

# Summary of the

# Hanford Thyroid Disease Study

## FINAL REPORT

### About the Hanford Thyroid Disease Study (HTDS)



The Hanford Thyroid Disease Study (HTDS) is a study of thyroid disease among people who were exposed to radioactive iodine (iodine-131) from the Hanford Nuclear Site in Washington State. Iodine-131 was released into the air from Hanford from 1944 through 1957.

The purpose of the study was to answer the question: “Did exposure to iodine-131 from Hanford result in increased incidence of thyroid disease?”

Congress mandated the study in 1988. The HTDS Final Report was released in June 2002.

#### STUDY FOCUS: THYROID DISEASE

The HTDS focused on thyroid disease because iodine-131 concentrates in the thyroid gland when it is inhaled or consumed in contaminated food. Iodine-131 was the primary source of radiation for many people exposed to releases of radioactive materials from Hanford in the 1940s and 1950s.

#### TYPE OF STUDY

The HTDS is an epidemiological study, which is a type of study used for investigating possible causes of disease in a population. While no such study can determine the cause of an individual case of disease, an epidemiological study, such as the HTDS, provides the best way to determine whether disease has increased in a population exposed to a potentially harmful agent such as radiation.

#### HTDS RESEARCH TEAM

The HTDS was managed by the Centers for Disease Control and Prevention (CDC), an agency in the U.S. Department of Health and Human Services. The Fred Hutchinson Cancer Research Center in Seattle, Washington conducted the scientific and technical work.



## ▶ WHAT HAPPENED AT HANFORD

The Hanford Nuclear Site was built in the 1940s in southeastern Washington State to produce plutonium for nuclear weapons.

In the mid 1980s, as a result of public requests, the U.S. Department of Energy released previously unavailable or classified documents about past operations at Hanford. The information showed that large amounts of iodine-131 and other radioactive materials were released into the air from Hanford from 1944 through 1957.

Concerns about the possible health effects of Hanford's radiation led to a decision by Congress to mandate the HTDS in 1988.

## ▶ HOW THE STUDY WAS CONDUCTED

To investigate the health effects of Hanford's iodine-131, researchers studied a group of people with a wide range of radiation doses to the thyroid, from higher doses to low doses.

All of the participants were from the Hanford region. In this way, researchers could compare people with similar characteristics (such as lifestyle and diet) but different levels of exposure.

In addition, all of the participants were young children when Hanford releases of iodine-131 were highest. Other studies suggest that young children may be the most susceptible to the effects of radiation on the thyroid gland.

### Participant Selection

From a sampling of 5,199 birth certificates from seven counties in the Hanford region, scientists were able to locate 3,440 people who were both willing to participate and able to provide the necessary data for evaluation of thyroid disease and estimation of radiation dose.

### Data Collection

Each participant was given a complete evaluation for thyroid disease.

Participants also provided detailed information about the places they lived and the quantities and sources of the food and milk they consumed. Drinking contaminated milk was a primary source of radiation from Hanford's iodine-131.

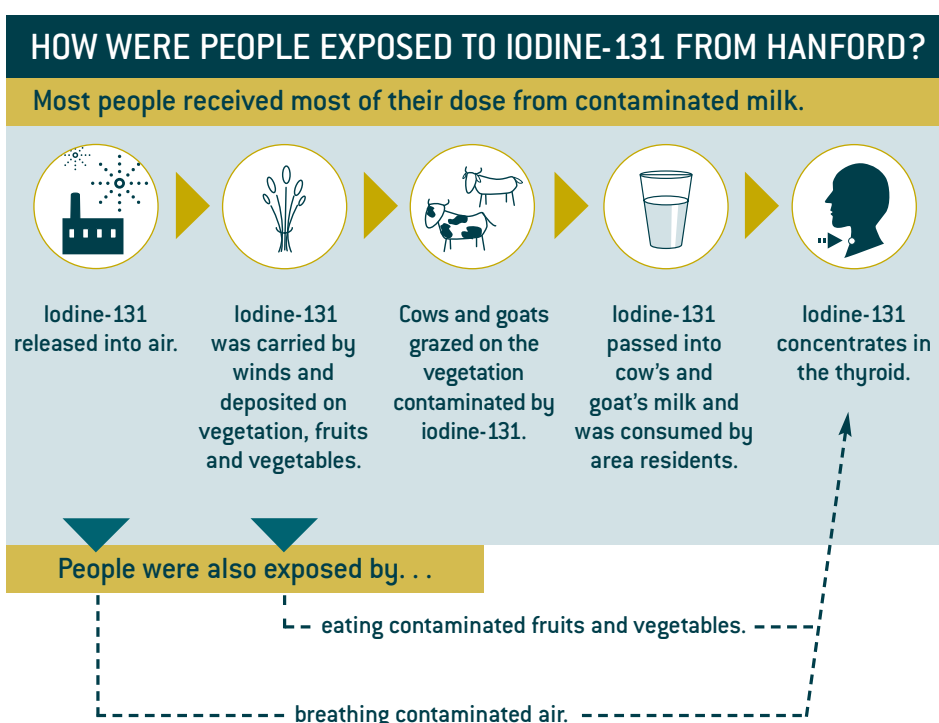
### Dose Estimation

Scientists used computer programs together with information provided by the HTDS participants to estimate each participant's radiation dose to the thyroid. The computer programs were developed under a project called the Hanford Environmental Dose Reconstruction Project (HEDR).

### Data Analysis

Researchers studied all types of thyroid disease, a disease of the parathyroid glands, and abnormalities of the thyroid gland that can be seen on ultrasound examinations.

For each type of disease, the research team examined how the rates of disease varied in relation to participants' estimated radiation doses from Hanford's iodine-131.



► FINDINGS

The HTDS data show that the risk of thyroid disease was about the same regardless of the radiation doses people received from Hanford. In other words, no associations between Hanford's iodine-131 releases and thyroid disease were observed.

The percentages of people with each kind of thyroid disease or with ultrasound abnormalities were about the same regardless of their estimated radiation dose from Hanford's iodine-131.

**Meaning of the Findings**

The findings do not prove that Hanford radiation had no effect on the health of the area population. However, they show that if there is an increased risk of thyroid disease from exposure to Hanford's iodine-131, it is probably too small to observe using the best epidemiologic methods available.

**Comparison to Other Populations**

Thyroid disease was found in the study population. This was expected because thyroid disease is common in other populations, especially among older people and women.

Based on a review of other studies, researchers found that the rates of thyroid disease in the HTDS population were generally consistent with the rates of disease detected in other populations. There was no indication that the rates of disease in the HTDS population are any higher than what have been reported around the world.

► PUBLIC INVOLVEMENT AND SCIENTIFIC REVIEW

CDC formed a committee of scientists and members of the public to advise CDC on the design and implementation of the study. Members of the public and public interest groups provided input in public meetings and written comments to CDC throughout the study.

At the request of CDC, the National Academy of Sciences peer reviewed the HTDS at key points in the study in 1995, 1997 and 1999. Peer review is an independent analysis of a study that provides confidence that the correct methods are being used.

► ABOUT THYROID DISEASE

The thyroid gland is located at the base of the neck (see figure below).

Thyroid disease is common in the general population. Thyroid disease includes functional disorders and abnormal growth in the gland, including cancer.

Many factors affect thyroid health, including a person's general health, gender, age and family health history. Most thyroid problems can be detected and treated.

If you are concerned about exposure to iodine-131 from Hanford or experience thyroid disease symptoms, you are encouraged to see your doctor for a thyroid evaluation.

**THYROID GLAND**

The thyroid gland is butterfly-shaped, with two lobes about the size of teaspoons. It is located in the front of the neck, below the Adam's apple.

