

## INTRODUCTION

- Single-cancer screening strategies address only one component of the overall population cancer burden
- Public health actions that simultaneously address multiple cancers have the potential to yield a far broader impact than those that target one cancer at a time

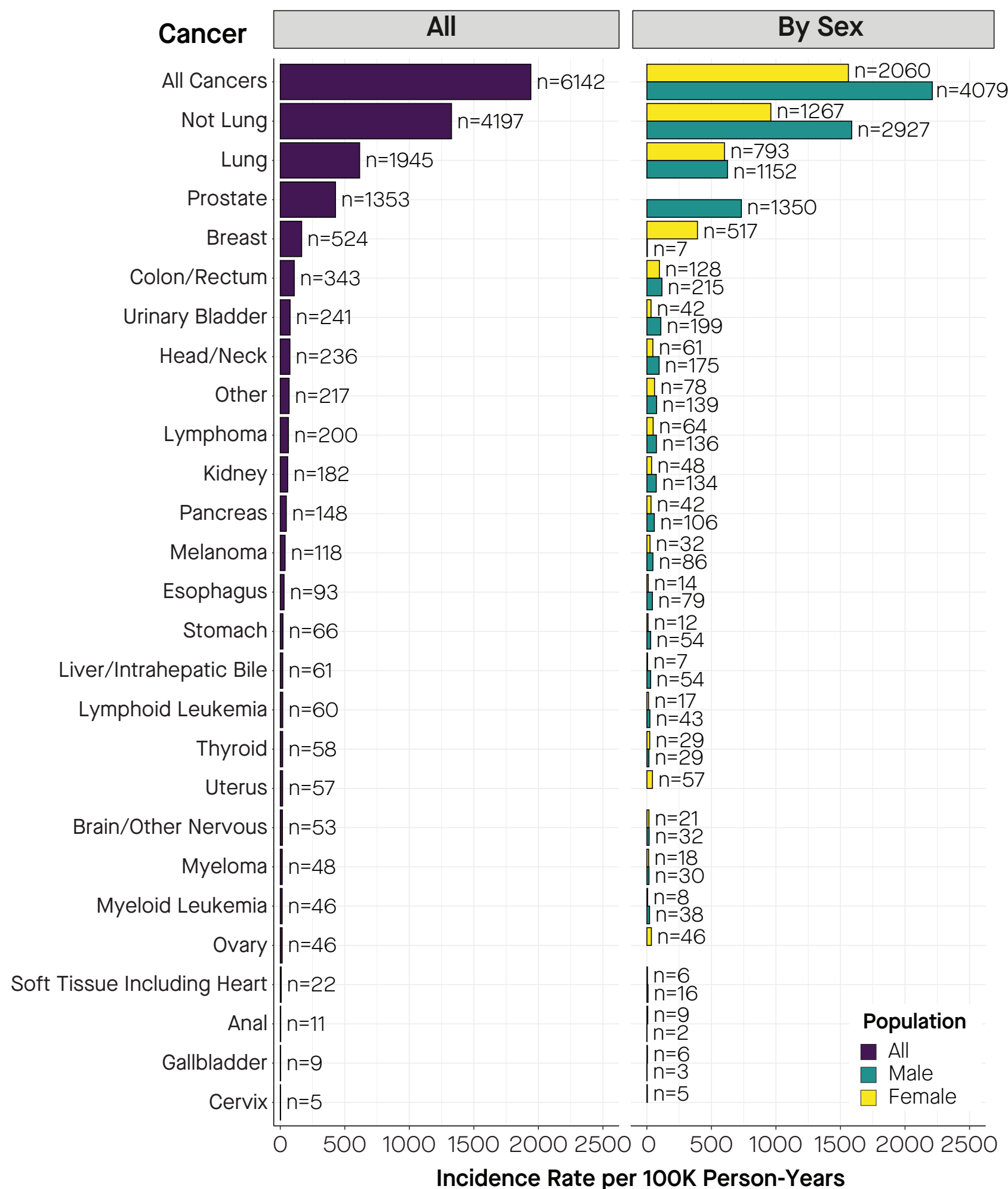
## OBJECTIVE

- To understand the overall cancer burden in a single-cancer screening population, we evaluated the incidence of all newly diagnosed invasive cancers, especially non-lung, following study entry in the National Lung Screening Trial (NLST; ClinicalTrials.gov number NCT00047385)<sup>1</sup>

## THE INCIDENCE OF NON-LUNG CANCER IS MORE THAN DOUBLE THAT OF LUNG CANCER, EVEN IN A HIGH-RISK SMOKER POPULATION

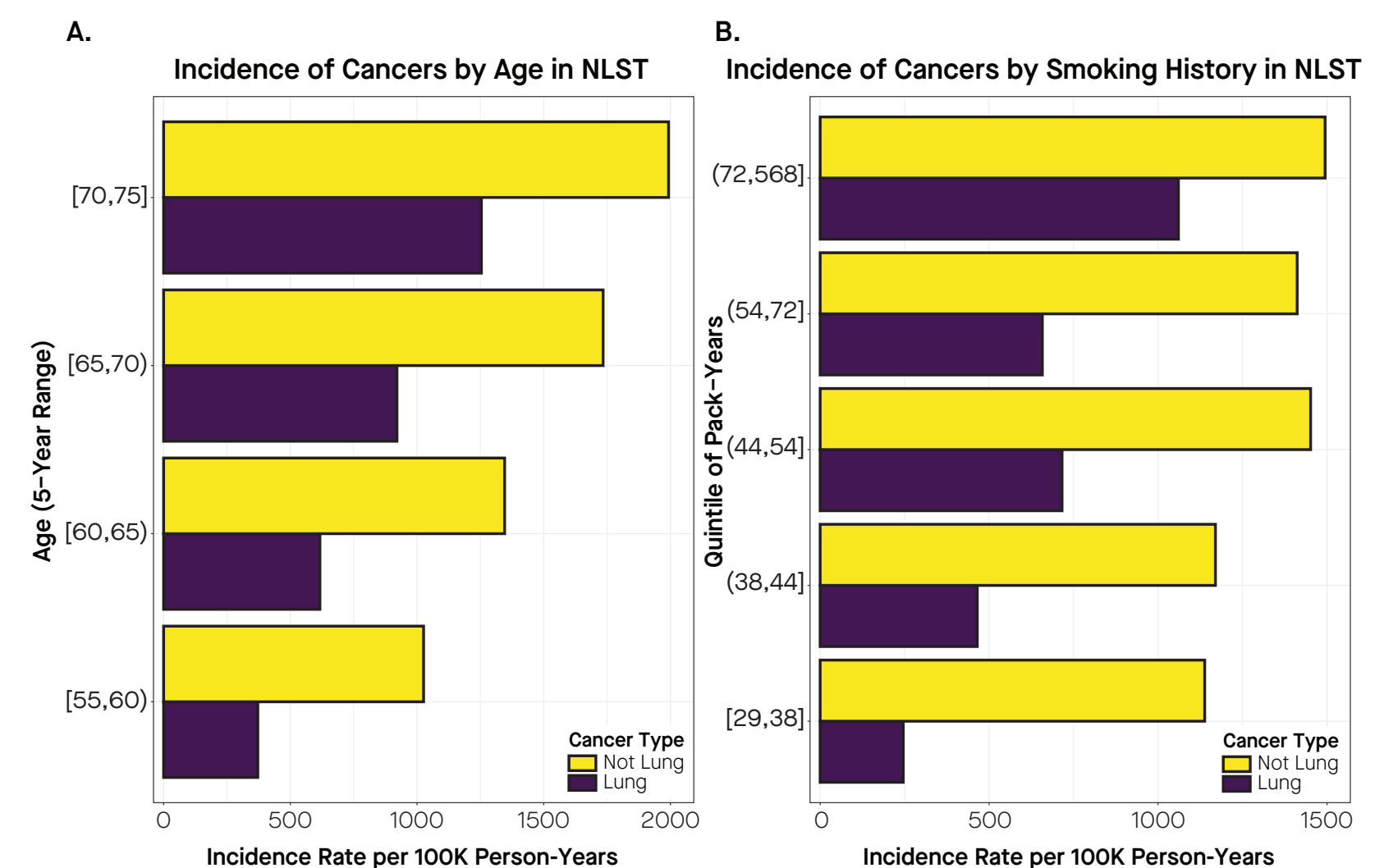
- Among 53 229 subjects (median follow-up 6.5 years), the incidence of any first primary invasive cancer during active follow-up after randomization was 1941 per 100 000 person-years, of which 1327 per 100 000 (68%) was non-lung cancer (Figure 1)

**Figure 1. Incidence rates of first primary invasive cancers after randomization in the NLST study population by cancer type and sex. Case counts are indicated next to rates.**



- The non-lung cancer incidence rate exceeded that for lung cancer in all 5-year age categories (Figure 2A)
- Non-lung cancer incidence also exceeded lung cancer incidence in all quintiles of smoking pack-years (Figure 2B)

**Figure 2. Incidence rates of first primary invasive lung and non-lung cancers after randomization in the NLST study population, stratified by risk factors. A) Stratified by 5-year age group. B) Stratified by quintile of smoking pack-years.**



## CONCLUSIONS

- In the NLST, only 32% of cancer incidence was lung; non-lung cancer comprised 68% of cancer incidence after study entry, and most cases were cancer types with no generally recommended screening strategy
- Even in a high-risk population, a single-cancer screening test misses most cancers. These results illustrate the value of multi-cancer screening tests that can detect a broad spectrum of cancers and, therefore, have the potential to address a currently inaccessible portion of cancer morbidity and mortality

## METHODS

- The NLST was a randomized controlled trial of lung cancer screening with low-dose computed tomography or chest radiography<sup>1</sup>
- From 33 participating medical institutions across the US between August 2002 and April 2004, the trial enrolled 53 454 adults who were aged 55–74 years at randomization, had no history of cancer in the last 5 years, and had at least a 30-pack-year history of cigarette smoking, and, if former smokers, had quit within the previous 15 years

- All reported cancers were confirmed by medical records
- Participants were actively followed for cancer incidence through December 31, 2009
- The present analysis includes first primary invasive cancers diagnosed after study randomization
  - Non-lung cancer incidence was similar between the two trial arms, which were therefore combined for analysis

References: 1. The National Lung Screening Trial Research Team. N Engl J Med. 2011;365(5):395-409.  
Disclosures: CAC, EAH, DSMB, and ETC are employees of GRAIL, LLC, and report other support from GRAIL, LLC, during the conduct of the study. In addition, EAH has multiple patents in the field of cancer detection pending to GRAIL, LLC. SMJ reports a research grant awarded from GRAIL, LLC, for a separate study; honoraria for travel, consultancy, or speaking from AstraZeneca, BARD1 Bioscience, Optellum, Jansen, Takeda, Evidera, and Achilles Therapeutics; grant funding from Owlstone for a separate research study; and a family member who is an employee of AstraZeneca. AH reports an honorarium for an advisory board meeting for GRAIL, LLC; a consultation fee for Evidera for a GRAIL-initiated project; and previously owned shares in Illumina.

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