Measuring health care spending and changes in health care spending

Joseph Dieleman, PhD
dieleman@uw.edu
Draw from two already published pieces of research:

**JAMA | Original Investigation**

***US Spending on Personal Health Care and Public Health, 1996-2013***

Joseph L. Dieleman, PhD; Ranju Baral, PhD; Maxwell Birger, BS; Anthony L. Bui, MPH; Anne Bulchis, MPH; Abigail Chapin, BA; Hannah Hamavid, BA; Cody Horst, BS; Elizabeth K. Johnson, BA; Jonathan Joseph, BS; Rouselle Lavado, PhD; Liya Lomsadze, BS; Alex Reynolds, BA; Ellen Squires, BA; Madeline Campbell, BS; Brendan DeCenso, MPH; Daniel Dicker, BS; Abraham D. Flaxman, PhD; Rose Gabert, MPH; Tina Highfill, MA; Mohsen Naghavi, MD, MPH, PhD; Noelle Nightingale, MLIS; Tara Templin, BA; Martin I. Tobias, MBBCh; Theo Vos, MD; Christopher J. L. Murray, MD, DPhil

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**JAMA | Original Investigation**

***Factors Associated With Increases in US Health Care Spending, 1996-2013***

Joseph L. Dieleman, PhD; Ellen Squires, MPH; Anthony L. Bui, MPH; Madeline Campbell, BS; Abigail Chapin, BA; Hannah Hamavid, BA; Cody Horst, MPH; Zhiyin Li, MPS; Taylor Matyasz, MS; Alex Reynolds, BA; Nafis Sadat, MA; Matthew T. Schneider, MPH; Christopher J. L. Murray, PhD, DPhil
1. Descriptive financial accounting

- **Personal health spending**
  - **Demographic Framework** – 38 age and sex groups
  - **Epidemiological Framework** – 155 health conditions
  - **Type of Care Framework** – inpatient, ED, ambulatory, dental, nursing facility care, retail pharma
2. Measuring drivers of changes in spending

Measure effect of 5 drivers: (i) population size, (ii) population age structure, (iii) disease prevalence, (iv) service utilization, and (v) service price and intensity.
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\text{Spending} \equiv \text{Population} \ast \text{Pop Age Fractions} \ast \text{Prevalence Rate} \ast \text{Util Rate} \ast \text{Price Rate}
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\[
\text{Spending}_{a,s,c,t,y} \equiv \text{Pop}_{y} \times \frac{\text{Pop}_{a,s,y}}{\text{Pop}_{y}} \times \frac{\text{PrevCases}_{a,s,c,y}}{\text{Pop}_{a,s,y}} \times \frac{\text{Encounters}_{a,s,c,t,y}}{\text{PrevCases}_{a,s,c,y}} \times \frac{\text{Spending}_{a,s,c,t,y}}{\text{Encounters}_{a,s,c,t,y}}
\]

\begin{align*}
\text{a} &= \text{age} \\
\text{s} &= \text{sex} \\
\text{c} &= \text{condition} \\
\text{t} &= \text{type of care} \\
\text{y} &= \text{year}
\end{align*}

- **Global Burden of Disease data**
- **Disease Expenditure project data**
Results: [https://vizhub.healthdata.org/dex/](https://vizhub.healthdata.org/dex/)
Thank you.

dieleman@uw.edu