Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

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National Lung Screening Trial Research Team
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Methods for Estimating Screening Test Parameters

For each dichotomized (positive vs. negative) screening result, whether lung cancer was present or not at the time of the screen was defined as follows. A screen was classified as having been done in the presence of lung cancer if a lung cancer diagnosis was documented for the participant during the period from the screen to either the next screen or one year later, whichever came first or, for positive screens, if a lung cancer diagnosis was documented after a longer period during which the participant had no further screening but a sequence of diagnostic procedures prompted by the screen and having no time gap between consecutive procedures greater than a year. A screen was classified as having been done in the absence of lung cancer if it was not classified as having been done in the presence of lung cancer and at least one of the following criteria was satisfied: (1) the participant had a subsequent screen, (2) the participant received at least one screen-prompted diagnostic procedure (clinical evaluation at a minimum), (3) the participant died and the death was certified by the NLST Endpoint Verification Process without documentation of a diagnosis of lung cancer, (4) the participant responded to a survey at least 300 days after the screen and reported that lung cancer had not been diagnosed, (5) the participant had a documented diagnosis of lung cancer more than one year after the screen. Screening results that could not be categorized as above were classified as having an unknown lung cancer status.

Subjects with missing and non-diagnostic T0 screens and those having screening results with unknown lung cancer status were excluded from screening accuracy calculations. Sensitivity was estimated as the ratio of the number of true positive screens (positive screens in the presence of lung cancer) to the sum of the numbers of true positive and false negative screens (negative screens in the presence of lung cancer). Specificity was estimated as the ratio of the number of true negative screens (negative screens in the absence of lung cancer) to the sum of the numbers

of true negative and false positive screens (positive screens in the absence of lung cancer). The numbers of positive screens and true positive screens were directly obtained from the tables. The number of false positive results was determined by subtracting the number of true positive results from the number of positive results, while the number of false negative results was determined by subtracting the number of true positive results from the number of lung cancer cases. The number of true negative results was determined by subtracting the number of false negative results from the number of negative results. The positive predictive value (PPV) of various findings was estimated by the ratio of true positive to all positives. The negative predictive value (NPV) was estimated by the ratio of true negatives to all negatives.

Supplementary Table 1: Sex, age, race/ethnicity, smoking history, and education by study arm and T0 screening result

	Study Arm									
	LDCT					**CXR**				
	# Randomized/eligible for screening	**# Screened**		**# Positive**		**# Randomized/eligible for screening**	**# Screened**		**# Positive**	
		N	**%**	**N**	**%**		**N**	**%**	**N**	**%**
All	26715	26309	98.5	7191	27.3	26724	26035	97.4	2387	9.2
Sex										
Male	15765	15539	98.6	4194	27.0	15758	15400	97.7	1504	9.8
Female	10950	10770	98.4	2997	27.8	10966	10635	97.0	883	8.3
Age(years)										
< 55[1]	2	2	100.0	1	50.0	4	4	100.0	0	0.0
55-59	11436	11245	98.3	2730	24.3	11417	11103	97.2	870	7.8
60-64	8168	8059	98.7	2217	27.5	8196	7975	97.3	747	9.4
65-69	4755	4689	98.6	1456	31.1	4760	4661	97.9	480	10.3
70-74	2353	2313	98.3	787	34.0	2344	2289	97.7	289	12.6
>=75[1]	1	1	100.0	0	0.0	3	3	100.0	1	33.3
Race										
White	24284	24001	98.8	6707	27.9	24255	23748	97.9	2177	9.2
Black or African-American	1195	1167	97.7	226	19.4	1180	1148	97.3	119	10.4
Asian	559	546	97.7	123	22.5	536	523	97.6	42	8.0
American Indian or Alaskan Native	92	89	96.7	21	23.6	98	94	95.9	8	8.5
Native Hawaiian or Other Pacific Islander	91	84	92.3	16	19.0	102	93	91.2	5	5.4
More than one race	332	326	98.2	83	25.5	346	334	96.5	27	8.1
Participant refused to answer	57	50	87.7	6	12.0	52	49	94.2	3	6.1
Unknown	105	46	43.8	9	19.6	155	46	29.7	6	13.0
Ethnicity	479	464	96.9	109	23.5	456	443	97.1	35	7.9

		Study Arm									
		LDCT						CXR			
		# Randomized/eligible for screening	# Screened		# Positive		# Randomized/eligible for screening	# Screened		# Positive	
			N	%	N	%		N	%	N	%
Hispanic or Latino											
Neither Hispanic nor Latino		26073	25741	98.7	7040	27.3	26033	25470	97.8	2339	9.2
Participant refused to answer		5	5	100.0	2	40.0	1	1	100.0	0	0.0
Unknown		158	99	62.7	40	40.4	234	121	51.7	13	10.7
Smoking status[2]	**Pack years**										
Former	0-29.99	4	4	100.0	0	0.0	11	11	100.0	0	0.0
	30-34.99	1824	1798	98.6	433	24.1	1905	1859	97.6	140	7.5
	35-39.99	2043	2010	98.4	518	25.8	1966	1926	98.0	172	8.9
	40-44.99	1813	1802	99.4	491	27.2	1761	1728	98.1	162	9.4
	45-49.99	1423	1407	98.9	394	28.0	1354	1325	97.9	122	9.2
	50+	6749	6645	98.5	1791	27.0	6832	6666	97.6	608	9.1
	Total	13856	13666	98.6	3627	26.5	13829	13515	97.7	1204	8.9
Current	Pack years										
	0-29.99	2	2	100.0	0	0.0	4	4	100.0	1	25.0
	30-34.99	1099	1081	98.4	251	23.2	1152	1117	97.0	93	8.3
	35-39.99	1859	1834	98.7	453	24.7	1869	1820	97.4	131	7.2
	40-44.99	2394	2353	98.3	646	27.5	2304	2232	96.9	200	9.0
	45-49.99	1549	1523	98.3	444	29.2	1585	1534	96.8	172	11.2
	50+	5956	5850	98.2	1770	30.3	5981	5813	97.2	586	10.1
	Total	12859	12643	98.3	3564	28.2	12895	12520	97.1	1183	9.4
Education level											
Less than HS degree		1641	1615	98.4	472	29.2	1607	1563	97.3	167	10.7
High school graduate/GED		6272	6174	98.4	1827	29.6	6436	6300	97.9	599	9.5
Post high school training, Associate's degree/ some college		9920	9803	98.8	2624	26.8	9786	9534	97.4	846	8.9
Bachelor's degree		4504	4448	98.8	1156	26.0	4441	4367	98.3	372	8.5

	Study Arm									
	LDCT					CXR				
	# Randomized/eligible for screening	# Screened		# Positive		# Randomized/eligible for screening	# Screened		# Positive	
		N	%	N	%		N	%	N	%
Graduate school	3779	3742	99.0	974	26.0	3820	3767	98.6	356	9.5
Other or unknown	599	527	88.0	138	26.2	634	504	79.5	47	9.3

[1]Ineligible but included in analysis

[2]Broken down by pack-year range. Former: reported having quit at baseline; Current: reported smoking at baseline

Supplementary Table 2: First-line treatment[1] procedures by randomization arm and stage of cancer[2]

	First-line treatment	Stage																		
		IA		IB		IIA		IIB		IIIA		IIIB		IV		Unknown		Total	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
LDCT	**Surgery only**	117	88.6	20	76.9	3	30.0	3	25.0	2	5.9	2	6.7	0	0.0	2	50.0	149	51.0
	Surgery and chemotherapy	8	6.1	4	15.4	3	30.0	3	25.0	2	5.9	4	13.3	3	6.8	0	0.0	27	9.2
	Surgery and radiotherapy	0	0.0	0	0.0	2	20.0	2	16.7	2	5.9	3	10.0	2	4.5	0	0.0	11	3.8
	Surgery, chemotherapy and radiotherapy	2	1.5	1	3.8	0	0.0	1	8.3	9	26.5	2	6.7	0	0.0	0	0.0	15	5.1
	Chemotherapy only	0	0.0	0	0.0	2	20.0	0	0.0	1	2.9	1	3.3	19	43.2	0	0.0	23	7.9
	Chemotherapy and radiotherapy	0	0.0	0	0.0	0	0.0	1	8.3	13	38.2	15	50.0	12	27.3	0	0.0	41	14.0
	Radiotherapy only	3	2.3	0	0.0	0	0.0	0	0.0	4	11.8	1	3.3	2	4.5	1	25.0	11	3.8
	Other treatment	0	0.0	0	0.0	0	0.0	1	8.3	0	0.0	0	0.0	2	4.5	0	0.0	3	1.0
	No treatment[2]	2	1.5	1	3.8	0	0.0	1	8.3	0	0.0	2	6.7	4	9.1	0	0.0	10	3.4
	Treatment data incomplete	0	0.0	0	0.0	0	0.0	0	0.0	1	2.9	0	0.0	0	0.0	1	25.0	2	0.7
	Total	132	100.0	26	100.0	10	100.0	12	100.0	34	100.0	30	100.0	44	100.0	4	100.0	292	100.0
CXR	**Surgery only**	40	87.0	17	70.8	1	33.3	3	30.0	2	6.9	4	14.8	1	2.2	1	20.0	69	36.3
	Surgery and chemotherapy	2	4.3	5	20.8	1	33.3	6	60.0	6	20.7	4	14.8	2	4.3	0	0.0	26	13.7
	Surgery and radiotherapy	1	2.2	0	0.0	0	0.0	0	0.0	2	6.9	1	3.7	0	0.0	1	20.0	5	2.6
	Surgery, chemotherapy and radiotherapy	1	2.2	0	0.0	1	33.3	0	0.0	5	17.2	2	7.4	3	6.5	0	0.0	12	6.3
	Chemotherapy only	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	7.4	23	50.0	1	20.0	26	13.7
	Chemotherapy and radiotherapy	0	0.0	1	4.2	0	0.0	1	10.0	11	37.9	10	37.0	11	23.9	1	20.0	35	18.4
	Radiotherapy only	2	4.3	0	0.0	0	0.0	0	0.0	2	6.9	2	7.4	2	4.3	0	0.0	8	4.2
	Other treatment	0	0.0	0	0.0	0	0.0	0	0.0	1	3.4	0	0.0	1	2.2	0	0.0	2	1.1
	No treatment[2]	0	0.0	1	4.2	0	0.0	0	0.0	0	0.0	1	3.7	3	6.5	1	20.0	6	3.2
	Treatment data incomplete	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	3.7	0	0.0	0	0.0	1	0.5
	Total	46	100.0	24	100.0	3	100.0	10	100.0	29	100.0	27	100.0	46	100.0	5	100.0	190	100.0

[1]Table includes first-line treatments that occurred within 6 months of diagnosis.
[2]"No treatment" includes subjects who received no treatment at all or who received first-line treatment after the 6 months following diagnosis.