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CIGUATERA IN THE FRENCH CARIBBEAN: PROVIDE MORE INFORMATION ON THE FISH SPECIES POTENTIALLY RESPONSIBLE

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Ciguatera is a type of food poisoning due to consumption of tropical fish contaminated with marine toxins known as ciguatoxins. Symptoms include digestive, skin, cardiovascular and neurological disorders, which can sometimes persist for several weeks or even months. The itching observed in cases of ciguatera has given this poisoning the French name la gratte. In order to provide more information to consumers, whether they are residents or holidaymakers, as well as to fishers and restaurant owners, ANSES has drawn up a list of 67 species of fish posing a risk of ciguatera in the French Caribbean.

Ciguatera is a particular type of food poisoning requiring medical attention and affecting residents of the French overseas territories, as well as people returning from a trip there. It is caused by eating fish from tropical and subtropical waters contaminated with marine toxins called ciguatoxins, which are produced by microscopic algae found in coral reefs. Herbivorous fish contaminated by ingesting these algae are then eaten by larger fish, in whose flesh or viscera the ciguatoxins accumulate, and so on throughout the food chain. Ciguatoxins do not affect the taste of the fish and are resistant to cooking and freezing. Poisoning can therefore also occur after eating imported frozen fish.

Because of climate change, ciguatoxins are spreading outside tropical and subtropical regions. In recent years, cases of ciguatera have been reported following consumption of fish caught in the Spanish Canary Islands. Fish contaminated with ciguatoxins have also been observed in the Balearic Islands, although to date there have been no cases of human poisoning.

WHAT IS CIGUATERA?

The first signs of ciguatoxin poisoning are usually digestive: abdominal pain, nausea, vomiting, diarrhoea, etc., and occur a few minutes to a few hours after eating contaminated fish. They are quickly followed by neurological disorders such as tingling and itching (hence the French name la gratte) in the hands, feet and face, reversal of hot and cold sensations[1], pain when cold, muscle pain and profuse sweating. This may be accompanied by a slowing of the heart rate and a drop in blood pressure, which can last for several days. Balance disorders, visual hallucinations and even a depressive syndrome have been observed in some cases.

While the digestive signs disappear on their own after a few days, the neurological signs may last for several weeks or even months. Treatment can only help ease the symptoms. The prognosis may be unfavourable in the case of paralysis of the respiratory muscles or heart attack. However, ciguatera is rarely fatal.

[1] Hot surfaces feel cold and cold surfaces feel hot.

Patients remain at risk of symptoms recurring, even several months after poisoning, if they consume alcohol or fish (whether contaminated or not), among other things. The mechanism of these resurgences is poorly understood.

In Guadeloupe, since 2002, a prefectoral order[2] has prohibited or restricted the marketing of certain fish due to the risk of ciguatera, depending on their weight[3] or the area in which they were fished[4]. However, certain unlisted species in the jack or snapper families are also frequently responsible for ciguatera poisoning. Cases of ciguatera are also regularly reported in Martinique, where unlike Guadeloupe there is no prefectoral order in place.

To better regulate the fishing and marketing of species posing a risk of ciguatera in the French Caribbean, the Directorate General for Food (DGAL) asked ANSES to draw up a list for Martinique and Guadeloupe.

WHICH FISH POSE A RISK OF CIGUATERA IN THE FRENCH CARIBBEAN?

Although ciguatera is not a notifiable disease, it is normal practice for healthcare professionals, catering professionals and the regional health agencies to report any cases of ciguatera of which they become aware to the Directorates for Food, Agriculture and Forestry (DAAFs) in their respective regions (Martinique or Guadeloupe). These reports are used to draw up a non-exhaustive list of poisoning cases. When fish leftovers from these cases are available, the DAAF informs the DGAL and sends samples (pieces or whole fish) to ANSES's National Reference Laboratory (NRL) for marine biotoxins, to test for ciguatoxins.

The NRL analysed fish samples associated with cases of ciguatera in the French Caribbean between 2002 and 2021. Some fish that were not consumed, but that had been caught in the same place and at the same time as other fish associated with cases, were also sent for analysis. In order to identify with certainty the fish species involved in poisoning, these same samples were sent to the Marseille laboratory of the Joint Laboratory Service (SCL) for DNA analysis. This is because visual or morphological identification of a fish species can be difficult and error-prone, especially with fish out of water.

The study ultimately focused on 74 fish analysed between 2002 and 2021, for Martinique and Guadeloupe combined. The results revealed three families of fish involved: jacks (40% of the fish analysed), snappers (32%) and groupers (18%), as well as a fourth group made up of miscellaneous fish (10%). A clear difference was observed between Martinique and Guadeloupe: groupers and snappers were found in Guadeloupe, but not in Martinique (Figure 1).

According to the DAAFs of Martinique and Guadeloupe, residents of both islands eat the same types of fish, but overfishing in Martinique means that there are now not enough groupers and snappers to satisfy local consumption. Most of these two families of fish are therefore imported from Venezuela and Grenada, which have so far been free of ciguatera.

In Guadeloupe, grouper and snapper are still fished locally.

DNA analysis results from the SCL in Marseille showed that the 74 fish analysed belonged to 22 distinct species.

As ciguatera reporting is not exhaustive and fish leftovers are not always available, a review of the scientific literature was also carried out to search for species that may not have been identified by the analysis of fish collected between 2002 and 2021. To do this, two databases of

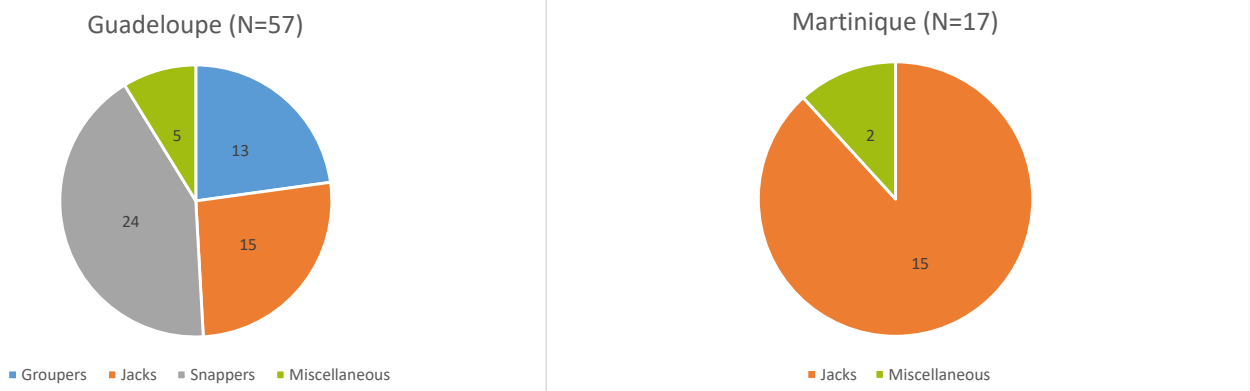


Figure 1 - Families of consumed fish responsible for cases of ciguatera reported between 2002 and 2021 in Guadeloupe and Martinique. Sources: Data from the DGAL and the NRL for marine biotoxins.

[2] Order No. 2002/1249/PREF/SGAR/MAP regulating inshore fishing in the waters of the département of Guadeloupe.
[3] Fish weighing more than 1 kg for certain species listed in the order.
[4] Fish caught north of 16.5° latitude for certain species listed in the order.

scientific articles were queried, searching according to a combination of geographical terms corresponding to a large area of the Caribbean[5] and keywords relating to ciguatera, ciguatoxins and the microalgae that produce them. This literature review added another 45 fish species posing a risk of ciguatera in the Caribbean to the 22 already identified.

Ultimately, the study of the data collected and the literature search led to a list being drawn up of 67 fish species posing a risk of ciguatera in the French Caribbean:

- 12 species of grouper (family Seranidae, subfamily Epinephalinae) and one species of Seranidae from another subfamily;
- 9 species of jacks or amberjacks (family Carangidae);
- 14 species of snapper (family Lutjanidae) and two species of bigeye (family Priacanthidae);
- 29 other fish species (28 native to the Caribbean and one invasive alien species) from 18 other fish families.

This list is detailed in the ANSES opinion of May 2025 (see "Find out more").
These fish species posing a risk of ciguatera are found in all the islands of the French Caribbean, in the Lesser Antilles outside France, in the Greater Antilles and in the continental United States and Mexico (Figure 2).

LESSONS TO BE LEARNED

Compared with other regions such as the Indian or Pacific Oceans, the number of fish species posing a risk of ciguatera listed for the French Caribbean is relatively low.

While each of the 15 species from the 2002 Guadeloupe prefectoral order is present among the 67 species identified by ANSES, two differences can be noted:

- The fish weight criterion was not included in the ANSES opinion, unlike in the Guadeloupe order, because recent articles have shown that poisoning can also occur after eating small or low-weight fish.
- The geographical criterion for the origin of the fish was not included in the ANSES opinion, unlike in the order. The risk of ciguatera from fish caught in the southern French Caribbean islands does not seem any lower than that from fish caught in the northern islands (Saint-Martin and Saint-Barthélemy). Moreover, the place where the fish were caught is not always known, limiting the possibility of determining the origin of fish identified as toxic.

In communications to the general public, restaurant

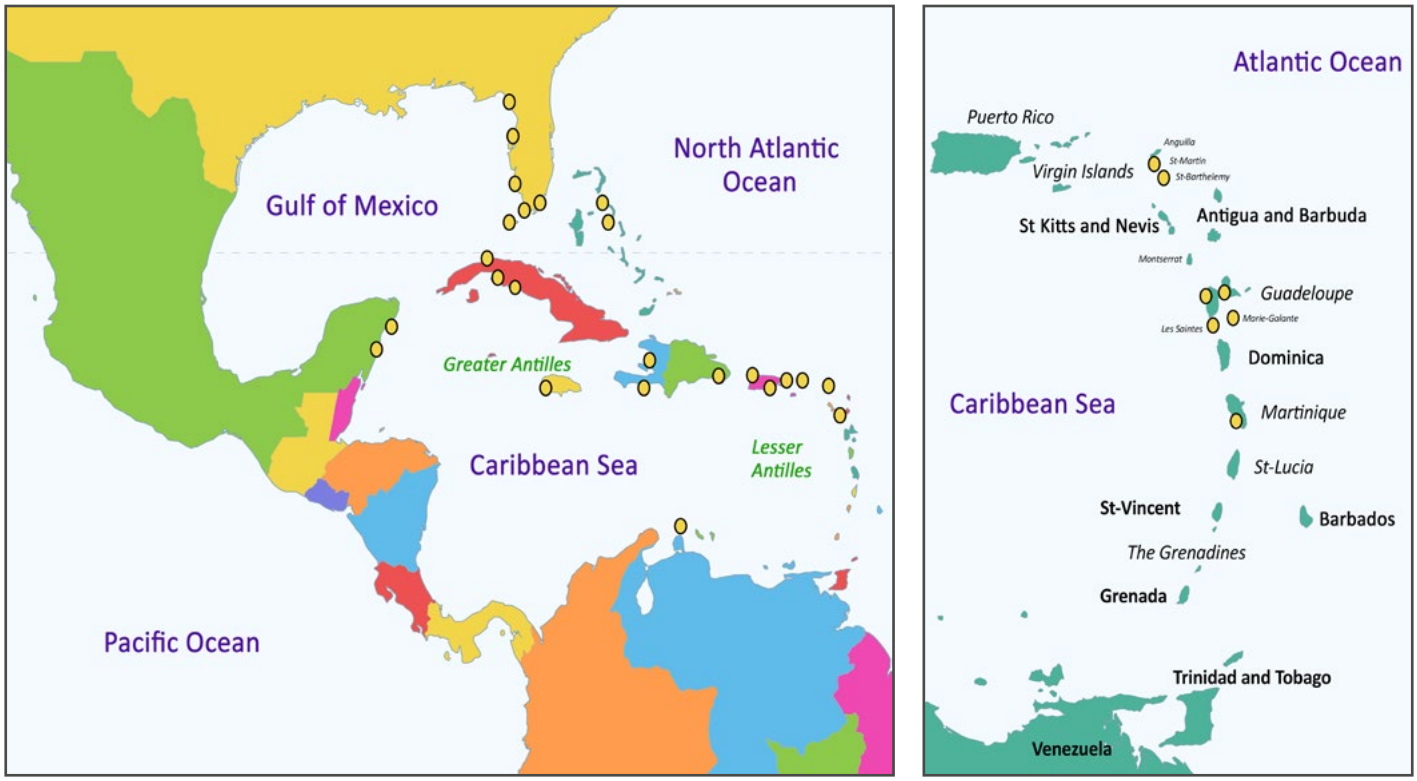


Figure 2 - Geographical areas of fish posing a risk of ciguatera, based on a study of data collected by the DGAL and the NRL for marine biotoxins between 2002 and 2021 and a literature review (yellow circles correspond to places where cases of ciguatera have been observed).

[5] Geographical areas corresponding to the French Overseas Territories, the Caribbean Sea and the Western Atlantic, selected on the basis of geographical proximity or trade interactions between these areas.

owners and fishers, it is important to mention the unambiguous Latin scientific name (genus and species) of fish posing a risk, as well as their common name and any local names. This makes it possible to precisely identify the species of fish observed and avoids confusion among fishers and consumers. A reference guide[6] has been published that gives the common names, local names and scientific names of the fish identified.

STRENGTHEN RECOMMENDATIONS FOR FISHERS AND CONSUMERS

Following this opinion, ANSES recommended that information on ciguatera be widely disseminated to consumers, whether they are residents or holidaymakers, as well as to fishers and restaurant owners, in order to reduce the risk of this little-known form of food poisoning.

Sandra Sinno-Tellier (ANSES),
Luc de Haro (Marseille poison control centre).

WHAT CAN BE DONE TO AVOID CIGUATOXIN POISONING??

- When buying fish, check with the fishmonger or fisher to avoid eating a high-risk species;
- If in doubt about the species of fish, do not eat it;
- Avoid the parts most likely to contain the toxin: head, viscera, offal.

WHAT SHOULD BE DONE IN THE EVENT OF POISONING?

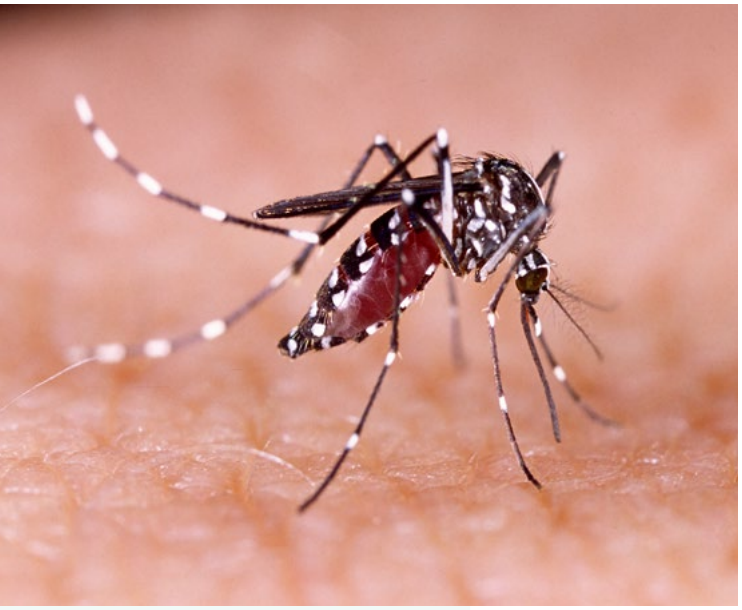
- Appelez un Centre antipoison 24h/24 7j/7 • Call a poison control centre (+33 (0)1 45 42 59 59: the line is open 24/7) or consult a doctor, mentioning any medicines you are taking, as some may aggravate the symptoms;
- In the event of heart problems (drop in blood pressure, slowing of the heart), call 15 (in France) immediately, or 112, or 114 for the hearing impaired;
- Keep leftovers of meals or fish in the freezer for toxin analysis;
- After an initial poisoning episode, certain foods and drinks can reactivate the symptoms: seek advice from a poison control centre.

FIND OUT MORE

Anses. (2025). Opinion on the study of fish species posing a risk of ciguatera in the French Caribbean Request No 2023-AST-0213. ANSES. Maisons-Alfort. 64 p.

[6] https://archimer.ifremer.fr/doc/00917/102881/

Monitoring the acute adverse effects of vector control



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Every year sees an increase in operations to combat the mosquito vectors of arbovirus diseases. In spite of this, in 2023 and 2024, the number of calls to poison control centres about poisoning due to insecticides remained low, and cases were not serious. Vigilance is still called for, however, in view of the increase in the number of arbovirus diseases, and the density and geographical spread of their mosquito vectors in mainland France.

VECTOR CONTROL INTENSIFYING WITH THE GEOGRAPHICAL SPREAD OF THE TIGER MOSQUITO

Vector control (VC) aims to prevent and limit the spread of diseases transmitted by vectors, including arbovirus diseases. These infectious diseases are caused by viruses transmitted by the bite of an infected arthropod vector. These vectors include the tiger mosquito (Aedes albopictus), which can transmit the dengue, chikungunya and Zika viruses.

Since 2020, all départements in mainland France have been considered at risk from the establishment and spread of the tiger mosquito. As of 1 January 2025, it was established in 81 départements, representing 84% of those in mainland France, compared with 51% in 2019.

The tiger mosquito's range is expanding towards the west and north of mainland France. This spread is facilitated by the movement of goods and people and by rising temperatures, which lengthen the season favourable to mosquitoes (shorter winters). Not all mosquitoes are carriers of arboviruses, but they can become so if they bite an infected person, even one who is asymptomatic.

The number of outbreaks of arbovirus disease transmission and of indigenous cases[1] in mainland France confirms the increase in risk observed since 2022, with 66 indigenous cases of dengue fever in 2022 [1], 45 in 2023 [2] and 83 in 2024 [3] (Table 1).

In France, VC is coordinated by the regional health agencies (ARSs) and their specialist mosquito eradication operators, who cover the entire country. Because dengue fever, chikungunya and Zika are notifiable diseases, as soon as a case of arbovirus disease is identified, the ARS mobilises its operator to search for tiger mosquitoes in the places frequented by the patient.

If the presence of the tiger mosquito is confirmed, VC measures are put in place, including the mechanical removal of breeding sites (destruction of eggs and elimination of the water in which the female mosquito lays its eggs) and, if necessary, a deltamethrin-based biocidal treatment to kill adult mosquitoes and reduce the risk of transmission of the arboviruses dengue, chikungunya and Zika.

[1] A person infected with the virus in mainland France who has not recently travelled to an area where the virus is circulating, indicating virus transmission by mosquito vectors found locally.

	2022	2023	2024
Imported cases			
Dengue	378	2524	4683
Chikungunya	23	44	34
Zika	6	11	8
Indigenous cases			
Dengue	66	45	83
Chikungunya	0	0	1
Zika	0	0	0

Table 1 - Number of imported[2] and indigenous cases of dengue, Zika and Chikungunya in mainland France between 2022 and 2024 (Source: Santé publique France).

This biocidal treatment is carried out within a defined perimeter, generally 150 metres, around places frequented by the patient and while complying with regulations concerning water points or water courses (application of a buffer zone). The aim is to eliminate any adult mosquitoes that may have bitten the patient and could then transmit the virus to other people in the surrounding area. Taking place at night during the mosquito's resting period, it is applied to vegetation to limit the population's exposure to the sprayed product and the impact on non-target fauna biodiversity (pollinating insects, in particular). In the days leading up to the operation, leaflets posted through letterboxes give the date of the operation and advise people to avoid exposure to the spray mist, stay home, close their doors and windows during spraying, turn off any ventilation, keep animals and their food bowls away or indoors, protect aquatic and cold-blooded animals, cover ponds, pools and sand pits, and move or protect beehives. They are also advised to bring washing indoors and put away garden furniture and outdoor toys.

	Information requests	Exposure cases	Total
2022	19	5	24
2023	34	19	53
2024	19	9	28
TOTAL	77	33	105

Table 2 - Breakdown of calls to poison control centres relating to vector control between 2022 and 2024.

Exposure to deltamethrin during VC is mainly via the respiratory route, following inhalation of a low-concentration aerosol dispersed in an unconfined environment, or via the dermal route, through contact with treated surfaces. Its low concentration in the formulations used limits the risk to the exposed population. The symptoms observed are generally mild and irritative: moderate difficulty breathing with coughing, slight eye irritation, redness of the skin, tingling. The co-formulants, in particular the solvents in the products used, may also play a role in symptoms. An exceptional form of bronchospasm remains possible in at-risk individuals, particularly asthmatics.

FEW REPORTS OF ADVERSE EFFECTS IN 2023 AND 2024

An initial assessment of calls to poison control centres (PCCs) in connection with VC during 2022 was carried out [4]. Of the 24 dossiers analysed, 19 people had called a PCC to ask for details of the vector control procedures (date and time), the products used and the potential effects on human or animal health. The other five people thought they had been exposed, but none exhibited any symptoms.

Over the period from 2023–2024, 81 calls about VC were recorded by the PCCs. However, as in 2022, they mainly concerned requests for information (n=53) from people who had been informed that a VC operation was going to take place near their home (Table 2).

The majority of these calls were made between June and October, coinciding with the period of activity of the tiger mosquito (May to November) and with the VC treatments around detected cases (Figure 1).

In total, in 2023 and 2024, 28 people contacted a PCC following direct exposure to a VC treatment. Thirteen of them showed symptoms (9 in 2023 and 4 in 2024). These symptoms were mainly irritative (irritation of the upper airways, coughing, oropharyngeal irritation), neurological (headaches) or digestive (nausea, abdominal pain). All poisonings were of low severity.

These people mainly lived in the Nouvelle-Aquitaine, Occitanie, Auvergne-Rhône-Alpes and Grand-Est regions. These results coincided with the regions in which the most VC treatments were carried out.

Although VC campaigns are being stepped up as a result of the increase in cases of arbovirus diseases, the PCC data show that the number of calls from people who have experienced symptoms following a VC treatment remains low. However, it is likely that not everyone who was affected called a PCC: some may have consulted their doctor or pharmacist, or even gone to the emergency department.

[2] A person who contracted the virus during a stay in an area where it is actively circulating, such as the French Caribbean, French Guiana, French Polynesia or Reunion Island, and who returned to mainland France while contagious.

	2023	2024	Total
Nouvelle-Aquitaine	8	14	22
Occitanie	15	4	19
Auvergne-Rhône-Alpes	13	4	17
Grand-Est	12	2	14
Île-de-France	2	3	5
Provence-Alpes-Côte d'Azur	2	1	3
Bourgogne-Franche-Comté	1	0	1
Total	53	28	81

Table 3 - Regional breakdown of calls to poison control centres about vector control (source: SICAP 2023–2024).

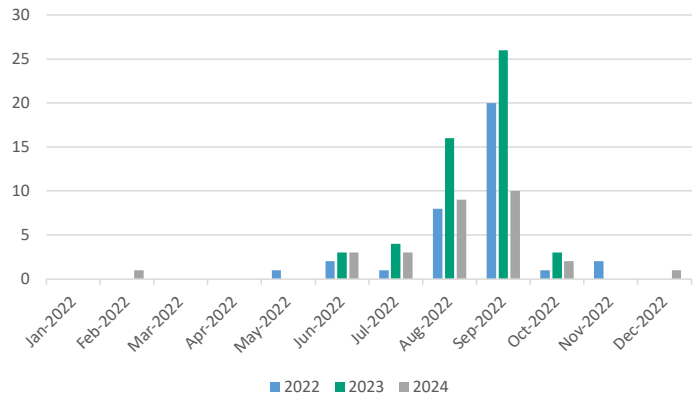

Figure 1 - Monthly breakdown of calls to poison control centres about to VC operations (source: SICAP 2022–2024)

AN UPWARD TREND IN 2025

2025 was a record year for arbovirus diseases in mainland France, with more than 1100 imported cases and 380 indigenous cases of chikungunya.

Calls to PCCs also appear to have increased since the start of the year. By 30 September 2025, 31 people had contacted a PCC following exposure to a VC treatment, 22 of whom were symptomatic. This is more than in 2023 and 2024 combined.

VC in mainland France is a major public health issue requiring an integrated approach: surveillance, prevention, innovation and community mobilisation. The monitoring of calls to PCCs relating to VC operations contributes to this approach by providing a picture of the acute adverse effects associated with these operations.

Chloé Greillet (ANSES)

FIND OUT MORE

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[2] **Fournier L, Calba C, Cochet A, Fournet N, Brottet E, Grard G, et al.** Bilan de la dengue, du Chikungunya et du Zika en France hexagonale en 2023. Bull Épidémiol Hebd. 2024 ;(13):260-266. https://beh.santepubliquefrance.fr/beh/2024/13/2024_13_1.html

[3] https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-a-transmission-vectorielle/chikungunya/documents/bulletin-national/chikungunya-dengue-et-zika-en-france-hexagonale.-bilan-2024

[4] **Battefort, F., Bloch, J. 2024**. No adverse effects from vector control: a finding that will need to be confirmed in the coming years. Vigil'Anses 22: 21-23 https://vigilanses.anses.fr/sites/default/files/VigilAnses_N22_Vectorcontrol.pdf

Carbon monoxide poisoning in the workplace: combustion-powered tools primarily responsible

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Carbon monoxide is responsible for several thousand cases of poisoning every year, including in the workplace. In 2023, poison control centres recorded 49 situations involving 90 poisoned workers. Occupations in construction and public works were the most affected, with the main cause being the use of internal combustion-powered work tools, most often in insufficiently ventilated environments. Information and prevention campaigns need to be stepped up to avoid these potentially serious and even fatal poisoning cases.

RECURRENT POISONING CASES, INCLUDING IN OCCUPATIONAL SETTINGS

Every year in France, carbon monoxide (CO) is responsible for around 3000 poisonings and around a hundred deaths [1]. This gas is emitted when the combustion process is incomplete, for example due to a faulty boiler or a combustion engine left running. It is odourless and colourless, making it undetectable to victims. Poisoning can lead to coma and death in just a matter of minutes, and if victims survive, they can be left with neurological or cardiovascular sequelae. The first symptoms (headaches, nausea and dizziness) are suggestive, especially if they affect several people in the same place.

Although these poisonings are known for occurring in private homes, they can also affect workplaces, with the possibility of numerous emission sources in a poorly ventilated environment in which the CO can then accumulate. Users can be poisoned by combustion-powered tools or electricity generators, for example. Are they sufficiently informed of the risks involved?

DOZENS OF CASES OF OCCUPATIONAL POISONING EVERY MONTH

In order to gain a better understanding of the circumstances surrounding these poisonings, data from the poison control centres' information system (SICAP) and the poison control centres' prospective investigation forms[1] were analysed. Situations in which one or more workers had been exposed to the same CO source were reviewed for the year 2023.

A total of 49 episodes were recorded, involving 90 poisoned workers. They were spread throughout the year, with a slightly higher frequency in the autumn and winter months (Figure 1). October and November saw the highest numbers of exposed workers (15 people exposed in seven and six episodes, respectively), followed by January (14 exposed in six episodes).

[1] When contacted by patients or medical services following CO poisoning, poison control centres (PCCs) investigate the cause through an individual medical investigation and provide clinical follow-up for patients. Each event is entered into SICAP and completed using a prospective investigation form that provides a better description of the circumstances and sources of the accident.

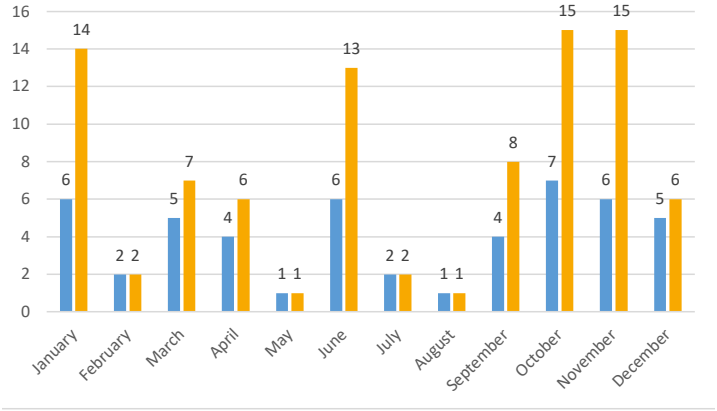

Figure 1 - Distribution over time of the number of episodes (in blue) and workers (in orange) exposed to carbon monoxide in 2023. Source: SICAP.

MOST CASES DUE TO COMBUSTION-POWERED APPLIANCES

Analysis of the CO emission sources showed that combustion-powered appliances were the main source of poisoning, accounting for 34 episodes and 59 exposed workers (Table I):

- combustion-powered work tools such as saws, mini-excavators, grinders, high-pressure cleaners and chainsaws, used in poorly ventilated premises,
- electricity generators installed in poorly ventilatedpremises (garage, attic of a house being renovated, for example), used to supply electricity to equipment such as heaters or cellar pumps,
- exhaust fumes from vehicles such as ambulances or tractors.

These were followed by heating systems, with 10 episodes involving 18 exposed people. They concerned:

- faulty boilers,
- a wood fire lit inside a tent,
- a gas radiant heater used by farmers when working in a hen house.

One episode involving six employees and 45 customers of a restaurant arose from the use of a barbecue inside the kitchen.

Lastly, in four episodes, the source of the CO emissions was not given, but CO poisoning had been confirmed by clinical, metrological or biological evidence: suggestive symptoms, CO measurement in the ambient air at the place where the poisoning occurred, or measurement of blood carboxyhaemoglobin[2] (HbCO) levels [2].

CONSTRUCTION OCCUPATIONS POSE THE GREATEST RISK

Among the poisoning cases caused by the use of combustion-powered appliances, workers in the construction and public works sector were the most affected. In total, in 2023, 29 episodes involved 54 construction and public works professionals, including:

- tilers who used a tile cutter all day in an enclosed environment,
- painters who connected their spray guns to a generator,
- workers poisoned by fumes from a digger that was faulty but was nevertheless used while waiting for the repair service.

The other episodes involved people working in a CO-contaminated area, but who were not the cause of the contamination. For example:

- a plumber called to service a boiler,
- a gas technician sent to the site of a malfunctioning boiler,
- police officers visiting an unsanitary dwelling with a faulty boiler.

	Number of episodes	Number of poisoning victims
Combustion-powered appliances	**34**	**59**
Combustion-powered tools	23	37
Electricity generators	8	13
Exhaust gases from vehicles	3	9
Heating systems	**10**	**18**
Boilers	8	15
Gas radiant heaters	1	2
Wood fire	1	1
Barbecue	**1**	**6**
Unidentified source	**4**	**7**
Total	**49**	**90**

Table 1 - Sources of occupational carbon monoxide poisoning in 2023. Source SICAP.

[2] Carboxyhaemoglobin (HbCO) is formed when CO binds to haemoglobin. Distributed throughout the body, it disrupts the supply of oxygen to the organs. The amount of HbCO is expressed as a percentage of total haemoglobin. Physiological HbCO levels are below 3% in healthy non-smoking adults and below 6% in smokers. At higher levels, an exogenous source of CO should be investigated, although the HbCO level should be interpreted with caution. It can be influenced by a number of factors, including the measurement method, the elapsed time between poisoning and blood sampling, oxygen therapy already started at the poisoning site, and certain medical conditions [3, 4].

SERIOUS POISONINGS AND ONE DEATH

Sixty of the poisoning cases, or two-thirds of the total recorded in 2023, were mild. Headaches were the most frequent symptom, often combined with nausea, vomiting or dizziness. Discomfort, sometimes accompanied by asthenia, was also reported.

Twenty-seven poisoning cases were of moderate severity. Headaches predominated, accompanied by loss of consciousness or convulsions.

Lastly, three workers suffered serious poisoning. This included:

- one who was sandblasting a piece of furniture and was found unconscious with HbCO levels of over 50%,
- two house painters, one of whom died, who were poisoned by an electricity generator on their work site, with CO measured at 1500 ppm at the site[3].

DETECTORS RARELY AVAILABLE

In 2023, only four episodes mentioned the fact that a CO detector was present and had been triggered. For 30 of the episodes, no system was in place, while no information was provided in the other 15.

In the four episodes where the detector was triggered, the victims were treated quickly and the poisonings were not serious. These examples also illustrate the diversity of occupational settings posing a risk:

- on the site of a house under construction, a fixed detector was activated due to an accumulation of exhaust fumes,
- at a waste recycling plant, two subcontractors equipped with portable CO detectors were alerted when working near wastewater treatment tanks (the CO emission source was not specified in the dossier),
- in a hairdressing salon, a hairdresser was alerted by a fixed detector to CO emissions from a faulty boiler,
- in an ambulance garage, portable detectors carried in a stationary medical vehicle with the engine running warned of the emission of exhaust fumes.

INFORMATION AND PRECAUTIONS TO BE REINFORCED

These figures confirm the data already published regionally by the Paris and Angers poison control centres [3, 4]. Between 2005 and 2011 in Île-de-France and between 2016 and 2021 for the North-West region, the occupational sectors affected were similar: manufacturing (factory or workshop staff), building/construction (site workers) or maintenance (technicians). The sources involved were also combustion-powered tools and generators.

These data probably underestimate the incidence of these poisonings, as not all cases are reported to a poison control centre. In addition, other occupational circumstances not covered here can lead to CO exposure: synthesis of chemical raw materials using CO, animal fermentations (such as in pig houses), paper mills, ice rink maintenance, etc. [4].

Workers who use combustion-powered tools in enclosed or poorly ventilated spaces should be reminded of the risk of poisoning. Ventilating the premises is the best solution, but is not always possible. The use of electrically powered tools is an alternative [3].

The annual information campaigns to the general public should also concern the workplace, as many workers may be exposed to faulty boilers or generators that have wrongly been placed in an enclosed space [1].

Lastly, the portable CO detectors already used by certain professionals (gas technicians and firefighters, for example) can provide early warning and limit the risk of poisoning.

Laurine Le Visage (Paris PCC), Cécilia Solal (ANSES)

FIND OUT MORE

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Some cosmetics designed to promote eyelash growth are not without risks

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Some cosmetics, whose intended effect is to promote eyelash growth, contain prostaglandins. These compounds expose consumers to the risk of side effects such as irreversible darkening of the iris and melting of periorbital fat. Pending the results of an assessment by the European Scientific Committee on Consumer Safety, ANSES has warned the public of these potential adverse effects.

CHANGE IN IRIS COLOUR AND MELTING OF THE FAT AROUND THE EYE SOCKETE

In February 2025, ANSES received a report of an adverse effect that had occurred in a young woman following use of an eyelash serum. The patient had noticed a change in the colour of her left eye, which had become noticeably darker than the right, and also observed a loss of fat around both eye sockets, accentuating her dark circles. The symptoms had appeared gradually after five months of using the product, which she applied once a day to the base of her upper eyelashes (like an eyeliner), systematically starting with her left eye.

The assessment found that causality (i.e. the probability of a causal link between the use of the product and the observed effect) was likely, according to the criteria of the method used in cosmetovigilance:

- the chronology, i.e. the time between the use of the product and the onset of symptoms, was compatible,
- the ocular and periocular symptoms following application of the serum to the base of the eyelashes were suggestive of a link,
- no other cause was identified, no further tests were carried out and the patient permanently stopped using the product.

Investigation of this report showed that the serum used by the patient contained, among other things, isopropyl cloprostenate. This prostaglandin derivative may have caused the adverse effects observed.

KNOWN ADVERSE EFFECTS IN OPHTHALMOLOGY

Prostaglandin and its derivatives are growth hormones used in certain eye drops, in ophthalmology, in the treatment of glaucoma[1]. Their adverse effects include eyelash growth and thickening, and permanent darkening of the iris, as well as chronic eye irritation, itching and loss of fat around the eye, affecting almost 10% of patients treated with these anti-glaucoma eye drops. However, with a treatment that is essential for effects are stated on the package leaflets for these medicines, and patients are usually informed of them when they are first prescribed.

[1] Claucoma is a disease in which the pressure inside the eye increases, threatening eyesight if left untreated.

ARE THESE RISKS ACCEPTABLE FOR A COSMETIC PRODUCT?

Prostaglandin derivatives used in cosmetics to promote eyelash growth expose the user to all the effects of prostaglandins detailed above. These effects are not usually mentioned on the packaging and users are therefore not informed of this possible risk.

In the United States, if prostaglandins are used in an eyelash growth cosmetic, the product is classified as a medicine, since its purpose is to modify a part of the body. It must therefore be approved as such by the Food and Drug Administration (FDA), the competent authority for cosmetics safety.

In Sweden, in 2013, the health authorities published a press release giving the results of analyses carried out on eyelash serums and eyelash growth products. They reported that "prostaglandin analogues were found in as many as nine of the 26 products in total. In three of the products prostaglandin analogues were not declared on the packaging. Prostaglandin analogues are added to stimulate eyelash and eyebrow growth." As a result, the Swedish Medical Products Agency advised consumers "not to use products containing prostaglandin analogues, as this may lead to serious side effects"[2].

In 2018, the German Federal Institute for Risk Assessment (BfR) informed the European Commission that prostaglandin derivatives used in eyelash growth products posed a health risk, even at the concentrations applied in cosmetics.

Subsequently, in early 2022, the European Scientific Committee on Consumer Safety (SCCS) concluded that the use of prostaglandin analogues in cosmetic products could present a risk to consumer health. In June 2025, having assessed all the evidence provided by the marketing authorisation applicants to support the safe use of the three prostaglandin analogues (isopropyl cloprostenate, norbimatoprost and dechloro dihydroxy difluoro ethylcloprostenolamide) for use in cosmetic products intended for promoting the growth of eyelashes and eyebrows, the SCCS published a preliminary opinion stating that "none of them can be considered safe"[3]. As required by the European Cosmetics Regulation, this preliminary opinion was submitted for public consultation until the end of August 2025. ANSES sent the SCCS information on the case mentioned at the beginning of this article. The European Union's conclusions are pending.

ANSES ISSUES AN ALERT WITHOUT WAITING FOR POSSIBLE CHANGES TO THE REGULATIONS

Depending on the SCCS's final conclusions, regulatory measures may be decided upon by the European Commission that could lead to a ban or restriction on these substances in cosmetic products. Without waiting for these conclusions, ANSES nevertheless warned consumers of the possible adverse effects of these substances, some of which – such as the changes to iris colour – are irreversible.

If you notice an adverse effect following the use of a cosmetic product, it is important to declare it on the Ministry of Health's adverse health event reporting portal. Your report may help identify a new risk and enable the necessary measures to be taken[4].

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Sarah Aouad, Elodie Lontsi (ANSES)

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Drug hypersensitivity in cattle

An account of how a signal is processed in veterinary pharmacovigilance

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There was an increase in the frequency of reported cases of immediate drug hypersensitivity in cattle, observed first in France and then more generally in the European Union between 2020 and 2023, leading to coordinated management of this signal at European level. The main hypothesis was that the cattle were sensitised to povidone, an excipient contained in many veterinary medicines, particularly vaccines. Although the assumed mechanism could not be confirmed, risk management measures were taken, including the exclusion of povidone from the manufacturing processes of certain vaccines. By 2024, the frequency of hypersensitivity reactions observed in cattle had returned to its previous level.

A RARE BUT WELL-KNOWN ADVERSE EFFECT IN CATTLE

Immediate (or Type 1) hypersensitivity reactions are a recognised phenomenon described in many animal species, including cattle. Symptoms include respiratory problems, oedema, cyanosis and sometimes shock, which can lead to the death of the animal. Certain classes of drugs, such as antibiotics and vaccines, are among the possible causes of these hypersensitivity reactions. They are mentioned as a potential adverse effect in the package leaflets of many medicines.

Hypersensitivity reactions in cattle following the administration of various medicines have regularly been reported to the French Agency for Veterinary Medicinal Products (ANMV), part of ANSES. However, this type of reaction is considered to be very rare (fewer than one animal in 10,000 treated) and the reported cases tend to be isolated.

EMERGENCE OF THE SIGNAL IN FRANCE

In 2020, thanks to adverse effect reporting by veterinarians, the ANMV detected clusters of immediate hypersensitivity reactions in cattle, triggered mainly by antibiotic injections. These grouped hypersensitivity reactions (several animals reacting simultaneously or within a short period of time) occurred on farms following the administration of antibiotics with a long history of use, without any such clusters previously being observed. In 2020, the number of cases was still limited, with 16 recorded. However, they had been reported by several veterinarians and seemed to occur mainly on farms on which a new vaccine against bovine mastitis had been administered.

Investigations carried out on the products triggering these reactions had not identified any "batch effect" or change in the manufacturing processes. This led to suspicions that the animals had been sensitised by an external factor, whether environmental or medicinal. An ANMV survey of reporting veterinarians found no major differences in the practices of affected farms compared with control farms (farms monitored by the same veterinarians, but not affected by these reactions).

However, previous vaccination against mammary infections was identified in around 50% of the farms concerned, compared with 21% of control farms [1].

EXTENSION OF THE SIGNAL TO EUROPEAN LEVEL

In the years that followed, this signal was extended both geographically and clinically: a European-level analysis of veterinary pharmacovigilance data showed an overall increase in the frequency of hypersensitivity reactions in cattle (clusters as well as isolated cases) to various types of medicines (antibiotics as well as vaccines, anti-inflammatories, antiparasitics, mineral supplements, etc.) in several other European countries (mainly Spain, Italy and Belgium).

While various medicines were mentioned in the medical histories of the animals concerned, the product most frequently cited in the declarations was a vaccine against bluetongue, a disease affecting all domestic ruminants. Prior administration of this vaccine was reported in almost 25% of the cases of bovine hypersensitivity recorded in France in 2022. The profile of the animals affected by hypersensitivity reactions had also changed, from mainly dairy cattle (75% of cases recorded in France before 2022) to mainly beef breeds (67% of reports in France between 2022 and early 2023).

INVESTIGATIONS COORDINATED BY EMA

Faced with the increase in these pharmacovigilance reports, beginning in 2023, the European Medicines Agency (EMA) organised coordinated management of this pharmacovigilance signal at European level, bringing together experts from several veterinary medicine agencies in Europe (including the ANMV) along with the pharmaceutical companies concerned, in an attempt to gain a better understanding of the mechanisms involved.

The variety of medicinal products triggering these reactions and the frequency of certain vaccinations in the medical histories of the affected animals supported the hypothesis of prior sensitisation of cattle through vaccination. In the absence of any other identified lead and insofar as most of the reported reactions had been triggered by the administration of medicines containing povidone (an excipient[1] found in numerous veterinary medicines), the hypothesis of prior sensitisation to this substance was explored as a priority, especially since a similar phenomenon had already been reported in the literature in the mid-1990s [2].

Additional studies to explore this hypothesis were then carried out by the manufacturers concerned under the coordination of the EMA. The findings did not confirm the involvement of povidone or the link with prior ad-

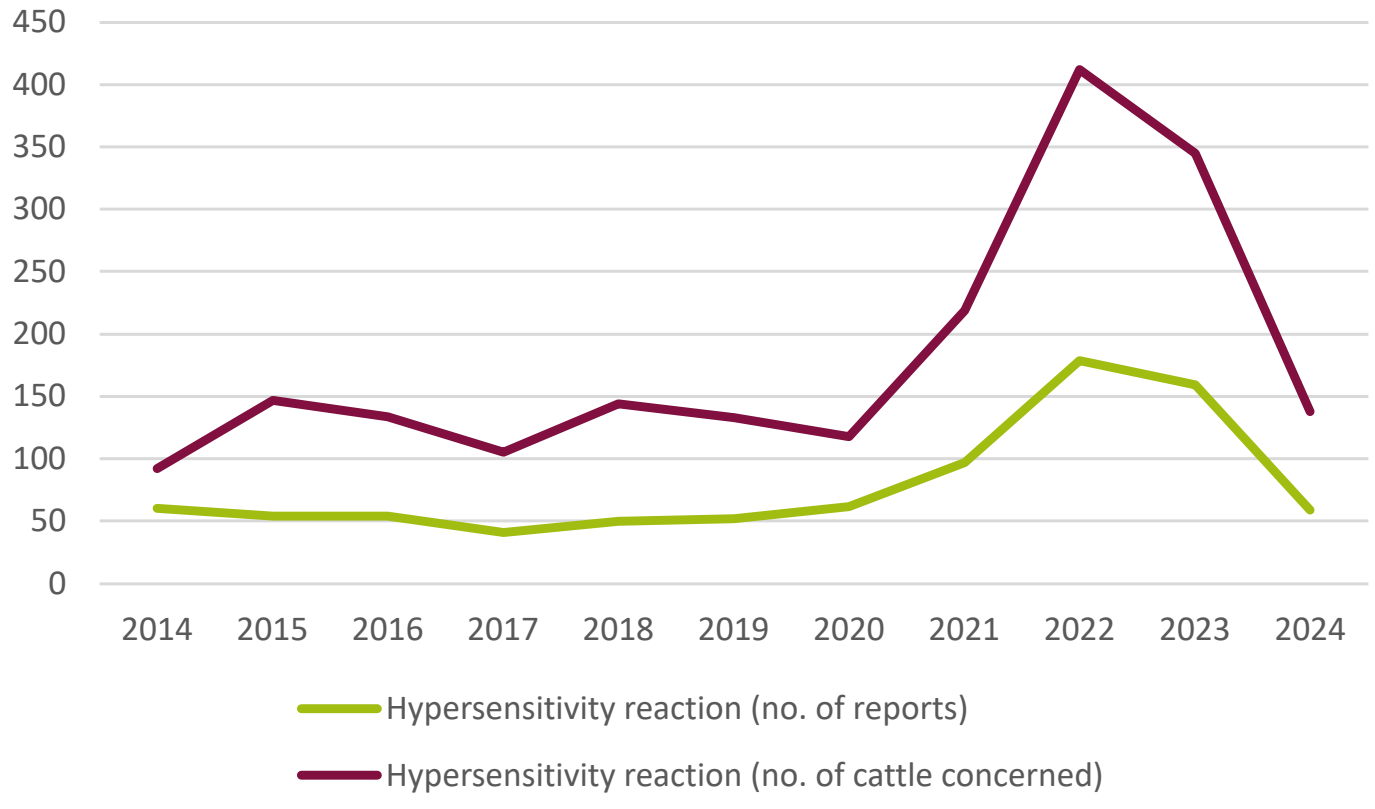

Figure 1 - Annual trend in hypersensitivity reactions in cattle reported to the pharmacovigilance scheme in France.

ministration of the main vaccines in question. However, measures were taken by the pharmaceutical industry from 2023 to limit the risk of sensitisation to povidone, by removing this substance from the manufacturing process of certain vaccines. This is because although povidone was not used directly in these vaccines, it was used in the industrial manufacturing process and could therefore have ended up in trace amounts in the finished product.

IMPACT OF THE MEASURES TAKEN

A decline in the number of reports of bovine hypersensitivity reactions has been observed since 2023, with the level in 2024 being similar to that prior to 2020 (Figure 1), corresponding to a normal frequency of reactions for the medicines concerned.

At this stage, it is difficult to determine whether this return to normal is due to the changes made to certain vaccines or to an adaptation of practices in the field, such as the use of medicines that do not contain povidone or a change in vaccination practices. On several occasions since 2022, the ANMV has issued communications about this signal to veterinarians, which could potentially have influenced the use of the medicines concerned [1,3].

In any case, given that risk management measures have been taken by industry and a favourable trend has been observed, the specific signal management procedure put in place by the EMA came to an end in late 2024. There are no plans to continue investigations or take any further action in relation to this signal [4]. However, manufacturers and the veterinary medicine authorities are continuing to closely monitor reported cases of bovine hypersensitivity, so that they can respond in the event of a new alert. In this context, it is important for veterinarians to maintain vigilance and report any adverse effects they observe to pharmacovigilance.

The detection and investigation of this signal led to the identification of a new risk inherent in the use of vaccines in animals. Discussions are under way at European level to take better account of this risk of sensitisation to povidone in the manufacturing process for veterinary vaccines.

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TO REPORT AN ADVERSE EFFECT TO VETERINARY PHARMACOVIGILANCE

→ **National veterinary pharmacovigilance scheme**

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[1] Component of a medicinal product, other than the active substance or the packaging materials, which does not confer any therapeutic or preventive properties, but may play a role particularly in the absorption (assimilation) and stability of the medicinal product, and affects its appearance, colour and taste.

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ANSES, which is responsible for several health vigilance schemes (pharmacovigilance of veterinary medicinal products, nutrivigilance, phytopharmacovigilance, toxicovigilance, vigilance for occupational and environmental diseases, cosmetovigilance and tattoovigilance), reports on its vigilance activities through a dedicated newsletter: **Vigil'Anses.**

Reflecting the latest news from each of the vigilance schemes, this four-monthly newsletter presents the main results of the Agency's work as part of its vigilance missions, in conjunction with its partners, professional networks and expert groups, along with the actions undertaken. The articles, which are deliberately short, are aimed at all environmental and occupational health players: public authorities, health agencies, ANSES's expert appraisal partner organisations and institutes, managers of prevention policies, the scientific community, professionals, associations and users. They encourage the interested reader to read the publications, opinions or reports available on the Internet for further information.

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