

SUPPLEMENTAL MATERIAL

Table S1: Characteristics of WTC General Responder Cohort ($N= 33\ 076$) and WTC-Heart ($N= 6481$)

Table S2: Hazard ratios of incident (including recurrent) MI or stroke, recognized cardiovascular risk factors, and WTC exposure in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

Table S3: Hazard ratios of incident (including recurrent) MI, recognized cardiovascular risk factors, and WTC exposure in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

Table S4: Hazard ratios of incident (including recurrent) stroke, recognized cardiovascular risk factors, and WTC exposure in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

Table S5: Hazard ratios of exposure to the WTC complex cloud and incident (including recurrent) MI or stroke in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

Table S6: Hazard ratios of PTSD and incident (including recurrent) MI or stroke in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

Table S7: Hazard ratios of PTSD and hospitalization for MI or stroke in 4533 men and 951 women residing in New York City or State. WTC-Heart, 2012-2016.

Table S8: Recognized cardiovascular risk factors and WTC exposure among 4942 men and 1029 women followed up and 424 men and 86 women lost to follow-up. WTC-Heart, New York, 2012-2016.

Figure S1: Cumulative risk of incident (including recurrent) myocardial infarction (MI) by PTSD status in men of the WTC-Heart cohort, New York, 2012-2016.

Figure S2: Cumulative risk of incident (including recurrent) stroke by PTSD status in the WTC-Heart cohort men, New York, 2012-2016.

Figure S3: Cumulative risk of incident (including recurrent) myocardial infarction (MI) by PTSD status in women of the WTC-Heart cohort, New York, 2012-2016.

Figure S4: Cumulative risk of incident (including recurrent) stroke by PTSD status in the WTC-Heart cohort women, New York, 2012-2016.

Table S1: Characteristics of WTC General Responder Cohort ($N = 33\,076$) and WTC-Heart ($N=6\,481$)

| Variable | General Cohort in 2014 | WTC-Heart in 2013 |
|--------------------------------------------|-------------------------------|--------------------------|
| <i>N</i> | 33 076 | 6 481 |
| Mean age (SD) in years | | |
| On 11 September 2001 | 38.69 (8.8) | 39.48 (8.8) |
| At Visit 1 | 43.82 (9.1) | 44.35 (8.9) |
| Age Groups at Visit 1: <i>n</i> (%) | | |
| 20 to 24 | 217 (0.7) | 28 (0.4) |
| 25 to 29 | 1138 (3.4) | 181 (2.8) |
| 30 to 34 | 3424 (10.4) | 639 (9.9) |
| 35 to 39 | 6330 (19.1) | 1155 (17.8) |
| 40 to 44 | 7620 (23.0) | 1528 (23.6) |
| 45 to 49 | 6064 (18.3) | 1198 (18.5) |
| 50 to 54 | 4043 (12.2) | 834 (12.9) |
| 55 to 59 | 2421 (7.3) | 563 (8.7) |
| 60 to 64 | 1206 (3.7) | 235 (3.6) |
| 65 and older | 613 (1.9) | 120 (1.9) |
| Sex: <i>n</i> (%) | | |
| Female | 4759 (14.4) | 1115 (17.2) |
| Male | 28 317 (85.6) | 5366 (82.8) |
| Race: <i>n</i> (%) | | |
| African American | 3448 (10.4) | 1013 (15.6) |
| Asian/Pacific Islander | 461 (1.4) | 109 (1.7) |
| White | 18 760 (56.7) | 3465 (53.5) |
| Other | 1030 (3.1) | 271 (4.2) |

| | | |
|-------------------------------------|---------------|-------------|
| Unknown | 9377 (28.4) | 1623 (25.0) |
| Hispanic: <i>n</i> (%) | 7259 (21.9) | 1909 (29.4) |
| Primary language | | |
| English <i>n</i> (%) | 28 376 (85.8) | 5673 (87.5) |
| Marital status: <i>n</i> (%) | | |
| Married or partnered | 20 561 (62.2) | 3876 (59.8) |
| Education: <i>n</i> (%) | | |
| < High school graduate | 2305 (7.0) | 485 (7.5) |
| High school graduate | 6781 (20.5) | 1162 (17.9) |
| Some college | 11 831 (35.8) | 2281 (35.2) |
| College graduate | 8213 (24.8) | 1808 (27.9) |
| Unknown | 3946 (11.9) | 745 (11.5) |
| Monitoring visits (SD) | 3.4 (2.1) | 4.1 (1.8) |

Table S2: Hazard ratios of incident (including recurrent) MI or stroke, recognized cardiovascular risk factors and WTC exposure in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

| Gender | | Categories# | No of MI/Stroke | aHR* | 95% CI | |
|--------|-------------------|-------------|-----------------|------|--------|------|
| | | | | | LL | UL |
| Men | All | | 102 | | | |
| | Blood Pressure | Normal | 70 | 1.00 | Ref | |
| | | High | 31 | 1.19 | 0.74 | 1.89 |
| | Total cholesterol | Normal | 83 | 1.00 | Ref | |
| | | High | 15 | 1.33 | 0.73 | 2.40 |
| | BMI | Normal | 9 | 1.00 | Ref | |
| | | Overweight | 38 | 1.02 | 0.47 | 2.21 |
| | | Obese | 55 | 1.12 | 0.53 | 2.40 |
| | Smoker | Never | 44 | 1.00 | Ref | |
| | | Current | 17 | 2.65 | 1.48 | 4.74 |
| | | Former | 31 | 1.04 | 0.65 | 1.68 |
| | Used respirator | No | 13 | 1.00 | Ref | |
| | | Yes | 87 | 0.89 | 0.48 | 1.88 |

| | | | | | | |
|--------|-------------------|------------|-----|------|------|------|
| Women | All | | 16 | | | |
| | Blood Pressure | Normal | 4 | —** | — | |
| | | High | 12 | — | — | |
| | Total cholesterol | Normal | 14 | — | — | |
| | | High | 1 | — | — | |
| | BMI | Normal | 1 | — | — | |
| | | Overweight | 8 | — | — | |
| | | Obese | 7 | — | — | |
| | Smoker | Never | 8 | — | — | |
| | | Current | 1 | — | — | |
| | | Former | 3 | — | — | |
| | Used respirator | No | 2 | — | — | |
| | | Yes | 12 | — | — | |
| All*** | All | | 118 | | | |
| | Blood Pressure | Normal | 82 | 1.00 | Ref | |
| | | High | 35 | 1.25 | 0.80 | 1.94 |

| | | | | | |
|-------------------|------------|-----|------|------|------|
| Total cholesterol | Normal | 102 | 1.00 | Ref | |
| | High | 16 | 1.19 | 0.68 | 2.10 |
| BMI | Normal | 10 | 1.00 | Ref | |
| | Overweight | 46 | 1.28 | 0.62 | 2.67 |
| | Obese | 62 | 1.32 | 0.64 | 2.72 |
| Smoker | Never | 52 | 1.00 | Ref | |
| | Current | 18 | 2.33 | 1.32 | 4.12 |
| | Former | 34 | 1.01 | 0.64 | 1.58 |
| Used respirator | No | 15 | 1.00 | Ref | |
| | Yes | 99 | 0.95 | 0.51 | 1.78 |

aHR=adjusted hazard ratios, CI=confidence interval, LL=lower limit, UL=Upper limit

*Adjusted to all other variables in the table and to PTSD (yes/no)

**Insufficient sample size

*** Also shown in Figure 2

#See Table 1 for definitions

Table S3: Hazard ratios of incident (including recurrent) MI, recognized cardiovascular risk factors, and WTC exposure in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

| Gender | | Categories# | No of MI | aHR* | 95% CI | |
|--------|-------------------|-------------|----------|------|--------|------|
| | | | | | LL | UL |
| Men | All | | 61 | | | |
| | Blood Pressure | Normal | 41 | 1.00 | ref | |
| | | High | 19 | 1.13 | 0.60 | 2.12 |
| | Total cholesterol | Normal | 50 | 1.00 | ref | |
| | | High | 11 | 1.72 | 0.83 | 3.55 |
| | BMI | Normal | 6 | 1.00 | ref | |
| | | Overweight | 23 | 0.97 | 0.36 | 2.60 |
| | | Obese | 32 | 0.98 | 0.37 | 2.58 |
| | Smoker | Never | 22 | 1.00 | ref | |
| | | Current | 11 | 3.34 | 1.55 | 7.18 |
| | | Former | 20 | 1.36 | 0.72 | 2.58 |
| | Used respirator | No | 9 | 1.00 | ref | |
| | | Yes | 50 | 0.97 | 0.38 | 2.45 |

| | | | | | | |
|-------|-------------------|------------|----|------|------|------|
| Women | All | | 9 | | | |
| | Blood Pressure | Normal | 7 | —** | — | |
| | | High | 2 | — | — | |
| | Total cholesterol | Normal | 8 | — | — | |
| | | High | 1 | — | — | |
| | BMI | Normal | 0 | — | — | |
| | | Overweight | 5 | — | — | |
| | | Obese | 4 | — | — | |
| | Smoker | Never | 5 | — | — | |
| | | Current | 0 | — | — | |
| | | Former | 2 | — | — | |
| | Used respirator | No | 2 | — | — | |
| | | Yes | 6 | — | — | |
| All | All | | 69 | | | |
| | Blood Pressure | Normal | 48 | 1.00 | ref | |
| | | High | 21 | 1.10 | 0.60 | 2.02 |

| | | | | | |
|-------------------|------------|----|------|------|------|
| Total cholesterol | Normal | 58 | 1.00 | Ref | |
| | High | 12 | 1.56 | 0.78 | 3.09 |
| BMI | Normal | 6 | 1.00 | ref | |
| | Overweight | 28 | 1.44 | 0.54 | 3.82 |
| | Obese | 36 | 1.37 | 0.52 | 3.64 |
| Smoker | Never | 27 | 1.00 | Ref | |
| | Current | 11 | 2.82 | 1.35 | 5.91 |
| | Former | 22 | 1.28 | 0.71 | 2.30 |
| Used respirator | No | 11 | 1.00 | Ref | |
| | Yes | 56 | 0.81 | 0.37 | 1.80 |

aHR=adjusted hazard ratios, CI=confidence interval, LL=lower limit, UL=Upper limit

*Adjusted to all other variables in the table and to PTSD (yes/no)

**Insufficient sample size

#See Table 1 for definitions

Table S4: Hazard ratios of incident (including recurrent) stroke, recognized cardiovascular risk factors, and WTC exposure in 4,942 men and 1,029 women comprising WTC-Heart, New York, 2012-2016.

| Gender | | Categories# | No of Stroke | aHR* | 95% CI | |
|--------|-------------------|-------------|--------------|------|--------|------|
| | | | | | LL | UL |
| Men | N | | 46 | | | |
| | Blood Pressure | Normal | 33 | 1.00 | Ref | |
| | | High | 12 | 1.13 | 0.57 | 2.23 |
| | Total cholesterol | Normal | 42 | 1.00 | Ref | |
| | | High | 4 | 0.84 | 0.30 | 2.36 |
| | BMI | Normal | 4 | 1.00 | Ref | |
| | | Overweight | 17 | 1.22 | 0.35 | 4.21 |
| | | Obese | 25 | 1.55 | 0.46 | 5.19 |
| | Smoker | Never | 24 | 1.00 | Ref | |
| | | Current | 6 | 1.87 | 0.76 | 4.63 |
| | | Former | 13 | 0.73 | 0.36 | 1.49 |
| | Used respirator | No | 6 | 1.00 | Ref | |
| | | Yes | 40 | 0.82 | 0.32 | 2.08 |

| | | | | | | |
|-------|-------------------|------------|----|------|------|------|
| Women | N | | 7 | | | |
| | Blood Pressure | Normal | 5 | —** | — | |
| | | High | 2 | — | — | |
| | Total cholesterol | Normal | 7 | — | — | |
| | | High | 0 | — | — | |
| | BMI | Normal | 1 | — | — | |
| | | Overweight | 3 | — | — | |
| | | Obese | 3 | — | — | |
| | Smoker | Never | 3 | — | — | |
| | | Current | 1 | — | — | |
| | | Former | 1 | — | — | |
| | Used respirator | No | 0 | — | — | |
| | | Yes | 6 | — | — | |
| All | N | | 53 | | | |
| | Blood Pressure | Normal | 38 | 1.00 | Ref | |
| | | High | 14 | 1.30 | 0.68 | 2.67 |

| | | | | | |
|-------------------|------------|----|------|------|------|
| Total cholesterol | Normal | 49 | 1.00 | Ref | |
| | High | 4 | 0.73 | 0.26 | 2.03 |
| BMI | Normal | 5 | 1.00 | Ref | |
| | Overweight | 20 | 1.18 | 0.39 | 3.54 |
| | Obese | 28 | 1.39 | 0.47 | 4.06 |
| Smoker | Never | 27 | 1.00 | Ref | |
| | Current | 7 | 1.72 | 0.70 | 4.20 |
| | Former | 14 | 0.72 | 0.38 | 2.42 |
| Used respirator | No | 6 | 1.00 | Ref | |
| | Yes | 46 | 0.95 | 0.40 | 4.61 |

aHR=adjusted hazard ratios, CI=confidence interval, LL=lower limit, UL=Upper limit

*Adjusted to all other variables in the table and to PTSD (yes/no)

**Insufficient sample size

#See Table 1 for definitions

Table S5: Hazard ratios of exposure to the WTC complex cloud and incident (including recurrent) MI or stroke in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

| Exposure | Category | aHR* | LL | UL |
|-----------------------|------------------------|------|------|------|
| Lower Manhattan | Yes | 1.08 | 0.59 | 1.95 |
| | No | 1.00 | | |
| Directly in the cloud | Yes | 0.76 | 0.32 | 1.88 |
| | No | 1.00 | | |
| Worked on the pile | Yes | 1.30 | 0.69 | 2.46 |
| | No | 1.00 | | |
| First Day | 9/11/2001 + cloud | 1.00 | | |
| | 9/11/2001 not on cloud | 1.45 | 0.59 | 3.57 |
| | 9/12-13/2001 | 1.05 | 0.43 | 2.54 |
| | 9/14-30/2001 | 0.90 | 0.34 | 2.43 |
| Summary Exposure | Low | 1.00 | | |
| | Intermediate | 1.21 | 0.57 | 2.54 |
| | High | 0.88 | 0.29 | 2.65 |

aHR=adjusted hazard ratios, CI=confidence interval, LL=lower limit, UL=Upper limit

*Adjusted for age and all variables shown in Table S3 and for PTSD

Table S6: Hazard ratios of probable PTSD and incident (including recurrent) MI

or stroke in 4942 men and 1029 women comprising WTC-Heart, New York, 2012-2016.

Analysis using Firth's correction.

| Gender | Outcome | Measure | PTSD | | Age-adjusted | | | Multivariate* | | |
|--------|--------------|----------|-------|----|--------------|--------|------|---------------|--------|------|
| | | | yes | No | HR | 95% CI | | HR | 95% CI | |
| | | | Cases | | | LL | UL | | LL | UL |
| Men | MI | Incident | 23 | 38 | 2.29 | 1.36 | 3.85 | 2.22 | 1.25 | 3.94 |
| | Stroke | Incident | 19 | 27 | 2.71 | 1.25 | 3.94 | 2.76 | 1.48 | 5.13 |
| | MI or Stroke | Incident | 41 | 61 | 2.55 | 1.71 | 3.79 | 2.46 | 1.60 | 3.78 |
| Women | MI | Incident | 4 | 5 | 2.03 | 0.54 | 7.20 | --** | -- | -- |
| | Stroke | Incident | 3 | 4 | 2.11 | 0.47 | 8.75 | -- | -- | -- |
| | MI or Stroke | Incident | 7 | 9 | 2.04 | 0.75 | 5.33 | -- | -- | -- |
| All | MI | Incident | 27 | 43 | 2.24 | 1.38 | 3.64 | 2.22 | 1.30 | 3.82 |
| | Stroke | Incident | 22 | 31 | 2.61 | 1.51 | 4.53 | 2.51 | 1.39 | 4.57 |
| | MI or Stroke | Incident | 48 | 70 | 2.46 | 1.70 | 3.56 | 2.35 | 1.57 | 3.52 |

HR=hazard ratios, CI=confidence interval, LL=lower limit, UL=Upper limit

*Adjusted for age and all variables shown in Table S3

**Insufficient sample size

Table S7: Hazard ratios of PTSD and hospitalization for MI or stroke in 4533 men

and 951 women residing in New York City or State. WTC-Heart, 2012-2016.

| Gender | Outcome | Measure | PTSD | | Age-adjusted | | | Multivariate* | | |
|--------|--------------|-----------------|-------|-----|--------------|--------|------|---------------|--------|------|
| | | | yes | No | HR | 95% CI | | HR | 95% CI | |
| | | | Cases | | | LL | UL | | LL | UL |
| Men | MI | Hospitalization | 39 | 63 | 2.27 | 1.45 | 3.56 | 2.27 | 1.45 | 3.56 |
| | Stroke | Hospitalization | 29 | 36 | 2.97 | 1.82 | 4.87 | 3.12 | 1.81 | 5.41 |
| | MI or Stroke | Hospitalization | 64 | 94 | 2.45 | 1.78 | 3.37 | 2.65 | 1.87 | 3.76 |
| Women | MI | Hospitalization | 5 | 5 | 2.49 | 0.73 | 8.45 | -- | -- | -- |
| | Stroke | Hospitalization | 5 | 7 | 1.97 | 0.61 | 5.95 | -- | -- | -- |
| | MI or Stroke | Hospitalization | 10 | 12 | 2.44 | 1.05 | 5.55 | -- | -- | -- |
| All | MI | Hospitalization | 44 | 68 | 2.20 | 1.50 | 3.20 | 2.17 | 1.41 | 3.32 |
| | Stroke | Hospitalization | 34 | 43 | 2.75 | 1.75 | 4.33 | 3.01 | 1.84 | 4.93 |
| | MI or Stroke | Hospitalization | 74 | 106 | 2.35 | 1.75 | 3.17 | 2.40 | 1.73 | 3.34 |

HR=hazard ratios, CI=confidence interval, LL=lower limit, UL=Upper limit

*Adjusted for age and all variables shown in Table S4

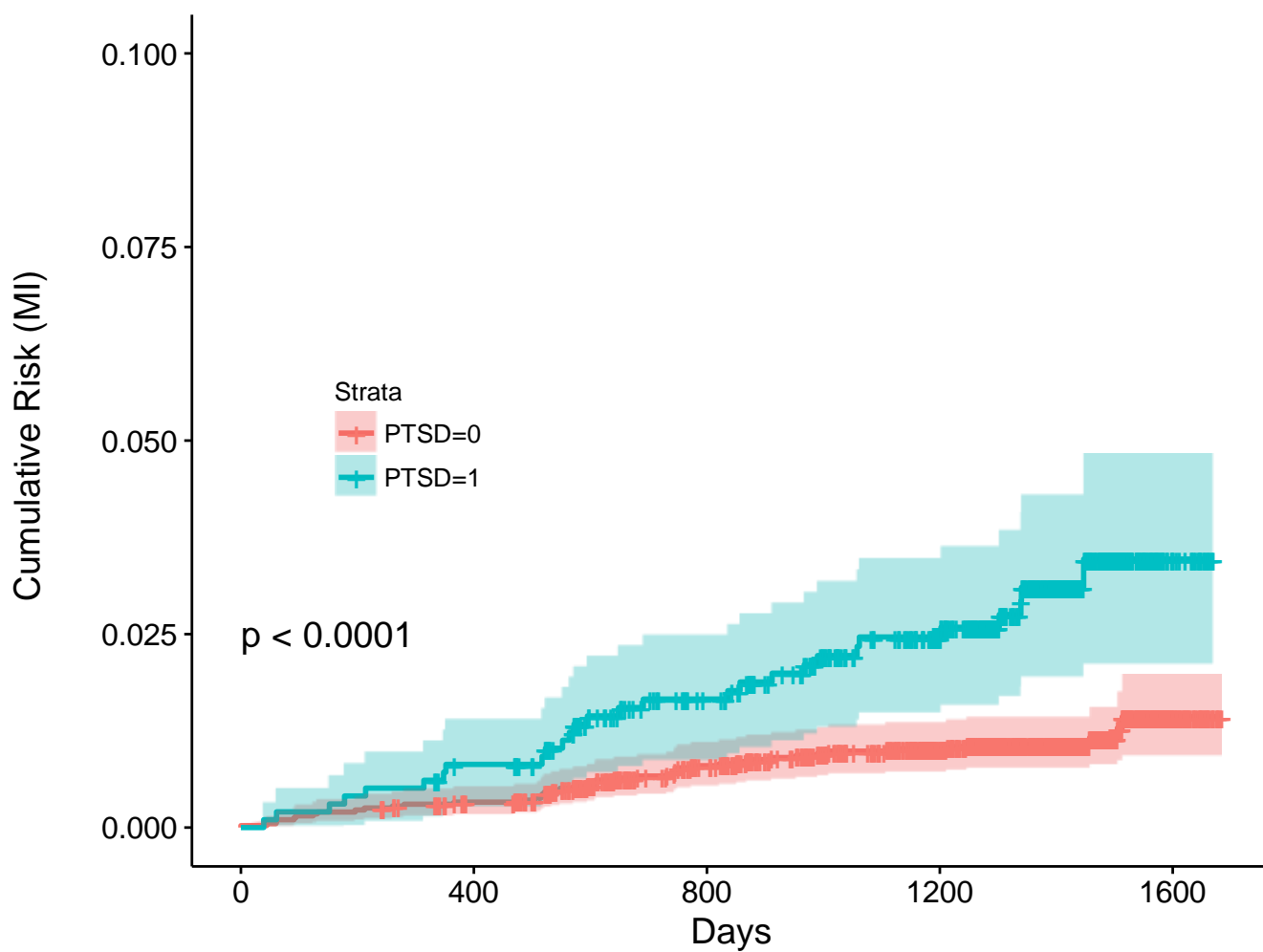
**Insufficient sample size

Table S8: Recognized cardiovascular risk factors and WTC exposure among 4942 men and 1029 women followed up and 424 men and 86 women lost to follow-up. WTC-Heart, New York, 2012-2016.

| Gender | | Categories# | % followed up out of n=4942 | % lost out of n=424 | p |
|--------|-------------------|-------------|--------------------------------|------------------------|---|
| Men | Blood Pressure | Normal | 77.1 | 73.7 | |
| | | High | 22.9 | 22.3 | |
| | Total cholesterol | Normal | 89.5 | 88.7 | |
| | | High | 10.5 | 11.3 | |
| | BMI | Normal | 9.3 | 10.9 | |
| | | Overweight | 40.7 | 35.4 | |
| | | Obese | 50.0 | 53.8 | |
| | Smoker | Never | 60.8 | 57.0 | |
| | | Current | 7.9 | 13.4 | |
| | | Former | 31.3 | 29.7 | |
| | Used respirator | No | 10.5 | 10.4 | |
| | | Yes | 89.5 | 89.6 | |
| | PTSD | No | 80.1 | 73.4 | |

| | | | | |
|-------------------|------------|----------------------------------------|-------------------------------|------|
| | Yes | 19.9 | 26.7 | .001 |
| Women | | % followed up out of n=1029 | % lost out of n=86 | |
| Blood Pressure | Normal | 87.4 | 80.9 | |
| | High | 12.6 | 19.1 | .095 |
| Total cholesterol | Normal | 85.8 | 87.2 | |
| | High | 14.2 | 12.8 | .720 |
| BMI | Normal | 25.1 | 18.6 | |
| | Overweight | 37.1 | 30.2 | |
| | Obese | 37.8 | 51.2 | .049 |
| Smoker | Never | 66.8 | 69.1 | |
| | Current | 7.0 | 3.7 | |
| | Former | 26.2 | 27.2 | .526 |
| Used respirator | No | 18.0 | 21.4 | |
| | Yes | 82.0 | 78.6 | .434 |
| PTSD | No | 74.2 | 64.0 | |
| | Yes | 25.9 | 36.1 | .040 |

| All*** | | % followed up out of n=5971 | % lost out of n=510 | |
|-------------------|------------|--------------------------------|------------------------|------|
| Blood Pressure | Normal | 78.9 | 75.0 | |
| | High | 21.1 | 25.0 | .048 |
| Total cholesterol | Normal | 88.9 | 88.4 | |
| | High | 11.1 | 11.6 | .749 |
| BMI | Normal | 12.0 | 12.2 | |
| | Overweight | 40.1 | 34.5 | |
| | Obese | 47.9 | 53.3 | .038 |
| Smoker | Never | 61.8 | 59.1 | |
| | Current | 7.8 | 11.7 | |
| | Former | 30.4 | 29.2 | .013 |
| Used respirator | No | 11.8 | 12.3 | |
| | Yes | 88.2 | 87.7 | .752 |
| PTSD | No | 79.1 | 71.8 | |
| | Yes | 20.9 | 28.2 | .000 |



Number of men at risk by time

| Strata | 0 | 400 | 800 | 1200 | 1600 |
|--------|------|------|------|------|------|
| PTSD=0 | 3952 | 3914 | 3720 | 3396 | 114 |
| PTSD=1 | 980 | 968 | 895 | 772 | 44 |

Days

Figure S1: Cumulative risk of incident (including recurrent) myocardial infarction (MI) by PTSD status in men of the WTC-Heart cohort, New York, 2012-2016.

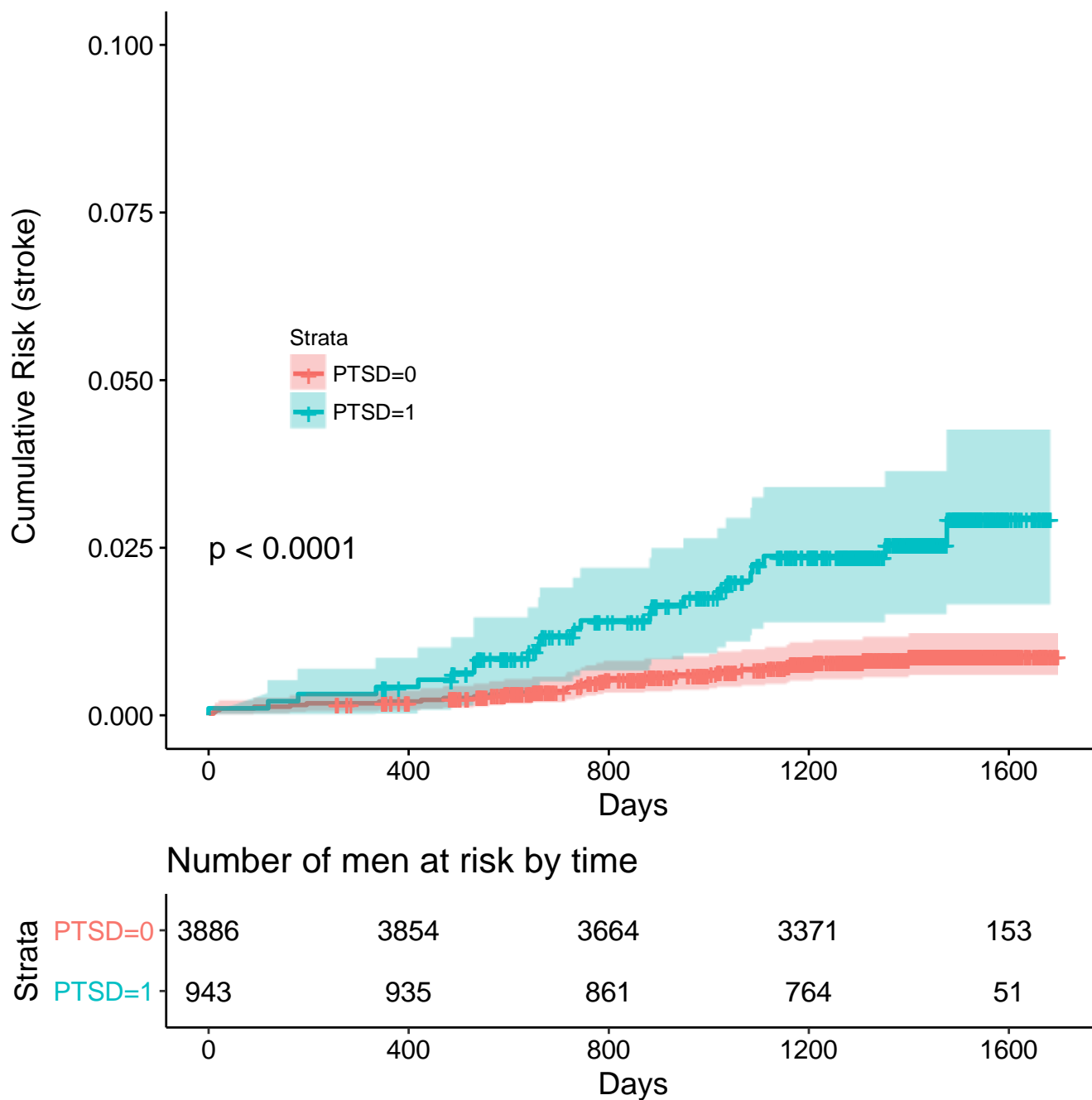
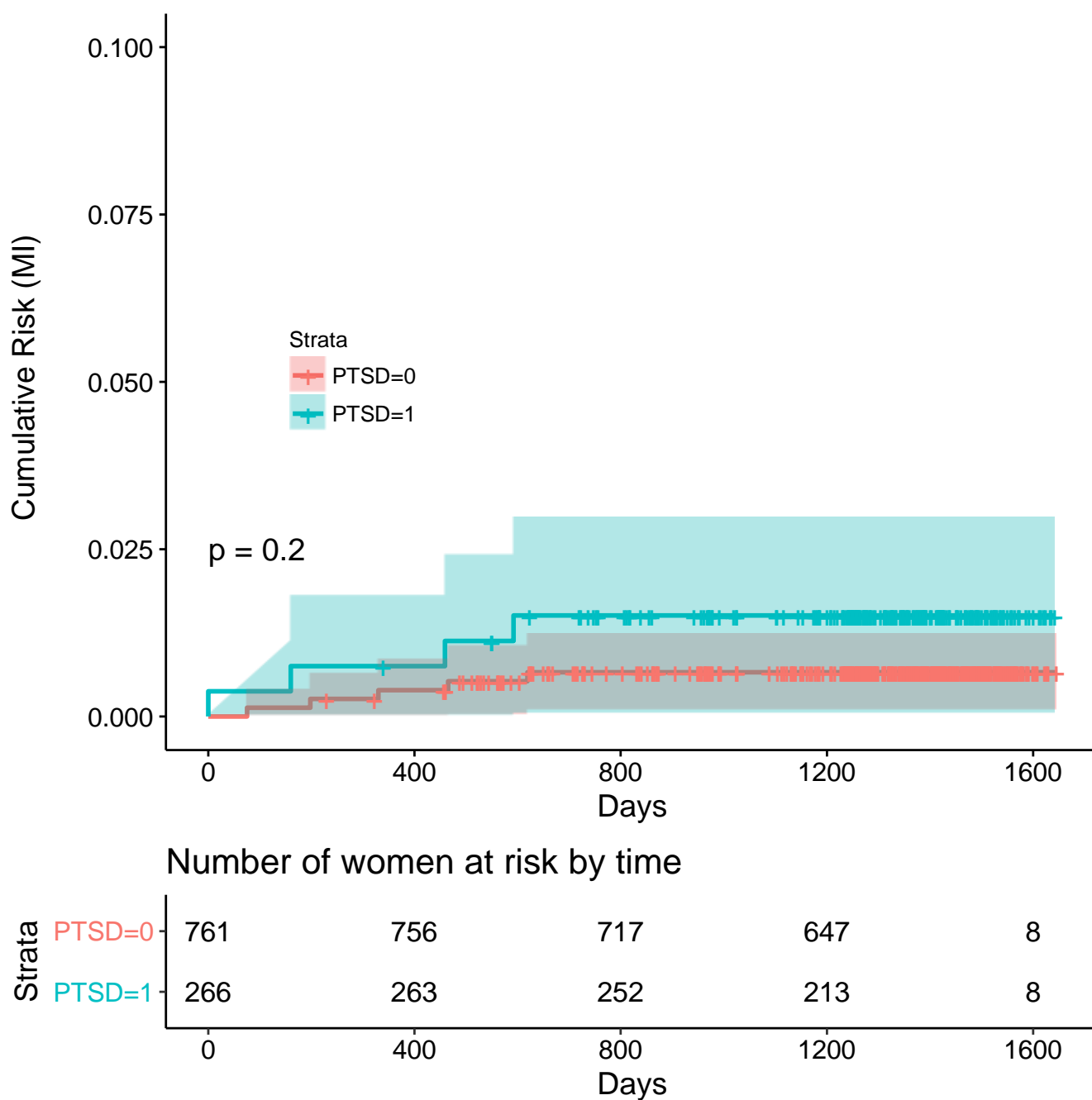


Figure S2: Cumulative risk of incident (including recurrent) stroke by PTSD status in the WTC-Heart cohort men, New York, 2012-2016.



Figure

S3: Cumulative risk of incident (including recurrent) myocardial infarction (MI) by PTSD status in women of the WTC-Heart cohort, New York, 2012-2016.

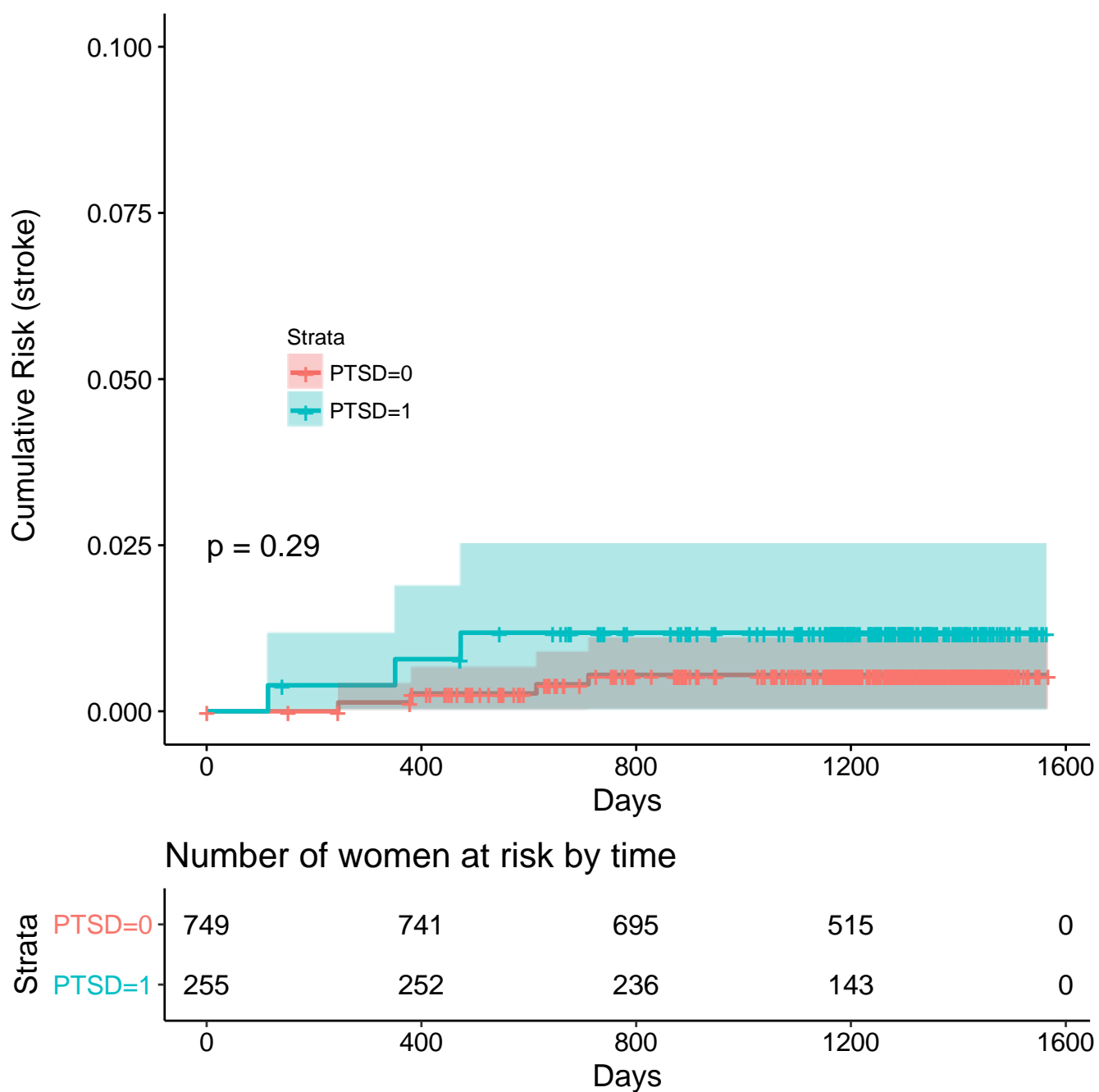


Figure S4: Cumulative risk of incident (including recurrent) stroke by PTSD status in the WTC-Heart cohort women, New York, 2012-2016.