

1388

DIABETES, CARDIOVASCULAR DISEASE, PSYCHOSOCIAL DISTRESS AND OTHER RISKS AMONG AUSTRALIAN FARMERS AND AGRICULTURAL COMMUNITIES – HEALTH SURVEILLANCE AND OUTCOMES

^{1,2}Susan Brumby*, ^{1,2}Muhammad Aziz Rahman, ³Joe Lewis, ³Tracey Hatherell, ³Tam Phillips. ¹Deakin University, School of Medicine, Waurin Ponds, Victoria, Australia; ²La Trobe University, School of Nursing and Midwifery, Melbourne, Victoria, Australia; ³Western District Health Service, National Centre for Farmer Health, Hamilton, Victoria, Australia

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Background Farmers and rural populations have increased risk of cardiovascular disease, diabetes and suicide compared to general Australians. They also encounter problems of equitable access of expertise, exacerbated by large distances. If risk factors are identified or prevented then better health outcomes should follow for this high risk group. There is also a lack of cultural competence in health professionals around agricultural work, and its occupational and lifestyle risks.

Methods A cross-sectional study was conducted across rural Australia on 1697 participants during 2009–2016 at agricultural events to explore the behavioural, cardiovascular and diabetes risks among the farming community. Study participants were >18 years of age, spoke English and were involved/associated with farming. Diabetes risk was assessed by the validated AUSDRISK tool and cardiovascular risk through a 20 min one-on-one assessment—anthropometric measures, blood cholesterol, blood glucose, blood pressure, psychosocial distress, and waist measurement. Participants were provided with health information relevant to their risks and also recommended for further follow up.

Results Mean age was 53 (± 15.5) years, 62% was male and 58% were farmers/agricultural workers. More than two-thirds (73%) were overweight/obese; no difference between farmers and non-farmers. Males were more likely to undertake short term risky alcohol use compared to females (62% vs 46%), although both were higher than Australian rates. 55% were at risk of developing type 2 diabetes within 5 years; males (90% vs 79%, RR1.14, 95% CI: 1.09 to 1.20) and farmers (88% vs 83%) were at increased risk. Hypertension ($\geq 140/90$ mmHg) was 44% and more common in males and farmers.

In 2016, a random selection (150) were contacted to evaluate change in their behaviours and engagement with health practitioners since the intervention with surprising outcomes.

Conclusion Health surveillance and occupationally sensitive placed-based interventions for farming/rural populations should be the primary focus for health promotion strategies.

1412

SUSTAINABLE FARM FAMILIES ACROSS THE GLOBE—THE MOST IMPORTANT PART OF ANY FARM IS A HEALTHY FARM FAMILY

^{1,2}Susan Brumby*, ²Tracey Hatherell, ³Jordan Jensen, ³Laura Nelson. ¹Deakin University, School of Medicine, Waurin Ponds, Victoria, Australia; ²Western District Health Service, Hamilton, Victoria, Australia; ³Farm Safety Centre, Raymond, Alberta, Canada

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Background Farmers across the globe have increased risks – accident, injury, cardiovascular disease, diabetes, suicide and zoonosis. They also face difficulties accessing expertise exacerbated by large distances and lack of transport. The Sustainable Farm Families (SFF) program commenced in Australia in 2003

and has delivered 151 programs to over 2500 Australian farm men and women. In 2014, SFF commenced in Alberta, Canada and over 400 farmers have participated including 17 Hutterite communities. Each SFF program consists of 3 workshops, over 4 days, approximately 6–12 months apart.

Methods SFF is a multifaceted health program, developed specifically for the agricultural context. Each workshop is facilitated by trained SFF nurses and an agricultural facilitator. At the beginning of each workshop a full health assessment is gathered—anthropometric measures, lipid studies, glucose, blood pressure, psychosocial distress, waist measurement and % body fat. Health and safety behaviours are also reviewed. Education sessions on CVD, diabetes, stress, farm safety, anxiety, depression, diet and nutrition, respiratory conditions, pesticides, physical activity, men's health and women's health are delivered. Participants were >18 years, spoke English and were farming. Diabetes risk was assessed by the validated AUSDRISK or CANRISK tool and psychosocial distress using the Kessler K10.

Results More men than women participated showing that farmers are interested in their health, wellbeing and safety. 'Can't take care of the farm if you don't take care of yourself.' This presentation will discuss the baseline results from Australia and Canada. Where longitudinal data is available it will be discussed. In Australia, the results showed that the more risk factors you had when you began the SFF program the better you did, including reducing your risk factors.

Conclusion Both the Australian and Canadian program have been positively and extensively independently evaluated. The SFF program has been successfully repeated and transferred to Alberta, Canada, saving lives and saving money across the globe.

1556

PRELIMINARY PRODUCTION OF PESTICIDES USE CONDITIONS IN CASHEW PRODUCTION IN CÔTE D'IVOIRE

^{1,2}JH Kouadio*, ¹YS Koffi, ²B-Y Yeboué-Kouamé, ¹KC Diby, ²AJ Eba. ¹Equipe de recherche Gestion de la Qualité des Productions végétales (GQPV), Département de Biochimie – Microbiologie, UFR Agroforesterie, Université Jean Lorougnon Guédé, B.P. 150 Daloa; ²Laboratoire de (Bio) Toxicologie et Hygiène Industrielle, DPPSST, CNPS 01 B.P. 317 Abidjan, Côte d'Ivoire

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Introduction Côte d'Ivoire is the top exporter as well as producer of cashew nuts in the world. Chemical pesticides are used as one of preference crop protection measures. However, the conditions use of any pesticide must meet good agricultural practices in order to mitigate occupational risks for pesticides users, to ensure cashew nuts safety and other hand the preservation of the ecosystem. Our study explored essentially occupational risks linked to chemical pesticides in cashew farming and the rate of non-homologated products use in Côte d'Ivoire.

Methods Data collection was through well-structured questionnaire administered on respondents selected through random sampling technique. The geographical site of our study was two main cashew production areas namely the Gbeke, Centre (6 departments) and the Poro, North (4 departments) of Côte d'Ivoire. In total, 43 farmers have participated in the study covering the whole of the 10 departments of the two regions. After counting of survey sheets, data have been codified, entered and analysed using the software Sphinx 4.5.0.30.

Results Results showed that the majority of farmers (81.4%) used chemical pesticides in the production of cashew, but only 11% of them have been trained to safe use of pesticides. In addition, 16 of the 35 farmers (45.7%) had individual protection equipment appropriate. Thus, 10 cases of acute intoxication were reported during the application of pesticides. Glyphosate isopropylamine salt was responsible for 5 cases of poisoning, while 2.4 D amine salt caused 3 cases. However, 35% of these pesticides were not homologated for their use in cashew farming in Côte d'Ivoire.

Conclusion Pesticide use was a real handicap for the sustainability of the cashew farming in Côte d'Ivoire. High use of non-homologated pesticides and absence of farmers training in safe use of pesticides could be cause occupational hazards, possibly environmental pollution and affected cashew nut safety.

452 **A PESTICIDE EXPOSURE STUDY USING 24-HOUR BIOMONITORING AND DERMAL SAMPLING TO DETERMINE TOTAL UPTAKE AND THE ROUTES OF EXPOSURE**

¹Alison Connolly*, ²Kate Jones, ³Karen S Galea, ³Ioannis Basinas, ²Laura Kenny, ⁴Padraic McGowan, ¹Marie Coggins. ¹Centre for Climate and Air Pollution Studies, School of Physics, National University of Ireland, Galway, Ireland; ²Health and Safety Laboratory (HSL), Harpur Hill, Buxton, UK; ³Centre for Human Exposure Science (CHES), Institute of Occupational Medicine (IOM), Edinburgh, UK; ⁴Irish Commissioners for Public Works, Jonathon Swift Street, Trim, Co Meath, Ireland

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Introduction A pilot exposure assessment study using biomonitoring was conducted in Ireland to determine the likelihood of exposure to pesticides among amenity horticulturalists. A spot sampling approach was employed of workers using pesticides, had urinary pesticide concentrations in post-work samples with a geometric mean (geometric standard deviation) of 0.66 (1.11) $\mu\text{g L}^{-1}$ for glyphosate and 0.29 (1.69) $\mu\text{g L}^{-1}$ for fluroxypyr. The study showed a potential for pesticide exposure during horticulture amenity work, higher than average environmental exposure levels and warranted further investigation.

Methods In 2017, an exposure assessment study involving 24 hour biomonitoring will take place to evaluate pesticide exposure among these workers. Workers will be grouped into four similar exposure groups based on application method and active ingredient used, glyphosate or fluroxypyr. Three urine samples will be collected for each task, a sample before the task begins, a sample within one hour of the task completion and a following morning void. The potential routes of exposure, will be examined through the collection of additional dermal, glove and potentially contaminated object wipe samples. Dermal wipes of the hands and the perioral region will be taken before and after the task and glove analysis will be conducted. Detailed contextual information will be collected by the researcher to support all samples collected.

Results The biomonitoring results will indicate the extent of pesticide uptake for each task. Correlation between the dermal and biomonitoring samples will be investigated to explore the contribution of dermal exposure. The perioral and the contaminated object wipes alongside the contextual information will be used to determine the potential exposure from inadvertent ingestion.

Discussion This study will provide a comprehensive biomonitoring dataset describing amenity horticultural user's exposure to glyphosate and fluroxypyr and the contribution of dermal and inadvertent ingestion routes on total body burden of pesticides.

556 **WORK-RELATED DISEASES AMONG FARMERS IN NORWAY: WHAT DO THE DOCTORS REPORT TO THE LABOUR INSPECTORATE REVEAL, AND WHAT THEY MISS?**

¹Y Samant, ²HM Gravseth, ³O Aas, ¹R Ekle, ¹T Strømholm. ¹Norwegian Labour Inspection Authority, Norway; ²National Institute of Occupational Health, Norway; ³St. Olav's Hospital, Division of occupational medicine, Norway

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Introduction Doctors in Norway report work-related diseases to the Labour Inspection Authority as required by the Working Environment Act. These reports make the basis for the labour inspectorates registry for work-related diseases (RAS). The purpose of this study is to highlight the lack of reliable data with regards to work-related diseases among Norwegian farmers which hinders our preventive efforts.

Methods Data as they concern the occupation 'farmers' were extracted from RAS for the period 2005–2017. The data among others included variables pertaining to demographics, occupational exposures, diagnosis, year of reporting, and the type of doctor who reported the disease. We performed descriptive analysis on the extracted data to obtain frequency, and percentage distribution of the data. We plan to calculate incidence rates; however, it has been difficult to find a reliable denominator for such computations.

Result In the period 2005–2017, 616 cases of work-related diseases among farmers were reported. On average 44 reports of work-related disease among farmers were reported to the Labour Inspectorate annually. 95% of the reported cases were farmers under the age of 67 years. Hearing loss made up about 60% (n=368) of all the cases followed by respiratory diseases that make up 19% (n=116) of all cases. Only a few cases are attributed to other diagnosis groups like skin diseases, musculoskeletal- and psychological disorders.

Discussion The doctors report on work-related diseases among farmer's reveal that hearing loss is still a major challenge. Some of these data are being applied for preventive actions. Having said that, we know from research studies and self-reported data that farmers are exposed to among others dust, gas, pesticides, infectious materials. They work long hours in difficult postures. However, RAS data is missing a large number work-related diseases among the Norwegian farmers which is hindering effective prevention.

1659 **HEALTH EFFECTS OF PESTICIDES: PROBLEMS TO SOLUTIONS**

¹Claudio Colosio, ²Gert van der Laan, ³Hanifa Denny. ¹Department of Health Sciences of the University of Milan and International Centre for Rural Health of the ASTT Saints Paolo and Carlo Hospital, Milan, Italy; ²Foundation Learning and Developing Occupational Health, PE Leusden, Netherlands; ³Diponegoro University, Semarang, Indonesia

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