



# Future of Work Injuries

Work Related Injuries Workshop

May 1-2, 2017

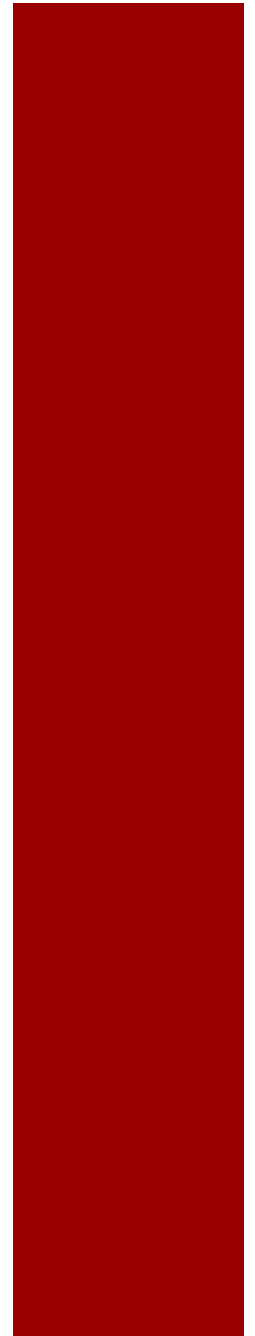
Thomas H Winters MD FACOEM FACPM



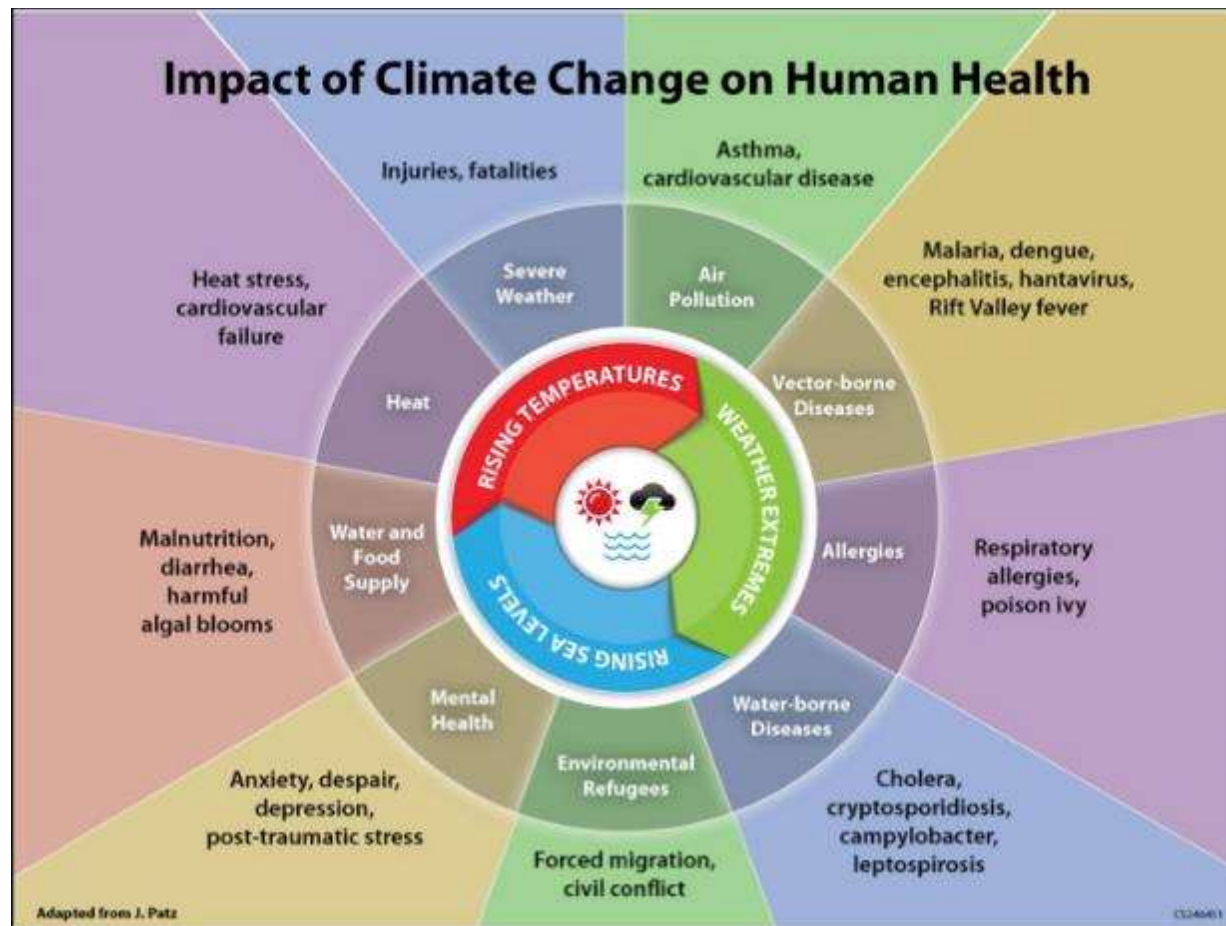
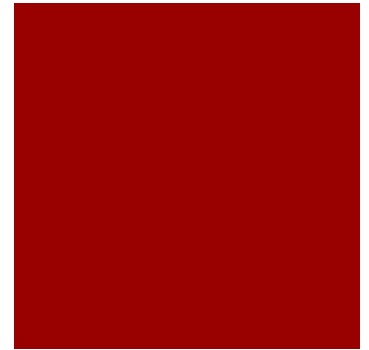
# INTRODUCTION

- Changing (Work) Environment
- Baseline Worker Health
- Evolving Workplace
- Positive Changes
- Opportunities
- Conclusions

# CHANGING ENVIRONMENT

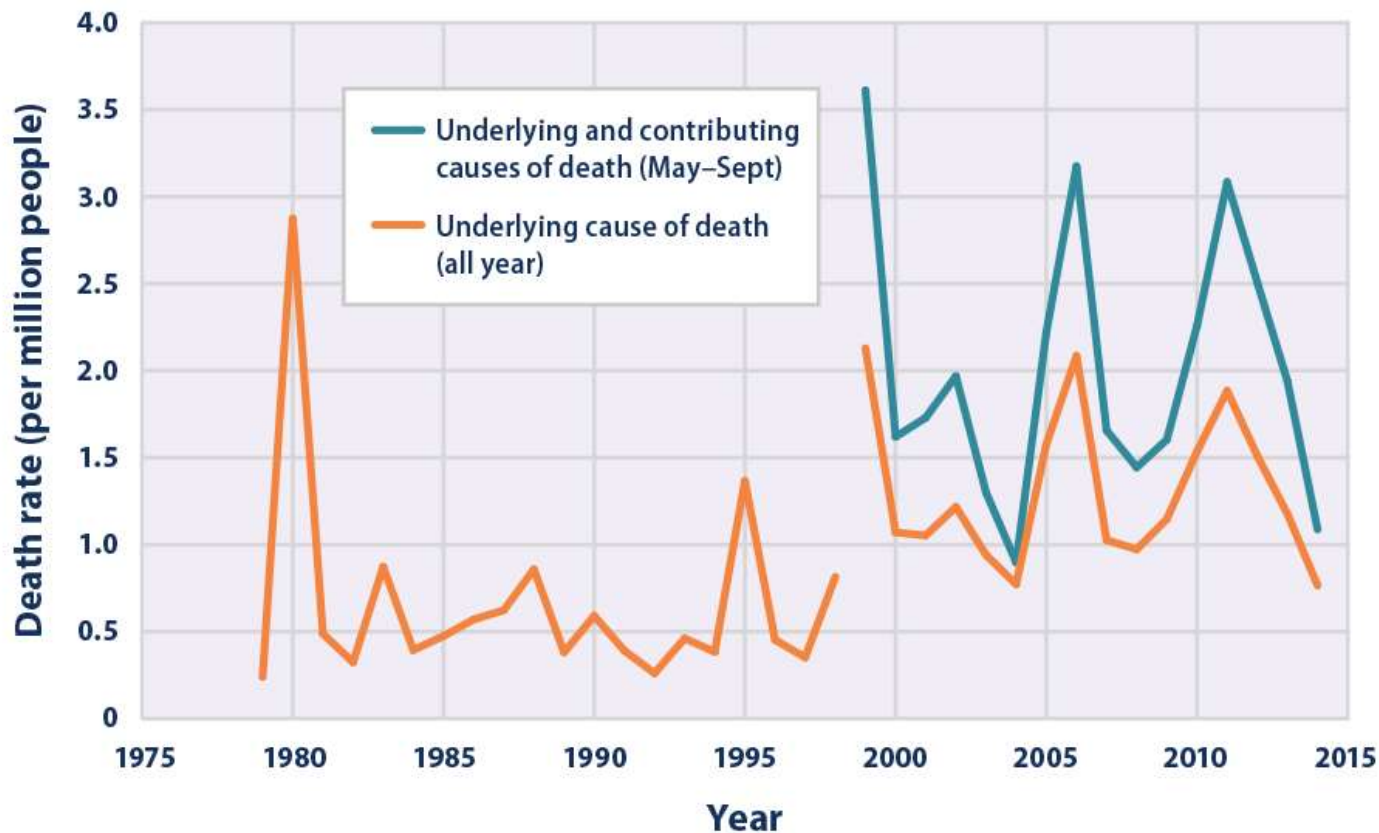


# climate change



- <https://toolkit.climate.gov/topics/human-health>

## Deaths Classified as “Heat-Related” in the United States, 1979–2014



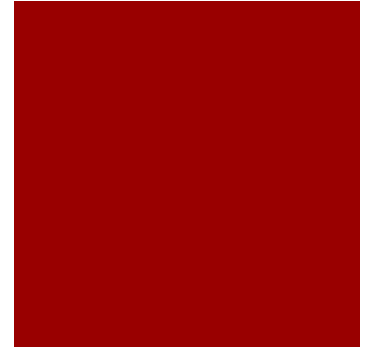
Between 1998 and 1999, the World Health Organization revised the international codes used to classify causes of death. As a result, data from earlier than 1999 cannot easily be compared with data from 1999 and later.

Data sources:

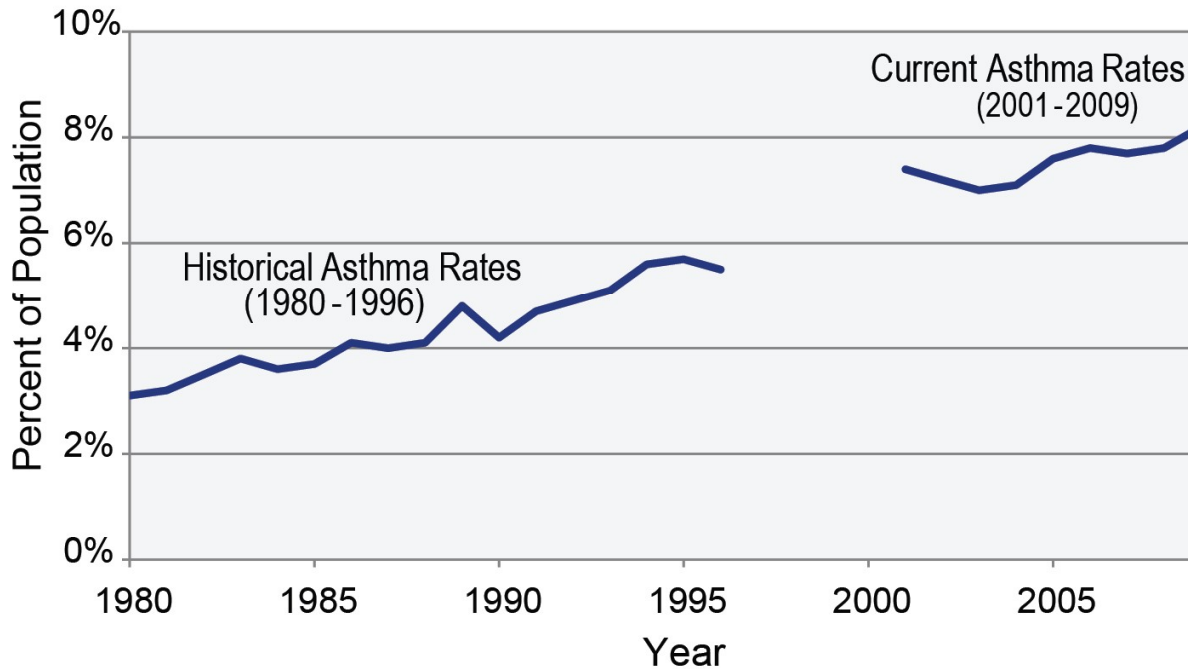
- CDC (U.S. Centers for Disease Control and Prevention). 2016. CDC WONDER database: Compressed mortality file, underlying cause of death. Accessed February 2016. <http://wonder.cdc.gov/mortSQL.html>.
- CDC (U.S. Centers for Disease Control and Prevention). 2016. Indicator: Heat-related mortality. National Center for Health Statistics. Annual national totals provided by National Center for Environmental Health staff in June 2016. <http://ephtracking.cdc.gov/showIndicatorPages.action>.

For more information, visit U.S. EPA’s “Climate Change Indicators in the United States” at [www.epa.gov/climate-indicators](http://www.epa.gov/climate-indicators).

# climate change



U.S. Asthma Rates (1980-2009)



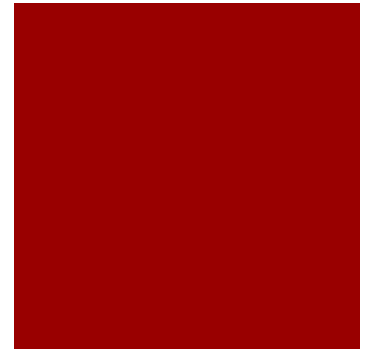
- CDC; Health E-Stat; U.S. Census Bureau 2010, 2012; and Akinbami et al. 2011

# Change Ecosystems



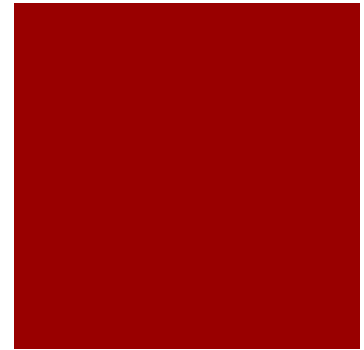
- Vectors expand northward with earlier seasons
  - Tick
    - Lyme is now in 16 states
    - Rocky Mtn spotted fever, now 3000 cases a year
    - ehrlichiosis, anaplasmosis, babesiosis, Powassan, Heartland
  - Mosquito
- Increased Global Travel -> Greater Transmission
  - influenza
  - Ebola
  - MERS

Disease maps

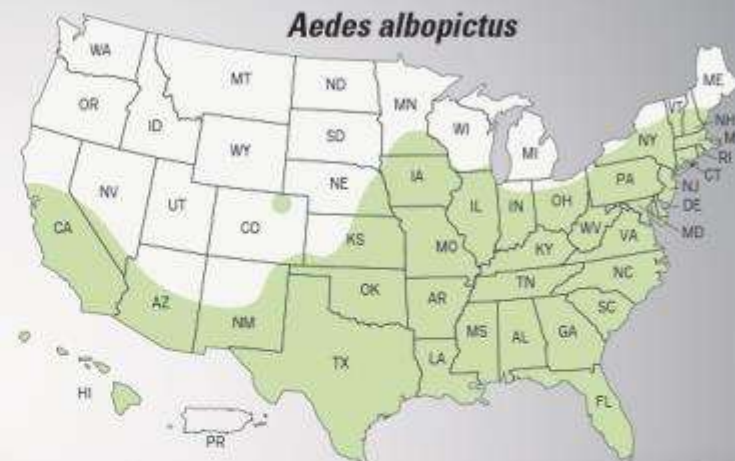




# Disease maps



Estimated range of *Aedes aegypti* and *Aedes albopictus* in the United States, 2016\*



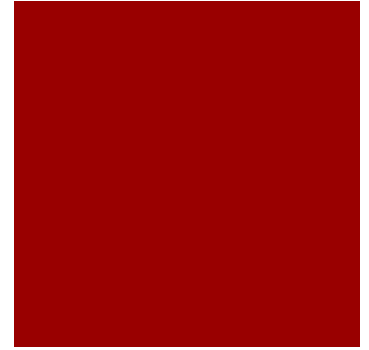
***Aedes aegypti* mosquitoes are more likely to spread viruses like Zika, dengue, chikungunya than other types of mosquitoes such as *Aedes albopictus* mosquitoes.**

- These maps show CDC's best estimate of the potential range of *Aedes aegypti* and *Aedes albopictus* in the United States.
- These maps include areas where mosquitoes are or have been previously found.
- Shaded areas on the maps do not necessarily mean that there are infected mosquitoes in that area.

\*Maps have been updated from a variety of sources. These maps represent CDC's best estimate of the potential range of *Aedes aegypti* and *Aedes albopictus* in the United States. Maps are not meant to represent risk for spread of disease.

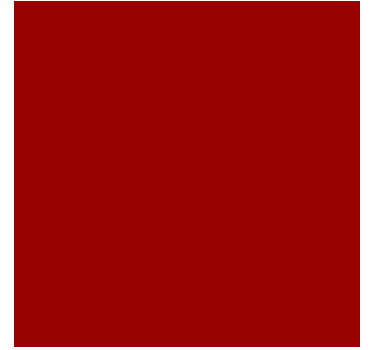
SOURCE: Zika: Vector Surveillance and Control. [www.cdc.gov/zika/vector/index.html](http://www.cdc.gov/zika/vector/index.html)

# novel agents of exposure



- greater spread of infectious agents
  - Climate change broadens range of vectors e.g.
  - global travel increases intercontinental transmission
- Clinicians must maintain high level understanding of emerging ID
- Clinicians role in corporate, hospital and community settings - inform and educate on risks:
  - outdoor workers and activities
  - Travel
  - In community

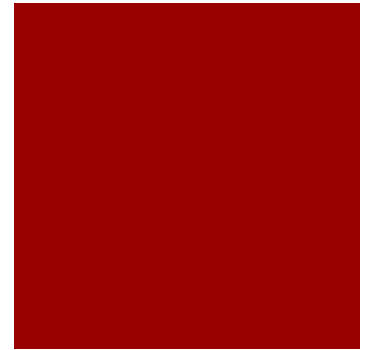
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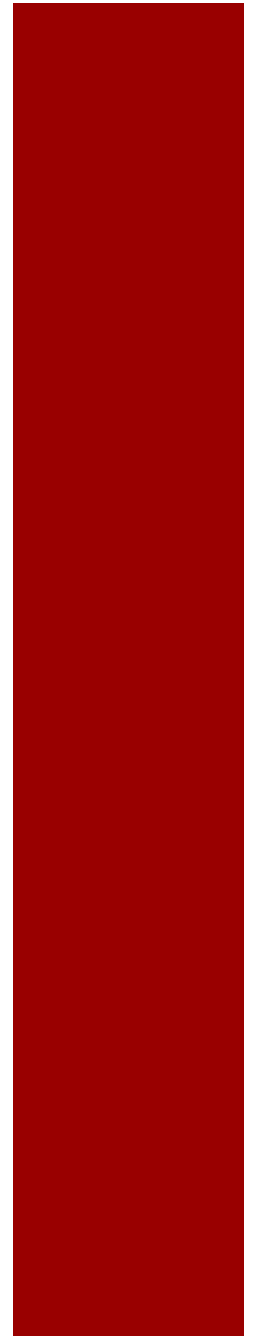
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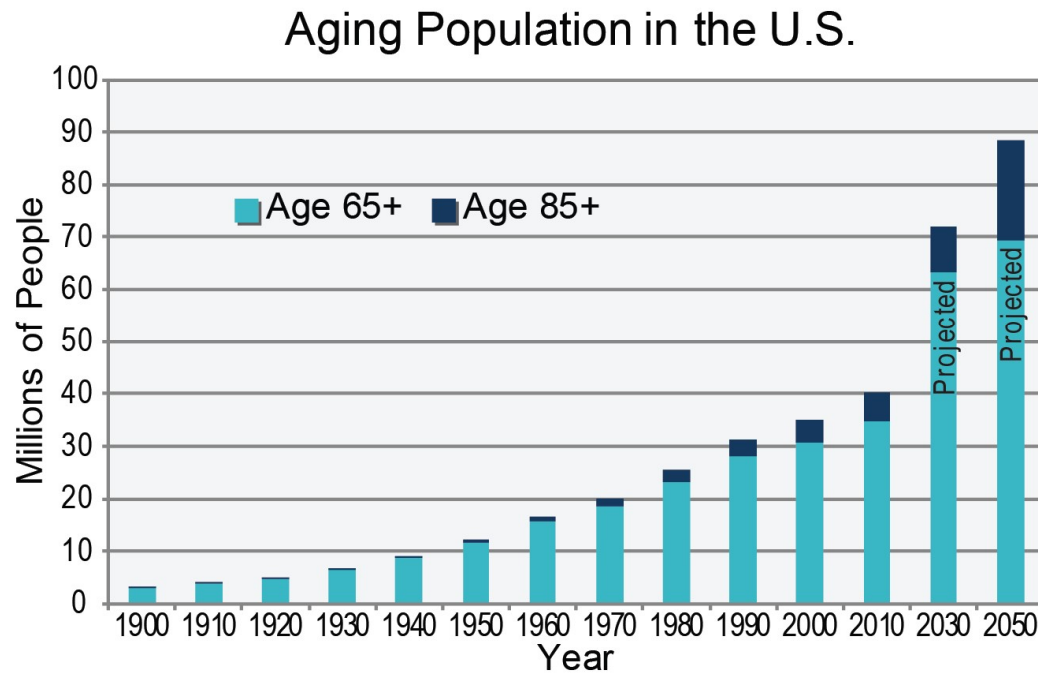
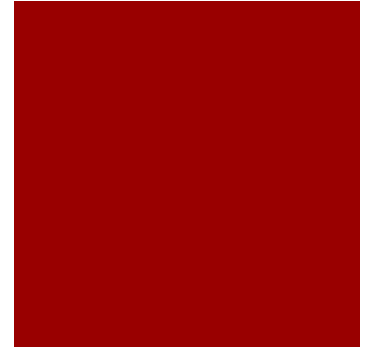
- Nanomaterials
- Immunologics
- Gene Therapy
  - e.g. Lentivirus



BASELINE  
HEALTH



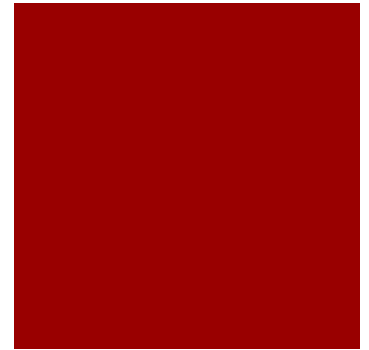
# aging workers



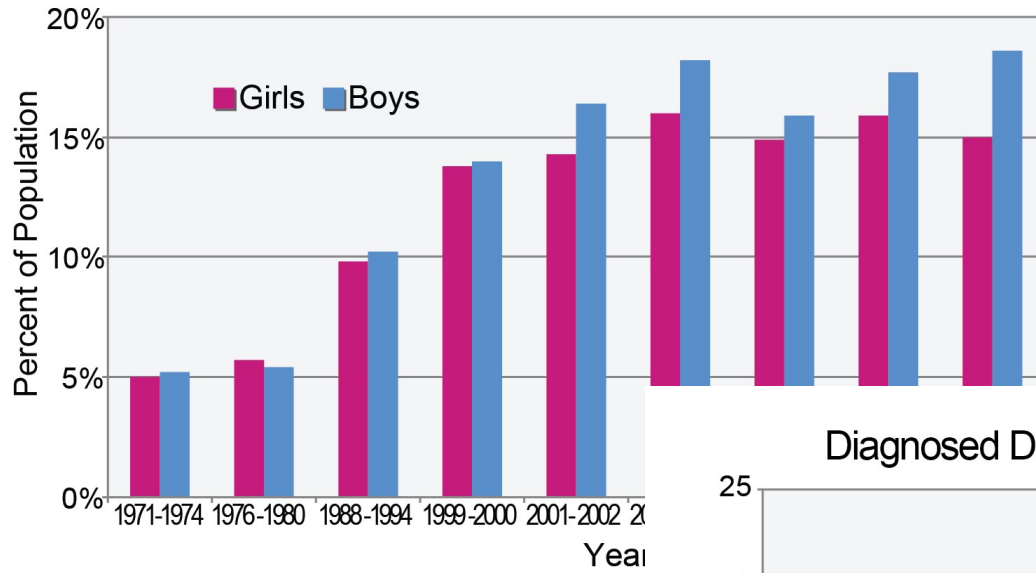
- CDC; Health E-Stat; U.S. Census Bureau 2010, 2012; and Akinbami et al. 2011

# obesity epidemic

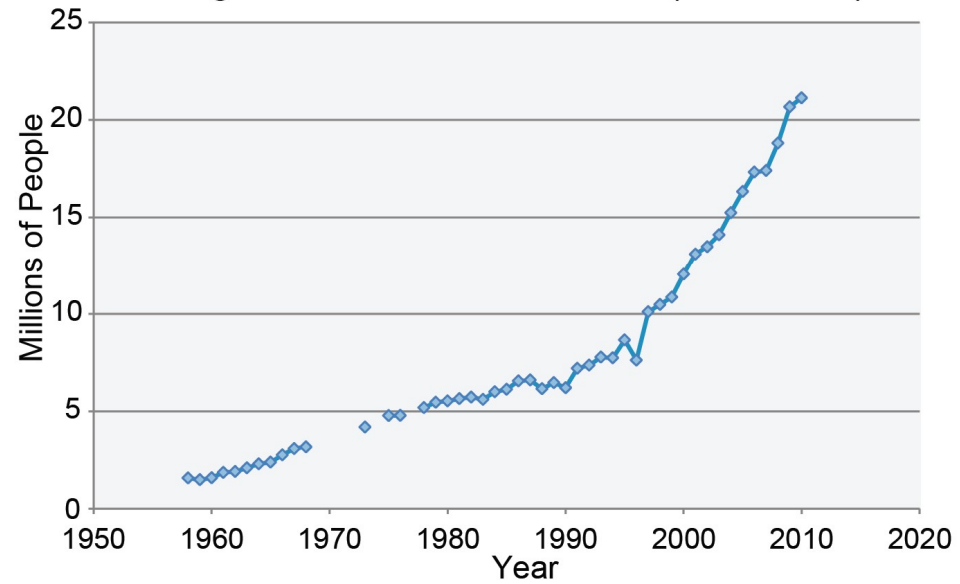
- Ergonomics
  - obese workers
  - workers who handle obese patients
- Cardiovascular
  - Sudden cardiac death e.g. firefighters, police
- MSD & DDD
  - mechanical stress
  - exacerbated by vasculopathy?
- Peripheral neuropathy
  - primary disorders e.g. CTS
  - tactile sensitivity loss reduces work safety



U.S. Obesity Rates in Children and Adolescents (1971-2010)



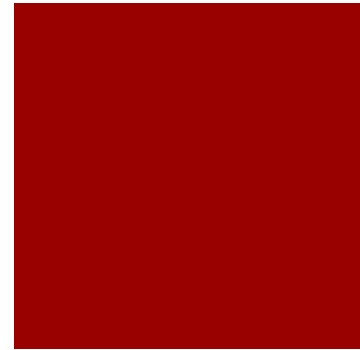
Diagnosed Diabetes in the U.S. (1958-2010)



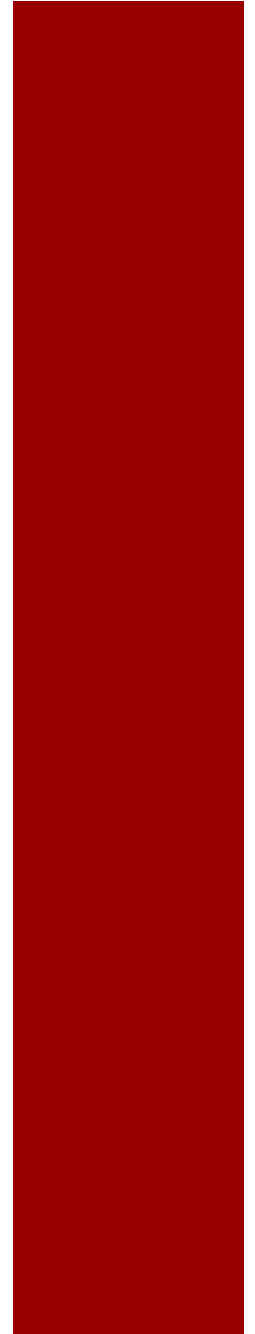
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# sitting disease

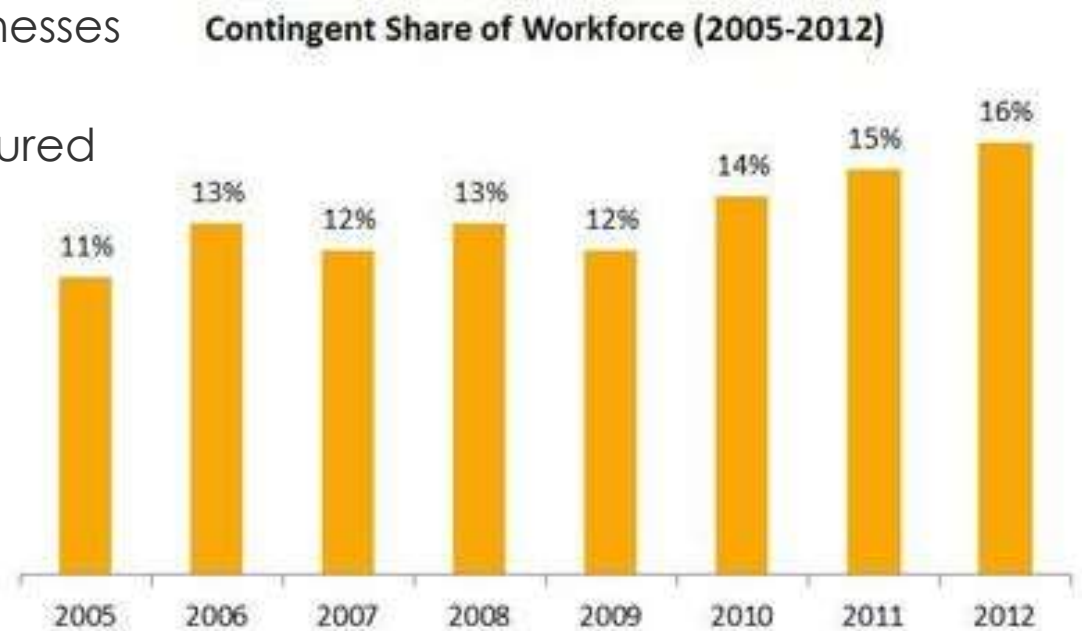


# EVOLVING WORKPLACE



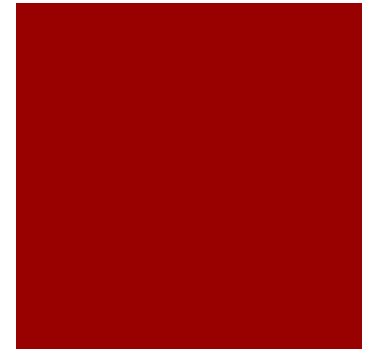
# non-employees

- Contingent Workers now third of workforce
  - contractors, consultants, free-lance, temporary
  - remote / telecommuters
  - small (family-owned) businesses
  - migrant workers
  - ACA allows most to be insured
  - app-based workers
    - e.g. Uber drivers

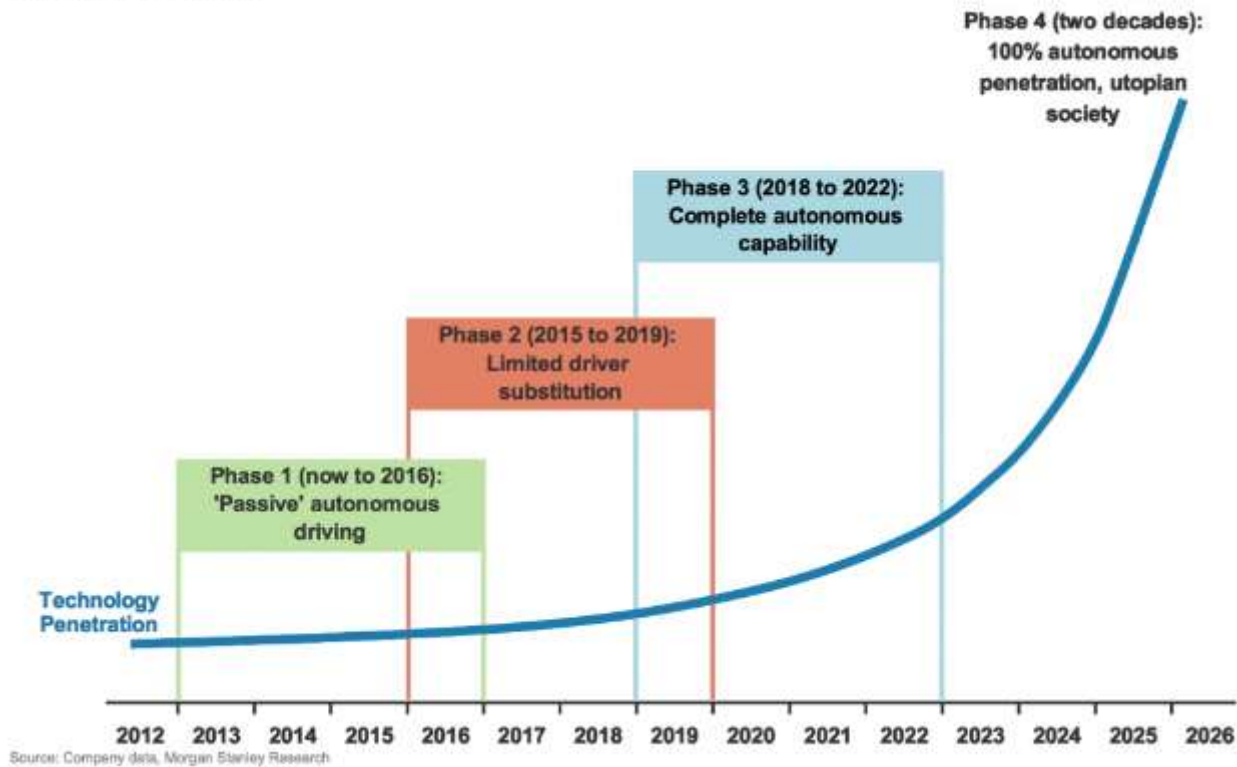


Staffing Industry Analysts 2013 Contingent Buyer Survey

# autonomous vehicles = fewer DOT exams



Timeline for Adoption

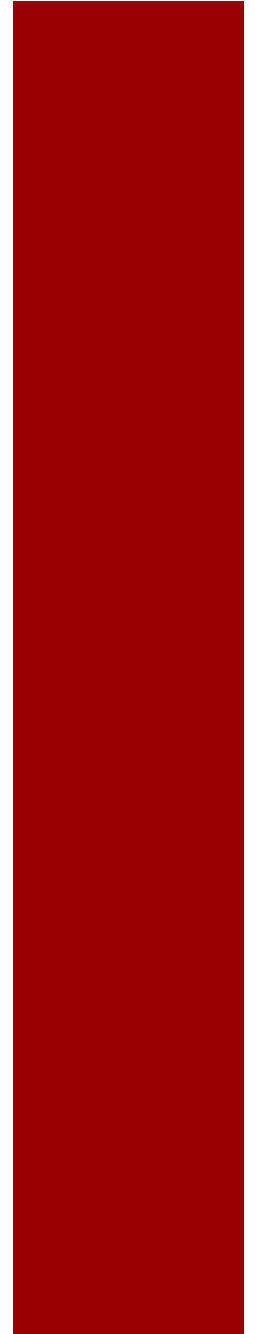


# data overload

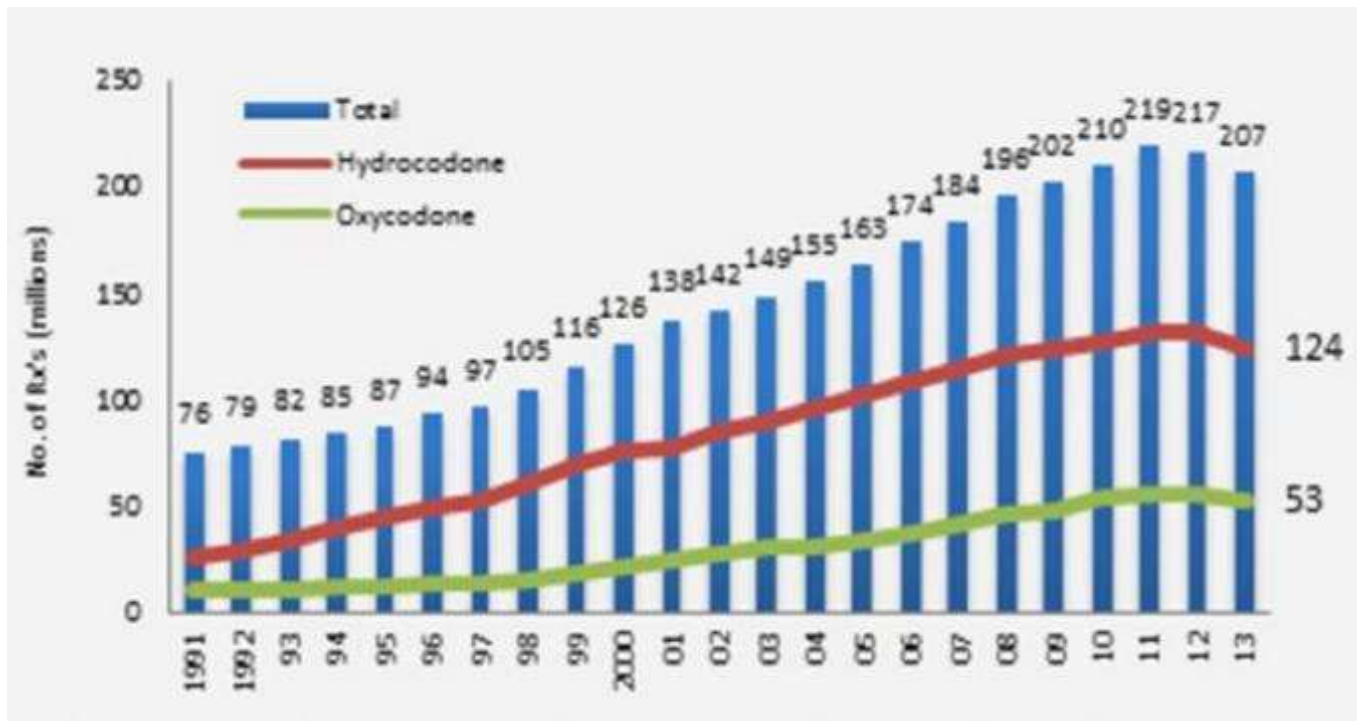
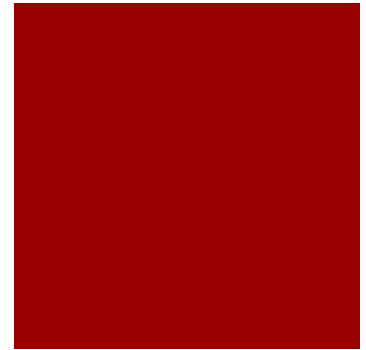
- genomics and epigenetics
- cameras and sensors
- biomonitoring
- Geolocation
- Artificial intelligence – Watson/IBM
- "internet of things"
  - devices that know more about you than you do



POSITIVE  
CHANGES

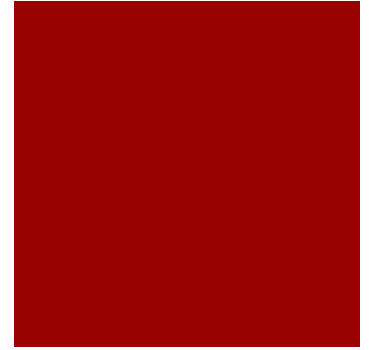


# peaked narcotics epidemic



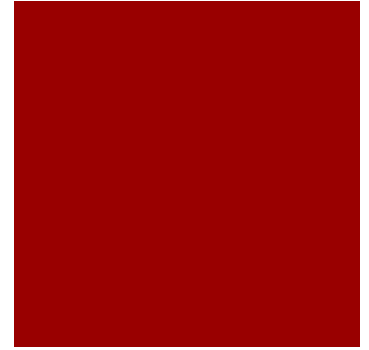
- Opioid Prescriptions Dispensed by US Retail Pharmacies  
IMS Health, Vector One: National, years 1991-1996, Data Extracted 2011. IMS Health, National Prescription Audit, years 1997-2013, Data Extracted 2014.

CDC MMR on narcotics





# Peaked narcotics epidemic



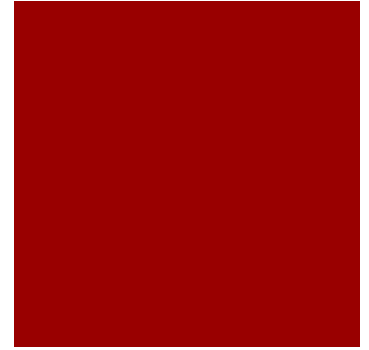
- National Institute of Drug Abuse Statistics:

2001 – 2014

3.4-fold increase in total # deaths from opioid pain relievers

- Patients > 120 morphine equivalent doses opioids 8X risk morbidity (overdosing) and risk increases if with Rx of anxiety meds and sedatives

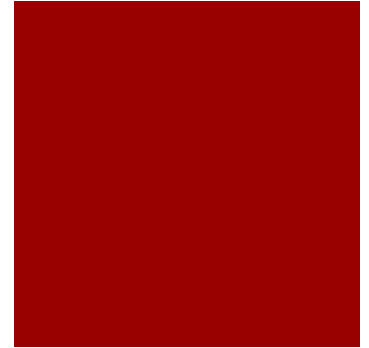
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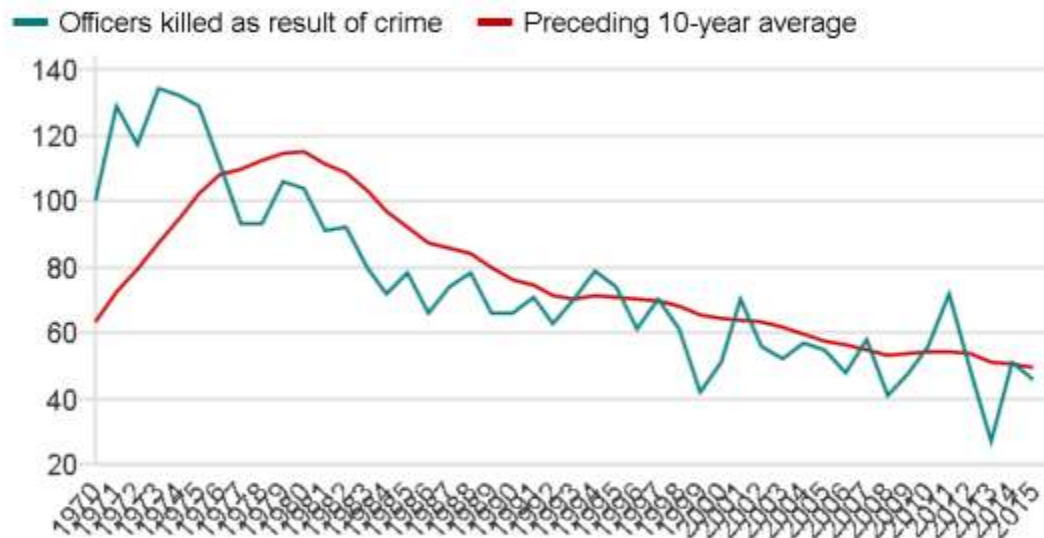
- near-term
  - Avoid unnecessary Rx
  - Short (<5-7 days) Rx durations
  - Wean ASAP e.g. 10% weekly

# Line of Duty Death

- highly publicized police shootings
- anecdotally more officers wearing arms off-duty
- application rates down
- but Line of Duty Deaths are decreasing



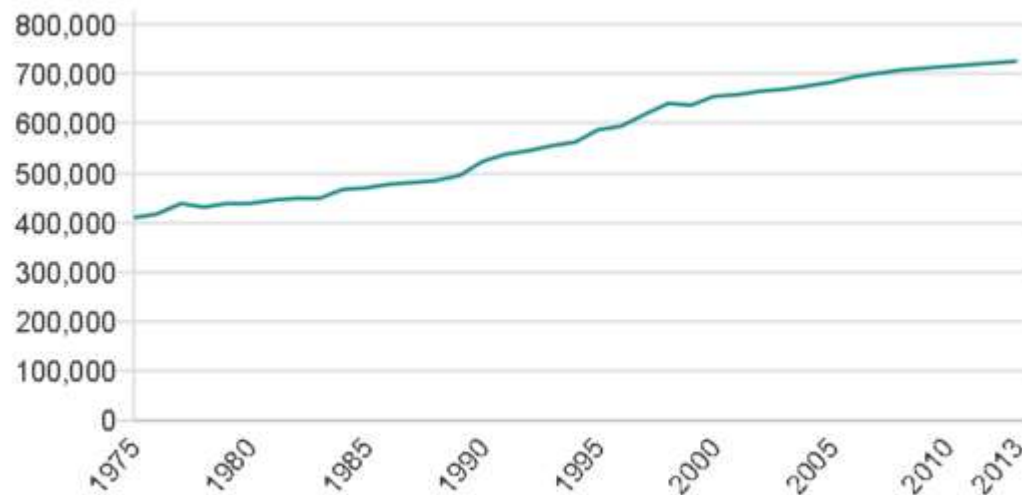
## US officers killed as the result of crime, 1970-2015



Source: FBI-LEOKA/Criminal Justice statistics/Seth Stoughton

BBC

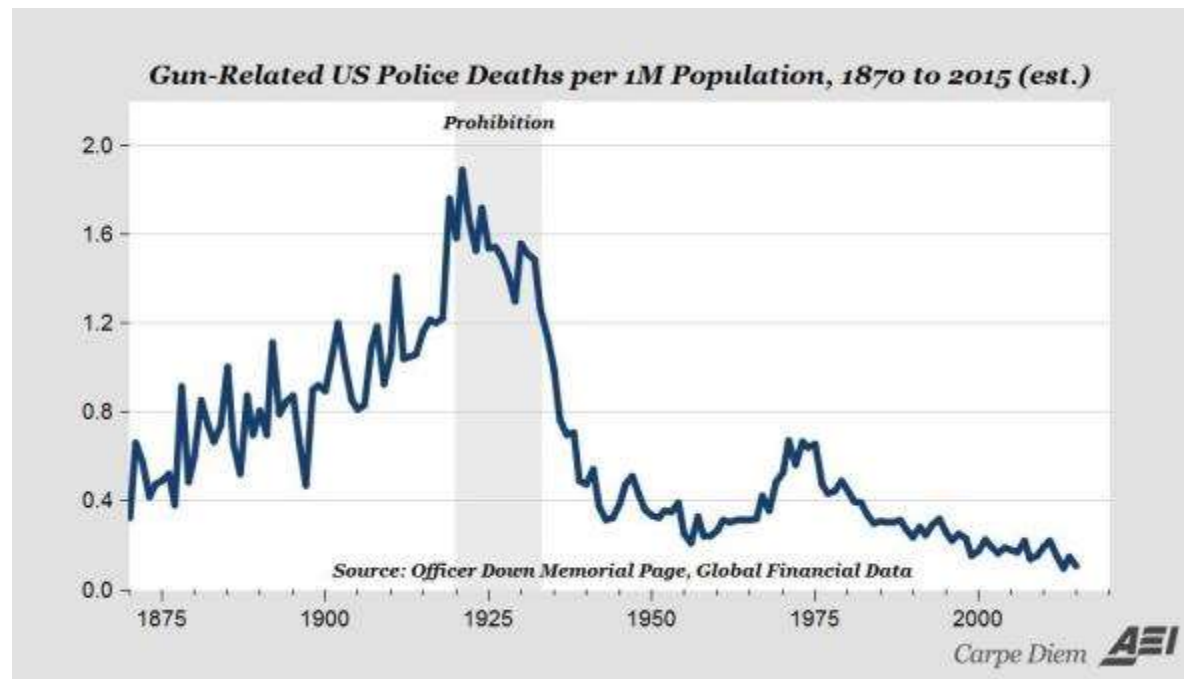
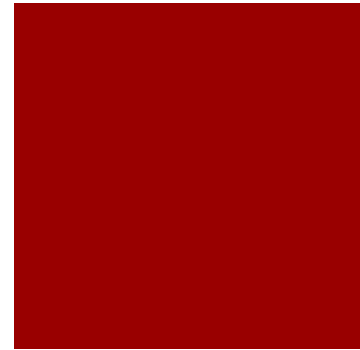
## US state and local police officer numbers, 1975-2013



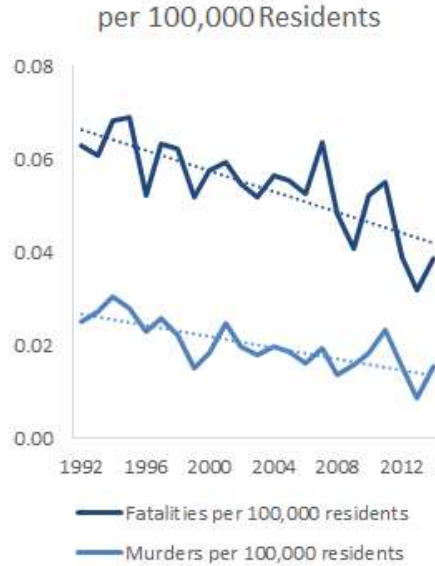
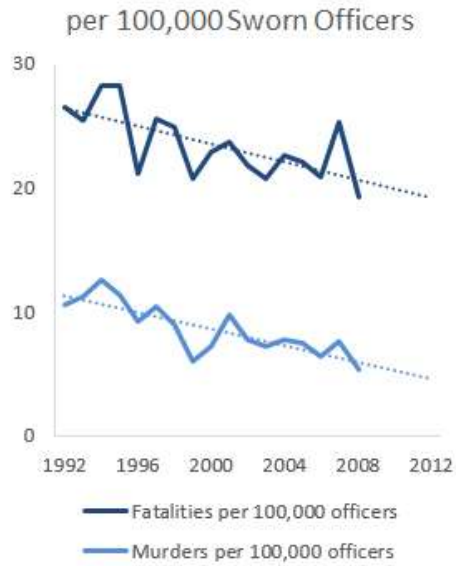
Source: FBI-LEOKA/Criminal Justice Statistics/Seth Stoughton

BBC



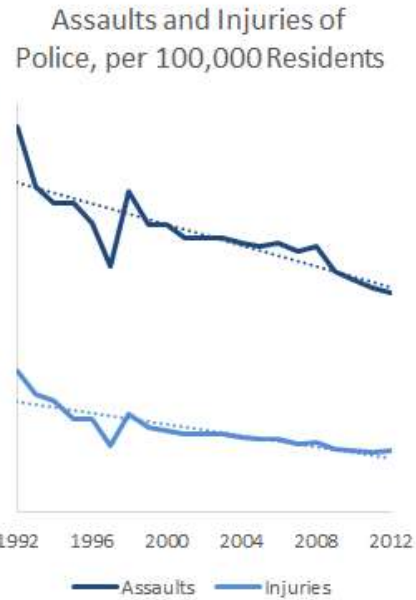
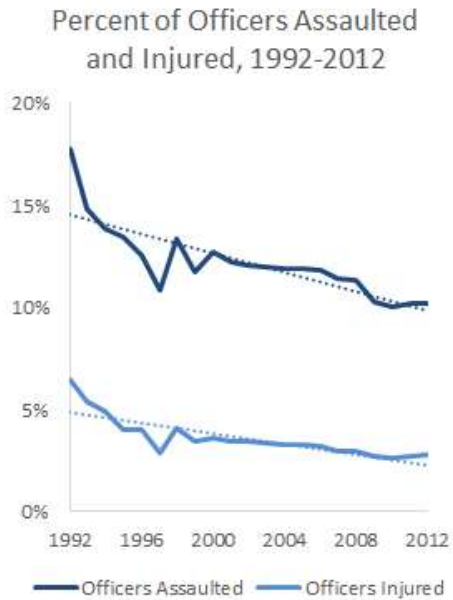


## Police Fatality and Murder Rates

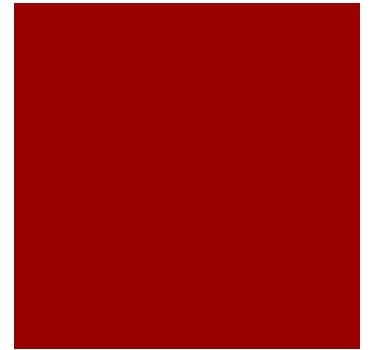


\* Excludes the 72 officers killed on 9/11.

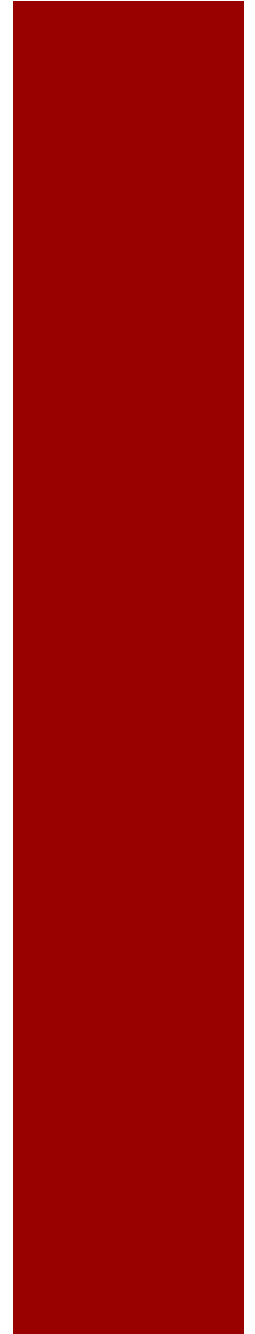
Sources: FBI, BJS, NLEOMF, Census



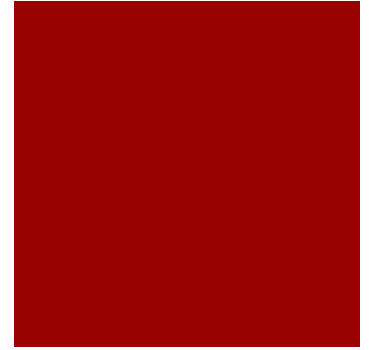
Source: FBI



OCC MED  
OPPORTUNITIES



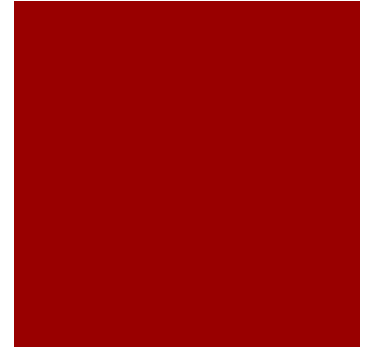
# prevention & total worker health



- currently occ med *reacts* to illness/ injuries
- not consistently providing prevention programs
- instead provided by Benefits , HR, or Safety
  
- partner with above
- work with senior leadership
- consider incentives, benefits
- known link between health of workforce and productivity



# prevention & total worker health



- Population Health
- New Delivery Models to improve care, outcomes

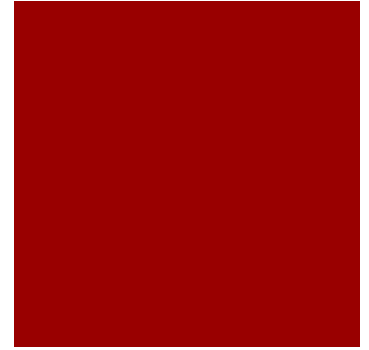
and lower costs:

- Patient Centered Medical Home (PCMH) – involving patients in owncare

- Accountable Care Organizations (ACOs)

- reaching those with high cost, chronic health conditions/  
value based payments

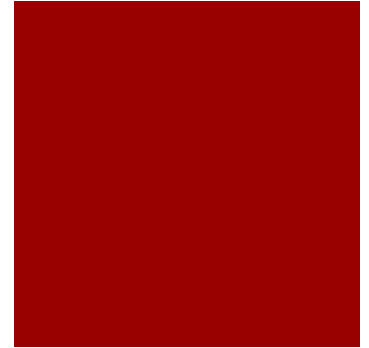
# prevention & total worker health



- Workplace can be model for:
  - Patient-centered medical home
  - Preventive- care per ACA
- Injury
  - Safety & Ergonomics
- Illness
  - Surveillance
  - Disease management
    - CHD and pulmonary disease predict absenteeism
  - Fitness & Wellness (1° and 2° prevention)
  - Mental health management

# Mental Health

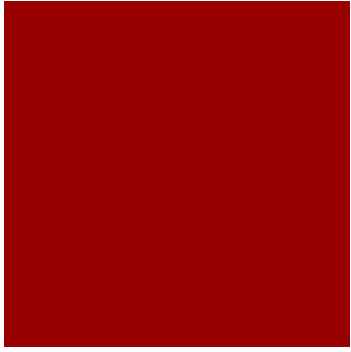
- pharma not the answer
- functional jobs
- supportive managers
  - Training to respect, motivate, nurture
- Occ Med helps drive these initiatives



# safety sensitive positions

- Occupational Health Clinicians should enlist support of clinical psychologists and psychiatrists
  - Psychological preplacement evaluations
  - Fitness for Duty – post injury/incident/illness
  - Critical incident debriefings etc





# QUESTIONS