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Poster Session

Overall and non-lung cancer incidence in the national lung screening trial (NLST) as indicators of potential for multi-cancer screening.

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Background: Single-cancer screening strategies address only one component of the overall population cancer burden. Even high-risk populations in single-cancer screening trials experience a considerable burden of other cancer incidence; therefore, we assessed non-lung cancer incidence in the NLST to evaluate the proportion of unscreened cancers. **Methods:** The NLST was a randomized controlled trial of screening for lung cancer in adults aged 55–74 years with ≥ 30 pack-years of smoking history, enrolled in 2002–2004 and actively followed through 2009. Incident cancers were identified via participant questionnaires, death certificates, and direct notifications, and confirmed by medical record abstraction. The present analysis includes first invasive primary cancers diagnosed after study randomization. Non-lung cancer incidence was similar between the two trial arms, which were therefore combined for analysis. **Results:** Among 53 229 subjects (median follow-up 6.5 years), the incidence of any first primary cancer was 1941 per 100 000 person-years, of which 1327 per 100 000 (68%) was non-lung cancer. Non-lung cancer incidence rates exceeded that for lung cancer in all 5-year age categories (especially at younger ages) and all quintiles of smoking pack-years (especially with fewer pack-years). After lung cancer, the most common cancers were other leading cancer types in the general US population, as well as other smoking-related cancers (Table). No recommended population-based screens exist for 54% of observed cancer cases (3332 of 6142, excluding lung, colon/rectum, female breast, and cervix). **Conclusions:** In the NLST, only 32% of first primary cancer incidence was lung; non-lung cancer comprised 68%, 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, illustrating 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. Research Sponsor: GRAIL, LLC, a subsidiary of Illumina, Inc., currently held separate from Illumina, Inc., under the terms of the Interim Measures Order of the European Commission dated 29 October 2021.

Cases and crude incidence rates (per 100 000) of first primary invasive cancers after randomization in the NLST.

Primary site	n	Incidence rate	Primary site (cont. 1)	n	Incidence rate	Primary site (cont. 2)	n	Incidence rate
Total	6142	1941.5	Lymphoma	200	63.2	Uterus	57	18.0
Non-lung	4197	1326.7	Kidney*	182	57.5	Brain/other nervous system	53	16.8
Lung*	1945	614.8	Pancreas*	148	46.8	Myeloma	48	15.2
Prostate	1353	427.7	Melanoma	118	37.3	Myeloid leukemia*	46	14.5
Breast	524	165.6	Esophagus*	93	29.4	Ovary	46	14.5
Colonrectum*	343	108.4	Stomach*	66	20.9	Soft tissue including heart	22	7.0
Urinary bladder*	241	76.2	Liver/intrahepatic bile duct*	61	19.3	Anal	11	3.5
Head/neck*	236	74.6	Lymphoid leukemia	60	19.0	Gallbladder	9	2.8
Other	217	68.6	Thyroid	58	18.3	Cervix*	5	1.6

*Smoking-related cancers