Invited Editorial

Occupational Hygiene in Africa

TON SPEE

International Occupational Hygiene Association past president

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In an editorial 6 years ago, Hans Kromhout (1999) commented on the scarcity of occupational hygiene publications, which took into account developing countries, and looked forward to the 4th International Occupational Hygiene Association (IOHA) Conference in Cairns, where their problems were to be a major theme. In September 2005, the 6th IOHA Conference became the first IOHA Conference to be held in Africa, after three conferences in Europe, one in Asia and one in Australia. The conference, at Pilanesberg, South Africa, was an excellent opportunity to raise the profile of occupational hygiene in the African continent.

I will not be the first to conclude that the level of occupational safety and health in Africa is low compared with the rest of the world. Generally the opinion is that in Sub-Saharan Africa public health problems are so massive that occupational health problems are subordinate to those like child mortality, malnutrition, water quality and AIDS. It is true that these factors are the main causes of the short life expectancy of the African population. But working conditions also influence the life expectancy. The Comparative Risk Assessment Collaborative Group has evaluated the causes of diseases and premature mortality due to a variety of hazards (Ezatti et al., 2002). Their studies reveal that in Africa, work-related factors cause twice as many lost years (expressed in disability adjusted life years, DALY) per thousand people as in Europe and North America.

CAUSES

It is easy to argue from my comfortable position in the Western world, but I prefer to quote some papers written on the spot to illustrate the situation in Sub-Saharan Africa.


‘The buildings are very old and do not fulfil acceptable safety and health standards. These buildings, for example, have poor lighting and ventilation, there are no emergency exit doors, the welfare and sanitary facilities, if any, are old or no longer in use and the machineries are outdated or improperly installed, unguarded and produce high noise levels’.

‘When Eritrea was under colonisation, technology was transferred from industrialized countries to Eritrea without any consideration for occupational safety, health and working conditions. Investors brought in technology based on economic or technical criteria only’.

As a consequence, 35 cases of death or permanent disability from occupational accidents and diseases have been reported in 2003 out of an industrial population of slightly over 8600 persons. This is 1 out of 250 employees in 1 year. The author considers it unlikely that all accidents have been reported, so the real figure may be even higher.


‘The main goal of the employee, or the would-be employee, is to get work and earn some money to feed his family for at least a day’.

‘The employer or his agent would claim that they are doing the employees (the casual labour) a big favour by giving them a job in the first place’.

‘The so-called “casual labour” is not supposed to use the first-aid materials. Immediately such a casual worker is hurt, he would be told by the employer to take his day’s due and go to the nearest dispensary, clinic or hospital and not come back to the workplace until he is fully recovered’.

An inspection of 120 workplaces including factories, warehouses, wood workshops and construction sites.
revealed that at 73% of all workplaces there was no or insufficient personal protective equipment. At 55% of the workplaces the working conditions were unsafe. At 65% of the workplaces there was a complete first-aid kit, but: ‘The employers would rather stock their first-aid boxes for ‘show’ to the officers of the Directorate of Occupational Health and safety than stock them for use by the many employees (the casual labour) in their establishments’.

These quotes illustrate informal labour and inadequate technology as important causes of bad working conditions. In addition, as addressed by Swuste and Eijkemans (2002), developed countries often transfer their polluting industries towards low-income countries. ‘Hazardous industries and chemicals are often quite wilfully exported to these low-income countries, due to the increasingly strict regulations with respect to environmental and occupational protection of the so-called established market economies’.

Furthermore, it is striking that, even when high-grade technology and education are available, Third World workers are predominantly in branches of industry associated with hazardous working conditions. Agriculture is an example. According to figures of the FAO, 67% of the working population in Sub-Saharan Africa worked in agriculture in 1997, compared with 8% in Europe (FAO, undated). Agriculture is hard and dangerous work. The Dutch government collects figures about occupational health and safety hazards in different branches of the Dutch industry. It appears that most health and safety hazards occur more frequently, and some even twice as frequently, compared with the average for the working population. The European Union reports that it imports a billion flower stems a year from Kenya. The European consumer prefers perfect blooms and leaves, so the producer must use pesticides.

Having addressed some causes of the unfavourable working conditions, and concentrating on the African situation, it may seem that these problems are exclusive for Africa. Of course, they are not. Two examples show how comparable working conditions problems over the world may be. One is about wood dust. We have studied exposure to wood dust among carpenters in the Dutch construction industry. In this branch of industry, control measures are rare. We found an average exposure of 3.3 mg m\(^{-3}\) (GM from 57 samples, GSD 1.9) (Spee et al., 2004). A study among small-scale wood industries in Tanzania yielded exactly the same average exposure: 3.3 mg m\(^{-3}\) (GM from 281 samples, GSD 2.5) (Rongo et al., 2004).

Asbestos is also an example. In the Netherlands, two former asbestos products factories gave away their asbestos waste for free for road surfacing. Currently, those roads are closed for all traffic pending decontamination. This situation, which would be more expected in a Third World country, illustrates how comparable exposure situations over the world may be and that exposure situations in developing countries are not necessarily very different from those in developed countries.

**ECONOMY**

The opinion that bad working conditions lead to costs that affect the economic growth is generally accepted. In the example of Eritrea, quoted earlier, the accidents caused nearly 62,000 lost working days, or seven per employee. The ILO estimates that ~4% of the world’s gross domestic product disappears through occupational accidents and diseases. Regrettably the worker has little choice. Odhiambo (2003): ‘A poor and hungry man is not selective in terms of employment and is never attentive to instructions or training of any kind—be it on occupational health and safety or personal hygiene.’ This is the vicious circle that must be broken. Apparently a certain basic level of prosperity is needed to get interest in working conditions started.

Fortunately, interest in occupational hygiene is rising in Third World countries. The figures of occupational hygiene society members in different parts of the world over the years in Figure 1 illustrate this. The increasing number of people involved in occupational hygiene in Asia is striking. In 1993, the IOHA welcomed the first society from Asia that of Hong Kong. Today, five member organizations are from Asia and looking at the contacts that we have with several emerging societies from Asian countries, it can be expected that the increasing trend will go on.

There has also been rapid growth in academic publication since Hans Kromhout’s (1999) editorial. Papers submitted to the Annals of Occupational Hygiene from developing countries show a strong upward trend (Figure 2), perhaps helped by the simplicity of on-line submission. Kromhout remarked on the problems of pesticides in tropical agriculture, and there has since been an interesting series from teams in Central America (Aragón et al., 2004, 2006; Blanco et al., 2005; Monge et al., 2005). There have been some papers dealing with Africa (e.g. Khudupetersen et al., 2000; Brätveit et al., 2003; Mamuya, 2006), although it would be great if in the longer term we could see even more. As well as these papers, a search in the Annals for the phrase ‘developing countries’ shows how much possible application in such countries enters into the thinking of European workers especially.

**INITIATIVES**

Fortunately, many initiatives are being taken to strengthen occupational hygiene in Africa. Many projects are summarized on the website: http://www.sheafrica.info/en/(Programmes). This website mentions
initiatives from WHO, ILO and several cooperation projects with countries like the USA, Finland, Switzerland and Sweden. Projects concentrate on master degree programmes at universities, exchange of information and research topics like silicosis. Being from the Netherlands, I cannot resist mentioning some projects in which the Dutch Utrecht University was or is involved. Exposure to wood dust and endotoxins among small-scale wood industry workers in Tanzania (Rongo et al., 2004) and exposure to pesticides in East Africa (Ohayo-Mitoko et al., 2000) are two of them. It is interesting that all the Annals papers cited in the previous paragraph are the fruit of cooperation with North American or European teams, and many are the results of PhD study in the developed country.

IOHA has also taken several initiatives to contribute to the development of occupational hygiene in Africa. Regrettfully, IOHA is not able to give any financial support. The budget of the association is small and the work is done by enthusiastic volunteers. Mostly, the IOHA cooperates with other organizations to obtain the maximum result out of its efforts.

The African initiative is a set of interrelated projects. Among these are the cooperation with developing a Masters programme on occupational hygiene at the Witwatersrand University in South Africa and a mentor programme for teachers.

Silicosis prevention. The IOHA supports the development of training material: ‘Hazard prevention and control in the work environment: airborne dust’.

PACE, Prevention And Control Exchange. This project, in cooperation with the WHO, aims on exchange of knowledge about simple preventive and control measures.

International Chemical Control Toolkit (ICCT). This is one of the key projects of the IOHA at this moment. Many organizations cooperate in the project and the coordination is with ICPS, the International Program on Chemical Safety from WHO and ILO. The key element of the toolkit is an approach to risk assessment and risk management that assigns products a hazard class (or hazard band) and a probability of exposure. Control measures in the form of guidance sheets are linked to these bands.

The IOHA supports emerging societies for occupational hygiene. Much effort has been put in European and Asian countries over the past few years. As a result of this, a society was established in Malaysia and contacts with India, South Korea and Indonesia have been set up. In Eastern Europe a society has been established in Poland and, hopefully, one will be established in Romania within a short time. Maybe we can find partners to establish societies for occupational hygiene in African countries as well.
No matter how sincere our intentions may be, every initiative is bound to fail when the target group, in this case those involved in occupational hygiene in Africa, is not convinced that the initiative is useful. It is, therefore, mandatory for success that initiatives are taken within the countries themselves and supported from outside. There are certainly positive signs. Three times a year a well-filled journal appears, the African Newsletter for Occupational Health and Safety. It is available on the web: www.ttl.fi. It contains many examples of projects and other initiatives in Africa.

**COOPERATION**

Fortunately, the occupational hygienist is not alone in his task. Many parties are involved in improving working conditions. A workshop during the conference was dedicated to surveying the possibilities of cooperation (Stanton, 2006). Our possible allies, mentioned at the workshop, are summarized in Table 1. First of all, there are the manufacturers and suppliers. Multinational companies do have the knowledge to care for decent working conditions. The framework is the international standard SA 8000: social accountability (SAI, 2001). Practical guidelines, for instance based on the ICCT concept, would also offer smaller companies a possibility to manufacture responsibly and to assess the social accountability of suppliers in Third World countries. Occupational hygienists could help establish such guidelines.

Machine manufacturers are the key for control measures at the source. Bolt-on constructions are mostly unsuccessful with a low educated workforce and poor maintenance. Intrinsically low-emission machines are, therefore, of prime importance. Occupational hygienists can give guidance for research.

Manufacturers and suppliers could more actively provide clear and unambiguous information. Too often the recommendation for hand protection on Material Safety Data Sheets stops with a recommendation: protective gloves, material: plastic. This is of little use for the end-user of chemicals. It would be useful if the information, provided in Europe based on REACH, would also be at the disposal of end-users outside Europe. Occupational hygienists can help disseminate this information.

Governments have a task to protect the employee with legislation and enforcement. Labour inspectors in developing countries can have advantage of instruments for assessment, developed in countries with a longer occupational hygiene tradition.

With 24 000 occupational hygienists in a working population of ~3 billion people we will never be enough to disseminate our message everywhere. Therefore we need other people like primary health care workers, safety staff and suppliers. This, however, may be a tremendous pitfall. Schulte (2002) has explained the way from data to knowledge. Data as such, especially many data, are of little use. They must be ordered to make them accessible. Ordering makes data useful, transforms data into information. However, only those who can interpret, integrate and relate information to earlier situations possess knowledge. Knowledge in the hands of non-experts is information again, as illustrated in Figure 3.

Without discounting the role of non-experts in disseminating information, information for non-experts must, therefore, be unambiguous, and often apply to just one exposure scenario. This limitation is often underestimated. Experts in the Western world are often not aware of exposure scenarios in Third World situations. Also the usefulness of advice depends on whether local limitations are taken into account. Well educated and trained local experts are, therefore, indispensable to put working conditions on a higher plane. Only those who are familiar with the

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**Table 1. Possible allies for better working conditions**

<table>
<thead>
<tr>
<th>Who</th>
<th>What</th>
<th>Role of occupational hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multinational companies</td>
<td>Apply decent standards (based on SA 8000)</td>
<td>Practical guidelines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>based on SA 8000</td>
</tr>
<tr>
<td>Machine manufacturers</td>
<td>Low-emission machines, suitable for Third World countries</td>
<td>Guidance for research</td>
</tr>
<tr>
<td>Chemicals manufacturers</td>
<td>Guidelines for working with chemicals</td>
<td>Collect and disseminate</td>
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<tr>
<td>and suppliers</td>
<td>REACH also outside Europe</td>
<td>knowledge</td>
</tr>
<tr>
<td>Governments</td>
<td>Legislation</td>
<td>Expertise and tools</td>
</tr>
<tr>
<td>Primary health care workers</td>
<td>Enactment</td>
<td></td>
</tr>
<tr>
<td>Safety staff</td>
<td>Bring the message across</td>
<td>Tailor-made information</td>
</tr>
</tbody>
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![Fig. 3. The way from data to knowledge and back to information.](https://academic.oup.com/annweh/article-abstract/50/5/431/189521)
local situations have the knowledge to offer information in the right way. Local experts and local structures are needed.

It is an illusion to think that working conditions in Africa will improve overnight. But I hope to have illustrated that many dedicated people are involved in many outstanding projects. A conference like IOHA 2005 can help to put working conditions on the agenda of policy makers, engineers, company owners and labour unions alike. I am convinced that changes will come, although not as fast as many of us would like. We are on the right track and I hope that the IOHA can play its role as a catalyst not only to disseminate knowledge but also to get to bring together peers with a common goal: to improve working conditions.

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REFERENCES


