

Trends in Pre-hospital Delay Time for Acute Myocardial Infarction: ARIC Surveillance Data 1987-1997

Aileen P. McGinn¹
Wayne Rosamond¹
Herman Taylor²

¹University of North Carolina at Chapel Hill

²University of Mississippi Medical Center

Background

- Pre hospital delay is the time from symptom onset to arrival at a hospital
- Current treatments for acute myocardial infarction (AMI) have been shown to reduce morbidity and mortality if administered in a timely manner
- Optimal delay time < 1 hour, maximum delay: 12 hours

Background (2)

- Factors associated with increased pre hospital delay:
 - age, race, gender, lay consultation, medical consultation, self treatment, history of CHD
- Factors associated with decreased pre hospital delay:
 - use of emergency medical services (EMS)
- Efforts to decrease pre-hospital delay have shown increased public awareness but no change in delay times

Objectives

- Document the trends in pre-hospital delay for AMI over an 11 year period in 4 US communities
- Assess factors associated with prolonged delay for AMI
- Evaluate gender or race differences in the trends in pre-hospital delay for AMI

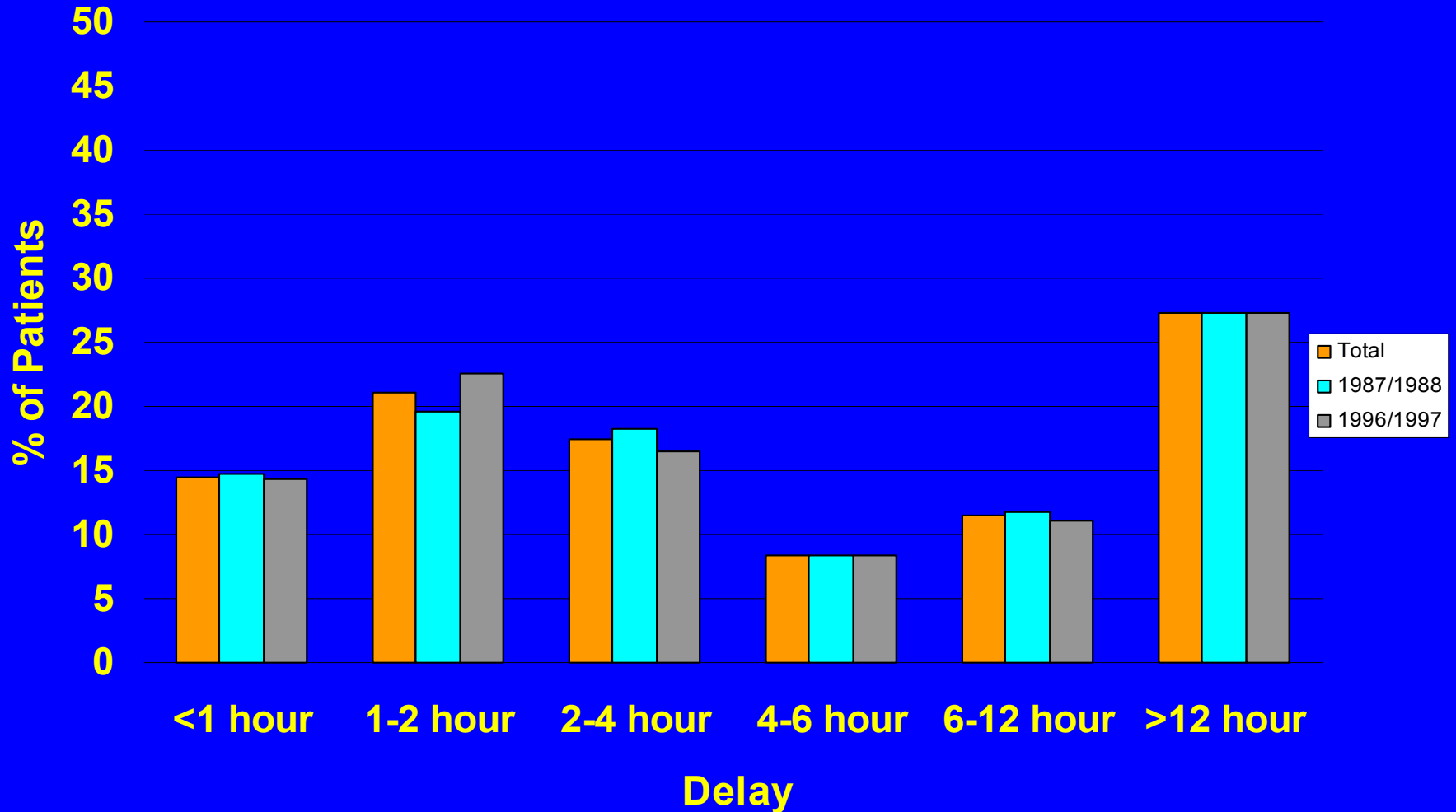
ARIC Surveillance Population

- Community-wide retrospective hospital surveillance from 1987 to 1997
- 4 ARIC communities
 - Jackson, MS (80,088)
 - Forsyth County, NC (127,125)
 - Washington County, MD (57,092)
 - Suburbs of Minneapolis, MN (101,546)

Event Definition

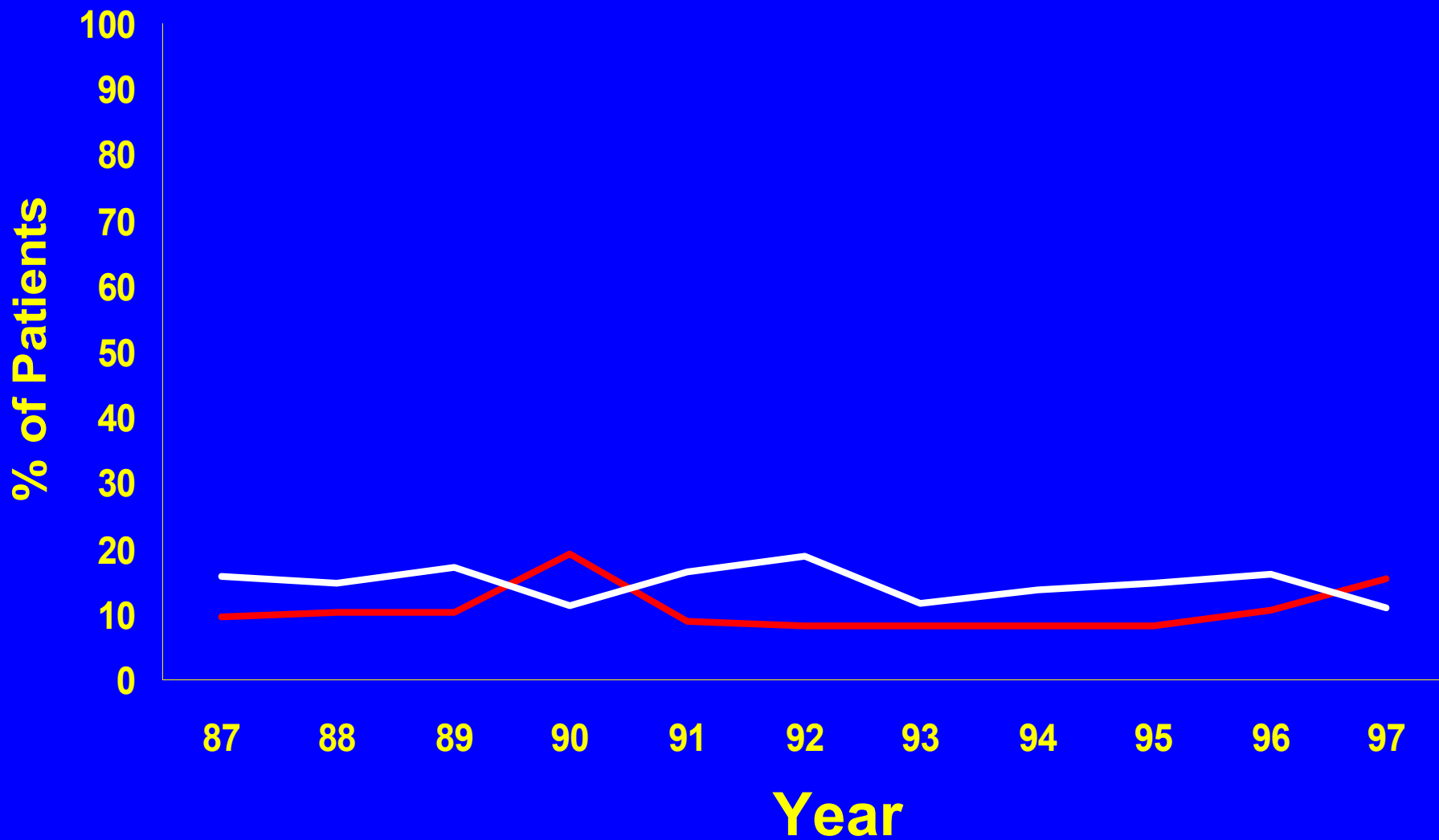
- Validated hospitalized AMI: n=17,513
- Exclusions:
 - Patients transferred from another hospital (n=735)
 - Patients who did not report acute cardiac symptoms beginning prior to arrival at hospital (n=1,540)
 - Persons with missing or unknown delay time (n=141)
 - Non-white and non-black persons (n=91)
- Final sample size: n=15,006

Distribution of, and Temporal Trends in, Duration of Prehospital Delay



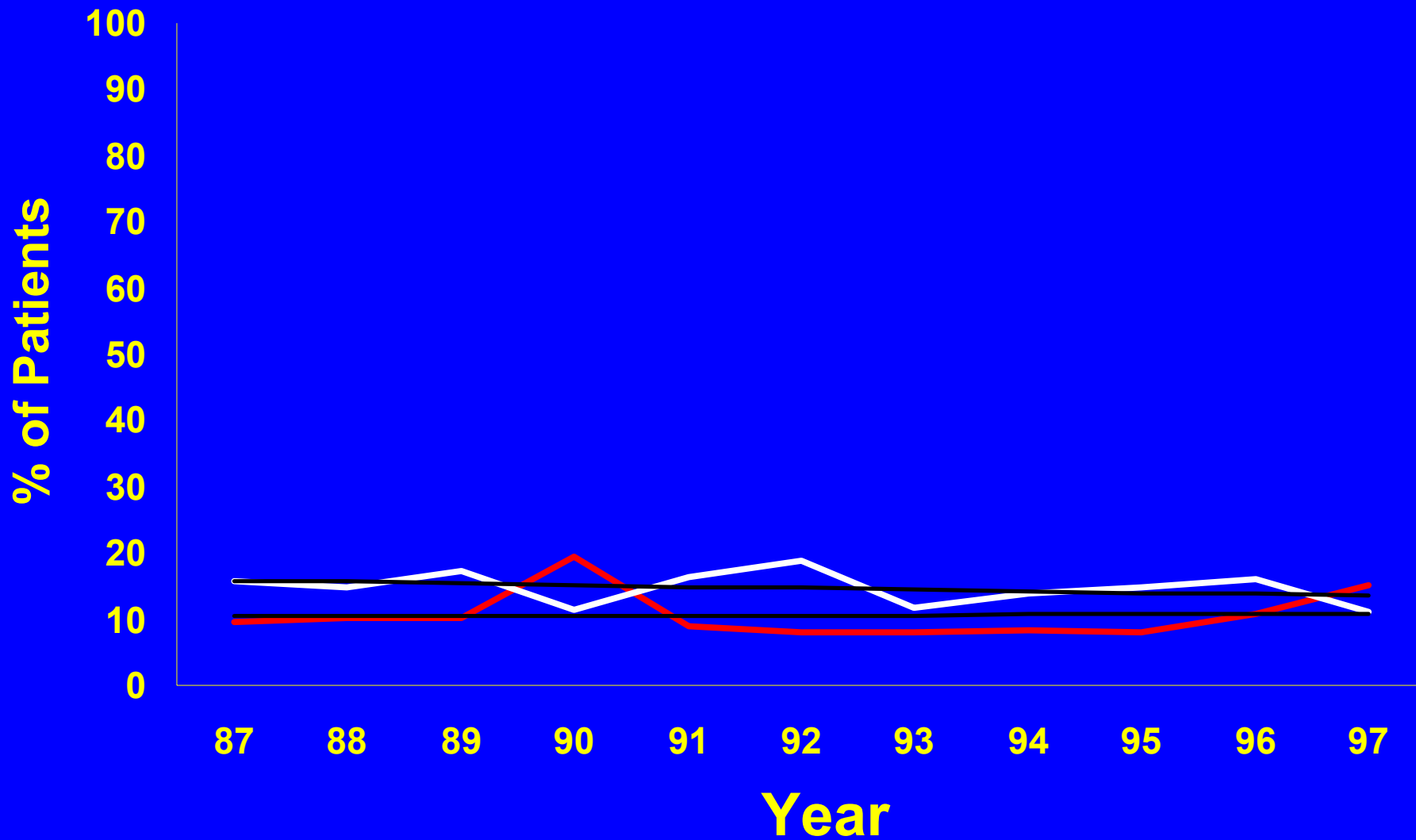
Onset of Symptoms to Hospital Arrival < One Hour by Gender

— Females delaying < one hour — Males delaying < one hour



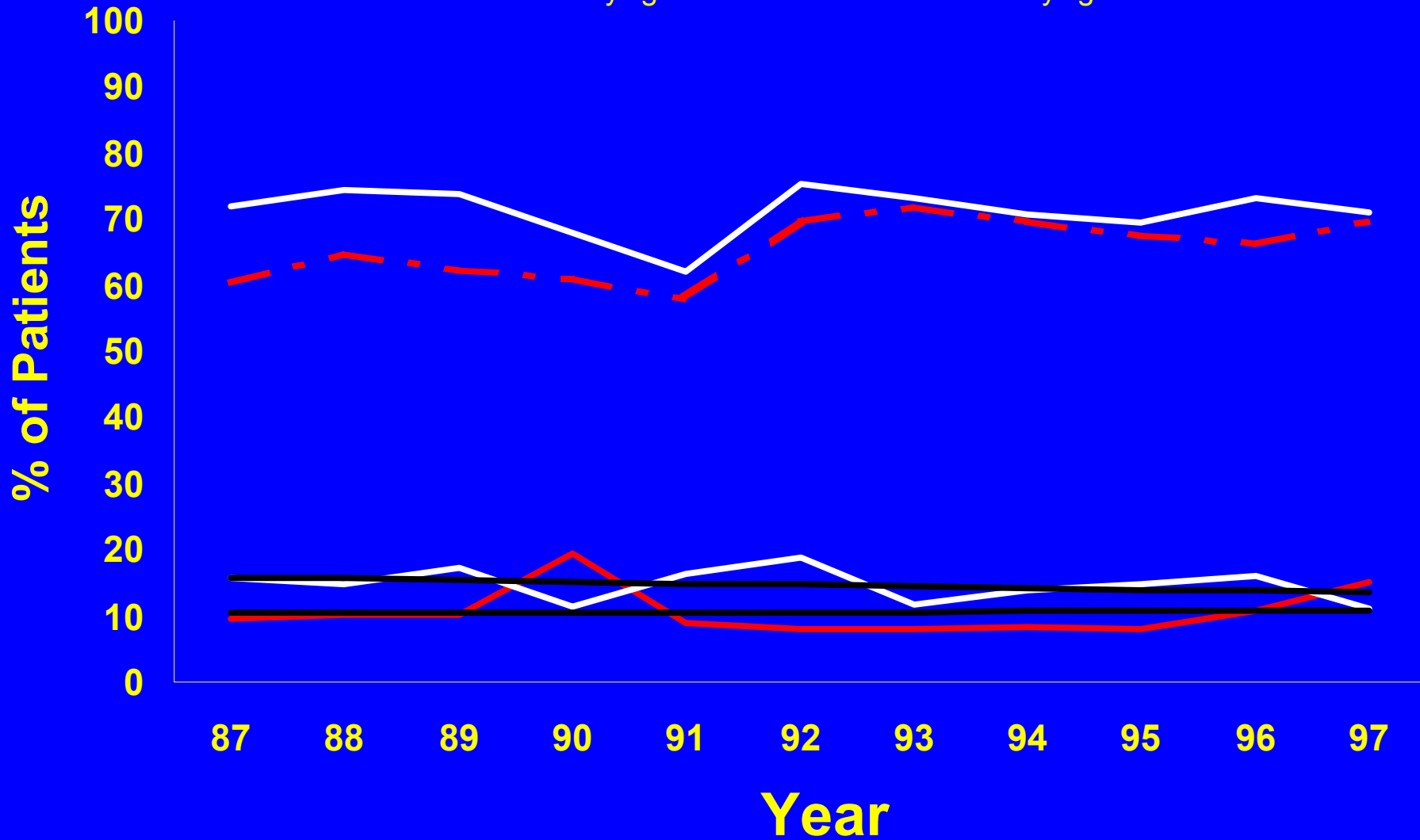
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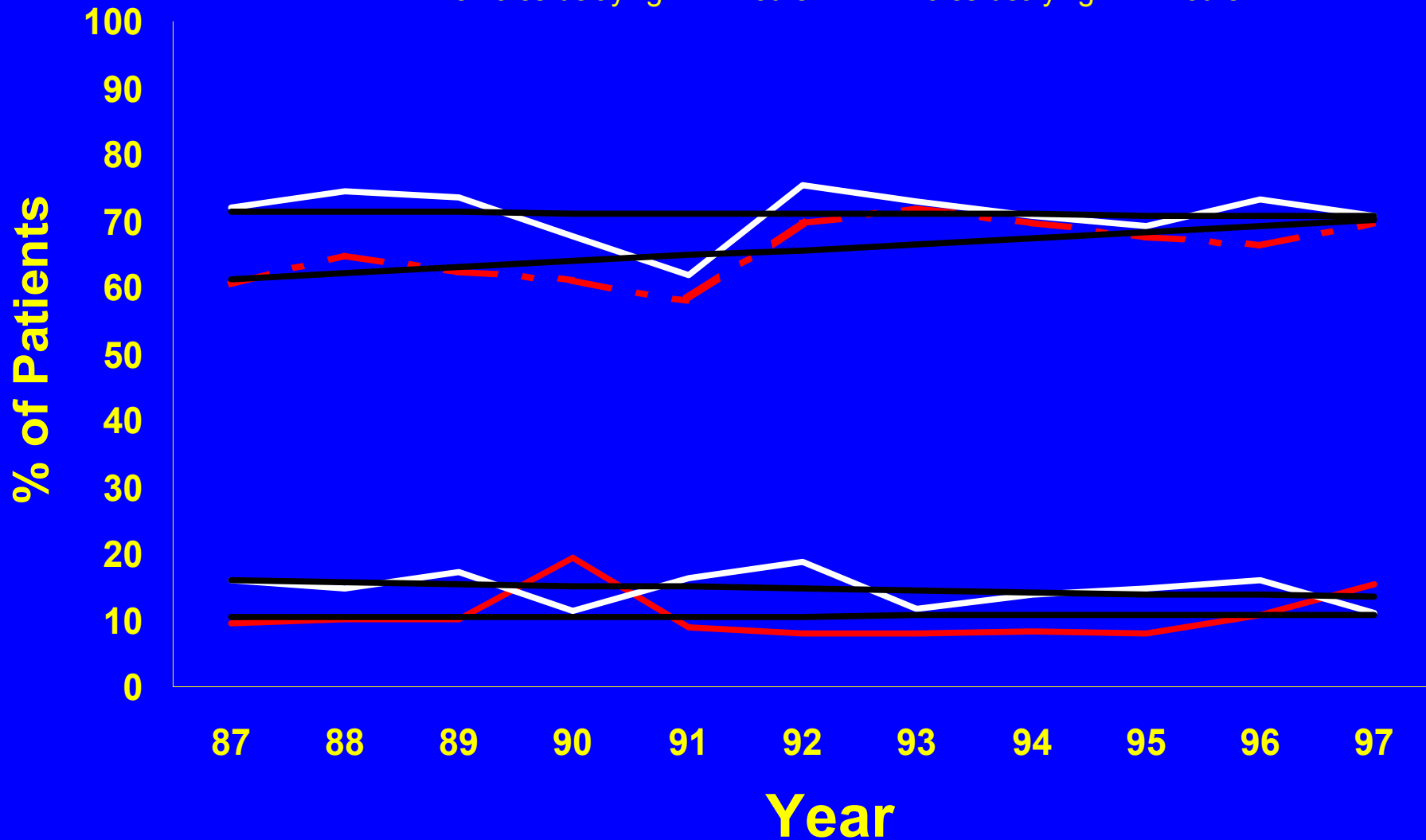
Onset of Symptoms to Hospital Arrival < One Hour and < 12 Hours by Gender

— Females delaying < one hour — Males delaying < one hour
- - Females delaying < 12 hours - - Males dealying < 12 hours



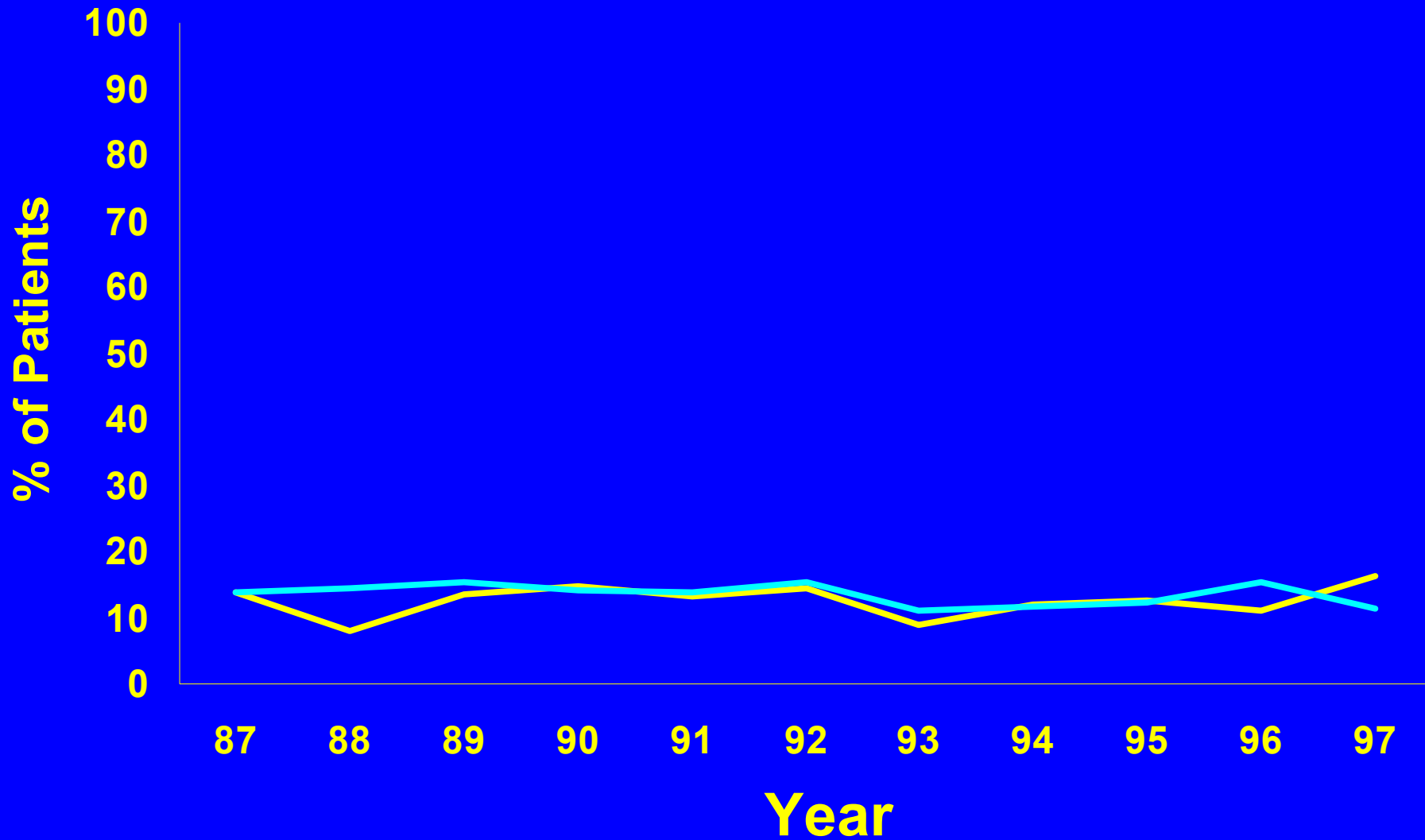
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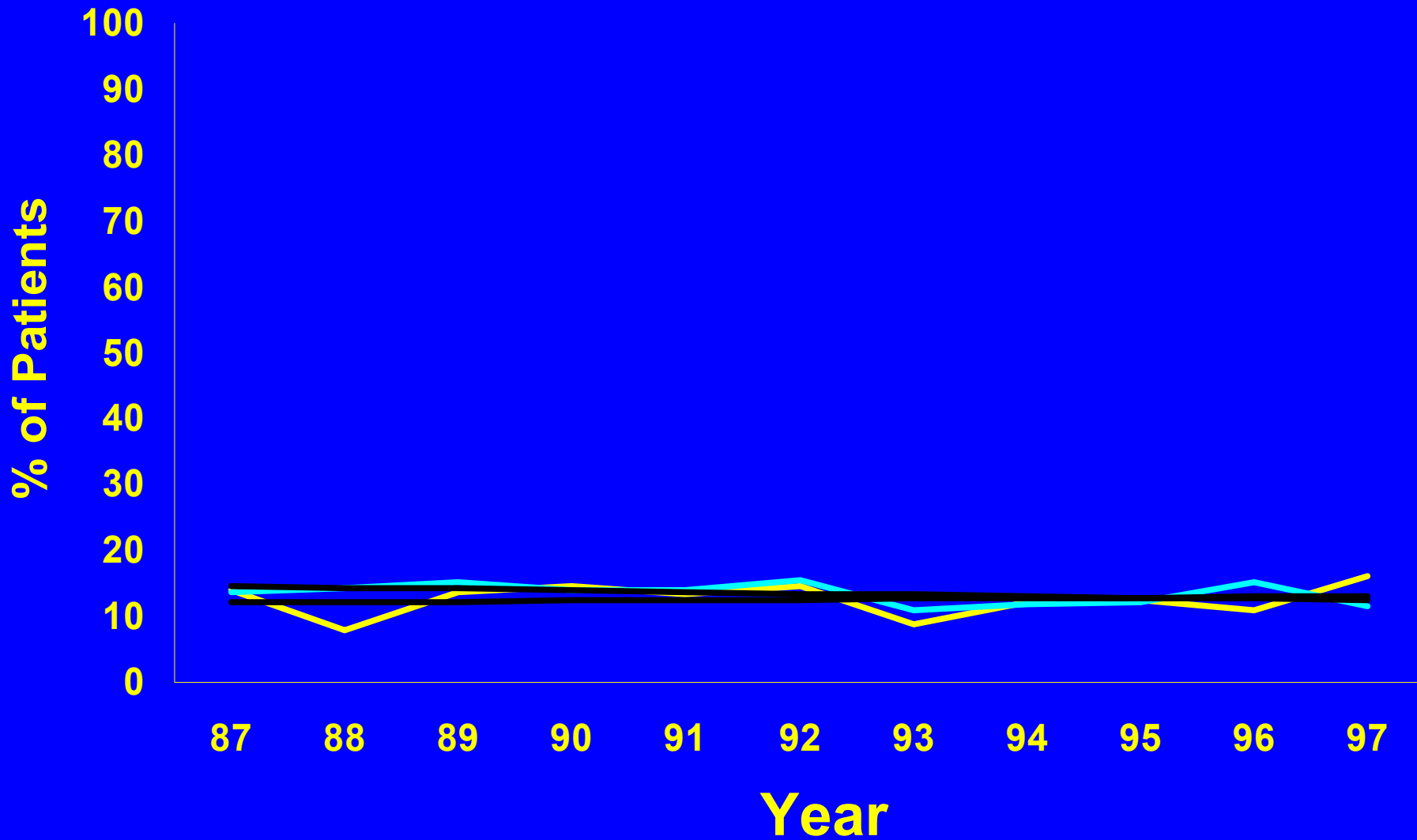
Onset of Symptoms to Hospital Arrival < One Hour by Race

— Blacks delaying < one hour — Whites delaying < one hour



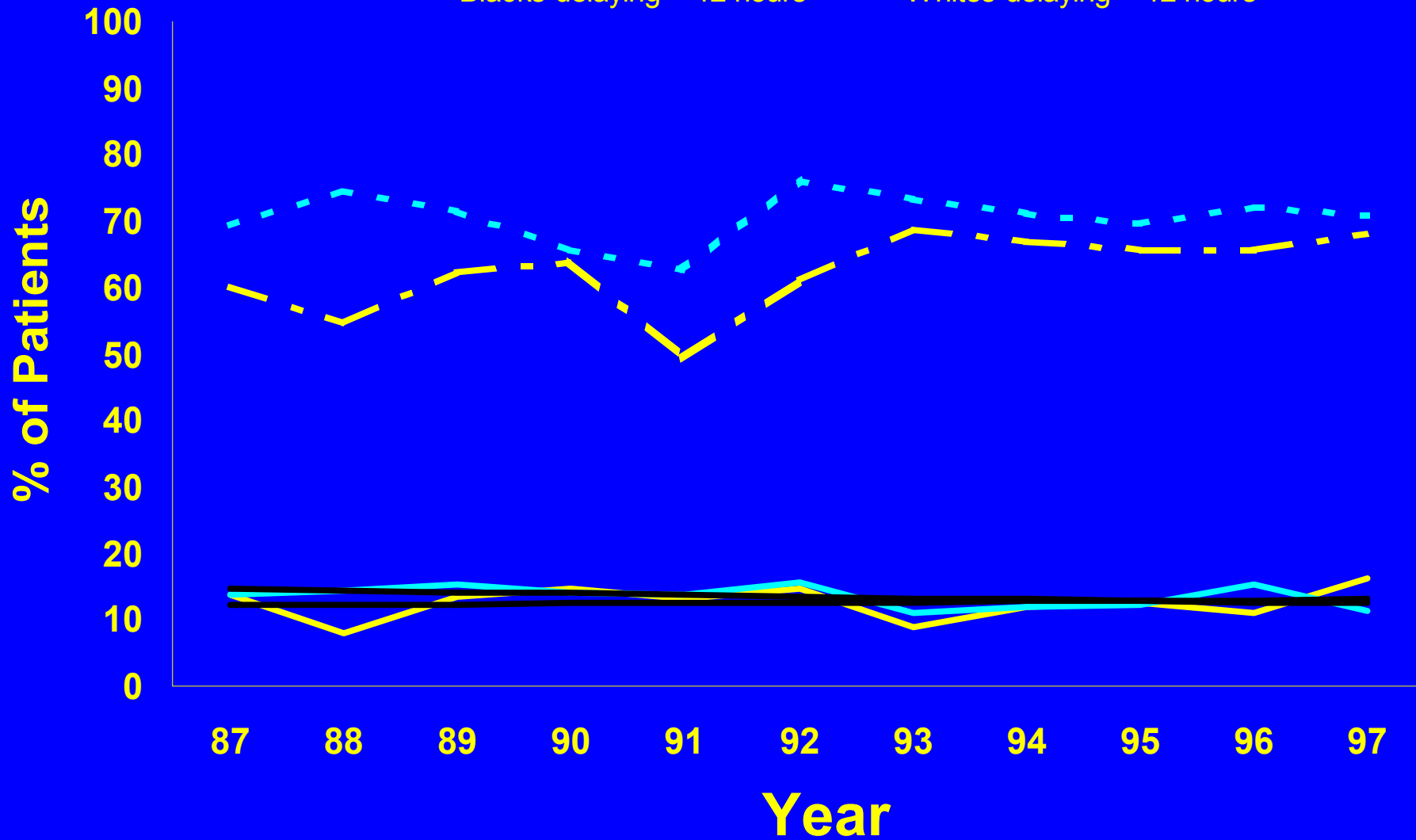
Onset of Symptoms to Hospital Arrival < One Hour by Race

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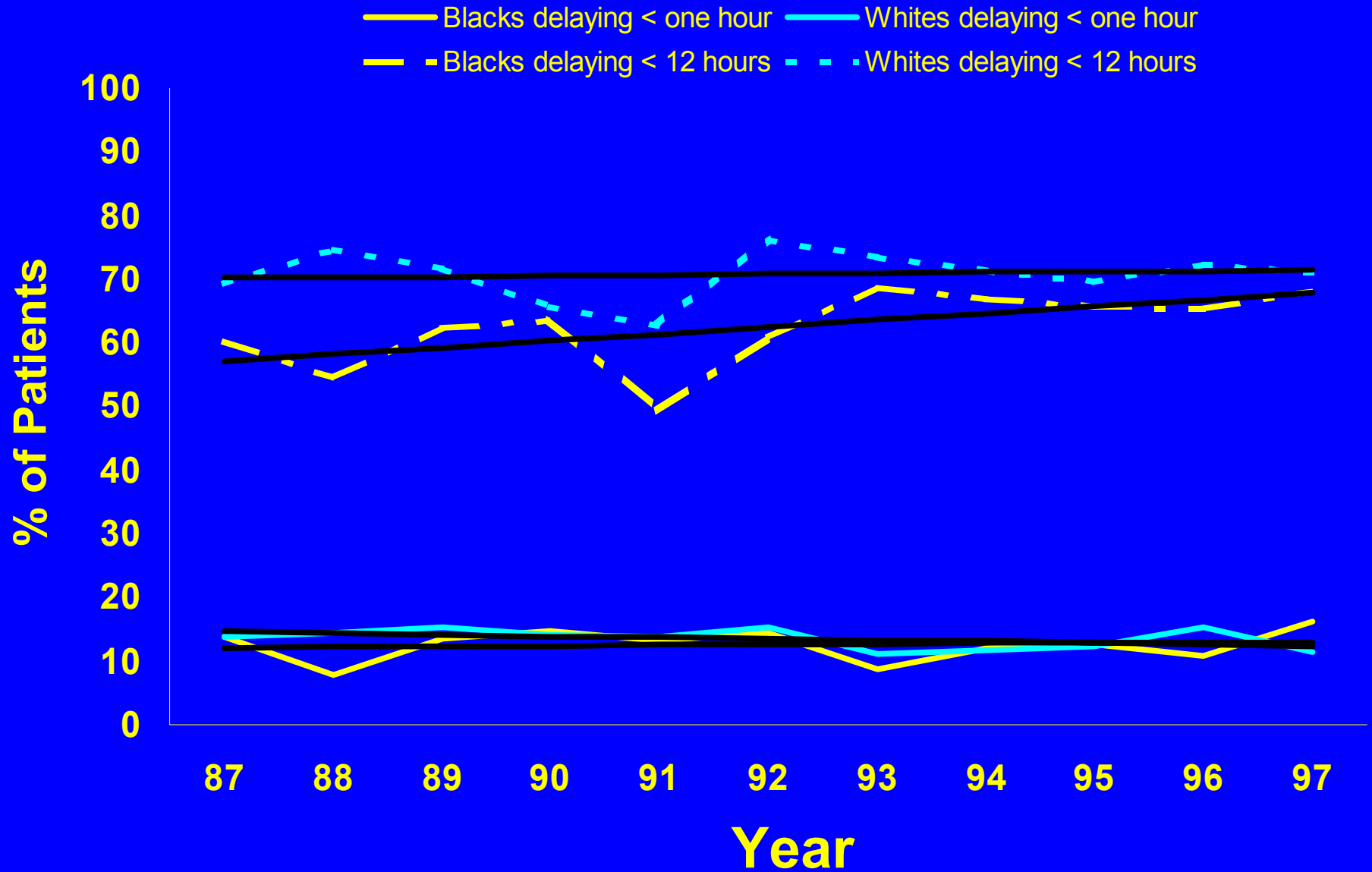


Onset of Symptoms to Hospital Arrival < One Hour and < 12 Hours by Race

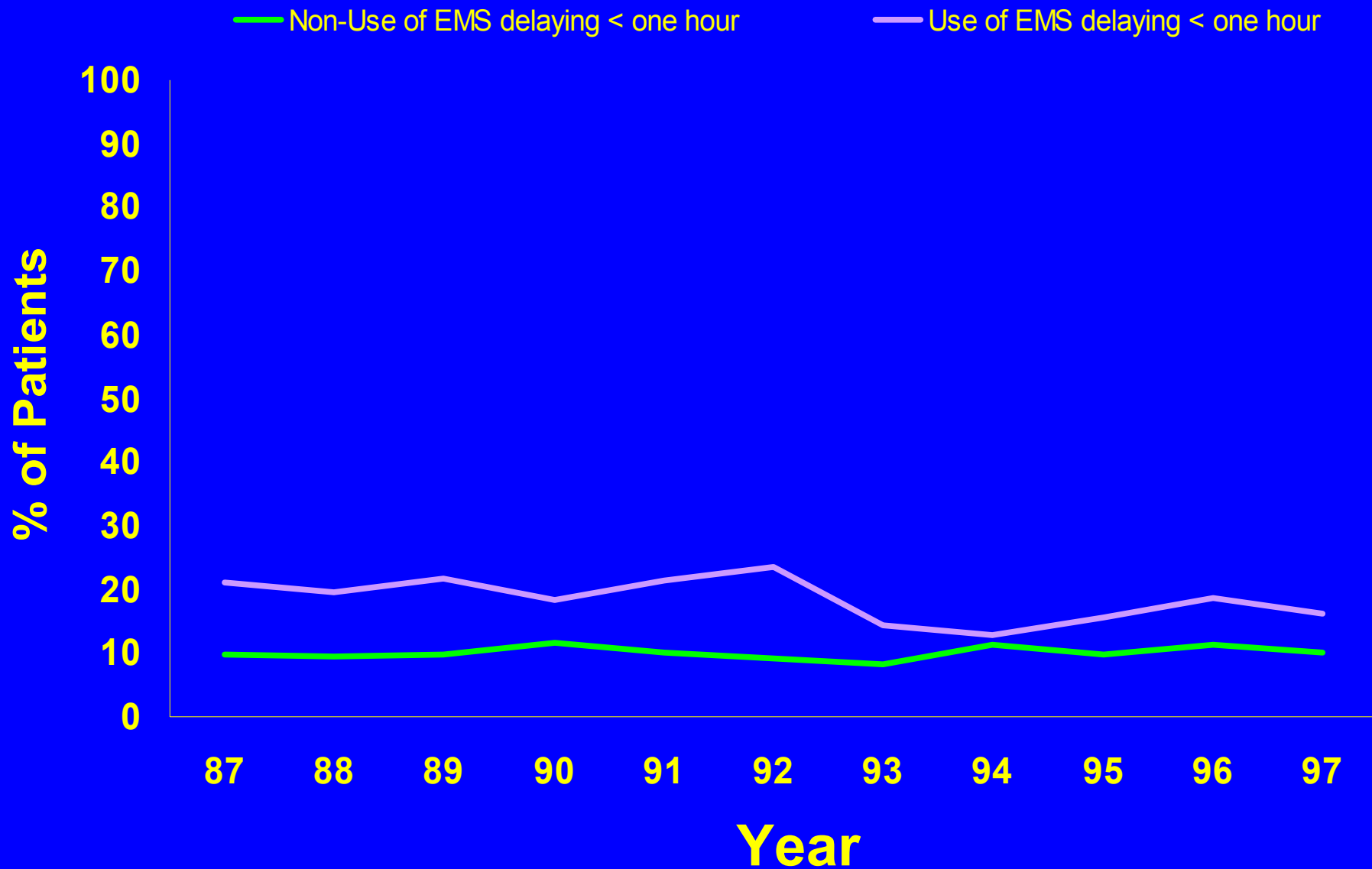
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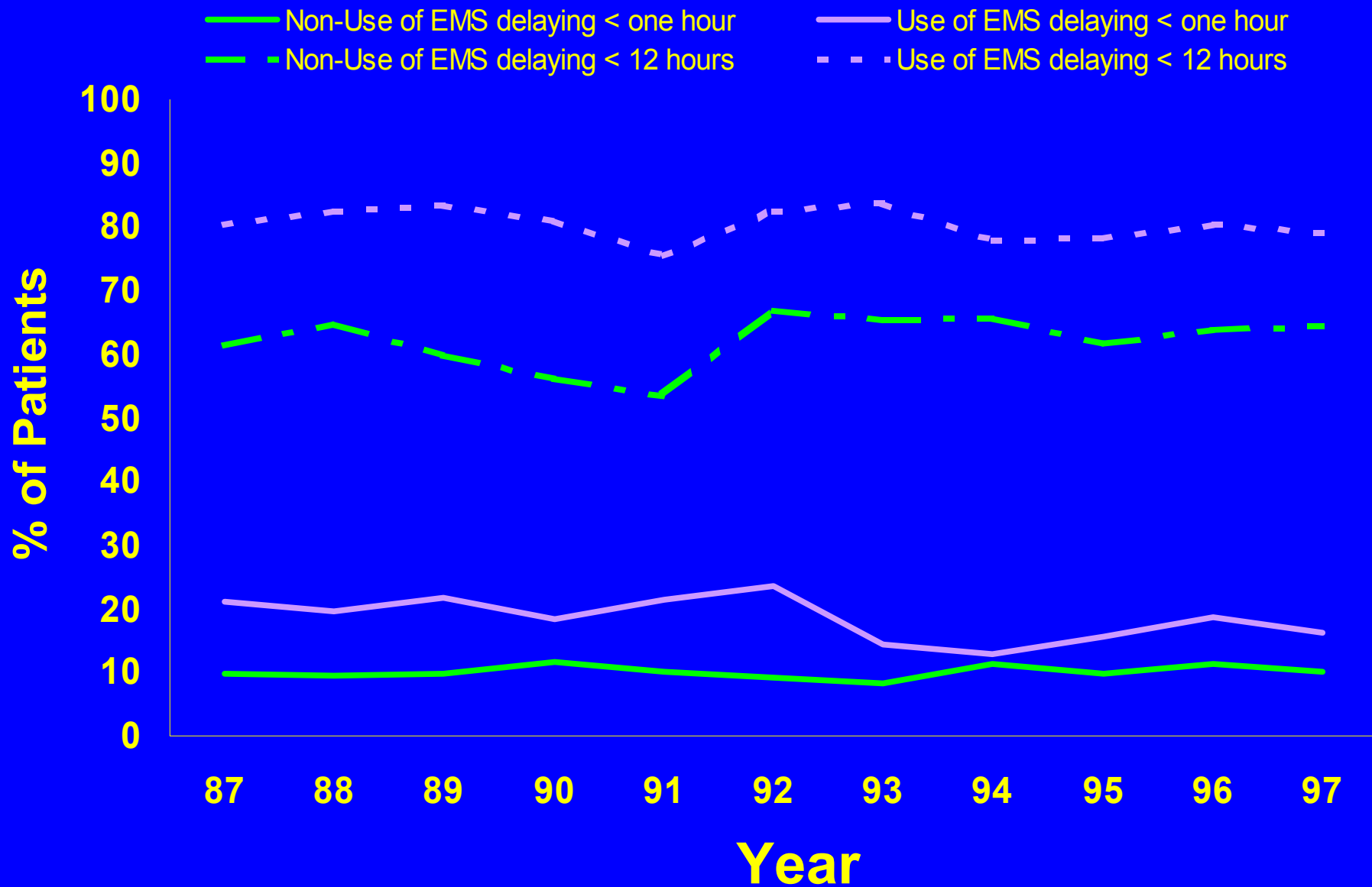
Onset of Symptoms to Hospital Arrival < One Hour and < 12 Hours by Race



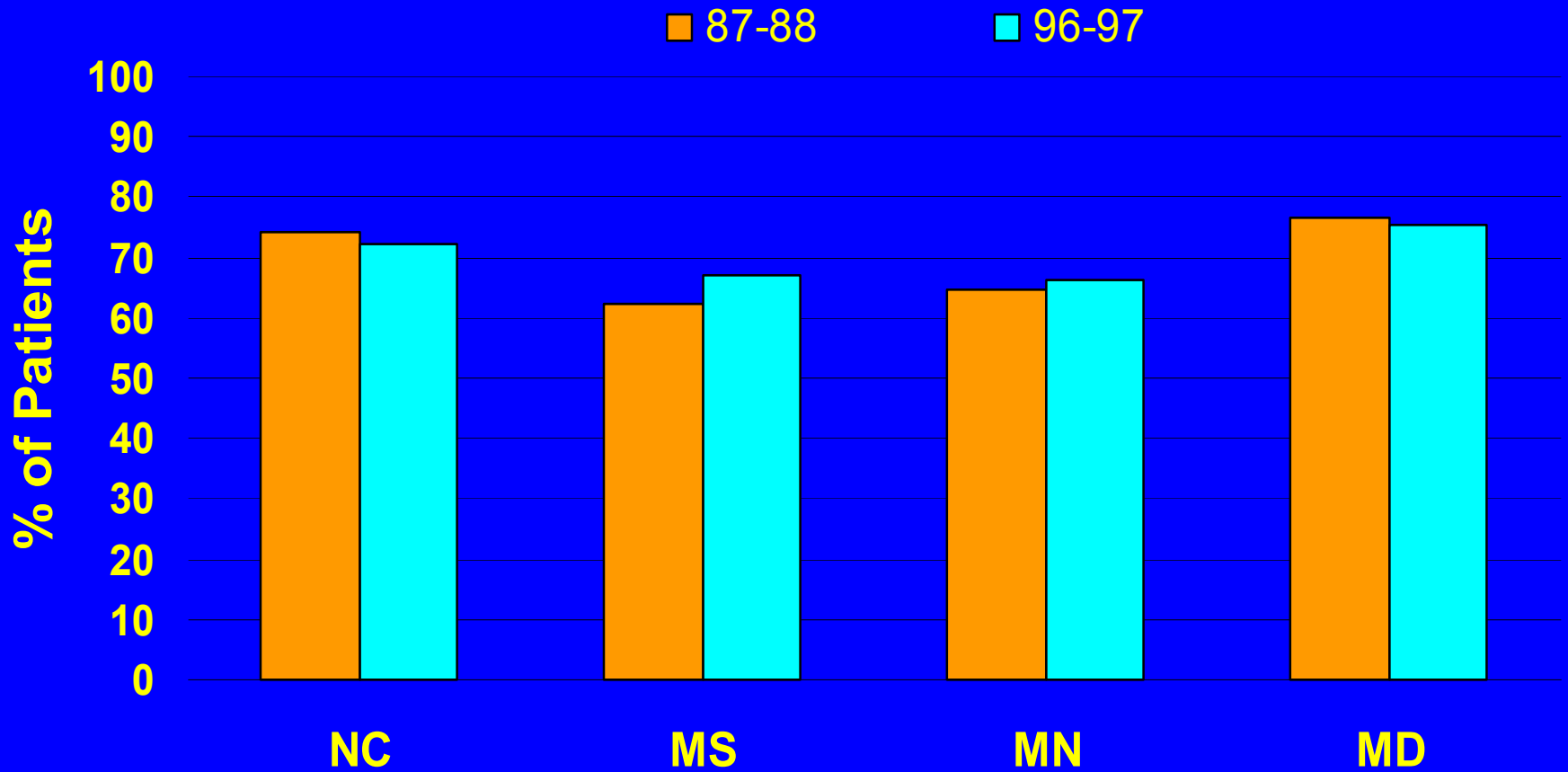
Onset of Symptoms to Hospital Arrival < One Hour by EMS Use



Onset of Symptoms to Hospital Arrival < One Hour and < 12 Hours by EMS Use



Onset of Symptoms to Hospital Arrival < 12 Hours by ARIC Community



Adjusted Odds Ratios for Pre-hospital Delay \geq One Hour

Characteristic	Adjusted OR	95% CI
Age \geq 65 years	1.35	1.23-1.51
Female	1.39	1.24-1.55
Blacks	1.09	0.96-1.27
Study Year: 1997 vs. 1987	1.09	0.90-1.41
Weekend	0.86	0.77-0.96
Utilized EMS services	0.45	0.41-0.50
History of:		
Angina or Coronary Insuff	1.29	1.14-1.47
Hypertension	1.17	1.06-1.30
Stroke	0.98	0.82-1.17
AMI/Revascularization	1.21	0.73-0.93
Diabetes	1.28	1.14-1.45

* Adjusted for Discharge status and ARIC center and other variables in the table

Adjusted Odds Ratios for Pre-hospital Delay \geq 12 Hours

Characteristic	Adjusted OR	95% CI
Age \geq 65 years	1.07	1.00-1.16
Female	1.22	1.16-1.35
Blacks	1.46	1.34-1.64
Study Year: 1997 vs. 1987	0.89	0.76-1.06
Weekend	0.71	0.65-0.77
Utilized EMS services	0.36	0.33-0.39
History of:		
Angina or Coronary Insuff	0.98	0.90-1.09
Hypertension	1.13	1.07-1.25
Stroke	1.20	1.09-1.41
AMI/Revascularization	0.92	0.81-0.97
Diabetes	1.19	1.10-1.30

* Adjusted for Discharge status and ARIC center and other variables in the table

Other Case Definitions

- Occurrence of cardiac symptoms regardless of diagnosis
- Discharge diagnosis of 410 - 414

Limitations

- Validity of delay time obtained retrospectively from medical records
- Socioeconomic factors may not have been adequately controlled for

Summary

- Overall, little or no improvement in pre-hospital delay time
- Longer delay times for females vs. males
- Longer delay times for blacks vs. whites
- EMS use consistently associated with shorter delay times

Implications and Further Research

- The environment in our study sites has not resulted in significant declines in pre-hospital delay
- Current interventions may be too recent to show an effect in our data
- Changes in the diagnostic sensitivity of AMI may have resulted in the identification of less severe AMI's
- Innovative ideas are still needed to help improve behavior that will lead to a decrease in delay time