eAppendix of “Outbreak of Hemorrhagic Disease due to Exposure to High Concentrations of Anticoagulant Superwarfarin Rodenticides: China, 2010.”

We tested the blood specimens of 4 case-patients for anticoagulant rodenticides. The date of the blood specimen collection for these 4 patients fell on the 20\textsuperscript{th}, 30\textsuperscript{th}, 32\textsuperscript{nd} and 39\textsuperscript{th} days of their symptom onset, respectively. Brodifacoum was found in the blood of all 4 case-patients (Figure).

Our investigations revealed that members of the case-families mixed the high-concentration liquids, without dilution, into rice or wheat grains, and placed the baits thus made in various places in the home for rodent control. When being asked why they used the high-concentration liquid without dilution, the farmers thought the rodenticides were ineffectiveness at the concentration recommended on the package inserts, for rodent activities did not decline quickly if they followed the instructions to make the baits. Also, when handling the high-concentration liquids, none of the farmers wore gloves. If there was any leftover high-concentration liquid in the capsule, the farmers would store it somewhere in the home (e.g., bedroom, parlor, granary). Our investigation showed that the liquid sometimes had evaporated during storage. In one case-family, for example, the woman demonstrated how she used a syringe to inject the high-concentration liquid into approximately 50 peanuts; her husband then spread those peanuts in the peanut field for rodent control. Subsequently, she and her husband both developed the disease. When she showed us the leftover high-concentration liquid, the plastic capsule had dried up. In another case-family, in which all 5 members developed illness, members of the family mixed grains with the
high-concentration rodenticide and placed the baits around the rat holes on the family-owned poultry farm. They reportedly saw ducks and chicken sometimes ate the baits but none had died; therefore they thought the rodenticide was ineffective. The family often ate the chicken and ducks raised on the farm, but denied ever eating sick or dead poultry. A family cat died 2 days before the onset of the first human case in the family, presumably from eating dead rodents.

When we visited shops selling agricultural materials in the area, we found that high-concentration anticoagulant rodenticides were available in 36% (12/33) of those shops. Two kinds of high concentration anticoagulant rodenticides, brodifacoum and bromadiolone, were available in those shops. The packaging was poor; leakage was often visible inside the package.
Figure.

Chromatograms of (1) a standard solution and (2) the blood specimen of the four patients during an outbreak of hemorrhagic disease due to superwarfarin poisoning:

Xiamen City, China, 2010.