patients consulting at the basic health center. Sociodemo-
graphic, medical and professional data were collected through
a pre-established form.

**Results** A total of 65 patients and 130 controls matched for
age, gender, and region were included in this study. The mean
age was 38.4 ±6.7 years. The sex ratio M/F was 0.38 for
both groups. Respectively 77% and 54% of the patients and
controls were professionally active. The mean duration of
work was 13.81 years ± 8.5 years in the patients and 10.65
years ± 5.1 years in the controls. In univariate analysis, the
predictive occupational factors for the occurrence of MS were
the work sector, the duration of occupational exposure, and
certain products such as organic products, petroleum products,
pesticides, and ionizing radiation.

In multivariate analysis, the independent factors for the
occurrence of MS were petroleum products (p=0.004), pesti-
cides (p=0.001), ionizing radiation (p=0.007), and the num-
ber of working hours per day (p=0.000).

**Conclusion** According to our results, many occupational
factors could increase the risk of the occurrence of MS. Targeted
preventive measures are therefore required.

**Occupational epidemiology in unorganised sectors: agriculture, construction, service
sectors**

**O-294 OCCUPATIONAL RISK ASSESSMENT ON HANDS AMONG
GARDENERS INVOLVED WITH COMMERCIAL PLANT
NURSERY INDUSTRY – UNORGANIZED SECTOR OF
JABALPUR, INDIA**

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10.1136/OEM-2023-EPICOH.71

**Introduction** In today’s concrete urban spaces in India, there
is an increase in demand of plants in residential households
due to interior decoration, medicinal values, air purification and
green space effect. Online nursery is a new supply chain
business of today, generating employment for skilled, semi-
skilled and unskilled labourers for propagating and growth of
plants. Gardeners engaged in plant nurseries are responsible
for cutting, pruning, planting, digging with the help of hand-
tools. Use of different hand-tools in these plant nurseries
causes both acute and chronic hand injuries among the work-
ers. This study is focused only on the identification of hand
injuries, as hands are the main body parts involved.

**Methods** This study was conducted on eighty-two gardeners
involved with commercial plant nurseries of Jabalpur. Acute
risk of hand, which are physically visible are identified with
direct observation method such as cuts and infections while
chronic hand symptoms were identified with the help of
modified Boston and modified Dutch questionnaire.

**Results** According to the acute risk of hand study by the
direct observation it was found that while planting and dig-
ging activities high percentage of pathogenic infections (spor-
othrix) in hand region was observed 76.2%, cuts on the hands
recorded percentage of 75.0% while performing the cutting
activity. In chronic hand symptoms study by using modified
Boston and modified Dutch questionnaire it found that 79.2%
are suffering with Gamekeeper’s thumb by performing the dig-
ging activity. Lifting activity resulted wrist tendonitis of
70.6%.

**Conclusion** From this study it is evident that the gardeners
involved in the plant nursery sector were exposed to higher
risk of acute and chronic hand symptoms. Design intervention
with ergonomic hand-tool design is the need of the hour for
the growth and future prospective of this evolving business
sector.

**Pesticides**

**O-305 OCCUPATIONAL EXPOSURE TO PESTICIDES AND
NEUROBEHAVIORAL OUTCOMES. IMPACT OF DIFFERENT
EXPOSURE MEASURES ON THE ASSOCIATION**

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10.1136/OEM-2023-EPICOH.72

**Introduction** Several measures of occupational exposure to pes-
ticides have been used to study associations between exposure
to pesticides and neurobehavioral outcomes. In a study of 246
smallholders farmers in Uganda the impact of different expo-
sure measures for glyphosate and mancozeb based on original
and recalled self-reported data on the association with neuro-
behavioral outcomes was studied.

**Methods** In 2017 the performance of six questionnaire-based
measures of exposure the previous year was assessed. These
measures entailed: (1) applicator status (yes/no), (2) number of
application days, (3) exposure-intensity scores (EIS) derived
from a semi-quantitative exposure algorithm and (4) number of
EIS-weighted application days. We also used recalled infor-
mation in 2019 for (5) applicator status and (6) EIS.

The association between the six exposure measures and six
selected neurobehavioral test scores was investigated using lin-
ear multivariable regression models. The performance of the
exposure measures was compared in a descriptive manner in
terms of effect size (beta and 95% confidence intervals (CIs))
and p-values.

**Results** Recalled applicator status and EIS were higher for
both pesticides. We observed significant negative associations
between original measures of exposure to glyphosate and four
neurobehavioral tests ( Benton visual retention, digital symbol,
finger tapping dominant hand and trail making A). Finger tap-
ing non-dominant hand and semantic verbal fluency tests
showed no association. Measures of exposure to glyphosate
based on recalled information did not show any negative asso-
ciations. For mancozeb none of the exposure measures were
associated with neurobehavioral outcomes.

**Conclusion** The relation between different self-reported glyph-
osphate exposure measures and neurobehavioral test scores
appeared to be robust. However, when based on recalled
exposure data associations were no longer present. Future epi-
demiological studies on self-reported exposure should critically
evaluate the potential bias towards the null in observed expo-
sure-response associations.