**Table S1.** (**a**) Cumulative Incidence of COVID-19 by Work Assignment. (**b**) Cumulative Incidence of COVID-19 by Exposure Intensity.

| (a) | | | | | | |
|---|---|---|---|---|---|---|
| Work Assignment | Severe COVID-19 | Not Severe COVID-19 | No COVID-19 | Total | Cumulative Incidence Severe | Overall Cumulative Incidence |
| Firefighters | 44 | 949 | 6530 | 7523 | 0.6 | 13.2 |
| EMS | 8 | 80 | 645 | 733 | 1.1 | 12.0 |
| Total | 52 | 1029 | 7175 | 8256 | 0.6 | 13.1 |
| (b) | | | | | | |
| Exposure Intensity Assignment | Severe COVID-19 | Not Severe COVID-19 | No COVID-19 | Total | Cumulative Incidence Severe | Overall Cumulative Incidence |
| Higher Exposure | 32 | 690 | 4364 | 5086 | 0.6 | 14.2 |
| Lower Exposure | 20 | 316 | 2633 | 2969 | 0.6 | 11.3 |
| Total [1] | 52 | 1006 | 6997 | 8055 | 0.6 | 13.1 |

[1] Removed those with unknown exposure history.

**Table S2.** Cox proportional hazards models *. (**a**) Fully adjusted. (**b**) Partially adjusted. (**c**) Fully adjusted with vaccination status.

| (a) | | |
|---|---|---|
| **Characteristic** | **Hazard Ratio** | **95% CI** |
| WTC Exposure | | |
| High (9/11) | 1.14 | 1.00-1.31 |
| Low (≥9/12) | ref | |
| Age, years | 0.97 | 0.96-0.98 |
| Sex | | |
| Male | 1.36 | 0.82-2.26 |
| Female | ref | |
| Race | | |
| White | 1.03 | 0.81-1.32 |
| Non-white | ref | |
| Smoker | | |
| Ever | 0.93 | 0.82-1.06 |
| Never | ref | |
| Work assignment | | |
| Firefighter | 1.07 | 0.82-1.40 |
| EMS | ref | |
| Hypertension | 0.89 | 0.78-1.02 |
| Obesity | 1.05 | 0.92-1.19 |
| OAD | 1.10 | 0.97-1.25 |
| ILD | 1.04 | 0.68-1.58 |
| Diabetes | 0.88 | 0.65-1.18 |
| (b) | | |
| **Characteristic** | **Hazard Ratio** | **95% CI** |
| WTC Exposure | | |
| High (9/11) | 1.15 | 1.00-1.31 |
| Low (≥9/12) | Ref | |
| Age, years | 0.964 | 0.96-0.98 |
| Sex | | |
| Male | 1.32 | 0.80-2.19 |
| Female | ref | |
| Race | | |
| White | 1.05 | 0.83-1.35 |

| | | |
|---|---|---|
| Non-white | ref | |
| Smoker | | |
| Ever | 0.93 | 0.82-1.06 |
| Never | Ref | |
| Work assignment | | |
| Firefighter | 1.07 | 0.82-1.40 |
| EMS | ref | |

| (c) | | |
|---|---|---|
| **Characteristic** | **Hazard Ratio** | **95% CI** |
| WTC Exposure | | |
| High (9/11) | 1.14 | 1.00-1.30 |
| Low (≥9/12) | ref | |
| Age, years | 0.97 | 0.96-0.98 |
| Sex | | |
| Male | 1.34 | 0.80-2.23 |
| Female | ref | |
| Race | | |
| White | 1.04 | 0.81-1.33 |
| Non-white | ref | |
| Smoker | | |
| Ever | 0.93 | 0.82-1.06 |
| Never | ref | |
| Work assignment | | |
| Firefighter | 1.15 | 0.88-1.51 |
| EMS | ref | |
| Hypertension | 0.86 | 0.76-0.99 |
| Obesity | 1.06 | 0.94-1.20 |
| OAD | 1.16 | 1.02-1.32 |
| ILD | 1.35 | 0.89-2.07 |
| Diabetes | 0.90 | 0.66-1.21 |
| Vaccination Status | | |
| Vaccinated | 0.31 | 0.27-0.36 |
| No Vaccine | ref | |

* N = 224 participants with unknown missing exposure or race data were excluded from the models.