Persistence of Multiple Illnesses in September 11 Rescue Workers

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### Background

- >50,000 individuals from diverse background participated in the response to the WTC attack
- Worked in multiple sites
- Exposed to a complex mix of airborne toxins
- Multiple physical and mental health problems have been reported in this population
- Limited data about the long-term trajectory and comorbidity between these conditions

# **Study Objective**

 Asses the incidence of health conditions over the 9 years since the WTC attacks, examine their associations with occupational exposures, and quantify comorbidities within physical and mental health problems

#### **Methods**

- 27,449 rescue workers enrolled in the WTC Screening, Monitoring and Treatment Program
- Enrolled between 2002 and 2010
- Participation in the program is voluntary
- Followed every 12 to 18 months with questionnaires, examination, and spirometry

#### **Outcomes**

- Asthma, sinusitis and GERD were evaluated by self-report of physician diagnosis
- Symptoms of depression (PHQ-9), PTSD (PTSD Symptoms Checklist), and anxiety (PHQ-9) were assessed with validated instruments
- Spirometry results were classified as normal vs. abnormal (obstruction, restriction, or mixed)

#### **Exposure Assessment**

- Based on total time working at WTC, exposure to the dust of cloud, and work in the pile of debris
- Very High: those who worked >90 days, were exposed to the dust cloud, and worked at least some time on the pile
- High: exposed to the dust cloud but either worked <90 days or did not work on the pile
- Intermediate: not exposed to the dust cloud and who either worked between 40 and 90 days or did not work on the pile
- Low: worked <40 days, were not exposed to dust from the collapse, and did not work in the debris pile

### **Statistical Methods**

- Cumulative incidence of conditions
- Used Kaplan-Meier methods to incorporate censoring
- Prevalence of active disease was calculated using data on rescue workers evaluated in 2010
- Used Venn diagrams to assess comorbidities within physical and mental health conditions

## Cumulative Incidence of Asthma in WTC Recovery Workers by Exposure Group



## Cumulative Incidence of Sinusitis in WTC Recovery Workers by Exposure Group



# **Cumulative Incidence of GERD in WTC Recovery Workers by Exposure Group**



## Cumulative Incidence of Depressive Symptoms in WTC NYC Police by Exposure Group



# Cumulative Incidence of Depressive Symptoms in WTC Other Workers by Exposure Group



# Cumulative Incidence of PTSD in NYC Police by Exposure Group



# Cumulative Incidence of PTSD in Other Rescue and Recovery Workers by Exposure Group



# Cumulative Incidence of Panic Disorder in WTC NYC Police by Exposure Group



# Cumulative Incidence of PD in Other Rescue and Recovery Workers by Exposure Group



# Cumulative Incidence of Abnormal Spirometry in WTC Recovery Workers by Exposure Group



# Physical Comorbidities in the WTC Study Population



## Mental Health Comorbidities in the WTC Study Population



### Limitations

- Selection bias
- Lack of control population
- Limited assessment of exposure



 We found substantial burden of persistent physical and mental health conditions among WTC rescue and recovery workers

- Considerable comorbidity
- Strong relationship with exposure

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