

Occupational hygiene (defined as the science of anticipation, recognition, evaluation and control of hazards arising in or from the workplace) is recognized as the primary discipline in ensuring healthy and safe workplaces. Closely associated with the practice of occupational medicine, occupational hygiene is key to preventing workers from developing occupational disease or injuries through the effective control of workplace hazards. This recognition has resulted, over the last few decades, in the rapid growth of the practice of occupational hygiene, as more governments and industries realize its importance. This is particularly true of industrialized countries. As a general rule, however, these rapid developments have not been mirrored in sub-Saharan Africa. In fact, the extent of the development of occupational hygiene is only slightly known or poorly understood. As the levels of economic activity increase in the emergent industrial sub-Saharan countries, and as multinationals establish their presence in these countries, the need to protect the health of workers similarly increases. Governments need to balance rapid economic growth and

the health of their working population. As such, governments and the corporate sector in sub-Saharan Africa have to place occupational hygiene high on the agenda. In order to promote occupational hygiene, the existing status of the discipline on the sub-continent has to be appropriately characterized. This article attempts to begin that process.

Information for this article was obtained through a survey directed to occupational health practitioners and occupational hygienists for whom email addresses were available and through a mailing list established by the American Industrial Hygiene Association. The survey intended to understand the state of occupational hygiene, identify what presents as useful resources, the weaknesses and strategies for developing the discipline and controlling hazards in the many varied workplaces in Southern Africa. Responses were received from nine countries: Uganda, Democratic Republic of Congo, Lesotho, Swaziland, Botswana, Zimbabwe, Kenya, Tanzania and South Africa. This article does not purport to be a definitive situational analysis of occupational hygiene in Southern Africa, particularly as not every country is reflected in these respons-

es. The authors are of the opinion that it does provide us with a better understanding of the opportunities and obstacles for the growth of this critical discipline on the sub-continent.

## The state of occupational hygiene in Southern Africa

The practice of occupational hygiene on the sub-continent has been in existence for several years, and this has been documented in published literature (1,2). However, the form and nature of this practice has varied across the countries and over the years. In many instances, the practice of controlling hazards at workplaces was (and to some extent, still is) essentially being done by practitioners with basic training in either health and safety or public health, working as factory inspectors or health officers (1). In some cases, these inspectors have received advanced training in occupational hygiene, either in their home country or at regional training initiatives funded by international agencies such as the International Labour Organisation (ILO) or the Finnish International Development Agency (FINNIDA) (2). Generally these practitioners had a strong understanding of qualitative fac-

Table 1. Estimated numbers of occupational hygienists (all hygienists and hygienists with above graduate levels of training)

	Uganda	Botswana	Congo	Lesotho	Swaziland	Kenya	Tanzania	Zimbabwe	South Africa
All hygienists	35	6	3	2	3	11	10	13	
No. with Postgraduate Diploma	-	-	-	1	1	-	-	-	NA
No. with Masters Degree	1*	1*	1*	1	2	11*	4	3+1*	>25 (*?)
No. with Doctoral Degree	-	-	-	-	-	-	1*	1*	NA

\* indicates qualification obtained from non-African institution

**Table 2. Occupational hygiene services provided by occupational hygienists in the private and public sector.**

Private Sector Services	Uganda	Botswana	Congo	Lesotho	Swaziland	Kenya	Tanzania	Zimbabwe	South Africa
Factory walkthrough assessments	-	+	+	+	+	+	-	+	+
Risk assessments	-	+	+	-	+	+	+	+	+
Quantitative measures									
Noise	-	+	+	-	+	+	+	+	+
Temperature	-	+	+	-	+	+	+	-	+
Biological	-	-	-	-	+	-	-	-	+
Chemical	-	-	-	-	+	+	+	-	+
Dusts									
Silica	-	-	-	-	+	+	-	+	+
Respirable coal dust	-	+	+	-	+	+	+	+	+
Asbestos	-	-	-	-	+	+	+	+	+
Other	-	+	+	-	+	+	-	-	+
Other hazards	--	-	-	-	-	-	+	-	+
<b>Public Sector Services</b>									
Legislation enforcement	+	+	-	+	+	+	+	+	+
Educational and Information sharing	+	+	-	+	+	+	+	+	+
Factory walkthrough assessments	+	+	+	+	+	+	-	+	+
Risk assessments	+	+	+	+	-	+	+	+	+
Quantitative measures	+	+	-	+	-	+	+	+	+

"+" indicates service provided

tory workplace evaluations, conduct of qualitative risk assessments and hazard control.

Although occupational hygienists are present in all countries responding to the survey, there is a clear disparity in the distribution of the numbers and educational qualification of occupational hygienists among the various Southern African countries (Table 1, on previous page). The numbers of occupational hygienists trained at postgraduate levels range from one (Uganda) to more than 25 (South Africa). With the exception of South Africa, almost all of those with master level qualifications have been obtained from non-African institutions. Some countries have hygienists with doctoral training (Tanzania, South Africa and Zimbabwe), indicating a steady growth in the professional standard. Hygienists in South Africa are graded by the professional body, the South Af-

rican Institute of Occupational Hygiene (SAIOH). Based on appropriate experience, qualification and passing a certification exam, candidates are graded as occupational hygiene assistants, technologists or hygienists.

At least two Southern African countries (Tanzania and Zimbabwe) have well structured parastatal agencies, which employ occupational hygienists. These agencies are responsible for monitoring workplace environments, providing training and information to the private and public sectors. The Occupational Safety and Health Authority in Tanzania and the National Social Security Agency in Zimbabwe have been instrumental in promoting occupational hygiene principles in their respective countries, and can serve as models for the rest of the sub-continent.

### Occupational hygiene: Key sectors of activity

The services (factory walkthroughs, risk assessments, quantitative measures for specific hazards) provided by occupational hygienists in both the private and public sectors are very similar across sub-Saharan Africa apart from Uganda and Lesotho where services are mostly provided in the public sector (Table 2, above). Most of the services provided are industry-specific. In some instances, there is a total absence of quantitative assessments in the public sector (DR of Congo and Swaziland). This could imply the lack of capacity for agencies, such as the factory inspectorates to enforce any legislation governing levels of exposure for workers.

The inconsistent employment patterns of occupational hygienists imply that there is limited coverage of certain

workplaces, and the key skills of hygienists are not afforded to all workers (Table 3, below). This disparity varies across the countries: all 35 occupational hygienists in Uganda are employed in the public sector with private enterprises having no such skills, compared to the Democratic Republic of Congo, where all 3 hygienists in the country are employed in the private sector. With the exception of South Africa, most industrial sectors are not serviced by occupational hygienists, including some of the traditionally high-risk sectors, such as the metalworking and construction sectors. The presence of occupational hygienists in the informal sector is both interesting and encouraging, given that this is one of the largest sectoral groupings on the subcontinent. Only South Africa and Tanzania have occupational hygienists employed at academic institutions.

### Academic programmes in occupational hygiene

Undergraduate training (undergraduate diploma or bachelor level training) in

occupational hygiene/occupational health takes place in Uganda (Mbale School of Hygiene), Tanzania (Muhimbili University College of Health Sciences), Zimbabwe (University of Zimbabwe), Swaziland (University of Swaziland) and various institutions in South Africa. Several institutions offer short courses, which serve as ongoing professional development programmes. Only two institutions in South Africa (Universities of Witwatersrand and KwaZulu-Natal) and one in Kenya (University of Moi) offer master level programmes in occupational hygiene. In most countries there are currently no academic training programmes.

### Discussion

This review on the practice of occupational hygiene among the nine Southern African countries has revealed that most countries have few trained occupational hygienists, particularly those trained at a postgraduate level. With these small numbers it is possible that there is inadequate coverage of the workplaces by occupational hygiene services and likely that the provision of a safe and healthy

work environment is not afforded to most workplaces. However, these assumptions must be counterbalanced by the presence of general occupational health practitioners (factory inspectors and health officers), who, in many of these countries, are responsible for much of the activities related to occupational health and safety. Many of these practitioners have a broad understanding of occupational hygiene, allowing them to perform qualitative risk assessments, and provide advice and technical assistance on hazard control.

Notwithstanding the participation of the general occupational health practitioner in occupational hygiene, the presence of postgraduate trained occupational hygienists is critical to the protection of the health of workers in sub-Saharan Africa. These specialists need to be trained in large numbers, with competent knowledge in the control of hazards in our workplaces. Hygienists need to be trained to address the variety of hazards found in differing occupational activities which differ markedly from those found in industrially developed coun-

**Table 3. The distribution of occupational hygienists in the various sectors**

Sectors	South Africa								
	Uganda	Botswana	DR Congo	Lesotho	Swaziland	Kenya	Tanzania	Zimbabwe	Africa
Academic	-	-	-	-	-	-	+	-	+
Public	+	+	-	+	+	+	+	+	+
NGO	-	-	-	-	-	+	+	-	+
Private	-	+	+	+	+	+	+	+	+
Mining	-	+	+	-	-	-	+	-	+
Metalworking	-	-	-	-	-	-	-	-	+
Construction	-	-	-	-	-	-	-	-	+
Agriculture	-	-	-	-	-	-	+	-	+
Informal / Other	-	-	-	+	-	+	-	+	+

"+" indicates hygienist employed in that sector

"-" indicates hygienist not employed in that sector

**Table 4. Level of occupational hygiene training available**

Training level	South Africa								
	Uganda	Botswana	Congo	Lesotho	Swaziland	Kenya	Tanzania	Zimbabwe	Africa
Undergraduate	+	-	-	-	+	-	+	+	+
Postgraduate	-	-	-	-	-	+	-	-	+
Short course / Modules	-	-	-	-	-	+	+	+	+

"+" indicates training level available

"-" indicates training level not available

tries. These include understanding and controlling hazards in the agricultural sector, employing relatively low levels of technology, through to the poorly regulated informal sector, where modern hazard control may not be feasible. In addition, the skewed distribution of hygienists found between the public and private sectors also needs to be addressed.

Most Southern African countries lack educational institutions with the appropriate postgraduate programmes in occupational hygiene, resulting in most occupational hygienists receiving their training from non-African institutions. Based on the responses to this survey, only four institutions are offering occupational hygiene programmes at a master's level: the Universities of Witwatersrand and KwaZulu-Natal in South Africa, Moi University in Kenya and the University of Benin. Although this represents a small number of institutions, it does indicate that there are resources immediately available to the sub-continent to train large numbers of occupational hygienists. This finding is in keeping with the audit conducted in 1996/1997 on the training capacity in Southern African countries for conducting programmes in occupational health. At that time it was felt that there was a serious lack of resources in most countries to conduct advanced academic training (3). Only two countries (South Africa and Tanzania) have master level occupational hygienists located in the academic institutions. This means that creative partnerships between the various sectors need to be established to allow

for the development of postgraduate programmes in our institutions.

There are some difficulties in having only a small number of centres of regional expertise, particularly as these master programmes follow different models of teaching delivery, varying from full-time programmes, to part-time block release or distant models. None of these may be appropriate for non-resident students dependent on external funding.

### Recommendations for the Development of Occupational Hygiene in Southern Africa

#### Training needs analysis in occupational hygiene

This analysis must clearly determine the different levels of training requirements and needs for each country. This will require an update of the 1997 SADC Training Needs document (3). Each country will need a critical mass of occupational hygienists trained at a post-graduate level. These professionals must be located in private and public sectors, but also in academia, to allow for the conduct of research relevant to the needs of the country, and to develop training programmes for future generation of hygienists. The training of master's level occupational hygienists will require considerable resources, particularly in the short term. Thus, bridging mechanisms to meet the national needs must be considered. This can be achieved through short courses (many of which

have already been conducted in the region by international agencies), focusing on specific issues, e.g. dust abatement, risk assessments or noise control. These short courses, directed at the general occupational health practitioner will empower such practitioners to immediately address hazard control in the work environment.

#### Audit of training programmes in occupational hygiene

All centres offering occupational hygiene programmes must be identified. The academic levels of these programmes, and the model of teaching delivery must be examined to determine how best these can be modified to suit the needs of those interested in pursuing such degree programmes. A distance model of teaching, with short practicums at the host institution, the identification of academic and professional supervisors in specific countries, and the conduct of professional attachments in resident country may be the way to generate the required numbers of hygiene professionals. In the medium term, academic institutions, through sub-continental instruments, such as SADC need to develop mechanisms for the standardization of academic curricula, such that professional standards are made uniform across the sub-continent. Academics responsible for the development of training programmes must be wary of not just importing programmes from industrialized countries, as these may not be useful for the types of hazards faced by workers in sub-Saharan Africa. While control technologies and standards employed by multinationals and other corporations must be equivalent to the best practice anywhere in the world, hazards that are unique in the workplaces in our countries must be addressed with solutions that are appropriate in these settings.

#### Development of quantitative evaluation and laboratory analytical capacity

The resource demands of occupational hygiene are tremendous, particularly for the conduct of quantitative evaluation of workplaces. The high costs for the purchase of equipment, need for regular calibration, costs of consumables and subsequently costs of analysis of samples result in the very infrequent quantitative assessment of workplaces in most countries. To address this shortcoming, the hazards that are considered to be the most important in the region, affecting the most number of workers, or likely to have a significant impact on



Photo by M. Lintunen

Closely associated with the practice of occupational medicine, occupational hygiene is key to preventing workers from developing occupational disease or injuries through the effective control of workplace hazards.

substantial number of workers must be targeted for hazard quantification and laboratory evaluation. For example, silica dust has been highlighted as part of an international programme for the elimination of silicosis. In keeping with this campaign, each country should have the basic capacity to conduct silica monitoring and analysis: purchase of equipment, training of hygienists in monitoring for silica, establishment of laboratories for reliable analysis. A similar approach must be adopted for other priority exposures in the region, e.g. pesticides exposure. For exposures not routinely present in all countries, centres of regional expertise must be developed.

## Conclusion

We have attempted to describe the practice of occupational hygiene on the Southern African continent by reviewing levels of expertise and services in key sectors in the various countries. The task of achieving comprehensive occupational hygiene practice is a challenge that all Southern African countries have to undertake together, by focusing on issues such as training and capacity development.

## References

1. Ojok JRM. Occupational hygiene in Uganda. *Afr Newslett on Occup Health and Safety* 1996;6(3):70–71.
2. Shilla CPN. Practical examples on improvements in occupational hygiene in Swaziland. *Afr Newslett on Occup Health and Safety* 1996;6(3):76–78.
3. SADC. Report and Resolutions of the Southern African Meeting on the Education and Training of Occupational Health and Safety Professionals, Johannesburg, South Africa, 22–24 October 1997.

Yoganathan Gounden  
Centre for Occupational and  
Environmental Health  
Nelson R. Mandela School of  
Medicine  
University of KwaZulu-Natal  
Private Bag x7  
Congella, 4013  
South Africa  
Tel. +2731-260 4385  
Fax +2731-260 4211  
Email: goundeny2@ukzn.ac.za  
Rajen N. Naidoo  
Associate Professor  
Occupational Medicine  
Centre for Occupational and  
Environmental Health/  
Department of Community  
Health

## Planning occupational health within WHO

### Planning Committee of the WHO Collaborating Centres' Network, Johannesburg



Photo by S. Lehtinen

The meeting of the Planning Committee of the Global Network in Occupational Health was held on 15–16 September 2005 in Johannesburg,

South Africa directly before the IOHA Conference in Pilanesberg.

The Network of the WHO Collaborating Centres in Occupational Health was established in 1990, as a result of the desire of national institutes of occupational health to support the Workers' Health Programme in the Headquarters of the World Health Organization in Geneva. Since then, the network has organized six meetings every two to three years. The meetings have been a common forum for the occupational health experts in the WHO Headquarters, the Regional Offices and the Collaborating Centres to discuss and agree upon a joint work plan for specific years.

The Network consists of 64 collaborating centres in occupational health worldwide.

## Global Strategy

In 1994, the Global Strategy on Occupational Health for All was prepared and discussed within the Network. In May 1996, it was endorsed by the World Health Assembly (WHA), in order to guide both all the WHO Member States and the Network in their efforts to improve working conditions and develop occupational health and safety.

Several Work Plans of the Network have been based on the Global Strategy on Occupational Health for All, which aims to expand the provision of occupational health services to all working people in all countries of the world. The countries are in dire need of guidance in the development of their occupational health service systems. Here the role

of WHO is crucial.

Now that the WHA resolution 49.12 has been in force for more than ten years, it is time to evaluate what has

been achieved and accomplished during this period. A new resolution to further guide the development of occupational health in the countries must now also be prepared. The renewal of the resolution on occupational health was only briefly touched upon in the Planning Committee meeting. It is expected to be discussed in the World Health Assembly in 2007.

## Work Plans

The Network has been very active in the past 15 years. It has worked through 15 Task Forces during the years 2001–2005, and the topic of the present meeting was to further develop the work plan of the network for the period 2006–2010. The meeting proposed 6 Activity Areas for the next five-year programme. The work plan for 2006–2010 will be approved in the 7th Meeting of the Global Network of WHO Collaborating Centres in Occupational Health. It is scheduled for 8–9 June 2006, to be held in Stresa, Italy.

More information on the WHO Occupational Health Network is available at: [http://www.who.int/occupational\\_health/network/en/index.html](http://www.who.int/occupational_health/network/en/index.html)

Read the Global Strategy on Occupational Health for All at:

[http://www.who.int/occupational\\_health/publications/globstrategy/en/index.html](http://www.who.int/occupational_health/publications/globstrategy/en/index.html)

Suvi Lehtinen  
Finnish Institute of Occupational  
Health

# Chrysotile fibre levels in asbestos-cement manufacturing in Zimbabwe

B. Mutetwa, M. Chikonyora, R. Dozva, D. Mazibuko  
ZIMBABWE

## Introduction

Zimbabwe mines and processes chrysotile asbestos. The manufacturing industry in Zimbabwe makes high-density non-friable products in which the chrysotile fibre is encapsulated in a matrix of cement. These high-density products include asbestos cement pipes and sheets, brake linings and gaskets. The products are made in the ratio of 85–90% cement to 10% fibre; the rest is water.

The Zimbabwean asbestos industry monitors exposure of its workers to chrysotile fibres in their various workplaces. The regulatory authority is National Social Security Authority (NSSA), which regularly measure chrysotile fibres in the ambient air in these industries in order to ascertain whether the figures on exposure being produced by industry are authentic and valid. This current investigation was thus meant to evaluate chrysotile asbestos fibre levels in major chrysotile-cement manufacturing companies in Zimbabwe. There are three chrysotile-cement manufacturing companies in Zimbabwe; two of these were evaluated.

## Programmes for monitoring workplace environments in the chrysotile industry

Previous risk assessment investigations conducted in the chrysotile-cement manufacturing factories and mines have noted that the environmental monitoring programmes at workplaces are done on a monthly basis (1). This practice still prevails in the industry. The levels of dust and chrysotile fibre in the ambient air have generally been noted to be below the hygienic limit values, i.e. workers' exposure remains within levels considered permissible for most workers'

repeated exposure without significant risk of health impairment.

The chrysotile asbestos industry in Zimbabwe has been driven by the spirit of self-regulation, and the environmental monitoring programme at workplaces is one among many of the various aspects where the industry has striven to comply with the provisions of ILO Convention 162 on the safe use of asbestos. The regulatory authority, the NSSA, regularly makes an effort to ascertain the effectiveness and validity of the workplace environmental monitoring programmes being implemented by the chrysotile asbestos industry, partic-

ularly the measurement of chrysotile asbestos fibre in the ambient air.

The chrysotile-cement manufacturing industry applies (2) an action level of 0.15 fibres/ml and a maximum acceptable limit of 0.2 fibre/ml, against a statutory hygienic limit value and WHO exposure limit of 1 fibres/ml. Thus the chrysotile measurement programme conducted by the Division of Occupational Health and Safety also sought to determine whether these action levels and hygienic limit values were complied with, with a view to protecting workers' health.

**Table 1. Fibre levels at various areas of the Harare Factory: 24 March 2005 and 29 March 2005**

Area	Results fibres/ml	
	Personal	Static
Laundry	-	0.07
Fetting Table	0.05	0.01
Saw Number 1	0.08	0.12
Middle of Shed Number 3	-	0.01
Stockyard Shed Number 1	-	0.01
Saw Number 4	0.10	0.07
Kollergang Number 2	-	0.23
Ground Hard Waste Mill	-	0.04
Fibre Storage	-	0.03
Changing Room	-	0.01
Saw Number 5	0.08	0.07
Kollergang Number 1	0.04	-
Intermediate Silo Number 2	-	0.02
Moulded Goods Row No. 2	0.09	0.002
Physical Laboratory	-	0.02
Work Canteen	-	0.03
<b>Average factory level of chrysotile fibre</b>	<b>0.07+ 0.02</b>	<b>0.05+ 0.05</b>

NB:

- ∑ Statutory limit - 1 fibres/ml
- ∑ Manufacturing industry maximum acceptable limit (2) - 0.2 fibres/ml
- ∑ Manufacturing industry action limit<sup>2</sup> - 0.15 fibres/ml
- ∑ TLV of the ACGI (5) - 0.10 fibres/ml

## Methodology

### Monitoring in the workplace

The airborne concentration of asbestos fibres should ideally be measured in all places of work where a risk of exposure to asbestos dust may occur. In order to identify the sources of asbestos dust emission and to determine the extent of asbestos dust exposure, static and personal monitoring should be carried out when asbestos or products containing asbestos are produced and handled in such a manner as to be liable to emit airborne dust (3). Both static and personal sampling methods were used during this investigation.

### Static monitoring

In order to obtain an indication of the spatial and temporal distribution of airborne asbestos throughout the general atmosphere of the work areas, air samples should be taken (3),

- as close as possible to sources of emission in order to evaluate the dust and/or fibre concentration or the standard of engineering controls
- at various places in the working areas in order to ascertain the spread of asbestos dust; and
- from working areas which represent typical exposure.

### Personal monitoring (3)

In order to evaluate the risk to the individual worker, air samples are collected in the worker's breathing zone by means of a personal air sampler. Sampling is carried out while the work process is in operation.

### Measuring method (4)

The measurement of asbestos fibre was done using the AIA membrane filter method which employs phase contrast light microscopy. This is a standard reference international method used by the asbestos industry worldwide. The industry in Zimbabwe uses the same method.

Fibre having a diameter less than  $3\mu\text{m}$  and a length greater than  $5\mu\text{m}$ , and a length to diameter ratio greater than 3:1 and which does not appear to touch any particle with a diameter greater than  $3\mu\text{m}$ , is considered as a countable fibre.

## Discussion

From Tables 1 and 2, it can be noted that of the 40 samples taken (both personal and static) in the two manufacturing factories, only one area of the Harare factory, i.e. Kollergang No. 2, had chrysotile fibre levels above the maximum acceptable limit of 0.2 fibres/ml set by the companies involved in manufactur-

**Table 2. Levels of chrysotile fibre at various areas of the Bulawayo Factory: 30–31 May 2005, 1 June 2005**

Area	Results fibres/ml	
	Personal	Static
Rowland saw	0.05	0.08
Multicutter	-	0.02
Large lathe machine	0.09	0.05
Width lathe machine	0.09	0.05
Saw number 7	0.03	-
Sweeper (saws area)	0.01	-
Kollergang area	0.01	0.005
Laundry & mending of clothes	0.04	0.01
Germinis machine	0.05	0.02
Saw number 3	-	0.03
Kollergang pipe	0.03	0.005
Sewer fitting lathe	0.01	-
<b>Average factory level of chrysotile fibre</b>	<b>0.04+0.03</b>	<b>0.03+0.02</b>

ing chrysotile cement products. It is also interesting to note that all fibre levels, except one, in the two manufacturing companies were below the manufacturing industry action limit of 0.15 fibres/ml.

The American Conference of Governmental Industrial Hygienists (ACGIH) (5) have set a threshold limit value (TLV) for all forms of asbestos at 0.1 fibres/ml, below which it is expected that workers may be repeatedly exposed day after day without suffering any significant health impairment. It is thus of interest also to note that fibre levels in all areas sampled in the two manufacturing factories were below this TLV except for the value at the Kollegan No 2. In fact, average fibre levels in the factories are about 14 to 33 times below the Zimbabwe Statutory exposure limit of 1 fibre/ml or about 1.5 to 3 times below the TLV of the ACGIH.

Exposure to asbestos is sometimes expressed in fibres/millilitre-years, which is the level of exposure in the workplace, measured as the number of fibres found in each ml of air in the air which is breathed at work and multiplied by the number of years or fraction of a year worked at that level (6). Thus, in a study by Huang (1990) (7) on exposure-response analysis in an asbestos textile plant, it was predicted that a 1% prevalence of grade 1 asbestosis is attainable at a cumulative exposure concentration of 22 fibres/ml-years. It has also been generally accepted that the relative risk for lung cancer is roughly doubled for individuals exposed to asbestos fibre at

a cumulative exposure of 25 fibres/ml-years, at which level asbestosis may possibly not be present or detectable (8).

Assuming that the order of magnitude for the levels of chrysotile fibre levels obtained in the Zimbabwean asbestos manufacturing industry evaluated is maintained (**which is highly possible with the current control measures in place**), and taking average personal fibre values (i.e. 0.07 fibres/ml for the Harare factory and 0.04 fibres/ml for the Bulawayo factory), it may possibly take up to 357 years for anyone working at an average exposure level of 0.07 fibres/ml to attain a cumulative exposure of 25 fibres/ml-years, a value above which the risk of developing asbestosis and/or lung cancer is increased about twofold. Similarly it may possibly take up to a staggering 625 years for anyone working at an average exposure level of 0.04 fibres/ml in the Bulawayo factory to attain a cumulative exposure of 25 fibres/ml-years. Of course, in reality, no one can work for 600 years in a lifetime; working for even 50 years in one work environment where there is exposure to chrysotile fibre is almost impossible.

Furthermore, taking 40 years as the average working life time of an individual in a chrysotile asbestos industry, for a person to attain a cumulative exposure of 25 fibres/ml-years, average exposure concentrations have to be 0.625 fibres/ml in the manufacturing industry. Tables 1 and 2 show that all exposures are nowhere near the 0.625 fibres/ml concentration, an indication that with the current control measures in place it is pos-

sible to provide workers exposed to chrysotile asbestos with sufficient protection. It should further be noted that despite the low exposure levels experienced in the major manufacturing industries in Zimbabwe, workers are still provided with respiratory protection, to ensure effective protection against any airborne chrysotile asbestos fibres.

The work practices at the Kollergan No. 2 (Harare factory), however, need to be reviewed, as they appear to be spreading some amount of fibres into the ambient air and thus posing a risk to workers.

## Conclusion

The results obtained clearly demonstrate that the control measures in place in the major chrysotile cement factories in Zimbabwe are having a positive impact on reducing airborne chrysotile asbestos in the work environment. Ideally, the manufacturing processes are wet processes for which chrysotile is eventually encapsulated in a cement matrix, to the extent that the release of airborne chrysotile fibre into the ambient air becomes very minimal. The control measures in place have shown that they are effective in minimizing fibre levels to below hygienic limit values. Hence, manufacturing companies involved in the use and handling of chrysotile asbestos are encouraged to maintain or even improve on the current control measures in place, in order to ensure that their work environments are free from exposure to chrysotile asbestos fibre in the ambient air. **The Zimbabwean occupational exposure limit for chrysotile asbestos fibre is recommended to be reduced and set at 0.5 fibres/ml for the manufacturing industry, and further reduced to 0.2 fibres/ml by 2010.** These are standards which we believe are quite achievable in view of the prevailing low exposure levels observed during this investigation. In addition, it would take a person working at an average exposure of 0.5 fibres/ml a working lifetime of 50 years to attain a cumulative exposure of 25 fibres/ml-years, a duration which is unlikely for almost all persons.

## References

1. Mutetwa B, Chikonyora M. Exposure Assessment to Asbestos in major asbestos producing/processing industries in Zimbabwe. NSSA OHS Divisional Report. 2001.
2. Turnall Fibre Cement (Harare). Dust Count Report for January 2005.
3. The Asbestos Institute. Safe Use of Chrysotile – A Manual on Prevention and Control Measures. Quebec Asbestos Mining Association (QAMA), Canada. 1993, 1998.
4. Asbestos International Association (AIA). Reference Method for the Determination of Airborne Asbestos Fibre Concentrations at Workplaces by Light Microscopy (Membrane Filter Method). 1982.
5. American Conference of Governmental Industrial Hygienists. Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs). Cincinnati, Ohio, USA. 2003.
6. Brown K. Chrysotile, Threshold of Risk. Paper presented at an International Seminar on Safety in the Use of Chrysotile, Asbestos: Basis for Scientifically Based Regulatory Action. Havana, Cuba. 2000.
7. IPCS. Environmental Health Criteria 203. Chrysotile Asbestos Geneva, UNEP, ILO, WHO and IPCS. 1998.
8. Consensus Report. Asbestos, Asbestosis and Cancer. The Helsinki criteria for diagnosis and attribution. Scand J Work Environm Health. 1997;23:311–6.

Benjamin Mutetwa  
Chief Research and Development  
Officer  
National Social Security  
Authority  
Division of Occupational Health  
and Safety  
P. O. Box CY 1387  
Causeway, Harare  
Zimbabwe  
Tel. +263-4-723822, -4-706523/5  
Fax: +263-4-706528  
E-mail: mtetwabjm@yahoo.com  
or bmtetwa@comone.co.zw

**More information about the health effects of chrysotile and classifications of IARC can be found at:**

<http://www.ilo.org/public/english/protection/safework/cis/products/safetytm/iarclist.htm>

<http://www.intox.org/databank/documents/chemical/asbestos/iarc836.htm>

<http://www-cie.iarc.fr/htdocs/iarcpubs/pub140/pub140cons.html>

## Jonathan Akhabuhaya TANZANIA

### Introduction

The United Republic of Tanzania (Tanzania), which consists of mainland Tanzania and the Islands of Zanzibar, Pemba and Mafia, has an area of 945,000 km<sup>2</sup> and a population of 36.8 million people (July 2005 est.) The country's economy depends heavily on agriculture, which accounts for almost half of the GDP, provides 85% of the export earnings and employs 80% of the workforce.

In order to increase crop production and combat various human disease vectors (especially malaria) and livestock disease vectors (especially ticks and tsetse flies), pesticides are widely used. The current official figure for imported pesticides was 6,200 tons in 2004 with a total FOB value of 15.6 million US dollars (1). The imports for 2003 were 6,900 tons. These figures are certainly an underestimate because a significant amount of pesticides enters the country through some of the unguarded borders which Tanzania shares with her eight neighbouring countries. Furthermore, some pesticides, particularly mosquito coils and rodenticide baits, are formulated/manufactured locally. Hence, a realistic estimate for the amount of pesticides used in Tanzania is put at around 8,000 tons per year.

Parallel with the increase in imports of pesticides, free market economy trade and unemployment have significantly stimulated various business in pesticides. The official pesticides business register has 725 pesticides wholesale and retail shops, 408 fumigators and termite controllers, and 34 pesticides importers. The country has about seven pesticides formulation plants engaged in the formulation of small quantities of rodenticides, mosquito coils and canned aerosols. Last year a big pesticides formulation plant was opened in the outskirts of the capital, Dar es Salaam. The plant formulates and repacks Mancozeb and Chlorothalonil. It has a large capacity, and in fact about 80% of the pesticides it produces is expected to be exported to the neighbouring countries of Malawi, Kenya, Uganda and Rwanda.

# Needs for pesticide safety outreach programmes in developing countries: a Tanzanian example

Photo by J.L. Akhabuhaya



A young street vendor is selling rodenticides in the street. The speaker is advertising his business!

## Pesticides legislation and registration

Tanzania was one of the first African countries to enact a pesticides legislation. It was enacted in 1979 under the Tropical Pesticides Research Institute Act (2). The legislation was later incorporated into the Plant Protection Act of 1997 (3) and its accompanying Regulations of 1999 (4). The first list of registered pesticides was published in 1986. Since then, the list of registered pesticides has grown up considerably (see Table 1 below).

## Implementation assessment

Parallel to pesticides registration, many activities have been carried out in the course of implementing the legislation. The activities include control of pesticides imports and exports, licensing of various pesticides handlers (retailers, fumigators, wholesalers, formulators, termite controllers), and training of various cadres on the effective and safe use and handling of pesticides.

The legislation was passed more than 25 years ago. The regulatory authority therefore thought it was time to assess the impact of implementing the legislation through compliance of the law at the business and grassroots levels. A study for this purpose was thus planned in two agricultural zones of Tanzania. It was carried out by inspectors from the Offices of the Registrar and the Inspector in charge of the Plant Health Services of the Ministry of Agriculture and Food Security. The study consisted of

two parts: inspection of the pesticides dealers and handlers, and thereafter, follow-up training seminars.

## The Survey

Pesticides inspectors (three to five) paid impromptu inspection visits to various pesticides dealers and fumigators in Tanzania's Southern Highlands Region (Mbeya Municipality and Makambako) and the Central Region (Dodoma Municipality, Mpwapwa and Kongwa). The

inspectors observed the general pesticides and equipment layout and conditions in the shops, noting prominent irregularities, such as unregistered/expired/decanted pesticides, leaking equipment, etc. They paid particular attention to the pesticides handling practices in the shops, interviewed the counter shop personnel and shop owners to assess their level of knowledge on pesticides, and finally, took a photograph of pertinent irregularities.

A total of 52 pesticides shops were inspected and the anomalies in each shop recorded. For convenience, the anomalies were grouped into three categories as per Table 2 on next page.

## Findings

Each shop visited had several shortcomings. Table 3 (on next page) summarizes the nature of the observed shortcomings as per the severity categorization in Table 2.

Table 1. Growth in the list of registered pesticides

Year	Insecticides	Fungicides	Herbicides	Others	Total
1986	149	38	69	15	271
1991	137	37	66	16	256
1996	177	30	37	22	266
2001	141	46	54	29	270
2005	188	76	88	40	392

**Table 2. Categorization of anomalies**

Category	Anomaly in the category
Very serious	No permit to sell pesticides, sale of unlabelled/unregistered/expired/repacked pesticides, untrained salesperson, cooking/eating/drinking inside the shop, mixing pesticides with foods/feeds, shop near a restaurant, poor ventilation, clear spills
Serious	No protective clothing, no fire extinguisher, no first-aid kit, mixing pesticides with other things in the shop (not foods/feeds), no facilities for washing hands
Somewhat serious	Expired permit to sell pesticides, no warning sign on shops, no records of bought and sold pesticides, poisoning cases, etc. poor shop layout.

use of protective clothing and first-aid procedures. They must clearly learn to appreciate the irrevocable harm pesticides can cause to their health and environment.

To instill this knowledge at the grassroots level, proper and adequate pesticides outreach safety programmes are needed. Only through such grassroots knowledge can situation change for the better.

#### References

1. Anon. Tropical Pesticides Research Institute. Annual Report, 2004.
2. The Tropical Pesticides Research Institute. Act No. 18 of 1979.
3. The Plant Protection Act (1997), in the Acts Supplement No. 27, Vol. 78 of 4th July, 1997.
4. The Plant Protection Regulations (1999) in the Gvt. Notice No. 401 of 1999.

### Seminars

Having observed the above anomalies, a one-day seminar was organized in order to inform the stakeholders of our findings, and to learn from them why they were not complying with the safety and legal standards of the business as laid down by the law. For effective participation, we drew up four topics for group discussion. The topics covered the most serious anomalies and violations of the law observed. The four discussion topics were:

- What are the major obstacles you faced/are facing in registering your pesticides business? Give recommendations for solving this problem
- Why are many pesticide shops selling unregistered/expired/repacked/unlabelled pesticides? Give recommendations for solving this problem
- The current pesticides legislation penalties for contravening any of the sections of the Act are very severe (3 months' imprisonment and/or a fine of USD2,000-100,000). Yet this does not deter many of you from committing the offences. Why? What is it that needs to be done to help you to comply?
- Most shopkeepers are unaware of the pesticides legislation and are semi-trained or ill-trained in pesticides safety issues. Why? Give recommendations for solving this problem.

### Conclusion

Although the Tanzanian pesticides legislation and registration scheme has been in force now for over 25 years, most pesticides shops and handlers carry out their business contrary to the law. Many shops handle and sell unregistered, expired, repacked, unlabelled or poorly labelled pesticides. Most of sales personnel at the counter do not wear protective clothing, and have very little knowledge about pesticides, particular-

ly about their safe handling and use. The public is also by and large unaware of the law and the dangers pesticides pose to their lives and environment.

Contrary both to the Government's intention and to most people's beliefs, the heavy penalties described by the legislation do not seem to have improved the situation nor deter the culprits. Instead, our theory that positive changes can only be realized through proper and effective sensitization and training of various cadres, especially at the grassroots level, seemed to stand. It was in fact supported by the seminar participants. Pesticide dealers, farmers and the general populace need to be educated on the right and correct way to handle pesticides and how to identify substandard or repacked products. They need to be educated to refuse to buy such products. They must be educated on the proper

Jonathan Akhabuhaya  
Registrar of Pesticides (Tanzania)  
and Member of the FAO Panel of  
Experts on Pesticides Management  
Tropical Pesticides  
Research Institute  
P.O. Box 3024  
Arusha  
TANZANIA

**Table 3. Summary of the observed anomalies**

Inspected area	Shops inspected (N)	Firms with the abnormalities (N)		
		<i>Very serious</i>	<i>Serious</i>	<i>Somewhat serious</i>
Dodoma Municipality	12	9	12	12
Mpwapwa	4	4	4	4
Kongwa	1	1	1	1
Makambako	17	12	15	17
Njombe	11	9	10	11
Iringa	3	2	3	3
Ilula	4	4	4	4
TOTAL	52	41	49	52
Percentage of the 52 shops		79%	94%	100%

# Health effects of chronic exposure to pesticides of farm workers in Ethiopia

Michael Biru Abebe,  
Yalemtehay Mekonnen  
ETHIOPIA

## Introduction

Organophosphate and carbamate pesticides are the major insecticides used in Ethiopia. The overall use of pesticides on the agricultural fields of Ethiopia was 1993 kg pesticides per year (averages of 1987–1988 to 1991–1992) (1). State farms used about 70% of the total. Organophosphate pesticide poisonings can result in various acute and chronic health problems. Among the usual health problems are respiratory and cardiovascular abnormalities. The normal lung function, pulse rate and blood pressure can be altered (2, 3). Lung function parameters are affected in consequence of acute and chronic poisonings by pesticides (4). Acetyl cholinesterase is an important enzyme for nerve function. Many studies have shown the importance of measuring the enzyme as indicator of pesticide poisoning (5).

The present work addresses the impact of pesticide applications on the cardiopulmonary system and the cholinesterase level of farm workers.

## Study subjects and methods

The study site is Ziway Agricultural Development State Farm at Ziway in Ethiopia. It is located about 160 km south of Addis Ababa, at an altitude of about 1640 miles above sea level.

The study subjects were all male farm workers at the State Farm. They were mainly engaged in pesticide mixing and spraying on the farm fields. Citrus fruits, vegetables and some cereals are grown on the farms. There were 24 farm workers aged from 16 to 40 years and 22 controls aged from 18 to 43 years. The controls were not associated with pesticide work. A standard questionnaire adapted from that of the British Medical Research Council (6) was used to assess the possible respiratory impairment due to pesticide applications. The



Photo by the Photo Gallery of the Dept. for Int. Development Co-operation, Finland.

questionnaire was in the form of an interview and was conducted by one of the authors. All the study subjects including the controls consented to participate in the study. Ethical clearance was also obtained from the concerned authorities.

An automatic instrument (Visomat) was used to record arterial pulse rate and systolic and diastolic blood pressure. A

Vicatest-P1 spirometer was used to measure lung function of the farm workers and the controls. Then the subjects were asked to take in a deep breath and then to breathe out into the instrument inlet with full effort in a standing position. The best of three measurements was taken. Plasma acetyl cholinesterase (PChE) enzymes were determined by the modified version of Michel's electrometric method (7). The enzymes were determined from blood drawn from the forearms of the subjects.

The statistical package for social science students (SPSS) software was used to analyse the data. Student's t-test was used for the continuous variables and chi-square for the categorical data.

## Results and discussion

At Ziway State Farm, 16 farm workers (66.7%) were sprayers, 4 (16.7%) were mixer-loaders and 4 (16.7%) were supervisors. Sixteen (66.7%) of the farm workers had less than one year of service on the job; 4 (16.7%) had been in farm service between 1–5 years and 4 (16.7%) for at least 6 years. There was a significantly higher prevalence of breathlessness among the farm workers (Table 1 below). However, there were no cases with chronic respiratory impairments among the farm workers. A recent

Table 1. The prevalence of respiratory symptoms at Ziway State Farm.

Respiratory symptom	Farm workers (N)	%	Chi-square test
Cough	1	4.16	$\chi^2 = 0.433$
Phlegm	0	0	
Wheezing	4	16.6	$\chi^2 = 0.64$
Breathlessness	11	45.8	$\chi^2 = 4.202$ ; (P<0.05)
Chest illness	3	12.5	$\chi^2 = 0.862$
Normal findings	12	50	

N = number of farm workers

**Table 2. Student's t-test (two-tailed) for lung function parameters of the farm workers (FW) at Ziway State Farm as compared to controls.**

LUNG FUNCTION	STUDENT'S T-TEST (TWO-TAILED)					
		N	Mean	SD	t-value	P-value
FVC	Control	22	3.77	0.3928	2.491	P<0.05
	FW	24	3.46	0.4410		
FVC % Norm	Control	22	82.8	8.8078	2.270	P<0.05
	FW	24	76.12	11.3063		
FEV <sub>1</sub>	Control	22	3.42	0.4167	1.456	P>0.05
	FW	24	3.25	0.4002		
FEV <sub>1</sub> %	Control	22	89.52	5.0979	-3.483	P<0.01
	FW	24	93.96	3.6683		

study by Mekonnen and Agonafir (8) reported similar findings. This symptom can be observed in restrictive, obstructive or mixed type respiratory disease (9). Breathlessness is a symptom reflecting hypoxemia (oxygen concentration below normal) in the arterial systemic blood circulation, the partial pressure of oxygen falling well below the normal value (100 mmHg). Three farm workers had chest illnesses. This can possibly be related to restrictive diseases that cause pulmonary hypertension, leading to discomfort in the central chest area (10).

Most of the respiratory diseases reported in this study are generally aggravated in January and February, when the weather is hot at the farm. This could be attributed to the volatile components of pesticides that tend to reach the respiratory system easily (11).

The use of personal protectors by the farm workers was not satisfactory. Those who did not wear the personal protectors gave various reasons. Some complained that they were uncomfortable to wear in the hot climate. A few said that they were not the appropriate type; for instance, respirators let fumigants pass through. Some claimed that the personal protectors were not provided at all or were out of use. Boots were worn by less than 50% of the farm workers; the rest of the personal protectors were being used by more than half of the farm workers. The workers claimed that they did not use the irrigation canal water for drinking and have had no meal on duty. Only 3 (12.5%) washed regularly after work. Four (16.6%) of them were formally educated.

A study conducted by Mekonnen and Lakew (12) also showed that only 18.1% of the farm workers at Upper Awash, Northern Omo and Wellega (Ethiopia) State Farms used a complete set of personal protectors. A recent report by

Mekonnen and Agonafir (13) confirmed the skepticism of some farm workers with regard to the use of personal protectors. There are reports that training plant protection workers, uses of risk-free equipment with the appropriate personal protectors, and medical supervision have resulted in reduction of exposures as compared to corresponding situations where such practices were not employed (14).

The results of the present study revealed that six (25%) farm workers did not use gloves during the application of pesticides. The fact that there is no real division of labour between mixer-loaders and sprayers makes these statistics even more alarming.

The blood pressure and arterial pulse of the farm workers did not differ significantly from those of the controls. The lung function test results showed that 14 farm workers had restrictive type respiratory impairments. They had FEV<sub>1</sub> % >80 and FVC % <80. Their mean FVC % was significantly less than that of the controls ( $p<0.05$ ), while their mean FEV<sub>1</sub> % was significantly greater than that of the controls ( $p<0.01$ ) (Table 2).

The lung function test results showed that restrictive pulmonary diseases were prevalent among farm workers in the study area. When some parts of the lung parenchyma are damaged, the blood flow to the ventilated parts increases to make up for the loss in the unventilated areas. Unfortunately, this mechanism results in pulmonary hypertension and fluid starts to leak into alveolar spaces, causing edema (concentration of fluid in the lung and insufficient intake of oxygen). The mean FEV<sub>1</sub> % of the farm workers was significantly greater than that of the controls. The results obtained in the present study are in agreement with the study done by Rastogi et al. 1989 (15) on pesticide sprayers on a Mango plantation in India, where re-

strictive type disease was found to be dominant.

The mean PChE activity determination showed that farm workers at the site had significantly lower mean values than the controls. Despite this fact, there were no subjects whose cholinesterase activity was less than 50% of the normal value. The significant difference in PChE activity between the farm workers and the controls could be due to the fact that plasma cholinesterase is sensitive for a short period of exposure. In this study, the farm workers were on duty while the samples were taken.

## Conclusion

Breathlessness and some restrictive type of respiratory impairments were found to be prevalent among the farm workers. This finding was in agreement with the farm workers' inadequate use of personal protectors. However, the cardiovascular parameters did not show significant differences as compared to those of the controls. The study has indicated the need for better awareness among farm workers as well as the need for regular medical check-ups.

Conflicting interests: none

Authors' contributions: MB did the study as a graduate student and drafted the manuscript, and YM finalized the manuscript, provided advice and worked on the method of the study. Both authors read and approved the final manuscript.

## Acknowledgements

The authors would like to thank the School of Graduate Studies of Addis Ababa University, Ethiopia and all the individuals and governmental organizations that enabled the completion of this study.

## References

1. Gordon H, Tsedeke A, Chiri A. Environmental and Economic review of Crop Protection and Pesticide Use in Ethiopia. Environmental and Natural Resource policy and Training; Applied Research Technical Assistance and Training, International Environmental Alliance 1995:24–32.
2. Benowitz N. Cardiovascular toxicology. Occupational and Environmental Medicine (Edit. LaDou, J) Appleton and Lange 1997:328–38.
3. Luciano DS, Vander AJ, Sherman J. Human Physiology: The Mechanism of Body Function (3rd ed.). McGraw – Hill 1980:253–326.
4. Balmes RJ, Scannell CH. Occupational lung disease. In: Occupational and Environmental Medicine. (Edited by LaDou J) Appleton and Lange, USA 1997:305–26.
5. Mekonnen Y, Lakew K. The health status of Northern Omo State farm workers exposed to chlorpyrifos and profenifos. Ethiopian Medical Journal 1998;46:175–9.
6. British Medical Research Council Committee on the Etiology of Chronic Bronchitis. Standardized Questionnaire on Respiratory Symptoms. BMJ 1960;2:1663.
7. Glick D. Method of Biochemical Analysis. Interscience Publishers 1957:20–9.
8. Mekonnen Y, Agonafir T. Effects of pesticide applications on respiratory health of Ethiopian farm workers. Int J Occup Environ Health 2002;8:35–40.
9. Cotes JE. Lung Function: Assessment and Application in Medicine. Blackwell Scientific Pub. Oxford, London 1979.
10. West JB. Respiratory Physiology the essentials (2nd ed.). The Williams and Wilkins 1980:86–113,143–160.
11. American Medical Association (AMA). Essential Guide to Asthma. Pocket Book Association 1998:45–6.
12. Mekonnen Y, Lakew K. Use of pesticides and casual factors of poisoning. Afr Newslett Occup Health and Safety 1997;7:68–70.
13. Mekonnen Y, Agonafir T. Pesticide sprayers' knowledge, attitude and practice of pesticide use on agricultural farms of Ethiopia. Occup Med 2002;52:311–5.
14. Maddy KT, Gibbons DB, Knaak JB. Monitoring the urine of pesticide applicators for residues of chlordimeform and its metabolites. Toxicology Letters 1986;33:37–59.
15. Rastogi SK, Garg N, Gupta BN, Husain T, Mathur N. Study of respiratory impairment among pesticide sprayers in mango plantations. American Journal of Industrial Medicine 1989;15:529–38.

Dr. Yalemtehay Mekonnen  
 Department of Biology  
 Addis Ababa University  
 P.O.Box 1176  
 Addis Ababa  
 Ethiopia  
 E-mail: yalemtehay@yahoo.com

Michael Biru Abebe  
 E-mail: birumk@yahoo.com

# Occupational health hazards in the Nigerian cement industry – workers' awareness and perceptions

F.C. Ezeonu, J.N. Ezeonu, O.C. Edeogu  
 NIGERIA

## Introduction

Oil-generated wealth in Nigeria encouraged rapid growth of the construction industry, with an attendant increase in the use of cement. Today, with rising unemployment in the country, a sizeable population of young men in the informal sector is employed in cement associated industries, as casual labourers engaged in field extension, loading, masonry and construction work, and quite a few as cement factory workers. Cement production and use are associated with the generation of much dust. The health hazards associated with this industry are great. An inventory of occupational hazards associated with the cement sector include: respiratory and pulmonary problems and lung disease (1,2,3); irritation and contact dermatitis (4); organ-system perturbations, particularly of the lungs and liver (5); wheezing, cough, phlegm, tightness of the chest, lacrimation (6); and physical injuries, headache, fatigue and musculoskeletal disorders.

An increase in the prevalence of occupation-related diseases brings a need for a greater focus on preventive activities, particularly occupational hygiene. Occupational hygiene entails the recognition, evaluation and management of risk arising from a work environment, so as to put in place regulatory controls to achieve a state of cleanliness and work safety. At the root of occupational hygiene are workers' awareness of the existing hazards and their perceptions of the impacts of these hazards.

A cross-sectional survey of workers at cement workstations – the factory

loading bay, extension workers at market outposts and workers at construction sites in Southeastern Nigeria – was carried out in order to determine the following: awareness and the perception of risks at workplaces, workers' demographic characteristics, their period of employment and the incidence rate of work-related hazards.

## Methodology

### Design of the survey

The survey was an observational, cross-sectional design based on a random sample. This design is most suitable because of the unregulated nature of the informal sector. The survey involved visits to workplaces and the administration of questionnaires in situ to workers in a cement factory workstation, to field extension loaders in sale depots/outlets and at several masonry and construction sites in Abakaliki, Awka, Enugu, Nnewi and Onitsha. All are urban towns in South-east Nigeria, with intense commercial and construction activities.

### The questionnaire

A version of the questionnaire previously used for an ILO study in Zimbabwe (7) was modified to suit our purpose. The questionnaire had five sections: workers' demographic characteristics and duration of exposure; occupational health and safety (OH&S) awareness; perception of the impact of workplace hazards; incidence rate of work-related hazards; and personal protective equipment and OH&S practices. In all, 1,214 workers responded to the questionnaire.

**Table 1. Workers' demographic characteristics and duration of exposure.**

Demographic data	Duration of exposure					Total
	Less than 2 yrs	2-3 yrs	4-5 yrs	6-8 yrs	Above 8 yrs	
18-20 yrs	89	20	8	-	-	117
21-25 yrs	101	73	29	2	-	205
26-30 yrs	100	132	57	23	-	312
31-35 yrs	73	85	46	37	31	272
35-40 yrs	28	60	35	20	15	158
Above 40 yrs	12	38	36	33	31	150
	403	408	211	115	77	1,214

Questionnaires were filled in during face-to-face interviews and after translation into the local Ibo language. All subjects participated willingly after being assured that their identity would be protected, and that they could withdraw or drop out at any stage. The incidence of work-related health hazards was recorded after physical examination and osculation of the chest by the physician. Out of the initial 2,000 questionnaires administered, 786 were discarded for failure to respond to some part of the questionnaire (i.e. failure to complete the questionnaire) or failure to comply with the physical examination.

### Definition of work-related hazards at the workplace

Symptoms of workplace hazards were linked to workplace by:

- i. Common sense – i.e. checking whether symptoms are worse during the workday and better on weekends or work-free days. Such symptoms as cough, chest tightness and musculoskeletal disorder frequently come and go in this pattern.
- ii. Established occupational cause – e.g. pulmonary and respiratory problems are established hazards in a dust-producing industrial environment.
- iii. Research and record-keeping – for instance, when workers repeatedly experience similar symptoms and health complaints.

## Results

### Workers' demographic characteristics and duration of exposure

Table 1 above shows the workers' demographic characteristics and duration of exposure. Most of the workers are young, single and have little education, belonging to a labour force with a high turnover rate. Labour in this sector is of a highly casual nature, and this combined with the energy exertion required by the work, means that the workforce is highly transient. In all, 403 (33%) of

the respondents have worked over four years in this sector, and most of this number (about 87%) are localized in the masonry and construction sector.

### Awareness of health hazards

The results of the baseline survey show that virtually all of the respondents are aware of the manifest health hazards, e.g. lacrimation and irritant and contact dermatitis. Headache, fatigue and musculoskeletal disorders were commonly appreciated as accompanying hazards. About 72% (874) of the respondents recognize that runny nose is associated with the job. Less than 45% (544) of the respondents associated respiratory distress with their workplace. Only negligibly few, 58 respondents (<5%), were aware that chemicals in cement dust could cause systemic problems. The respondents did not consider excessive sweating and tightness in the chest to be hazards.

### Perception of the impact of health hazards

Though most respondents were able to identify certain occupational health risks, 1,056 respondents (87%) did not consider these hazards to be dangerous to their health, and 898 respondents (74%) did not consider these risks capable of causing a disease. These proportions of the respondents know that

inhaling dust is detrimental to health, but they do not know what health effects are related to this risk. Amazingly, the very few workers who have a correct orientation and accurate perception of the accompanying health hazards believe that "It could happen to someone else, it couldn't happen to me". This belief derives either from individual optimism or superstition.

### Incidence rate of work-related hazards

Since workers were mostly of low education and were illiterate, they do not keep records of ill health or disease. Most could not recount their medical history since they started the job. Some report having gone to hospital but do not know what their diagnosis was or for what condition they have been treated. We documented an incidence rate based on our observations and inspection during the field study. Table 2 shows the incidence rate of work-related hazards recorded on the basis of these observations. Headache, tiredness, pain in the chest and weakness were found to be the most prevalent hazards.

### Occupational health and safety practices

Despite having a reasonable insight into the risks associated with their workplaces, respondents generally lacked OH&S knowledge. Only seven respondents out of the whole material had ever participated in an OH&S programme, during their individual participation in separate turnkey projects handled by multinational construction companies where they had previously worked. This wide gap in OH&S knowledge is easily observed in the respondents' lack of personal care and hygiene in their workplaces. Workers at the cement factory workstation were provided with sufficient protective equipment; helmets, protective overall suits, rain boots, gloves, dust masks, and

**Table 2. Incidence rate of work-related hazards (measured by the prevalence of symptoms on the day of interview)**

Symptoms	No. of respondents (%)
Tightness in the chest	210 (17.3)
Wheezing/shortness of breath	336 (27.7)
Pulmonary congestion*	284 (23.4)
Cough/phlegm	529 (43.6)
Runny nose	257 (21.2)
Chest pain	692 (57.0)
Headache	862 (71.0)
Feeling tired	742 (61.1)
Feeling weak	652 (53.7)
Lacrimation	256 (21.0)
Irritant and contact dermatitis# **	21 (00.7)

\*Pulmonary congestion was confirmed by osculation of the chest  
# this was observed by physical examination.



in few cases face shields. Most of the workers complained that they found some of these protective coverings uncomfortable and usually do not put them on except when compelled by supervisors.

Within the more informal sector (i.e. loading bays, market outposts and construction industry) OH&S practices are very poor; workers cannot afford to buy protective coverings and most do not even see the need for this. Construction workers improvise protective boots, using used cement bags or rags. They reported that humid cement attacks the soles of the feet, so they feel compelled to protect themselves. None of the workers had ever participated in occupational health screening and they did not appreciate the need for this.

## Discussion

The data analysed here give a good overview of the status of OH&S awareness among cement industry workers in Nigeria, and of these workers' perceptions of the impacts of workplace risks. Generally, the respondents identified risks easier than the accompanying potential ill health. Ironically, situations considered by the workers to be unsafe were always considered unhealthy. Affected workers place the blame for their colds, headaches, breathing difficulties, dizziness, fatigue, stuffy nose, phlegm, wheezing, coughs and tightness of chest on their workplaces, because the workers admit that these symptoms are highly reduced or disappear entirely during weekends and work-free days. On the basis of personal experience, 133 of the

respondents (11%) concluded that the prevalence of respiratory distress symptoms is related to the duration of exposure and the presence of cement dust.

The most common hazards in this occupation are occupational hygienic and organizational in nature; they could be avoided by behavioural changes. The casualty of the workforce, however, makes this impossible. More so, most of the respondents see working in this sector as a transient phase because most leave the job, which they consider arduous, tedious and dirty, once they have raised a little capital to rearrange their lives. However, given the poor wages paid in the cement-related industry, it takes the most stringent workers a minimum of about two years to accumulate sufficient savings to leave the job. Workers do not believe that two years is enough to initiate or accelerate the process of health damage, although this perception is wrong. Obviously some develop occupationally related ill health, e.g. bronchitis, without knowing it, perhaps because the pathophysiological features are not sufficient to confine or immobilize them; but the damage progresses steadily over time.

Despite the existence of copious occupational health and safety legislation in Nigeria, government – whether at the federal, state or local level – does not pay adequate attention to workers' safety and health. There are provisions for safety audits in workplaces and for occupational health and safety education, but these are neither pursued nor enforced. In consequence, employers maintain a deliberate policy of not informing workers about the possible workplace hazards, striving in this way to protect themselves from the angst of estranged workers who may wish to sue for health hazard compensation. It is for employers also a deliberate way of keeping labour cheap.

Given the casual nature of this workforce, employers owe no responsibility to these workers, who in effect are hired on a daily basis. Any worker absent from work on any one day is immediately replaced from the pool of unemployed youths which abounds everywhere. Ultimately, the poor health status of workers in this informal sector may not in the main affect the country's gross national product (GNP), which is highly dependent on oil, but it does affect the health status of the workers, most of whom are still within reproductive age.

## Conclusion

There is no doubt that the creation of a safe and healthy workplace is vital for

the economic development of a nation, and for the good of its people. In Nigeria this fact remains a mirage. It is well appreciated and well provided for by legislation, but it is rarely implemented or enforced. It is trapped in the same circle of apathy, inaction and corruption that characterizes Nigeria's way of life. People in power or at the corridors of power own the big corporations, industries and enterprises. Through political lobbies they make the laws inoperative and unenforceable, and create reprehension for what should be. In Nigeria we have the money, the material and the human resources to do things right, but we lack the political will. Until this situation is overturned, we may remain in the backwoods of occupational health for a long time.

## References

1. Theodore B. Effect of occupational exposure of dust on respiratory system of cement workers. *J. Soc Occp Med.* 1980;30:31–6.
2. Abron HL, Petersen MR, Sanderson WT, Engelberg AL, Haber P. Symptoms, ventilatory function and environmental exposures in Portland cement workers. *Br J. Ind Med* 1988;45(6):368–75.
3. Saric M. Occupational and environmental exposures of dust and non-specific lung disease: a viewed of selected studies. *Isr J. med Sci.* 1992;28(8–9):509–12.
4. Lachapelle JM. Industrial airborne irritant or allergic contact dermatitis. *Contact dermatitis* 1986;14:137–45.
5. Ezeonu FC, Ezejiofor TIN. Biochemical indicators of occupational health hazard in Nigeria. *The Science of the Total Environment.* 1999;228:275–8.
6. Ezeonu FC. Occupational health hazards among cement industry workers. *Afr Newslett on Occup Health and Safety* 2004;14(3):63–5.
7. Loewenson RH. Health impact of occupational risks in the informal sector in Zimbabwe. *Int J Occup Environ Health* 2000;4(4):264–74.

Francis C. Ezeonu  
Department of Applied Biochemistry  
Nnamdi Azikiwe University  
P.M.B. 5025  
Awka  
Nigeria

Jane N. Ezeonu  
Medical Centre  
Nnamdi Azikiwe University  
Awka

Oswald C. Edeogu  
Department of Medical Biochemistry  
College of Medicine  
Ebonyi State University  
Abakaliki

# WAHSA Project



Photo by S. Lehtinen

The collaboration of the Swedish occupational health and safety experts in Southern Africa began in 1990. The first forms of collaboration were regional capacitybuilding within the framework of the Ministry of Labour in Zimbabwe. Networks were built during this period, though they focused more on regional rather than on bilateral collaboration. Professor Christer Hogstedt and Mr. Kaj Elgstrand reported the developments of the current project in a project meeting organized on 15 September 2005 in Johannesburg, South Africa. The meeting took place in connection with the Conference organized by the International Society on Environmental Epidemiology.

## Work and Health in Southern Africa

The programme's long-term goals are to improve health and help decrease poverty in the region by preventing work-related injuries. The countries involved in the programme are Angola, Botswana, Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. All the countries, with a total population of some 83 million, belong to SADC, the Southern African Development Community, which is also one of the participants in the programme.

The long-term programme is funded by the Swedish International Development Agency, SIDA. It is a university-based, action-oriented research and development project. Several approaches have been integrated into the project, e.g. twinning between the institutions in various countries.

The project comprises the building of infrastructures and increasing capacity,

preparing profiles in occupational health and safety, raising awareness, promoting advocacy, surveying pesticide use, and improving occupational health and safety in the informal sector, just to mention a few elements. The main approach is to conduct research, disseminate information, and to implement the changes. A website is being developed in order to keep stakeholders informed of the developments in the project.

Phase I of the WAHSA Programme is organized into 10 projects (overall activities):

- Establishment of resource complexes
- Profiling occupational safety and health
- Creating a basis for future interventions
- Training of health and safety professionals
- Improving access to information
- Advocacy and awareness raising
- Action on silica, silicosis and tuberculosis
- Action on pesticide poisoning
- Action on health and safety in informal small-scale enterprises
- Planning of the second phase of the Programme.

A total of 25 experts from Tanzania, South Africa, Uganda, Costa Rica, Sweden, Finland, USA and WHO came together in a brief meeting in September to share experiences from respective

projects and activities and to plan future activities of the extensive Work and Health Southern Africa (WAHSA) Project components. The goal of each of the respective participating countries is to build a resource

complex which can eventually be developed into a national occupational health and safety institute. This would ensure the sustainability of the activities.

## SALTRA Project

Ms. Catharina Wesseling of Costa Rica reported on a similar regional project that is being carried out in seven Latin American countries. It covers the informal sector and construction. Occupational health and safety profiles have been prepared in all countries, and occupational health measurements compiled onto a data base. Extensive training is also taking place. This resembles the current project in the sense that the focal points of every country are the state universities. The achievements of the project are accessible at: [www.saltra.net](http://www.saltra.net).

The WAHSA Project has two Regional Programme Managers: Dr. Rajen Naidoo and Dr. Amanda Ryan.

For more information, see: [http://www.nioh.ac.za/Collaborations/collab\\_wahsa.htm](http://www.nioh.ac.za/Collaborations/collab_wahsa.htm)

Suvi Lehtinen  
Finnish Institute of Occupational Health  
Topeliuksenkatu 41 a A  
00250 Helsinki  
FINLAND

# International Occupational Hygiene Association (IOHA)

## 6th International Scientific Conference (IOHA 2005), South Africa, 19–23 September 2005

### International Occupational Hygiene Association (IOHA)

The International Occupational Hygiene Association (IOHA) conducts a wide range of activities intended to promote and develop occupational hygiene worldwide. From its creation in 1987 the IOHA has grown to more than twenty member organizations, representing over 20,000 occupational hygienists worldwide.

IOHA also co-operates with the work of other international organizations such as the International Commission on Occupational Health (ICOH) and International Ergonomics Association (IEA).

IOHA provides an international voice for the occupational hygiene profession through its recognition as a non-governmental organization (NGO) by the International Labour Organisation (ILO) and World Health Organization (WHO).

### IOHA International Scientific Conferences (ISCs)

During the 1990s, IOHA became an international platform for occupational hygiene through the organization of international conferences on the scientific basis of occupational hygiene professional practice. IOHA has convened six such conferences, the first being held in Brussels, Belgium in 1992. The conference offered an international platform to exchange knowledge on anticipating, recognizing and controlling health hazards in the work environment and the promotion of healthful and safe working conditions worldwide. It gathered specialists in occupational hygiene from all over the world to review the state of the art concerning major and current issues and discuss subsequent consequences for professional practice in occupational hygiene.



Photo by D.W. Stanton

Dr David Grantham (left) from Australia received IOHA Lifetime Achievement Award in 2005. The IOHA President Mr. Tai-wa Tsin from Hong Kong, China (right).

### IOHA 2005

The Scientific Programme for IOHA 2005 was developed by an IOHA 2005 Organising Committee and an International Scientific Committee and was designed to be of interest to occupational hygienists and occupational health and safety (OHS) personnel from around the world. It included twenty-one Scientific Sessions and fourteen Professional Development Courses on a wide range of topics. The conference sponsored ten persons from around Africa to attend a one-week fundamentals course in occupational hygiene and IOHA 2005.

A National Programme for the Elimination of Silicosis was launched in South Africa in 2004. Three sessions at IOHA 2005 were dedicated to silicosis where we were updated on the ILO/WHO Global programme, the work of the WHO Network of Collaborating Centres in Occupational Health and IOHA on silicosis and new national and international initiatives.

### Scientific Sessions

Some 260 abstracts were submitted for IOHA 2005 and 150 were accepted for oral presentation and thirty-two for poster presentation.

Twenty-one Scientific Sessions were arranged and included: Agriculture; Asbestos; Biological Agents; Biological Monitoring; Chemical Exposures; Construction; Environmental Issues/ Management; Ergonomics; Exposure Assess-

ment Strategies; Health Care Sector; Mining; New Developments in Occupational Hygiene; Occupational Hygiene in Africa; OHS Management Systems; Physical, Chemical and Biological Agents; Physical Agents – Noise and Vibration; Risk Assessment/ Management; Silicosis; Shift work and Stress Management; Visualisation Techniques/ PIMEX.

The Third International Control Banding Workshop (3ICBW) also took place at IOHA 2005 and was split into three sessions

1. Global Trends in Control Banding Collaborations
2. Silica Workshop Discussion and Round Table
3. CB Expansion of Range (Beyond Chemicals).

A Medical Surveillance Workshop was held for occupational medicine and occupational health nursing practitioners attending IOHA 2005 to facilitate discussions with practitioners visiting South Africa including those attending the WHO Network of Collaborating Centres in Occupational Health Planning Committee meeting.

### Keynote talks presented at IOHA 2005 included:

- Communications and Information Technology: Dr P.K. Abeyunga, CCOHS, Canada
- COSHH Essentials – Reducing Silicosis: Mr. Paul Evans, HSE, UK
- Global Programme on the Elimination of Silicosis: Dr Igor Fedotov, ILO, Switzerland
- Global Trends in Occupational Hygiene Education and Training: Professor Michel Guillemin, IST, Switzerland
- IOHA and Combating of Silicosis: Mr. T.W. Tsin, IOHA President, Hong Kong, China

- IOHA Development of Occupational Hygiene in Africa and Globally: Mr. Ton Spee, IOHA Immediate Past President, the Netherlands
- IOHA Lifetime Achievement Award Lecture: Standards, Regulations and Public Policy: Still a Need for the Best Hygiene Input: Dr. David L. Grantham, Australia
- Medical Surveillance: Dr. M. Yssel, Lancet Laboratories, South Africa
- Occupational Health in Construction: Mr. Lawrence Waterman, President IOSH, UK
- Occupational Health in the Health Care Sector: Professor Mary Ross, NIOH, South Africa
- Occupational Hygiene in Mining: Ms. May Hermanus, Chief Inspector, DME, South Africa
- Status of Occupational Hygiene Globally: Dr. Paul Oldershaw, HSE, UK
- WHO/ILO Joint Effort on OHS in Africa: Dr. Gerry Eijkemans, WHO, Switzerland
- WHO Network of Collaborating Centres in Occupational Health Global Work Programme: Dr. Marilyn Fingerhut, NIOSH International Coordinator, USA

The IOHA 2005 Proceedings are available on the IOHA 2005 website and will be available for publication on CD early in 2006.

#### Listing of IOHA International Scientific Conferences:

- Seventh ISC:** 18–22 February 2008, Taipei, Taiwan. Organised by Taiwan Occupational Hygiene Association (TOHA). <http://www.ioha2008.org>
- 6.** 19–23 September 2005, Pilanesberg, South Africa. Organized by Southern African Institute for Occupational Hygiene (SAIOH) and the Mine Ventilation Society of South Africa (MVS). Theme: Promoting occupational hygiene in Africa and globally. Delegates: 360 from 40 countries. Web: <http://www.saioh.org/ioha2005/>
- 5.** 10–14 June 2002, Bergen, Norway. Organised by Norwegian Occupational Hygiene Association (NYF). Web: <http://www.nyf.no/bergen2002/>
- 4.** 10–14 July 2000, Cairns, Australia. Organised by Australian Institute of Occupational Hygienists (AIOH). <http://www.ioha.net/>
- 4.** 13–17 September 1997, Crans Montana, Switzerland. Organised by Swiss Society for Occupational Hygiene (SGAH).
- 2.** 16–18 November 1994, Kowloon, Hong Kong. Organised by HK Institute of Occupational and Environmental Hygiene (HKIOEH). Hong Kong as the venue added an Asian perspective to the conference.
- 1.** 7–9 December 1992, Brussels, Belgium. Organised by Belgian Society for Occupational Hygiene (BSOH). Under the patronage of the WHO and of Mrs. V. Papandreou, member of the European Commission for Social Affairs.

David W. Stanton  
Conference President of  
OHA2005 and Organizing Chair

## D. W. Stanton SOUTH AFRICA

This two-hour workshop session discussed the Development of Occupational Hygiene in Africa and Globally on 22nd September 2005 and the delegates were split into groups. Recommendations from the African and European groups are provided below:

### African Group

Report by: Vijay Nundlall, South Africa. Email: [vijay.nundlall@dme.gov.za](mailto:vijay.nundlall@dme.gov.za)

The session on the development of Occupational Hygiene in Africa was well-attended (approximately 60 delegates from 10 African countries and 3 Middle East countries), robust debates and discussions were held by all delegates on the status of Occupational Hygiene and Occupational Health in their countries.

The discussions focussed on the following main aspects:

1. Assistance currently available to Occupational Health and Safety (OH&S) Practitioners in the different countries
2. Government commitment to OH&S and the availability of national policy or legislation on OH&S
3. Assistance required by the OH&S Practitioners to improve working conditions in the respective countries
4. Recommendations on the Way Forward.

The following is a brief report back on the deliberations and opinions expressed by the various delegates:

#### Assistance currently available to OH&S Practitioners

Most countries that reported to this question indicated that little or no support was available within their own countries from professional organizations or statutory bodies; in some countries OH&S organizations are in their infancy. In South Africa, support is available from professional organizations and statutory bodies.

#### Government commitment to Occupational Health and Safety and the availability of national policy or legislation on OH&S

A variety of responses were received to this question ranging from no OH&S legislation, draft legislation, and where legislation exists some countries have reported that there is little or no politi-

cal will to ensure that the provisions of the legislation are actually enforced. Swaziland and South Africa reported commitment from their respective governments; however, greater “buy-in” from the employees was required to ensure a reduction on occupational illness and disease rates.

Many delegates also raised concerns about the effects of poverty experienced in most countries on occupational health and the levels of awareness of occupational health issues amongst the general workforce.

One of the other key concerns was the level of communication between the various national government departments that have occupational health responsibilities, e.g. departments of labour, health and environment and the hindrance or progress that is made depending on the effectiveness of the communication.

#### Assistance required by the OH&S Practitioners to improve working conditions in the respective countries

An almost unanimous agreement was reached that African countries must be able to assist themselves first before seeking assistance from outside Africa. African countries present were requested to assist one another in terms of information sharing, expertise and equipment in occupational exposure assessment and technical support.

The creation of a database or newsletter to ensure all practitioners remain connected and to disseminate relevant OH&S information – it was noted that this could be done within existing publications from the International Labour Organisation (ILO) and World Health Organization (WHO). A suggestion to create an African Chapter of the International Occupational Hygiene Association was supported by all members as a vehicle to keep practitioners informed of “local” conditions. The idea of creating a “Centre of Excellence” to provide technical support for Africa was supported.

It was also strongly felt that training initiatives be prioritized to increase expertise in the field and to improve awareness of the general working population on occupational health and safety issues.

Some countries felt that aid that is

# Some Recommendations from the IOHA 2005

provided by international agencies should be conditional to certain OH&S target/milestones being met.

## Recommendations on the Way Forward

- a) It was resolved that Africa will initiate an internal collaboration process to assist each other by raising issues to bodies, such as the African Union, African Ministers Forum and regional bodies, such as the Southern African Development Community (SADC).
- b) Request that all African countries have basic OH&S legislation and policy in place that can be enforced.
- c) Pressure be placed on certain African countries, through the appropriate channels, to provide the necessary political will to ensure compliance to OH&S legislation. This will assist in decreasing the incidence of occupational illness and disease.
- d) Request that all African countries evaluate and prioritize their OH&S needs to ensure that when aid is provided the high priorities are addressed.
- e) Africa to initiate an internal dialogue mechanism (this may include utilizing existing channels) to ensure all practitioners are able to receive the latest OH&S information and engage in dialogue with their peers in different countries.
- f) Request that drafters of OH&S guidance at the ILO, the WHO or other international aid organization tailor their guidance to suit local conditions.
- g) Pressure be placed on multi-national companies operating in Africa to maintain the same stringent OH&S standards they adhere to in their home countries to their operations in Africa.
- h) Request that training and skills improvement opportunities be increased through African and international aid agencies.
- i) Ensure that international or African aid reaches the intended recipients via the correct channels, this will depend on the country concerned whether aid is channelled via the relevant ministry or directly a non-governmental organization.

## European Group

Report by Paul Scheepers, The Netherlands.

Email: P.Scheepers@EPIB.umcn.nl

In this group there were representatives from Austria, Finland, Norway, Sweden, The Netherlands and the UK.

After a quick brainstorm round, four main topics were discussed:

### Design out problems

It was felt that occupational hygienists should be more aware of their role to help users of equipment and machinery to improve on the design. When buying new equipment users (especially small enterprises) should ask critical questions to the manufacturer/supplier about the safety of the equipment, noise and vibration levels produced and about other potential health risks that may result from its use. Suppliers of machinery should be made aware of their product responsibility and product stewardship, similar to the responsibility of suppliers of e.g. chemicals. Eventually this could lead to a system of what the group would like to call "Manufacturer's Essentials". To put this idea into action it was suggested to organize a workshop at the next IOHA meeting in order to develop strategies to influence manufacturers and designers of industrial equipment.

Also it was suggested that the suppliers should provide more information on occupational hazards of chemical products. Countries outside the EU should follow the EU-initiative called 'REACH'.

### Global target setting

In addition to targets set by the WHO and ILO (e.g. on silicosis elimination), the occupational hygiene community should set additional (occupational hygiene) targets for 10–20 years ahead. Targets could be set for e.g. acceptable noise levels in 2020. In such a way we would have our own Occupational Hygiene Protocol, similar to the Kyoto Protocol on environmental issues. This idea should be passed on to the IOHA Board and be further discussed.

### Seeking partners

The occupational hygienists are limited in their numbers and capabilities. We

should find ways to build partnerships with other stakeholders in occupational health who can help us to achieve the goals of improved working conditions. Possible partners could be e.g. manufacturers, suppliers of products and machinery and people working in primary health care (at hospitals and clinics). The occupational hygienists should be careful not to be identified with commercial interests of manufacturers and suppliers. On the other hand, improvements of working conditions can only be achieved by highlighting the available 'best practices'. The group felt that it is the responsibility of every occupational hygienist to develop these partnerships.

### Education

The participants agreed that education is at the base of improving occupational hygiene globally. In Europe there are different initiatives for training of occupational hygienists (Master courses in Norway and The Netherlands). Also there is experience in Sweden with training of occupational hygienists from developing countries. In this programme opportunities for apprenticeships are offered. A tutor who also visits the candidate in his/her home country coaches each candidate. Furthermore, it should be made clear that 'information' is not the same as 'knowledge'. Occupational hygienists should be aware that the information they provide should be focused and clear and self-explaining (leaving no room to differences in interpretation). This is especially important when sharing information with our colleagues in developing countries. Information (that can be used directly) should be shared on websites (e.g. [www.ioha.net](http://www.ioha.net)). It was suggested to organize a session on education and training at the IOHA 2008 conference in Taiwan.

David W. Stanton  
 Conference President of  
 IOHA2005  
 Chamber of Mines  
 P.O. Box 61809  
 Marshalltown 2107  
 Johannesburg, South Africa  
[davidws@asosh.org](mailto:davidws@asosh.org)

## Contact persons/country editors

---

Chief Inspector of Factories  
Commissioner of Labour and  
Social Security  
Department of Labour and  
Social Security  
Private Bag 0072  
Gaborone  
BOTSWANA

Samir Ragab Seliem  
Egyptian Trade Union Federation  
Occupational Health and  
Safety Secretary  
90 Elgalaa Street  
Cairo  
EGYPT

Ministry of Labour and  
Social Affairs  
P.O.Box 2056  
Addis Ababa  
ETHIOPIA

Commissioner of Labour  
Ministry of Trade Industry and  
Employment  
Central Bank Building  
Banjul  
GAMBIA

The Director  
Directorate of Occupational  
Health and Safety Services  
Commercial Street  
P.O.Box 34120  
Nairobi  
KENYA

Noel J. Mkhumba  
Information and Documentation  
Centre  
P/B 344  
Capital City Lilongwe 3  
MALAWI

Mrs Ifeoma Nwankwo  
Federal Ministry of Labour  
and Productivity  
Occupational Safety and  
Health Department  
P.M.B. 4  
Abuja  
NIGERIA

Peter H. Mavuso  
Head of CIS National Centre  
P.O.Box 198  
Mbabane  
SWAZILAND

Chief Executive  
Occupational Safety and  
Health Authority  
Ministry of Labour,  
Youth Development and Sports  
P.O.Box 9724  
Dar es Salaam  
TANZANIA

Paul Obua  
Occupational Health and  
Hygiene Department  
Ministry of Labour  
P.O.Box 4637  
Kampala  
UGANDA

Tecklu Ghebreyohannes  
Director of Labour Inspection Div.  
Ministry of Labour and Human  
Welfare  
Department of Labour  
P.O. Box 5252

Asmara  
ERITREA

## Editorial Board

*as of 28 February 2005*

*Chief Inspector of Factories  
Commissioner of Labour and Social  
Security  
BOTSWANA*

*Mathewos Meja  
OSH Information Expert  
Ministry of Labour and  
Social Affairs  
ETHIOPIA*

*Chief Inspector of Factories  
Ministry of Labour and Social  
Welfare  
GHANA*

*Chief Inspector of Factories  
Ministry of Labour and Industrial  
Relations  
MAURITIUS*

*Chief Inspector of Factories  
Ministry of Labour  
SIERRA LEONE*

*Ministry of Labour and Social  
Security  
SUDAN*

*Jukka Takala  
Director  
SafeWork, Global Programme on  
Safety, Health and Environment  
International Labour Office  
SWITZERLAND*

*Gerry Eijkemans  
Scientist  
Occupational and Environmental  
Health Programme  
World Health Organization  
20, Avenue Appia  
CH-1211 Geneva 27  
SWITZERLAND*

*Jorma Rantanen  
President of ICOH  
ICOH c/o Finnish Institute  
of Occupational Health  
FINLAND*

*Harri Vainio  
Director General  
Finnish Institute of Occupational  
Health  
FINLAND*