Various approaches to assessing criminal lethality: implications for changes in for total criminal violence

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Two criminal violence lethality issues

1. Primary: lethality itself – the danger of death, expressed as deaths per some unit of serious violent attacks, e.g.,

CFR= homicides/(homicides + aggravated assaults)

2. Secondary: changing amounts of criminal violence in late 20th and early 21st-century U.S.

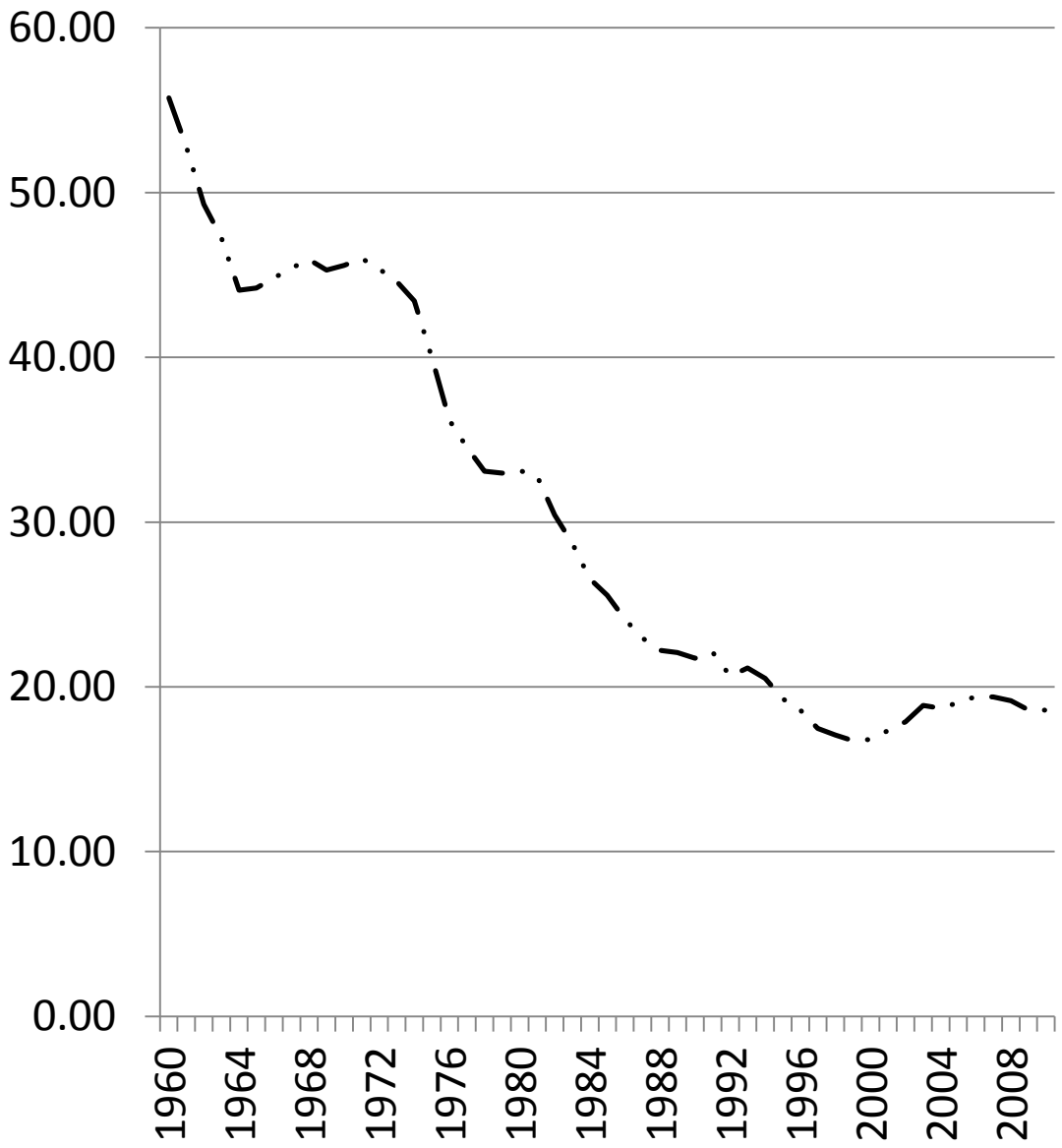
To begin:

Fatality rates (per 1,000 cases) based on UCR aggravated assaults, 1960-2010

Using UCR aggravated assaults as a proxy for nonfatal violent criminal incidents, lethality of such incidents dropped by some two-thirds between 1960 and 1999.

Lethality (fatality rate) = Homicides/(homicides + aggravated assaults)

Source: FBI Uniform Crime Reports (UCR Data Tool): annual aggravated assault and homicide counts.



Harris, Thomas, Fisher, and Hirsch pointed this out in 2002, and proposed:

1. that the extraordinarily steep decline was caused by improvements in medical care and ancillary services

2. that homicide count trends therefore understated large increases in the quantity of criminal violence

3. further, that in the absence of improvements in care, late 20th-century homicides would have increased to as many as 45,000 to 70,000 per year

Anthony R. Harris, Stephen H. Thomas, Gene A. Fisher and David J. Hirsch (2002)

But there are well-known issues with aggravated assaults and UCR data in general

1. UCR crimes do not provide information on injuries

2. Aggravated Assault is a heterogeneous measure that may include a changing mix of types of actions

3. Specifically:
   a. High proportions of aggravated assaults are unreported or unrecorded

   b. changes in counts may represent changes in police "productivity" or "efficiency" and may follow from computerized crime reporting, 9-1-1 systems, and effects of the women's movement

4. When applied to lethality, it is questionable if observed trends adequately trace changes in similar types of events

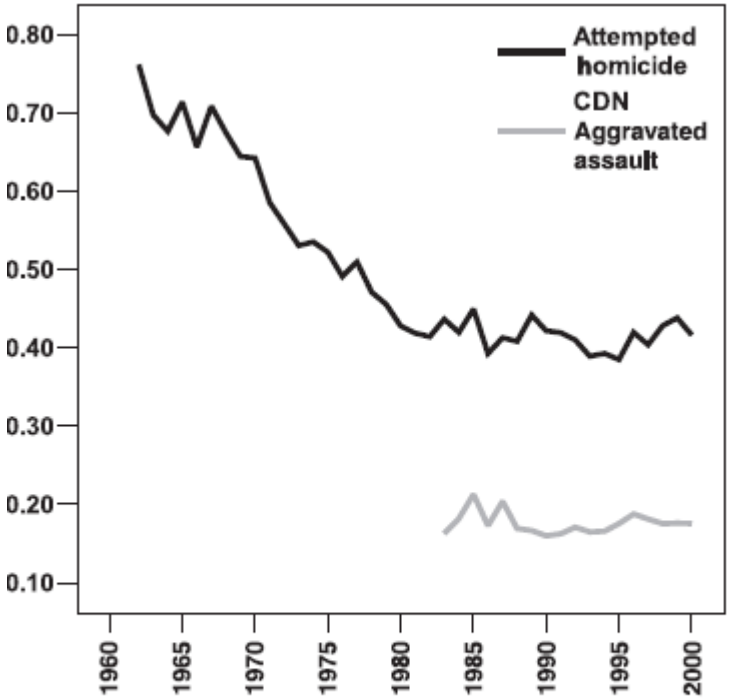
Sources: O'Brien (1996, 2003); Rosenfeld (2007); Blumstein (2006)

First test of this: Canadian lethality based on attempted homicides : no drop after 1980

Andresen found for Canada the same trend for aggravated assault "lethality" as Harris et al. did for the U.S.

When he substituted attempted homicide for aggravated assault, there was no decline in lethality after 1980,

Source: Andresen (2007)

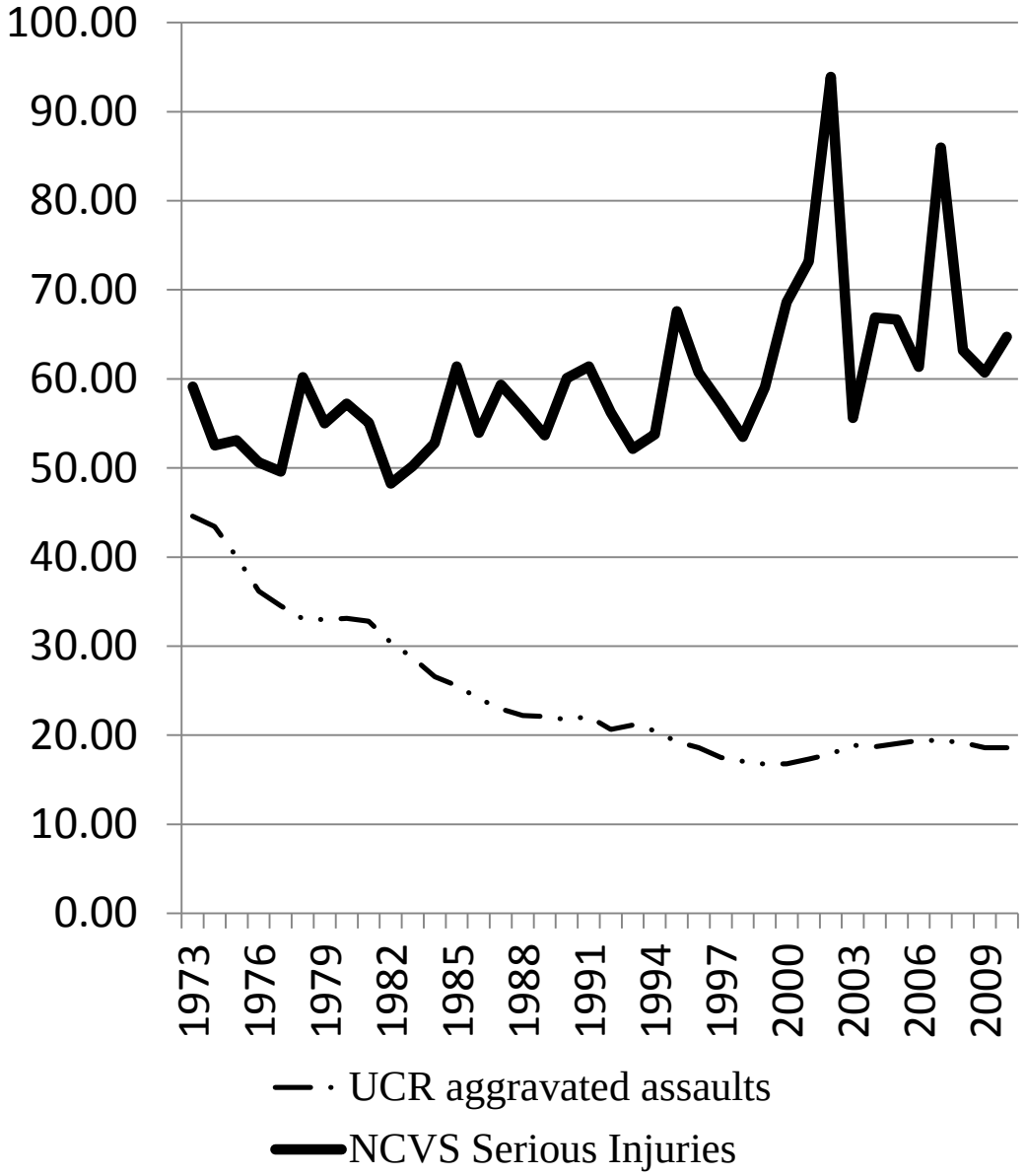


igure 5: Augmented lethality indices for Canada
ource: Statistics Canada, calculations by the author.

Second test: fatality rates (per 1,000 cases) based on UCR aggravated assaults and NCVS serious injuries, 1973-2010

No consistent decease in measured lethality at any time in the history of the National Crime Victimization Survey

UCR and NCVS figures diverge consistently



Source: Eckberg (2015)

I have suggested that the NCVS trend is more reliable, because:

1. The known issues with aggravated assault reporting and recording

2. Evidence that medical care and ancillary services can have relatively small effects on the overall mortality from criminal attacks (especially with ongoing “crisis” in emergency medicine)

3. Criminological findings on lethality have generally pointed toward fairly small and/or vacillating effects of availability of medical facilities, EMS, etc., on criminal homicide

4. Evidence that changes in weaponry and targeting may offset medical advances (in social science, particularly Lauritsen, Gorislavsky, & Heimer, 2013).

However, the NCVS also has “issues”

1. The nature of a survey

2. noncooperation, especially among minority youth

3. particularly, long-known underestimation of gun crimes

One approach to testing reliability of lethality changes

Comparisons of approaches using different, if possible independent, data series & measures:

1. NCVS aggravated assaults (1973-2010)

2. UCR robberies (1960-2010)

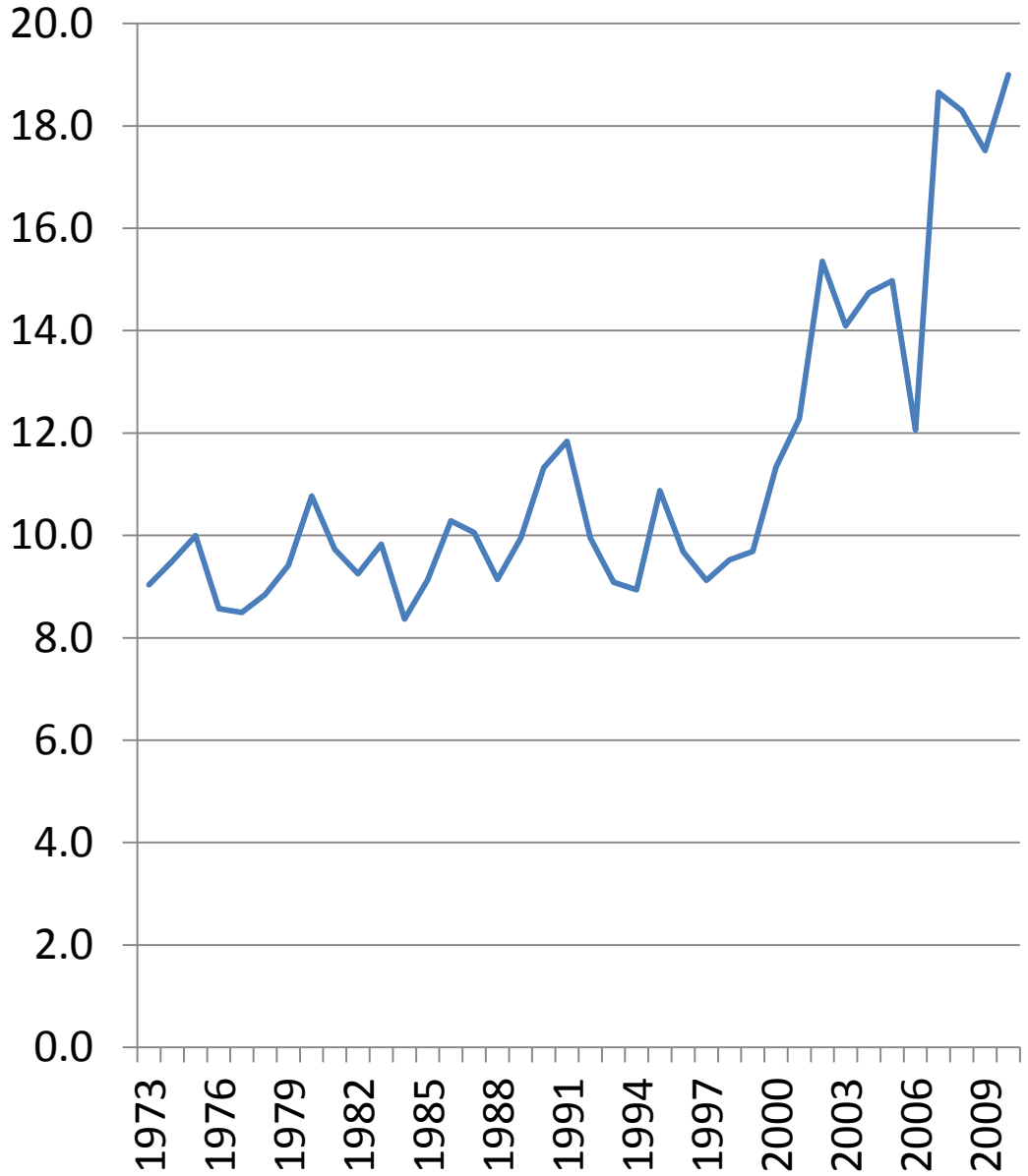
3. Survey of non-fatal emergency department admissions (National Hospital Ambulatory Medical Care Surveys, 1992-2010)

Example One: Lethality based on NCVS aggravated assaults, 1973-2010 (CFR/1,000 assaults)

NCVS aggravated assault approach shows no decline in any period and a steep rise in lethality post 2000

Sources: NCVS annual Criminal Victimization reports and UCR homicides of those 12+

NOTE: NCVS break in series in 1993, adjusted via ratio factor

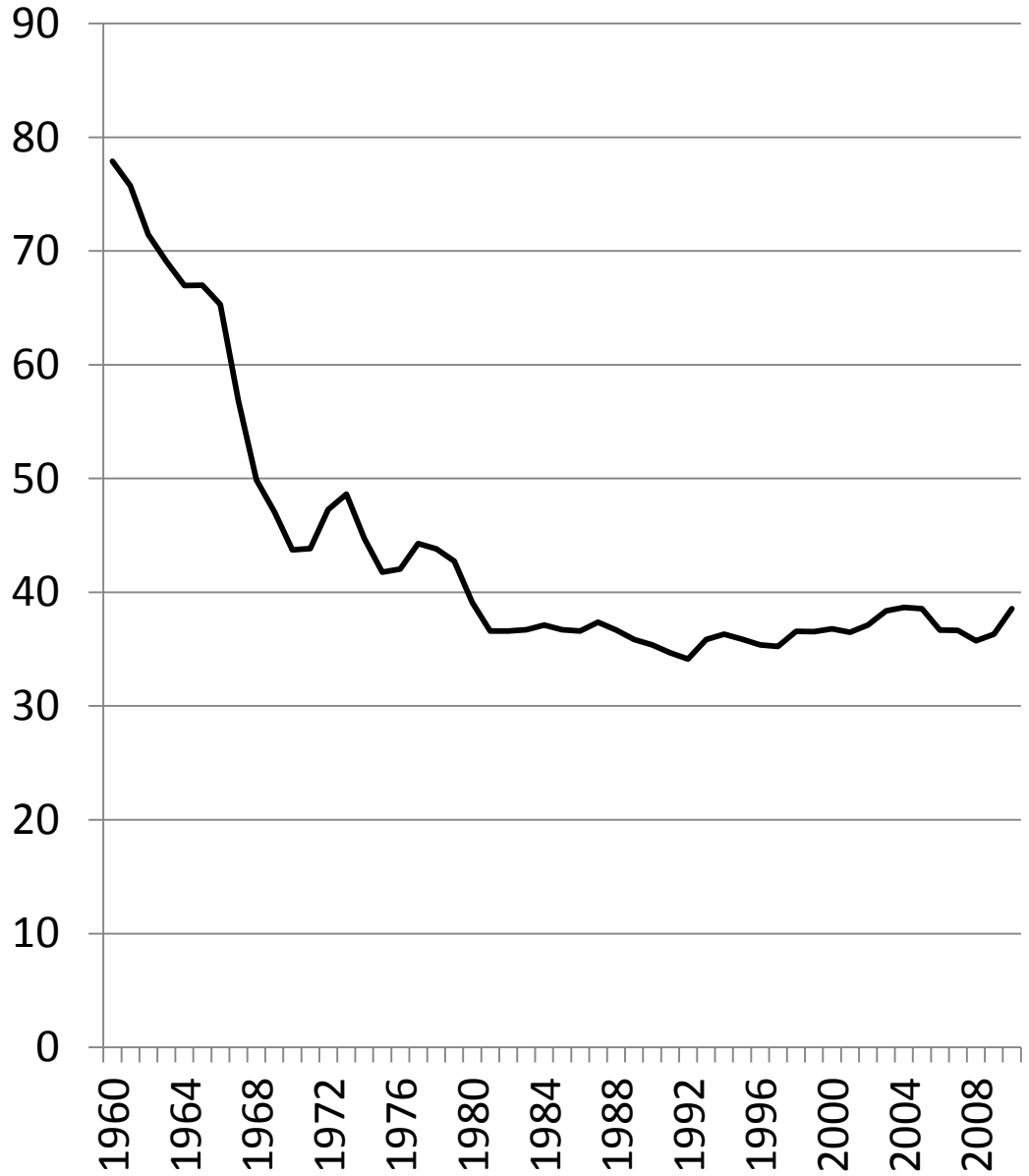


Example Two: Lethality based on UCR robberies, 1960-2010 (CFR/1000 robberies)

Blumstein (2006) suggested robbery as a better measure for violent crime trends than aggravated assault.

Graph shows strong lethality drop to 1971, a smaller drop to 1981, no further appreciable decline

Source: FBI Uniform Crime Reports annual reports (UCR Data Tool)



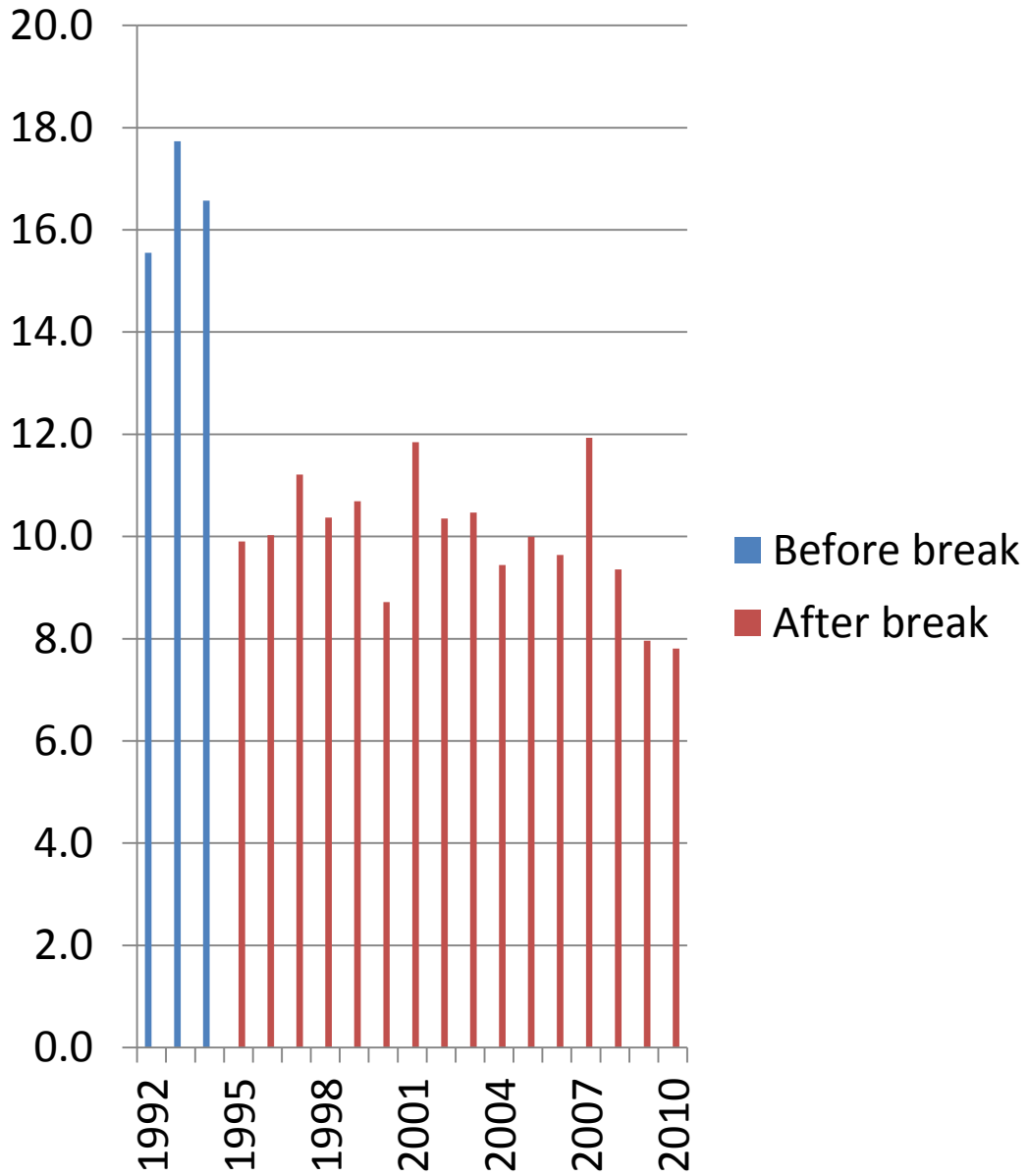
Example three: Lethality based on nonfatal emergency department admissions, 1992-2010

(Break in series 1994-1995, caused by change in survey instrument)

No indication of decline in lethality—before or after the break—into the early 2000s.

Sources: National Hospital Ambulatory Medical Care Surveys, Public Use Data, "Cause of injury" (ICD-9), 1992-2010; and CDC Compressed Mortality Data (CDC Wonder)

NOTE: NHAMCS data include some fatalities; these have been removed.



Other examples of weaponry, etc., offsetting medical care?

Lethality of battle injuries, U.S. Army, by war.

Note Civil War vs. WWII. Similar fatality rates despite various developments:

(a) Antisepsis

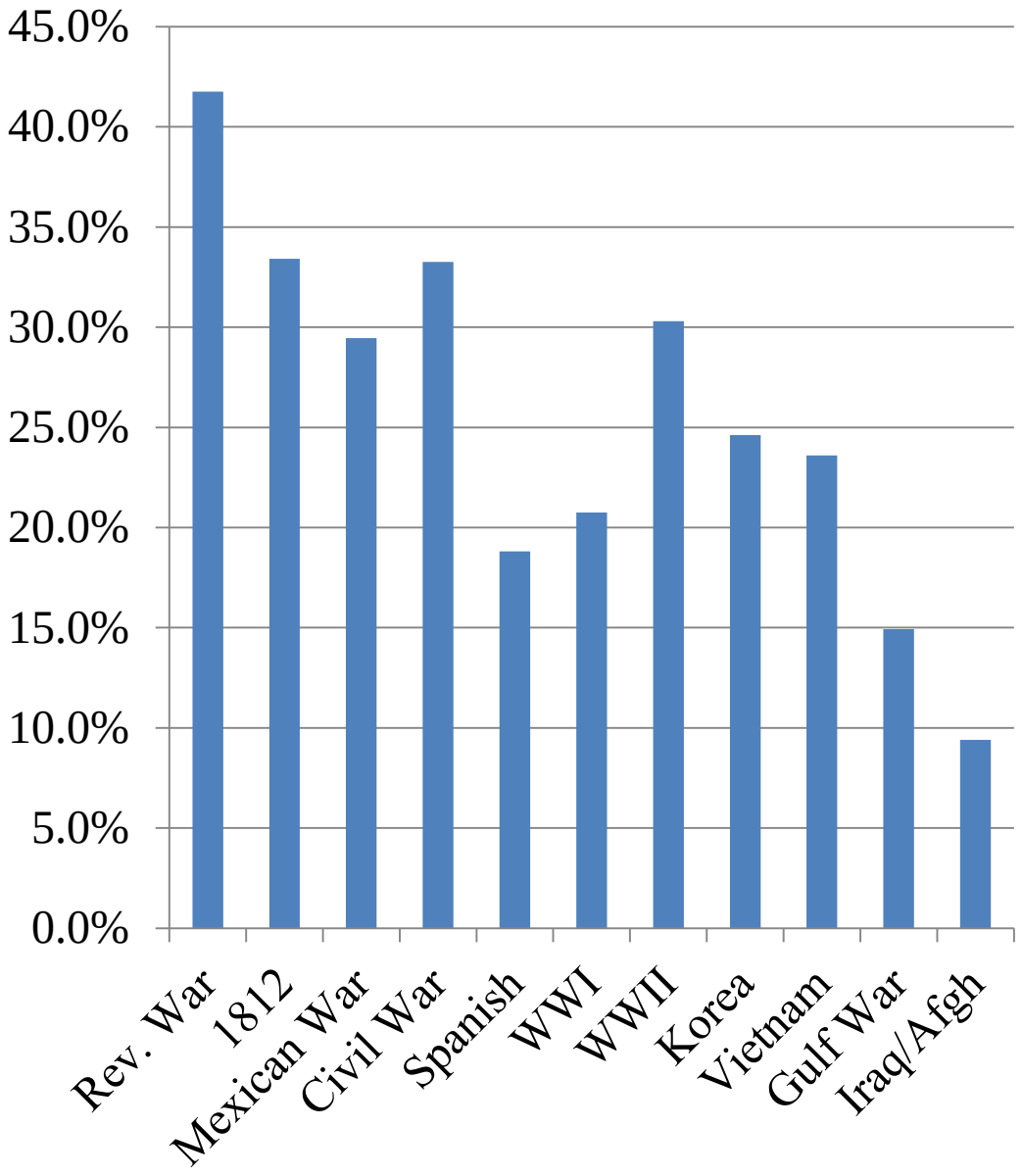
(b) Blood typing & transfusion

(c) Antibiotics

(d) Professionalization of medicine

(e) Organized systems of medics and forward-based hospitals

Source: DOD, Office of the Adjutant General



Conclusions

1. Lethality trend based on UCR aggravated assaults as non-lethal violence is an outlier

2. None of the other data sources/types supports a conclusion of declining lethality of criminal violence from (at least) 1981 through the end of the 20th century

3. NCVS flat lethality to the end of the 20th century is consistent with trends using other measures, at least since 1981.

Implications for amount of serious violence

1. This supports the arguments that the extraordinary late-20th century increase in UCR aggravated assault counts is inflated by the processes noted above.

2. An implication is that the argument of a masked increase in total societal violence is incorrect

3. Rather – it is more likely that rises and falls in homicide rates are reasonable proxies for changes in total societal violence

References

1. Andresen, M. A. (2007). Homicide and medical science: Is there a relationship? *Canadian Journal of Criminology and Criminal Justice*, *49*, 185-204.
2. Blumstein, A. (2006). Disaggregating the violence trends. In A. Blumstein & J. Wallman (Eds.), *The crime drop in America* (Rev. ed., pp. 13-44). New York, NY: Cambridge University Press.
3. Eckberg, D. L. (2015) Trends in Conflict: Uniform Crime Reports, the National Crime Victimization Surveys, and the Lethality of Violent Crime. *Homicide Studies 19* (1): 58-87.
4. Harris, A. R., Thomas, S. H., Fisher, G. A., & Hirsch, D. J. (2002). Murder and medicine: The lethality of criminal assault 1960-1999. *Homicide Studies*, *6*, 128-166.
5. Lauritsen, J. L., Gorislavsky, E., & Heimer, K. (2013). Economic conditions and violent victimization trends among youth: Guns, violence and homicide, 1973-2005. In R. Rosenfeld, M. Edberg, X. Fang, & C. S. Florence (Eds.), *Economics and youth violence: Crime, disadvantage and community* (pp. 92-124). New York: New York University Press.
6. O'Brien, R. M. (1996). Police productivity and crime rates: 1973-1992. *Criminology*, *34*, 183-207.
7. O'Brien, R. M. (2003). UCR violent crime rates, 1958-2000: Recorded and offender-generated trends. *Social Science Research*, *32*, 499-518.
8. Rosenfeld, R. (2007). Explaining divergence between UCR and NCVS aggravated assault trends. In J. P. Lynch & L. A. Addington (Eds.), *Understanding crime statistics: Revisiting the divergence of the NCVS and UCR* (pp. 251-268). New York, NY: Cambridge University Press.