Seasonal (sub-extreme) Hot Weather: Public Health Impacts and Prevention

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Workshop on Climate Information Systems for Heat Health Early Warning
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Heat Advisory Criteria for NYC

- 1997-2006 analysis
- HI vs alternative, correlated metrics
- Non-linear and lagged effects
- Confirmed risk at sub-extreme temperatures
- NYC advisory level
  - tradeoff of frequency vs risk
  - 2+ days with HI ≥95°F
  - 1+ day with HI ≥100°F

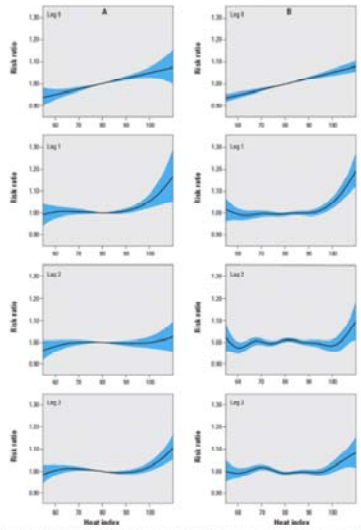
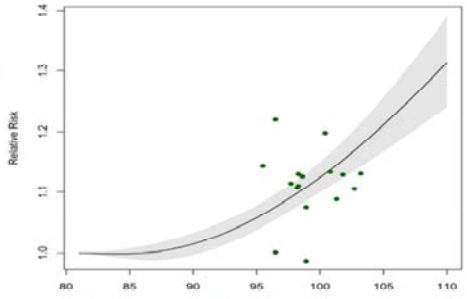


Figure 1. Risk ratios (and 95% CIs) for the association of daily natural-cause mortality by maximum heat index on the same day (lag 0) and 3 previous days (lags 1–3, respectively) using parametric generalized linear models (*A*) and nonparametric generalized additive models (*B*), New York City, 1997 through 2006. Each risk ratio function is adjusted for temporal covariates for year, season, and day of week and for the other lagged heat index terms.

Heat-associated mortality, extreme and non-extreme - NYC

- EHE excess non-external ~ 100
- All excess non-external ~ 350
- 'Heat-specific' ~ 13 (most during EHE)
- Mortality data lags by days -> months
- "Syndromic" heat ED and EMS spike during EHE



Heat Index and Mortality during EHE, NYC 1997-2013

Sources: 2013 MMWR 62;617-621; Matte et al. 2014; NYC SIRR 2013

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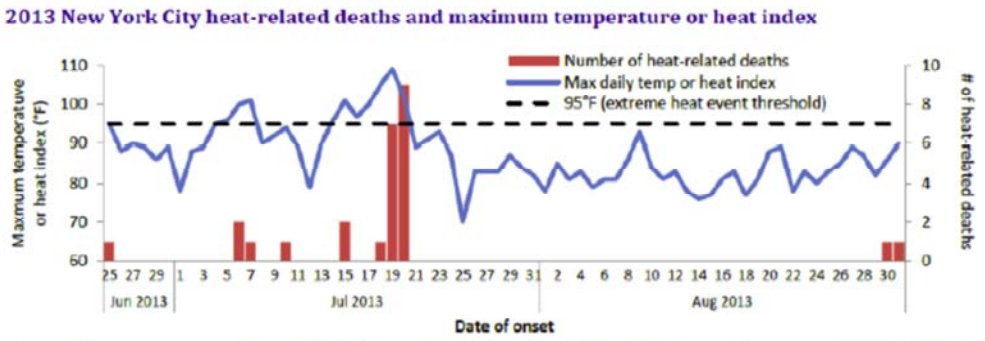
Heat-health surveillance

- During events: heat EMS and ED
- After extreme events: heat-related OCME case review
- Periodically, update multi year excess mortality modeling



http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief47.pdf

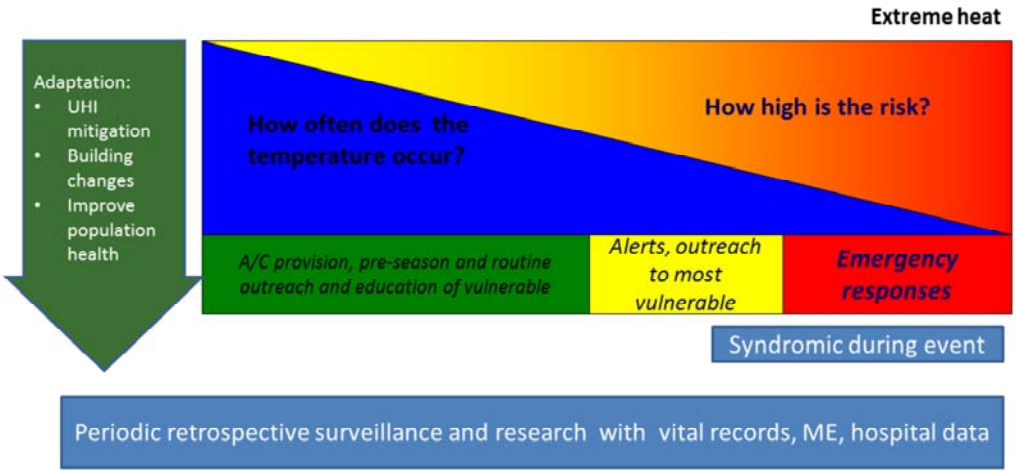
Heat-risk associations NYC and elsewhere

- Risk increases across range of warm season temps
- 'Heat waves' mostly non-linear, lagged, and consecutive effects
- Vulnerability: social disadvantage, health, no AC, less green
- In NYC, residential exposures important in deaths and admissions
- Large vulnerable populations
- Power outage, other events cab increase risk with seasonal heat
- Heat-mortality slopes have declined (why?)
- Heat-mortality risk across seasonal temps used climate change impact estimates.
- Excess and heat-specific deaths sometimes inappropriately compared

Heat Emergency Response Tactics

- Health advisories: public, clinical providers, VP service providers
- Cooling Centers
- Vulnerable population provider outreach (home-based and homeless)
- Formal and informal buddy systems
- Protection of water and power supply

Continuum of risk, response, and surveillance



Periodic retrospective surveillance and research with vital records, ME, hospital data

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How has evidence informed our strategies?

- Near-term strategies
  - Partner with NWS re: advisory criteria and messages
  - Promote cooling center use
  - Enhance vulnerable population outreach
    - Service providers
    - CBOs and public
- Long-term strategies
  - Urban heat Island mitigation: Cool roofs, tree planting
  - Community engagement
  - Electric grid resilience
  - A/C subsidies+responsible use
  - Code changes
  - Population health promotion (e.g. active transportation, nutrition)

A few communication Challenges

- Message penetration depends on others with larger audiences (e.g. media, NWS)
  - Extreme heat events – not exotic and no dramatic visuals
  - Outdoor activities vs
  - Indoor, hidden vulnerable
- Continuum of risk
  - Seasonal measures for vulnerable population and providers
  - Mobilize early for extreme events
- Air conditioning:
  - Messages for vulnerable
  - Responsible use for others including commercial
  - Public health protection vs CC mitigation

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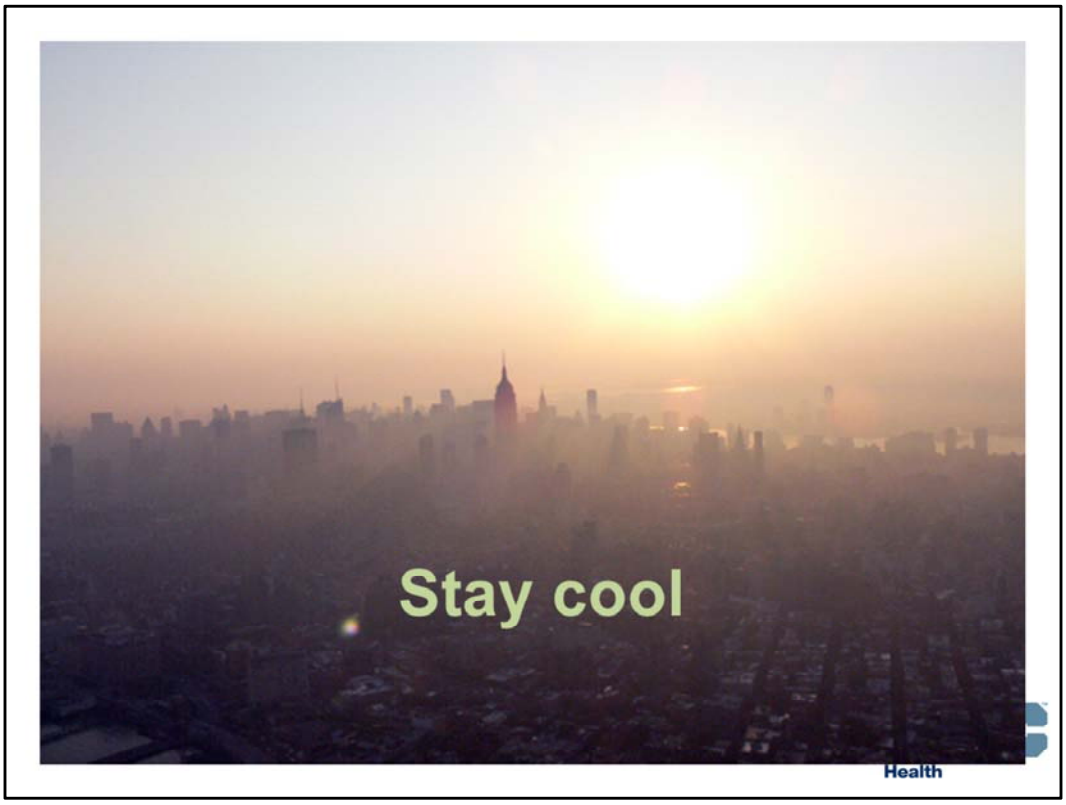
Stay cool
Health