

Trends in Rates and Methods of Suicide

United States, 1985-2004

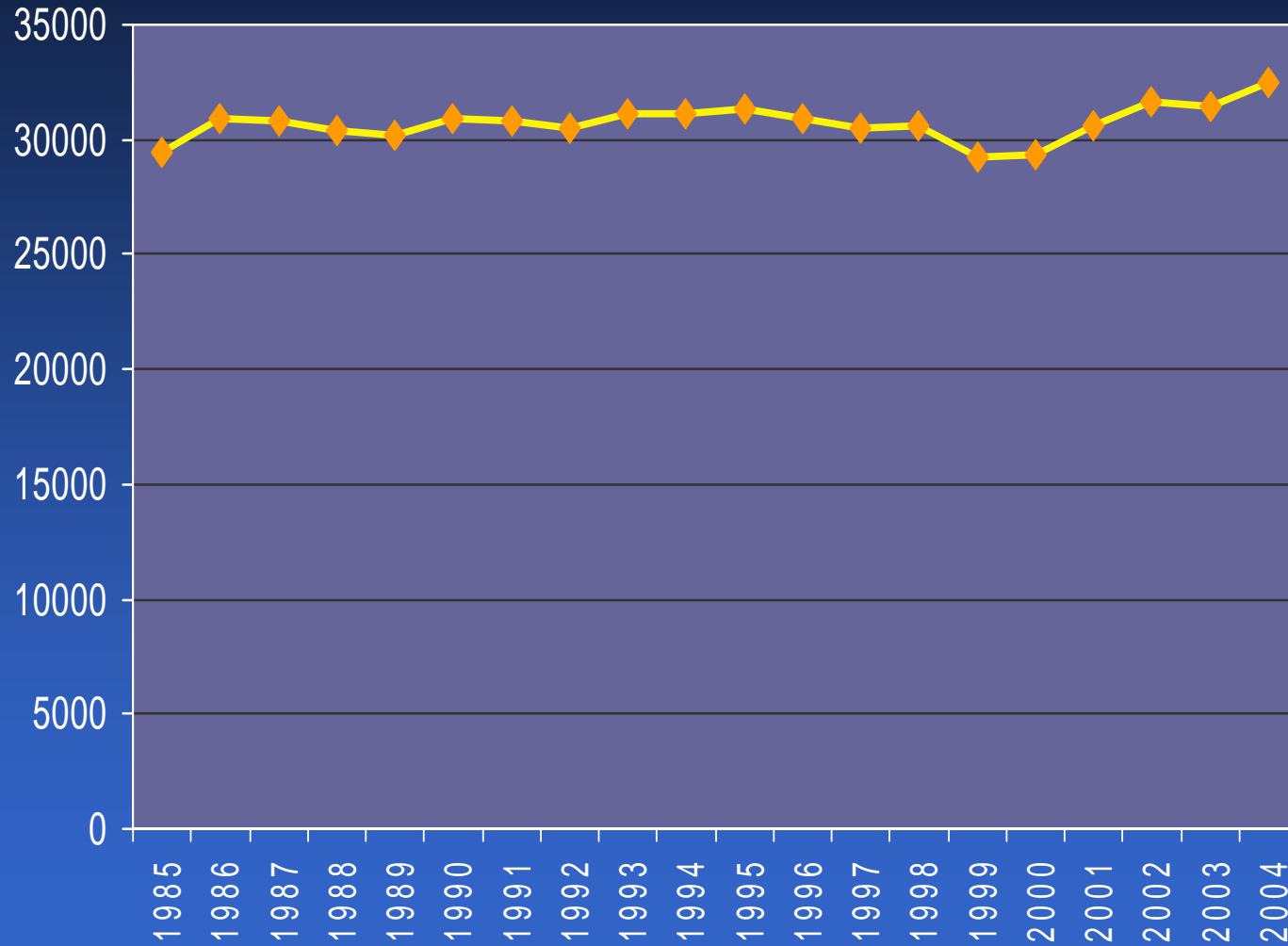
Catherine Barber

Harvard Injury Control Research Center

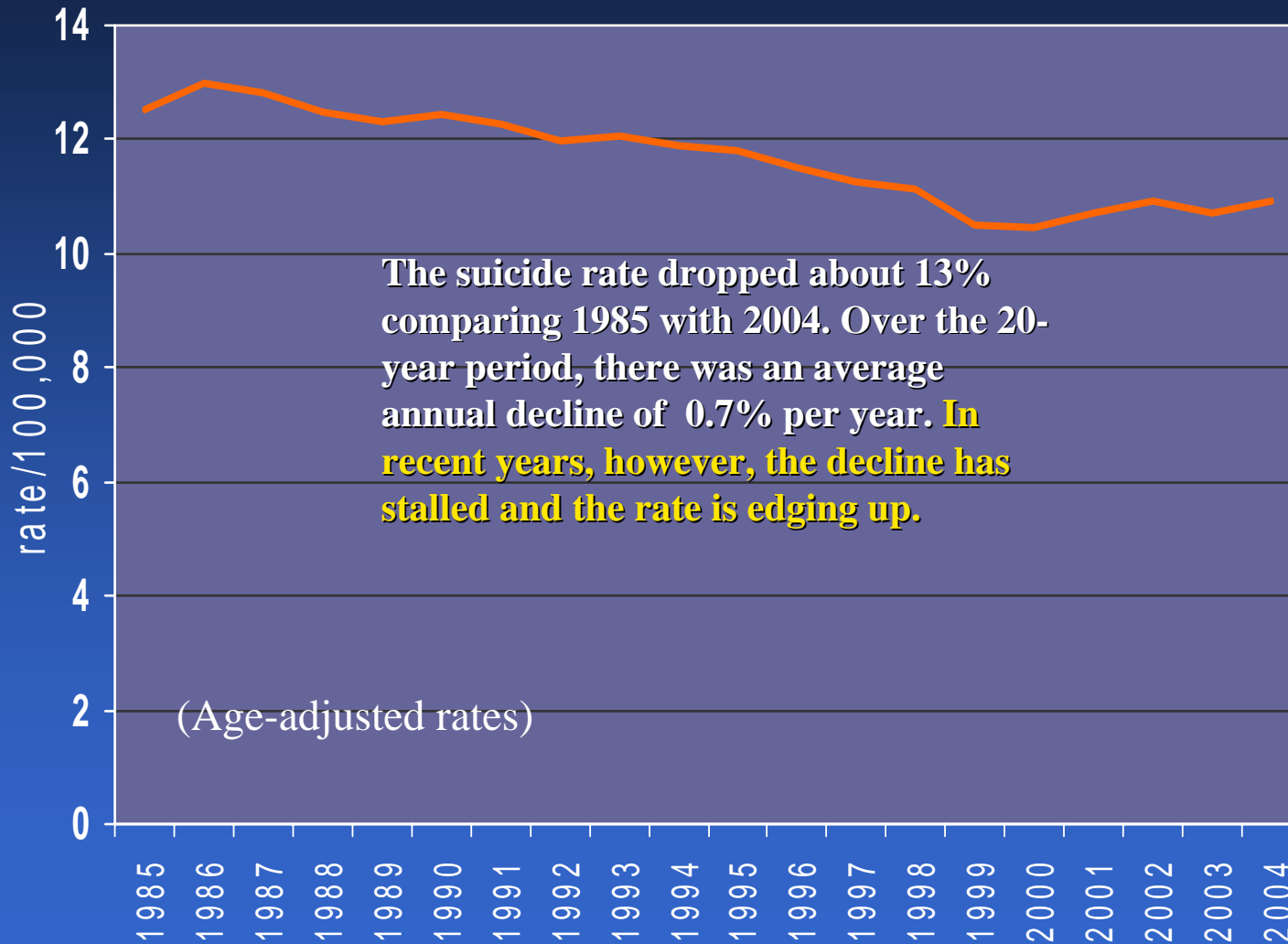
Based on US Vital Statistics data accessed from:

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) Available from URL: www.cdc.gov/ncipc/wisqars

U.S. Suicide Deaths (numbers)



U.S. Suicide Deaths (rate/100,000)



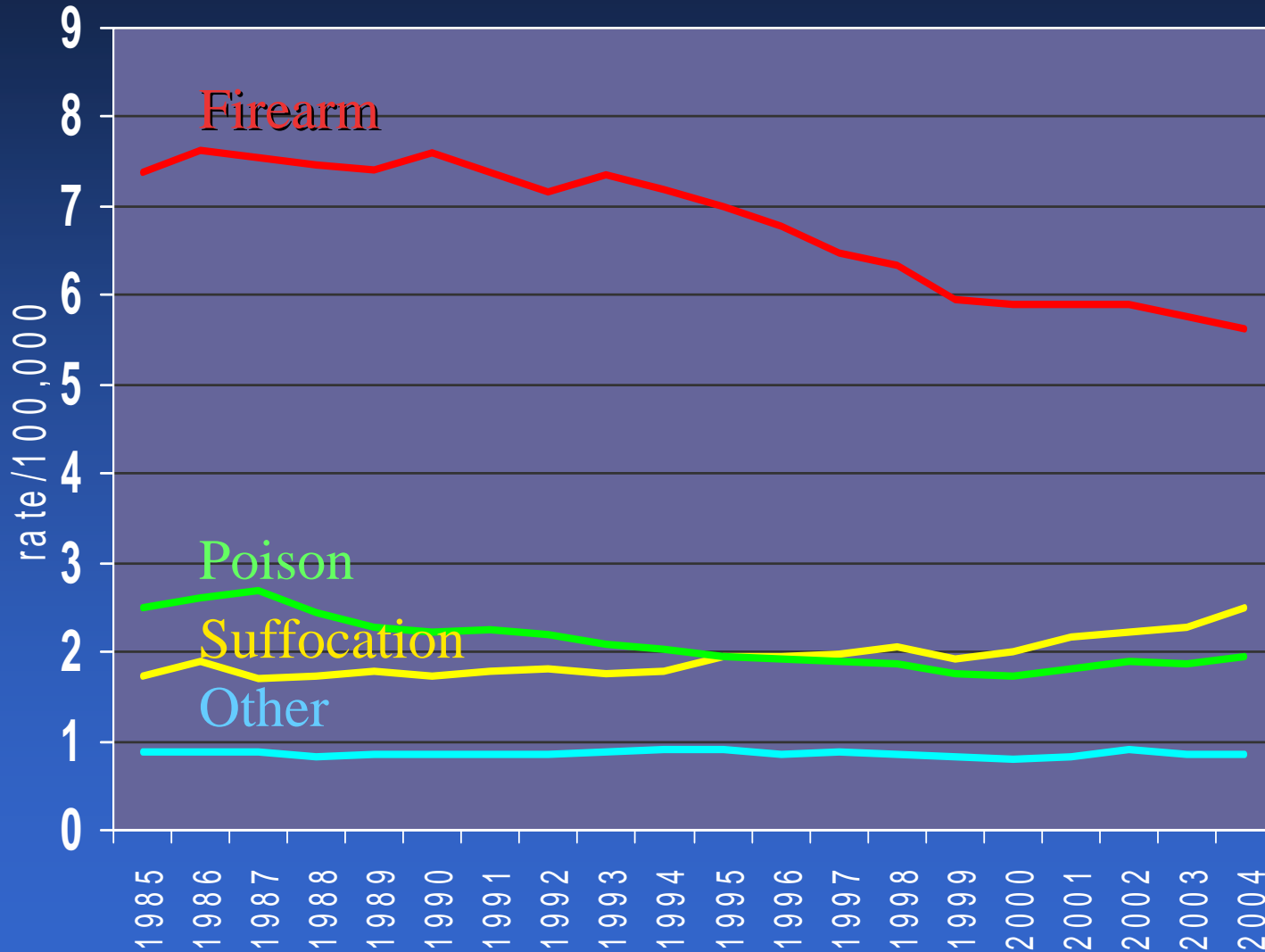
Decline

The suicide rate (deaths per 100,000 population) has declined. About 4,300 fewer deaths occurred in 2004 than if 1985 rates had applied.

Objectives

- Examine how the 20-year suicide trends vary by age group, sex, and race/ethnicity
- Examine how the suicide trends vary by method
- Discuss ways to evaluate factors that may be driving recent trends

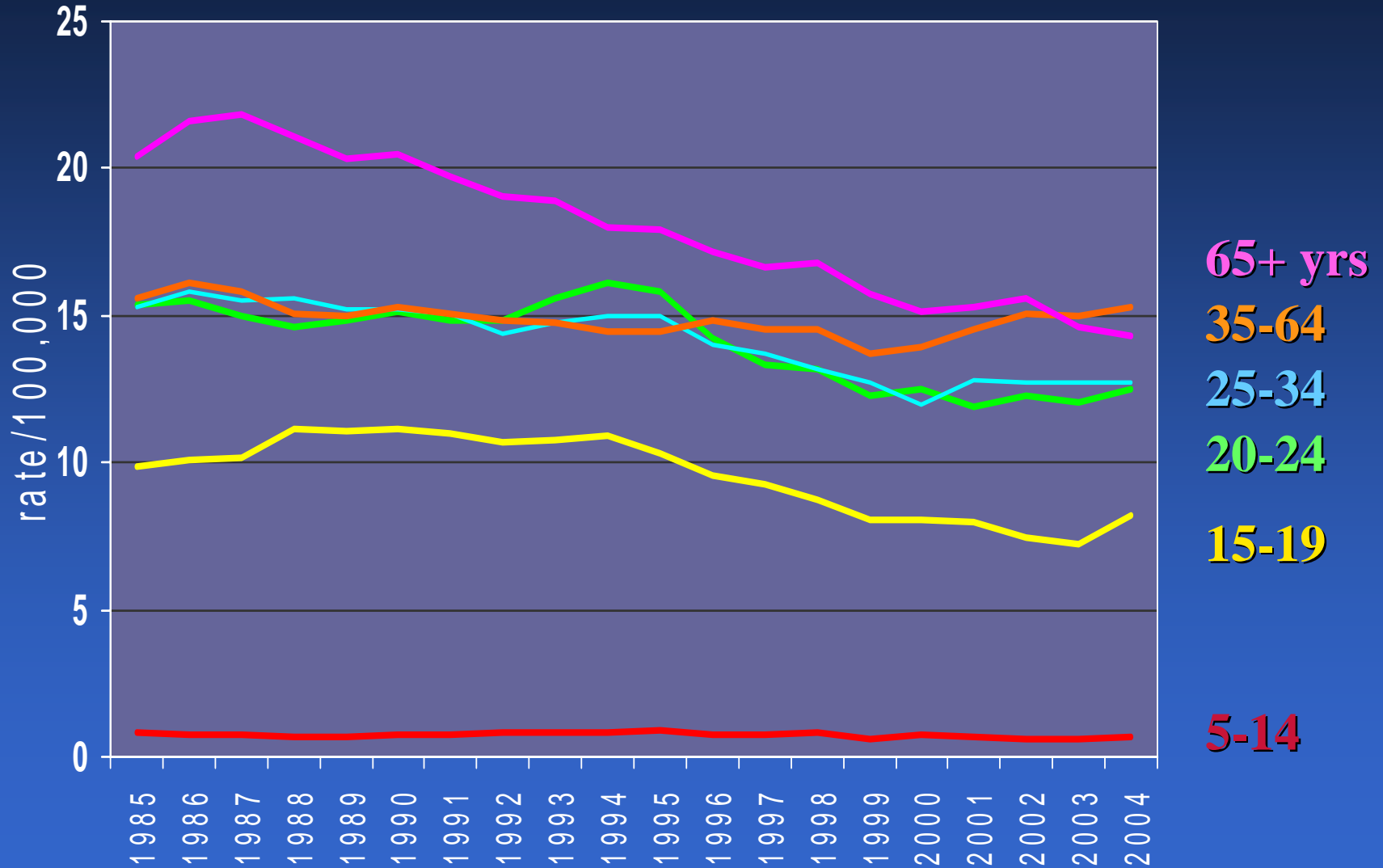
U.S. Suicide Rate, by Means



Firearms

The decline in the suicide rate has largely been due to a decline in firearm suicides, particularly in the 1990s.

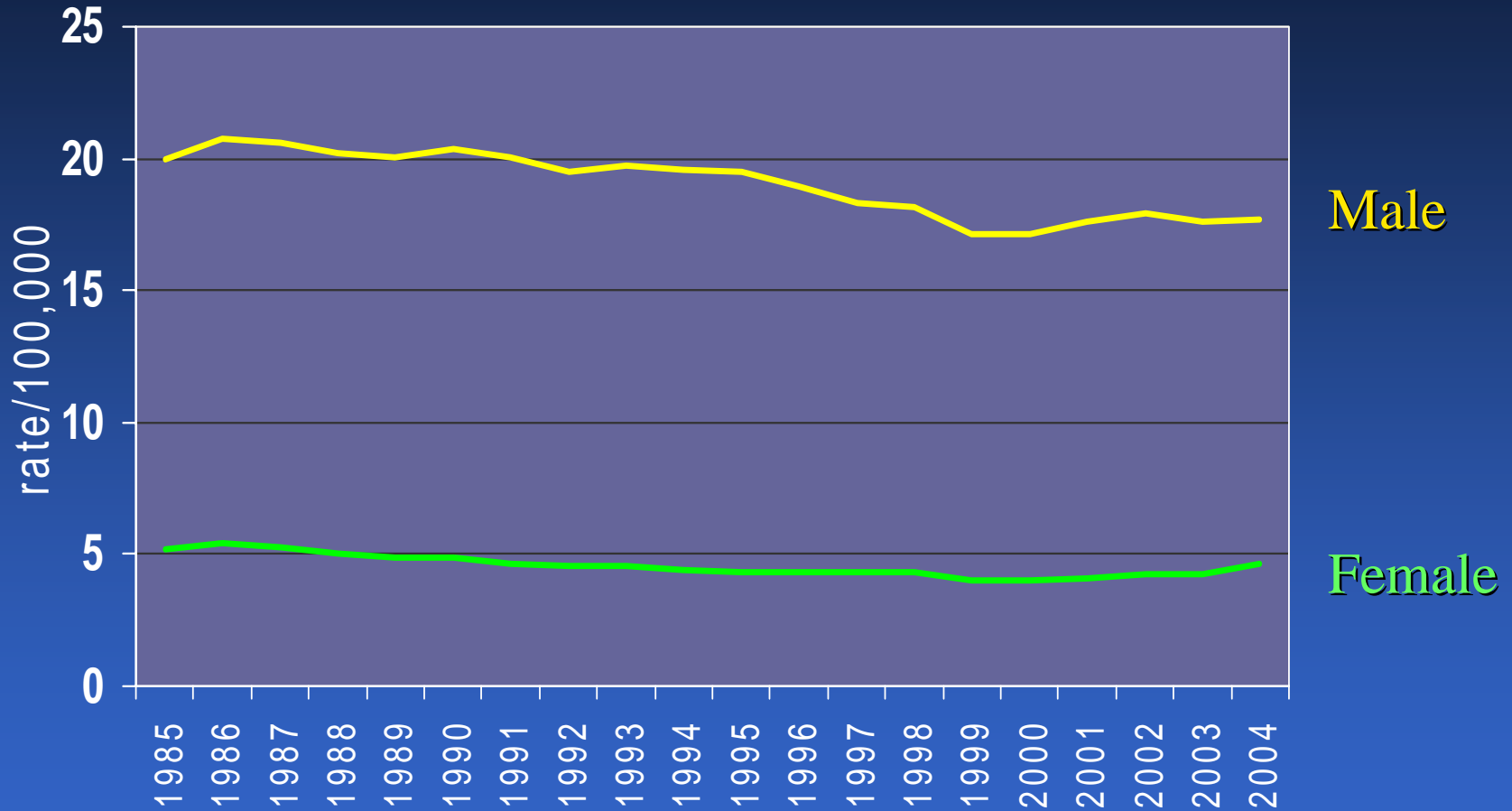
U.S. Suicide Rate, by Age Group



Age Groups with Declining Rates

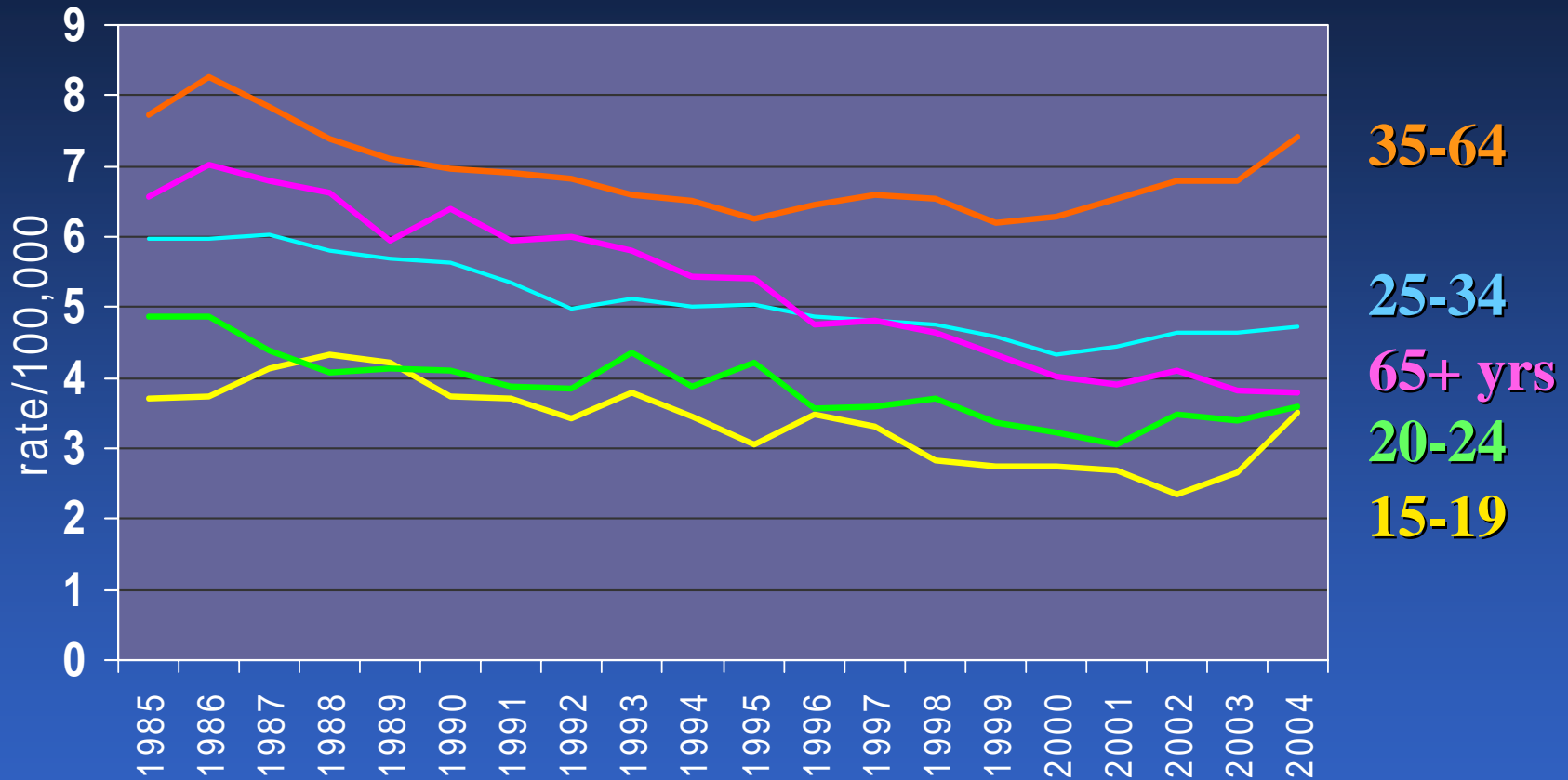
- Elders
- Younger adults
- Youths
- Not the middle-aged (35-64 years)
- 2003 marked the first year in the 1984-2004 period in which the suicide rate of 35-64 year-olds equaled that of elders

US Suicide Rate, by Sex



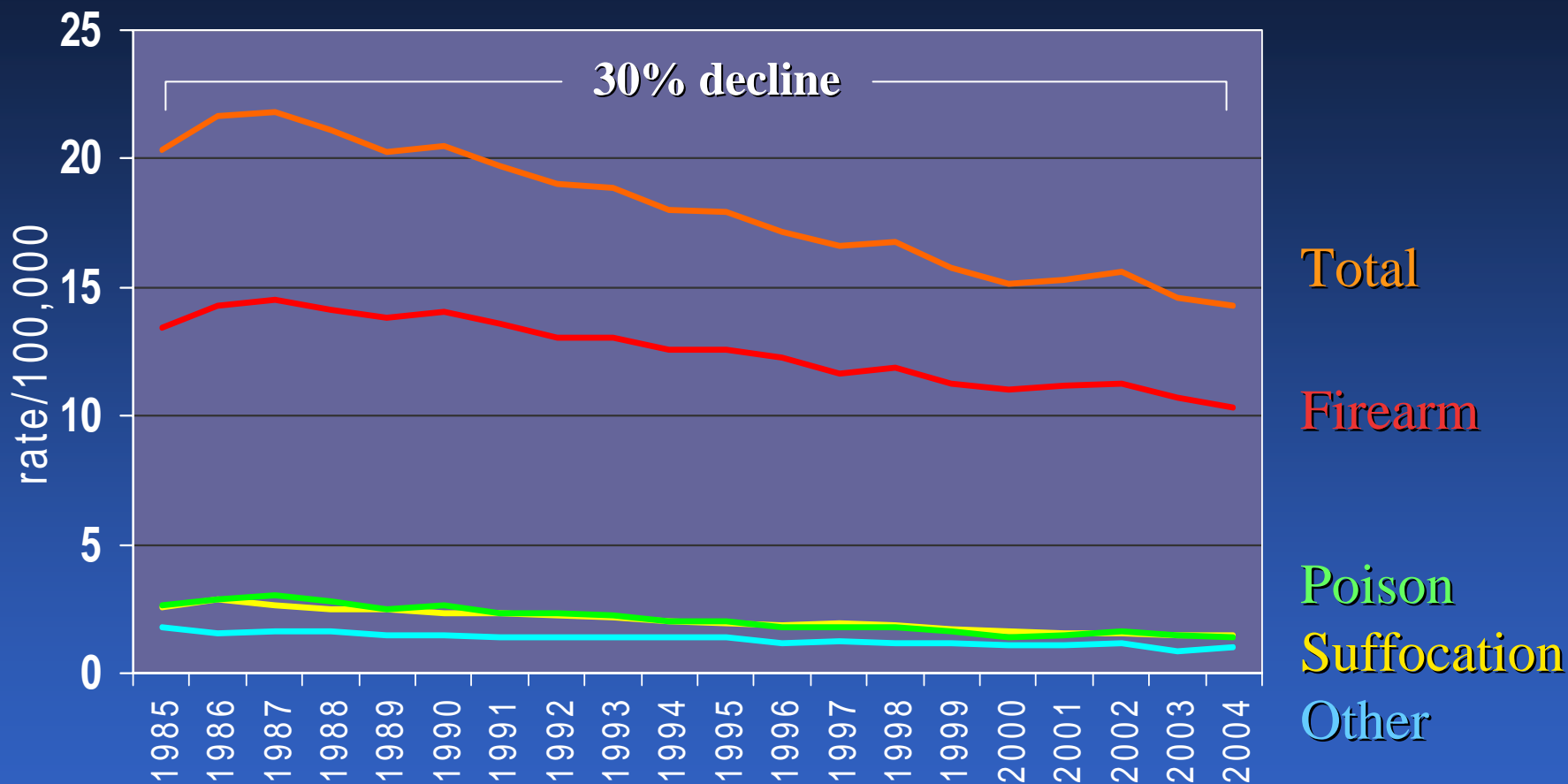
Declines were seen among both males and females until the early 2000s.

Female Suicide Rate, by Age Group



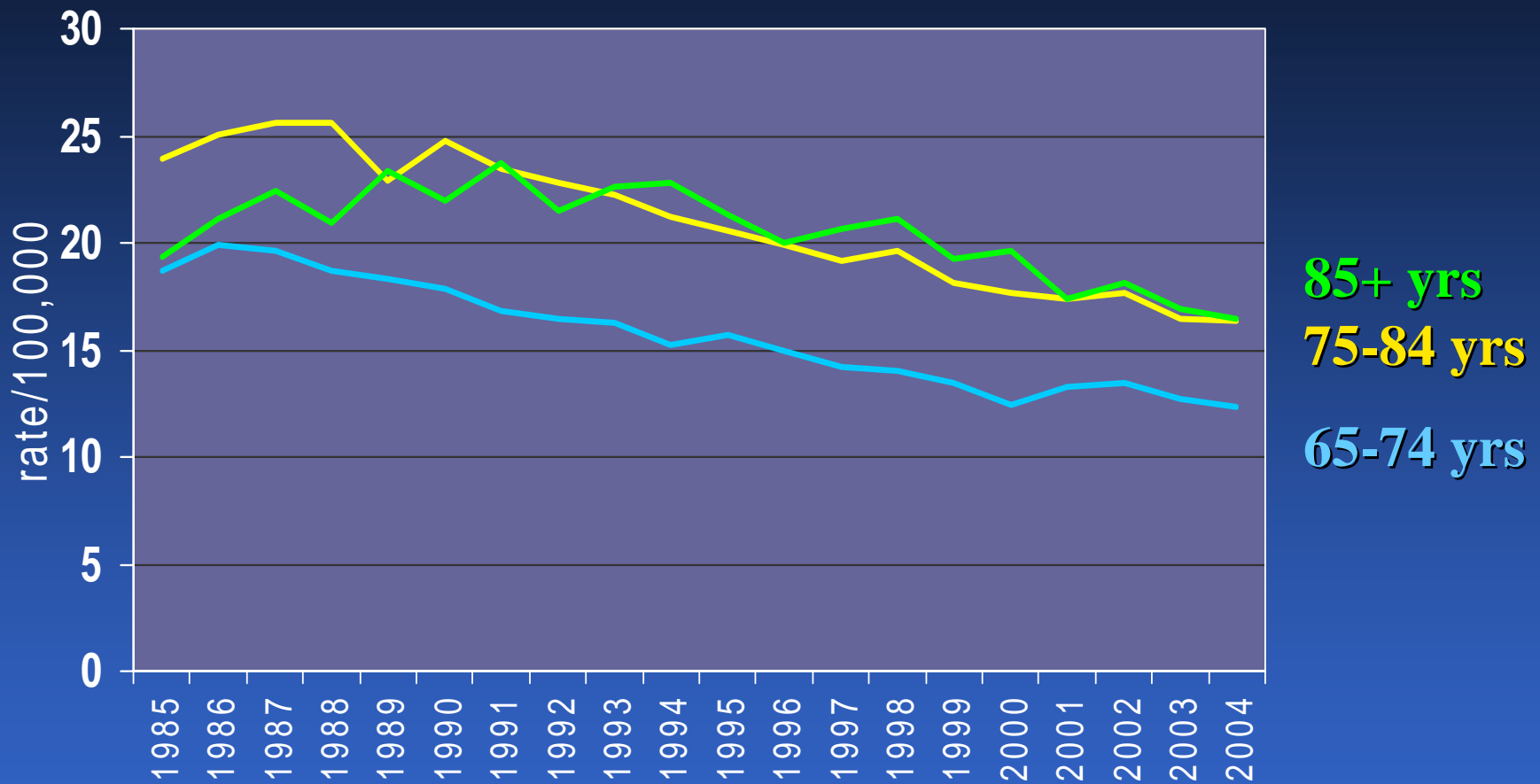
Elder female suicide rates declined steadily throughout the period; all age groups declined in the 1990s. Middle-aged women's rates have increased since 1999.

Suicide Rate, 65+ year-olds



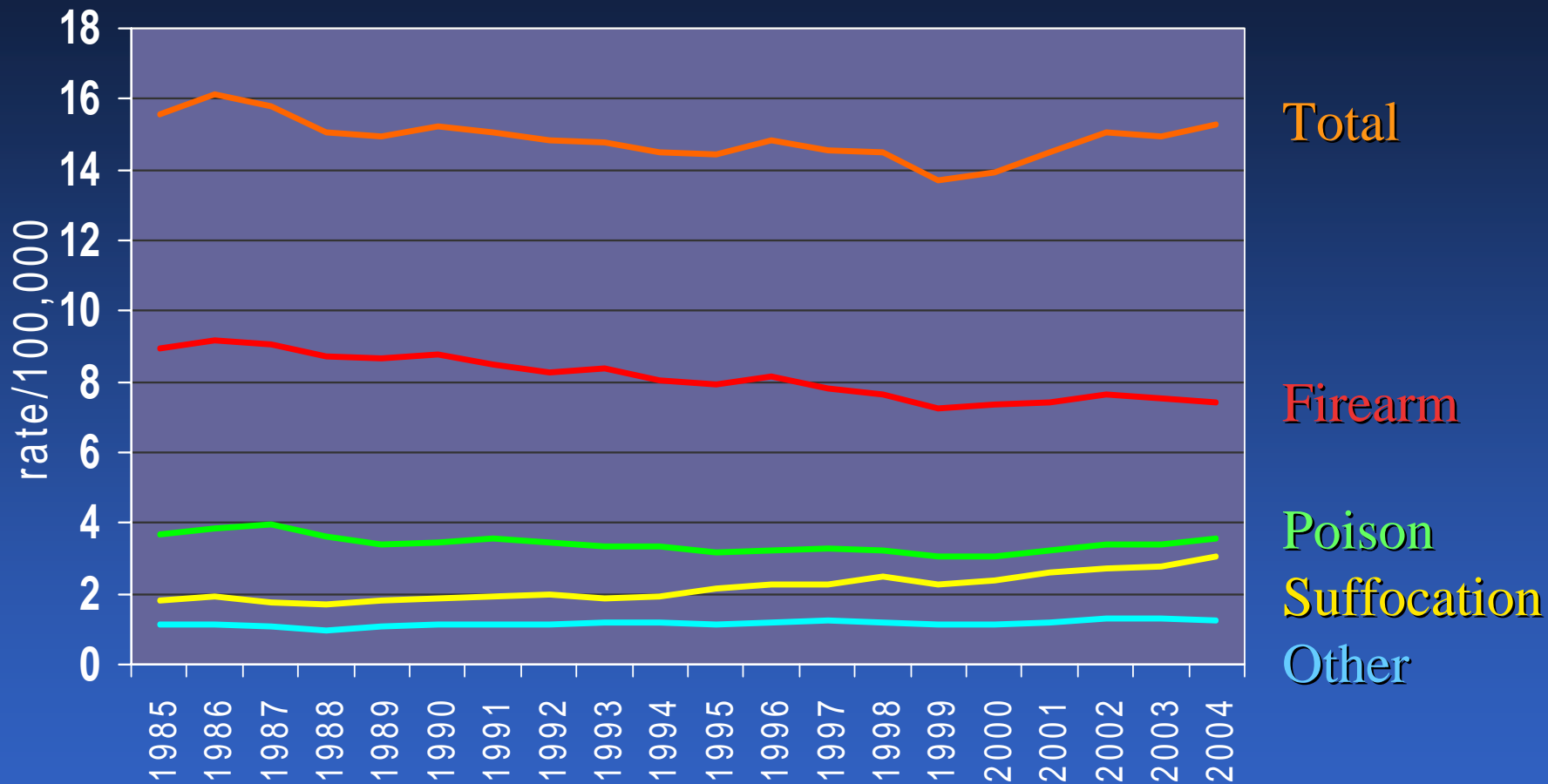
The suicide rate for elders declined steadily by all methods. During the 20-year period, the rate declined an average of 1.8% annually, or about 30% when comparing the 1985 rate with the 2004 rate. In 1985 firearms were 66% of the total; by '04 they were 72%.

Suicide Rate, 65+ by Age Group



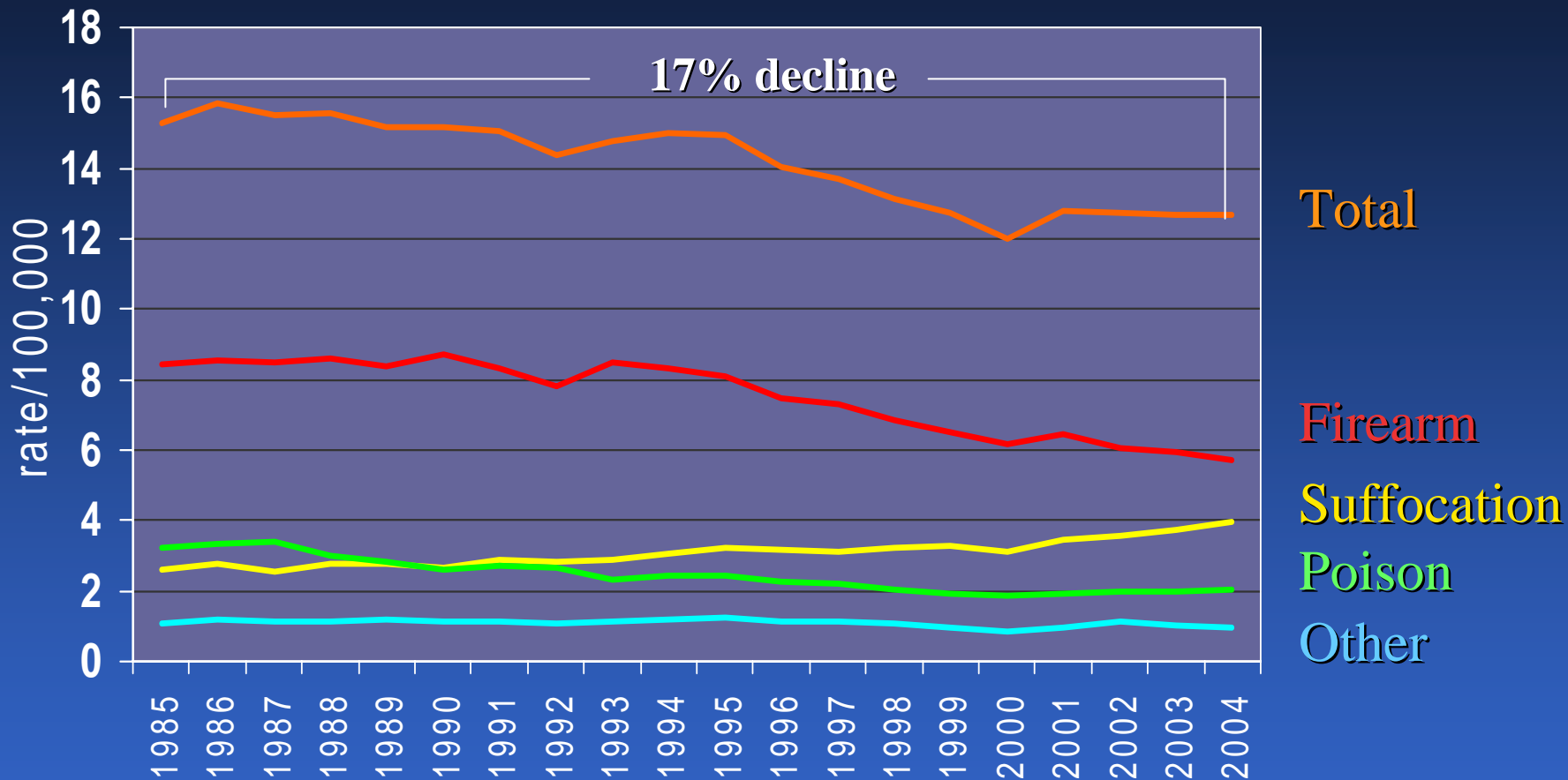
The decline in suicide rates among the older-old began more recently than among the younger-old.

Suicide Rate, 35-64 year-olds



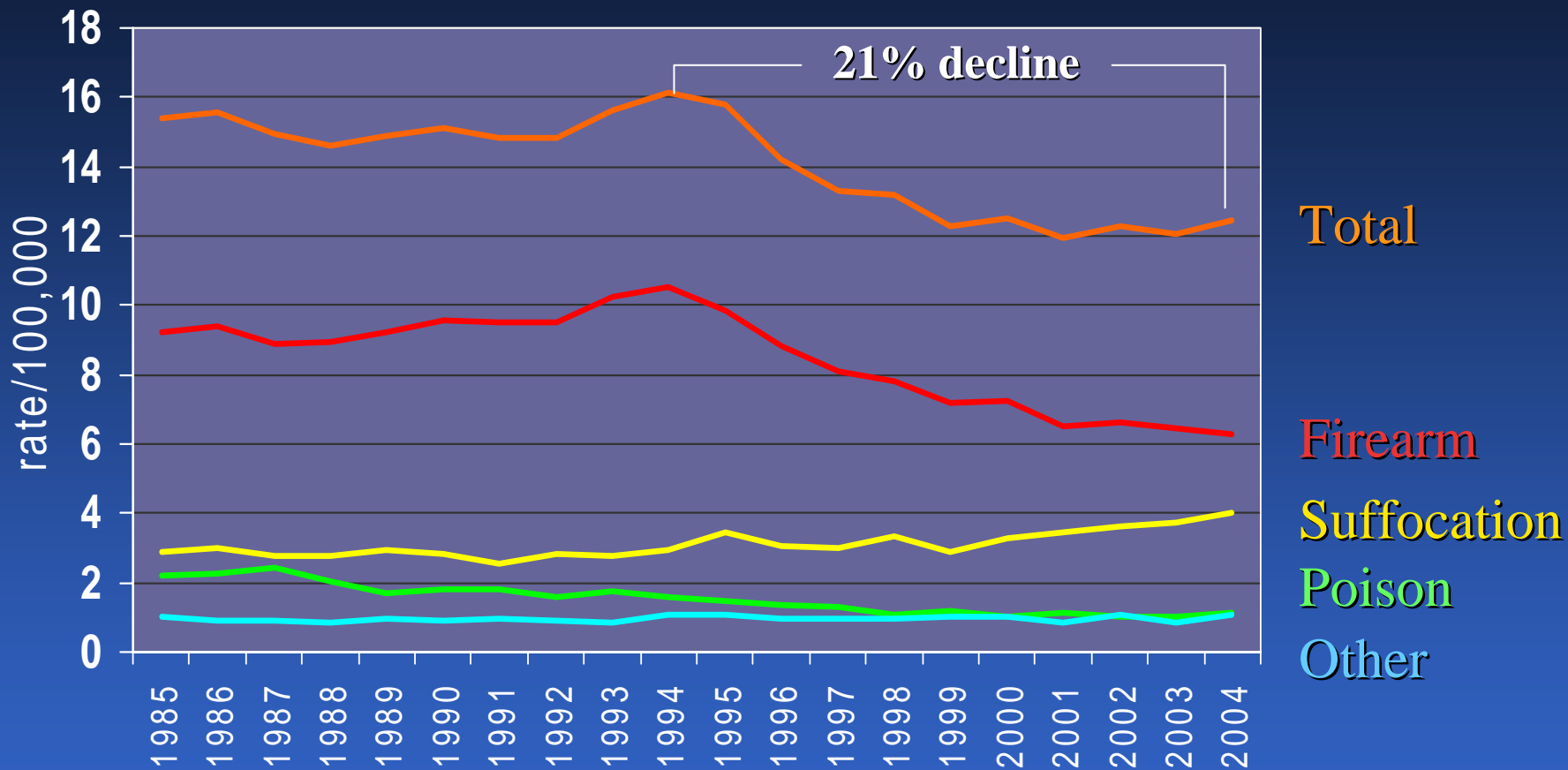
The suicide rate for middle-aged adults declined by roughly 12% from 1985-1999 but increased steadily after 1999. Because this is a large group comprising half of the suicides in the country, the recent increase is notable.

Suicide Rate, 25-34 year-olds



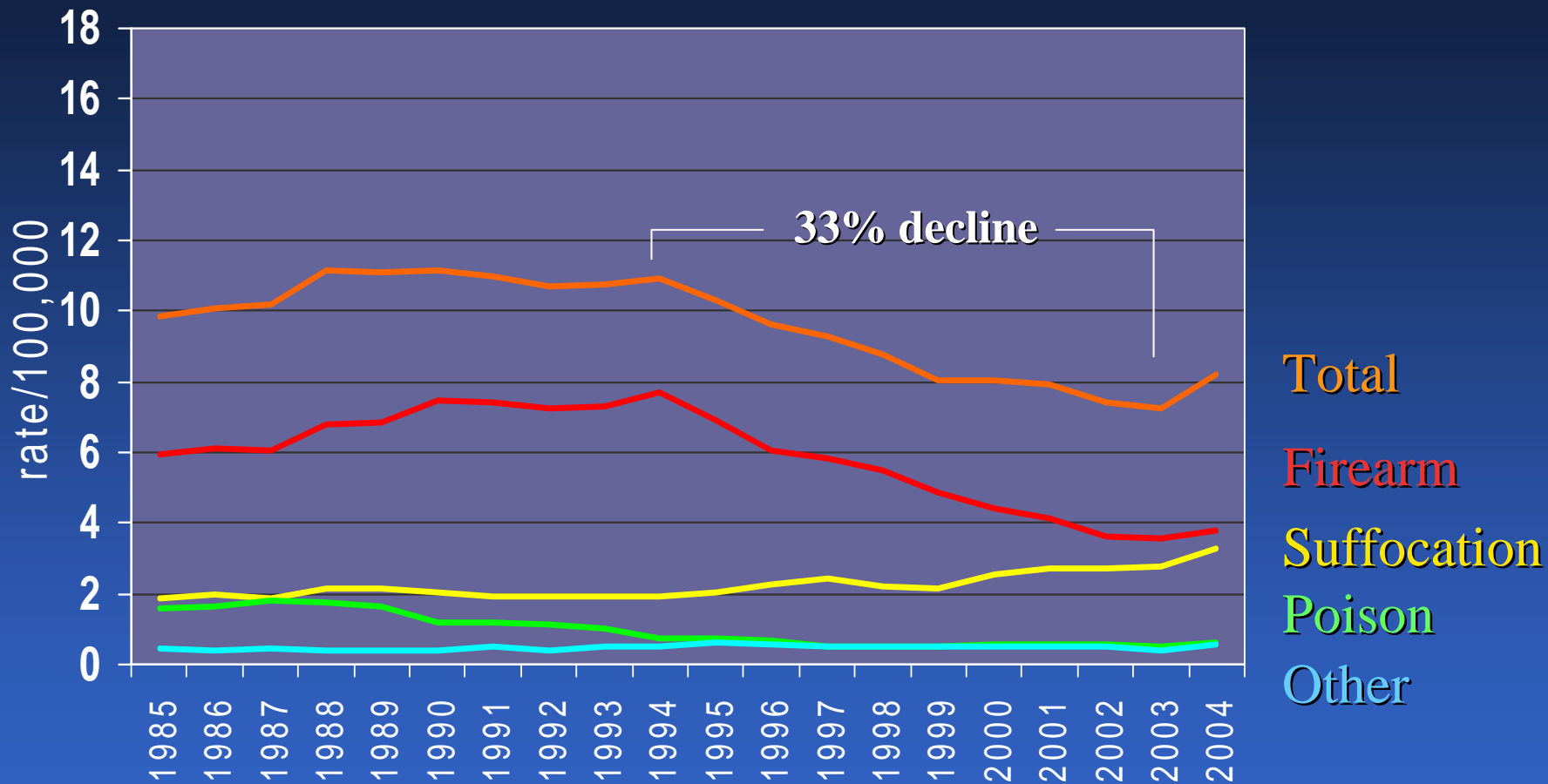
The suicide rate for 25-34 year-olds declined an average of 0.9% annually, or about 17% when comparing 1985 with 2004. A drop in firearm suicides led the decline; a drop in poisonings also contributed. Suffocation suicides have been increasing. The overall rate has been flat from 2002 to 2004.

Suicide Rate, 20-24 year-olds



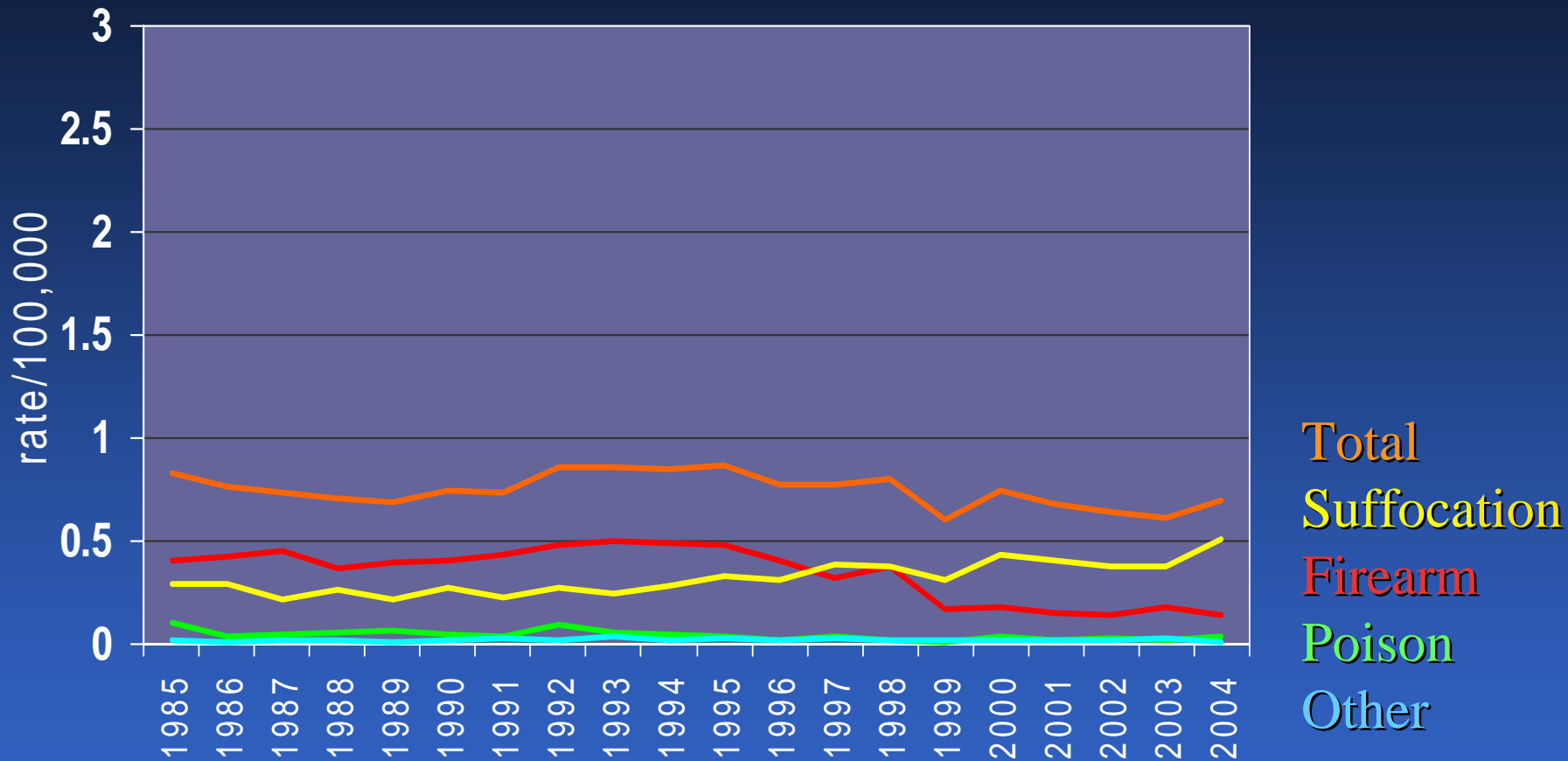
The suicide rate for young adults did not begin to decline until the mid-90s and then declined sharply. During the 10 years 1995-2004, suicides dropped an average of 2.4% annually, closely mirroring drops in firearm suicides. Suffocations have been increasing.

Suicide Rate, 15-19 year-olds



The suicide rate for teens began declining sharply in the mid-90s. During the 10 years 1994-2003, suicides dropped an average of 3.8% annually, or 33% when comparing 1994 with 2003. Rates rose in 2004. Suffocations increased in the 2000s.

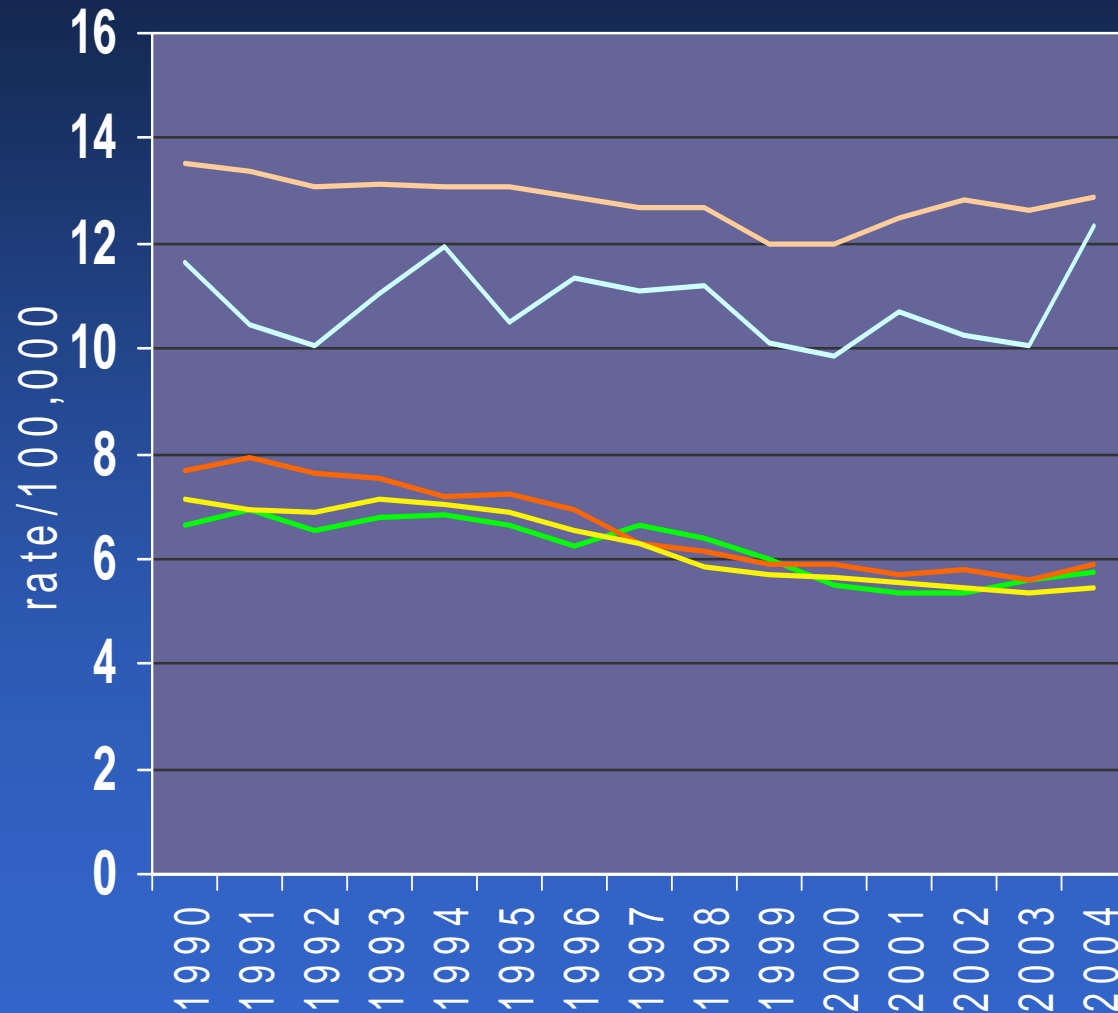
Suicide Rate, 5-14 year-olds



The suicide rate for children is very low (see change in scale on left axis) and is based on relatively small numbers (250-300 deaths per year). The rate began to decline in the mid-90s. This is the one age group in which suffocations have begun outnumbering shootings.

In Which Racial/Ethnic Groups Has the
Suicide Rate Dropped?

US Suicide Rate, by Race/Ethnicity



White Non-Hispanic

American Indian

Black Non-Hispanic

Hispanic

Asian

Note: Data on Hispanic ethnicity not available before 1990

In Which Racial/Ethnic Groups Has the Suicide Rate Dropped?

- Steady, strong drops in suicide rates among Hispanics, Black Non-Hispanics, and Asians, leveling off recently.
- More gradual decline among White Non-Hispanics in 1990s, followed by increases in the 2000s. Strong decline among white youths and elders but increases among the middle-aged.
- American Indian rates fluctuated; no steady trend. Based on 200-400 cases annually.

Why might declines occur?

- Need to first ask if suicide *attempts* are changing.
- If suicide attempts are going down, possible reasons:
 - Improved life circumstances
 - Improved mental health and/or mental health tx
 - Cohort characteristics
 - Changes in social norms
 - Changes in population (e.g. large influx of immigrants with lower suicide rates; change in age distribution)
 - Coding changes

In most of these scenarios, we would expect to see attempts by all methods going down.

Why might declines occur?

- If suicide attempts are staying flat or going up:
 - Coding changes
 - Improved medical care of attempts
 - Improved mental health care of attempters
 - Lethal methods less available (e.g. fewer households with guns, lower CO in car exhaust, SSRI antidepressants less toxic than tricyclics)

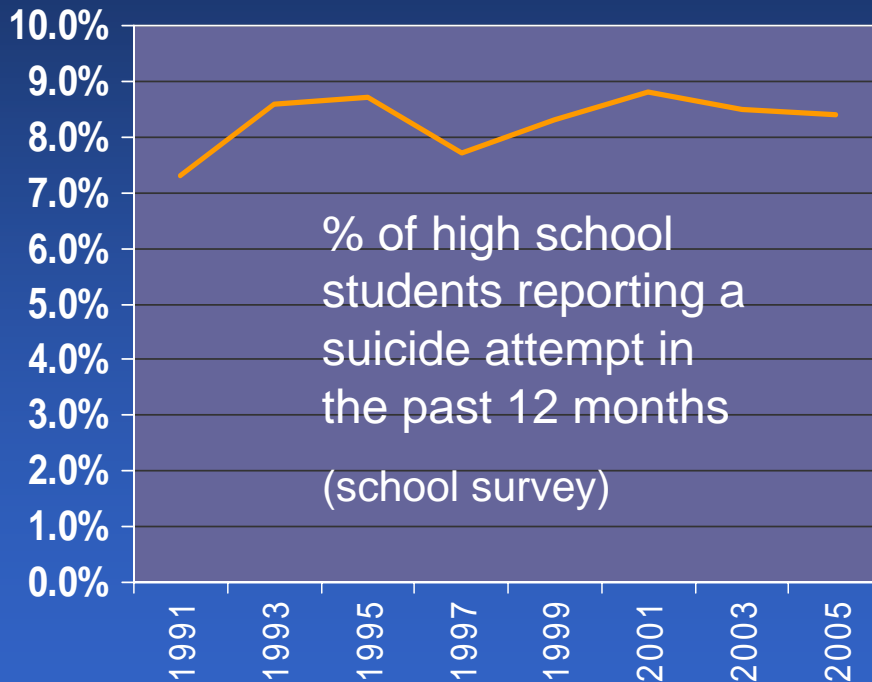
What's happened with attempts?

- Available evidence indicates no change for teens and adults under age 55.
- Unknown for adults 55+

US Suicide Attempt Rates

No decline in suicide attempts since early 90s.

Youth Risk Behavior Survey



Source:
www.cdc.gov/HealthyYouth/yrbs/trends.htm

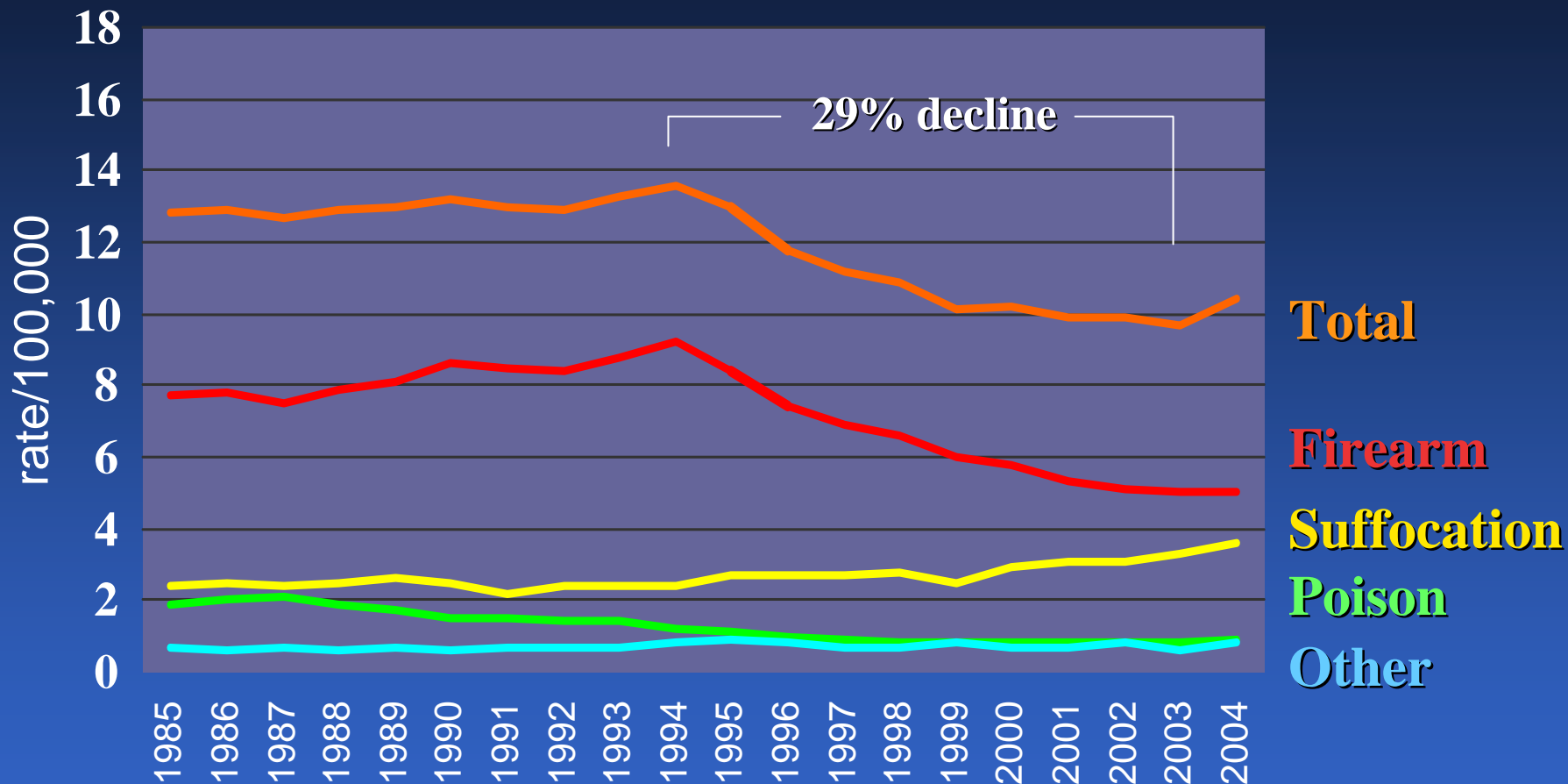
National Comorbidity Survey

Made a suicide attempt or gesture in past 12 months	
1990-92	0.7%
2001-03	0.8%

Household survey, ages 18-54

Source: Kessler et al., JAMA 2005

Suicide Rate, 15-24 year-olds



From 1994-2003, the youth suicide rate dropped by about 29%, driven almost exclusively by a drop in firearm suicide. Suffocation (hanging) suicides increased, poisonings declined in the late '80s but were flat in the late 90s/early 2000s, and all other methods showed no change.

Is It a Coding Issue?

That is, has there been no decline in suicide deaths but rather increasing misclassification of suicides as accidents or injuries of unknown intent?

Deaths to 15-24 year-olds	1990	2000
Suicide deaths	4,869	3,994
Firearms – unknown intent	119	58
Firearms – unintentional	500	202
Suffocations – unknown intent	15	12
Suffocations – unintentional	147	147

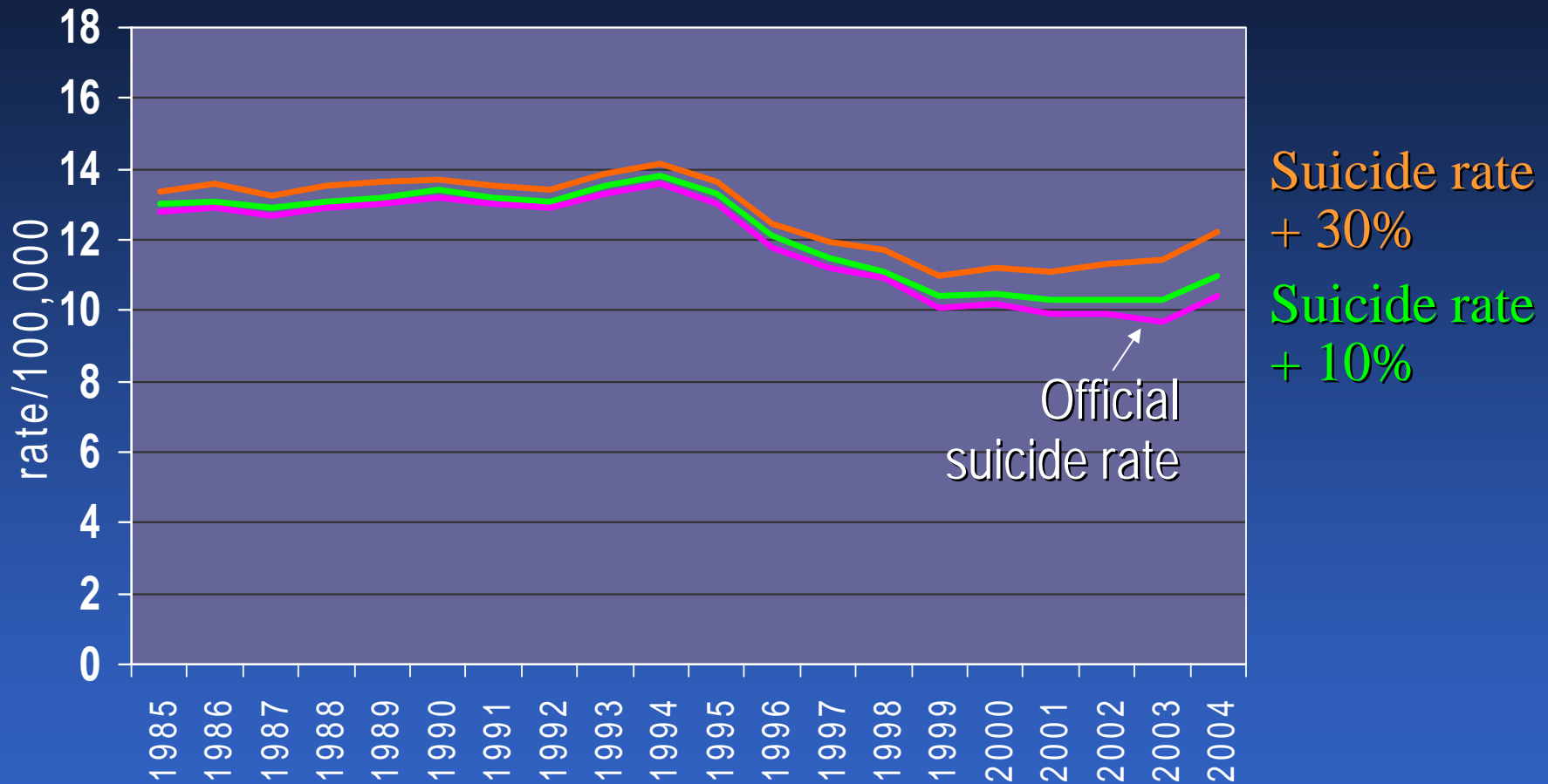
Answer is no for shootings and suffocations; too few unintentional and unknown-intent deaths to “hide” suicides.

Is It a Coding Issue?

Deaths to 15-24 year-olds	1990	2000
Poisoning – unknown intent	88	200
Poisoning – unintentional	519	1,160 (2,259 by 2004)

Poisonings are another matter. There has been a very large increase in overdose deaths over the past decade, particularly among opioids. Opioid deaths are rarely assigned to the suicide category.

Two Scenarios, 15-24 yr-olds



Suicide rate under two theoretical scenarios:

30% of unintentional and undetermined poisonings are suicides

10% of unintentional and undetermined poisonings are suicides

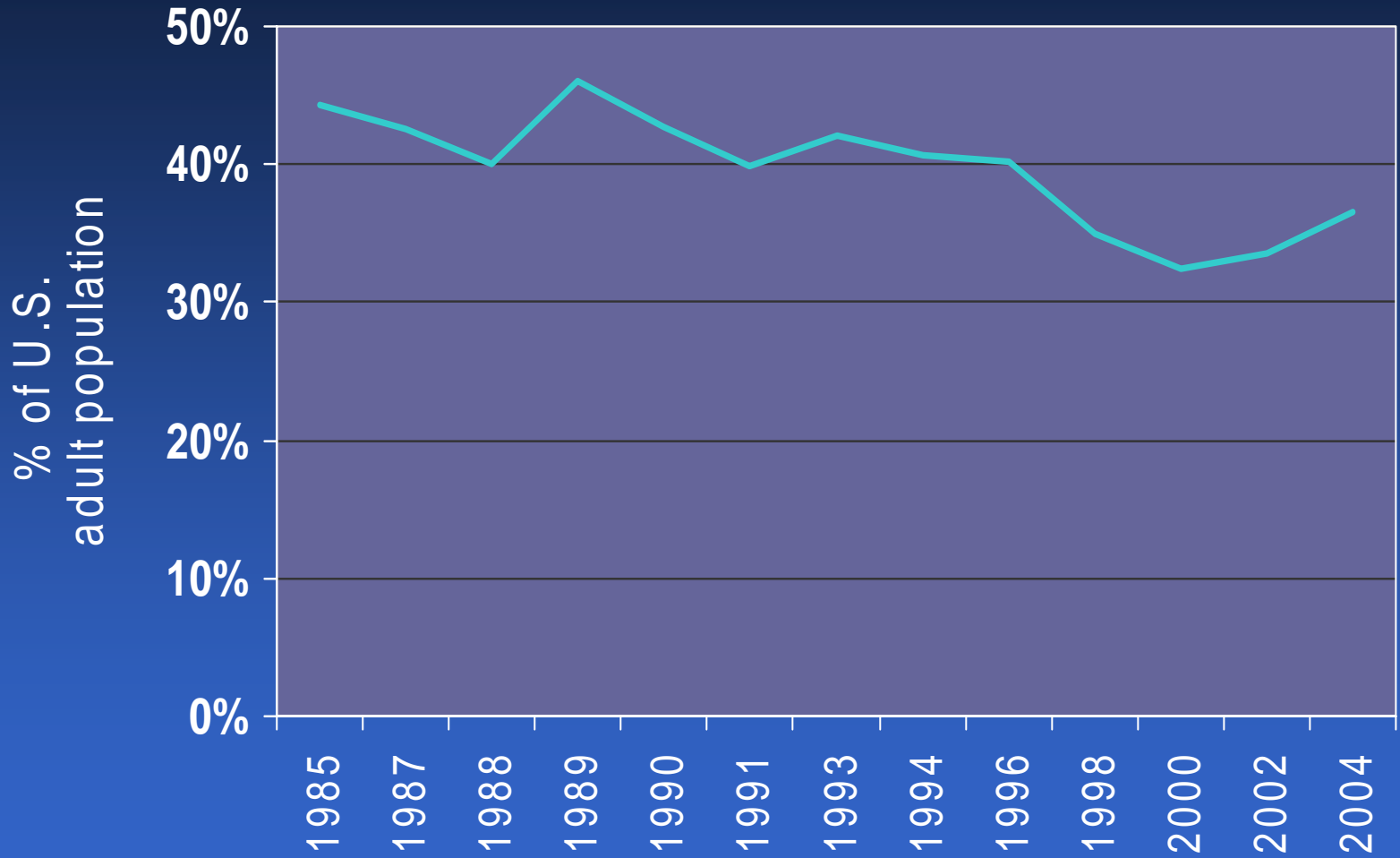
Why Did the Youth Suicide Rate Drop?

- McKeown et al. (AJPH, 2006) proposed increased SSRI antidepressant treatment may be the reason for the declines
- The evidence indicates:
 - No change in suicide attempts
 - A decrease in overall suicide driven by a decrease in firearm suicide
 - Other methods increased or stayed flat
- If increase in antidepressant Rx's reduced suicide by reducing depression, why did attempts stay flat and only firearm suicides decline?

Why might declines occur?

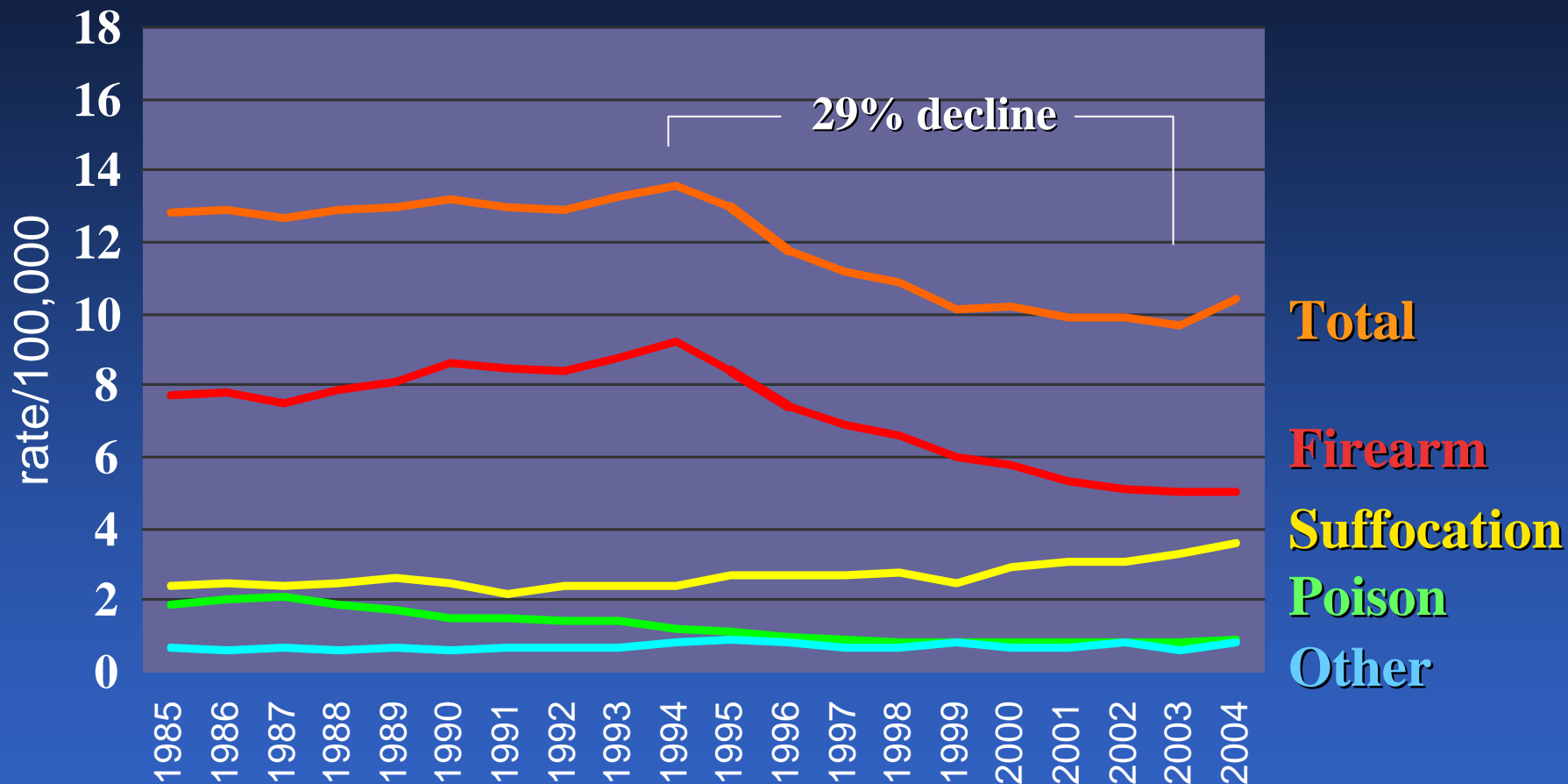
- If suicide attempts are staying flat or going up:
 - Coding changes
 - Improved medical care of attempts
 - Improved mental health care of attempters
 - Lethal methods less available

% of Population with Guns at Home



Source: NORC, General Social Survey

Suicide Rate, 15-24 year-olds



From 1994-2003, the youth suicide rate dropped by about 29%, driven almost exclusively by a drop in firearm suicide. Suffocation (hanging) suicides increased, poisonings declined in the late '80s but were flat in the late 90s/early 2000s, and all other methods showed no change.

Why does gun availability matter?

- Some suicide attempts are impulsive
- Some occur during a crisis
- If a gun is not available, nearly every other method substituted is less lethal
- 90% of those who survive a nonfatal attempt do not go on to die by suicide (Owens, *British J Psych*, 2002; review of 90 studies of repetition of self-harm)
- All US case control studies have indicated the presence of a gun as a risk factor for suicide

What is it about guns?

- **Lethality** (85-90% ED case fatality ratio compared with 2-3% for poisoning, 70-80% for suffocation)
- **Immediacy & irreversibility**
- **Most other methods allow a “back-out” opportunity--even many hangings. About half of hanging deaths are partial suspension (Gunnell 2005) which allows for “back-outs”**

Houston Study

Study of nearly-lethal suicide attempts

“How much time passed between the time you decided to complete suicide and when you actually attempted suicide?”

Simon et al. 2001. Suicide & Life-Threatening Behavior

Houston Study

Study of nearly-lethal suicide attempts

“How much time passed between the time you decided to complete suicide and when you actually attempted suicide?”

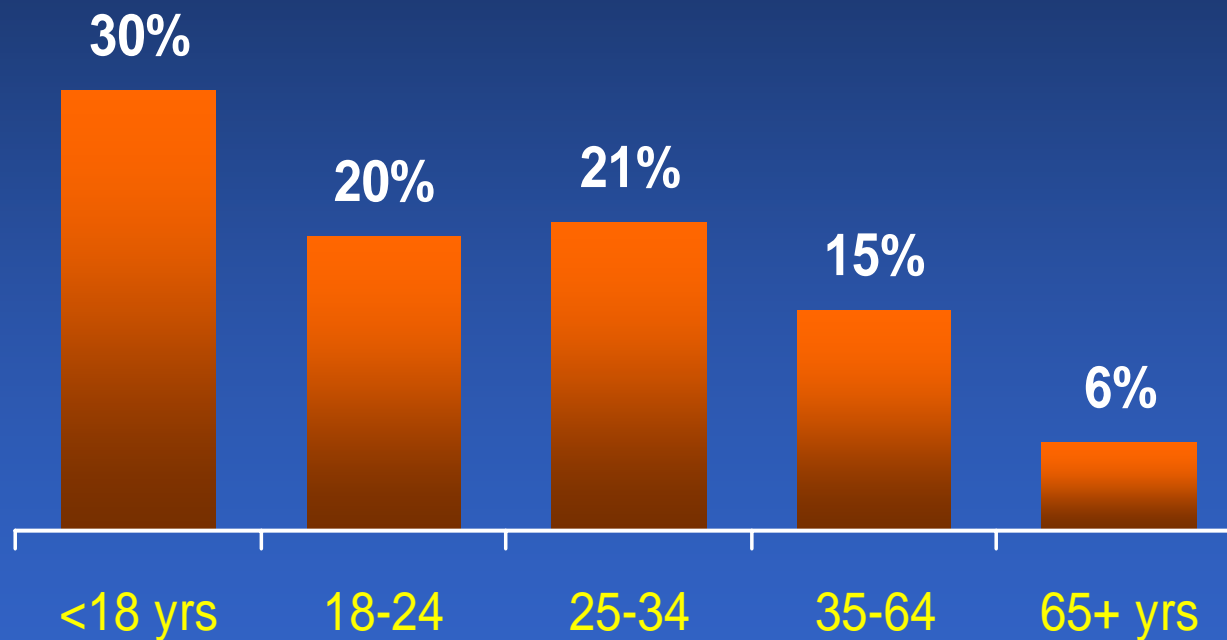
- **24% said less than five minutes**

Simon et al. 2001. Suicide & Life-Threatening Behavior

Same-day Crises

- Did a crisis like an arrest, argument, lay-off, etc., occur within 24 hours of the suicide according to the police or coroner/medical examiner report?
- Source: NVISS data (pilot for National Violent Death Reporting System)
- All suicide deaths occurring in 2001 in 5 states (CT, ME, MD, UT, WI) and 6 metropolitan areas (Pittsburgh, Miami, San Francisco, Atlanta, Detroit)
- N=2,470

Same-day Crises by Age Group



Source: NVISS, 2001, all sites, n=2,470 suicide deaths

Same-day, same-moment

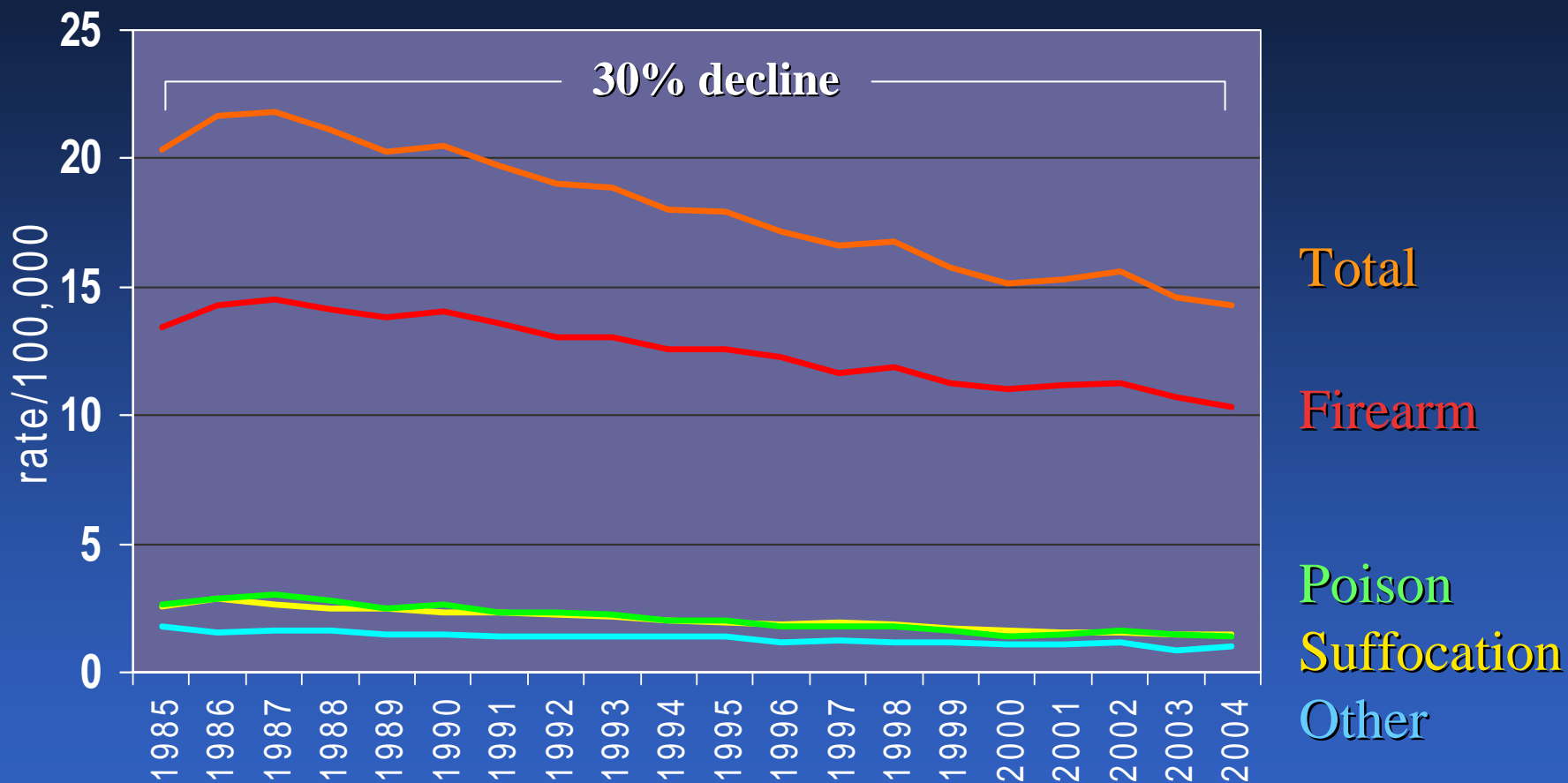
- Teenaged girl heard her mother tell a neighbor she was not going to be allowed to see her boyfriend. Girl went to the closet, got the gun, ran outside, and shot herself.
- Police officer was arguing with his wife who was trying to leave him. He went to the bedroom got his gun, returned and pulled the trigger in front of her.



Means Matter

Suicide, Guns & Public Health

Suicide Rate, 65+ year-olds



The suicide rate for elders declined steadily by all methods. During the 20-year period, the rate declined an average of 1.8% annually, or about 30% when comparing the 1985 rate with the 2004 rate. In 1985 firearms were 66% of the total; by '04 they were 72%.

One Size Doesn't Fit All

- Among elders, we don't know whether suicide attempts overall were declining
- Declines have been strong throughout the period
- Declines have occurred across all method types
- The evidence doesn't point strongly toward the declining gun ownership explanation (although it may have contributed)
- An age cohort effect looks possible

Summary

- Suicide rates declined over the 20-year period.
- The decline is led largely by declines in firearm suicides.
- Elder and youth suicide rates have declined; suicide among the middle-aged has not.
- Declines have been strongest among Black, Hispanic, and Asian Americans.
- The declines of the 1990s have stalled or reversed in the early 2000s for all age groups except elders.

Questions, Comments?

Contact Cathy Barber

cbarber@hsph.harvard.edu