



NATIONAL HEALTH LABORATORY SERVICE

# **ANNUAL REPORT**

**2003**

of the

**NATIONAL INSTITUTE FOR  
OCCUPATIONAL HEALTH**

**JOHANNESBURG**





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# NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

## CHAPTER I

### INTRODUCTION

#### DIRECTOR / PROFESSOR'S REPORT 2003

In 2003, the NCOH joined the National Health Laboratory Service (NHLS) as the National Institute for Occupational Health (NIOH). The Department of Health remains the primary funder of the NIOH, and hence will continue to guide us in our goal to promote good occupational health and working life. The new relationship with the Department of Health means that the NIOH needs to be particularly responsive to the Department's public health obligations and supportive of the need to develop occupational health capacity and services in the public sector. The first strategic planning meeting in the new context identified three areas of focus for the immediate future:

- improved communication particularly within the public service;
- research that supports the development of effective occupational health services; and
- improved support of the social partners, but particularly organized labour (i.e. trade unions).

Improved communication is not only to ensure that knowledge is made available in the public service to develop policy and strategy, but also to ensure that the NIOH's contribution is known and valued.

Since we are in some respects a new institution it is worth repeating the functions of the NIOH. They are:

- Advisory services which include giving advice on establishing occupational health services at provincial, district and enterprise levels; serving on technical committees; and consultations with enterprises on hazard control and the monitoring of workers.
- Information services, including the national reference library, the query handling service and the SADC Clearing House.
- Support services e.g. specialised laboratories and health hazard evaluations.
- Applied laboratory and epidemiological research.
- Surveillance of occupational disease and indicators of occupational health practice.
- Development of occupational health professionals and specialists.
- The statutory autopsy services in terms of the Occupational Diseases in Mines & Works Act (ODMWAAct).

One of the challenges in this new environment will be to ensure that the NIOH responds to the changing world of occupational health and that we continue to develop knowledge and services in ergonomics, bio-aerosols, psychosocial aspects of work and molecular biology.

## Research

Research is a core function of occupational health and safety institutions around the world. The NIOH is no exception. Research is needed to provide the knowledge for evidence-based practice, for the design of effective services and for monitoring health and safety performance. But almost as important, engaging in research develops confident, independent professionals, an absolute requirement for improving occupational health services and working life.

A summary of the NCOH's journal publications over the past 7 years (Table 1) shows the rich scope of the institution's research contribution. For a small institution with large service obligations the range of research issues is wide.

The selection of research topics by a national institute is not only informed by the country's needs, but also by what is being done elsewhere, and institutional knowledge and resources, among other factors. Allergy, asbestos, occupational lung disease, silica and tuberculosis (with and without concurrent silica exposure) have been prominent topics in NIOH publications, and this is appropriate given the importance of these issues here. It is notable, though, that the modern concerns of occupational health and working life that dominate research in richer northern countries have been virtually untouched by the NIOH. Occupational stress, disability and work capacity, ergonomics, musculoskeletal disorders, occupational health services, reproductive health and work organization issues including working hours surely deserve attention.

**Table 1: NCOH journal articles and book chapters by topic and year from 1997 to 2003**

<b>Topic</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Allergy	1	4	2	3	4	1	
Asbestos and asbestos related disease	2	1	5	4	1	2	3
Burden of occupational lung disease			3	2	3	2	2
Biological monitoring and biomarkers	1	1			2		1
Compensation			2				
COPD and work	1			1			
Exposure to chemicals		1					
Exposure to fumes		2					
General overview of a topic	3	2	1	1	2	1	
Hand arm vibration and musculoskeletal disorders				1	1		1
HIV			2	1	1	1	2
Information on professionals, programmes and services	3	1					
Legionella	1	2		2	2		3
Lung cancer						1	
Mechanism of disease			2	1	1		2
Metals		1			2	1	2
Neuropsychology			1				1
Occupational asthma	1			1	2	1	
Occupational lung disease						1	4
Physical agents					1		1
Psychological issues						1	
Occupational dermatitis		1					
Reproductive health	1						
Sick buildings and indoor air quality			1	1			
Silica and cancer	1						
Silica and tuberculosis	1	1		1	3	1	2
Silicosis				1		1	
Surveillance and indicators	1				2		3
The NCOH	1	2		1			
Training of professionals	7		3			1	
Tuberculosis and work (not silica)		1		6			2
Other (occupational topic)		1	2				1
Other (not directly occupational)	4	5	2	6	3		5
<b>TOTAL</b>	<b>30</b>	<b>28</b>	<b>26</b>	<b>32</b>	<b>30</b>	<b>15</b>	<b>35</b>

(1) 2003 includes published articles and those in press.

(2) The topics covered in General overview of a topic were cancer and work, cardiovascular disease and work, the electronics industry, free radicals, hairdressing, skin, bitumen and coal tar and occupational health services.

## **CONFERENCE PRESENTATIONS & TECHNICAL DOCUMENTATION – 2003**

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**Candy G, Murray J.** Trends in atheroma diagnosed at autopsy in SA miners 1975 – 2001. 13th Congress of the SA Hypertension Society. 7-9 March 2003, Johannesburg.

**Candy G. Murray J.** Increasing prevalence of coronary artery atherosclerosis in South African black and white miners: NCOH pathaut mining autopsy data. 43rd Conference of the federation of South African Society of Pathology. June 2003, Johannesburg. .

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**Gulumian M.** Mineral particles as environmental mutagens and carcinogens. PAEMS Fourth International Meeting, PAEMS 2003, 2-7 March 2003, Cairo, Egypt.

**Gulumian M.** Mineral particles as environmental and industrial Pollutants: Mechanisms of toxicity, 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 55 Final Review Board on Polychlorinated biphenyls: Human health Aspects. International Programme on Chemical Safety and WHO, Geneva, 2003.

**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 52 Final Review Board on Diethyl phthalate. International Programme on Chemical Safety and WHO, Geneva, 2003.

**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 48 Final Review Board on 4-Chloroaniline. International Programme on Chemical Safety and WHO, Geneva, 2003.

**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 46 Final Review Board on Carbon Disulfide. International Programme on Chemical Safety and WHO, Geneva, 2002.



**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 45 Final Review Board on Ethylene glycol: Human Health Aspects. International Programme on Chemical Safety and WHO, Geneva, 2002.

**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 44 Final Review Board on Silver and Silver Compounds: Environmental Aspects. International Programme on Chemical Safety and WHO, Geneva, 2002.

**Gulumian M.** Concise International Chemical Assessment Document (CICAD) 43 Final Review Board on Acrolein. International Programme on Chemical Safety and WHO, Geneva, 2002.

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**Gulumian M, Semano M.** Surface activity of silica particles: an important parameter in dose-response relationship. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Honma K, Murray J.** Intrapulmonary lymph nodes in South African miners – An autopsy survey. 19th European Congress of Pathology. 6-11 September 2003, Ljubljana, Slovenia.

**Kgalamono S.** Review of cases of asbestosis assessed at NCOH from 1980 to March 2000. Dare to Care Conference 24 – 28 August 2003, Cape Town.

**Kielkowski D, Esterhuizen T, Duma T.** Respiratory disease reported to SORDSA from 2000 – 2003. Dare to Care Conference 24 – 28 August 2003, Cape Town.

**Makhubela S, Maraba M, Sifile S, Radebe M, Mamburu M, Gulumian M.** The effect of in vitro co-exposures to crystalline silica and BCG on human MNC. PAEMS fourth International Meeting, PAEMS 2003, 2-7 March 2003, Cairo, Egypt.

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**Malema M, Sifile C, Gulumian M.** Are there sufficient and effective programmes in place for the prevention and eradication of silicosis in the pottery industry of South Africa? 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Mamburu M, Sifile C, Maraba M, Radebe T, Makhubela S, Gulumian M.** Measurement of reactive oxygen species and lipid peroxidation in human peripheral blood mononuclear cells using fluorescent probes. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Masoka X, Molefe T, Masike A, Mashigo L, Maraba M, Makhubela S, Gulumian M.** Effect of smoking on DNA damage and intra-individual variation in DNA damage in human mononuclear cells. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Masoka X, Molefe T, Masike A, Thukutha K, Mashigo L, Maraba M, Gulumian M.** Determination of basal level DNA damage in human mononuclear cells from an “unexposed” African population using the Comet assay. 5th International Comet Assay Workshop, 29-31 August 2003, University of Aberdeen, Scotland.

**Murray J, Nelson G.** Health Effects Associated with Mining and Milling of Grunerite (Amosite) Asbestos in South Africa. International Symposium on Health Hazard Evaluation of Fibrous Particles Associated with Taconite and Adjacent Duluth Complex. 30 March – 01 April 2003, Minnesota, USA.

**Murray J, Nelson G.** A Tale in the tailing. Mine Medical Officers' Association, Sixth Annual Congress. 9-11 May 2003, Rustenburg.

**Murray J.** Beyond silicosis~silica dust exposure and lung cancer. Dare To Care - Combined Congress of The SA Thoracic Society and the Critical Care Society of SA. 24-28 Aug 2003, Cape Town.

**Phillips J, Murray J, Nelson G.** Asbestos, Simian Virus 40 and Mesothelioma. Mine Medical Officers Association, Sixth Annual congress. 9-11 May 2003, Rustenburg .

**Ramafi G.** The pro-oxidative interactions of platinum with human neutrophils in vitro. 1st World Congress on Work-related and Environmental Allergy, 9 – 12 July 2003, Helsinki, Finland.

**Renton K, Garton EA** (2003). Measuring low concentrations of asbestos fibres in environmental air samples from asbestos roofed houses. Environmental Health Risk II. Witpress, [www.witpress.com](http://www.witpress.com) pages 113 -120.

**Röllin HB, Mathee A, Levin J, Wewers F, Theodorou P.** Levels of manganese in blood and environment of school children in Cape Town and Johannesburg. PHASA Conference, March 2003, Cape Town.

**Röllin HB, Mathee A, Wewers F, Theodorou P, Levin J.** Comparison of blood and environmental manganese levels among school children in two South African cities. 15th International Society Environmental Epidemiology Conference, ISEE, 23 – 26 September 2003, Perth, Australia.

**Semano M, Motsepe A, Gulumian M.** Manganese binding proteins in human serum. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Thukhutha KM, Siziba K, Gulumian M.** The extent and nature of glue sniffing amongst South African street children: the toxic ingredients in glues and their health related effects. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**Vetten M, Bornman L, Gulumian M.** Assessment of toxicity assays employed to evaluate complex groundwater contamination. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, Johannesburg.

**White N, Murray J, Nelson G.** South African experience with asbestos related environmental mesothelioma: Is asbestos fibre type important? USA International Environmental Research Foundation; International Symposium on Health Hazard Evaluation of Fibrous Particles Associated with Taconite and Adjacent Duluth Complex. 30 March – 01 April 2003, Minnesota, USA

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2/2003 **Davies JCA.** Maandagshoek Project: Fourth Programme – 2002

3/2003 **Davies JCA.** A dictionary of mines in the Limpopo Province – compiled for use in the programmes forming part of the Maandagshoek Project. The area concerned is referred to as the Pietersburg Asbestos Field or as Sekhukhuneland

4/2003 **Davies JCA.** Maandagshoek Project – First programme: 1996

5/2003 **Davies JCA.** A report on the Maandagshoek Project – Second programme: April – September 1998.

6/2003 **Davies JCA.** A report on the Maandagshoek Project – Third programme: April – September 2000.

7/2003 **Murray J, Candy G, Nelson G, Khumalo L.** Pathology Division Report: Demographic data and disease rates in January to December 2003.

8/2003 **Masoka X, Gulumian M.** Pesticide risk management – from use and exposure to control measures

9/2003 **Spies A.** A walk through survey at the forensic laboratory, Johannesburg

10/2003 **Yousefi V.** An out of stack sampling as a base line dust and acid emission at the Afrox welding consumable factory, Brits

- 11/2003 **Renton K, Matjiela I.** A report on the use of bacteriocidal agents at Ga-Rankuwa hospital, Gauteng
- 12/2003 **Baker A.** Exposure assessment at Ultra Litho (Pty) Ltd
- 13/2003 **Spies A.** HDI airborne exposure assessment in workers in an automotive body repair workshop 1
- 14/2003 **Spies A.** HDI airborne exposure assessment in workers in an automotive body repair workshop 6
- 15/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Tembisa Hospital
- 16/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Ga-Rankuwa Hospital
- 17/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Chris Hani Baragwanath Hospital
- 18/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Kopanong Hospital
- 19/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Kalafong Hospital
- 20/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Johannesburg General Hospital
- 21/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Pretoria West Hospital
- 22/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Pretoria Academic Hospital
- 23/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Helen Joseph Hospital
- 24/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Dr Yusuf Dadoo Hospital
- 25/2003 **Ntsuba H.** Solvent exposure assessment at histopathology section in Pathology Department in NIOH

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- Davies JCA** (2002). Managing pulmonary tuberculosis in the workplace. *SORDSA News* 6 (1): 3-4.
- Gulumian M** (2003). Research in occupational health in general and in occupational toxicology in particular in South Africa: past achievements and future challenges. *Comm. Chinese Toxicol.* 7 (4): 17.
- Gulumian M, Semano M** (2003). Surface activity of silica particles: an important parameter in dose-response relationship. *Occup. Health SA* 9 (4): 10-15.
- Kgalamono S** (2003) Review of cases of asbestosis assessed at NCOH from 1980 to March 2000. *South Afr. Resp. J.* 9: 94.
- Kielkowski D, Esterhuizen T, Duma T** (2003). Respiratory disease reported to SORDSA from 2000 – 2003. *South Afr. Resp. J.* 9: 96.
- Mathee A, Röllin HB, Ditlopo NN, Theodorou P** (2003). Childhood lead exposure in South Africa. *South Afr. Med. J.* 93 (5): 313.
- Murray J and Rees D** (2003). Tuberculosis and silicosis in South African gold mining. *OSH & Development* 5: 2-9
- Myers JE, Thompson ML, Naik I, Theodorou P, Esswein E, Tassel H, Daya A, Renton K, Spies A, Paicker J, Young T, Jeebhay MF, Ramushu S, London L, Rees D** (2003). The utility of biological monitoring for manganese in ferroalloy smelter workers in South Africa. *Neurotoxicology* 24: 875-883.
- Myers JE, Thompson ML, Ramushu S, Young T, Jeebhay MF, London L, Esswein E, Renton K, Spies A, Boulle A, Naik I, Iregren A, Rees DJ** (2003). The nervous system effects of occupational exposure on workers in a South African manganese smelter. *Neurotoxicology* 24: 885-894.
- Myers JE, te Water Naude J, Fourie M, Zogoe HB, Naik I, Theodorou P, Tassel H, Daya A, Thompson ML** (2003) Nervous system effects of occupational manganese exposure on SA manganese mineworkers. *Neurotoxicology* 24(4-5): 649-56.
- Phillips J, Dias B, Ross M, Murray J, Curran A** (2003). Whole body vibration in the South African mining industry. *Occup. Health SA* 9: 4-6.
- Röllin HB, Mathee A, Wewers F, Theodorou P, Levin J** (2003). Comparison of blood and environmental manganese levels among school children in two South African cities. *Epidemiology* 14 (5): S19, abstract.

**Schukla A, Gulumian M, Hei T, Kamp D, Rahman Q, Aust A, Mossman B** (2003). Multiple roles of oxidants in the pathogenesis of asbestos-induced diseases. *Free Radic. Biol. Med.* 34: 1117-1129.

**Solomon A, Rees D, Felix M, Venter E** (2003). Silicosis and tuberculosis. Silicosis and concomitant tuberculosis: the radiologists enigma. A proposed radiographic classification of tuberculosis to accompany the ILO International Classification of Radiographs of the pneumoconioses. *Occup. Health SA*: 9(4) 4-9.

**Solomon A, Venter E** (2003). Radiological tuberculosis lung scarring – the ignored hazard. *Occup. Health SA*: 9(6) 22-23.

**Venter E, Solomon A** (2003). The mobile X-ray caravan: an important contributor to monitoring workers' health in foundries. *Occup. Health SA*: 9(3) 14-16.

### **STAFF QUALIFICATIONS OBTAINED – 2003**

The occurrence of Hand Arm Vibration Syndrome in a South African gold mine, **Master of Science (Med)**, School of Public Health, University of the Witwatersrand, 2003 **Busisiwe Maria Nyantumbu**

## CHAPTER II

# OCCUPATIONAL HYGIENE

In order to maintain our position as a leading occupational hygiene centre in the country, we continued offering technical services, undertook applied research, provided a specialized hygiene service, collaborated with health professionals and applied occupational hygiene principles to promote the control and prevention of work related discomfort, injuries, illness and diseases. During 2003 we focused mainly on the following activities:

- \* recognition of workplace hazards
- \* co-ordination of teaching and training
- \* applied research
- \* standard setting and technical co-operation
- \* providing specialized analytical services
- \* dissemination of technical information
- \* providing technical and advisory services to the provinces
- \* mentoring new graduates planning to practice as occupational hygienists

### **RECOGNITION OF WORKPLACE HAZARDS**

Workplace hazard identification was a major function of the section. Emphasis was placed on assistance to government institutions and provincial structures. Many of these institutions are not yet resourced to undertake occupational hygiene work. Assistance in setting up occupational health and safety programmes was given to most of the provinces. Private industries and enterprises were also visited. Technical support, monitoring and the quantification of hazardous agents were continued as in the past.

Exposure to high temperature, noise, asbestos fibers and quartz-containing dust; ergonomic factors and indoor air quality are still the major occupational and environmental issues. The sampling and evaluation of these hazardous agents requires specialized knowledge, skills and equipment, and the NCOH continues to be the national reference centre for such work. During 2003 there was an increased interest in the identification of hazards, and the section was able to provide this service effectively.

Research and routine survey findings were presented in the form of NIOH Internal Reports, a list of which follows:

9/2003 **Spies A.** A walk through survey at the forensic laboratory, Johannesburg

10/2003 **Yousefi V.** An out of stack sampling as a base line dust and acid emission at the Afrox welding consumable factory, Brits

11/2003 **Renton K, Matjiela I.** A report on the use of bacteriocidal agents at Ga-Rankuwa hospital, Gauteng

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- 17/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Chris Hani Baragwanath Hospital
- 18/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Kopanong Hospital
- 19/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Kalafong Hospital
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- 21/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Pretoria West Hospital
- 22/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Pretoria Academic Hospital
- 23/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Helen Joseph Hospital
- 24/2003 **Baker A, Ntsuba H.** The airborne concentration of ethylene oxide in Dr Yusuf Dadoo Hospital
- 25/2003 **Ntsuba H.** Solvent exposure assessment at histopathology section in Pathology Department in NIOH

### ***TEACHING & TRAINING***

Occupational hygiene staff were involved in both formal and informal teaching, lecturing and training.

Risk assessment, health hazard evaluation, exposure assessment and the principles of occupational hygiene, control and prevention of exposure to hazardous agents, risk management, the monitoring of workplace environments, radiation and electromagnetic stressors were taught to different audiences. The selection, calibration, use, care and operation of direct and indirect reading instruments and field sampling equipment was demonstrated to a variety of visitors and students. Diploma of Occupational Health students, Occupational Health Nursing students, and Environmental Health students from the Witwatersrand Technikon, Free State University, MEDUNSA and the University of Pretoria participated in training activities.

The section was heavily engaged in the running of postgraduate courses, in particular, the MPH: Occupational Hygiene with the School of Public Health, University of Witwatersrand. The section also presented various industrial hazard awareness and occupational health and safety courses at Peninsula Technikon, Free State University and the University of Pretoria.

### ***STANDARD SETTING & TECHNICAL CO-OPERATION***

Staff from the section were also involved in various technical committees and standard generating groups. One senior hygienist continues to act as a local examiner for the Diploma and Competency examinations of the British Institute of Occupational Hygiene.

Senior hygienists served on a number of technical committees, representing the NIOH and the National Department of Health.



## **RESEARCH**

The Occupational Hygiene section contributed to research by participating in, and supporting, a number of research projects, both within the NIOH and externally. The topics included:

- ethylene oxide
- solvents
- environmental dust due to wind erosion of mine waste dumps
- environmental asbestos concentrations in Soweto dwellings with asbestos cement roofs
- occupational allergy in workers exposed to soybean
- isocyanate exposure in automotive spray shops.

## **SPECIALIZED ANALYTICAL SERVICES**

Specialized testing was carried out in the form of asbestos fiber and crystalline silica evaluation using x-ray diffraction (XRD). This service had been hampered by out-of-date XRD equipment which has been replaced during 2003. With the new instrument now commissioned, this service is in the process of being expanded.

The section continues to maintain legal compliance with respect to the regulations governing hazardous chemical and biological agents.

## **RECRUITMENT AND STAFF DEVELOPMENT**

During the year:

- all practicing hygienists were encouraged to become members of a professional society
- the section continued taking newly-graduated environmental health graduates for mentoring, professional supervision and in-house training. This programme adds to their experience and confidence and assists them in obtaining appropriate employment. Subsequently, two graduates got appointments in the provincial public services.

## **CONFERENCES ATTENDED**

## **SAFETY, HEALTH AND ENVIRONMENT**

Staff of the section were involved with the health and safety issues at the NCOH. These included:

- Advice to the NIOH SHE Committee
- Advising the Acting SHE officer
- Promoting the SHE action plan for the NIOH
- Developing SHE standard operating procedures for use in all laboratories at NIOH

## **PUBLICATIONS**

**Myers JE, Thompson ML, Naik I, Theodorou P, Esswein E, Tassel H, Daya A, Renton K, Spies A, Paicker J, Young T, Jeebhay MF, Ramushu S, London L, Rees D** (2003). The utility of biological monitoring for manganese in ferroalloy smelter workers in South Africa. *Neurotoxicology* 24: 875-883.

**Myers JE, Thompson ML, Ramushu S, Young T, Jeebhay MF, London L, Esswein E, Renton K, Spies A, Boule A, Naik I, Iregren A, Rees DJ** (2003). The nervous system effects of occupational exposure on workers in a South African manganese smelter. *Neurotoxicology* 24: 885-894

## **SCIENTIFIC & TECHNICAL STAFF**

V Yousefi <b>Head:</b>	MSc, MSPH, MPhil, DOHy
A Baker	BTech
R Khakhu	Technician
JT Mohasoane	Technician
JF Moseboa	Technician
HS Ntsuba	BSc
KA Renton	MSc, MSc (Ind Hyg)
A Spies	BSc Hons, MSc

## **CHAPTER III**

### **INFORMATION SERVICES**

A core function of the NIOH is to provide specialist information services in occupational health and safety. An expanding community of users was provided with technical and scientific information covering a wide range of topics. Queries were received from all nine of the South African provinces, from the SADC, and from countries further afield. Staff of the section handled queries directly whenever possible, but also called on an extensive network of experts, both from within the NIOH and elsewhere, to ensure that accurate and appropriate information was supplied.

The role played by the AJ Orenstein Library for Industrial Medicine continues to be an essential element in the support of occupational health and safety practice in South Africa and the region. As the only specialist reference library dealing exclusively with the subject, it plays a strategic role in teaching, research and the provision of specialist services.

Members of the section were active in promoting the further development of the SADC Clearing House for OH&S information. This effort is being harmonized with our commitment to the WHO/ILO Joint Effort in Occupational Health and Safety in Africa. Material is accumulating from the various SADC countries, and particular assistance has been received from the WHO in the form of donations of printed and electronic material on OH&S. At the same time, contact information for networking African OH&S practitioners and organizations is being gathered. Particular emphasis is being given to the areas of practical OH&S Solutions, training, national policies, programmes & legislation, and the promotion of OHS involving workers in the informal sector.

#### ***TEACHING & TRAINING***

With Dr Spo Kgalamono, Prof Cantrell continued to co-ordinate the teaching of the postgraduate Diploma in Occupational Health (DOH) for the University of the Witwatersrand during 2003. Twenty candidates sat for the examination, and all succeeded in obtaining the Diploma. These candidates were drawn from six of the nine national provinces, with one each from Namibia and Zimbabwe.

Staff of the section contributed to training workshops on biological monitoring and hazardous chemicals held at various venues.

Prof Cantrell was involved also as visiting lecturer on DOH programme at the University of Pretoria. He also tutored undergraduate medical students on factory visits and acted as examiner for the MBChB IV exams.

#### ***PRESENTATIONS***

The Section continues to co-ordinated educational and fact-finding visits to the NIOH. Postgraduate student groups from three universities, technikon students from three of the northern provinces, and occupational health

nurses in training were introduced to the scope of services offered by the NIOH.

NIOH and the range of activities carried out by the scientific and technical sections. The Resource Centre staff co-ordinated an exhibition stand at the annual NOSHCON conference at Sun City. This is a prestige event attended by leading OH&S practitioners, and the services of the NIOH were promoted on this occasion.

### ***TRAINING & PRESENTATIONS***

**Prof Cantrell** was a **Visiting Researcher** at the Alice Hamilton Laboratory, NIOSH at Cincinnati, Ohio in terms of the Memorandum of Understanding between the NIOH and NIOSH. He spent six weeks doing field work on Health Hazard Evaluations with NIOSH staff.

He contributed to teaching on the **Introduction to Occupational & Environmental Toxicology: A Certification Course** at the University of the Witwatersrand, 4-8 Aug 2003.

He was invited by the **Sri Ramachandra Medical College & Research Institute** and the **Manali Petroleum Industries Association** to present a Training Programme on Applied Chemical Safety. October 2003, Manali, Chennai, India. During this visit also, he addressed the **Safety Engineers Association of India [Chennai Chapter]** on Occupational Health & Safety in SA..

### ***INTERNATIONAL ACTIVITIES***

Members of the Section took part in a **Planning Meeting on the Information Strategy for the WHO/ ILO Joint Effort**, Johannesburg, 23-24 Oct 2003.

### ***SCIENTIFIC & TECHNICAL STAFF***

AC Cantrell	<b>Head:</b> PhD, COCOH
L Darwin	BSc (Hons)
S Mabona	Library Messenger
KM Hlazana	Senior Network Controller
N Malao	BBibI
T Papo	BSc (Hons)
EK Semanya	Operator
NE Sesoko	BA (Hons)

## CHAPTER IV

### TOXICOLOGY & BIOCHEMISTRY RESEARCH

Research in biomarkers has continued in the Toxicology & Biochemistry Research Section with the addition of a new project to investigate the possible biomarkers of silicosis. In addition, a second new project was added to investigate the surface properties of silica dust collected from South African gold mines.

#### **TEACHING AND TRAINING**

- ❖ **Training of Technikon students:** The Toxicology and Biochemistry Research trained 11 intern students from Technikons during 2003.
- ❖ **Toxicology Teaching Courses:** A new certificate course on “Introduction in Occupational and Environmental Toxicology” has been introduced and presented at the University of the Witwatersrand.
- ❖ **Training students on specific projects:** Training of four students on three specific projects has continued with funds obtained from the WHO.
  - **C Sifile, M Malema** - *Are there sufficient effective programmes in place for the prevention and eradication of silicosis in the pottery industry in South Africa?*
  - **K Thukhutha:** *Glue sniffing in street children,*
  - **T Molefe:** *Health effects of occupational exposure to pesticides.*
- ❖ **Ad hoc training:** Dr Gulumian gave tutorials to 5 Honours students from the Department of Haematology & Molecular Medicine, University of the Witwatersrand.

#### **SERVICE PROVISION**

Established methodologies were used to provide service in the assessment of the toxicology and genotoxicity of medicinal plants investigated at the University of Pretoria. In addition, the levels of DNA damage were investigated in scleroderma patients using the Comet assay.

#### **RESEARCH**

##### ***Mineral dusts and fibres:***

- The investigations by S Makhubela on the increased predisposition to *Mycobacterium tuberculosis* infection following exposure to silica were completed and a thesis was submitted.

- M Semano has continued her investigations on the surface activity of particles collected from a number of gold mines in South Africa. Work on WHO-funded project investigating the programmes in place to eradicate silicosis in the pottery industry has continued.

**Pesticides:** X Masoka has continued the laboratory testing of the genotoxicity of DDT and its metabolites. A WHO sponsored programme to assess health effects of pesticides was completed.

**Toxic Metal Ions:** Work on the speciation of manganese in biological fluids continued in collaboration with the Department of Chemistry, University of the Witwatersrand.

**Solvents and Glue sniffing:** A very successful workshop was organized.

### **PUBLICATIONS**

**Gulumian M, Semano M** (2003). Surface activity of silica particles: an important parameter in dose-response relationship. *Occup. Health SA* 9 (4): 10-15.

**Schukla A, Gulumian M, Hei T, Kamp D, Rahman Q, Aust A, Mossman B** (2003). Multiple roles of oxidants in the pathogenesis of asbestos-induced diseases. *Free Radic. Biol. Med.* 34: 1117-1129.

### **PUBLISHED ABSTRACTS**

**M Gulumian.** (2003) Research in occupational health in general and in occupational toxicology in particular in South Africa: Past achievements and future challenges. *Comm Chinese Toxicol* 7 (4): 17.

### **REPORTS**

**Thukhuta KM, Gulumian M.** Glue sniffing amongst SA street children. Technical Report, WHO, 2003.

**Sifile LC, Gulumian M.** Are there sufficient and effective programmes for the elimination and eradication of silicosis in the pottery industry in South Africa? Technical Report, WHO, 2003.

### **REPORTS FOR NATIONAL DIPLOMA AT DIFFERENT TECHNIKONS**

As part of their training, Technikon students produced 11 technical reports under supervision.

**F Babha** Optimization experiments for the measurement of phagocytosis of fluorescent beads by MNC using the fluorescent spectrophotometer (National Diploma, Vaal Technikon, 2003).

**M Malema** Identification and quantification of mineral particle induced lipid peroxidation products in liquid, solid and gas phases using GC-MS (National Diploma, Wits, 2003).

**M Maraba** The effect of silica and BCG on intracellular glutathione and the expression of CD69 in human monocytes and lymphocytes (B Tech, Vaal Triangle, 2003).

**K Molefe** Determination of HDI monomers and oligomers in samples collected from spray painting industry (Diploma, Technikon Northern Gauteng, 2003)

**T Molefi** An in vitro assessment of DNA damage in MNC treated with DDT and its metabolites (National Diploma, 2003).

**B Molo**i Extraction of RNA from lung tissues and whole blood (National Diploma, Vaal Technikon, 2003).

**A Motsepe** Method development, optimization and measurement of manganese bound to serum protein fractions using AAS. (National Diploma, Wits Technikon, 2003)

**L Mugivhi** Method development, optimization and determination of iron content in manganese binding protein fractions using AAS (National Diploma, Vaal Technikon, 2003).

**K Nombelani** Method development, optimization and determination of HDI monomers and oligomers (Diploma, Vaal Technikon, 2003)

**T Radebe** Assessment of DNA damage in human peripheral blood MNC treated with silica and BCG (National Diploma, Vaal Technikon, 2003).

**C Sifile** Measurement of lipid peroxidation using a fluorescent probe, diphenyl-1-pyrenylphosphine (B Tech, Wits Technikon, 2003).

### **CONFERENCE PRESENTATIONS**

**L Darwin, J Murray, G Nelson, V Castranova, V Vallyathan, K Donaldson, M Gulumian.** Biomarkers for prediction and early detection of pneumoconiosis. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg

**M Gulumian.** Mineral particles as environmental mutagens and carcinogens. PAEMS Fourth International Meeting, PAEMS 2003, 2-7 March 2003, Ain Shams University, Cairo, Egypt.

**M Gulumian** Mineral particles as environmental and industrial Pollutants: Mechanisms of toxicity, 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**M Gulumian.** Research in occupational health in general and in occupational toxicology in particular in SA: Past achievements and future challenges. 5th CTDC, Guilin China, 10-16 November, 2003.

**M Gulumian, M Semano.** Surface activity of silica particles: an important parameter in dose-response relationship. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**S Makhubela, M Maraba, C Sifile, M Radebe, M Mamburu, M Gulumian.** The effect of in vitro co-exposures to crystalline silica and BCG on human MNC. PAEMS Fourth International Meeting, PAEMS 2003, 2-7 March 2003, Ain Shams University, Cairo, Egypt.

**M Malema, C Sifile, M Gulumian.** Are there sufficient and effective programmes in place for the prevention and eradication of silicosis in pottery industry of South Africa? 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**M Mamburu, C Sifile, M Maraba, T Radebe, S Makhubela, M Gulumian.** Measurement of reactive oxygen species and lipid peroxidation in human peripheral blood mononuclear cells using fluorescent probes. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**X Masoka, T Molefe, A Masike, L Mashigo, M Maraba, S Makhubela, M Gulumian.** Effect of smoking on DNA damage and intra-individual variation in DNA damage in human mononuclear cells. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**X Masoka, T Molefe, A Masike, K Thukutha, L Mashigo, M Maraba, M Gulumian.** Determination of basal level DNA damage in human mononuclear cells from an “unexposed” African population using the Comet assay. Comet assay workshop. Aberdeen, UK. August 29-30 2003.

**M Semano, A Motsepe, Gulumian.** Manganese binding proteins in human serum. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**KM Thukutha, K Siziba, M Gulumian.** The extent and nature of glue sniffing amongst the South African street children: the toxic ingredients in glues and their health related effects. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

**M Vetten, L Bornman, M Gulumian.** Assessment of toxicity assays employed to evaluate complex groundwater contamination. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

#### ***INVITED LECTURE***

**M Gulumian** Mineral particles as environmental and industrial pollutants: Mechanisms of toxicity, 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand Medical School, Johannesburg.

#### ***TRAINING OF STAFF***

**M Semano.** Performance & Development Workshop: Pretoria Training Department. Pretoria. 28 Feb 2003.

**M Semano, X Masoka.** GC and HPLC Column Seminar: Agilent Technologies and Chemetrix. 24 Jul 2003. CS Holdings, Midrand.

**M Semano, X Masoka.** Chemetrix GC-MS and LC-MS Seminar: 28 Oct 2003. CS Holdings, Midrand.



**SCIENTIFIC STAFF**

M Gulumian	<b>Head:</b> MSc, PhD
X Masoka	BSc Hons
M Semano	MSc

## CHAPTER V

### ANALYTICAL SERVICES

#### INTRODUCTION

Analytical Services continued rendering specialized analytical services in environmental and biological monitoring, during 2003, in support of occupational and environmental health in private enterprises and the public sector. The section supported research projects of national importance, by providing analytical capacity and continued the quality assurance scheme for blood lead and cadmium for laboratories countrywide.

#### ANALYSES CONDUCTED

Samples submitted during the year for analysis were mainly on blood, urine, tissues, bulk, filters, water, soil and on charcoal absorption tubes. Analyses included assays on toxic metals mainly for lead, cadmium, mercury, manganese, copper, zinc, nickel, chromium and aluminium, vanadium, uranium, cobalt, molybdenum and antimony in biological and air samples. Organic assays included RBC and plasma cholinesterase, acetic acid, trichloroethylene, trichloroacetic acid, mandelic acid, toluene, styrene, phenol, o-cresol, MEK, MIBK, N-methylformamide, methanol, ethylene oxide, methyl chloride and xylene in biological and air samples.

#### NEW DEVELOPMENTS

One of the key functions of Analytical Services is to expand analytical capacity to meet the requirements of the Hazardous Chemical Substances Regulations. A number of new methods introduced during the year included mercury in soil, filters and water samples, antimony and molybdenum on filters and also vanadium and cobalt in urine and blood samples. A new method was developed, with shorter digestion time, to measure mercury in blood samples. In Organic Chemistry, new methods introduced were N-dimethylformamide, methyl chloride, xylene, methyl chloroform, and styrene in biological and air samples.

The total number of samples received in the Organic Chemistry laboratory increased from 280 samples in 2002 to 2519 samples in 2003, a nine fold increase in samples analyzed.

All the staff continued preparing the laboratory for SANAS ISO 17025 accreditation.

#### RESEARCH

- Phase III of the collaborative project with the SA Medical Research Council entitled ***A cross-sectional comparative study of childhood blood and environmental levels of lead and manganese in urban,***

**informal and rural areas of SA** was completed in 2003. All the environmental and biological samples were analyzed by Analytical Services.

- o Analytical Services analyzed ethylene oxide in samples generated during the following projects: ***The airborne concentration of ethylene oxide (EO) in public hospitals in Gauteng Province, SA*** and ***Occupational exposure to ETO in women sterilizing staff working in Gauteng Province, SA: Exposure assessment and association with adverse reproductive outcome.***

## **PUBLICATIONS:**

**Mathee A, Rollin HB, Ditlopo NN, Theodorou P.** (2003) Childhood lead exposure in SA. S Afr Med J 93(5): 313.

**Myers JE, Thompson ML, Naik I, Theodorou P, Esswein E, Tassell H, Daya A, Renton K, Spies A, Paicker J, Young T, Jeebhay M, Ramushu S, London L, Rees DJ.** (2003) The utility of biological monitoring for manganese in ferroalloy smelter workers in SA.. Neurotoxicology 24(6): 875-83.

**Myers JE, Thompson ML, Ramushu S, Young T, Jeebhay MF, London L, Esswein E, Renton K, Spies A, Boule A, Naik I, Iregren A, Rees DJ.** (2003) The nervous system effects of occupational exposure on workers in a SA manganese smelter. Neurotoxicology 24(6): 885-94.

**Myers JE, te Water Naude J, Fourie M, Zogoe HB, Naik I, Theodorou P, Tassel H, Daya A, Thompson ML.** (2003) Nervous system effects of occupational manganese exposure on SA manganese mineworkers. Neurotoxicology 24(4-5): 649-56.

**Rollin HB, Mathee A, Wewers F, Theodorou P, Levin J.** (2003) Comparison of blood and environmental manganese levels among school children in two South African cities. Epidemiology 14(5): S19, abstract.

## **OTHER ACTIVITIES**

A seminar titled ***Biological Monitoring in Occupational Health*** was organized in Bloemfontein in May 2003. It was attended by 100 provincial occupational health co-ordinators, labour and university staff from the Occupational Health Department..

## **STAFF DEVELOPMENT**

Mrs Naik and Mrs Channa visited the Institute for Occupational Social & Environmental Medicine, Biological

Monitoring Laboratories in Erlangen, Germany in November 2003.

Mrs Naik and Mrs. Theodorou attended the GCLP course offered by NHLS in October 2003.

Mr Mokoena attended a one week course on ICP-OES in Stellenbosch in December 2003.

Mrs Theodorou and Ms Graf attended a two day course on sample preparation in Pretoria in October 2003.

Four students from the Analytical Chemistry Department at the Technikon Witwatersrand and Vaal Technikon completed their one year in-service training in the section.

## STAFF APPOINTMENTS

- Mrs. Tassell was appointed as a laboratory manager and Ms Graf was promoted to Chief Medical Technologist.
- Mrs Khoosal was transferred from Pathology to Analytical Services and commenced duties in November.

## SCIENTIFIC AND TECHNICAL STAFF

I Naik	<b>Head:</b> Dip Med Tech (Chem Path, Micro & Haem) MSc DOH
K Channa	<b>Head Organic Tox:</b> MSc
C Graf	NHD Med Tech
N Khoosal	Dip Med Tech
LK Mokoena (Medical Technologist)	Dip Biotech
H Tassell	<b>Lab Head:</b> Dip Pharm Tech
P Theodorou	<b>Head QA:</b> BSc Hons

## CHAPTER VI

# OCCUPATIONAL MEDICINE

The Occupational Medicine Section continued with its core functions of conducting research, providing advisory services and doing health hazard evaluations (HHEs). It also provided education and training to occupational health practitioners. In addition, clinical and radiological services were provided and assistance was given in the processing of compensation claims.

### **RESEARCH**

**924401: *A review of cases of asbestosis diagnosed at the National Institute for Occupational Health's Occupational Medicine Referral Clinic from January 1980 to March 2000.*** The project has been completed. A paper has been accepted for publication in the South African Medical Journal.

**924703: *An ergonomics audit in South African public hospitals.*** The project was initiated by the then Chief Director: Non-personal Health Services, Mr. G Sekobe. The objectives of the study are to evaluate the status of ergonomics practices in hospital wards. The target wards will be the intensive care unit, emergency unit, orthopaedics and medical wards. Another objective is to make ergonomics recommendations on how to improve the health status and efficiency of female nurses. This project will be done using a postal survey, which will utilize a "self-reporting" questionnaire to gather information. The proposal which was compiled by Ms Dyosi and Ms Mufamadi, was submitted to the Research Committee in September 2003. Ms Mufamadi left the NIOH in December. Currently Ms Dyosi is editing the proposal by changing the approach of the study according to the comments made by the Research Committee. The revised proposal will be submitted to the Research Committee in September 2004.

**924704: *World Health Organisation and International Council of Nurses Project on: Prevention of needle stick injury and transmission of HIV in health care workers.*** This is a collaborative project involving the World Health Organisation (WHO), International Council of Nurses, Department of Health, Democratic Nurses Organisation of South Africa and the National Institute for Occupational Health. It is being conducted at Pretoria Academic Hospital and Skinner Street Clinic in Pretoria. The project is piloting the effectiveness of training health care workers in following safe procedures when handling sharps during injections. The training material is contained in a toolkit which was developed by the Blood Safety and Clinical Technology ***Safe Injection Global Network alliance at WHO.*** The main aim of the pilot project is to prevent needle stick injuries which have the potential to transmit infections such as hepatitis B, hepatitis C and Human Immunodeficiency Virus.

**925401: *South African Musculoskeletal Occupational Surveillance Action (SAMOSA) Group: A pilot study of upper limb work-related musculoskeletal disorders in Gauteng Province.*** SAMOSA involves the monthly

reporting of all new cases of work-related upper limb musculoskeletal disorders by occupational health practitioners. The information collected is used to identify jobs and industries with high risk factors for the development of work-related upper limb musculoskeletal disorders. The industries with high risk factors are helped to control ergonomic hazards that contribute to the development of work-related upper limb musculoskeletal disorders. An important spin off from the SAMOSA project was the establishment of the SAMOSA referral clinic for upper limb musculoskeletal disorders. The clinic is conducted once a month by Dr Stuart. The first cases were seen in the clinic in March 2003. The main aim of the clinic was to establish the diagnosis and work-relatedness of upper limb musculoskeletal disorders and also to help companies to prevent and control these disorders by offering them advice. From March to November the clinic got bookings for four months (March, April, May and July). In the other five months no bookings were received. A total of 10 workers were assessed in the period of four months. Recommendations were made to the workplaces which included relocation to a lighter job. The confirmed cases were submitted for compensation.

Because of the small number of SAMOSA reports received by the end of 2002, a renewed effort to recruit reporting members and promote SAMOSA was embarked upon at the beginning of 2003. More than 400 occupational health practitioners were telephoned in January 2003. They were asked if they were aware of SAMOSA. If not, an explanation of what SAMOSA is was given and they were asked if they wanted to be reporting members to SAMOSA. This resulted in 200 occupational health practitioners being recruited to report to SAMOSA.

The major success of the project was being able to train 160 occupational health practitioners on the recognition and diagnosis of upper limb musculoskeletal disorders during workshops conducted in 2002 and 2003.

In the Board of Directors meeting, it was agreed that a lot of work had gone into SAMOSA and therefore, work should be continued for another year. One of the suggestions was to select a particular industry from the available data, for instance hospitals, where a survey/s can be carried out to determine the prevalence of musculoskeletal disorders and associated ergonomics risk factors. A proposal for a hospital survey has been written.

### ***HHEs AND OTHER SERVICES***

**The mobile X-ray van** was used in factory surveys conducted at four independent workplaces. The workplaces comprised a power station, a ferrous foundry, and factories in the packaging and gypsum industries. In each of these these surveys workers exposed to silica and asbestos dusts were investigated for radiographic changes in the lungs.

**Occupational Radiology Services:** Prof Solomon was involved in reading and reporting of chest X-rays and consultations for the NIOH clinic. He also was involved in reading x-rays for Anglo American Coal, Goede Hoop

Colliery, Inteohm Insulators, Iscor - Vereeniging, Federated Employers, Ergo, Fosco SA, DGMS Health Centre, Tshwane Municipality, Barlow Rand, Columbus Highveld Steel and the Nelson Mandela School of Medicine.

**Prof Davies** continues to run clinics around Limpopo Province to assist ex-miners who have asbestos related diseases to apply for compensation.

### ***TEACHING AND TRAINING OF MEDICAL PRACTITIONERS***

Diploma in Occupational Health: Prof Solomon, Ms Nyantumbu and Dr Kgalamono participate regularly in teaching for the University of Witwatersrand and the University of Pretoria.

Masters in Public Health: Ergonomics Module for the University of Witwatersrand.

University of KwaZulu-Natal: Ms Nyantumbu was asked to give a presentation on Ergonomics to the Diploma in Occupational Health students

X-Ray Teaching: This was done every Thursday at the Department of Radiology, Johannesburg Hospital. Open weekly sessions were also run at NIOH every Friday. Topics and cases discussed were based on occupational health cases - NIOH and MBOD.

Presentations: Friday morning presentations to Metro Local Clinic doctors and nurses on various aspects of occupational health.

Presentations were given to hospital nurses at two academic hospitals on Latex Allergy in Health Care Workers

Training was provided to CSIR, MBOD and NIOH staff on Hand Arm Vibration Syndrome as part of technology transfer.

### ***WORKSHOPS AND SEMINARS***

**Latex Allergy:** These were offered to nurses at the Johannesburg Academic Hospital to raise awareness about latex allergy and answer question related to prevention and compensation.

**HIV / AIDS in the Workplace workshop:** This informative workshop drew expertise from different companies like Anglo Gold (mining), Daimler Chrysler, Lifeworks, Soul City and Unilever. HIV/AIDS is topical and most companies are involved in programmes to deal with the problem. The aim of the workshop was to impart practical knowledge to participants through discussion of successful programmes running in a variety of settings.

**SAMOSA Workshops:** These workshops provided special hands–on training to occupational health nurses and doctors to promote understanding, recognition and diagnosis of work-related upper limb musculoskeletal disorders at their workplaces.

**Workshop on Occupational Health** topics was held at St Benedictine Hospital, KwaZulu-Natal Provincial unit at their request. The Occupational Medicine and Immunology sections gave presentations on ergonomics, occupational dermatitis, latex allergy, legionella, hazardous biological agents (new legislation) and musculoskeletal disorders.

### ***OCCUPATIONAL MEDICINE REFERRAL CLINIC***

Two hundred and eighty one workers were assessed at the Occupational Medicine Clinic in 2003. The most common diagnosis was occupational asthma. Latex allergy, byssinosis, silicosis, pleural plaques, mesothelioma, asbestosis, tuberculosis and respiratory conditions due to the inhalation of chemical, gases, fumes and vapours were also diagnosed.

**Compensation:** Eighty five cases were submitted to the COID Act Compensation Commissioner. They are presented in Table 1.

**Table 1: Cases submitted for compensation**

<b>Occupational Disease</b>	<b>Cases</b>
Asbestosis	18
Asthma	22
Broncho-pulmonary disease	2
Latex allergy	3
Mesothelioma	2
Tuberculosis	1
Laryngeal cancer	1
<b>TOTAL</b>	<b>85</b>

### ***PUBLICATIONS***

**Solomon A, Rees D, Felix M, Venter E** (2003). Silicosis and tuberculosis. Silicosis and concomitant tuberculosis: the radiologists enigma. A proposed radiographic classification of tuberculosis to accompany the ILO International Classification of Radiographs of pneumoconiosis. *Occup. Health SA*: 9(4) 4-9.



**Solomon A, Venter E** (2003). Radiological tuberculosis lung scarring – the ignored hazard. *Occup. Health SA*: 9(6) 22-23.

**Venter E, Solomon A** (2003). The mobile X-ray caravan: an important contributor to monitoring workers' health in foundries. *Occup. Health SA*: 9(3) 14-16.

### **CONFERENCE ATTENDANCE AND PRESENTATIONS**

**Nyantumbu B, Dias B, Kgalamono S, Phillips J.** *The occurrence of Hand Arm Vibration Syndrome in South African miners.* Oral presentation. 18th Biennial Congress of the S.A. Rheumatism and Arthritis Association, 10 May 2003

**Nyantumbu B.** *The occurrence of Hand Arm Vibration Syndrome in South African miners.* Poster Presentation. University of the Witwatersrand, School of Public Health Research Day, 14 May 2003

**Nyantumbu B.** Conference attendance. NOSHCON Sun City, 24 – 27 June 2003

**Kgalamono S, Rees D, Kielkowski D.** *Review of asbestos exposure in cases of non-mining asbestosis presenting to the NIOH Occupational Medicine Clinic.* Poster presentation. Dare-t-Care Pulmonology Conference, Cape Town, 24 – 28 August 2003

**E Venter, A Solomon, S Kgalamono, B Nyantumbu, B Mashitisho, B Mota, F Penxa.** *Radiologic survey of four foundries in Gauteng.* Poster presentation. Dare to Care Pulmonology Conference, Cape Town, 24 – 28 August 2003

### **CONTINUING EDUCATION**

**du Preez D** attended a Microsoft Excel 2000 Intermediate course at SITA.

**Kgalamono S, Mashitisho B, Nyantumbu B** attended a short course on Teaching Role at the University of the Witwatersrand, 25 – 27 February 2003.

**Mashitisho B** attended occupational health modules at the University of Pretoria.

**Nyantumbu B** attended a workshop at St Benedict Hospital, Kwazulu Natal 14 – 15 October 2003.

**Nyantumbu B** attended a WHO Needlestick Injury Workshop in Geneva, Switzerland 1 - 3 October 2003

**Nyantumbu B, Dyosi S** attended SIMRAC Launch - Health 806 at Gold Fields Academy, 29 August 2003

**Nyantumbu B, Mashitisho B, Kgalamono S, Dyosi S** attended an Epi Info 2002 short course at the School of Public Health, University of the Witwatersrand, 24 July 2003

***SCIENTIFIC & TECHNICAL STAFF***

JCA Davies	MBBS, DPH, FFPHM, FFOM (supernumary)
S Dyosi	MSc Biochem, MSc Ergonomics
DR du Preez	Admin Clerk
MA Felix	MBBCh, DOH, PhD
S Kgalomono	B Cur, MBBCh, DOH
Mashitisho B	MBBCh
B Mota	Admin Clerk
B Nyantumbu	MSc (Med), DOH, Adv Dip Occ Safety Hlth, Cert Ind Erg
A Solomon	MBBCh, MMed (Rad), FC (Rad)
E Venter	MSc

## CHAPTER VII

# EPIDEMIOLOGY & SURVEILLANCE

As in previous years our main activity was surveillance, research and teaching occupational epidemiology. The emphasis was on operational research. The Section lost two experienced staff members, which delayed completion of some projects. Two projects have been initiated in the hospital industry viz. Tuberculosis Surveillance, and the Ethylene Oxide project to quantify exposure and investigate reproductive outcomes in the sterilizing units in public health hospitals in Gauteng.

### **SURVEILLANCE**

- ***SORDSA-Surveillance of work related & occupational respiratory disease in South Africa***

The SORDSA programme continued for the seventh year. The number of cases reported by 2003 was 7717, but the number of participating doctors is shrinking. A major review of the programme was discussed and plans are underway to revive reporting to the programme.

- ***SAMOSA – South African Occupational Musculoskeletal Disorders Surveillance Action Group***

Additional workshops were held to train occupational health nurses and doctors in the recognition of musculoskeletal disorders of the upper limbs. Approximately 200 occupational health practitioners underwent training. The programme, however, received only a few cases reported by a handful of practitioners. This is not satisfactory but surveillance will continue for another year.

- ***TB surveillance***

This is a collaborative project with the National TB Programme of the Department of Health. Approximately 300 cases were reported to the programme by Provincial TB coordinators. Data are being analyzed for publication in a NIOH report due for publication in 2004.

### **RESEARCH**

- ***Ethylene oxide exposure in public hospitals***

This is a collaborative project with the Occupational Hygiene Section. Five of ten hospitals in Gauteng use ethylene oxide sterilization for heat sensitive materials. A survey was carried out to characterize ethylene oxide exposure in sterilizing units. A total of 318 samples was collected, of which 97 were personal samples and 221 static measurements. The ethylene oxide content was analyzed by the Analytical Services section of the NIOH. In

five hospitals levels were low or undetectable. In four academic hospitals high levels were detected for both personal and static samples. These values fell within the local Occupational Exposure Level [OEL], but significantly exceeded Permissible Exposure Levels [PELs] set by OSHA.

### ***Provision of Occupational Health Services in Industry***

A mail survey was conducted on request of the Department of Health to determine the provision and content of health services in different types of industries. Questionnaires were sent to 1 800 randomly selected industrial concerns. The response rate of approximately 30% was poor, and data collection has closed. Analysis has to be carried out before the report can be written. This project will also be greatly affected by staff turnover.

### ***TEACHING***

Ms Calverley again coordinated the occupational health component of 16 factory visit tutorials and end of year examinations for 250 Fourth Year MBChB students of the University of the Witwatersrand.

**Dr Kielkowski** and **Ms Calverley** lectured on the Diploma in Occupational Health postgraduate course and the Master in Public health courses. This work involved supervision of epidemiology projects and case studies, the setting of examination papers and marking. **Ms Chauhan** facilitated tutorial groups. **Dr Kielkowski** supervised one PhD and two MSc students.

### ***RESEARCH***

- Data have been collected for the updating of the Occupational Health Indicators Report and work continued on the Occupational Health Atlas Report. These reports have been delayed due to staff shortages.
- A new research project to determine adverse reproductive effects in women working in sterilising units and exposed to ethylene oxide was launched. This is the first occupational epidemiological study in South Africa looking at adverse reproductive health of health care workers.
- New questionnaire tools to measure reproductive effects were tested in South Africa and validated against hospital records. The results will be published shortly.

### ***STAFF TRAINING AND DEVELOPMENT***

- Members of staff attended Epi-Info 2002 software training at the School of Public Health, University of the Witwatersrand.
- Mondli Govuzela completed the first year, and Shobna Chauhan the second year of the MSc (Med.) Epidemiology & Biostatistics degrees at the University of the Witwatersrand.

### **PRESENTATIONS**

- **AE Calverley, J Murray.** South Africa's Treasure Chest - Pandora's Box for Health? 9th International Inhalation Symposium, 11–14 June 2003. Hannover, Germany
- **D Kielkowski** Respiratory diseases reported to SORDSA 2000-2002. **Dare to Care Conference** 25-29 August 2003 in Cape Town.

### **PUBLICATION**

**Kielkowski D, Esterhuizen T, Duma T** (2003). Respiratory disease reported to SORDSA from 2000 – 2003. S Afr Resp J. 9: 96.

### **SCIENTIFIC & TECHNICAL STAFF**

D Kielkowski	<b>Head:</b> PhD, AIMLT
A Calverley	MSc
S Chauhan	BSc Hons
MH Govuzela	BSc Hons
S Pitso	Data Capturer
F Penxa	Data Capturer
T Duma	Nat Dip Admin (SORDSA)

## CHAPTER VIII

# IMMUNOLOGY & MICROBIOLOGY

The Immunology & Microbiology Section continued with its core functions of service provision, research and training in the field of occupational health for sectors of the South African workforce in 2003. The Section's main areas of interest are occupational allergies, waterborne pathogens and bioaerosols. The Section expanded in the latter part of 2003 to include a new unit, the Bioaerosol Monitoring Unit. This was developed to build capacity in the Section to investigate problems related to aerosolised biological particles causing both allergies and infections in the workplace.

### SERVICE PROVIDED

- ***Occupational Allergies***

A summary of the tests of sensitisation that were done are skin prick tests (SPT) (34), patch tests (45), radioallergosorbent assays (RAST) (20). In summary, SPT results showed that sensitivity to grains, particularly flour in the bakery industry, and latex among health care workers were common. Patients that were patch tested were mainly from the mining industry. Common allergens apart from the European Standard Series were from the Rubber Series and Metal Working Oils, followed by nickel sulphate. Approximately 50% of patients tested with the rubber series were positive. On the basis of the results from the various tests of sensitisation, recommendations were made to employers to modify workplace activities or change PPE for those affected so as to avoid or reduce the levels of exposure that could lead to occupational disease. An awareness programme was initiated to promote awareness of latex sensitisation among health care workers.

- ***Waterborne Microbial Pathogens***

Services generated in this area of speciality included the analysis of 40 samples for Legionella bacteria. Recommendations were made to companies when the results were positive so that the appropriate actions could be instituted.

- ***Bioaerosols***

Services for the Bioaerosol Monitoring Unit took the form of fungal and bacterial tests (174). The Unit investigated a possible Legionnaires' disease case. The individual worked in a dental setting and was re-infected with Legionella after two years. Air samples were processed for Legionella. The results were communicated with the Environmental Health Officers of that Region who investigated further. A survey for suspected bioaerosol exposure in an office building was conducted. The results were communicated to a contracted hygiene company who made the final recommendations.

### TRAINING & DEVELOPMENT

- Tanusha Soogreem gave a presentation on the *Buzz about Bioaerosols* to a group of occupational health nurses in North West Province. She is actively involved in training in-service students in the Section, preparing them for employment in laboratory based research facilities.
- Anna Fourie presented on contact dermatitis at the following venues: Pretoria, North West Province and Nongoma. A latex presentation was given at the above venues as well as at the University of the Witwatersrand. She also attended an allergy update course. A visit to Crocodile River Mine was undertaken in conjunction with the Section's external advisor to promote awareness.
- Zubaydah Kirsten gave a presentation entitled ***Latex Update*** to occupational health nurses and health and safety representatives at a public sector hospital in the Northern Province.
- Delene Bartie presented on Legionella to occupational nurses in Nongoma, KwaZulu-Natal. A presentation on Hazardous Biological Agents was given to students registered for the Masters in Public Health. She is also involved in training in-service training students in the field of microbiology. She has also assisted two students with protocol development, and also gave a presentation on the services offered by the Section to visiting nursing students.

#### **LEGIONELLA ACTION GROUP (LAG)**

The Group's main objective is to promote awareness of Legionella in South Africa. Mrs Soogreem is the chairperson of this Group, and an active member, and responsible for the Group's website. She, with Delene Bartie, is involved in organising the Terminators Conference for 2004.

#### **RESEARCH PROJECTS**

##### ***923105 The pro-inflammatory effects of platinum in human neutrophils in vitro:***

**G Ramafi, R Anderson, A Theron and Z Kirsten.** This is a collaborative project by the NIOH and the Immunology Department at the University of Pretoria.

Platinum allergy in refineries is well documented. Inhalation of platinum salts during industrial processing of this metal may result in the development of respiratory symptoms, including sneezing, lacrimation, rhinorrhea, cough and asthma. Asthma is believed to result from both IgE and cell mediated immune responses to platinum, although specific sensitisation to this metal has been difficult to establish.

It is therefore the aim of this study to investigate the effects of platinum on various pro-inflammatory activities of neutrophils in order to understand the mechanism by which platinum sensitises the airways. Is it IgE-mediated or due to a non-specific irritant mechanism or to both of these? The project is ongoing.

- ***923503 Sensitization to maize in workers in the maize milling industry:***

**D Bartie, G Ramafi** - Grain dust is complex in nature and specific allergens in the grain milling industry are difficult to identify. It is well known that exposure to grain dust in general increases the risk of respiratory diseases but very little has been published on the specific respiratory health effects of maize (corn). The aim of the study is to investigate the role of tests of sensitisation to maize and common allergens in predicting maize-related respiratory disease, and the role of these tests in monitoring exposed workers. The project is ongoing.

▪ **923402 Occupational allergy in workers exposed to soybeans: N Mansoor,**

**A Fourie, D Rees, D Kielkowski** - The subjects of this study were workers exposed to soybean material at a processing plant in the North West Province. The project is ongoing.

#### CONFERENCES ATTENDED

- **Grace Ramafi** gave a presentation entitled **The pro-oxidative interactions of platinum with human neutrophils in vitro** at the 1st WOREAL Congress in Helsinki, Finland, 9-12 July 2003.
- **Tanusha Soogreem** presented at the International Water Association Conference. The presentation was entitled **Pathogenic Legionella species in dental unit waterlines in South Africa**. Cape Town, 15-19 September 2003.
- **Zubaydah Kirsten** attended the NOSHCON conference held at Sun City, Rustenburg, 24-27 June 2003 where she was actively involved in manning the NIOH exhibition stand.

#### WORKSHOPS AND COURSES

A successful workshop was hosted to launch the Bioaerosol Monitoring Unit. The event was held at NIOH on the 13 November 2003. The event was well attended and a great interest was shown, which is promising for the unit.

#### PUBLICATION

**Bartie C, Venter SN, Nel LH** (2003). Identification methods for *Legionella* from environmental samples. Water Res. 37: 1362-1370.

#### SCIENTIFIC & TECHNICAL STAFF

G Ramafi	Head: BSc, PhD
A Fourie	BSc (Lab Med), MSc
D Bartie	ND Med Lab Tech, PhD
O Mabe	BSc Hons
T Soogreem	BSc Hons, MSc (Med)
Z Kirsten	NHD Med Tech, Btech



## CHAPTER IX

### PATHOLOGY

#### **DIAGNOSTIC SERVICES**

In October 2003 the NCOH became part of the National Health Laboratory Service and became the National Institute for Occupational Health. In terms of the Occupational Diseases in Mines & Works Act [Act 78 of 1973], the Pathology section continues to carry out the statutory requirement of examining the cardio-respiratory organs of deceased miners. The post mortem service is utilized by 80% of families of men who die while in mining service. To increase the efficiency of the compensation process, the NIOH, Medical Bureau for Occupational Diseases and Compensation Commissioner for Occupational Diseases are being linked by a web-based computer network. Work on this new system is well under way and the infrastructure is now in place at the three sites. Staff training on the new system has begun and full deployment of the new system will take place in the first quarter of 2004.

The computerized Pathology database (PATHAUT) has made the information derived from the service more accessible. The data reflect disease trends in the mining industry and the database is a national resource. The data base contains unique information about disease trends in the mining industry. It is an important tool for disease surveillance. The data have also been utilized in international collaborative studies. A detailed report of the database giving demographic data and disease rates is produced annually. During 2003, 2318 cases came to autopsy compared with 2529 cases during 2001 and 2518 in 2002. In 2003, the overall disease rate for tuberculosis was 223 per

1000, for emphysema 190 per 1000 and for silicosis 189 per 1000.

The Pathology section is also a national reference centre for lung pathology. Some 470 surgical and cytological consultations were received this year compared with 443 in 2002.

Pathology provides a scanning electron microscopy (SEM) service for occupational disease and environmental monitoring. Tissues, dusts, fumes and fibres are analyzed to determine possible adverse health effects. Analyses are carried out for other sections of the NIOH, other Government departments, as well as private industries and laboratories. In 2003, 384 specimens were analyzed. SEM provides morphological data and this is combined with energy dispersive spectrometry which analyzes the chemical composition of the specimen.

#### **RESEARCH**

Research has benefited from funding by various institutions:

- Colt Foundation, UK
- International Environmental Research Foundation, USA
- National Institute of Occupational Safety & Health, USA
- Safety in Mines Research Advisory Committee, SA

Research continues to be an important focus. The projects are relevant to South African workers and are therefore of national importance. Several of the

projects involve international collaboration with prestigious institutions and scientists acknowledged as leaders in their fields of study. The results of completed studies have been widely disseminated through research reports, publications and regional seminars to the various stakeholders.

### **Major Projects**

- **Trends in the frequency of HIV associated lung infections in South African miners in the 1990's – a population based autopsy series.** With the advent of the HIV epidemic in the 1990's in South Africa, the rate of tuberculosis has increased. As the HIV epidemic matures, other pulmonary infections, which occur with lower CD4 cell counts, have been described in South Africa. There is however, no information on the trend in prevalence of these diseases in the 1990's. This study aims to analyze trends of pulmonary tuberculosis, Pneumocystis carinii pneumonia and Cryptococcal pneumonia diagnosed at autopsy in South African miners and to evaluate the accuracy of the clinical diagnosis of these diseases. The study is being expanded to include Nocardia infections.
- **Process-based performance review for the diagnosis of pulmonary tuberculosis.** A collaborative project in conjunction with Mine Medical Officers, Chris Hani Baragwanath Hospital and the School of Clinical Medicine, Faculty of Health Sciences, University of the Witwatersrand. The purpose of this project is to identify, produce and distribute appropriate material to facilitate implementation of best practice with regards to TB in the mining industry. This project has developed innovative methods and technology to meet the needs of the end-users (doctors as well as allied health care workers such as nurses and laboratory technologists).
- **The adverse health effects of noise and vibration in the South African mining industry.** A collaborative project with the CSIR, Stellenbosch University and the Health and Safety Laboratory, Sheffield, U.K. This project has several thrusts and includes the deployment of a hearing conservation programme at two mines and the follow up of a cohort of gold miners with Hand Arm Vibration Syndrome (HAVS), identified in a previous study. A rapid diagnostic screening tool for HAVS is being developed and the effect of temperature on HAVS is being investigated in a cooler mine. A comparative study of rock drills is being carried out to determine their noise and vibration outputs. These studies along with data on whole body vibration, HAVS and noise induced hearing loss will be made available on an interactive CD.
- **The association between SV40, asbestos and malignant mesothelioma.** A collaborative study with Brooklyn College, City University of New York and the Medical School, Mount Sinai Hospital, New York, USA. The natural hosts of SV40 are Macaque monkeys. SV40 was introduced to the human population between 1955 and 1963 through contaminated polio vaccines. It is known that vaccines produced in the USA and used in the USA and parts of Europe were contaminated. South Africa produced and used its own polio vaccines. Available evidence suggests that these vaccines were free from contamination. SV40 induces malignant mesothelioma in hamsters.

SV40 DNA has been found in patients with malignant mesothelioma in the USA. Simian virus 40 (SV40) has recently been suggested as a cofactor, along with asbestos, in the aetiology of malignant mesothelioma. This project examines the association between asbestos, SV40 and MM.

- **The effect of HIV on morbidity and mortality in South African gold miners: a retrospective cohort study.** A collaborative study with Gold Fields Ltd. the London School of Hygiene and Tropical Medicine and the Clinical Trials Unit, Medical Research Council UK. Most of the information on HIV in developing countries is based on prevalent cases (persons known to be HIV positive, but for whom the date of infection is unknown). In order to have a full picture of the course and impact of HIV, it is important to have information from seroconversion (point of infection with HIV) and to follow individuals over time.

The study is assessing long term survival (10 year follow-up) and sickness in nearly 2000 miners with known dates of HIV infection. The study is using routine records from the mines and the Employment Bureau of Africa, together with field visits to check survival status of those thought to be alive. The death rates, causes of death, time off work, and sickness records of these HIV positive men will be compared with that of HIV negative miners to establish the impact of HIV at different time intervals since infection.

- **Markers for prediction and early detection of pneumoconiosis** The debate regarding the risk

of developing silicosis at various exposure levels continues. Silicosis is the currently used health outcome for silica dust dose-response assessments and clinical detection of is dependent on radiology. Early evaluation of the health outcomes of dust allaying interventions is not currently performed. The use of biomarkers can greatly enhance the process of risk assessment. In the past few years, many aspects of the previously unknown pathological mechanisms in the pathway from silica exposure to the development of silicosis have been elucidated. If scientifically acceptable existing biomarkers for silica dust exposure can be identified, industry could utilize these for the early detection of adverse health effects, rapid evaluation of dust-allaying projects that may be introduced in the near future, and timely implementation of intervention strategies.

The objectives of the project are to:

- Undertake a comprehensive literature survey to identify biomarkers for the early detection and / or prediction of silicosis
- Develop a systematic framework for the evaluation of studies on biomarkers
- Conduct a meta-analysis of data, if appropriate
- Hold a workshop of international experts, to evaluate the potential for conducting a Phase II study.
- Develop an outline of a proposal for a Phase II evaluation of any promising markers(s) identified.

#### **AFFILIATIONS**

The department continues to forge links between the NIOH and scientists and institutions in South Africa

and other countries. National and international institutions and collaborators currently include:

- University of Cape Town: Professor Neil White.
- University of Pretoria: Prof. Brendan Girdler-Brown
- University of the Witwatersrand: Schools of Pathology, Public Health and Clinical Medicine. Profs Charles Feldman, Guy Richards and Mary Ross.
- University of Stellenbosch: Prof W v Niekerk
- CSIR: Mike Franz and Shu Schutter
- Safety in Mines Research Advisory Committee Prof Mary Ross
- Health and Safety Laboratory, and Occupational and Environmental Lung Injury Centre, Sheffield University, UK: Drs A Curran and D Fishwick
- Brooklyn College, City University of New York, USA: Prof R Nolan
- Mount Sinai Medical School New York: USA Prof S Aaronson and Dr J Manfredi
- National Institute for Occupational Health and Safety, USA: Drs L Stayner, E Hnizdo, V Vallyathan, A Weston, V Castronova
- Dokkyo University School of Medicine, Japan: Dr K Honma
- London School of Hygiene and Tropical Medicine: Dr J Glynn, Dr P Godfrey-Fausset, Dr P Sonnenberg
- Clinical Trials Unit, Medical Research Council UK. Dr. Kholoud Porter
- University of Edinburgh Medical School, Edinburgh, UK: Prof K Donaldson
- Institut für Umweltmedizinische Forschung gGmbH, Dusseldorf, Germany Prof P Borm

#### **STAFF DEVELOPMENT**

- Ms Mkhize was awarded her Diploma in Anatomical Pathology Technology in June

2003, from the Royal Institute of Public Health and Hygiene, U.K.

- Mr Vallabh passed his Networking and PC Technologies course at Damelin College in October 2003.
- During 2003 12 staff members attended at least one SITAS computer course.

#### **VISITS/CAPACITY BUILDING**

Presentations were made throughout 2003 to Occupational Health Nurses, the National Union of Mineworkers and SIMRAC.

The following workshops were convened by Pathology staff:

- Two workshops on the subject of Autopsies relating to Tuberculosis
- Hand Arm Vibration Syndrome in the South African Mining Industry
- Noise Induced Hearing loss in the South African Mining Industry
- The application of biomarkers in silicosis

#### **VISITORS**

- Dr Andrew Curran from the HSL, UK visited the section and participated in a workshop on Hand Arm Vibration Syndrome.
- Drs V Vallyathan and V Castronova from the National Institute for Occupational Safety and Health, USA,
- Prof P Borm, Institut für Umweltmedizinische Forschung, Dusseldorf, Germany and Prof K Donaldson, University of Edinburgh Medical School; Edinburgh, UK visited the section and were presenters at two workshops on biomarkers of silicosis.
- Drs P Sonnenberg and J Glynn from the London School of Hygiene & Tropical Medicine visited the section and held meetings concerning their

collaborative research in the field of HIV and tuberculosis.

#### **OTHER DEPARTMENTAL ACTIVITIES**

- The Pathology section continues to host a monthly clinico-pathology meeting with physicians from the Johannesburg area teaching hospitals.
- Registrars from the NHLS serve a rotation period of two weeks at the NIOH as part of their training in lung pathology.
- Dr Murray lectures for the School of Public Health, University of the Witwatersrand and supervises M.Sc students in the School as well as teaching the Diploma in Occupational Health.
- Dr Phillips co-supervised the MSc Thesis of Ms Busisiwe Nyantubu which was awarded by the Faculty of Health Sciences, University of the Witwatersrand in December 2003.
- Dr Murray supervised the MSc thesis of Mr B Sartorius which was awarded by the Faculty of Health Sciences, University of the Witwatersrand in 2003.

#### **INTERNAL REPORTS**

**Murray J, Candy G, Nelson G, Khumalo L.** Pathology Division Report: Demographic data and disease rates 2002. NCOH Report 7/2003

#### **PUBLICATIONS**

**Murray J and Rees D** (2003). Tuberculosis and silicosis in South African gold mining. OSH & Development 5: 2-9

**Phillips J, Dias B, Ross M, Murray J, Curran A** (2003). Whole body vibration in the South African mining industry. Occup. Health SA 9: 4-6.

#### **CONFERENCE PRESENTATIONS**

\* **Calverley A and Murray J.** South Africa's treasure chest – Pandora's Box for health. 9th International Inhalation Symposium, Hannover, Germany, 11 – 14 June 2003.

\* **Candy G, Murray J.** Trends in atheroma diagnosed at autopsy in SA miners 1975 – 2001. 13th congress of South African Hypertension Society. 7-9 March 2003, Johannesburg.

\* **Candy G. Murray J.** Increasing prevalence of coronary artery atherosclerosis in South African black and white miners: NCOH pathology mining autopsy data. 43rd Conference of the federation of South African Society of Pathology. June 2003, Johannesburg.

\* **Darwin L, Murray J, Nelson G, Castranova V, Vallyathan V, Donaldson K and Gulumian M.** Biomarkers for prediction and early detection of pneumoconiosis. 2nd TOXSA and 43rd FSASP Conference 29 June – 1st July 2003, University of the Witwatersrand, Johannesburg.

\* **Honma K, Murray J.** Intrapulmonary lymph nodes in South African miners – An autopsy survey 19th European Congress of Pathology. 6-11 September 2003, Ljubljana, Slovenia.

\* **Murray J.** Beyond silicosis~silica dust exposure and lung cancer. "Dare To Care" Combined Congress of: The SA Thoracic Society, The Critical Care Society of South Africa. 24-28 Aug 2003, Cape Town.

\* **Murray J.** Clinico-Pathological case presentations. "Dare To Care" Combined Congress of: The SA Thoracic Society, The Critical Care Society of South Africa. 24-28 Aug 2003, Cape Town.

\* **Murray J, Nelson G.** Health effects associated with mining and milling of gunerite (amosite) asbestos in South Africa. International Symposium on health hazard evaluation of fibrous particles with mining and milling of grunerite (amosite) asbestos in

South Africa. International Symposium on health hazard evaluation of fibrous particles associated with taconite and adjacent Duluth Complex. 30 Mar–1 Apr, St Paul, Minnesota, USA.

\* **Murray J, Nelson G.** A tale in the tailing. Mine Medical Officers Association, Sixth Annual Congress. 9-11 May 2003, Rustenburg.

\* **Phillips J., Murray J and Nelson G.** Asbestos, Simian Virus 40 and Mesothelioma. Mine Medical Officers Association, Sixth Annual congress. 9-11 May 2003, Rustenburg.

\***Renton K, Garton EA.** Measuring low concentrations of asbestos fibres in environmental air samples from asbestos roofed houses. Environmental Health Risk II. Witpress, www.witpress.com pages 113-120.

\* **White N. Murray J. Nelson G.** South African experience with asbestos related environmental mesothelioma: Is asbestos fibre type important? USA International Environmental Research Foundation; International Symposium on Health Hazard Evaluation of Fibrous Particles Associated

with Taconite and Adjacent Duluth Complex. 30 Mar–1 Apr, St Paul, Minnesota, USA..  
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