

**Web Table 1. Hazard ratios (HRs) and 95% confidence intervals (CIs) for invasive breast cancer incidence associated with smoking status among 76,622 post-menopausal women by obesity status defined by BMI $\geq$ 30 \* (Extension study not included)**

	<i>Non-obesity</i>		<i>Obesity</i>	
<i>Exposure</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)**</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)**</i>
<b>Smoking status</b>				
Never Smokers	907	Referent	353	Referent
Ever smokers	997	1.18 (1.07 1.30)	319	0.95 (0.81 1.12)
Former smokers	877	1.18 (1.07 1.30)	288	0.96 (0.81 1.13)
Current Smokers	120	1.18 (0.97 1.44)	31	0.92 (0.63 1.34)
<b>Age of smoking initiation</b>				
Less than 20	570	1.21 (1.09 1.35)	188	0.99 (0.82 1.19)
20-24	325	1.17 (1.02 1.33)	89	0.89 (0.70 1.13)
25 or older	102	1.08 (0.88 1.33)	42	0.93 (0.67 1.29)
P value for trend		0.0003		0.66
<b>Average No. of cigarettes per day</b>				
<15	543	1.15 (1.03 1.28)	163	0.96 (0.79 1.16)
15 or more	454	1.22 (1.09 1.38)	156	0.95 (0.78 1.15)
P value for trend		0.0004		0.56
<b>Total No. of smoking years</b>				
Less than 10	225	1.07 (0.92 1.24)	75	0.97 (0.75 1.25)
10-29	453	1.19 (1.06 1.34)	131	0.89 (0.72 1.09)
30-49	277	1.22 (1.06 1.41)	107	1.05 (0.84 1.32)
50 or more	42	1.67 (1.22 2.29)	6	0.73 (0.33 1.65)
P value for trend		<0.0001		0.71
<b>No. of smoking pack-years</b>				
Less than 10	402	1.09 (0.96 1.23)	131	1.00 (0.81 1.23)
10-<30	349	1.30 (1.15 1.48)	88	0.87 (0.68 1.10)
30-<50	134	1.16 (0.99 1.40)	41	0.77 (0.61 1.07)
50 or more	113	1.24 (1.01 1.51)	59	1.19 (0.90 1.58)
P value for trend		0.0004		0.81
<b>Years since quit smoking (former smokers)</b>				
less than 10	155	1.28 (1.08 1.53)	61	0.89 (0.53 1.49)
10-<20	219	1.20 (1.03 1.40)	80	0.95 (0.72 1.26)
20-<30	213	1.13 (0.97 1.32)	61	0.90 (0.68 1.18)
30 or more	235	1.17 (1.01 1.35)	71	1.01 (0.78 1.31)
P value for trend		0.0008		0.59

\*The adjusted variables in all multi-adjusted models included age (<55, 55-59, 60-64, 65-69, 70-74, 75- ), race (American Indian or Alaskan Native, Asian or Pacific Islander, Black or African-American, Hispanic/Latino, non-Hispanic white, and other), education (high school or less, some college/technical training, college or some post-college, and master or higher), family history of cancer (yes/no), age of menarche (less than 12 years old, 12-13 years old, 14-15 years old, 16 years old or older), age of first live birth (never had term pregnancy, less than 20 years old, 20-29 years old, 30 years old or more), hormone use (no, estrogen alone, estrogen and progestin, mixed), parity (never pregnant, never had term pregnancy, 1, 2, 3, 4, 5+), alcohol intake (non drinker, past drinker, < 1 drink/month, 1 drink/month-<1 drink/wk, 1-<7 drinks/wk, 7+ drinks/wk), BMI (< 18.5, 18.5 - 24.9, 25.0 - 29.9, 30.0 - 34.9, 35.0 - 39.9,  $\geq$  40), physical activity (metabolic equivalent tasks (METs) per week: <5, 5-<10, 10-<20, 20-<30, 30 or more), mammography during last two years (yes/no). P for trend test included reference group.

**Web Table 2. Hazard ratios (HRs) and 95% confidence intervals (CIs) for invasive breast cancer incidence associated with smoking status among 76,622 post-menopausal women by abdominal obesity defined by waist circumference  $\geq 88$  cm\* (Extension study not included)**

	<i>Non-obesity</i>		<i>Obesity</i>	
<i>Exposure</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)**</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)**</i>
<b>Smoking status</b>				
Never Smokers	801	Referent	459	Referent
Ever smokers	846	1.18 (1.07 1.31)	470	1.01 (0.88 1.16)
Former smokers	750	1.19 (1.07 1.32)	415	1.01 (0.87 1.16)
Current Smokers	96	1.14 (0.92 1.42)	55	1.01 (0.76 1.34)
<b>Age of smoking initiation</b>				
Less than 20	498	1.26 (1.12 1.41)	260	0.98 (0.83 1.15)
20-24	270	1.13 (0.98 1.30)	144	1.02 (0.84 1.24)
25 or older	78	0.98 (0.78 1.24)	66	1.11 (0.85 1.44)
P value for trend		0.0003		0.97
<b>Average No. of cigarettes per day</b>				
<15	471	1.14 (1.02 1.29)	235	1.01 (0.86 1.19)
15 or more	375	1.23 (1.09 1.40)	235	1.01 (0.86 1.19)
P value for trend		0.0009		0.88
<b>Total No. of smoking years</b>				
Less than 10	199	1.05 (0.90 1.23)	101	1.04 (0.83 1.29)
10-29	389	1.20 (1.05 1.36)	195	0.96 (0.80 1.14)
30-49	223	1.23 (1.05 1.43)	161	1.08 (0.90 1.30)
50 or more	35	1.84 (1.30 2.60)	13	0.85 (0.49 1.48)
P value for trend		<0.0001		0.77
<b>No. of smoking pack-years</b>				
Less than 10	357	1.09 (0.96 1.24)	175	1.02 (0.85 1.22)
10-<30	292	1.29 (1.13 1.49)	145	1.00 (0.82 1.21)
30-<50	110	1.17 (0.96 1.44)	65	0.87 (0.67 1.23)
50 or more	87	1.26 (1.01 1.58)	85	1.16 (0.92 1.47)
P value for trend		0.0007		0.66
<b>Years since quit smoking (former smokers)</b>				
less than 10	125	1.29 (1.07 1.57)	91	1.02 (0.81 1.29)
10-<20	185	1.23 (1.04 1.44)	114	1.00 (0.81 1.24)
20-<30	184	1.12 (0.95 1.32)	90	0.98 (0.78 1.24)
30 or more	203	1.15 (0.98 1.34)	103	1.10 (0.89 1.37)
P value for trend		0.001		0.97

\*The adjusted variables in all multi-adjusted models included age (<55, 55-59, 60-64, 65-69, 70-74, 75- ), race (American Indian or Alaskan Native, Asian or Pacific Islander, Black or African-American, Hispanic/Latino, non-Hispanic white, and other), education (high school or less, some college/technical training, college or some post-college, and master or higher), family history of cancer (yes/no), age of menarche (less than 12 years old, 12-13 years old, 14-15 years old, 16 years old or older), age of first live birth (never had term pregnancy, less than 20 years old, 20-29 years old, 30 years old or more), hormone use (no, estrogen alone, estrogen and progestin, mixed), parity (never pregnant, never had term pregnancy, 1, 2, 3, 4, 5+), alcohol intake (non drinker, past drinker, < 1 drink/month, 1 drink/month-<1 drink/wk, 1-<7 drinks/wk, 7+ drinks/wk), BMI (< 18.5, 18.5 - 24.9, 25.0 - 29.9, 30.0 - 34.9, 35.0 - 39.9,  $\geq 40$ ), physical activity (metabolic equivalent tasks (METs) per week: <5, 5-<10, 10-<20, 20-<30, 30 or more), mammography during last two years (yes/no). P for trend test included reference group.

**Web Table 3. Hazard ratios (HRs) and 95% confidence intervals (CIs) for mortality from any cause other than invasive breast cancer with smoking status among 76,628 post-menopausal women by obesity status defined by BMI $\geq$ 30 \***

	<i>Non-obesity</i>		<i>Obesity</i>		<i>P for interaction</i>
<i>Exposure</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)*</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)*</i>	
<b>Smoking status</b>					
Never Smokers	2022	Referent	868	Referent	
Ever smokers	2714	1.76 (1.66 1.87)	1042	1.52 (1.38 1.68)	0.01 <sup>1</sup>
Former smokers	2095	1.55 (1.46 1.66)	888	1.43 (1.29 1.58)	0.02 <sup>2</sup>
Current Smokers	619	3.27 (2.98 3.60)	152	2.51 (2.10 3.00)	
<b>Age of smoking initiation</b>					0.06
Less than 20	1463	1.89 (1.76 2.03)	589	1.66 (1.49 1.86)	
20-24	896	1.66 (1.53 1.80)	301	1.41 (1.23 1.61)	
25 or older	355	1.57 (1.40 1.77)	150	1.32 (1.11 1.58)	
P value for trend		<0.0001		<0.0001	
<b>Average No. of cigarettes per day</b>					0.006
<15	1262	1.41 (1.31 1.52)	459	1.25 (1.11 1.41)	
15 or more	1452	2.28 (2.12 2.45)	581	1.85 (1.66 2.07)	
P value for trend		<0.0001		<0.0001	
<b>Total No. of smoking years</b>					0.002
Less than 10	395	1.16 (1.04 1.30)	166	1.08 (0.91 1.28)	
10-29	884	1.35 (1.24 1.47)	368	1.29 (1.13 1.46)	
30-49	1153	2.52 (2.33 2.72)	445	2.03 (1.80 2.29)	
50 or more	282	3.42 (3.01 3.89)	61	2.49 (1.91 3.25)	
P value for trend		<0.0001		<0.0001	
<b>No. of smoking pack-years</b>					0.001
Less than 10	772	1.21 (1.11 1.32)	291	1.09 (0.95 1.25)	
10-<30	843	1.69 (1.55 1.83)	307	1.48 (1.30 1.70)	
30-<50	489	2.37 (2.14 2.62)	210	1.91 (1.63 2.23)	
50 or more	610	3.36 (3.06 3.70)	232	2.42 (2.08 2.81)	
P value for trend		<0.0001		<0.0001	
<b>Years since quit smoking (former smokers)</b>					0.08
less than 10	401	2.54 (2.27 2.84)	209	1.95 (1.66 2.28)	
10-<20	606	1.82 (1.66 2.00)	263	1.55 (1.35 1.79)	
20-<30	457	1.46 (1.31 1.62)	173	1.25 (1.06 1.48)	
30 or more	522	1.17 (1.06 1.29)	200	1.18 (1.01 1.38)	
P value for trend		<0.0001		<0.0001	

\*The adjusted variables in all multi-adjusted models included age (<55, 55-59, 60-64, 65-69, 70-74, 75- ), race (American Indian or Alaskan Native, Asian or Pacific Islander, Black or African-American, Hispanic/Latino, non-Hispanic white, and other), education (high school or less, some college/technical training, college or some post-college, and master or higher), family history of cancer (yes/no), age of menarche (less than 12 years old, 12-13 years old, 14-15 years old, 16 years old or older), age of first live birth (never had term pregnancy, less than 20 years old, 20-29 years old, 30 years old or more), hormone use (no, estrogen alone, estrogen and progestin, mixed), parity (never pregnant, never had term pregnancy, 1, 2, 3, 4, 5+), alcohol intake (non drinker, past drinker, < 1 drink/month, 1 drink/month-<1 drink/wk, 1-<7 drinks/wk, 7+ drinks/wk), BMI (< 18.5, 18.5 - 24.9, 25.0 - 29.9, 30.0 - 34.9, 35.0 - 39.9,  $\geq$  40), physical activity (metabolic equivalent tasks (METs) per week: <5, 5-<10, 10-<20, 20-<30, 30 or more), mammography during last two years (yes/no). P for trend test included reference group.

1: when smoking was categorized as never and ever smokers.

2: when smoking was categorized as never, former and current smokers.

**Web Table 4. Hazard ratios (HRs) and 95% confidence intervals (CIs) for mortality from any cause other than invasive breast cancer associated with smoking status among 76,628 post-menopausal women by abdominal obesity defined by waist circumference  $\geq 88$  cm\***

	<i>Non-obesity</i>		<i>Obesity</i>		<i>P for interaction</i>
<i>Exposure</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)*</i>	<i>cases</i>	<i>Multivariable-adjusted HR (95%CI)*</i>	
<b>Smoking status</b>					
Never Smokers	1633	Referent	1257	Referent	
Ever smokers	2061	1.73 (1.61 1.85)	1693	1.61 (1.49 1.74)	0.07 <sup>1</sup>
Former smokers	1601	1.52 (1.42 1.64)	1382	1.43 (1.36 1.60)	0.21 <sup>2</sup>
Current Smokers	460	3.30 (2.96 3.68)	311	2.78 (2.44 3.16)	
<b>Age of smoking initiation</b>					0.25
Less than 20	1099	1.86 (1.72 2.02)	953	1.74 (1.56 1.90)	
20-24	698	1.65 (1.51 1.81)	499	1.49 (1.34 1.66)	
25 or older	264	1.50 (1.32 1.71)	241	1.46 (1.27 1.68)	
P value for trend		<0.0001		<0.0001	
<b>Average No. of cigarettes per day</b>					0.001
<15	979	1.37 (1.27 1.49)	742	1.35 (1.23 1.49)	
15 or more	1082	2.29 (2.11 2.49)	951	1.90 (1.74 2.08)	
P value for trend		<0.0001		<0.0001	
<b>Total No. of smoking years</b>					0.001
Less than 10	325	1.16 (1.03 1.31)	236	1.11 (0.97 1.28)	
10-29	681	1.32 (1.20 1.45)	571	1.32 (1.19 1.46)	
30-49	845	2.50 (2.29 2.73)	753	2.15 (1.95 2.36)	
50 or more	210	3.71 (3.20 4.30)	133	2.58 (2.14 3.10)	
P value for trend		<0.0001		<0.0001	
<b>No. of smoking pack-years</b>					<0.0001
Less than 10	604	1.17 (1.06 1.28)	459	1.19 (1.07 1.33)	
10-<30	661	1.72 (1.57 1.89)	489	1.48 (1.32 1.65)	
30-<50	361	2.36 (2.10 2.66)	338	2.00 (1.76 2.26)	
50 or more	435	3.48 (3.12 3.89)	407	2.53 (2.25 2.85)	
P value for trend		<0.0001		<0.0001	
<b>Years since quit smoking (former smokers)</b>					0.12
less than 10	281	2.44 (2.14 2.79)	329	2.10 (1.85 2.39)	
10-<20	455	1.83 (1.64 2.04)	414	1.59 (1.42 1.79)	
20-<30	362	1.43 (1.27 1.61)	268	1.33 (1.16 1.53)	
30 or more	413	1.14 (1.02 1.27)	309	1.22 (1.07 1.39)	
P value for trend		<0.0001		<0.0001	

\*The adjusted variables in all multi-adjusted models included age (<55, 55-59, 60-64, 65-69, 70-74, 75- ), race (American Indian or Alaskan Native, Asian or Pacific Islander, Black or African-American, Hispanic/Latino, non-Hispanic white, and other), education (high school or less, some college/technical training, college or some post-college, and master or higher), family history of cancer (yes/no), age of menarche (less than 12 years old, 12-13 years old, 14-15 years old, 16 years old or older), age of first live birth (never had term pregnancy, less than 20 years old, 20-29 years old, 30 years old or more), hormone use (no, estrogen alone, estrogen and progestin, mixed), parity (never pregnant, never had term pregnancy, 1, 2, 3, 4, 5+), alcohol intake (non drinker, past drinker, < 1 drink/month, 1 drink/month-<1 drink/wk, 1-<7 drinks/wk, 7+ drinks/wk), BMI (< 18.5, 18.5 - 24.9, 25.0 - 29.9, 30.0 - 34.9, 35.0 - 39.9,  $\geq 40$ ), physical activity (metabolic equivalent tasks (METs) per week: <5, 5-<10, 10-<20, 20-<30, 30 or more), mammography during last two years (yes/no). P for trend test included reference group.

1: when smoking was categorized as never and ever smokers.

2: when smoking was categorized as never, former and current smokers.

## **Web Appendix**

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