



**DEPARTMENT OF HEALTH & HUMAN SERVICES, CENTERS FOR DISEASE CONTROL AND PREVENTION**

March 23, 2023

Office of Pesticide Programs

U.S. Environmental Protection Agency

Re: Docket ID number EPA-HQ-OPP-0777-0050, 0051

Proposed Interim Registration Review Decision for Rodenticides

To Whom It May Concern:

Thank you for the opportunity to comment on EPA's Proposed Interim Registration Review Decision for Rodenticides. The Center for Disease Control and Prevention (CDC)'s National Center for Environmental Health, Division of Environmental Health Science and Practice, with input from our colleagues in the National Center for Emerging and Zoonotic Infectious Diseases, reviewed EPA's Proposed Interim Registration Review Decision for eleven Rodenticides and concur that the proposal is in the interest of public health.

Reducing human exposure to disease vectors, including rodents, is of great importance to CDC and public health. The 2021 American Housing Survey, conducted by the U.S. Census Bureau in cooperation with the U.S. Department of Housing and Urban Development found that nearly 12% of 128,000 households surveyed reported signs of mice or rats inside their homes in the past 12 months. Rodent infestation and rodenticide use may be more problematic in neighborhoods with lower access to resources. A higher proportion of households below the poverty level reported signs of rodents in their homes (14.5%) compared to households above the poverty level (11.5%). These issues are further exacerbated when such communities face specific infrastructural challenges, including potentially a higher number of overcrowded housing units and proximity to landfills. Individuals living in communities more vulnerable to higher rates of rodent infestations may feel compelled to acquire and utilize rodenticides without proper instruction on protecting themselves. Furthermore, communities with higher rates of poverty face additional structural-related challenges. For example, residents of public housing may be exposed to rodenticide use by property managers without consulting the residents themselves. Partnering with community members to address the inequities that create unnecessary exposure to rodent infestation may reduce the harms of improper use and disposal of rodenticides. Recommended strategies include increased public health awareness on proper rodenticide use and examining local and public policies that influence structural factors contributing to rodent infestation, particularly in communities with increased exposure risk.

Rats and mice carry pathogens that cause diseases in humans, including hantavirus, plague, salmonellosis, and leptospirosis and play a role in the transmission of vector-borne and food-borne illness. Additionally, exposure to rats and mice can trigger asthma symptoms for some individuals, contributing in part to the \$80 billion annual economic burden of asthma in the U.S. Rodents can also cause direct injury to humans, accounting for nearly 15,000 ED visits and ten deaths from 2010 to 2014

in the United States with an estimated economic burden of \$10 million in ED and in-patient costs. While proper use of rodenticides as part of an integrated pest management strategy has benefits, misuse resulting in poisoning is also a public health concern. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks requires that federal agencies identify and assess environmental health risks and safety risks that may disproportionately affect children; and ensure that its policies, programs, activities, and standards also address these tasks. Accidental exposure to rodenticide disproportionately affects children under the age of 6 years and it is preventable.

CDC in partnership with America's Poison Center analyzed rodenticide exposure trends using the National Poison Data System, a database of near real-time data from all cases reported to the 55 U.S. poison centers (PCs). NPDS was used to review all cases reporting exposure (i.e. exposure cases) to U.S. PCs associated with rodenticides from 2017 through 2021. The rodenticides were classified into the following three categories: first-generation anticoagulants (e.g., chlorophacinone, diphacinone, diphacinone sodium salt, warfarin, and warfarin sodium salt), second-generation anticoagulants (e.g., brodifacoum, bromadiolone, difenacoum, and difethialone), and non-anticoagulants (e.g., bromethalin, cholecalciferol, zinc phosphide, and strychnine). The analysis of medical outcomes were restricted to single-substance rodenticide exposures. The medical outcome categories included in the analysis were "no effect," "minor effect," "moderate effect," "major effect," "death," "death, indirect report," "not followed, judged as nontoxic exposure (clinical effects not expected)," "not followed, minimal clinical effects possible (no more than minor effect possible) and "unable to follow, judged as a potentially toxic exposure." Outcomes marked as "confirmed non-exposure" or "unrelated effect, the exposure was probably not responsible for the effect(s)" were excluded from the query.

From 2017 to 2021, there have been 40,808 total human exposure cases to rodenticides, including single and multi-substance exposures, reported to America's Poison Centers. Overall, the total number of rodenticide related exposure cases have decreased slightly since 2017 (Table 1). Exposure cases related to first-generation and second-generation anticoagulants have steadily decreased when compared to the data from 2017, by 22% and 45%, respectively. Exposure cases related to non-anticoagulants have increased by 36% since 2017 (Table 1).

Single-substance exposure cases classified with a medical outcome of no effect or not followed comprised most of the rodenticide related cases reported to PCs from 2017 through 2021 (Table 2). Of the 38,881 total human single-substance exposure cases related to rodenticides, 11,052 (28%) exposure cases were classified with a medical outcome of no effect and 26,117 (67%) exposure cases were categorized with a medical outcome of not followed. Similarly, single-substance exposure cases for first-generation and second-generation anticoagulants were most frequently classified with a medical outcome of not followed or no effect. From 2017 to 2021, there were 4,842 (71%) exposure cases related to first-generation anticoagulants categorized with a medical outcome of not followed, and 1,815 (27%) exposure cases classified as no effect. Amid second-generation anticoagulants, there were 5,185 (71%) exposure cases that were classified with a medical outcome of not followed and 1,936 (27%) exposure cases categorized as no effect. Additionally, there were 3,803 (58%) exposure cases related to non-anticoagulants classified with a medical outcome of not followed and 2,377 (36%) exposure cases categorized as no effect.

Exposure cases involving children between the ages of 0 and 5 comprised 71% of the rodenticide related cases received by PCs, including both single and multi-substance exposures, from 2017 to 2021. In 2021, there were 5,273 rodenticide related exposure cases in children from 0 to 5 years old, resulting in a 16% decline in child related rodenticide exposure cases from 2017 (Table 3). Similar to the overall trends, exposure cases in children related to first-generation and second-generation anticoagulants have

steadily decreased when compared to the data from 2017, by 29% and 51%, respectively. Exposure cases related to non-anticoagulants in children have increased by 30% since 2017 (Table 3).

As seen in the overall trends, medical outcomes for single-substance rodenticide related exposure cases involving children between the ages of 0 and 5 were largely classified as no effect or not followed (Table 4). Of the 28,564 total human exposure cases related to rodenticides in children, 8,904 (31%) exposure cases were classified with a medical outcome of no effect and 19,100 (67%) exposure cases were categorized with a medical outcome of not followed.

Based on the overall trends for first- and second-generation anticoagulant rodenticides from 2017 to 2021, human exposures have steadily decreased, and this is consistent with EPA's assessment in the "Revised Tier I Update Review of Human Incidents" (EPA-HQ-OPP-2015-0777-0057) which looked at trends in poison center calls prior to 2017. However, exposure to non-anticoagulant rodenticides have continued to increase since then and this finding should be studied more closely to find associated causes that may be amenable to a public health intervention. While most exposures resulted in no adverse health effects, this class of rodenticides still accounted for the highest number of minor effects for those reported to a poison center in children and adults. (NPDS defines minor effects as those symptoms that improved rapidly without any long-term health effects. Examples include skin irritation and mucus membrane irritation). While most cases resulted in no more than minor effects, the potential for harm remains a possibility while at the same time, these exposures are preventable.

EPA's proposed interim decision to classify first generation anticoagulant sold in packages greater or equal to 4 pounds, all second generation anticoagulant and some non-anticoagulant rodenticides as "Restricted Use Only" may further prevent accidental exposures, especially in children. Additional proposed actions for the benefit of public health also include restricting wide area applications of certain rodenticides in recreational areas where children and adults may come in contact with these substances. While there could be economic disadvantages from these new regulations, these need to be balanced with the high costs of medical treatment for rodenticide poisonings, or worse yet potential life-long disability.

CDC's standard control recommendations for naturally occurring plague in the United States include use of host-targeted flea control measures (including burrow applications) and environmental modifications to reduce available rodent food and harborage in affected areas, particularly peri-domestic environments. If a serious urban plague epizootic outbreak occurred in commensal rats and conditions seemed to warrant rodenticide use, the increased packaging requirement for first-generation anticoagulant rodenticides or the "Restricted Use Only" second generation anticoagulant and non-anticoagulant rodenticides, would still be in line with our recommendations of rodent vector plague control be done by professionals rather than by the consumer.

In summary, EPA's Proposed Interim Registration Review Decision for Rodenticides is reasonable and is supported by strong concerns and solid data about rodenticide poisoning of children and possible secondary toxic effects to protected animal species. We believe that any economic disadvantages from implementation of this proposal would be outweighed by the public health and environmental benefits that would result from these new proposed regulations.

Sincerely,



Erik Svendsen  
Director, DEHSP  
CDC | NCEH

**Table 1.** First-Generation Anticoagulants, Second-Generation Anticoagulants, Non-Anticoagulants and Total Rodenticide Exposures Reported to America’s Poison Centers from 2017 to 2021.

<i>Year</i>	<i>Total No. of Rodenticide Cases</i>	<i>First-Generation Anticoagulants</i>	<i>Second-Generation Anticoagulants</i>	<i>Non-Anticoagulants</i>
<i>2017</i>	8,339	1,608	2,036	1,159
<i>2018</i>	8,452	1,520	1,804	1,218
<i>2019</i>	8,165	1,317	1,406	1,441
<i>2020</i>	7,900	1,351	1,212	1,496
<i>2021</i>	7,952	1,247	1,115	1,575
<i>Total</i>	40,808	7,043 <sup>a</sup>	7,573 <sup>a</sup>	6,889 <sup>a</sup>

<sup>a</sup>Case count totals for the first-generation, second-generation, and non-anticoagulant categories do not equal the total number of rodenticide cases because not all rodenticides were classified into one of the previously mentioned categories.

**Table 2.** Medical Outcomes for First-Generation Anticoagulants, Second-Generation Anticoagulants, Non-Anticoagulants and Total Rodenticide Single-Substance Exposures Reported to America’s Poison Centers from 2017 to 2021.

<i>Outcome<sup>a</sup></i>	<i>Total No. of Rodenticide Cases</i>		<i>First-Generation Anticoagulants</i>		<i>Second-Generation Anticoagulants</i>		<i>Non-Anticoagulants</i>	
	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>
<i>No Effect</i>	11,052	28.4%	1,815	26.5%	1,936	26.6%	2,377	36.2%
<i>Minor</i>	1,354	3.5%	156	2.3%	131	1.8%	323	4.9%
<i>Moderate</i>	306	0.8%	22	0.3%	32	0.4%	50	0.8%
<i>Major/Death</i>	52	0.1%	<sup>b</sup>	<0.1%	<sup>b</sup>	<0.1%	10	0.2%
<i>Not Followed<sup>c</sup></i>	26,117	67.2%	4,842	70.8%	5,185	71.1%	3,803	57.9%
<i>Total</i>	38,881	100.0%	6,841 <sup>d</sup>	100.0%	7,289 <sup>d</sup>	100.0%	6,563 <sup>d</sup>	100.0%

<sup>a</sup> Single-substance exposure cases only.

<sup>b</sup> Case counts less than 10 were omitted to protect the privacy of patients. Corresponding case count percentages are displayed as <0.1% to continue to protect the privacy of patients.

<sup>c</sup> The “Not Followed” category includes “not followed, judged as nontoxic exposure (clinical effects not expected),” “not followed, minimal clinical effects possible (no more than minor effect possible) and “unable to follow, judged as a potentially toxic exposure.

<sup>d</sup> Case count totals for the first-generation, second-generation, and non-anticoagulant categories do not equal the total number of rodenticide cases because not all rodenticides were classified into one of the previously mentioned categories.

**Table 3.** First-Generation Anticoagulants, Second-Generation Anticoagulants, Non-Anticoagulants and Total Rodenticide Exposures Reported to America’s Poison Centers, Ages 0-5 Years, from 2017 to 2021.

<i>Year</i>	<i>Total No. of Rodenticide Cases (0 to 5 Years Old)</i>	<i>First-Generation Anticoagulants</i>	<i>Second-Generation Anticoagulants</i>	<i>Non-Anticoagulants</i>
2017	6,241	1,288	1,700	806
2018	6,097	1,217	1,462	830
2019	5,818	1,051	1,151	991
2020	5,577	1,069	967	1,046
2021	5,273	914	830	1,047
<i>Total</i>	29,006	5,539 <sup>a</sup>	6,110 <sup>a</sup>	4,720 <sup>a</sup>

<sup>a</sup> Case count totals for the first-generation, second-generation, and non-anticoagulant categories do not equal the total number of rodenticide cases because not all rodenticides were classified into one of the previously mentioned categories.

**Table 4.** Medical Outcomes for First-Generation Anticoagulants, Second-Generation Anticoagulants, Non-Anticoagulants and Total Rodenticide Single-Substance Exposures Reported to America’s Poison Centers, Ages 0 to 5 Years, from 2017 to 2021

<i>Outcome<sup>a</sup></i>	<i>Total No. of Rodenticide Cases (0 to 5 Years Old)</i>		<i>First-Generation Anticoagulants</i>		<i>Second-Generation Anticoagulants</i>		<i>Non-Anticoagulants</i>	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
<i>No Effect</i>	8,904	31.2%	1,564	28.7%	1,694	28.2%	1,877	40.6%
<i>Minor</i>	506	1.8%	75	1.4%	63	1.1%	123	2.7%
<i>Moderate</i>	48	0.2%	<sup>b</sup>	<0.1%	10	0.2%	10	0.2%
<i>Major/Death</i>	<sup>b</sup>	<0.1%	<sup>b</sup>	<0.1%	<sup>b</sup>	<0.1%	<sup>b</sup>	<0.1%
<i>Not Followed<sup>c</sup></i>	19,100	66.9%	3,802	69.8%	4,232	70.5%	2,613	56.5%
<i>Total</i>	28,564	100.0%	5,444 <sup>d</sup>	100.0%	6,000 <sup>d</sup>	100.0%	4,624 <sup>d</sup>	100.0%

<sup>a</sup> Single-substance exposure cases only.

<sup>b</sup> Case counts less than 10 were omitted to protect the privacy of patients. Corresponding case count percentages are displayed as <0.1% to continue to protect the privacy of patients.

<sup>c</sup> The “Not Followed” category includes “not followed, judged as nontoxic exposure (clinical effects not expected),” “not followed, minimal clinical effects possible (no more than minor effect possible) and “unable to follow, judged as a potentially toxic exposure.

<sup>d</sup> Case count totals for the first-generation, second-generation, and non-anticoagulant categories do not equal the total number of rodenticide cases because not all rodenticides were classified into one of the previously mentioned categories.