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Occupational reproductive health research in South Africa: a neglected area

In 1996, NIOSH, CDC and the United States Department of Health – in NORA (National Occupational Research Agenda) – recognised Reproductive Health as a priority research area needing attention in occupational health research.[1] NORA has been used as a guide in a number of other countries to direct research interests and funding. In a 2002 report, the National Institute for Occupational Health South Africa also identified reproductive health as an important research area in occupational health.[2] These largely stem from the increasing awareness on the effects of workplace exposure on reproductive health. Scientific evidence leaves no doubt that occupational exposure may cause irreversible reproductive health changes in men and women and harm offspring.[3,4]

Research in South Africa into aspects of occupational health has been increasing. One hundred and fifty published papers were identified from 1990 to 2005, but only 28 were on women even though women comprise 50% of the workforce.[5] The areas that have received the most attention include: occupational injuries; musculoskeletal disorders; respiratory ailments such as silicosis, COPD and asthma; and cancers such as mesothelioma. Since the surge of the HIV/AIDS pandemic the health sector has also received considerable research attention.[6,7] Of the 28 studies on women, eight were initiated by NIOH.[5] However, little is known about the effects of local occupational exposures on the reproductive health of the South African population. While many occupational risk factors for adverse reproductive health outcomes are known and many are prevalent in work places, there is limited research in South Africa that has assessed the effect of occupational exposures on reproductive outcomes. Currently only five reproductive health studies have assessed any effects of occupation in South Africa. Two of these studies focused on men, two on women and one on both genders.[8,9,10,11,12,13]

We would like to bring attention to the effect workplace exposures may have on the reproductive health of workers and the need for reproductive health research to be recognised, by researchers and fund-

ing groups, as a priority area of research in occupational health. Increased awareness is needed amongst workers and employers of the effects of occupational exposures on the reproductive health of men and women. Workplace policies need to protect the reproductive health of the workforce. But validated information on which sound policies can be built can only become available from rigorously designed studies on the effect of workplace exposures on reproductive health. Firms and governments should help fund research in this area.

Cooperation between companies and researchers is needed as reproductive health studies are difficult to conduct and require a number of participants with known exposures. Assistance is needed with access to workers and measurement of exposures. But more imperative at this time, are studies to address the dearth of information on population rates for reproductive outcomes which can be used as a baseline for assessing future workplace rates.

We have designed a study to address the lack of information on reproductive rates, including adverse reproductive outcomes, and the effect of some occupational and environmental exposures on these outcomes. This study will include a cross-sectional arm – where women will be randomly selected and surveyed – and a prospective arm where pregnant women will be surveyed. For the cross-sectional arm, information will be collected on reproductive history and their exposures; occupational and to pesticides. For the prospective arm, logistics will be set up in local ante-natal clinics to identify women in their first trimester of pregnancy who will be interviewed and their blood and urine samples collected to measure relevant biomarkers of pesticide, lead and mercury exposure.

This study aims to describe pregnancy, fertility and other reproductive health outcomes in four South African communities and subgroups. Apart from providing rates of adverse reproductive outcomes (including novel outcomes like time to pregnancy, which is a measure of fertility) for the general population and by occupational subgroups, this study will seek to identify significant risk factors in South Africa for these outcomes. Other studies of different designs will also come from the project. With increasing availability of information, it will then become possible to begin to develop workplace policies that will protect the reproductive health of our national workforce and the general health of their unborn children.

"... occupational exposure may cause irreversible reproductive health changes in men and women and harm offspring."

References

1. U.S. Department of Health and Human Services, Public Health Services, Centres for Disease Control and Prevention, National Institute for Occupational Safety and Health. The team document. Ten years of leadership advancing the National Occupational Research Agenda. Washington, DC: DHHS (NIOSH). Publication No. 2006-121.
2. Chauhan S, Sebata T, Kielkowski D, Rees D. Research questions in occupational health in South Africa. Johannesburg: NIOH; 2002. NIOH Report No.1 2002.
3. Brugge D, de Lemos JL, Oldmixon B. Exposure pathways and health effects associated with chemical and radiological toxicity of natural uranium: a review. Rev Environ Health. 2005;20(3):177-93.
4. Zahir F, Rizwi SJ, Haq SK, Khan RH. Low dose mercury toxicity and human health. Environmental Toxicology and Pharmacology. 2005;20(2):351-60.
5. Kielkowski D, Ross M. Occupational health research in South African women. Poster, presented at ICOH June 2006. Milan, Italy.
6. Rabbitts JA. Occupational exposure to blood in medical students. S Afr Med J. 2003;93(8):621-4.
7. Gounden YP, Moodley J. Exposure to human immunodeficiency virus among healthcare workers in South Africa. Int J Gynaecol Obstet. 2000;69(3):265-70.
8. Dalvie MA, Myers JE, Thompson ML, Robins TG, Dyer S, Riebow J, *et al.* The long-term effects of DDT exposure on semen, fertility and sexual function of malaria vector-control workers in Limpopo province, South Africa. Environ Res. 2004;96:1-8.
9. Malaria control and longitudinal changes in levels of DDT and its metabolites in serum from KwaZulu. Bull World Health Organ. 1994;72:921-30.
10. Dalvie MA, Myers JE, Thompson ML, Dyer S, Robins TG, Omar S, Riebow J, Molekwa J, Kruger P, Millar R. The hormonal effects of long-term DDT exposure on malaria vector-control workers in Limpopo Province, South Africa. Environ Res. 2004;96(1):9-19 .
11. Robins TG, Bornman MS, Ehrlich RI, Cantrell AC, Pienaar E, Vallabh J, Miller S. Semen quality and fertility of men employed in a South African lead acid battery plant. Am J Ind Med. 1997;369-76.
12. Heeren GA, Tyler J, Mandeya A. Agricultural chemical exposures and birth defects in the Eastern Cape Province, South Africa. A case control study. Environmental Health: A Global Access Science Source. 2003;2:11-19.
13. Gresie-Brusin D, Kielkowski D, Baker A, Rees D. Ethylene oxide exposure and health effects in public hospitals in Gauteng. Proceeding of 17th Conference of the International Society for Environmental Epidemiology (ISEE) Epidemiology. 2005;16:S30.