

Monitoring of Pesticide Poisoning in Germany: Answers to Frequently Asked Questions

BfR FAQ of January 10, 2022

The German Federal Institute for Risk Assessment (BfR) has the legal mandate to collect and to evaluate data on poisoning in Germany and to report on this topic to the public. It cooperates on this task with the poison centres (PCs) of the federal states of Germany and German-speaking Society for Clinical Toxicology (Gesellschaft für Klinische Toxikologie e. V. - GfKT). A national poisoning register is being set up at the BfR so that new poisoning risks can be identified earlier in the future. A legal basis is required for the establishment of this register, to be created and approved by the German Federal Parliament and the Federal Council of Germany. In order to demonstrate the register's faster detection of poisoning risks, reports on poisoning cases related to pesticide exposures were collected and evaluated in a pilot study.

The BfR is already registering all cases that medical doctors and PCs report to the institute on a legal basis, including poisonings and suspected cases involving pesticides (plant protection agents and biocides). Currently, pesticide exposures account for around 8% of the total of around 5,000 reports received each year. The evaluation of the data from the pilot study showed that the PCs received a total of 2,647 inquiries (with 2,808 persons affected) about contact with pesticides during the study period from May 2018 to February 2019 - a share of around 1.4% of the total number of calls - mostly on biocides (75.7%) and less often on plant protection agents (17.5%). The case reports on pesticides registered by the BfR based on medical reports in the period 2011-2020 relate almost exclusively to occupational exposures. Within the pesticide product group in broader sense including all biocides, most of the reported health disorders were caused by eye contact with disinfectants.

The BfR has compiled selected questions and answers on the monitoring of poisoning involving pesticides in Germany in the following.

What are pesticides?

The term "pesticides" is colloquially mostly used synonymously with the term "plant protection agents" and includes products that are used to control harmful organisms in a targeted manner. In the EU, pesticides are divided into two categories according to their intended use: plant protection agents and biocides. While plant protection agents are primarily used to control pests on plants, biocides are used against organisms that are harmful to humans or animals or which damage materials.

Herbicides, fungicides and insecticides are the best-known groups of plant protection agents. Disinfectants and pest control agents - which in turn also include insecticides - are the best-known groups of biocides.

When monitoring poisonings, it is not always possible to assign a case to either biocides or plant protection agents because product names were registered incompletely and because some product groups and active ingredients are used in both categories. For medical care and for documentation toxic effects of substances it is not relevant whether a product is used on a plant or in the household. The official classification used for the internationally harmonised coding of medical diagnoses (ICD-10) does not differentiate between plant protection agents and biocides.

Who collects data on poisoning in Germany?

Doctors who treat patients with illnesses that are at least suspected of being the result of exposure to hazardous substances and mixtures report on these cases in an anonymised way to the BfR (Section 16e Subsection 2 of the Chemicals Act, in short: ChemG¹). If the contact (exposure) took place within the remit of a Berufsgenossenschaft² or an Unfallversicherungsträger³ trade association or a public accident insurance institution, e.g. at workplace or at school, the Berufsgenossenschaft² or the public accident insurer will take over the notification obligation. In addition to statutory notifications, the BfR also includes voluntary notifications (e.g. from patients affected themselves) in the BfR poisoning database.

The seven PCs of the federal states advise people who have inquiries about poisonings or suspected cases of poisoning. Each request is documented and saved in PCs' own databases. The PCs report to the BfR on findings that are of general importance for advice on substance-related diseases in accordance with Section 16e Subsection 3 ChemG. The information provided by the PCs on special cases is registered and evaluated in the BfR database.

Further information on cases of poisoning can be found in the information system of the Federal Health Monitoring. This Website enables individual evaluations, for example in accordance to the ICD-10 classification of diseases.

How can poisoning risks be identified earlier and more accurately in the future?

In Germany, the BfR is responsible for the national assessment of poisoning. It cooperates closely with the PCs and the German-speaking Society for Clinical Toxicology (Gesellschaft für Klinische Toxikologie e. V. - GfKT). Case reports stored at the PCs and at the BfR are currently only merged manually in urgent cases. Implementation of a national poisoning register, in which all case reports will be merged continuously, will offer a significantly improved overview of national poisoning frequencies and earlier detection of poisoning risks. Official inquiries to the BfR about poisoning incidences will then be answered much easier, faster and more accurately. This also includes national reporting obligations to the EU Commission and the World Health Organization (WHO) of poisoning with biocides or plant protection agents or of poisoning in the context of serious cross-border chemical threats. In addition, the national poisoning register will provide detailed data for scientific questions.

What has been done so far to introduce the national poisoning register?

The BfR carried out a pilot study with the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), GfKT and the PCs from April 2017 to October 2019 which trialled the merging of the case reports from all PCs in Germany and the BfR. As part of the project, the operation of a national poisoning register was successfully tested in cooperation between the BfR, GfKT and the PCs. As an example, data from PC inquiries about issues such as pesticides, e-cigarettes and dietary supplements, were included in the project. A total of 5,495 cases were registered, assessed and analysed.

More on this in the [final report of the pilot study \(in German\)](#).

¹ In German "Chemikaliengesetz" (ChemG)

² Professional/trade association having liability for industrial safety and insurance

³ State entity responsible for mandatory insurance against accidents

What requirements must be met for a national poisoning register at the BfR?

According to the assessment of a legal opinion commissioned by BfR a legal basis is required for the project, which has yet to be created and passed by the German Federal Parliament and the Federal Council of Germany. This law must describe the tasks of the register and the parties involved - in addition to the BfR, in particular the federal ministries and the PCs. In addition, it must regulate the protection of the data of the patients whose diseases are being included in the register.

Therefore the federal ministries involved need to agree on how to proceed with the next steps.

What findings on poisoning with pesticides can be drawn from the final report of the pilot study for the establishment of a national monitoring system?

In the "Pesticides" sub-project of the pilot study to establish national monitoring of poisoning, a total of 2,808 cases were collected between May 2018 and February 2019 in which a PC was contacted about a possible or confirmed exposure to a plant protection product or a biocide. This corresponds to around 1.4% of the cases collected by the PCs. Assessments relating to active substances or toxicologically relevant ingredients were not carried out in this project. Of the cases documented in the project, 75.7% were biocides (mainly pest control agents) and 17.5% were plant protection agents. In 6.8% of the cases, it was not possible to make an assignment to one of those two groups.

What information on poisoning with pesticides can be obtained from the medical reporting obligation in accordance with the German Chemicals Act?

In addition to the time-limited data of the pilot project, the reports that were submitted to the BfR as part of the medical notification obligation pursuant to Section 16e, Subsection 2 and Subsection 3, Clause 2 of the Chemicals Act, are also available. The BfR has registered these case reports in the national poisoning database.

The cases registered at the BfR concerning plant protection products and biocides refer almost exclusively to occupational use. Often, the eyes are affected (especially disinfectant spraying in the eyes), followed by skin contact or inhalation of vapours. In the majority of these cases, only mild symptoms occurred (assessment according to the [Poisoning Severity Score](#)).

Are the number of cases registered by the BfR representative of pesticide poisoning in Germany?

The overwhelming majority of the poisoning reports sent to the BfR are made by employer's liability insurance association, who take over the reporting in the event of exposure at work. It is not known to what extent the reports by medical doctors are complete. The BfR does not currently assume that the number of cases listed in the analysis are representative of pesticide poisoning in Germany.

In addition to the cases registered at the BfR, is there any further data available on cases of poisoning with pesticides?

The information system of the Federal Health Monitoring provides further data on serious poisonings. Hospital treatments (Table 1) and lethal outcomes (Table 2) due to "Toxic effects of pesticides" according to the ICD-10 diagnosis code are shown there. It is not possible to make a distinction between plant protection products and biocides. In the 10-year period 2010-2019, 242 deaths from pesticide exposure were documented, the majority of them from exposure to insecticides. In the period under review, 94% of the pesticide cases (228 deaths)

recorded, according to the cause of death statistics, are assigned to the diagnosis code "X60-X84 Intentional self-harm" (suicide).

Table 1: Hospital inpatient treatment statistics, toxic effects of pest control agents (T60 and subcategories), broken down by year.

ICD 10	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
T60 Toxic effect of pest control agents (pesticides)	165	145	137	140	112	107	115	106	83	87
T60.0 Toxic effect: Organophosphate and carbamate insecticides	34	32	19	20	14	12	21	11	12	4
T60.1 Toxic effect: Halogenated insecticides	2	2	2	-	2	-	2	5	-	3
T60.2 Other insecticides not specified further	27	35	27	22	15	20	24	23	25	17
T60.3 Toxic effect: Herbicides and fungicides	31	23	31	24	18	12	20	11	8	14
T60.4 Toxic effect: Rodenticides	18	15	18	37	20	20	22	25	19	24
T60.8 Toxic effect: Other pesticides	45	29	36	32	40	34	21	23	12	17
T60.9 Toxic effect: Pesticides, not specified further	8	9	4	5	3	9	5	8	7	8

Table 2: Cause of death statistics, toxic effects of pest control agents (T60 and subcategories), broken down by year.

ICD 10	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
T60 Toxic effect of pest control agents (pesticides)	39	27	21	40	19	17	20	14	22	23
T60.0 Toxic effect: Organophosphate and carbamate insecticides	21	18	13	24	12	11	9	8	12	11
T60.1 Toxic effect: Halogenated insecticides	-	2	2	1	1	-	-	-	-	-
T60.2 Other insecticides not specified further	-	1	-	3	-	2	2	1	3	3
T60.3 Toxic effect: Herbicides and fungicides	2	2	4	4	-	1	3	3	4	2
T60.4 Toxic effect: Rodenticides	2	1	-	2	-	-	1	1	-	2
T60.8 Toxic effect: Other pesticides	10	2	-	3	2	-	1	-	2	2
T60.9 Toxic effect: Pesticides, not specified further	4	1	2	3	4	3	4	1	1	3

Why has the BfR registered significantly fewer cases than the Poison Information Centres?

According to the prevailing legal opinion, the medical reporting obligation according to the Chemicals Act (ChemG) is limited to "illnesses" caused by products that are subject to this

law. Of the approx. 250,000 consultations registered by German PCs each year, around 25% are cases with products that could be subject to the legal reporting obligation. However, the majority of cases constitute **suspected** poisonings, i.e. contacts (exposures) that do not lead to serious health effects. These cases often do not require medical treatment or the consulting doctor does not consider the exposure to be an illness to be reported. The PCs only report to the BfR in exceptional cases: In accordance with Section 16e Paragraph 3 ChemG, the PCs report to the BfR *“about knowledge gained in the course of their work that is of general importance for advising on substance-related illness”*. There is currently no comprehensive obligation for the PCs to notify all cases of poisoning or suspected cases to the BfR.

In the course of setting up the national poisoning register, the notification requirements will be expanded substantially.

Further information on pesticides on the BfR website:

A-Z index: Pesticides:

https://www.bfr.bund.de/en/a-z_index/pesticides-130187.html



BfR “Opinions app”

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. The BfR advises the Federal Government and the States (‘Laender’) on questions of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.

This text version is a translation of the original German text which is the only legally binding version.