# Incorporating Economic Modeling and Cost Estimation into Local Public Health Data Reports


Leslie Ray, MPH, MPPA, MA
Alicia Sampson, MPH, CPH
Barbara M. Stepanski, MPH
Alan M. Smith, PhD, MPH
Joshua Smith, PhD, MPH
Isabel Corcos, PhD, MPH


COUNTY OF SAN DIEGO
HHSA
HEALTH AND HUMAN SERVICES AGENCY

# Presenter Disclosures

Leslie Ray

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

# San Diego County

- Over 3 million residents
- Popular tourist destination - 15 million overnight tourists annually
- Largest military installation in continental US
- Over 4500 Sq Miles
- Geographically isolated (bordered by desert, Mexico, Pacific Ocean and Camp Pendleton military base)
- 20 hospitals with Emergency Departments (2 military, no County Hospital)

# Background:

- In 2009, Public Health Services embarked on a major, multi-year health promotion effort to reduce death and disability due to chronic disease in the County.
- While incidence and prevalence data on chronic diseases and relevant behavioral data were readily available, there was no local level data on the economic cost of chronic disease.
- This data was necessary in order to create cost benefit analyses and return on investment models to support the need for prevention and early intervention.

# Methods:

- Epidemiologists identified existing research on national level cost estimation of chronic disease.
  - *An Unhealthy America: the Economic Burden of Chronic Disease* by the Milken Institute as a model.

http://www.milkeninstitute.org/publications/publications.taf?function=detail&ID=38801020&cat

- Estimated costs were limited to direct medical costs only.
- Multiple data sources were available but for differing geographies.
- MEPS provided expenditure data by condition at the Regional level, which was adjusted to the county level.
- CMS provided point of service data used to verify estimates.

# Methods, continued:

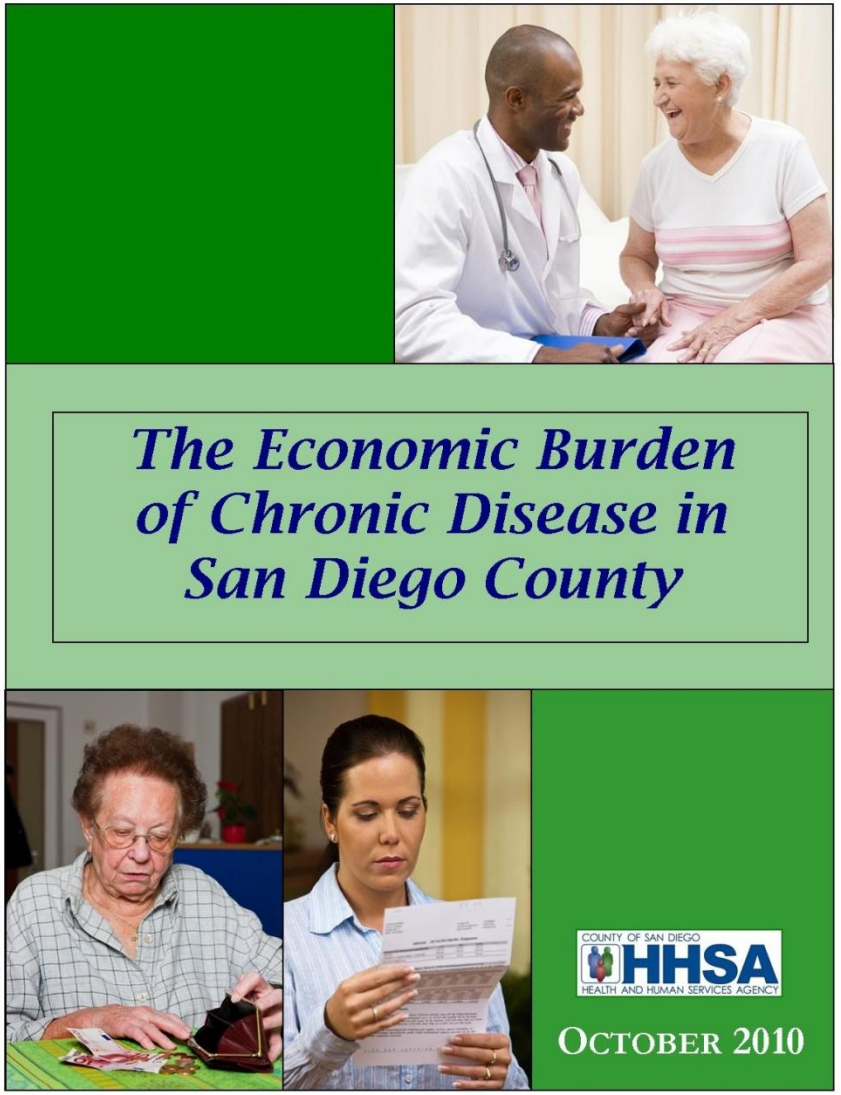
- Incidence data for San Diego County was available through Public Health Services.
  - www.sdhealthstatistics.com
- Prevalence data was available through the California Health Interview Survey (CHIS).
  - www.askCHIS.com
- Costs were adjusted for medical inflation using county level medical CPI.
  - http://www.bls.gov/cpi/cpifact4.htm

# Results

- The results showed that direct medical costs associated with chronic disease in San Diego County totaled $4.6 billion in 2007.
  - $4 billion attributable to the 3-4-50 chronic diseases
- Local costs were projected to reach $25 billion in 2050 based on national cost projections and local disease projections, assuming no change in risk behaviors or disease treatment.
- Annual total and per person cost for each of seven chronic diseases were also calculated.
  - Included estimates for chronic mental health direct service costs.

# Results of the publication

- Featured report along with *3-4-50: Chronic Disease in San Diego County* after the launch of HHSA's *Live Well, San Diego!* Initiative.
- Data used to support a multitude of local prevention activities.
- Big increase in email and phone calls from other counties asking how we did it.

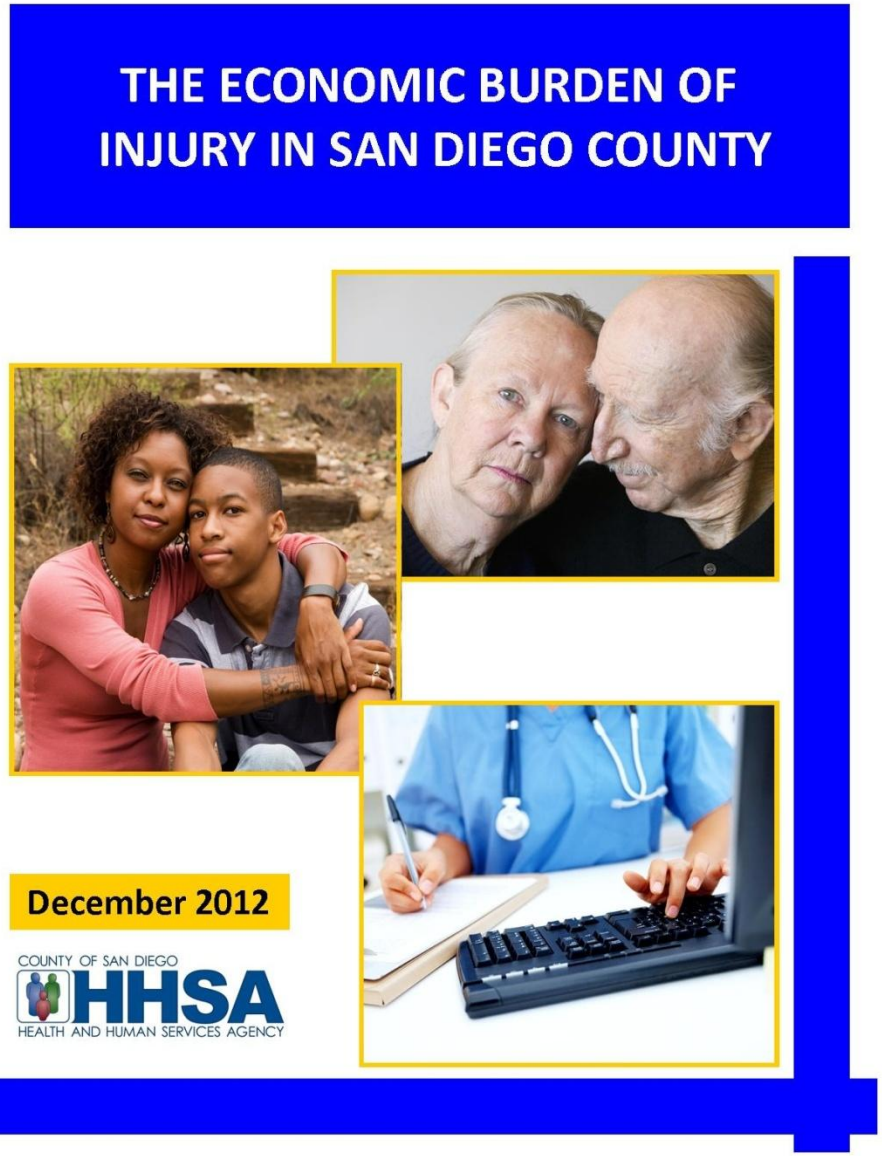


# As a result of the *Economic Burden of Chronic Disease in San Diego County*:

- Cost data has become an integral part of population health epidemiology in San Diego County.
  - Available online along with other population health reports, analyses, tools and data tables.
- These models have been used to provide evidence to support the costs of local prevention activities.
  - Community partners
  - Grants
  - Component of ROI analyses
- These methods have now been applied to other public health issues.
  - Violent and unintentional injury (in process)
  - Sexually transmitted disease (in process)
  - Maternal and child health and behavioral health (in planning)

# If you don't have a report to model, find a reliable cost calculator…..

- Injuries have defined prevention opportunities that fit neatly into ROI and cost models.
- CDC staff and members of the Injury Control and Emergency Health Section of APHA have worked on various cost of injury calculators for years.
- On the CDC website WISQARS can provide both incidence data for your state or county as well as a cost estimation calculator that includes both direct medical costs and work loss costs.



# WISQARS™ provides cost estimates for injury deaths (including violent deaths) and nonfatal injuries where the patient was treated and released from a hospital or ED. http://www.cdc.gov/injury/wisqars/index.html

| **UNINTENTIONAL INJURY** | Number of cases | Medical costs | Work loss costs | Total combined costs | |
|---|---|---|---|---|---|
| Deaths | 949 | $11,868,000 | | $1,002,829,000 | $1,014,696,000 |
| Hospitalizations | 21,149 | $540,635,000 | | $1,113,603,000 | $1,654,238,000 |
| ED discharges | 149,437 | $136,439,000 | | $473,753,000 | $610,192,000 |
| | 171535 | $688,942,000 | **TOTAL UNINTENTIONAL INJURY COSTS** | | **$3,279,126,000** |

| **INTENTIONAL INJURY** | Number of cases | Medical costs | Work loss costs | Total combined costs | |
|---|---|---|---|---|---|
| Homicides | 90 | $645,000 | | $144,997,000 | $145,642,000 |
| Assault Hospitalizations | 1,644 | $38,947,000 | | $152,845,000 | $191,792,000 |
| Assault ED discharges | 8,188 | $9,041,000 | | $27,661,000 | $36,702,000 |
| | 9922 | $48,633,000 | **TOTAL ASSAULT INJURY COSTS** | | **$374,136,000** |
| | | | | | |
| Suicides | 365 | $1,390,000 | | $400,950,000 | $402,339,000 |
| Self-inflicted Hospitalizations | 1,590 | $15,120,000 | | $29,807,000 | $44,928,000 |
| Self-inflicted ED discharges | 2,435 | $3,360,000 | | $2,329,000 | $5,689,000 |
| | 4390 | $19,870,000 | **TOTAL SELF-INFLICTED INJURY COSTS** | | **$452,956,000** |

# WISQARS™ also calculates cost estimates by injury mechanism.

| **UNINTENTIONAL INJURY** | | | |
|---|---|---|---|
| *for 2009 | Overdose/Poisoning | Falls | Pedestrian |
| **Number of cases** | | | |
| Deaths | 409 | 231 | 59 |
| Hospitalizations | 2,365 | 10,734 | 348 |
| ED discharges | 4,677 | 52,581 | 963 |
| | | | |
| **Total costs (both medical & work loss) det. by WISQARS** | | | |
| Deaths (based off 2005 CA costs) | $492,291,000 | $85,786,000 | $65,859,000 |
| Hospitalizations (based off 2005 US costs) | $34,325,000 | $666,846,000 | $50,822,000 |
| ED discharges (based off 2005 US costs) | $6,539,000 | $237,293,000 | $3,972,000 |
| **Total costs of all three categories** | $533,155,000 | $989,925,000 | $120,653,000 |
| | | | |
| **Calculated cost per person** | | | |
| Deaths | $1,203,645 | $371,367 | $1,116,254 |
| Hospitalizations | $14,513 | $62,124 | $146,040 |
| ED discharges | $1,398 | $4,512 | $4,124 |

# Find the published paper that most closely resembles your data….

- *Economic Burden of Sexually Transmitted Infections: Incidence and Direct Medical Cost of Chlamydia, Gonorrhea, and Syphilis Among Illinois Adolescents and Young Adults, 2005-2006* by Elizabeth Pultorak, et al.
- Calculated incidence data from public health databases.
- Adjusted cost multipliers based on local medical CPI.

# Four Things to Consider

- Is there a reliable calculator, respected analysis or peer reviewed methodology available?
- Can you apply medical CPI to inflate the cost multiplier to your current data year?
- Does your cost multiplier estimate direct costs or include indirect costs?
- Do you have comparable data?

# Data Comparability Issues

- Do you have comparable data?
  - Same or similar source
- Do you have the same disease or injury definition as the cost model?
  - ICD9 or ICD10 code
  - CPT code
- Does your data measure cases the same way?
  - Incidence: e.g. number of new cases in a year
  - Prevalence: e.g. amount of disease in the population

# Basic Steps to Creating a Local Burden of Disease/Injury Document

- Identify a scientific or evidence-based cost model from the literature or legitimate cost calculator.
- Adjust the model by local medical CPI to year of your data.
- Pull comparable local data, either incidence or prevalence, based on model.
- Run the numbers and document your methods, results and assumptions.
- Be confident, but always double check your work.

# Acknowledgements


- Heartfelt thanks to the Health Economists, Health Policy Researchers and the Public Health Academics who do the hard part by researching, developing and publishing cost models.
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- Thanks to our leadership team in Public Health for always giving us latitude to try new ideas.

# Contact Information

**Leslie Upledger Ray, MPH, MPPA, MA**

County of San Diego

Health and Human Services Agency

Public Health Services

Emergency Medical Services

Epidemiology, Surveillance and Community Health Statistics

6255 Mission Gorge Road

San Diego, CA 92120

(619) 285-6429

leslie.ray@sdcounty.ca.gov

www.sdhealthstatistics.com