

# **Longitudinal Mental health Impact among Police Responders to the 9/11 Terrorist Attack**

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# Study Population Overview

- **Police respondents to 9/11 attack**
  - Registrants at the World Trade Center Health Registry
  - Worked at least 1 shift from 9/11/01 to 6/30/02 at WTC or related sites
- **or**
- **Involved in transportation of debris from WTC site**
- **Excluded:**
  - missing PTSD Checklist (PCL) items at either Wave 1 or Wave 2
  - working exclusively at Staten Island Landfill

# Wave 1 (baseline) study

## Gender Differences in Probable Posttraumatic Stress Disorder Among Police Responders to the 2001 World Trade Center Terrorist Attack

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- 2-3 yrs after 9/11/2001
- Computer-assisted telephone interview (94.5%) or in-person interview (5.5%)
- Total of 4017 police officers (3435 men and 582 women)
- Prevalence of probable PTSD based on DSM-IV criteria and PCL scores
- Overall prevalence of probable PTSD (DSM-IV criteria): 8.3%
- Prevalence of probable PTSD by gender: 13.9% among women police officers, and 7.4% among men.

# Wave 1 study: Risk factors

- **Overall risk factors for probable PTSD:**
  - Sustained an injury at 9/11
  - Older age
- **Risk factors for probable PTSD by gender:**
  - Police women:
    - Having witnessed horrific events
    - Less than a college education
  - Police men:
    - Hispanic race/ethnicity
    - Having been inside the towers or adjacent collapsing buildings
    - Asian or multiple race/ethnicity

# Wave 2 (follow-up) study

- 2-3 yrs after Wave 1 (4-6 yrs after 9/11)
- Web or mail (89.8%) or computer-assisted telephone interview (10.2%)
- Objective:  
To evaluate changes, residual symptoms & risk factors for PTSD among men and women police, 2-3 years after baseline testing

# Method

# Study Variables

- **PTSD Checklist (PCL):**
  - 17 self-report items rated on a 5-point Likert scale (1-5)
  - based on DSM-IV criteria (intrusion, avoidance, hypervigilance)
  - linked to a specific traumatic exposure (i.e., “the events of September 11”)
  - DSM-IV criteria met if :
    - intrusion (1/5 items endorsed as “moderate” or greater)
    - avoidance (3/7 items endorsed as “moderate” or greater)
    - hypervigilance (2/5 items endorsed as “moderate” or greater)
- **Co-morbid mental health diagnoses and utilization of mental health treatment (from interview schedule)**
- **Psychological Distress Index (Kessler-6):**
  - 6-item screen - ratings on a 5-point Likert scale (0-4)
  - used to create a non-specific Psychological Distress Index (PDI)

# Social Support Scales

Item	Friendship Contacts	Group Involvement
How Often Visited Friends	X	
How Often Socialize with Friends	X	
How Often Hosted Friends	X	
How Often Talked with Friends on Telephone	X	
How Often Wrote to Friends	X	
# of Close Friends	X	
How Active in Groups		X
Member of How Many Volunteer Groups		X
How Often Attended Religious Services		X



# Data Analysis

- **Descriptive Analyses:**
  - Paired-samples t-tests, separate for men and women, compared continuous psychological outcome measures between Waves 1 & 2
  - Fisher's Exact test was used to compare rates of meeting DSM criteria for intrusion, avoidance, hypervigilance, and probable PTSD between men and women at Waves 1 & 2
  - McNemar's test compared categorical variables over time
  - Wilcoxon Signed Rank test compared continuous variables over time
- **Random coefficient model:**
- Unstructured covariance matrix
- Change in PCL scores controlling for fixed effects and time point
- Two-way interactions indicate risk factors associated with change in PCL between time points

# Results: Demographics

# Response Rate and Attrition Analysis

- **4,091 original Wave 1 participants**  
**3,049 participated at Wave 2 (75%)**
  - 109 with incomplete data**2,940 final participants**
- **Respondents had significantly fewer:**
  - African-Americans
  - individuals with income less than \$50,000
  - individuals with age below 45
  - individuals with education of 15 years or less
  - unmarried

# Demographics

## Compared to men, at Wave 2 a greater proportion of women:

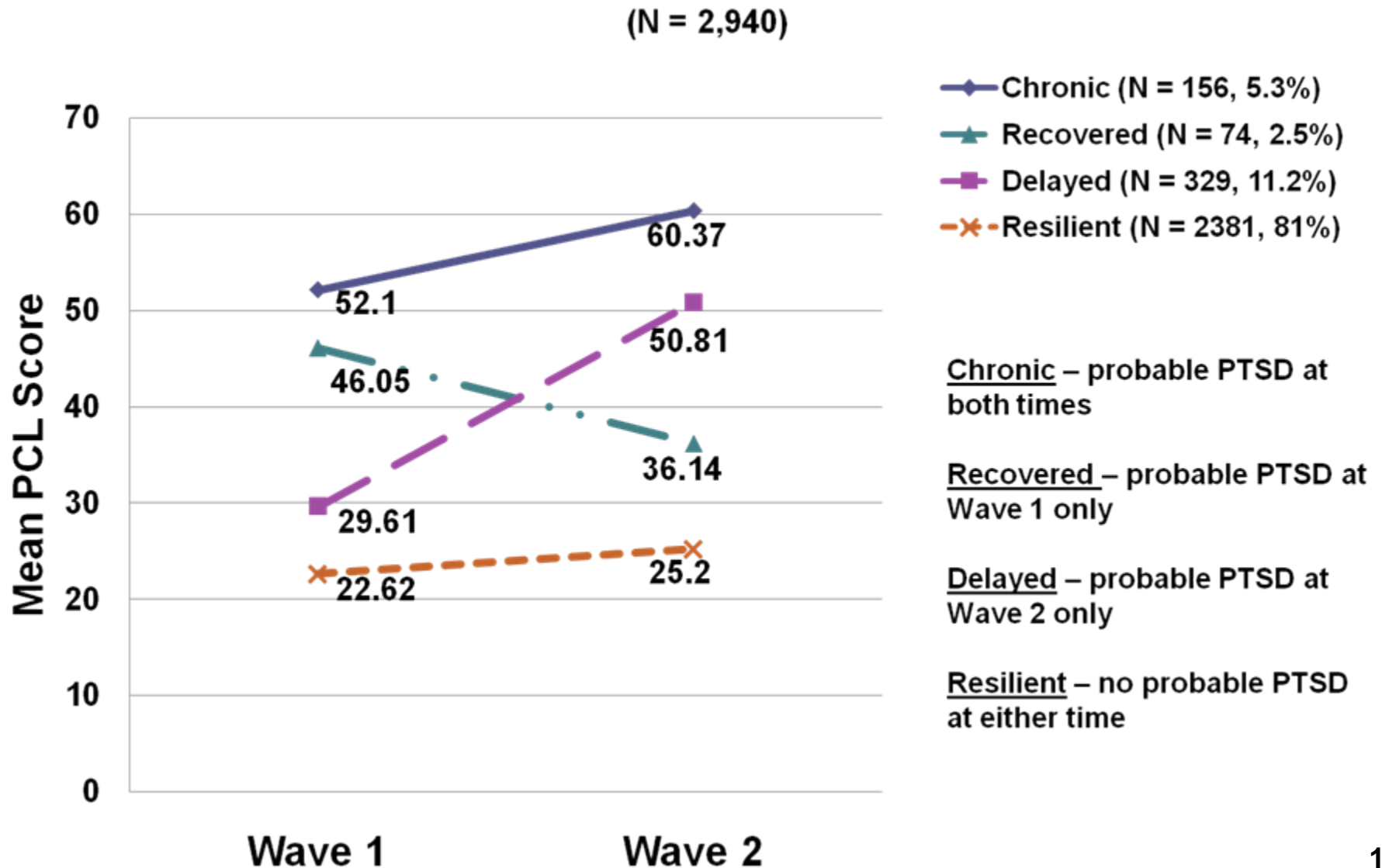
- had at least 18 yrs of education
- self-identified as Hispanic or African-America
- Reported lower household income in 2002
- Were unmarried, separated or divorced
- Had no children
- Smoked every day

## Compared to Wave 1, more registrants at Wave 2:

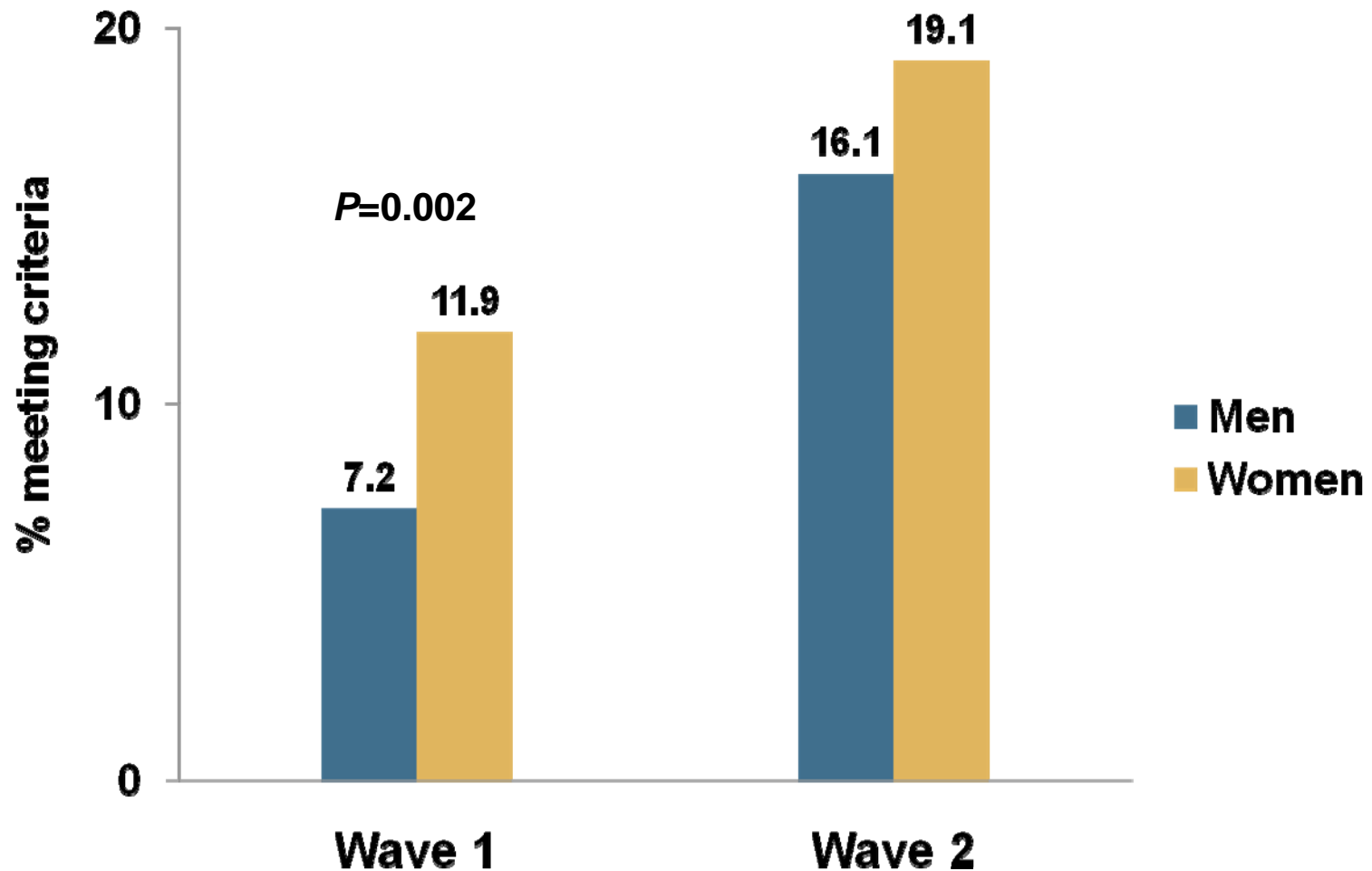
- Were married or divorced
- Were unemployed

# Results

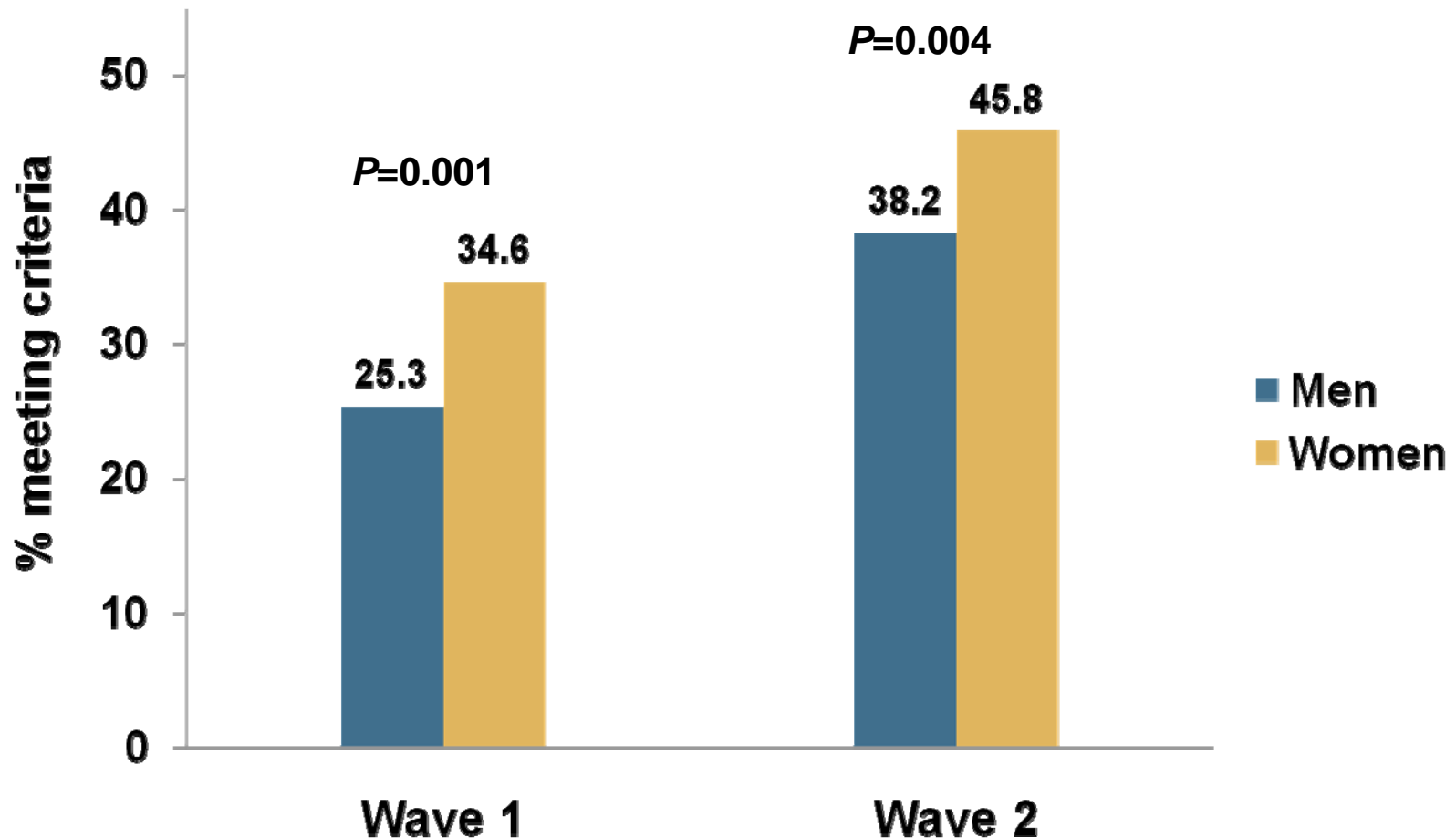
# PCL scores by probable PTSD category



# Percent Meeting Criteria for DSM-IV Diagnosis

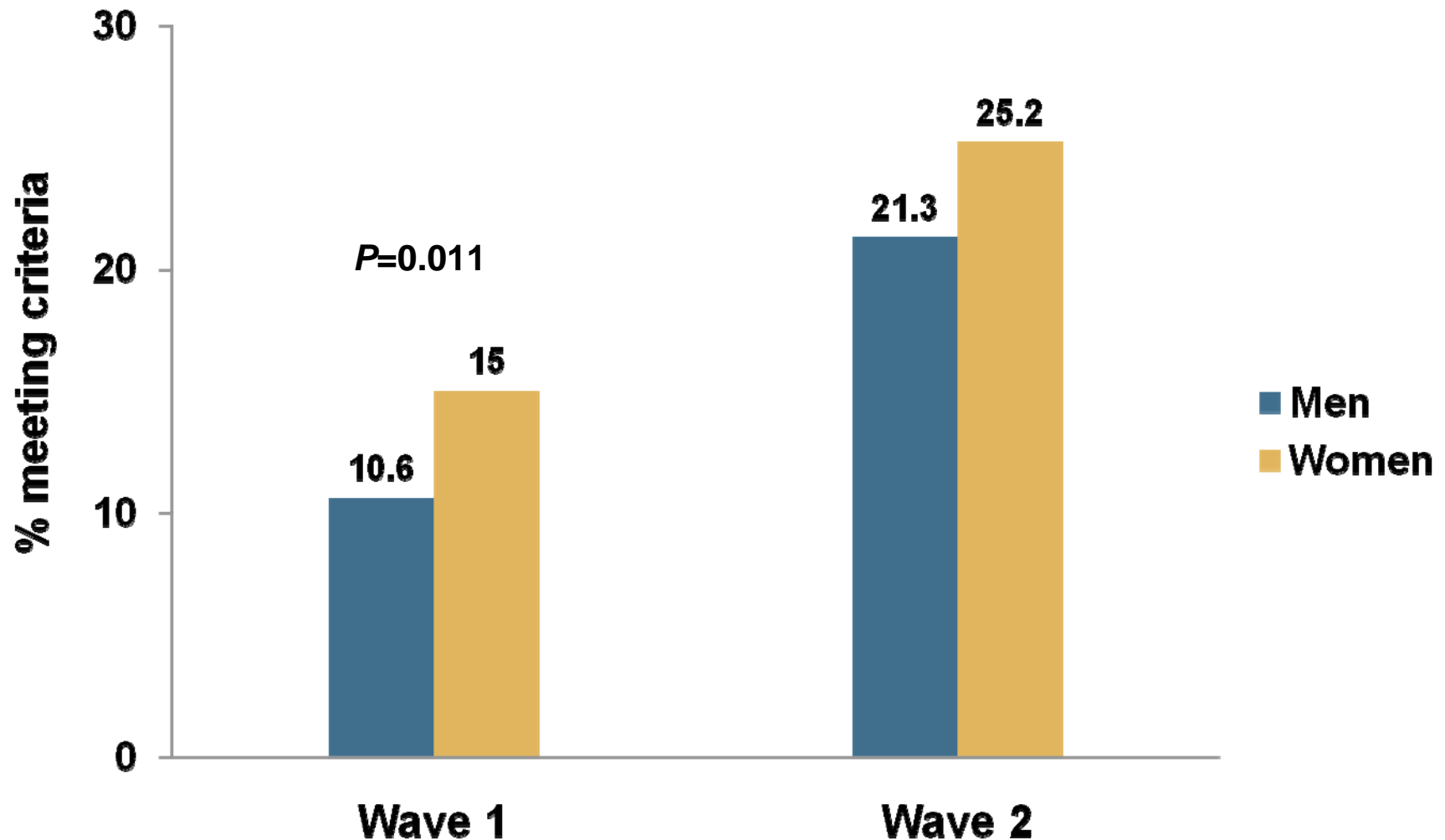


# Percent Meeting DSM-IV Criteria for PCL-Intrusion

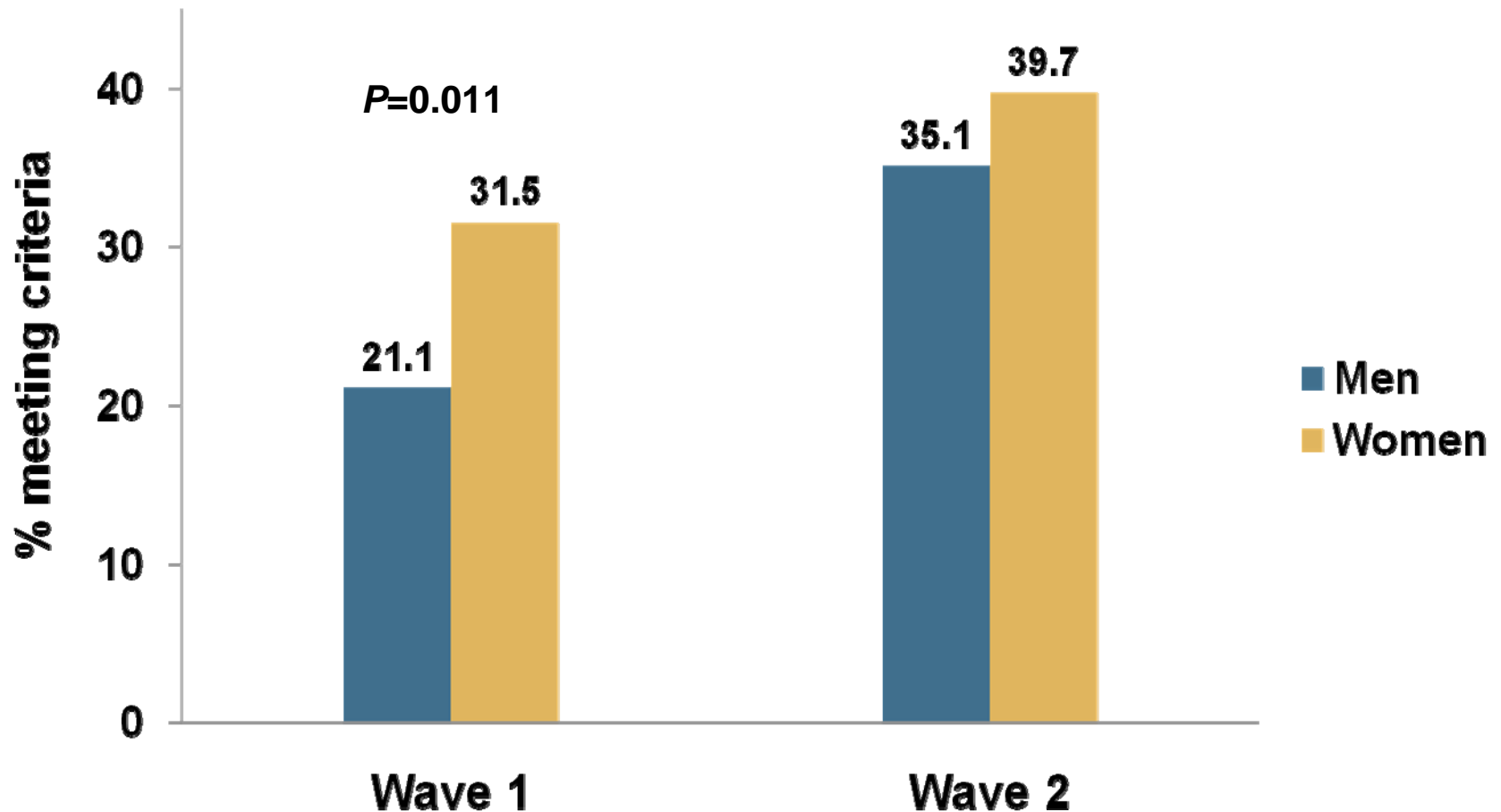




# Percent Meeting DSM-IV Criteria for PCL-Avoidance



# Percent Meeting DSM-IV Criteria for PCL-Hypervigilance



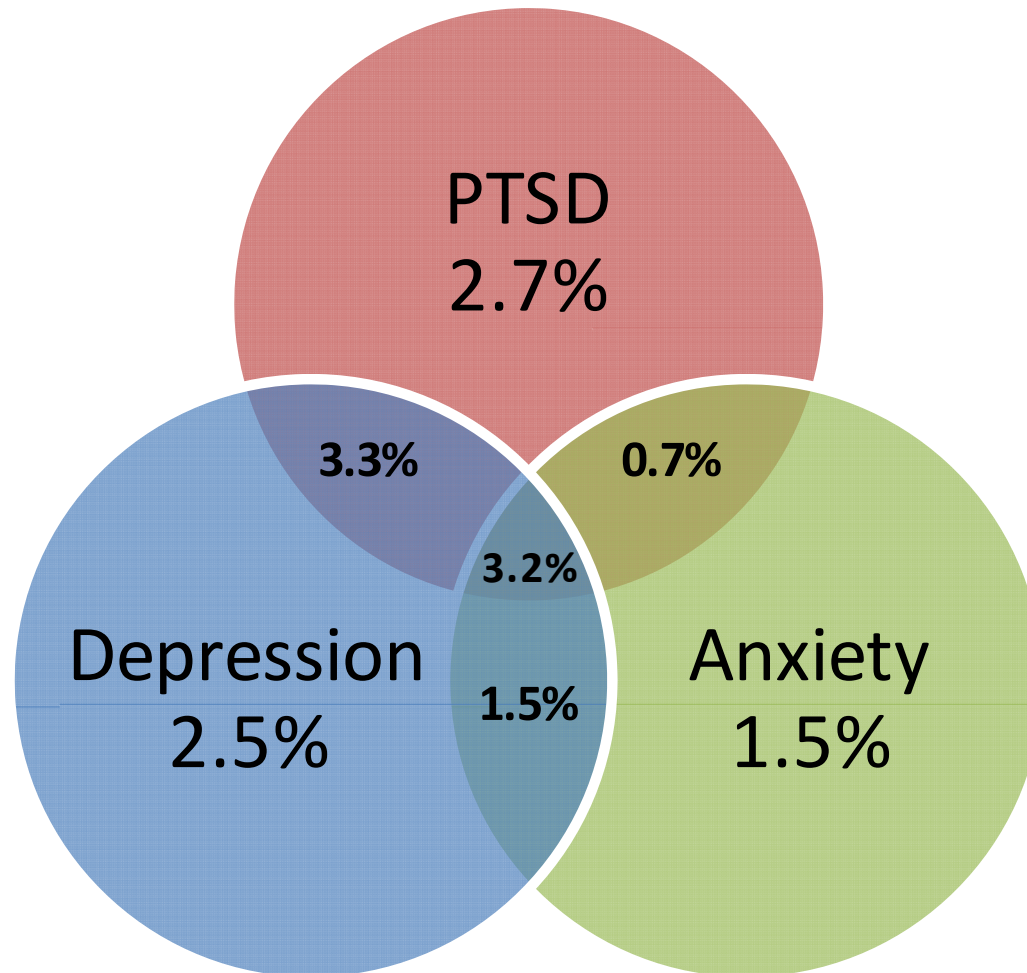
# Gender differences in PCL and PDI

- On all PCL scales, women scored significantly higher than men at both time points, but men consistently showed a larger increase over time than women.
- Women obtained significantly higher PDI scores than men during Wave 1 (Women:  $3.5 \pm 4.0$ ; Men:  $2.3 \pm 3.3$ ,  $P < 0.001$ ) and Wave 2 (Women:  $4.8 \pm 5.0$ ; Men:  $4.1 \pm 4.6$ ,  $P = 0.002$ ), though the gender difference was greater at Wave 1.

# Mental Health

- Anxiety, depression, and PTSD diagnoses were each related to higher PCL scores ( $P < 0.001$ )
- Seeing a mental health professional and taking psychiatric medication were related to higher PCL scores ( $P < 0.001$ )
- PCL scores were higher for those with a more recent mental health diagnosis

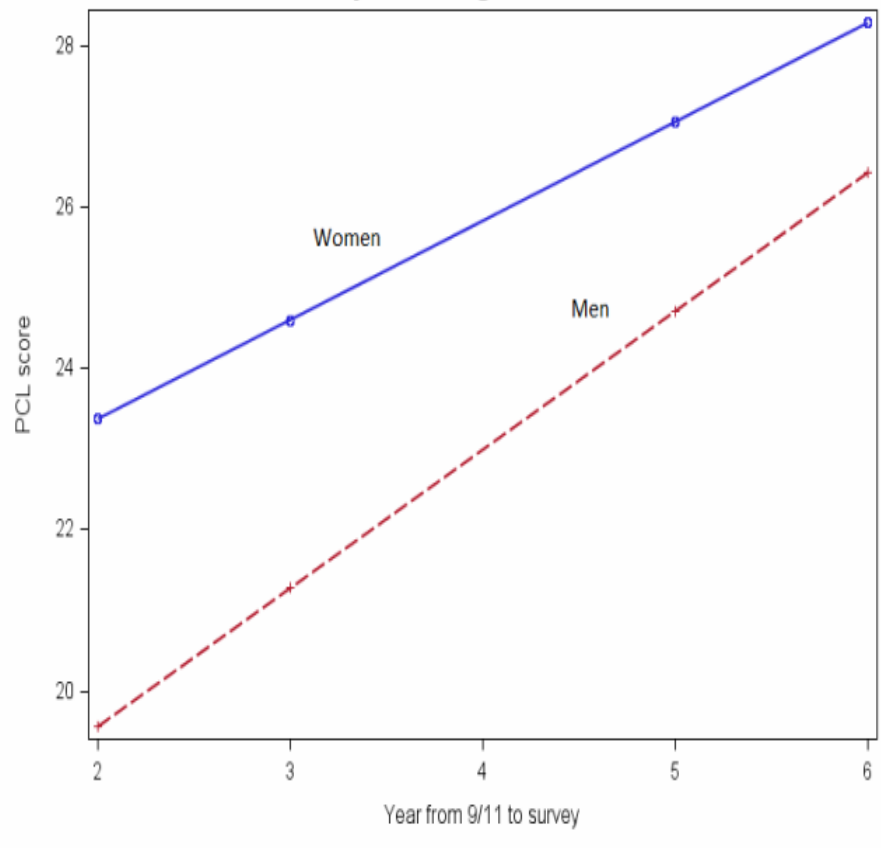
# Physician-diagnosed mental health conditions at Wave 2



# Random Coefficient Model Results

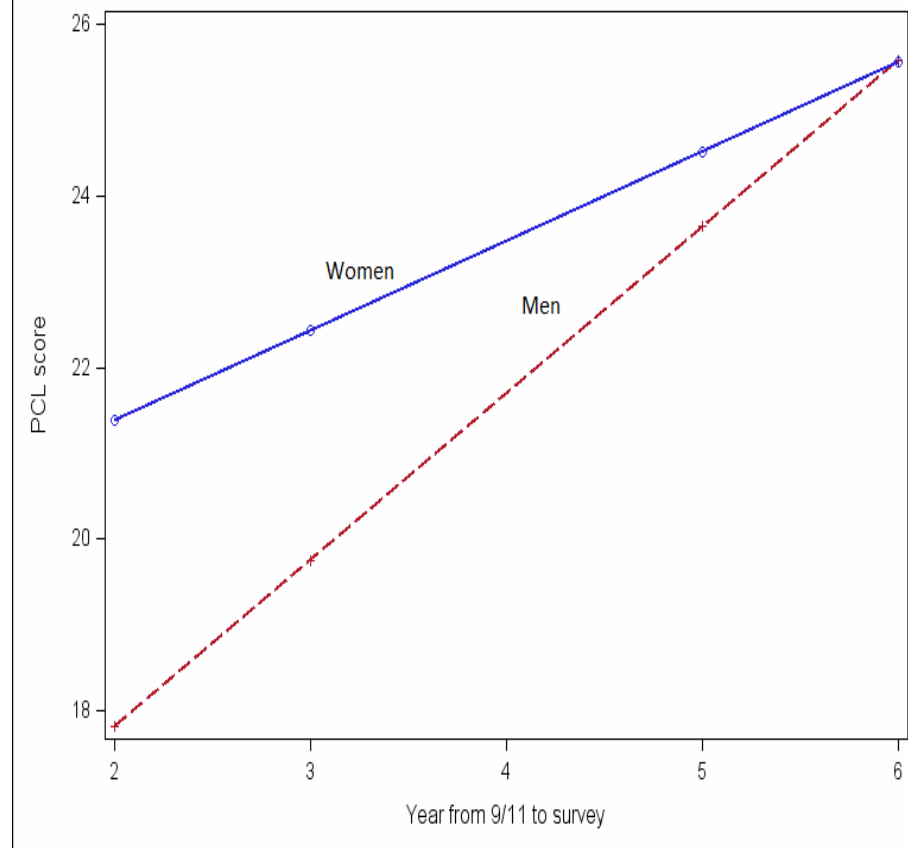
- **Risk factors related to higher PCL scores**
  - female gender
  - older age on 9/11
  - responding to the study by phone
  - witnessing more traumatic events on 9/11
  - being a current smoker
  - having lost one's job after 9/11
  - having lower levels of social integration
- **Related to increase in PCL between Wave 1 and Wave 2**
  - male gender
  - responding to the study by mail or web
  - having lost one's job after 9/11
  - being disabled

**Basic model adjusted for age on 9/11 shown in Table 4**



Basic Model: age, gender, and time point

**Final model shown in Table 4**



Final Model: age, gender, ethnicity, household income, response mode, days of work at the World Trade Center, number of traumatic events witnessed on 9/11, smoking status, losing job on 9/11, being currently disabled, change in marital status, social integration, and time point.

# Summary & Conclusions



# Summary of Findings

- **PTSD symptoms and psychiatric distress over time:**
  - The overall rate of probable PTSD doubled in the current study from 7.8% at Wave 1 to 16.5% at Wave 2
  - Mean scores on PCL and each PCL subscale increased significantly
  - The “resilient” group, without significant PTSD symptoms, is proportionally larger in this study than in residents of NYC who experienced 9/11, as reported by Bonnano et al. [2010]
- **Gender Differences in PCL Scores and DSM-IV Probable PTSD:**
  - Women had higher total PCL scores than men at both time points
  - Men showed a proportionally larger increase of probable PTSD from Wave 1 to Wave 2 than did women
  - The difference between men and women in frequency of probable PTSD was no longer significant at Wave 2

# Summary of Findings (Continued)

- **Mental health diagnoses:**

- Having a diagnosis of PTSD, anxiety disorder, or depression from a mental health professional was related to higher Wave 2 PCL scores for both men and women. PCL scores were higher for those with a more recent diagnoses.

- **Risk factors:**

- Factors related to a greater increase in PCL scores over time were male gender, responding to the study by mail or web, having lost one's job after 9/11, and being disabled.

# Conclusions

- Overall, rates of probable PTSD in police worsened over time
- Unclear whether the climate of the NYPD, the type of work performed after 9/11, or other factors affect the police officers' current probable PTSD rates
- Police employment screening practices likely decrease prevalence rates of adverse mental health effects after 9/11
- Lack of significant improvement after treatment suggests therapeutic policies and programs need to be developed and enhanced
- Police will always be among the first responders to such disasters and improvement of preventative measures is highly desirable

# Future plans & pursuits

- **Longitudinal study of police men and women WTCR registrants in Wave 3 - interviews currently taking place**
- **Evaluating the most efficacious treatments for PTSD in police in the “Chronic” and “Delayed onset” groups**

# Questions?



Thank you!  
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# Physician-diagnosed mental health conditions at Wave 2 by gender

