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on Occupational Health and Safety

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Chemical safety

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Chemical safety

The current issue of this journal, with its focus on chemical safety, is very timely indeed. The recent dumping of toxic waste in the Ivory Coast and the consequent impact on the population of Abidjan and its health-care system has drawn world-wide attention to just one of the current chemical safety problems affecting Africa. And in Cairo, representatives of 38 African governments, and of intergovernmental and non-governmental organizations, met on 11–14 September 2006 to discuss an African Regional Action Plan for implementation of a recently-agreed Strategic Approach to International Chemicals Management (SAICM).

SAICM was agreed by governments at a high-level International Conference on Chemicals Management in Dubai, February 2006, and it represents the culmination of some three years of negotiation. SAICM is comprised of three elements – a high-level political statement, the Dubai Declaration, an Overarching Policy Statement (OPS), and a Global Plan of Action. The World Summit on Sustainable Development (WSSD) endorsed the concept of development of SAICM which aims to meet the WSSD goal which is that by 2020, chemicals are used and produced in ways that minimize significant adverse effects on human health and the environment.

The SAICM OPS called for implementation efforts on SAICM to be undertaken through regional meetings. The Egyptian Environmental Affairs Authority, in collaboration with the SAICM secretariat, organized the first such regional meeting, for African countries in September 2006. SAICM covers the environmental, economic, social, health and labour aspects of agricultural and industrial chemicals, with a view to promoting sustainable development and covering chemicals at all stages of their life-cycle, also in products. The emphasis is on a multisectoral approach to implementation at national, regional and international levels.

The African regional meeting provided a forum for discussing strategic priorities, sharing technical experience and exchanging information. Participants agreed on the further development of a draft African Regional Plan of Action, on terms of reference for an African Core Group, and on African regional representatives to serve on a SAICM Quick Start Programme (QSP) Executive Board. The QSP has a Trust Fund designed to support country-led projects, in particular those that are multi-sectoral, as part of the process of implementation of SAICM. Participants at the African regional meeting agreed on a several regional projects to be submitted for possible QSP funding. There will be bi-annual cycles of project funding over the next five years and colleagues from the African region (and from other regions) may wish to explore this opportunity to obtain both financial and other kinds of support for chemical safety activities at national as well as at regional level.



It is anticipated that most project proposals will be linked to QSP strategic priorities and the broad objectives listed under the SAICM Global Plan of Action, namely: measures to support risk reduction; strengthening knowledge and information; the strengthening of institutions, law and policy in relation to governance; enhancing capacity-building; addressing illegal international traffic; and improved general practices.

Further information on SAICM, including the Global Plan of Action, the African regional meeting, the QSP Trust Fund, and on how to submit project proposals can be found at <http://www.chem.unep.ch/saicm/>.

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ILO activities in the area of chemical safety

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Introduction

Chemicals have become a part of our life, sustaining many of our activities, preventing and controlling many diseases, and increasing agricultural productivity. However, one cannot ignore that many of these chemicals may, especially if not properly used, endanger our health and poison our environment.

It has been estimated that approximately one thousand new chemicals come onto the market every year, and about 100 000 chemical substances are used on a global scale. These chemicals are usually found as mixtures in commercial products. One to two million such products or trade names exist in most industrialized countries.

The growing number of substances, and rising production means a rise in the storage, transport, handling, use and disposal of chemicals.

Many substances that are used regularly at work will contain chemicals which, if not handled correctly, can cause harm. ILO estimates that of the 2.2 million occupational fatalities, 439,000 are caused by chemicals and of the 160 million cases of work-related diseases, 35 million are due to chemicals. In addition, ILO also estimates that 10% of all skin cancers are attributable to workplace exposure to chemicals. There is widespread concern over the increase in fatalities and work-related diseases due to the rapidly increasing inventory of chemicals in commercial use, especially in developing countries where adequate control measures are often unavailable. Table 1 shows the estimated annual average number of deaths attributable to occupational ex-

posure to hazardous substances by condition in the world.

Major accidents

Most chemical accidents have a limited effect and are not usually reported. Unfortunately, in certain cases, chemical accidents can have disastrous effects with great loss of life and extreme damage to the environment. More than 20 years has passed since probably the worst chemical industrial disaster occurred, namely Bhopal. On the night of 2 December 1984, a gas leak caused a deadly cloud to spread over the city of Bhopal, in central India, leaving 2,500 people dead and injuring over 200,000 in the space of a few hours. The accident occurred because of a runaway reaction in one of the tanks of methyl isocyanate (MIC). The concrete storage tank containing some 42 tonnes of this compound, which was used to manufacture pesticides, burst open and vented MIC and other breakdown chemicals into the air. To this day, the effects of this disaster are still being felt. However, although tragedies like Bhopal occur, most chemical accidents and diseases occur from activities that are far less dramatic and in fact routine. A plantation worker spraying pesticides without protection in a field is one such example.

ILO instruments in the field of chemical safety

ILO has been active in the area of safety in the use of chemicals at work since the year of its creation in 1919, through activities such as the development of international treaties and other technical

instruments, the provision of technical assistance to its member States and the development of chemical safety information systems. Other instruments, such as those dealing with agriculture, construction and mining also include provisions dealing with chemical safety. Another important standard-setting activity related to chemical safety which is specific to ILO is the development of the ILO list of occupational diseases which includes a section dealing with diseases resulting from exposure to chemicals.

The key ILO labour standards in the area of chemical safety are the Chemicals Convention, 1990 (No. 170) and the Prevention of Major Industrial Accidents Convention, 1993 (No. 174).

The Chemicals Convention, 1990 (No. 170) aims to encourage ratifying Members to formulate, implement and periodically review a coherent policy on safety and the use of chemicals at work. It has the broad purpose of protecting the environment and the public, and the specific objective of protecting workers from the harmful effects of chemicals. It applies to all branches of economic activity in which chemicals are used, and it covers all chemicals, with particular measures concerning hazardous chemicals.

The general provisions for a national policy on safety in the use of chemicals at work should be undertaken through a national system for the management of chemicals, which should cover areas, such as the classification of chemicals, and the responsibility of the supplier for labelling and the provision of chemical safety data sheets. It should also provide for the identification of chemicals by the

user, and the responsibility of employers for labelling and providing information to workers' training, as well as operational control measures (including the monitoring of exposure to chemicals at the workplace).

The objective of the Prevention of Major Industrial Accidents Convention, 1993 (No. 174), is the prevention of major accidents involving hazardous substances and the limitation of the con-

sequences of such accidents. It seeks to protect workers, the public and the environment against risks of major industrial accidents.

The Convention requires ratifying States, in consultation with other interested parties in their country, to formulate a coherent national policy to be implemented through preventive and protective measures for major hazard installations and, where practicable, pro-

mote the use of the best available safety technologies.

The Convention includes the following provisions:

- Each Party is to formulate, implement and periodically review a coherent national policy concerning the protection of workers, the public, and the environment against the risk of major accidents. The policy is to be implemented through preventive and

Table 1. Estimated annual average number of deaths attributable to occupational exposure to hazardous substances by condition in the world.

Causes of death	No. of deaths		Estimated percentage attributed hazardous substances		No. of deaths attributed to hazardous substances
	Men	Women	Men	Women	
Cancer (Total)					314,939
Lung cancer and mesothelioma	996,000	333,000	15 %	5 %	166,050
Liver cancer	509,000	188,000	4 %	1 %	22,240
Bladder cancer	128,000	42,000	10 %	5 %	14,900
Leukaemia	117,000	98,000	10 %	5 %	16,600
Prostate cancer	253,000		1 %		2,530
Cancer of mouth	250,000	127,000	1 %	0.5 %	3,135
Cancer of oesophagus	336,000	157,000	1 %	0.5 %	3,517
Stomach cancer	649,000	360,000	1 %	0.5 %	8,290
Colorectal cancer	308,000	282,000	1 %	0.5 %	4,490
Skin cancer	30,000	28,000	10 %	2 %	3,560
Pancreas cancer	129,000	99,000	1 %	0.5 %	1,785
Other and unspecified cancer	819,000	1,350,000	6.8 %	1.2 %	71,892
Cardiovascular disease, 15–60 years	3,074,000		1 %	1 %	30,740
Nervous system disorders, 15+ years	658,000		1 %	1 %	6,580
Renal disorders, 15+ years	710,000		1 %	1 %	7,100
Chronic respiratory disease, 15+ years	3,550,000		1 %	1 %	35,500
Pneumoconioses estimate	36,000		100 %	100 %	36,000
Asthma 15+ years	179,000		2 %	2 %	3,580
TOTAL					438,489

protective measures for major hazard installations and, where practicable, promote the use of the best available safety technologies

- Competent authorities are to establish a system for the identification of major hazard installations (based on a list of hazardous substances, or categories of substances, with their threshold quantities)
- Employers are to identify any major hazard installations within their control and notify such installations to the competent authorities
- Employers are to establish and maintain a system of major hazard control at major hazard installations, prepare and update safety reports and submit the reports to the competent authorities
- Employers must report major accidents
- Competent authorities are to establish emergency plans and procedures
- Competent authorities are to disseminate information to the public on safety measures and correct behaviour in the event of an accident
- Competent authorities are to establish a siting policy with appropriate separation of proposed major hazard installations from areas frequented by the public and appropriate measures for existing installations
- Workers and their representatives are to be consulted in order to ensure a safe work system
- Workers are to be informed of e.g. hazards associated with the major hazard installations and to receive relevant instructions and training
- Workers are to comply with practices and procedures relating to the prevention of major accidents and the control of developments likely to lead to a major accident with the installations, and to comply with all emergency procedures should a major accident occur
- Exporting Parties are to provide any importing country with information concerning the use of hazardous substances, technologies or processes as a potential source of a major accident and the reasons for it.

International co-operation on chemical safety

A major part of ILO's work in the field of chemical safety takes place within the context of established mechanisms for inter-agency co-operation. The International Programme on Chemical Safety (IPCS), a partnership between ILO, the United Nations Environment Programme (UNEP) and the World Health

Organization (WHO) was established in 1980 with a mission to develop and disseminate internationally peer-reviewed chemical risk assessments and other activities related to chemical safety. Following the UN Conference on Environment and Development (UNCED) in 1992, the Inter-Organisation for the Sound Management of Chemicals (IOMC) was set up in 1995. The IOMC co-ordinates chemical safety activities of UNEP, FAO, ILO, WHO, UNITAR, UNIDO and OECD, and has UNDP and the World Bank as observers.

The globally harmonized system for the classification and labelling of chemicals (GHS)

At the 76th Session of the International Labour Conference (1989), ILO adopted a Resolution concerning the harmonisation of systems of classification and labelling for the use of hazardous chemicals at work. Work on the GHS started as a follow-up to the adoption of the Chemicals Convention, 1990 (No.170). The work was co-ordinated and managed under the auspices of the IOMC and the technical focal points were the ILO, OECD and the United Nations Economic and Social Council's Sub Committee of Experts on the Transport of Dangerous Goods (UN SCETDG). The GHS has been designed to cover all chemicals, including pure substances and mixtures and to provide for the chemical hazard communication requirements of the workplace, the transport of dangerous goods, of consumers and the environment. As such, it is a truly harmonized and universal technical standard that should have a far-reaching impact on all national and international chemical safety regulations.

Recognizing that unprecedented capacity building efforts would be required to enable countries, especially developing countries and countries with economies in transition, to implement the GHS, ILO and UNITAR established the UNITAR/ILO GHS Global Capacity Building Programme. The UNITAR/ILO Global GHS capacity building programme provides guidance documents, educational, awareness raising, resource and training materials regarding the GHS. Relevant topics include the development of national GHS implementation strategies, legislation, situation/gap analyses, chemical hazards, labelling, safety data sheets (SDSs), as well as related support measures, such as comprehensibility testing. UNITAR and ILO are the designated focal point for capacity building in the UN ECOSOC Subcom-

mittee of Experts on the GHS (SCEGHS).

In 2005–2007, UNITAR/ILO support national GHS implementation and capacity building projects in Cambodia, Indonesia, Laos, Nigeria, Senegal, Slovenia, Thailand, The Gambia, and The Philippines. Previous projects have taken place in Zambia and South Africa. Meetings and workshops have also been supported in Malaysia, Singapore and for the ASEAN OSHNET. Regional activities will be carried out in ASEAN and SADC, and other sub-regions subject to available resources.

For more information, please visit:

<http://www.unitar.org/cwg/ghs/index.html> and http://www.unitar.org/cwg/ghs_partnership/index.htm

The IPCS International Chemical Safety Cards

The International Chemical Safety Cards (ICSC) summarize essential health and safety information on chemicals and are intended for use by workers and employers in the workplace and in education and training activities. The information on the cards is expressed as far as possible using standard phrases thereby enabling the use of computer-aided translation into various languages. The Cards include data on:

- fire and explosion hazards and their prevention
- symptoms and first-aid treatment following acute exposure
- health effects of short-term or repeated exposure
- occupational exposure limits
- physical and chemical dangers
- spillage disposal and emergency response
- safe storage
- packaging and labelling requirements
- environmental data.

The ICSCs offer a basic tool to supply workers with information on the properties of the chemicals that they use and may often be the principal source of chemical safety information in less developed areas or in small and medium-sized enterprises.

The ICSC project is an undertaking of the joint WHO/ILO/UNEP International Programme on Chemical Safety (IPCS) and is being developed in the context of the co-operation between the IPCS and the Commission of the European Communities. The Cards are prepared by participating institutions in various countries and go through several steps of consultation and editing before being peer reviewed by a group of international experts. This last step

represents a significant asset of the ICSC as opposed to other packages of information prepared at national, local or professional levels.

There are currently over 1400 Cards. They are available to view and download on various Internet sites, including that of the ILO International Occupational Safety and Health Information Centre (CIS): <http://www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm>

Searches may be made by chemical name or synonym, Chemical Abstracts Service (CAS) number or ICSC reference number. The Cards are also available on the CIS SafeWork Bookshelf CD. The standard phrases used and criteria for their use are available in the Compiler's Guide: <http://www.ilo.org/public/english/protection/safework/cis/products/icsc/compguide.pdf>

Translations of the cards into 15 languages (including Chinese, Japanese, Korean, Swahili, Thai, Urdu, Vietnamese as well as many European languages) are available through links on the CIS site and the U.S. NIOSH (National Institute for Occupational Safety and Health) site: <http://www.cdc.gov/niosh/ipcs/icstart.html>

A recent development of the Cards has been the addition of the GHS classification (the Globally Harmonized System for the Classification and Labelling of Chemicals). Thus the Cards provide a potential way of assisting in the worldwide implementation of GHS.

A planned development within the project is the design and implementation of an Internet-based system to allow for easier international editing of the Cards and faster worldwide availability of the updated information. This development will include a change in the format of the data from standard phrases to standard sentences in order to facilitate translation.

The Strategic Approach to International Chemicals Management (SAICM)

ILO, as part of the Inter-Organization Programme for the Sound Management of Chemicals (FAO, ILO, UNIDO, WHO, UNITAR, UNEP, UNDP, World Bank and OECD), was an active member in the development of the Strategic Approach to International Chemicals Management (SAICM). The SAICM is a policy framework for international action to advance the sound management of chemicals, adopted by the International Conference on Chemicals Management (ICCM) on 6 Febru-

ary 2006 in Dubai, United Arab Emirates. SAICM aims to encourage governments and other stakeholders to address chemical safety more effectively in all relevant sectors such as agriculture, environment, health, industry, and labour. The Strategic Approach will support the achievement of the goal agreed at the 2002 Johannesburg World Summit on Sustainable Development which ensures that, by the year 2020, chemicals will be produced and used in ways that minimize significant adverse impacts on the environment and human health. To this end, SAICM will promote capacity building for developing countries and countries with economies in transition and better co-ordination of international efforts to improve chemicals management. For additional information on SAICM, please visit Internet pages: www.chem.unep.ch/saicm

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World AIDS Day 2006

GENEVA (ILO News)

According to the new ILO Report released on 1st December "HIV/AIDS and work: global estimates, impact on children and youth, and response 2006" (1) an estimated 36.3 million persons of working age are now living with HIV/AIDS – the vast majority in sub-Saharan Africa.

The report also says that the epidemic is causing a reduction in employment growth resulting in 1 million fewer jobs per year in the worst-hit countries, compared to what might have been in the absence of the HIV epidemic.

43 countries heavily affected by HIV/AIDS lost on average 0.5 percentage points in their rate of economic growth every year between 1992 and 2004 due to the epidemic, and as a result forfeited 0.3 percentage points in employment growth. Among them, 31 countries in sub-Saharan Africa lost 0.7 percentage points of their average annual rate of economic growth and forfeited 0.5 percentage points in employment growth. This produced a global employment shortfall of 1.3 million new jobs every year, of which 1.1 million were lost annually to sub-Saharan Africa.

In 2005, more than 3 million labour force participants worldwide were partially or fully unable to work because of illness due to AIDS. The new ILO report on HIV/AIDS and work (1) shows that both prevention and treatment could bring significant benefits to the global labour force and the economy, more particularly accessible and effective antiretroviral drug therapy (ARVs).

A recent study from Kenya (2) showed that providing antiretroviral drug (ARV) therapy resulted in a large and immediate increase in the number of people with HIV/AIDS who were able to continue working.

For more information, please contact the ILO Department of Communication, communication@ilo.org. Tel.: +4122/799-7062, or see the **ILO World AIDS Day site**: www.ilo.org/public/english/bureau/inf/event/aidsday06/index.htm

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Self-reporting of pesticide exposure and health effects among workers at a coffee estate

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Introduction

The exposure of farm workers to pesticides is a major concern for the population in agricultural communities worldwide (1,2,3). The situation is more serious in developing countries where huge quantities of pesticides are used under relatively unsafe conditions. The Tanzanian economy is largely dependent on agriculture, and the use of pesticides for pest control is widespread. Approximately 85% of the Tanzanian population lives in rural areas and is involved in agriculture, with people working on their private farms or employed by big estates.

Coffee production is of primary importance to the economy of Tanzania and is mostly concentrated in Kilimanjaro, North Tanzania; Arusha, Manyara; the western part of the Lake Victoria and Kagera Region; and also in the southern highlands, including some parts of Iringa and Ruvuma. Coffee production consumes high quantities of pesticides, mainly insecticides, fungicides and herbicides. A number of pesticide products are registered for coffee in Tanzania, including Bravo 500 (Chlorothalonil), Thionex 35EC (Endosulfan), Sumithion 50EC (Fenitrothion), Selecron 720EC (Profenofos), Dursban 4E (Chlorpyrifos) and many others (4).

While it is widely recognized that the extensive use of pesticides causes serious public health and environmental problems, it is not possible to state the number of people affected by pesticides use. Three decades ago, WHO estimated that there are three million cases of severe pesticide poisoning, with a total of 220,000 deaths each year (5,6). A survey of self-reported pesticide poisoning conducted in four Asian countries estimated that if all levels of severity were

included, 3% of agricultural workers in developing countries – or approximately 25 million people – suffer each year from pesticide poisoning (5).

Pesticide exposure is the main source of health injuries among farmers worldwide. Major pesticide poisonings among farm workers are fairly well characterized, but the health effects of routine exposure to low levels are uncertain (6). The primary route of farm workers' pesticides exposure is the skin, an exception being fumigants which are in the form of gases (7). Workers who mix, load and apply pesticides are extensively exposed especially if they are not well protected. Many workers are exposed particularly through the use of ground backpack spray equipment (7). Field workers involved in field surveys or harvesting are also exposed to pesticides, primarily either through the leafy

surface or from pesticide on the crop.

A study done in Costa Rica indicated that 97% of all poisoning cases recorded in 1980–1986 among the wage-earning labour force occurred among workers employed in agriculture-related jobs (annual rate of 15 per 1,000 workers) (8).

This study evaluates pesticide handling practices and health injuries from pesticides handling on the basis of self-reporting by the farm workers of a coffee estate in Northern Tanzania.

How was the study carried out?

The study was conducted at the Tropical Pesticides Research Institute (TPRI), Arusha in March and June 2006. Data were collected using a semi-structured questionnaire designed for self-report-

Table 1. Products used and spray frequency (n=35)

Active ingredient suspected to have caused poisoning	Group*	WHO Class	Frequency	%
Chlorpyrifos	OP	II	7	20
Glyphosate	OT	IV	6	17
Profenofos	PY	II	5	14
Copper	IN	III	4	11
Deltamethrin	PY	II	2	8.5
Diazinon	OP	II	3	8.5
Chlorothalonil	OT	IV	2	5.7
Cypermethrin	OP	II	2	5.7
Cyproconazole	OT	IV	1	2.8
Dimethoate	OP	II	1	2.8
Lambda Cyhalothrin	PY	II	1	2.8

(Key: WHO Class I (Extremely hazardous) II (Highly hazardous) III (Hazardous) IV (Unlikely to cause hazards)

*(OP: Organophosphates OC: Organochlorines IN: Inorganic OT: Others)

ing of pesticide handling and health effects. The information collected included personal details, the level of education, smoking/drinking habits, events involving poisoning, signs and symptoms of poisoning, the personal protective equipment (PPE) used and their maintenance, consideration of hygiene conditions during handling, farmers' knowledge on exposure to pesticides, types of pesticides handled, storage conditions, and disposal options for unwanted pesticides and empty pesticides containers. The workers were questioned and the data filled in by the principal investigator and assistants experienced in interviewing.

The data were coded, entered into a computer and analysed using Microsoft Access and Excel. The frequencies and proportions were calculated.

Results

The study involved farm workers working as sprayers, mixers or storekeepers in different sections of a coffee estate. The number of persons interviewed was 33.

The majority of workers (over 95%) were sprayers; there were also a few storekeepers and pesticides mixers. The respondents ranged in age between 19 and 51 years; 91% of them were males in the age group 21–40 years. The workers' education level ranged from adult education to a diploma. Among the 33 respondents, 26 (79%) were smokers and slightly more than half (55%) reported the use of alcohol.

Sixty-eight percent of the workers reported having been poisoned by pesticides in their lifetime. The poisoning frequency ranged from once to three times or more, with the majority (39%) having experienced poisoning three times or more. The poisoning symptoms most commonly reported were runny nose (60%), dizziness (57%), skin irritation (57%), chest pain (51%), coughing (51%), eye irritation (51%), headache (48%), high fever (48%) and throat irritation (45%).

The major active ingredients reported to be associated with events of poisoning were chlorpyrifos (20%), glyphosate (17%), profenofos (14%) and copper (11%). Out of the 28 poisoned workers, only 32% had gone to the hospital while 14% did nothing.

The PPE mostly used included overalls (reported by 96% of the respondents), gloves (96%), a mask (93%), and boots (90%).

Sixty eight percent of the respondents reported that they sprayed pesticides every day.

Table 2. Disposal of spray solution and empty pesticides containers

Spray disposal (n=14)		
In the farm	7	50%
Unknown	4	29%
Re spray on crop	2	14%
In a hole	1	7%
Empty pesticides containers disposal (n=23)		
Burn	16	69%
Bury in the soil	6	26%
Store for keeping pesticides	1	4%
Source of information		
Technical supervisor	27	81%
Label	7	21%
Unknown	2	6%

One out of five respondents (21%) reported that the equipment had been calibrated while the rest said that they were not calibrated. The reported area where spraying equipment was washed was "on the farm" (22 respondents) and "close to the water tap" (6 respondents).

Disposal of the remaining spray solution was done through dumping on the farm (50%) or re-spraying on the crop (14%) as well as dumping into a hole (7%). The empty pesticides containers were disposed of by burning (69%), burial in the soil (26%) or by setting them aside for future use to keep pesticides (4%).

The respondents reported that in most cases (80%) they got information regarding safe handling and use of pesticides from their technical supervisors (81%) or by reading pesticide labels (20%).

Discussion

Among 33 respondents, 90% were males, indicating that men are relatively more directly exposed to pesticides than women. The finding that women are less involved in pesticides application seems to agree with studies conducted in South Africa (9) and Costa Rica (10). On the other hand, studies conducted in Kenya (11) and South Africa (12,13) reported that women are more involved in pesticides application than men. Interventions targeted only at men might sideline women unnecessarily.

Despite the fact that the study showed the supply and distribution of PPE to be high, so that over 90% of the respondents reported having overalls, a mask, gloves and boots, many health complaints were reported. The actual use and maintenance of these PPEs are not known. Similar studies conducted in

developing countries around the world reveal low use of PPE (10).

The disposal of both empty pesticides containers and remaining spray solution was found to be another significant source of exposure in this study. The results indicate that workers appear to have no single consistent disposal method. Since all the respondents are from the same farm and they reported different disposal options, and since about 30% of them do not know how disposal is done, it appears that the farm is lacking sound disposal options for unwanted pesticides and empty pesticide containers. In consequence, the workers opt for hazardous disposal methods resulting in high human exposure to pesticides.

Reuse of empty pesticide containers for keeping pesticides, reported by 4% of the farm workers, implies that in some cases pesticides are not supplied in their original containers. Owing to this practice, users often fail to get the basic handling precautions which are displayed on pesticide labels. This situation might be the reason why only 21% of the respondents got pesticides information through labels (see Table 2 above).

Health services on the farm appear to be limited. Only a few of the workers who were poisoned went to hospitals or other health facilities. The farm seems to have no regular medical examination programme that would screen the workers for adverse effects stemming from pesticide exposure. Again, some farm workers were not aware of the implications of the health effects that pesticides may cause, and that is why they do not seem to take appropriate actions such as going to hospital immediately when they are poisoned. The low level of awareness about the health effects of

pesticides is corroborated by the fact that 85% of the respondents have never attended relevant training programmes on pesticides.

The products reported to be associated with poisoning included organophosphates, which accounted for 35% of all reported products. WHO Class II products accounted for 57% of all products reported. This high proportion of cholinesterase inhibiting and hazardous products appears to be consistent with the highly frequent symptoms of poisoning by organophosphates reported in this study. This is also supported by the fact that organophosphate products are the most commonly used products in Tanzania compared to other pesticide categories, and organophosphates are responsible for most of the poisoning cases (14).

Spraying operations on the farm are another important hazard from the perspective of personal health. The study revealed that 68% of workers sprayed pesticides every day. Of much concern is the fact that spraying continues until the afternoon, when there is a strong wind and sunshine – conditions that are not appropriate for safe spraying. This results in high exposure of the sprayer and pollution of the environment as well as in economic loss, incurred when the strong wind may cause the chemical to go off target.

The last significant finding of this study is that most of the farm workers reported poor hygiene practices. They wash their working clothes only at the end of the week and they take a bath in the evening when they return home. This indicates a possible serious pesticide exposure since most often the clothes and their bodies are contaminated after spraying. Washing working clothes once per week and taking a bath in the evening gives the pesticides enough time to be absorbed in the body through the skin. This implies a high level of human exposure and is consistent with the health effects reported. Furthermore, since the clothes are washed at home, probably by wives or children and most often mixed with other clothes, there is a high chance that family members not involved in the application of pesticides are indirectly exposed.

The situation regarding pesticides handling and the health effects caused by pesticides as reported by workers at this farm appears to be a representative of similar farms in Arusha and probably throughout Tanzania. A previous study by AVF. Ngowi conducted in coffee farms in 2001 reported a more or less similar situation. Correspondingly, stud-

ies conducted elsewhere in developing countries, e.g. in Kenya, have reported similar observations regarding pesticides handling and health effects (11,15).

Conclusion

This study reveals serious deficiencies which need to be addressed in order to reduce workers' health risks. These include an overly high frequency of spraying per worker, spraying at an undesirable time of the day, lack of programmes for examining workers for biomarkers of pesticides exposure, lack of treatment for workers poisoned by pesticides, poor disposal options and lack of training among workers. There is therefore a need to:

- organize workers' training programmes on appropriate handling and use of pesticides (in collaboration with TPRI)
- reorganize the spraying schedules in order to avoid overly high exposure among specific workers
- sensitize farm owners and supervisors to conduct spraying at times of the day recommended for proper and effective spraying
- establish a regular medical examination programme for assessing workers' health and determine biomarkers to guard against overexposures to pesticides
- improve treatment for workers, particularly those who, in spite of preventive measures, are poisoned by pesticides
- establish an environmentally sound disposal facility on the farm for both unwanted pesticides and empty pesticide containers
- provide recommended PPEs for the workers and train them in their use
- advise workers to observe hygiene principles, e.g. always to wash their bodies and PPE after pesticide spraying
- provide washing facilities for farm workers at the workplace.

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Action on silica, silicosis and tuberculosis. A project of Work and Health in Southern Africa (WAHSA)

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Introduction

Work and Health in Southern Africa (WAHSA)

WAHSA is a bi-regional programme on workers' health and safety with long-term goals to contribute to the reduction of poverty and promotion of human rights in Southern Africa, through improvements to occupational health and safety and the empowerment of the region's workers.

WAHSA was founded by a partnership between the Swedish National Institute for Working Life (NIWL), the Swedish National Institute for Public Health (NIPH) and the South African National Institute for Occupational Health (NIOH), and is in its first of three 4-year phases, funded by Sida (the Swedish International Development Cooperation Agency). Many southern African agencies and institutions are partners in WAHSA projects.

The 10 WAHSA projects of Phase 1 are concerned with gathering information on health and safety in the region; the development of a regional strategy on the training of health and safety professionals; advocacy of the importance of workers' health and safety in the region and the reduction of the impact of three common and important occupational health issues in southern Africa, namely silica and silica-associated tuberculosis; pesticide exposure; and work in the informal sector.

Project 7: action on silica, silicosis and tuberculosis

Silica, almost always in the form of quartz, is very common in the earth's crust so whenever the surface of the earth is worked and fine dust is generated, for example in mining, or when sand, stones or rocks are drilled, moved, crushed or processed, potentially hazardous exposure may occur. Silicosis,

the scarring of the lung due to silica dust, is well known; but other diseases including lung cancer and tuberculosis are also associated with exposure to silica.

As reported in Occupational Health Southern Africa (1): "A powerful case can be made for substantial efforts to eliminate silicosis in southern Africa: (A) dust control is inadequate in both mining and non-mining sectors (2,3,4); (B) there is a large burden of undetected lung disease in former silica-exposed miners now living in labour-sending areas (5,6); (C) silicosis is common in industrial workers (2,3) and in gold miners (7,8,9) and the attendant tuberculosis risk is high (10,7,11); and (D) fairly recent research has found that silica dust, independent of silicosis, increases the risk of tuberculosis (12), and that this risk is compounded in HIV-infected workers (13)." Also, small-scale mining, common in the region, has been shown to produce high levels of silica exposure when mining at least one type of material (14).

It is the association between silica exposure and tuberculosis that makes silica control in the region urgent; this is a part of the world facing a disastrous combined epidemic of tuberculosis and HIV infection. Hence Project 7 of WAHSA: Action on Silica, silicosis and tuberculosis. The main goals of this project are the reduction of silica dust exposure in key industries; and improved prevention of tuberculosis in silica-exposed workers.

To achieve these goals, activities are designed to:

1. support the co-ordination of country-specific silicosis elimination programmes in the region
2. improve dust measurement and control capacity in inspectorates
3. improve managers', workers' and practitioners' awareness and knowledge of silica exposure and control,

and the diseases associated with over-exposure

4. develop practical solutions for dust control in quarries and to disseminate these solutions
5. provide expert-group recommendations on chemoprophylaxis in silica-exposed workers; an appropriate occupational exposure limit for quartz; and case-findings and surveillance of silicosis.

WAHSA is in a position to ensure that Project 7 recommendations reach policy-making forums.

The first two years

WAHSA's Project 7 was launched in October 2004

An important preliminary task was to establish a network of collaborating partners. The NIOH and the University of the Witwatersrand, South Africa, the Occupational Health Management Board (OHMB), Zambia, and the Centre for Industrial Studies, Safety and Environment (CEISA), Eduardo Mondlane University, Mozambique, are the main institutional partners of Project 7, but many individuals have also contributed in this early period. Table 1 lists a number of resources produced in these first two years that are available to the region. Appendix 1 provides the contact details for obtaining them.

Supporting the coordination of country-specific silicosis elimination programmes in the region

The International Labour Organisation (ILO) and the World Health Organization (WHO) promote the development and implementation of national programmes for the elimination of silicosis (15). There is no database of these programmes in Southern Africa and no co-ordination of the elements that cross national borders – training and silicosis



Photo 1. Dust in a quarry during loading.

in migrant miners would be examples. To support future co-ordination, information on the programmes and the individuals driving them were collected through a questionnaire survey carried out by the OHMB. Not surprisingly, elimination programmes are sparse and incompletely developed. A regional workshop to promote the development and implementation of programmes was recommended.

Improving dust measurement and control capacity in inspectorates

Clearly the occupational health and safety inspectorates have a central role in ensuring that sources of silica dust exposure are identified and controlled. The capacity for them to do this is, however, limited, hence this activity to improve knowledge and confidence in the inspectorates. A course for occupational health and safety inspectors on dust measurement and control has been developed and presented in Zambia and Mozambique. The curriculum, with exercises and field work is available on request.

Improving managers', workers' and practitioners' awareness and knowledge of the importance of silica exposure, control and the diseases associated with over-exposure

Individual enterprises have the responsibility and often the basic tools to control dust. Awareness and knowledge are first steps on the road to control. Region-appropriate information packages for workers, managers and practitioners

– including occupational hygienists, nurses and doctors – are required. Those for practitioners have been completed and are described in Table 1. The packages for workers and managers will be informed by research sponsored by the South African Mine Health and Safety Council.

Developing practical solutions for dust control in quarries and disseminating these solutions

Quarries are common and operate in all countries of the region. Many generate large quantities of dust, not infrequently rich in silica. They are often in areas distant from towns and a reliable water supply, and many are unable to afford expensive dust control methods due to poor resources. Protecting workers in these settings is challenging and practicable dust control solutions need to be identified, the costs estimated, and tested and popularized. These are the aims of this part of Project 7.

Steps one to three of this activity as listed below have been carried out in the first two years and the rest are planned for the two subsequent years. The quarries are in Lesotho, Mozambique and Zambia. A manual "Control of dust in resource poor quarries in Southern Africa" is available.

1. Identify the sites (criteria for selection includes local institutional support)
2. Constitute an expert team to perform a risk assessment and plan practical solutions, consisting of local practitioners and local university departments. The team should

include technical people who can build the solutions on-site using local materials, preferably mostly what is already used on site or available in the local town.

3. Negotiate a long-term agreement with management
4. Measure dust and quartz levels
5. Build solutions on-site
6. Re-measure dust
7. Design a maintenance plan
8. Identify deficiencies and fix them
9. Identify maintenance difficulties
10. Re-measure dust and quartz levels
11. Find cost solutions and calculate operational costs (e.g. maintenance)
12. Write up the report
13. Disseminate widely in the quarry industry.

The next two years

Besides the ongoing activities on information packages and practical solutions for dust control in quarries, the major additional activity is to contribute to policy formulation on chemoprophylaxis in silica-exposed workers; an appropriate occupational exposure limit for quartz; and surveillance of silicosis. The method will be to constitute expert group meetings of regional participants and formulate a set of evidence-based recommendations on each topic. Interested potential participants should contact David Rees (Appendix 1).

Chemoprophylaxis in silica-exposed workers

Prevention of tuberculosis by treatment with anti-tuberculosis medication in high risk individuals is well established (16) but there are many regional-specific uncertainties. Among them is who to treat – for example how much silica dust constitutes a high risk to an individual; how to manage "indolent" tuberculosis (17); and issues related to treatment adherence.

An appropriate regional occupational exposure limit for quartz

A typical occupational exposure limit (OEL) for respirable quartz is 0.1 mg/m³. But there is increasing evidence that this limit is not protective against silicosis. South African gold mine data has been used to support this contention (9). Although a case can be made for lowering the respirable quartz OEL, the region has isolated capacity to reliably measure quartz even at 0.1 mg/m³, and many enterprises have yet to achieve this level of control. What will be gained by introducing an OEL that cannot be assessed?

Also important is that OELs should

be protective against all the major health effects of an agent. Tuberculosis is a major concern following silica exposure, yet the current OELs for quartz do not address this health outcome and so are only partially satisfactory at best.

These matters and others will be the topics of the expert group meeting.

Surveillance of silicosis

Surveillance is necessary to identify problem worksites for targeted action and to monitor the progress of elimination of silica-associated diseases. The nature of these programmes in a region with poor resources needs attention.

Conclusion and acknowledgements

The Project 7 goals to reduce silica dust exposure in key industries and to improve prevention of tuberculosis in silica-exposed workers are ambitious, but given their importance, understandably so. They will not be attained without the continued support of many agencies and individuals both regionally and internationally.

WAHSA owes its existence, to a very large extent, to the wisdom and determination of Kaj Elstrand and Christer Hogstedt. The Swedish International Cooperation and Development Agency, Sida, has been a reliable and supportive funder. The Swedish national institutes NIWL and NIPH have provided skills, support and encouragement. Nils Petersson, the Swedish programme manager in the NIWL has been tireless and forceful in ensuring WAHSA activities.

Appendix 1. WAHSA and Project 7 contact details

General information on WAHSA
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Table 1. Resources available to southern Africans involved in silica control or the health effects of silica exposure

Name of resource	Description of resource	Comment
Silicosis Prevention Information Resource	South African Mining Industry Best Practice on the Prevention of Silicosis. CDs of information materials on silica and silicosis and dust control. DVDs with videos on silicosis and dust control.	A product of the South African Mine Health and Safety council, and reproduced and distributed in the region by WAHSA. Compiled by David Stanton.
Curriculum for dust course for inspectors	3-day course with theory, practical exercises and field work.	Developed by Linda Grainger
Crystalline Silica Health Hazard and Precautions	A guide for doctors and nurses.	
Control of Dust in Resource Poor Quarries in Southern Africa	Handbook on silica associated health issues and dust control. Resources in the region listed. Main target quarry managers.	Comments welcome from quarry managers and health and safety practitioners. Available from Andrew Swanepoel – see Appendix.

Integrated Occupational Health Service: A survey of needs in Dar es Salaam, Tanzania

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Introduction

A healthy workforce is paramount for the continuation of the favourable economic and social development seen in many African countries. In the case of Tanzania, the annual growth of the GDP, which reached 6.7% in 2004 (1), is partly related to the development of industry, trade and transport in the greater Dar es Salaam area. Despite these achievements the majority of Tanzanians, including those in formal employment, still have low wages and low purchasing capacity. At the same time, they have to cope with supporting their usually large African families in which the HIV/TB epidemic has contributed to the morbidity pattern.

Consequent to awareness of this combination of poverty and ill health in many families, employers in the formal sector frequently provide free or subsidized health care for their employees and often additionally for family members. They also understand that long waiting hours and a severe shortage of drugs in the public health care system may influence the individual employees, as well as the enterprises, in terms of sickness absence and reduced productivity. In order to improve health care services, larger enterprises may establish an in-house dispensary and employ their own health care staff. Most small and medium-sized enterprises, however, are likely to purchase health care from private providers either directly or through insurance.

In addition to the provision of health care, many contemporary enterprises engage in preventive *occupational health and safety* (OH&S) issues. Preventive OH&S standards on a high and

international level constitute part of the corporate policy for most multinational companies. Now it is widely realized that a healthy and safe work environment is a prerequisite for healthy and safe workers but is also beneficial to productivity and marketing. In Tanzania, the increasing interest in OH&S is supported by national policies resulting in a strengthened inspection system and the recent introduction of a comprehensive OH&S Act (2).

According to the WHO Health for All principle, the ILO Conventions on Occupational Safety and Health (No. 155) and Occupational Health Services (No. 161), and the WHO Global Strategy on Occupational Health for All (3), every worker has the right of access to occupational health services, irrespective of the sector of economy, size of company, or type of assignment and occupation. The integration of curative and preventive primary health services including occupational health has been promoted worldwide since the Alma-Ata meeting in 1978. With *integrated occupational health services* (IOHS), the provision of health care close to the worker permits the identification of adverse health risks consequent to work and environment which would otherwise be neglected. Consequently, remedial preventive action against these risk factors may be taken, when applicable. The treatment of workers suffering from acute and chronic health conditions may often be integrated with individually targeted prevention at the worksite. This may be accomplished by providing appropriate work tasks and by reducing potentially harmful exposures to match the individual's vulnerability. Consequently, the worker can remain active and produc-

tive during treatment which represents an advantage not only to the individual worker and his/her family but also to the employer.

These considerations are paramount for the management of a number of work-related disorders, e.g. occupational asthma and upper limb diseases, but may also apply for many conditions that are not caused by but may be precipitated by adverse work exposures.

Regardless of the potential advantages, IOHS are rarely executed worldwide; this also applies in Tanzania. Despite the updating of policies in Tanzania, there is still a weak collaboration between sectors (4), including primary health and occupational health.

Background and aims

In addition to the economic transition and new OH&S legislation in Tanzania, the large-scale establishment of new and mostly foreign or multinational companies, as well as consolidation and expansion of existing enterprises have resulted in the demand for more and better OH&S services. To cope with this new situation, *Tanzania Occupational Health Services* (TOHS) – which has provided IOHS for Tanzanian enterprises since 1967 – has developed its capacity and resources, placing a high priority on preventive OH&S. In order further to expand the total competence, a strategic alliance was formed with *Tanzania Industrial Research and Development Organization* (TIRDO), which has a solid experience in specific fields of preventive OH&S, e.g. assessment of physical and chemical exposures and advice with regard to remedial action. This combination of medical and technical expertise was further

supported by the establishment of a partnership with a Danish consortium led by an Occupational Health Service (Jobliv Danmark) and encompassing a research institution (TeamArbejdsliv) and a hospital-based facility of clinical occupational medicine (Dept. of Occupational Medicine, Sydvestjysk Sygehus Esbjerg).

Considering the anticipated needs of enterprises, the partners developed a number of service packages relating to various aspects of IOHS (Table 1). As a part of the DANIDA support (DANIDA Private Sector Development Programme) to the development of occupational health in Tanzania, this study aimed to ascertain the market for IOHS among commercial and industrial enterprises in Dar es Salaam.

Material

68 out of 106 randomly sampled formal sector enterprises in Dar es Salaam re-

sponded positively and were enrolled in the study. They employed a total/mean of 34,225/503 workers (Table 2 on next page). Out of 16 current TOHS members, four enterprises were serviced by TOHS through a prepaid health care scheme and five through an insurance provider.

The responding/non-responding enterprises were of similar size, trade (manufacturing 54/53%, service 42/43% and transportation 4/4%), and ownership (Indian 33/37%, indigenous and shared 33/25%, multinationals 10/10%, government/parastatals 12/16%, South African 13/12%), indicating that the sampling was representative. Geographically, industrial and commercial areas were covered, with most of the interviewed enterprises located appropriately close to TOHS.

Methods

Following an appointment made by tel-

ephone in June 2005, an executive officer (general or human resource manager, director) in the responding enterprise was interviewed by TOHS/TIRDO staff, on the basis of an elaborated interview guide. During the first week, all interviewers worked together so that they would reach the same way of presenting the packages and performing the interviews. Subsequently, each interviewer worked independently. An oral presentation of each service package was followed by the handing-out of pamphlets describing its content. Provisions of the new Tanzanian OH&S Act were referred to when relevant and unknown to the interviewed person. Information was collected on currently and previously acquired services, by whom, the preferred modalities and methods of payment, as well as motivating factors and incentives for the enterprise to procure the packages. In addition, the interviewers inquired about the perceived

Table 1. Services currently offered within the proposed packages, showing the current provider, the preferred modalities, the motivating factors and the perceived relevance and wish to procure among the surveyed enterprises

Package	Current/previous experience %	Providing institutions	%	Preferred modality	%	Motivating factors/incentives	%	Found relevant, %	Wish to procure %
Curative services	97	Private health care Public health care TOHS	78	Prepaid	57	Cost effective	71	81	69
			44	Credit scheme	21	Variety of service	66		
			12	Specific services	16	Skilled personnel	50		
				Cash sales	9	Less waiting time	46		
Preventive OHS	66	OSHA Ministry of Health Local Government		Regular visits	85	Essential for productivity	81	88 (expected to increase by 62)	53
				Information leaflets	43	Visit from OSHA	34		
				Specific consultations	10	Legislation awareness	32		
				Contact when needed	4	Part of company policy	18		
				Regular phone contacts	2	An accident happening	7		
				Introduction of new services	2	Workers demand	4		
				Other	6	Customer's demand	1		
Health examinations	95	OSHA Local Government Private consultants TOHS	54	As demanded by the law	A legal demand Make it more preventive than business	81	68		
			49						
			9						
Training on OHS	50	OSHA TOHS		When needed		90	74		
First aid services	69 12 18	TOHS Private shops		According to legislation		96	49		
			-Sufficient						
			-Insufficient						
Risk assessment, workplace surveillance, assistance to low cost solutions	43 10	Company staff OSHA Private consultant	15	According to legislation	A legal demand	88	53		
			38						
			21						
Health promotion	34	Company efforts				88	54		
Personal protective equipment	33	Private shops			A legal demand	77	77		

Abbreviations: see the text.

Table 2. Size of enterprises with regard to the number of employees

Size	Number in the surveys
<25	3
25–49	5
50–99	18
100–249	18
250–499	12
500–999	5
1000 or more	7

relevance of the packages and the readiness to procure them. The collected data were entered into a database, and the market potentials for services were analysed by exploring OH&S experiences and comparing them against the expressed intentions.

Results

The service packages were appreciated by most respondents. Table 1 summarizes the main findings on previous page.

Current services

The level and quality of services with regard to various aspects of OH&S differed between the enterprises, but most had previous experiences of OH&S (Figure 1 below). Curative health care and health examinations were provided by almost all and first aid services by the majority. Only 5% had no such experiences. Enterprises with in-house dispensaries expressed interest in the option for affordable extra services (laboratory, physiotherapy and other specialized services) from clinics such as TOHS.

Preventive OH&S services were often inadequate. They were often limited to health examinations of workers, which was much more in compliance with legal stipulations than other preventive OH&S services, which are also mandatory by law. In many enterprises, failure to meet obligations with regard to other preventive services was mainly due to a

lack of knowledge or misunderstandings relating to the existence and availability of service-providers.

66% of enterprises considered the information they have received from legal authorities as insufficient. The mandatory legislative provisions to set up a safety committee and to appoint a safety officer were adhered to by a quarter of the enterprises, thus leaving many possibilities for improvements (Figure 2). Half of the surveyed enterprises offered OH&S-training to officers and workers and performed regular risk assessments.

Insufficient provisions were reported for first aid. The least offered services were *personal protective equipments* (PPE) and workplace health promotion, which were practised by less than a third of the respondents.

Prior and current service-providers

Curative services were predominantly offered by private health care providers. Some companies used their own staff for workplace assessments but prior consultancies with regard to preventive OH&S were common and mainly provided from public authorities, such as the Occupational Health and Safety Agency (OSHA), local governments, or the Ministry of Health. 54% of the enterprises had received external assistance to improve OH&S conditions while 37% had not had such assistance. Risk assessment and workplace surveillance are other compulsory legislative provisions, but still conducted by only half of enterprises. It mostly involved company staff; assistance from OSHA or other external consultants was less frequent. Some enterprises used risk assessments as an ad hoc measure only — this was typically related to an unwanted event. The quality of risk assessment and training was not investigated but would be important to document. Health examinations were mainly conducted by OSHA, local governments, and private

health facilities. According to the enterprises, the preventive scope was missed and the examinations were seen rather as income-generating activities. TOHS had provided about one out of ten enterprises with curative services and health examinations, and still fewer with training and first aid services.

Preferred services and payment modalities

Compatibility with preset budgets was a major determinant for most enterprises. Consequently, a prepaid scheme for curative services of a fixed annual amount for each worker was preferred. Second was a credit scheme. For the other specific services, enterprises prefer to follow the legal requirements in terms of frequency and coverage. 62% of respondents expected increased future needs for external OH&S service, and preferred regular visits of an external provider. It is noteworthy that health insurance schemes that are currently widely promoted by foreign companies entering the Tanzanian market were not perceived as attractive. Due to mixed experiences with these still relatively new structures (medical insurance companies), the enterprises preferred to avoid a fixed relation between the insurance company and the health care provider and rather to permit workers and/or the enterprise a choice of health care facility.

Relevance of the packages according to enterprise needs

Almost all surveyed enterprises regarded the packages as relevant and adequate for their needs. The first aid package ranked first; followed by preventive OH&S. Training, risk assessments and low cost solutions, and health promotion ranked third. Curative services and health examinations ranked fourth. The need for preventive OH&S was expected to increase by 62% of the enterprises.

Only 33% of enterprises provided

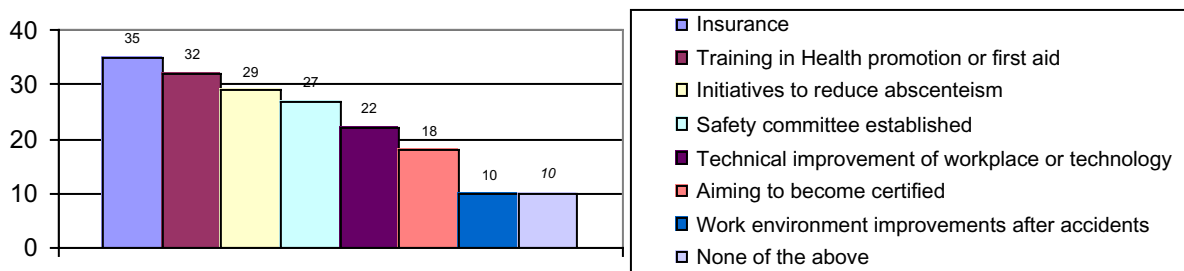


Figure 1. Important experiences with regard to occupational health and safety (%)

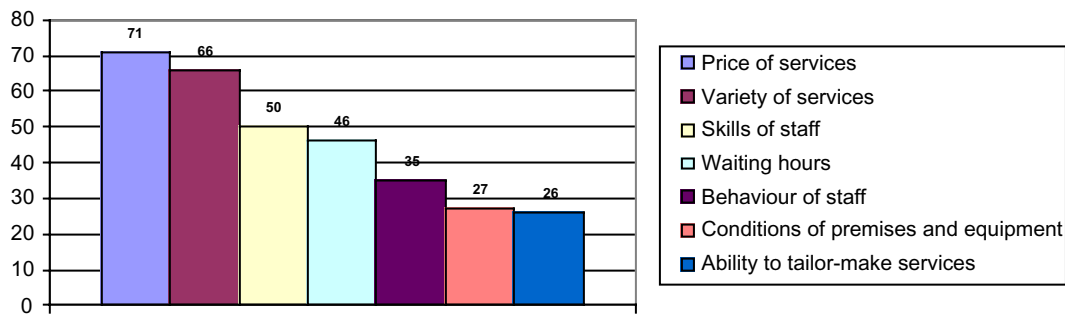


Figure 2. List of priorities in the assessment of an occupational health and safety provider

PPE to their workers, with uniforms accounting for 71%, gloves 69%, masks 57%, boots 57%, helmets 25% and hearing protection 15%. 56% of respondents perceive these devices to be easily accessible and 49% perceived their quality as satisfactory. According to visits by TOHS/TIRDO and the partners in various PPE shops in Dar es Salaam, however, the last mentioned appeared to be a misconception. 77% of the respondents found sales of PPE's and advice relating to their appropriate selection and use relevant and needed.

In spite of a sufficient amount of first aid boxes in most enterprises, the sub-standard nature of boxes and the common absence of trained first aid staff leave many possibilities for improvements. About half of the enterprises visited would consider buying first aid boxes and training.

What wishes were expressed for procuring the packages?

There was a high wish for procuring the packages. The likelihood of actually doing so would depend on a number of factors, including their quality and legislative obligations. The training package was the most attractive, and four new training appointments were made during data collection. The enterprises would like to carry on with health examinations but expected the examination to have a better preventive impact when conducted according to the con-

tent of the service package. Health promotion – especially on HIV, risk assessment, workplace surveillance and low-cost solutions were perceived as relevant by 88% of respondents but only half were likely to procure them. First aid services scored least, probably because this was perceived by many as well established already.

An increased interest in procuring the packages was expected with better facilities and their maintenance, service, computerized files and bills, nice fliers and brochures, adequate logistics and with improved dissemination of information about the service packages. Other requested qualities included short waiting hours, adequate location, content and reliability of services provided, staff professionalism and standards with regard to ethical conduct of health care. The last-mentioned means that medical staff would not, e.g. hide medical costs or grant excessive sick leave rendering employees unproductive unnecessarily. 29% suggested a more aggressive promotion of services, 13% advised a further concentration on OH&S services, and 6% wanted improved facilities and services. 15% requested better customer care by regular visits to enterprises.

Discussion

We have shown that enterprises experience both curative and preventive OH&S as important. Curative services, which are offered by most enterprises,

are seen as a fair contribution to the health and well-being of employees and their dependants. Although private health care may affect sustainability and cause inequity and increased costs, these side effects are not necessarily inherent. It has been shown that a private health care expenditure of USD 3–6/year for each subject in a developing country may well be cost-effective and may rapidly improve health (5) while reducing loads on public health care.

The influence of workers' health and safety on productivity and quality was largely appreciated by the respondents but preventive OH&S were less emphasized. This was not due to neglect; instead, external consultancies were largely perceived as unavailable and non-existent in Tanzania, as most private health care providers do not include preventive OH&S in their services. This was also apparent from the fact that international enterprises tended to deploy preventive OH&S from their mother companies abroad instead of seeking local assistance. In contrast to curative services, the competition for preventive OH&S was weak, less prioritized and unsystematically applied in spite of the great need. The widely practised statutory medical examinations were the most common preventive OH&S. As currently applied, they were costly to conduct and missed their preventive scope.

The increased awareness of OH&S is

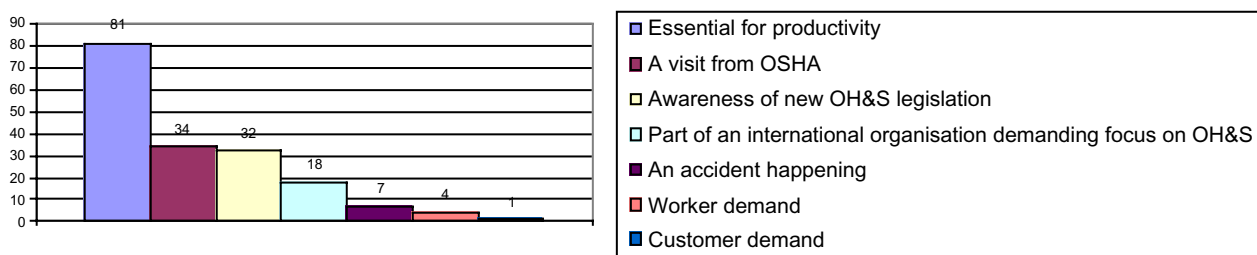


Figure 3. Perceived incentives for improving occupational health and safety (%)

evidenced by the substantial proportion (more than one out of four) of enterprises with an established safety committee. Widespread expressed needs for risk assessment, workplace surveillance, and OH&S training were also evident and indicated market potential. Most enterprises regarded OSHA as the main actor in the field to be currently overwhelmed and therefore requested consultancies from others. The new OH&S Act, governmental support (e.g. a visit from OSHA) and the establishment of a link – possibly through an external OH&S provider – between enterprises and OSHA would facilitate further development of preventive OH&S.

There is a growing demand for various aspects of certification, including accreditation of environmental aspects. Owing to the present lack of Tanzanian certifying bodies, these tasks are handled by foreign experts. Eventually, nationals will be appointed for certification as provided in the recent legislation. International and multinational enterprises currently need quality assurance of environmental matters the most, but globalization may result in many small and medium-sized enterprises following the same track. This will further increase the demand for expertise in certification, which would be an important task for an occupational health service.

Although IOHS was not a familiar concept, the combination of curative and preventive health was regarded as a major advantage. Adequately conducted, IOHS has a major potential for many preventive OH&S services, including health promotion relating to the HIV pandemic. Campaigns may also address additional public health issues, such as hand washing (6) or indoor air pollution from biomass combustion in homes (7), which has been documented to have a considerable influence on the health of children.

The success of IOHS would depend on public awareness of its existence and availability. Enterprise executives and other decision makers would be key persons. Not surprisingly, cost-effectiveness (competitive pricing and a transparent pricing system) was the major determinant for the potential readiness to purchase individual or combinations of packages for which flexible or differential prices would depend on needs and financial potentials. To match the requests and purchasing power of the Tanzanian industries, decisions to be taken should reflect the commitment by those involved (8).

Provision of IOHS in the desired qual-

ity and quantity would call for further promotion and capacity building and for continuous monitoring of the improvements attained in terms of development and marketing of services. Further increase in demand would result from improved facilities, streamlined administration, staff incentive packages and price levels adapted for competitiveness. The present involvement of external (including Danish) donors in the Tanzanian health care and business sector, including the OSHA, supports the aspirations of TOHS/TIRDO and the interviewed enterprises. A specific market for IOHS would be enterprises involved in the existing Private Sector Development Programme (cooperation between Tanzanian and Danish enterprises).

This study of the perceived needs for IOHS has demonstrated the elaborated service concept to present and potential future customers. There has been a positive feedback and many relevant proposals to act on. It has dealt with a sufficient number of representative enterprises in Dar es Salaam. The field work had no internal constraints but had appropriate support from DANIDA Private Sector Development Programme and the TOHS/TIRDO management with respect to manpower, transport, allowances, etc., all of which permitted the interviews to be conducted as planned. Externally, the fact that non-responders were encountered was attributed to constraints such as bureaucratic procedures inherent in some enterprises, e.g. the requirement of a formal written letter prior to an interview or executives with negative attitudes towards being interviewed. The results seem to permit further planning.

Acknowledgments

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Congresses

The 7th International Symposium on Biological Monitoring

Beijing China,
10–12 September 2007

The Scientific Committee on Occupational Toxicology (SCOT), the Scientific Committee on the Toxicology of Metals (SCTM) and the newly formed Scientific Committee on Rural Health: Agriculture, Pesticides and Organic Dusts (SCRH) of the International Commission on Occupational Health (ICOH), as well as the Peking University Health Science Center (PUHSC), China, will organize The 7th International Symposium on Biological Monitoring in Occupational and Environmental Health (ISBM2007) on 10–12 September 2007 in Beijing, China.

The chosen theme “Biological Monitoring in a Globalized World” is intended to reflect the fact that validated biological monitoring protocols can be used as a useful prevention tool in occupational and environmental health in any part of the world.

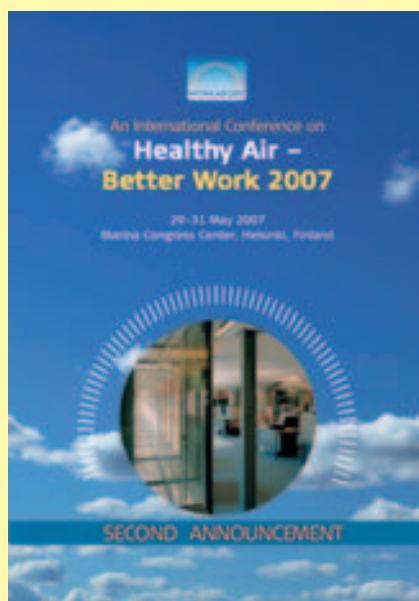
ISBM2007 has three main objectives that are to present and discuss the state of the art research and application in occupational and environmental health biomarkers and to improve the standardization of methodologies and the interpretation of biomonitoring results at the global level; to facilitate interaction and collaboration among eastern and western scientists and professionals working in the field of biological monitoring; and to strengthen the institutional collaboration among the three different ICOH Scientific Committees involved in biological monitoring research and practice.

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International Conference on Healthy Air – Better Work 2007

Helsinki, Finland
29–31 May 2007



WorkAir 2007 is the first international conference in which the quality of indoor air and the environment of occupational settings is the main focus. It is designed for professionals who operate in workplaces which are either planning indoor environment improvements or struggling with the problems. Its aim is to provide them with practical knowledge and tools for IEQ (indoor environment quality) problems. The Conference also highlights the newest and most advanced information on workplaces IEQ, and addresses special issues such as the reduction of occupational exposure to environmental tobacco smoke.

The scientific programme will consist of keynote lectures, and free oral and poster presentation. In addition, a special NIVA (Nordic Institute for Advanced Training in Occupational Health) Workshop will be arranged as a parallel session on 29 May 2007.

Main topics

- Identification and management of indoor environment problems at workplaces
- Good practices for solving indoor environment problems at workplaces
- Design and management of a good indoor environment at workplaces
- Work performance, productivity and indoor air
- Well-being and indoor environment at workplaces.

Abstracts

The **deadline for abstract submission is 15 February 2007**. Instructions for abstract submission will be found on the conference homepage at www.ttl.fi/workair2007 or in the Second Announcement, which can be ordered from the WorkAir Secretariat.

Organizers

The conference is organized by the Finnish Institute of Occupational Health (FIOH) and the Finnish Ministry of Social Affairs and Health, in collaboration with the Finnish Society of Indoor Air Quality and Climate.

The conference is sponsored by the Finnish Work Environment Fund.

More information on the conference can be found on the internet at www.ttl.fi/workair2007.

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