




EFSA activities following the publication of the EFSA External Scientific Report

Federica Crivellente, EFSA
Stakeholder Workshop
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PRESENTATION OUTLINE

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- Background
 - Summary of results from External Scientific Report
 - Caveats in the External Scientific Report
 - Triggering points
 - EFSA activities following the publication of the External Scientific Report

BACKGROUND

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- Over the last years an abundance of epidemiological studies investigating possible associations of pesticide exposure with adverse health effects have become available
 - However, contradictory or ambiguous studies exist for many adverse health effects that are attributed to pesticide exposure
 - **2012** - EFSA launched an Open call on 'Literature review on epidemiological studies linking exposure to pesticides and health effects' with the objectives to:
 1. Collect scientific publications (published 2006-2012) in which possible links between pesticide exposure and human health effects have been investigated
 2. Review and evaluate the studies in regard to their qualitative aspects
 3. Provide a database for the scientific publications and a report of the results
 - **Contractor/beneficiary** - University of Ioannina Medical School in Greece
 - **2013** - External scientific report and database published on EFSA's website (<http://www.efsa.europa.eu/en/supporting/pub/497e.htm>)

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EFSA supporting publication 2013:EN-497

EXTERNAL SCIENTIFIC REPORT

Literature review on epidemiological studies linking exposure to pesticides and health effects¹

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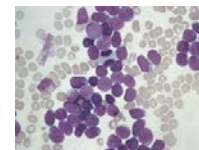
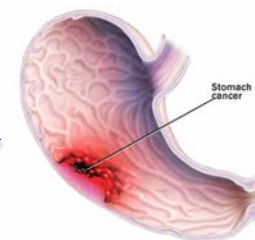
ABSTRACT

We performed a systematic and extensive literature review of epidemiological studies examining the association between pesticide exposure and any health outcome published after 2006. We searched 43,259 citations and identified 603 published articles examining a very wide variety of outcomes and presenting over 6,000 analyses between pesticide exposure and health outcomes. We divided the different outcomes into 23 major disease categories. The largest proportion of studies pertains to cancer outcomes (N=164) and outcomes related to child health (N=84). The majority of studies were case-control studies and cross-sectional studies (N=222) and examined occupational exposure to pesticides (N=329). A wide and diverse range of pesticides was studied with studies using various definitions of pesticides; it is very hard to harmonise between studies this information. Despite the large volume of available data and the large number (>6,000) of analyses available, firm conclusions cannot be made for the majority of the outcomes studied. This observation is disappointing especially when one accounts for the large volume of research in the area. However, this observation is in line with previous studies on environmental epidemiology and in particular on pesticides which all acknowledge that such epidemiological studies suffer from many limitations and that the heterogeneity of data is such that does not allow firm conclusions to be made. We also performed updated meta-analysis for major outcomes and for those where a relevant meta-analysis published after 2006 was identified. This has only been possible for childhood leukaemia and for Parkinson's disease. For both

SUMMARY OF RESULTS FROM THE EXTERNAL REPORT

- An association between pesticide exposure and 23 major categories of human health outcomes was pointed out.
- A statistically significant association was observed in the meta-analysis between pesticide exposure and:

- liver cancer
- breast cancer
- stomach cancer
- amyotrophic lateral sclerosis
- asthma
- type 1 diabetes
- childhood leukaemia
- Parkinson's disease



- Associations observed for Parkinson's disease and childhood leukaemia were supported by previous meta-analysis published in the scientific literature

EXTERNAL SCIENTIFIC REPORT - RESULTS

Health outcome	Pesticides examined	Country	Results OR [95% CI]
Leukaemia	Insecticides, Pesticides Chlorophenol, Fungicides	Thailand, China, France, Germany, Italy	1.26 [0.93; 1.71]
Childhood cancer: Exposure during pregnancy	Insecticides	America, France, Australia	1.55 [1.14; 2.11]
Breast cancer	DDE, Pesticides, Lindane Organochlorines	America, Japan, Spain, China	1.24 [1.08; 1.43]
Stomach cancer	Pesticides, DBCP Pentachlorophenol, Methyl bromide, Organochlorines	Spain, America, Canada, China, Sweden	1.79 [1.30; 2.47]
Liver cancer	Pesticides, DDT, Atrazine, Chlorophenol	China, America, Canada	2.50 [1.57; 3.98]
Risk of abortion	Pesticides, DDT	Italy, Europe, Australia, Armenia, Netherlands	1.52 [1.09; 2.13]
Parkinson's diseases	Paraquate	America	1.32 [1.10; 1.60]
Amyotrophic lateral sclerosis	Pesticides	Australia, America, India, Italy	1.58 [1.31; 1.90]
Asthma	DDT	Spain, America	1.29 [1.14; 1.45]
Type II diabetes	DDT and DDE	Slovakia, America, Sweden	1.89 [1.25; 2.86]

CAVEATS

- The literature review was not restricted to Europe only
- Many of the pesticides in the epidemiological studies are not approved in EU
- Firm conclusions could not be made for the majority of the results because of the acknowledged limitations of the studies and the large heterogeneity of data



OTHER ACTIVITIES ON THE SAME TOPIC

The results of the report were in line with similar reports from Europe:

- The report Pesticides – «Effets sur la santé: Synthèse et recommandations» - was published in 2013 by the French Institute INSERM (Insitut National de la santé et de la Recherche Médicale)



- ANSES was requested to analyse the data presented in the INSERM report and, if necessary, make recommendations concerning the marketing authorisation for products containing these active substances



TRIGGERING POINTS

The results from the External Scientific Report raised the following questions:

- Can the available experimental data and information on mechanisms of pesticide toxicity support the observed associations for Parkinson's disease and childhood leukaemia?
- Do the regulatory risk assessments, which are regularly carried out for authorising the placing of PPPs on the market, cover the hazard assessment of pesticides with regard to Parkinson's disease and childhood leukaemia?
- Can the findings observed in the individual epidemiological studies be of use when assessing risks to pesticides? How can these studies be integrated into the process of regulatory pesticide risk assessment?

FOLLOW-UP

In 2014, The EFSA Panel of Plant Protection Products supported the proposal of preparing 2 self-tasked Scientific Opinions as a follow-up of the results from the External Scientific Report:

- 1) Mandate 1 (Scientific Opinion 1) investigating experimental toxicological properties of plant protection products having a potential link to Parkinson's disease and childhood leukaemia (target interval 3rd quarter 2014-2nd quarter 2016)
- 2) Mandate 2 (Scientific Opinion 2) on the follow-up of the findings of the External Scientific report «Literature review on epidemiological studies linking exposure to pesticides and health effects»

MANDATE 1

- **Scientific opinion**

- **2014 – 2016:** The working group is expected to:
- Develop a prototype for assessing risk factors for Parkinson's disease/childhood leukaemia using the principles established for adverse outcome pathways (OECD, 2013)
- Evaluate if, how and to what extent the experimental toxicity studies on mechanisms of toxicity cover effects and modes of action that are relevant for Parkinson's disease and childhood leukaemia
- Address eventual data gaps and potential weaknesses in the current regulatory dossiers in supporting the hazard assessment

- **Call for tender** (OC/EFSA/PRAS/2014/01)

- **2014** Systematic literature review on Parkinson's disease and childhood leukaemia and mode of actions for pesticides

- **Public consultation**

- **2016** - Public consultation on the scientific opinion will be available on EFSA's website

MANDATE 2

▪ Scientific opinion

- **2014 – 2017:** The working group is expected to:
 - Discuss how the findings from the External scientific report could be interpreted and integrated into regulatory pesticide risk assessments
 - Review sources of gaps and limitations identified and defined in the External scientific report
 - Propose potential refinements for future epidemiological studies to increase the quality, relevance and reliability of the findings
 - Provide recommendations to improve and optimize the application of epidemiological studies in regulatory pesticide risk assessments
- **Considerations:** Commission Regulation (EU) No 283/2013

▪ Public consultation

- **2016** - Public consultation on the scientific opinion will be available on EFSA's website

STAKEHOLDER WORKSHOP - 2015



The screenshot shows the EFSA website with the 'NEWS & EVENTS' tab selected. The breadcrumb trail reads: Home > News & events > Events > Workshop with Stakeholders on the "Use of ...". A sidebar on the left contains links: News, Events (highlighted), EFSA Explains, FAQs, Newsletters, Email alerts, Multimedia, and Press Centre. The main content area is titled 'Workshop with Stakeholders on the "Use of Epidemiological findings in Regulatory Pesticide Risk Assessment"' and dated 'Paris, 18 February 2015'. It features an 'Introduction' section with text about epidemiological studies and a 'Background' section with text about the 2013 external scientific report.

- Objectives
 - To introduce EFSA's activities in the area of pesticide epidemiology
 - To allow for an open scientific discussion
 - To invite stakeholders and international partners to share views and knowledge
 - To create networking opportunities
- A Report on the outcome of the workshop will be published on EFSA's website

SCIENTIFIC CONFERENCE

- **Scientific conference**

- **2017** - to be organised by EFSA

Objectives:

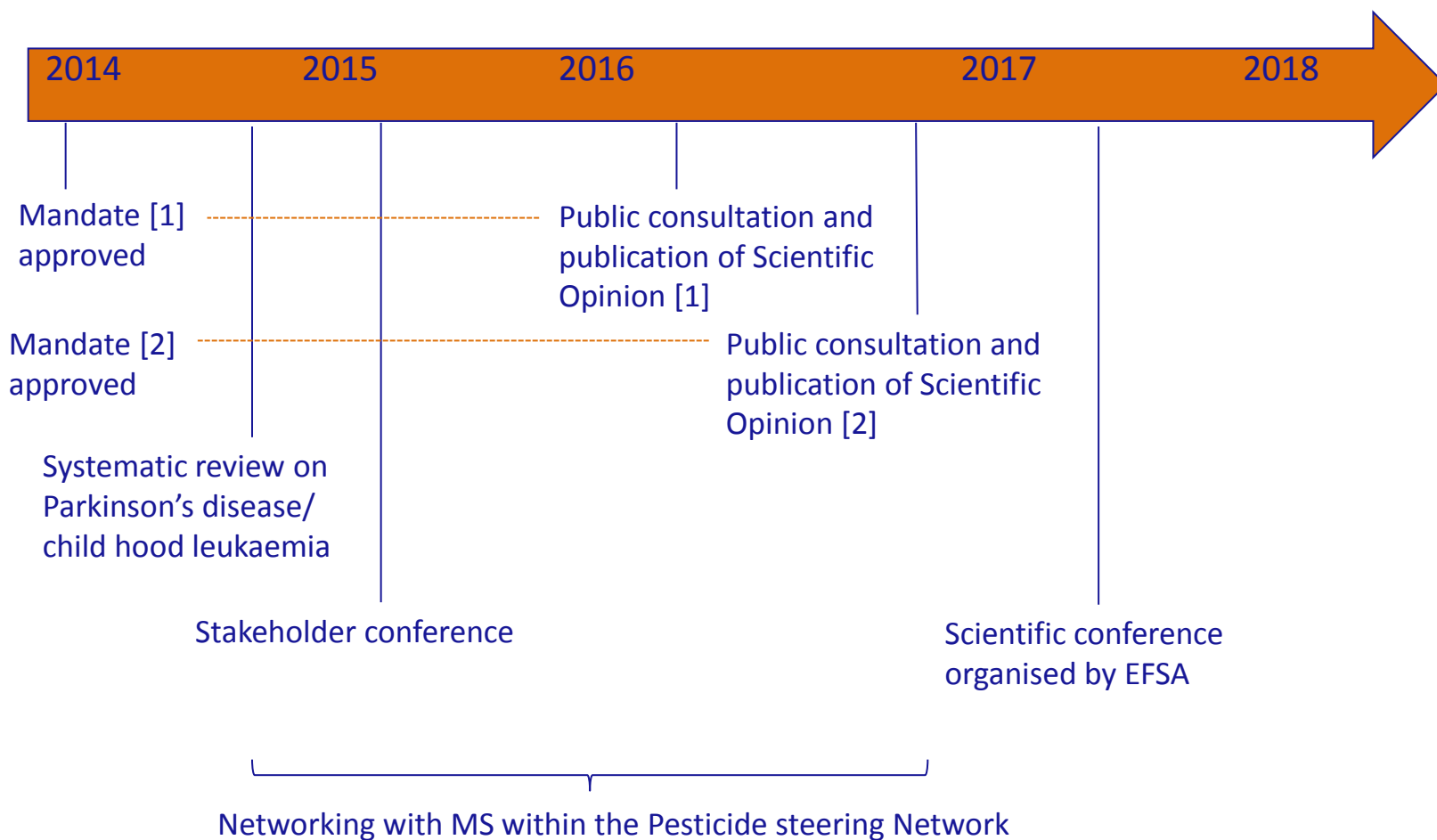
- To communicate with stakeholders on the achievements and outcome of the 2 scientific opinions
- To provide recommendations on further actions, especially in the area of scientific cooperation and networking

- **Report**

- **2017** - A report on the outcome of the conference will be published on EFSA's website



TIMELINE OVERVIEW





Thank you for your attention

