

# National Lung Screening Trial

## Summary

The National Lung Screening Trial (NLST) was a randomized controlled clinical trial of screening tests for lung cancer. Approximately 54,000 participants were enrolled between August 2002 and April 2004. Participants were randomly assigned to two study arms in equal proportions. One arm received low-dose helical computed tomography (CT), while the other received single-view chest radiography. Participants were offered three exams (T0, T1, and T2) at one-year intervals, with the first (T0) performed soon after entry. The goal of the study was to assess whether low-dose CT screening reduces lung cancer mortality relative to chest radiography among high-risk individuals. Data were collected on cancer diagnoses and deaths that occurred through December 31, 2009. Median follow-up time was 6.5 years. The [ClinicalTrials.gov](https://clinicaltrials.gov) number for NLST is NCT00047385. NLST was a collaborative effort of the National Cancer Institute's Division of Cancer Prevention (DCP) and Division of Cancer Treatment and Diagnosis (DCTD). DCP funded and administered the Lung Screening Study network (LSS, 10 centers, ~35,000 participants) while DCTD funded and administered the American College of Radiology Imaging Network (ACRIN, 23 centers, ~19,000 participants). The study protocols and data collection forms used by LSS and ACRIN were harmonized. A trial-wide database of harmonized data elements was built during the trial for reporting to the Data and Safety Monitoring Board (DSMB). Some additional data elements were collected only by ACRIN or by LSS, as described in the final section of this document.


The NLST collection includes Radiology images, Pathology Images, and Clinical data.

More information about NLST is offered through the [Cancer Data Access System \(CDAS\)](#) maintained by Information Management System (IMS), contracted by the National Cancer Institute (NCI) as keepers and statistical analyzers of the NLST trial data.

### Data Access

#### Data Access

This is a **limited access** data set. To request access, please review the procedures outlined at <https://biometry.nci.nih.gov/cdas/studies/nlst>. Once access is granted, you can view and download these images (requires Java) on The Cancer Imaging Archive (TCIA) Query Tool for NLST using the link below.

Data Type	Download all or Query/Filter
Images (DICOM, 11.3TB)	
Pathology (Aperio, ~1,250 images)	
Clinical ( <a href="#">more info</a> )	

Click the Versions tab for more info about data releases.

### Detailed Description

#### Detailed Description

Collection Statistics	
Modalities	CT
Number of Patients	26,254
Number of Studies	73,118
Number of Series	203,099
Number of Images	21,082,502
Images Size (TB)	11.3 TeraBytes

An NLST summary, is offered through the [Cancer Data Access System \(CDAS\)](#) maintained by Information Management System (IMS), contracted by the National Cancer Institute (NCI) as keepers and statistical analyzers of the NLST trial data. The summary includes:

- Introduction
- Recruitment and Enrollment
- Screening for Lung Cancer
- Diagnostic Evaluation of Lung Cancer
- Lung Cancer Data
- Non-lung Cancer Data
- Participant Withdrawal
- Mortality
- Results
- Images (Radiology)
- Biospecimens (Pathology)

NLST Design & Process, Protocol Documents, and Results: <https://biometry.nci.nih.gov/cdas/learn/nlst/main-findings/>

- Overview, study design, recruitment methods, endpoint verification process (determining cause of death), quality control (LSS and ACRIN).
- LSS Manual of Operations (MOOP) and ACRIN Protocol.
- DSMB announcement of results (10/28/2010).

**NLST Publications and Projects:** <https://biometry.nci.nih.gov/cdas/approved-projects/?q=&study.raw=NLST>

- Primary Results, Study Design, Feasibility Study for the NLST, Psychosocial and Behavioral Issues, Technical Publications.
- Browse Publications : [https://biometry.nci.nih.gov/cdas/publications/?request\\_types.raw=NLST](https://biometry.nci.nih.gov/cdas/publications/?request_types.raw=NLST)
- Browse projects : [https://biometry.nci.nih.gov/cdas/approved-projects/?request\\_type.raw=NLST](https://biometry.nci.nih.gov/cdas/approved-projects/?request_type.raw=NLST)
- Search.

**NLST Data Collected:** <https://biometry.nci.nih.gov/cdas/learn/nlst/data-collected/>

- Questionnaires, screening, diagnostic procedures, cancer diagnosis, treatment, progression, mortality, contamination.

## Accessing NLST Trial Data and Images

Data and images are owned by the National Cancer Institute (NCI) and subject to IRBs at NCI and at the institutions through which participants were recruited. NLST summary, design, protocols, and results are well-described and publicly available; see:

<https://biometry.nci.nih.gov/cdas/nlst/>

ANYONE can access the data and images with an approved CDAS request; see:

<https://biometry.nci.nih.gov/cdas/studies/nlst>

### > Non-image Data (Clinical)

Investigators with approved access to NLST data may acquire copies of data in two different ways:

- Directly from IMS  
Investigators with an approved request may download comprehensive NLST datasets directly from the CDAS website. Datasets are provided in SAS format in one compressed file (.zip); other formats are available upon request.
- Indirectly, through the Query Tool (QT): [NLST Database Query Tool](#)  
Investigators launch the web-based QT, make menu-driven queries against the QT database (a significant subset of all trial data), and save query results to an Excel spreadsheet. The chief advantage to the QT is the ability to rapidly adjust queries and build a final spreadsheet for analysis. In addition, the QT offers the ability to download associated CT image

### > Images

**CT images:** All CT images are available to investigators with approved access to NLST data and images. The chest X-rays are not available. Subsets of the CT images may be obtained in two ways:

- **Request from IMS.** Petition IMS for images associated with an NCI-approved project. IMS notifies The Cancer Imaging Archive (TCIA) management with a list of images to provide. TCIA pulls the images to an external hard drive (provided by the investigator) and ships the images to the investigator.
- **Request with Query Tool.** The investigator uses the Query Tool to define cohorts of subjects using non-image trial data, then directly downloads the associated CT images directly to their computer using the TCIA Download Manager tool. After selecting your cohort the Query Tool will save a JNLP file to your desktop which requires Java Web Start to launch. Double clicking that JNLP will launch the TCIA Download Manager to begin your download.

For general details about the CT images, see [NLST Images -- General Details](#)

**Pathology images:** A small number (~1,250) of lung-biopsy pathology images are viewable using caMicroscope which is launched by the Query Tool.

- For more details about how to use caMicroscope and annotate the images, see the [caMicroscope User's Guide](#)

## NLST Image-related Queries and Image Download Metrics

- Measures of image and data consumption are described [here](#).

## Contact Information

For anything regarding the NLST protocols, data, findings, projects, and publications:

<https://biometry.nci.nih.gov/cdas/contact/nlst/>

For anything regarding the Query Tool or the CT images or pathology images:

Please contact The Cancer Imaging Archive Support group at [help@cancerimagingarchive.net](mailto:help@cancerimagingarchive.net) or call +1 385-275-8242 (ASK-TCIA)

#### Citations & Data Usage Policy

### Citations & Data Usage Policy

This is a **limited access** data set. Upon receiving access you may only use it for the purposes outlined in your request to the data provider. You are not allowed to redistribute the data or use it for other purposes. See TCIA's [Data Usage Policies and Restrictions](#) for additional details. Questions may be directed to [help@cancerimagingarchive.net](mailto:help@cancerimagingarchive.net).

### NLST Publications and Projects:

- Primary Results, Study Design, Feasibility Study for the NLST, Psychosocial and Behavioral Issues, Technical Publications.
- Browse Publications : <https://biometry.nci.nih.gov/cdas/publications/?study=nlst>
- Browse projects : [https://biometry.nci.nih.gov/cdas/approved-projects/?request\\_type.raw=NLST](https://biometry.nci.nih.gov/cdas/approved-projects/?request_type.raw=NLST)

#### Versions

### Version 2 (Current): Updated 2015/12/14

Change: restoration of images that had become corrupted/missing during a storage transfer.

Data Type	Download all or Query/Filter
Images (DICOM, 11.3TB)	