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Conclusion At EU level these challenges have been recognised as a priority. ESENER-2 confirms the wide range of OSH issues identified in other sources and points too at a lower than average use of 'support' services in agriculture, as well as awareness problems. Further analyses of the findings contribute to a better understanding of the challenges and drivers and support policy makers and experts in their future actions to promote a health and safety culture in agriculture.

1205 COHORT STUDY OF MORTALITY AMONG MALE FARM WORKERS IN SPAIN

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Introduction Jobs in the agricultural sector are associated with high demands, risks, and stress for workers. Spain is of great importance for the European agricultural sector; nearly half the country's land is dedicated to agricultural use. However, the health and mortality risks associated with agricultural work in Spain remain understudied. The aim of this study is to compare the mortality rates for male farm workers with mortality rates for males in non-agricultural occupations in Spain over a ten-year period.

Methods The prospective cohort study followed 8,695,560 male workers in Spain from 2001 to 2010. Participants in the study were selected from the 2001 census; at baseline, all participants were ages 16 to 64 years and employed in an agricultural job. Mortality data included in the present study were obtained from participants' death certificates. For each cause of death, the age-adjusted mortality rates for farm workers and for non-farm workers was calculated per 1 00 000 person-years of follow-up. These rates were used to compare the rate ratio between male farm workers and non-farm workers.

Results The all-cause mortality rate for farm workers was 13% greater than that of non-farm workers, with a rate radio estimate of 1.13 (95% CI: 1.11 to 1.16). For cancer deaths, the mortality rates of lip, laryngeal and skin cancer were higher and statistically significant for farm workers. Rates of death resulting from respiratory disease, circulatory disease, accident, and suicide were all significantly higher for farm workers than for non-farm workers.

Discussion These results are the first obtained in Spain from a large prospective agricultural cohort. They show that male farm workers are a vulnerable population in terms of health status. Elevated rates of all-cause and specific-cause mortality in male farm workers could be associated with frequent exposure to occupational hazards, including pesticides, high temperatures, and long working hours.

1210 CIPA-TOX: A NEW TOOL TO ASSESS RETROSPECTIVE OCCUPATIONAL EXPOSURE AND HEALTH EFFECTS TO PESTICIDES IN FRANCE

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Introduction It is extremely difficult to evaluate the extent to which agricultural workers are exposed to pesticides. This is due to the large number of plant protection products (PPPs) used on a single crop and the variety of active substances (ASs) that have been used over the course of time.

Methods PPP Index is a repertoire of pesticides listing the ASs authorised and marketed in France each year.

All the data collected between 1961 and 2014 was compiled in CIPA-TOX database. Relevant toxicological iformation was added to 1053 ASs. The method used to is based on European regulations, international classification (IARC and US-EPA for carcinogens) and on the search for toxicological reference values (TRV). One or several health effects was attributed to ASs including carcinogenicity, reprotoxicity, neurotoxicity, endocrine disruption, etc.

Results CIPA-Tox provides information about the use of PPP over time in France. The number of ASs authorised, decreased slightly in the second half of the first decade of the millennium; it then remained stable through 2014. For the toxicoincluding logical field, more than 70% of the substances authorised in France since 1960 have at least one health effect. Six substances classified as probable or proven carcinogens remain on the market. Endocrine disruptors represent more than 100 authorised ASs. The most affected crops are vinyards and arboriculture.

Discussion The advantages of CIPA-TOX are to take into account all the ASs marketed since 1961 and to apply for identifying health effects a clear and rigorous protocol. The limits are that some substances do not show any health effect. This doesn't mean that they are not harmful but only that the data are lacking. The TRV based on a threshold to avoid the first relevant health effect that appears. This does not mean that other effects do not exist.

1280 IMPROVING EXPOSURE ASSESSMENT METHODOLOGIES FOR EPIDEMIOLOGICAL STUDIES ON PESTICIDES

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Introduction The presentation describes a comprehensive study to better understand the reliability of assessment of human exposure to plant protection products (PPP) in previous occupational epidemiological investigations, and to use this information to recommend improvements in scientific practice for future studies. Further, it aims to assess the reliability and external validity of surrogate measures used in these studies to assign exposure to individuals or groups of individuals on the basis of self-reported information, job/crop exposure matrices and exposure algorithms. The project will also evaluate the size and the effects of recall bias on the misclassification of exposure to PPPs and associated health effects.

Methods Existing and newly collected (biological) monitoring data from several existing epidemiological studies and historical records across various populations in Europe, Africa and Asia. Urinary metabolites of pesticides will be selected with due consideration on the extent of use within the study

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populations, validity of biomonitoring methods etc. The performance of the various exposure assessment methods will be compared and contrasted within existing epidemiological studies.

Results The main outcome will be the validation of widely accepted and easily adaptable semi-quantitative individual-based exposure assessment methods against measured levels of urinary PPP metabolites in a broad range of settings. Additionally, the study will compare the reliability and performance of several grouped- and individual-based exposure assessment methods in the frame of existing epidemiological studies.

Conclusion The project is due to commence in September 2017. We propose to present the study protocols, rationale and outcomes of a mini-symposium to be held at EPICOH 2017.

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1354 MEASURING AIRBORNE EXPOSURE OF FRENCH FARMERS DURING WORK RELATED TO LIVESTOCK AND TO HARVESTING OF VARIOUS CROPS: THE AIREXPA PROJECT

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10.1136/oemed-2018-ICOHabstracts.1322

Introduction Beyond pesticide exposure, farmers are likely to be exposed to several air pollutants. Some of them are of particular interest, either because of their known carcinogenic properties, for lung cancer (total dust, Diesel exhaust, crystalline silica,) or other cancer sites (mycotoxins) or because of a supposed protective effect on lung cancer risk (endotoxins). However, except for endotoxins, very few studies, assessed farmers' exposure levels by individual samplings. Our study aims at describing the levels, and assessing the determinants, of agricultural exposure to these air pollutants.

Methods We assessed French farmers' individual exposure to several air contaminants: (1) inhalable endotoxins and mycotoxins during various tasks in several breedings (cattle, horse) and 3 crops (grassland, wheat/barley, peas); (2) respirable crystalline silica during harvesting of these 3 crops; (3) respirable elementary carbon during the use of Dieselized farm equipment. Inhalable dusts, up to 20 µ, were assessed in real time.

Sampling was performed during the whole activity, and endotoxin exposure was also assessed for each task separately. Field monitors followed the farmers and collected detailed information on the activity.

Results The field study is on-going, we already observed around 40 individual measurements in 20 different farms. The protocol was judged acceptable by the participants. Sampling duration ranges from 80 to 240 min, depending on the type of activity. First results from real-time dust measurements suggest a higher exposure during stables cleaning and mulching (mean concentration of inhalable dusts: 0.545 mg/m³). A total of several hundreds of measurements is expected in various types of farms and working conditions (number of animals, cultivated area, type of equipment).

Discussion We hope our study will improve the assessment of occupational health hazards in agriculture, and thus primary prevention, by quantifying the levels of individual exposure to several air pollutants.

1369 IS PLASMA CHOLINESTERASE A RELIABLE BIOMARKER IN LONG-TERM EXPOSURE TO CHOLINESTERASE **INHIBITORS?**

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10.1136/oemed-2018-ICOHabstracts.1323

Introduction The use of insecticides has been intensified in Brazilian agricultural production and control of endemic diseases. Plasma - or Butiryl -Cholinesterase (BCHE) is used for biological monitoring of organophosphates (OP) and carbamate exposure. Despite legal requirements, there are controversies about this monitoring.

Methods Cross - sectional study carried out among pesticide applicators in tobacco farming. Sociodemographic, occupational data, PPE use, pesticide- related-symptoms (PRS) and standardised medical examination were collected BCHE was measure at low and high exposure period. Pesticide exposure was characterised by using chemical types and days from last exposure. The assessment by physicians and toxicologists classified poisoning by pesticides as possible or probable. The ing analysis was made by chi-square test, t test for comparison of two means and Poisson regression.

Results Out of 492 smokers studied, 43% had recent exposure to OP or Carbamates, with average BCHE increase in intensive period (p<0.001). Five people (2.4%) presented a reduction of >20% in BCHE. There was more BCHE reduction in the most exposed group. There were no association with any pesticide poisoning criteria, BCHE levels or use of PPE.

Conclusions Although consistent with some studies, the findings of BCHE contrast with other authors. Possible explanations include tolerance to long term exposure, differences in analytical methodology, genetic polymorphism, other diseases and limitations with the gold standard. Future studies should investigate these results to define better recommendations for occupational monitoring, including periodicity and cutoff points. New biomarkers should be developed to exposure monitoring of cholinesterase inhibitors and other pesticides.