

EDITORIAL / VAN DIE REDAKSIE

New developments in South African health and safety legislation

The new draft Bill on Occupational Safety and Health 1993 (BOSH), published in May this year, is a considerable improvement on the Machinery and Occupational Safety Act 1983 (MOSA) introduced 10 years ago. BOSH is a logical extension beyond a preoccupation with safety and accidents, and incorporates occupational health and medicine for the first time in non-mining industry.

BOSH has a number of additional positive features, *inter alia* the extension of powers and functions of safety representatives; increased general duties for employers and manufacturers; better access to information in the workplace including surveillance; and more realistic penalties for transgressing the law.

Unfortunately these features are reflected in a primarily theoretical fashion in BOSH and are insufficiently developed for meaningful implementation. This editorial focuses on some problematic areas.

Policy-making structures such as the Advisory Council on Occupational Safety have been reformed. However, there is still substantially uneven representation of parties whose participation and collaboration are necessary to promotive and preventive efforts aimed at improving health and safety at work. Collaborative needs consequent on the extension of legislation to cover occupational health and medical aspects have not been clarified at either national or local level. For example, medical and academic occupational health experts are notably underrepresented on the proposed National Safety and Health Council.

An important departure is the provision for certain activities to be declared 'risk work'. However, the Minister of Manpower will declare risk work centrally. This provision is very cumbersome and will only apply to a few selected, visibly dangerous industries at the extreme end of the hazard spectrum. All industries include hazardous subprocesses to varying degrees, and should as a matter of course be subjected to risk assessment. Assessments can only be done at a local level by personnel trained in occupational medicine and industrial hygiene. Risk assessment that covers the range of industry in any locality will exceed the capacity of the Factory Inspectorate as currently constituted. BOSH in fact contains an implicit mechanism in its provision for the appointment of approved inspection authorities, thereby opening the way for the creation of a functional medical inspectorate by means of local collaboration with occupational health professionals. Risk assessments could be carried out by the increasing number of physicians with postgraduate qualifications in occupational health such as the Postgraduate Diploma in Occupational Health, and specialist community physicians.

Such assessments should not involve more than a few hours' work, comprising a walk-through inspection, examination of substances used at work and completion of an appropriate report which would form part of the registration requirements of the company. The report could recommend appropriate company-based health surveillance procedures including medical and biological monitoring and links with governmental databases.

Present levels of training for health and safety personnel in industry are insufficient to support the extensions envisaged in BOSH. Existing training, with its exclusive focus on safety, is limited in capacity and its acceptability to all parties concerned, particularly trade

unions, should be critically evaluated in the light of future development needs. In particular, training must go beyond purely administrative considerations.

A notable weakness of MOSA involved the role of unions and employee representatives. BOSH unfortunately compounds the confusion as to what and whom the safety representatives represent. Do they represent health and safety? Or do they represent employees exposed to hazards at work (as opposed to management)? Either way the interface between health and safety and collective bargaining structures is unclear. This will continue, as in the past, to generate confusion and the potential for occupational health professionals to be drawn into unproductive industrial conflict around health issues.

One way of dealing with this is for BOSH to require recognised unions to be drawn in at all levels of health and safety administration from policy making at highest council level to that of safety representatives. Such involvement is important where recognised unions are present on the shopfloor, and perhaps even more important where unions are not present. In the latter case suitably trained union personnel could play an advisory and consultative role in respect of non-unionised sectors by being given approved inspection authorities.

BOSH attempts to introduce health surveillance mechanisms. This could play a critical role in respect of the control of health effects of risk work and the provision of data for effective prevention programmes. The recording of basic safety and health information, such as environmental and biological monitoring data and the occurrence of accidents and occupational diseases, for surveillance purposes in relation to general work and risk work is not specified clearly enough. Under these circumstances it is unlikely that an accurate perception of the accident or occupational disease problem in specific industries will be ascertained.

Even for those events that are readily ascertained, confusing lines of data flow required by present legislation have not been streamlined in BOSH. There is considerable overlap and duplication between reporting channels leading to the Factory Inspectorate and the Workmen's Compensation Commissioner. Past experience indicates that such fragmentary databases do not lead to efficient information retrieval and effective preventive or corrective action. Provision should be made for one streamlined inclusive reporting system that conforms to international standards.

The move to a more open approach regarding disclosure of information, as opposed to the preservation of secrecy approach characteristic of MOSA, is to be welcomed. However, this is still uneven in that inquiries other than special inquiries are insufficiently accessible to the parties concerned and the general public to promote public health objectives effectively.

Lastly a major anomaly in BOSH is the exclusion of the most hazardous of all industries (especially in the Cape), viz. fishing. It is disappointing to find such a glaring omission in a draft bill that otherwise takes important steps towards improving occupational health and safety in South Africa.

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Coronary artery disease and insulin resistance in the South African Indian

Coronary heart disease (CHD) is a major problem in migrant Indians throughout the world.¹ In South Africa, CHD is a major problem² in Indians and whites and has been described as having reached 'epidemic proportions'.³ In 1985, the relative risk of CHD death in South African Indians compared with whites was 1,3 in males and 1,7 in females.⁴ Epidemiological studies have identified a number of factors that increase the risk of cardiovascular diseases, including CHD and stroke. The major modifiable risk factors are hypertension, hypercholesterolaemia, left ventricular hypertrophy and cigarette smoking. Other factors that contribute to the risk of CHD include obesity, diabetes, decreased high-density lipoprotein (HDL) cholesterol, stress and physical inactivity.^{5,6} The more risk factors present, the greater the chances of CHD.⁷

Insulin resistance may be a key disease state underlying hypertension and non-insulin-dependent diabetes mellitus (NIDDM). Both hypertension and NIDDM are disorders that ultimately result in CHD. Nearly 50% of all newly diagnosed patients with NIDDM also have hypertension. How are the two conditions related? What is the common underlying mechanism? Hyperinsulinaemia has been suggested as the common denominator in hypertension, glucose intolerance, and other factors that increase the risk of CHD. Insulin resistance may be present in hypertensive patients and those with NIDDM and obesity and in 25% of the normal population. The syndrome of insulin resistance involves glucose intolerance, hyperinsulinaemia, hypertension, low plasma HDL cholesterol and high serum triglyceride levels.^{8,9} A patient probably has insulin resistance if he or she has the clinical profile of obesity, being middle-aged or elderly, and having hypertriglyceridaemia and an abnormal glucose tolerance test.¹⁰

The prevalence of risk factors, i.e. hypercholesterolaemia, hypertension, overweight and obesity, diabetes and hypertriglyceridaemia, is higher in those with a history of CHD compared with those with no history of CHD.¹¹ We have also shown that important factors denoting insulin resistance were associated with hypertension in our subjects, i.e. hypercholesterolaemia, low plasma HDL cholesterol, obesity, diabetes, and hypertriglyceridaemia.¹² Epidemiological studies have shown racial differences in the relationship between blood pressure and insulin resistance in whites, but not in the Pima Indians or blacks of the USA.¹³ The Indian population of Durban has high plasma insulin levels.¹⁴ This is also the case in those with an impaired glucose tolerance.¹⁵

It has been suggested that insulin resistance leads to the high incidence of CHD in south Asians in London. Insulin resistance is associated with a pattern of obesity in which a high proportion of body fat is deposited intra-abdominally; this central obesity (increase of waist/hip ratio) is commoner in south Asian men than in white men.¹⁶ The ability to store fat in intra-abdominal depots and rely on non-esterified fatty acids rather than glucose as fuel for muscle may have been selected as a thrifty gene¹⁷ in a time of scarcity.¹⁸ If the insulin resistance hypothesis is correct, the control of obesity and increased physical activity are likely to be the most effective means of reducing the risk of CHD in south Asians

in London. The criteria for ideal weight based on data for whites may be inappropriate for south Asians because of differences in body frame size and fat distribution. The efficacy of weight loss and physical training in reversing insulin resistance in south Asians has yet to be demonstrated.¹⁸

In conclusion, the association of hypertension with hypertriglyceridaemia, hypercholesterolaemia, excess alcohol intake and diabetes suggests an underlying state of insulin resistance that could lead to CHD in the Indian population of Durban.¹² The preventable risk factors, such as cessation of cigarette smoking, control of hypertension and reduction of saturated fats are important. In addition, the control of obesity and regular exercise throughout life may be as important in preventing diabetes and CHD in the Indian population of South Africa, as has been suggested by McKeigue with regard to the south Asian population of London.¹⁸

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1. Editorial. Coronary heart disease in Indians overseas. *Lancet* 1986; 1: 1307-1308.
2. Medical Research Council: Technical Report No. 1. In: *Review of South African Mortality*. Parow, CP: MRC, 1989; 41-45.
3. Wyndham CH. Mortality from cardiovascular diseases in the various population groups in the Republic of South Africa. *S Afr Med J* 1979; 56: 1023-1030.
4. Steinberg WJ, Balfe D, Küstner HG. Decline in the ischaemic heart disease mortality rates of South Africans, 1968-1985. *S Afr Med J* 1988; 74: 547-550.
5. American Heart Association: 1989 heart facts. *American Heart Association Newsletter* 1988; 19: 10-13.
6. Grundy SM, Greenland P, Herd A, Heusch JA, Jones RJ, Mitchell JH. Cardiovascular and risk factor evaluation of healthy American adults: a statement for physicians by an ad hoc committee appointed by the steering committee, American Heart Association. *Circulation* 1987; 75: 1340A-1362A.
7. Kaplan NM. Importance of coronary heart disease risk factors in the management of hypertension: an overview. *Am J Med* 1989; 86(suppl 1B): 1-4.
8. Reaven GM. Role of insulin resistance in human disease. *Diabetes* 1988; 37: 1595-1607.
9. Editorial. Type 2 diabetes of NIDDM: looking for a better name. *Lancet* 1989; 1: 589-591.
10. Seedat YK. Hypertension as an insulin-resistance state: a newly developed concept. *S Afr Med J* 1990; 77: suppl, 1-4.
11. Seedat YK, Mayet FGH, Khan S, Somers SR, Joubert G. Risk factors for coronary heart disease in the Indians of Durban. *S Afr Med J* 1990; 78: 447-454.
12. Seedat YK, Mayet FGH, Joubert G. Insulin resistance and hypertension: a study of coronary heart disease in the Durban Indian. *Coronary Artery Disease* 1991; 2: 1089-1091.
13. Saad MF, Lillioja S, Nyomba BL, Castillo C, Ferraro R, De GREGO RIOM. Racial differences in the relation between blood pressure and insulin resistance. *N Engl J Med* 1991; 324: 733-739.
14. Nodelovitz M. Oral hypoglycaemic therapy in diabetic pregnancies. *Lancet* 1974; 2: 902-903.
15. Motala AA. Impaired glucose tolerance in South African Indians living in Durban. M.D. thesis, University of Natal, 1991.
16. McKeigue PM, Shah B, Marmot MG. Central obesity and insulin resistance underlie high diabetes prevalence and cardiovascular risk in South Asians. *Lancet* 1991; 337: 383-386.
17. Neel JV. Diabetes mellitus: a 'thrifty' genotype rendered detrimental by 'progress'. *Am J Hum Genet* 1962; 14: 353-362.
18. Editorial. Coronary heart disease in Indians, Pakistanis and Bangladeshis: aetiology and possibilities for prevention. *BMJ* 1992; 304: 341-342.