

Disparities in Unintentional Injury among U.S. Children and Adolescents

Columbia University

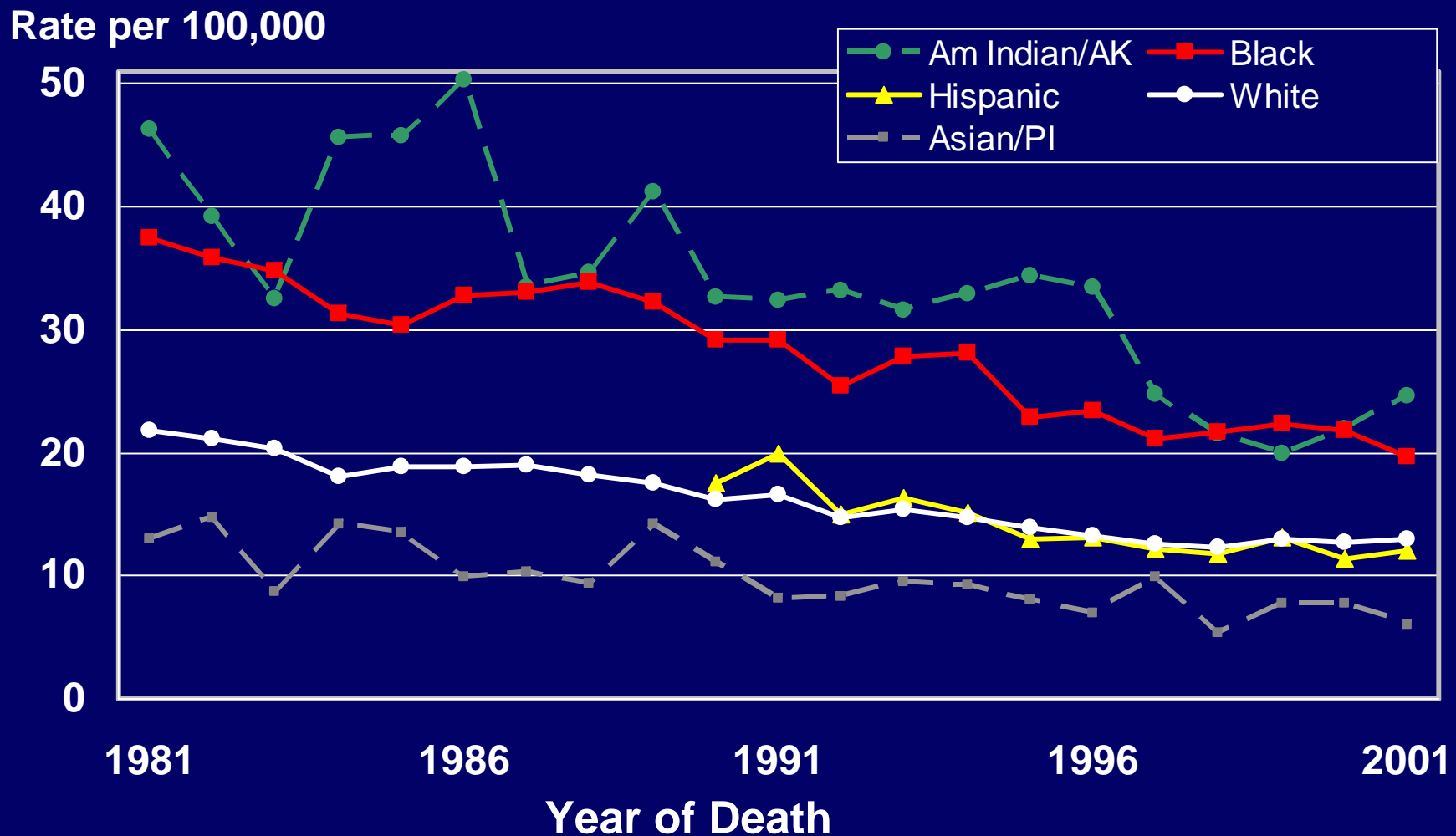
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Twenty Year Trends in Unintentional Injury Mortality in U.S. Children by Race and Ethnicity



Source: Pressley JC and Barlow BA. Preventing Injury and Injury-Related Disability in Children and Adolescents. Seminars in Pediatric Surgery 2004;13(2):133-140.

ICD-9 and ICD-10 External Cause of Injury Codes Facilitate Study by Mechanism of Injury

- WHO's International Classification of Diseases (ICD) provides condition codes and external cause codes (E codes)
- External cause (E-codes, X,Y,Z codes)
 - Intent (unintentional, intentional (assault/suicide/war), undetermined)
 - Mechanism (motor vehicle, fall, bicycle, firearm, fire/burn)
 - Place of occurrence (home, streets/highway, industrial place)
- Fatal and nonfatal frequently in 2 separate data bases and classifications systems (ICD-9 and ICD-10)
- Made use of multiple public administrative data sets (U.S. Vital statistics, KID-HCUP hospitalization data, a 40 year review of lexus nexus newspaper data bases, and a small pilot multi-site survey conducted among Injury Free Coalition for Kids sites)

Multicenter Study of Home Safety with Device Distribution in Low Income Neighborhoods

Study Population (n=542)

- Recruited prospectively from a primary care clinic in low SES neighborhoods during well child visits
- Sites in Hartford, CN; Cincinnati, OH; Pittsburgh, PA; Minneapolis, MN and NY, NY
- Population 10.5% White, 37.8% black, 41.7% Hispanic and 10% other
- Conducted interviews of live-in parents or guardians of infants aged 4-6 mos at enrollment
- Interviews in English and/or Spanish

Study Questionnaire

- Ask ownership and frequency of use of a variety of safety devices
- Ask storage and use of items such as sharps, medicines, vitamins in accessible areas
- Asked how often the areas were locked
- Ask characteristics on housing (ownership, public/private rentals, presence of stairs, window locks, smoke detectors/alarms)
- Asked their personal beliefs regarding:
 - 1) parent/guardian ability to protect child from injury
 - 2) whether they believe injuries are preventable

Example Rate Ratios¹ for Injury Mortality in Children Aged 0-4 Years (1999-2000)

<u>Injury</u>	<u>Black</u>	<u>Hispanic</u>	<u>AI/AN</u> ²	<u>AS/PI</u> ³
All Causes	2.23	1.02	2.17	0.56
Intentional	3.71	1.15	2.19	0.59
Unintentional	1.91	1.00	2.09	0.55

¹Whites are comparison group; based on U.S. vital statistics data obtained through WISQARS.

²AI/AN=American Indian/Alaska Native

³AS/PI=Asian/Pacific Islander

Rank of Injuries for Children Aged 0-10 by Cause of Death, Hospitalization and Emergency Department Visits (2003)

Mechanism of Injury	Mortality	Hospitalization, Nonfatal	ED Visits, Nonfatal
Fall*	8	1	1
Violence-Related	1	10	9
Suffocation*	2	15	19
Drowning*	3	12	-
Motor Vehicle – Occupant**	4	3	8
Pedestrian**	5	7	17
Fire/Burn*	6	8	13
Poisoning*	7	4	15
Natural/Environment*	9	-	-
Other Land Transport*	10	-	-

*Unintentional injury ; **When collapsed into one category *MV*, all causes ranks #1 in mortality
 Source: Pressley and Barlow, Seminars in Pediatric Surgery 2004;13(2):133-140

Rate Ratios¹ for Unintentional Injury Mortality in U.S. Children 0-4 Years

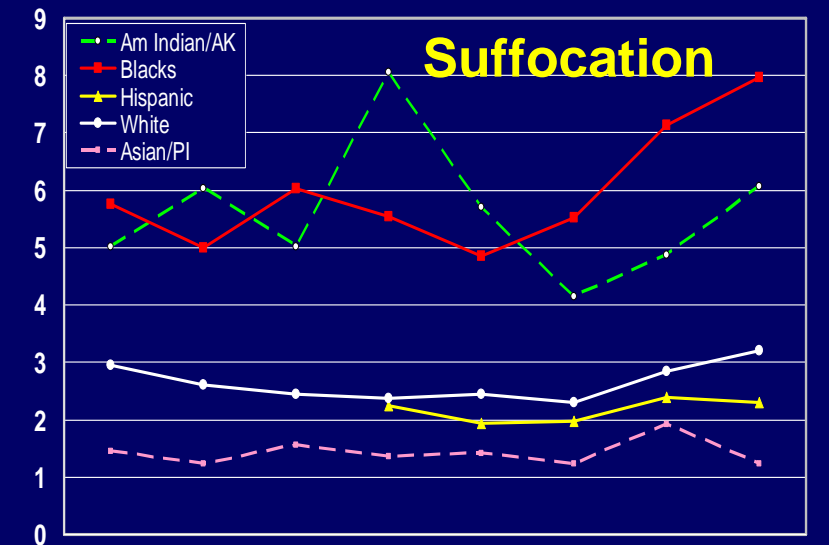
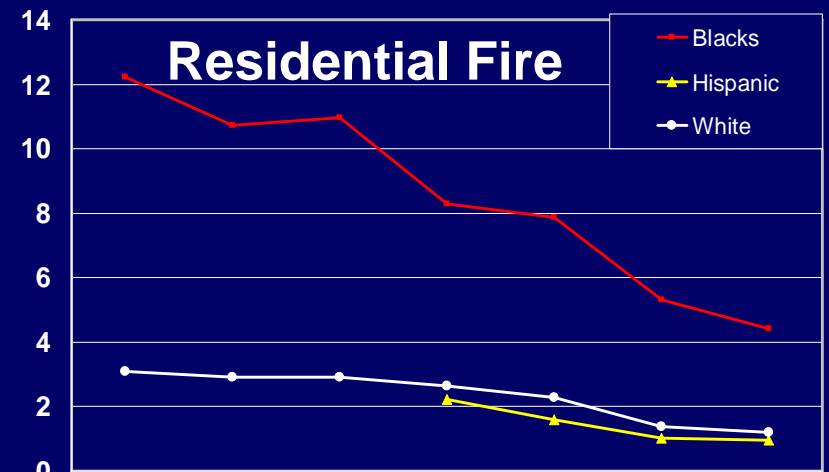
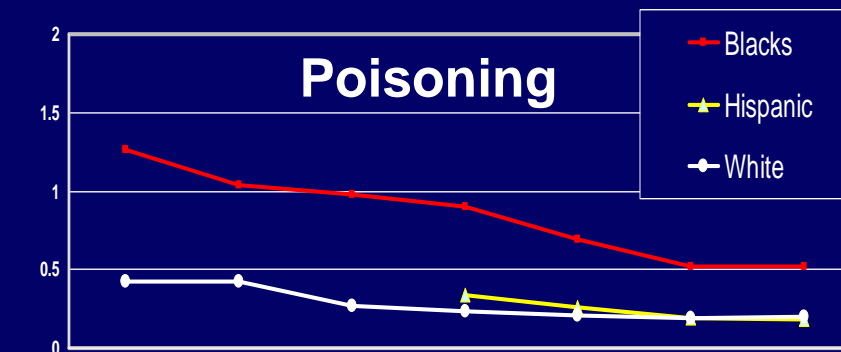
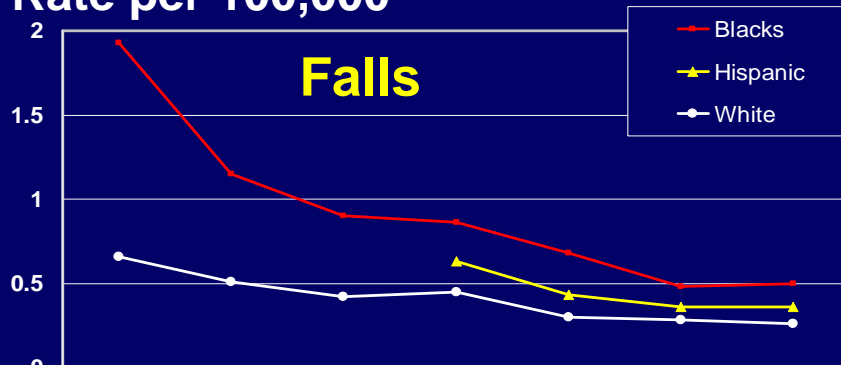
	<u>Black</u>	<u>Hispanic</u>	<u>AI/AN²</u>	<u>AS/PI³</u>
Burns	3.66	0.80	1.81	0.54
MV traffic occupant	1.61	1.74	2.98	0.67
Suffocation	2.51	0.84	1.78*	0.68
Pedestrian	2.01	1.68	1.89*	0.98
Poisoning	2.60	0.90*	3.65*	0.25*
Falls	1.92	1.38	1.84*	0.38*
<u>Drowning</u>	0.95	0.83	1.51*	0.36*

¹Whites are comparison group ² American Indian/Alaskan Native ³ Asian/Pacific Islander *Rates based on 20 or fewer deaths

Source: Pressley JC et al. Twenty Year Trends in Fatal Injuries to Very Young Children: The Persistence of Ethnic Disparities. 2004 World Injury Conference, Vienna Austria.

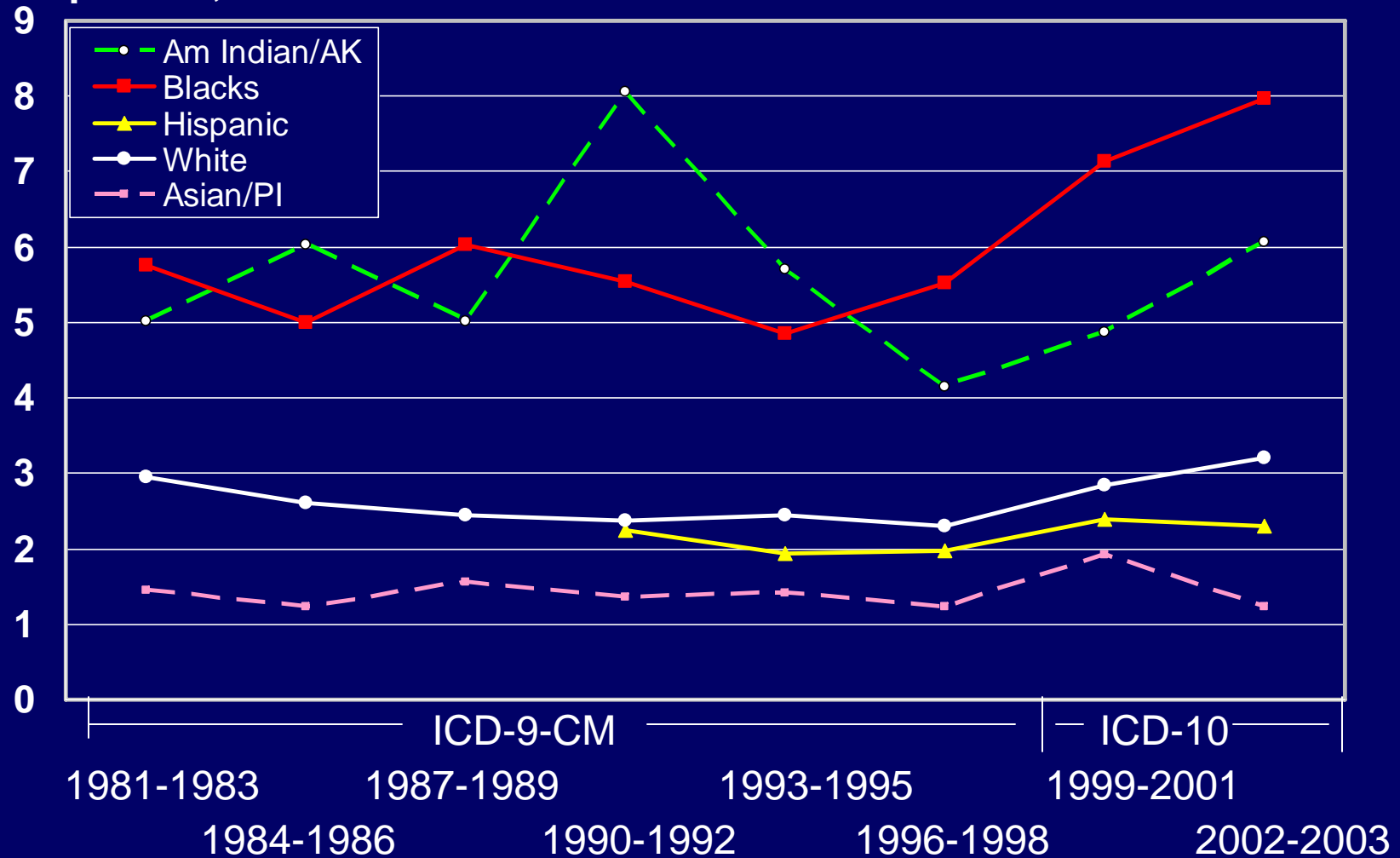
Trends in Unintentional Injury Mortality in Children Aged 0-4 Yrs (1981-2004)

Rate per 100,000



Rising Suffocation in 0-4 year olds: Real, SIDS classifications, or ICD-9 to ICD-10 transition?

Rate per 100,000



Pressley et al. Twenty year trends in fatal injuries to very young children aged 0 to 4 years: the persistence of racial disparities. *Pediatrics* 2007;119(4):e874-84.

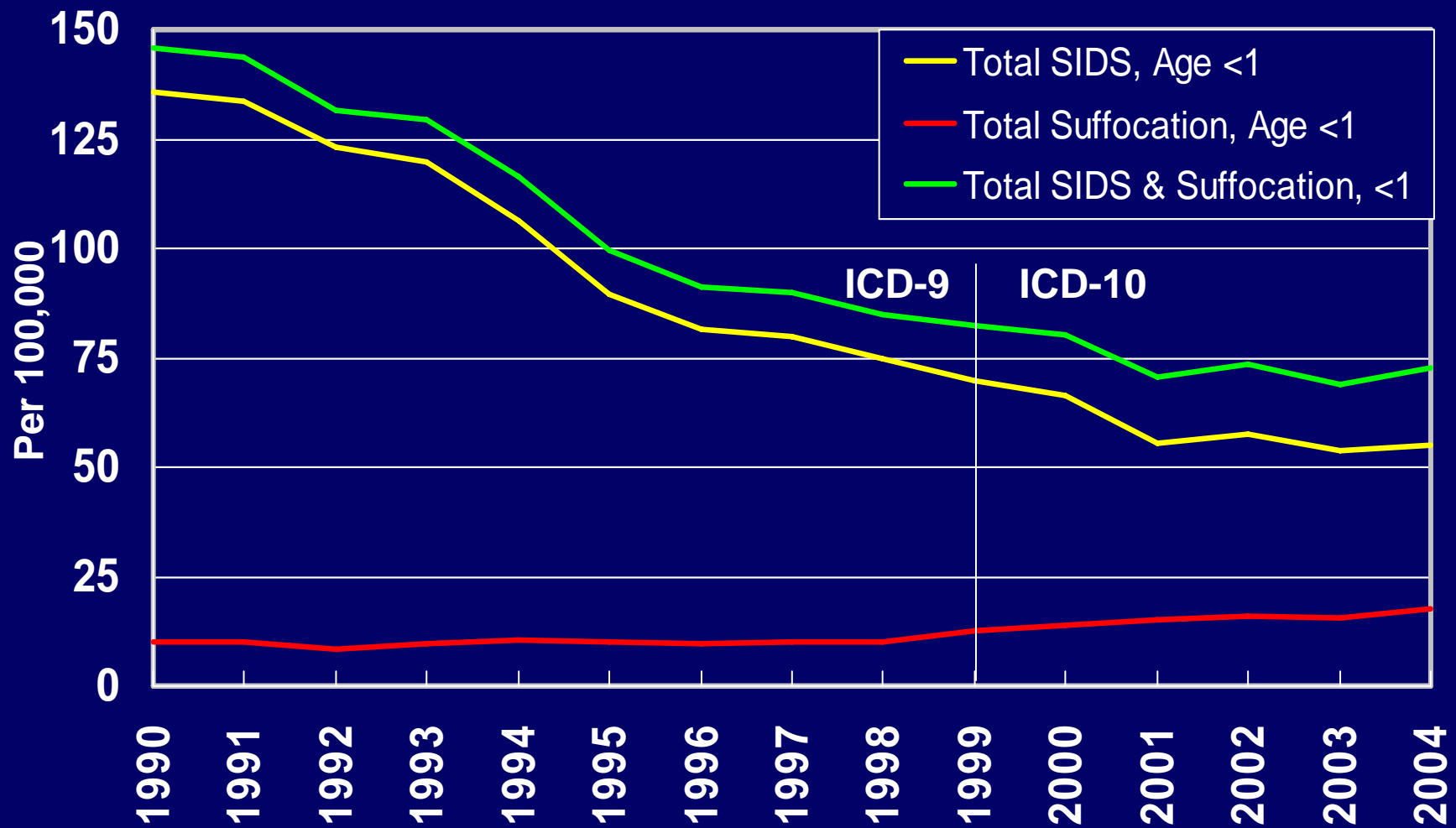
Suffocation in 0-4 year olds: Real, SIDS classifications, or ICD-9 to ICD-10 transition?

- Of the age groups 0-4, 4-9, 10-14 and 15-19, only the 0-4 age group experienced a rise in suffocation rates
- Within the 0-4 year group, only 3 of the 5 race and ethnic groups examined showed an increase in suffocation rates
- The increase began near the time of the change in ICD-9 to ICD-10 transition, but was a gradual linear increase (as opposed to a sharp increase observed only during the coding transition) that continued post transition

Suffocation in 0-4 year olds: Real, SIDS classifications, or ICD-9 to ICD-10 transition?

- When the 0-4 year old group was analyzed by year of age, only the < 1 year group experienced an increase in suffocation
- Black and White infants, but not Hispanic infants, experienced an increase in suffocation rates
- This increase occurred concomitantly with SIDS declines in the same age group as SIDS, but was very small compared to the large decrease in SIDS deaths

Sudden Infant Death Syndrome (SIDS) and Unintentional Suffocation Morality in Infants Aged < 1 Yr



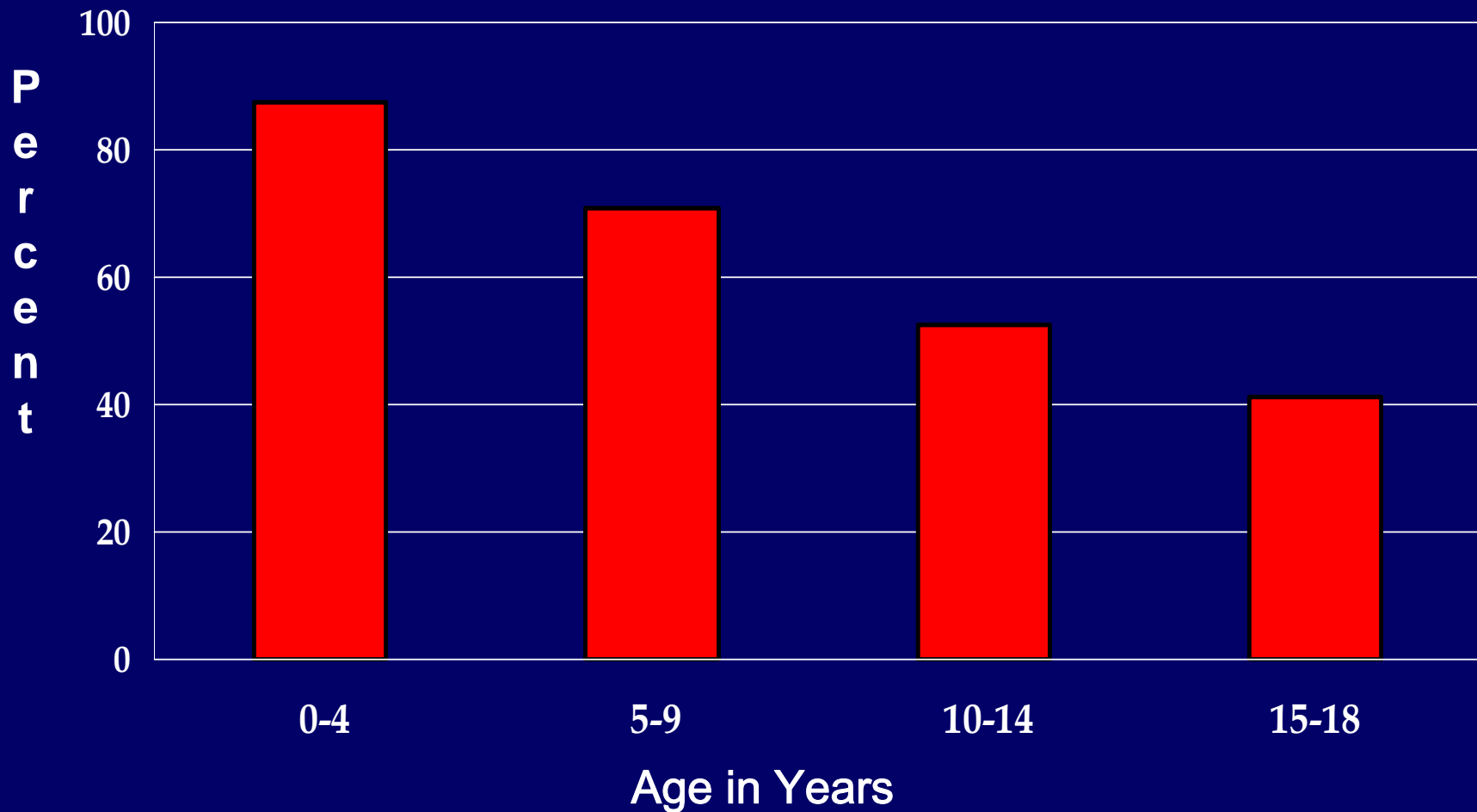
Injury Free Multi-Site Safe at Home Study: Suffocation, Burns and MV (%)

	<u>Whites</u>	<u>Blacks</u>	<u>Hisp</u>
<u>Suffocation</u>			
Stomach sleep position	15.8	29.3	17.7
Small parts tester	8.8	7.6	3.6
<u>Burns</u>			
No electric outlet covers	33.3	43.3	59.8
Smoke detector	94.6	98.0	95.5
Bath Thermometers	43.9	42.7	22.6
<u>Motor Vehicle Injury</u>			
Car seats, don't have	4.2	3.9	5.8
Car seats, always use	95.8	92.7	93.1

Incidence of Hospital Admission from Unintentional Fall from Buildings/Structures (per 100,000)

<u>Age (yrs)</u>	<u>Whites</u>	<u>Blacks</u>	<u>Hispanics</u>	<u>Total</u>
0 to 4	2.72	4.82	5.48	4.6
5 to 9	1.23	2.1	2.4	1.98
10 to 14	1.01	1.33	1.91	1.46
15 to 18	2.74	1.52	3.38	na ^c
Total	1.87	2.42	3.37	2.81

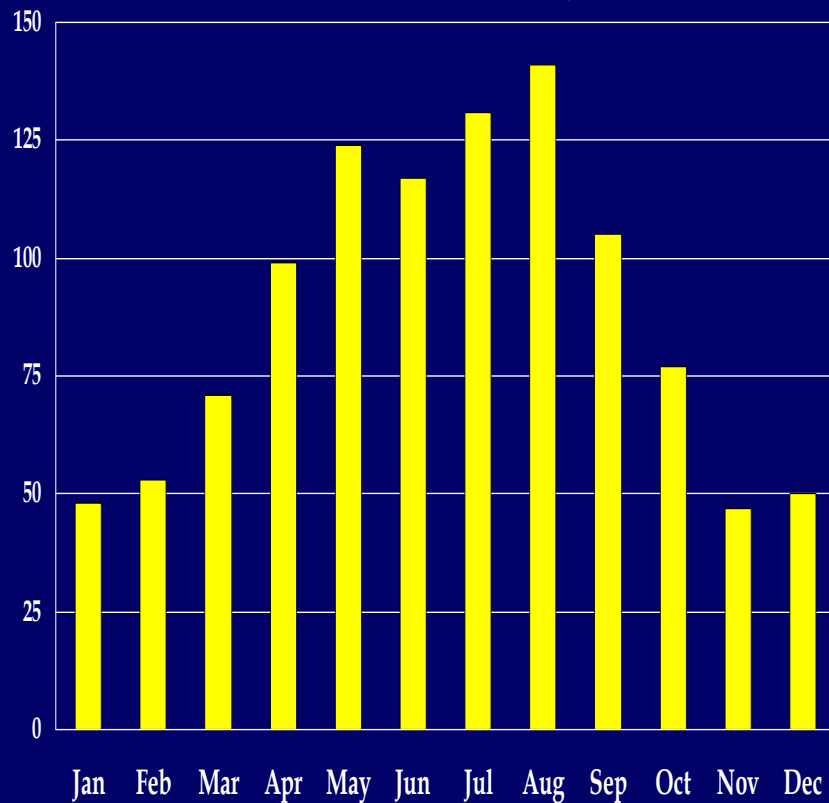
Proportion of U.S. Children Who Fall at Home Hospitalization by Age for Injury Due to Falls from Buildings



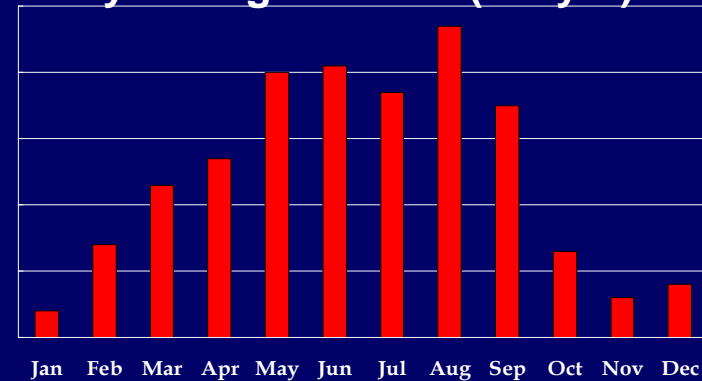
Source: Pressley JC and Barlow B. Injury Prevention 2005;11(5):267-73

Monthly Variation in the Distribution of U.S. Hospitalizations for Unintentional Pediatric and Adolescent Falls from Buildings (2000)

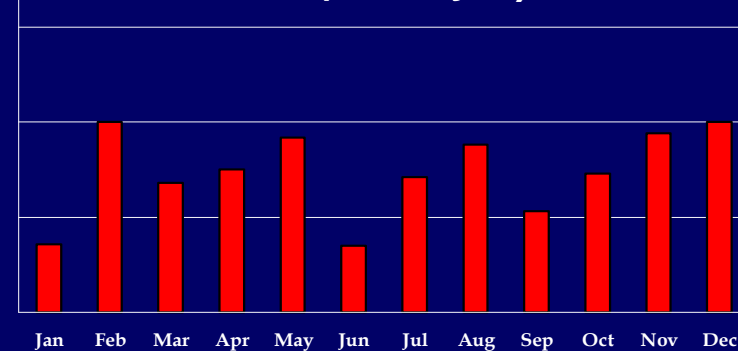
Total Population (0-18 yrs)



Very Young Children (0-4 yrs)



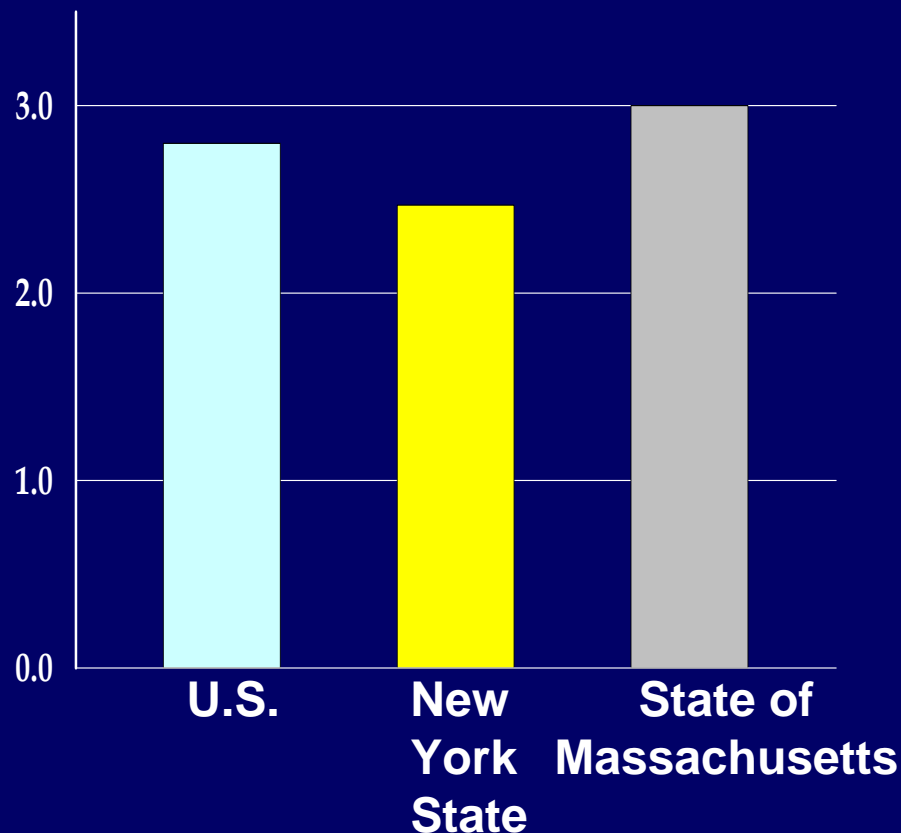
Adolescents (15-18 yrs)



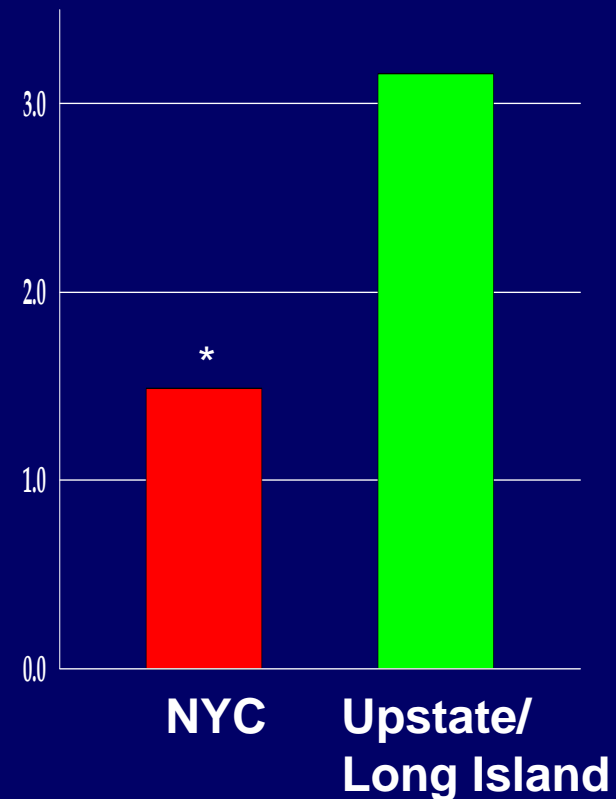
Number of Injuries by Month of Injury

Falls from Buildings/Structures: Hospitalization in Regions with and without Regulations (0-18 yrs)

Rate per 100,000



Rate per 100,000



*Window guard law for age 11 and under

Source: Pressley JC and Barlow B. Injury Prevention 2005;11(5):267-73

Injury Free Multi-Site Safe at Home Study: Fall Prevention

	<u>Whites</u>	<u>Blacks</u>	<u>Hisp</u>
<u>Falls</u>			
Stairs at home and no baby gates	45.6	39.0	20.8
No windows locks/ guards	22.9	25.3	85.2
Always use window locks	70.8	62.9	12.2
Window Space Disk for measuring opening for window fall risk	5.3	6.5	4.4

Conclusions

- All ethnic groups experienced significant declines in injury mortality during the study period
- Rates of decline varied considerably by race/ethnicity and individual injury mechanism
- Despite declines, the relative race and ethnic disparities observed over the last 20+ years have been largely maintained indicating a need for intensified, well-focused injury prevention approaches in minority communities
- A combined analysis of administrative data and pilot home safety data provide clues to areas where preventive efforts might be fruitful