ATSDR's Evaluation for Vieques, Puerto Rico
Updated 2013

Background

From 1999 through 2003, the Agency for Toxic Substances and Disease Registry (ATSDR) looked at whether U.S. Navy past military activity exposed Viequenses to harmful levels of chemicals. We looked at food, air, water, and soil. In 2009, we began updating our original findings. We evaluated data that we did not have in 2003. We met again with local officials, scientists, and residents to discuss their concerns about our earlier reports. ATSDR's conclusions are based on a thorough review of environmental, biological, and health data from Vieques. But like most data, those data have strengths and weaknesses.

This fact sheet summarizes ATSDR's conclusions and recommendations.

Eating Fish from Vieques Waters

Viequenses and scientists voiced concerns about mercury in fish taken from Vieques waters; therefore, our fish evaluation focused on this concern.

We found that most fish taken from Vieques contained low to moderate levels of mercury. The mercury was found in the fish flesh and is probably from background levels of mercury throughout the region and not from past military activity on or near Vieques. We also found more mercury in grunts and hinds than in other Vieques reef fish.

What does this mean for Viequenses? It means that

- Certain women should limit the amount and types of fish they eat per week. ATSDR agrees with the U.S. EPA and with the U.S. Food and Drug Administration:

Women who are pregnant, nursing, or planning to become pregnant should limit their weekly fish diet to no more than 12 ounces of those kinds of fish that have low or moderate mercury levels. Twelve ounces of fish is close in size to three decks of cards. If pregnant women eat more than 14 ounces a week of fish taken from Vieques waters, their children could have a small chance of problems later in life with language, attention, or memory—or to a lesser extent, problems with visual, spatial, and motor functions.

- Children under seven could eat up to 4 ounces of fish or shellfish weekly with low or moderate levels of mercury. But if they eat more than 4 ounces a week, they could have a small chance of nervous system problems. The more fish children eat above this amount, the greater their chances are of nervous system problems. Four ounces of fish is about the same size as one deck of cards.
- Due to the many nutritional benefits, women and young children should include in their diets fish or shellfish that are low in mercury.

Because of this, ATSDR recommends that scientists and environmental and public health agencies

- Educate the Vieques community about the benefits of eating fish and about choosing types of fish known to be low in mercury,
- Design and carry out a survey that asks what kinds, how often, and how much fish Viequenses eat,
- Look at the survey results to decide whether more fish should be collected and tested for mercury, and
- Continue the fishing restrictions around the Vieques former Live Impact Area (LIA) because of the danger from unexploded ordnance (also known as UXO).

Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations

CS238956-A

Eating Vieques Produce and Livestock

We have little information about local garden produce and livestock contamination on Vieques; so ATSDR cannot make firm conclusions about health hazards from eating these foods. Limited information suggests locally grown pigeon peas may contain cadmium, though these data are uncertain. It is uncertain whether cadmium is elevated in soils where the pigeon peas were collected. Our evaluation concluded that children could eat up to 30 ounces weekly of locally grown pigeon peas and would not add too much cadmium to their diet. Adults could eat up to 132 ounces weekly.

ATSDR recommends

- Children should eat fewer than 30 ounces of locally grown pigeon peas per week (about 20 typical child servings). A typical child serving (1.5 ounce) of pigeon peas is about ¼ cup.
- Adults should eat fewer than 132 ounces of locally grown pigeon peas per week (about 44 typical adult servings). A typical serving size for an adult is 3 ounces.

ATSDR recommends additional testing of locally grown produce and locally raised livestock. This may include:

- Collecting edible portions of produce from local farms, home gardens, and local markets
- Collecting samples of meat and milk products from Vieques livestock

Any testing should follow high standards of data quality when collecting and analyzing the samples. The U.S. Department of Agriculture has offered to help with developing sampling and analysis plans for local produce and livestock.

Breathing Vieques Air

ATSDR looked at air pollution levels at Vieques. The Puerto Rico Environmental Quality Board, local researchers, the U.S. Navy, and ATSDR scientists did air sampling and modeling studies. ATSDR scientists also reviewed air pollution results collected in recent years during open detonation events.

ATSDR collected enough information to conclude that

- Air pollution in the residential areas of Vieques was not and is not a public health hazard.
- The air model indicates that in the residential areas of Vieques, airborne contaminants from historic military exercises on the island would have been essentially nondetectable and unlikely to have resulted in harmful effects.

Because the main air pollution source of concern—the Navy's military training exercises—has been eliminated, we have no further recommendations about air.

Drinking Vieques Water

ATSDR looked at test results of groundwater, drinking water from the public water supply, and public and private wells on the island. We concluded

- The pipeline-supplied public drinking water on Vieques is acceptable to drink.
- With the exception of one private well, private and public wells are acceptable for people to use occasionally when the pipeline source is interrupted.
- One private well had high nitrate levels, not associated with bombing activities. No one should use water from this well until further tests show the water is safe. The well owner was notified of the high nitrate levels.
- Past military activities contaminated groundwater under some military areas, but it is not used for drinking water. Also, the groundwater does not flow toward the private and public wells.
- No data are available from private rainwater collection systems, so we cannot evaluate anything about potential exposures from such systems.

ATSDR recommends

- Continue to test the public drinking water to make sure it meets safe drinking water standards.
- Retest the backup public wells used when the pipeline service is interrupted.
- Find out if people drink water from private rainwater collection systems. If they do, test the water and sediments to see if the water is safe.

Contacting Vieques Soil

ATSDR looked at soil data collected from the former LIA and from the residential areas of the island. We concluded that

- Those who lived on the LIA from 1999 to 2000 likely did not contact contaminants at levels that would harm them.
- Small areas of contaminated soil might still exist in some parts of former military lands.
- Because of the presence of unexploded ordnance, persons cannot safely visit the LIA. If disturbed, unexploded ordnance (also known as UXO) still on the site could hurt or kill people.
- In the island's residential areas, no soil data are adequate to characterize potential exposures. Air modeling results and soil data from other parts of the island suggest that in the island's residential areas, exposure to military-related soil contaminants is not high enough to result in adverse health effects.

ATSDR recommends

- Continue restricting access to the former LIA.
- Continue environmental assessment and remediation activities at the LIA.
- Test soil in the residential areas to make sure it is safe.

Blood, Urine, and Hair Data

For some chemicals, measuring them in blood, urine or hair can tell how much of it is in your body. Since 1999, Puerto Rican scientists and physicians and the Puerto Rico Department of Health (PRDOH) have done five human studies in Vieques.

- PRDOH tested 500 residents and found some Viequenses with high levels of some metals in their blood, urine, or hair. PRDOH's report said that smoking, dyeing hair, and eating seafood might have caused some, but not all, of the high levels.
- A local physician's study found high levels of mercury in hair in some residents and concluded that exposure was linked to frequently eating seafood.

ATSDR reviewed these studies, but cannot conclude that the exposures are related to former military activities on Vieques.

Although we are not recommending a study at this time, public health officials could consider a targeted investigation to test for metals in people's blood and urine following the release of ATSDR's Vieques report. If an investigation is done, we recommend that it include people who do not live in Vieques, such as mainland Puerto Ricans, as a comparison group.

ATSDR recommends

- Residents who are concerned should ask their doctor about getting tested for mercury, cadmium, or other metals.
- ATSDR is available to provide local doctors and nurses information about testing blood, urine, and hair for metals.

Overall Health

To find out about the overall health of Viequenses, ATSDR looked at studies about births, deaths, and disease. We found that there are more people with chronic diseases, cancer or that have died from cancer in Vieques when compared to the rest of Puerto Rico. But limitations on the analysis of the data make the findings uncertain and difficult to interpret. The limitations are described in the report. Nonetheless, these findings can guide future investigations into the health of Viequenses. ATSDR recommends that public health officials explore options for looking at the number of people on Vieques with asthma, diabetes, high blood pressure, and other chronic diseases.

Any studies of health effects among Viequenses should consider whether associations between an exposure and a health outcome can be detected among such a small population.

More Information

For more information about ATSDR's efforts at Vieques please visit http://www.atsdr.cdc.gov/sites/vieques/. You can also call us toll free at 1-800-CDC-INFO (232-4636).

The Agency for Toxic Substances and Disease Registry (ATSDR), based in Atlanta, Georgia, is a federal public health agency of the U.S. Department of Health and Human Services. ATSDR partners with communities across the nation to increase knowledge about toxic substances, reduce the health effects of toxic exposures, and protect the public health.