

## Twice as many poisonings and serious cases due to mushrooms in 2017 as in 2016

Every year since 2010, poisonings due to wild mushrooms in France have been monitored nationally from July to December (weeks 27 to 52). This is due to the seasonal nature of these cases, since mushroom growth is dependent on temperature and humidity. This surveillance enables national and local media to disseminate prevention messages each year during the mushroom picking season.

ANSES has been in charge of this surveillance since 2016, and had provided an earlier assessment in its second issue of *Vigil'Anses* [1]. The particularly high number of poisonings and serious cases of poisoning in 2017 meant that a new review was now called for.

Mushroom poisoning cases occurring between 4 July 2017 and 31 December 2017 were extracted from the National Database of Poisoning Cases (BNCl) of the Poison Control Centres' Information System (SICAP).

A case was defined as a person who had consumed one or more of the higher fungi<sup>1</sup> (macromycetes) and had presented at least one clinical sign following this ingestion, for which the advice of a poison control centre was sought.

Only cases of poisoning for which the overall causality was coded as non-zero were retained. Cases where causality was zero<sup>2</sup>, i.e. where the link between clinical signs and mushroom consumption was excluded, were not included in this analysis, nor were cases of symptomless ingestion, or intentional ingestion of inedible mushrooms for recreational purposes or as part of a suicide attempt.

While 2016 only saw a few symptomatic poisoning cases (N = 603), in 2017, 1,386 cases of mushroom poisoning were recorded by the network of poison control centres (PCCs) during the surveillance period.

These poisonings occurred mainly in September (35.6%) and October (38% of cases), with respective peaks of 291 cases in week 39 and 215 cases in week 40.

During these weeks, the weather conditions combining heavy rainfall, little sunlight and cool temperatures favoured wild mushroom growth and therefore picking, which was responsible for the increase in poisonings.

Almost all cases of poisoning showed digestive signs (92%), which were mainly vomiting (62.8%), diarrhoea (45.7%), nausea (22.7%) or abdominal pain (40.8%).

More worryingly, 2017 also saw a high number of serious cases. While around 20 serious cases are expected every year on average, 41 cases of high severity<sup>3</sup>, including three deaths, were recorded by PCCs in 2017, with 33 cases occurring between weeks 39 and 42.

Of these 41 cases of high severity, more than two thirds (25 cases) corresponded to poisonings caused by wild mushrooms containing amanitin toxins (amatoxin poisonings). This is characterised by digestive signs (nausea, vomiting, abdominal pain and profuse diarrhea) occurring on average 8 to 12 hours after consumption, and can lead to serious or even fatal liver damage. This syndrome can be caused by death cap (*Amanita phalloides*), European destroying angel (*Amanita virosa*), etc.), small *Lepiota* or *Galerina*.

1. Mould was not included in this study.

2. Causality is the link between exposure to the agent and the patient's symptom. This causality is calculated according to version 7.6 of the method for determining causality in toxicovigilance (the method and a calculator are available at [tv.toxalert.fr](http://tv.toxalert.fr)). When this causality is zero, it means that the symptoms presented by the exposed individual are not related to the agent, which explains why these individuals are excluded from studies.

3. Causality is rated from I0 to I4: excluded, unlikely, plausible, likely, very likely.

Severity assessed based on the Poisoning Severity Score (Persson HE, Sjöberg GK, Haines JA, Pronczuk de Garbino, J. *J Clin Toxicol.* 1998;36(3):205-13).

The 25 patients with amatoxin poisoning ranged in age from 14 to 90 years (median 62 years). All the victims were poisoned during a meal. In five collective cases (representing 10 cases of poisoning), the meal had been shared by at least two diners who all suffered from high-severity amatoxin poisoning. Where information was available in the PCC files, most cases concerned fungi mistakenly assumed to be parasol mushrooms (*Macrolepiota procera*), boletus (*Boletus spp.*), sheathed woodtuft (*Kuehneromyces mutabilis* or *Pholiota mutabilis*), saffron milk cap (*Lactarius deliciosus*), puffballs (*Calvatia spp.* or *Lycoperdon spp.*) or field mushrooms (*Agaricus campestris*). In four cases, death cap (*Amanita phalloides*) and *Amanita submembranacea* were formally identified through photos; in the other cases the patients had not taken any photos of the mushrooms they had picked.

All 25 cases of high-severity *Amatoxin* poisoning caused liver damage, including 14 that were serious.

Of these, three cases required liver transplantation and two patients died before transplantation.

ANSES and the Directorate General for Health (DGS) issued an initial joint press release on 29 September 2017 (week 39) following the first peak in the number of poisoning cases, in order to remind the general public of the recommendations for good mushroom picking and consumption.

Due to an unusually large number of prescriptions in French hospitals for the antidote (Legalon®) used in the treatment of amatoxin poisoning, identified by the French Health Products Safety Agency (ANSM), ANSES issued a second press release on 20 October 2017 to reiterate the dangers related to mushroom consumption.

Apart from the large number of cases and the high frequency of severe cases, 2017 was comparable to 2016 in terms of the other characteristics of the poisoning victims. There were as many men as women and all age groups were involved, ranging from 9 months to 92 years (median age 48).

While all regions were represented, the geographical distribution was uneven, with a high proportion of cases in Nouvelle Aquitaine (14%) and Pays-de-la-Loire (12.7%) followed by the Grand-Est and Ile-de-France regions (around 11% of cases).

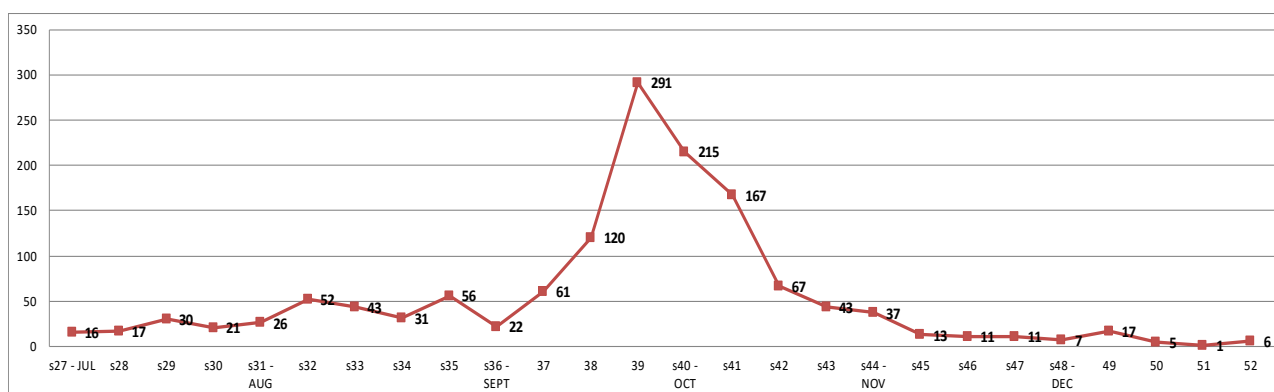


Figure 1: Weekly distribution of mushroom poisoning cases observed in SICAP between weeks 27 and 52.

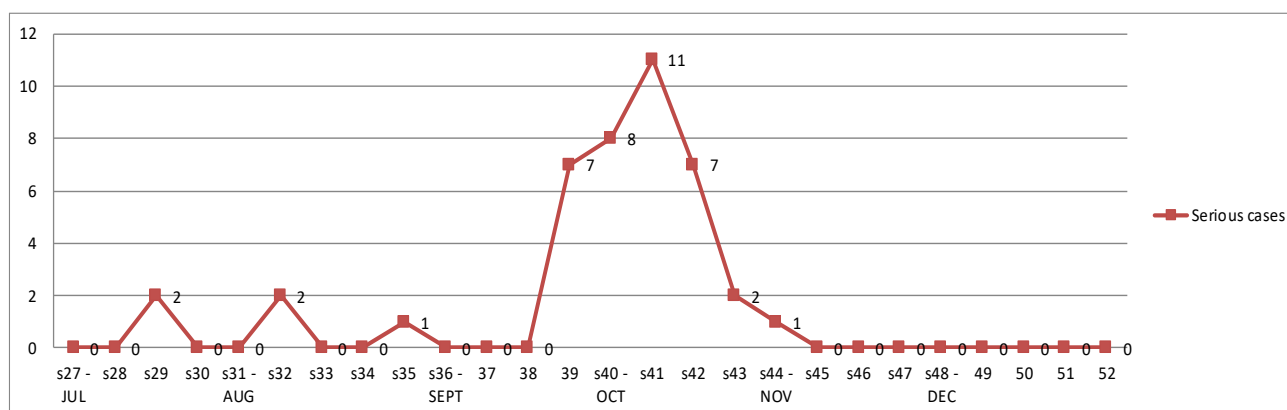
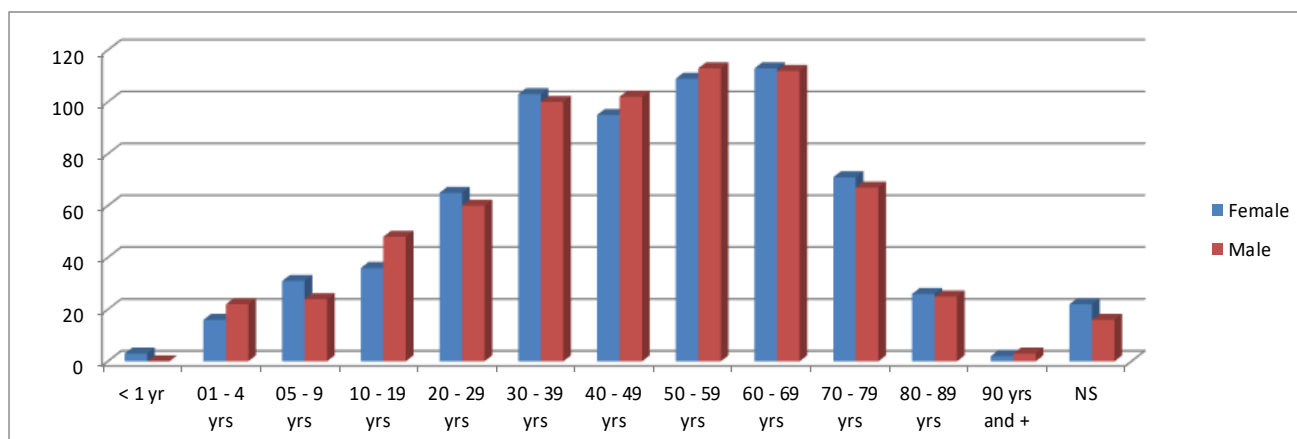


Figure 2: Weekly distribution of severe mushroom poisoning cases observed in SICAP between weeks 27 and 52.



**Figure 3:** Age and gender distribution of the number of cases of mushroom poisoning between weeks 27 and 52. (Source: SI-CAP).

Most of the mushrooms consumed were picked (72% of cases), whereas a small proportion (5.5%) were bought at a market or in a shop.

In addition, in almost 92% of cases, people were poisoned during a meal. However, in 5% of cases, ingestion of a piece of inedible mushroom concerned young children or, to a lesser extent, adults with neuropsychiatric disorders: they consumed a mushroom found by chance in the garden, without the knowledge of those around them.

Mushroom poisoning most often results from confusion with edible species. However, in some cases people are completely unaware of the existence of poisonous fungi; they then pick poisonous species and fail to seek specialist advice before eating them.

If you pick mushrooms, therefore, it is worth getting into the habit of asking a mycologist to identify them and taking photos of them before cooking! In the event of poisoning, the photo will help the practitioner at the PCC decide on suitable treatment.

**In the event of one or more symptoms occurring** (especially diarrhea, vomiting, nausea, tremors, dizziness, vision problems, etc.) following the consumption of picked wild mushrooms, **immediately dial "15" or call the poison control centre in your region, and explain that you have eaten wild mushrooms.**

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## References

[1] <https://vigilanses.anses.fr/fr/issue/2%20DE%20VIGIL'ANSES>