
Health Information: Lots of Good Words, Some Paragraphs, but Many More Paragraphs and Stories Still Coming

Michael Wolfson, Statistics Canada

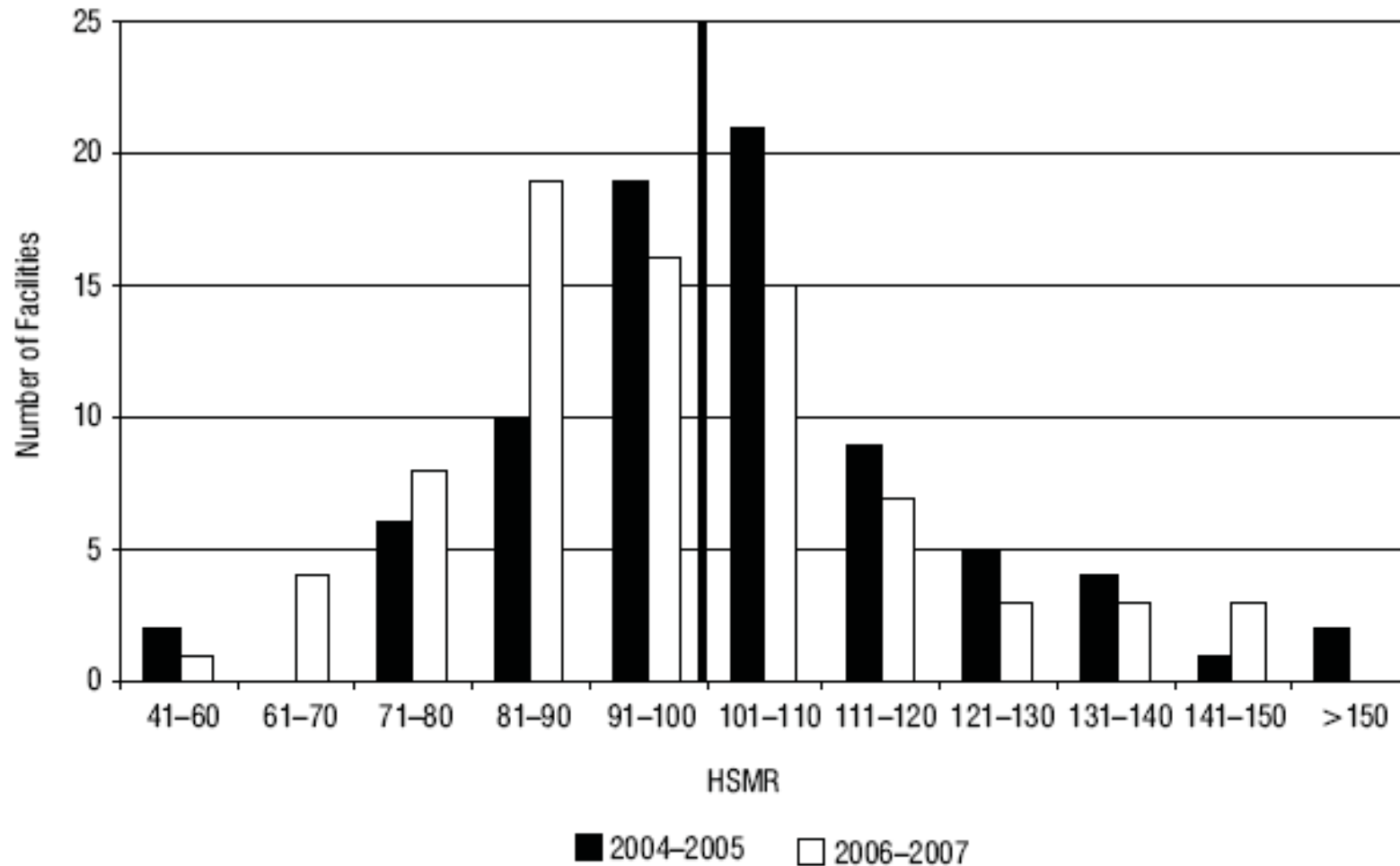
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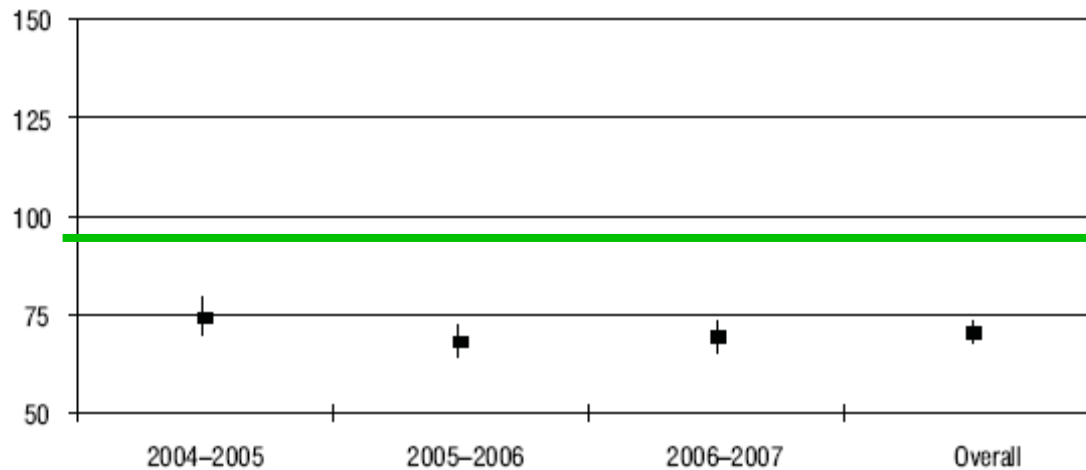
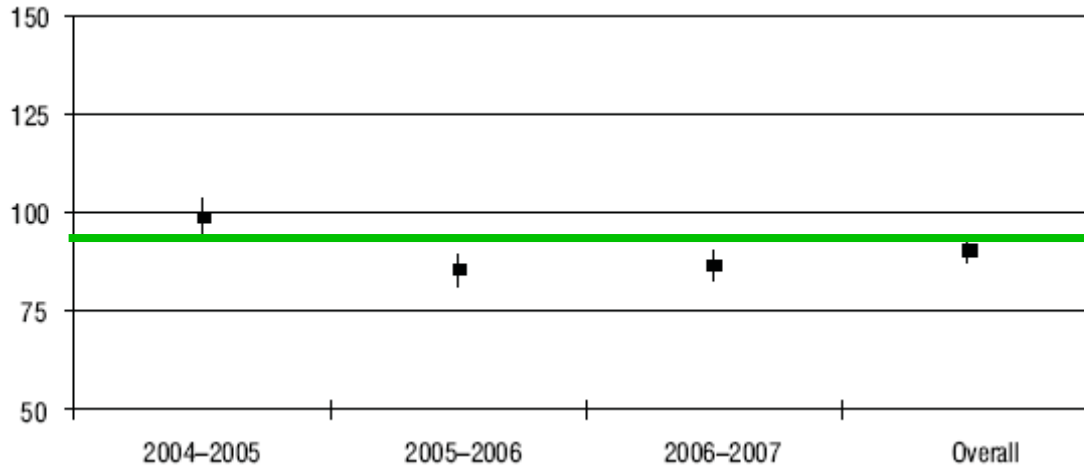
Health Information Stories

- Hospital “Death Lists”
- Small Area Variations
- Health Inequalities
- LHAD

Hospital “Death Lists” to CIHI’s HSMRs



HSMRs - Calgary and Champlain



- which is Ottawa?
- “you can’t manage what you don’t measure”
- “you get what you measure”
- key: benchmarking against peers; continuous monitoring



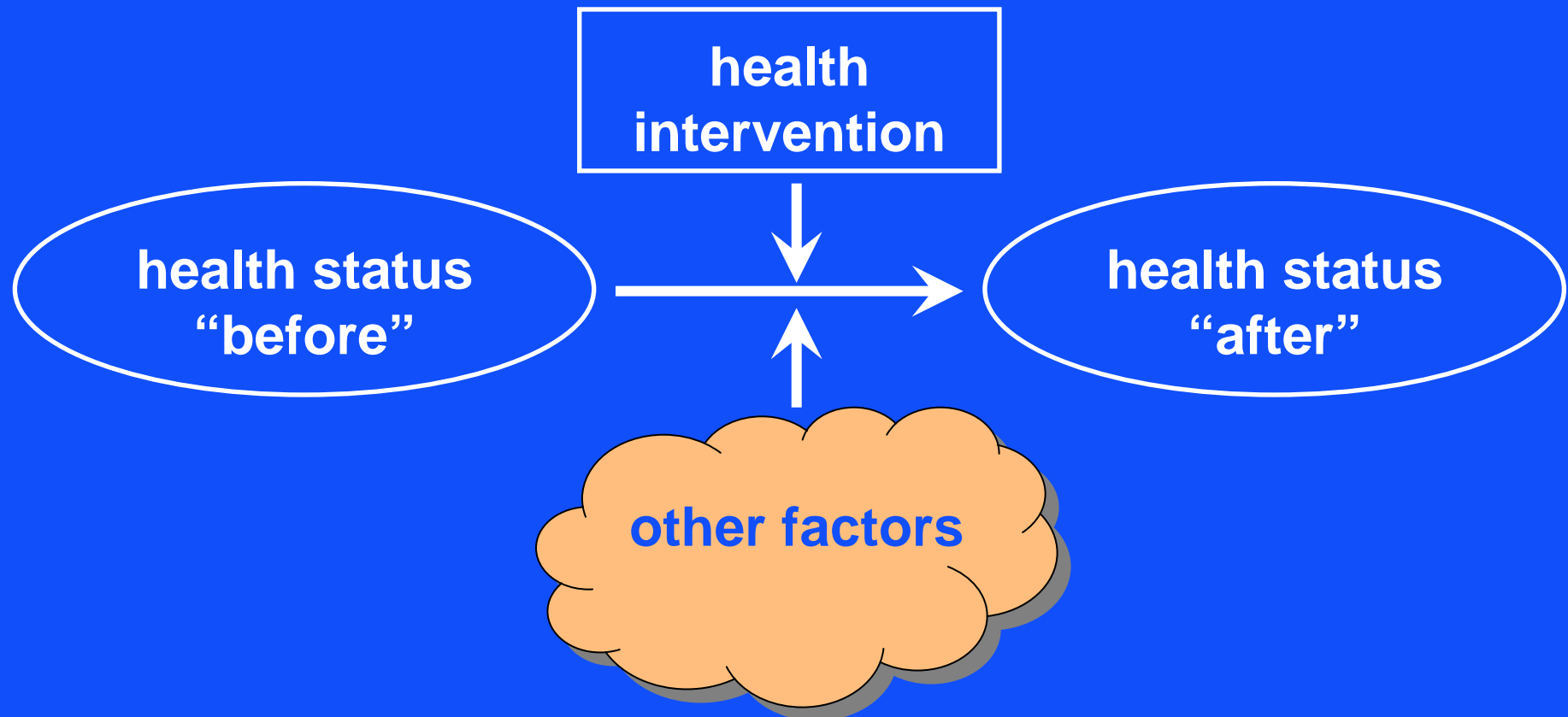
E. A. Codman and W.E. Deming



- **Codman**: early 1900s Boston surgeon
- famous for “End Results Cards” – to keep track of surgical patients and follow them up one year later to
 - » observe outcomes
 - » systematically learn from experience
- 100 years later: not yet implemented in health care

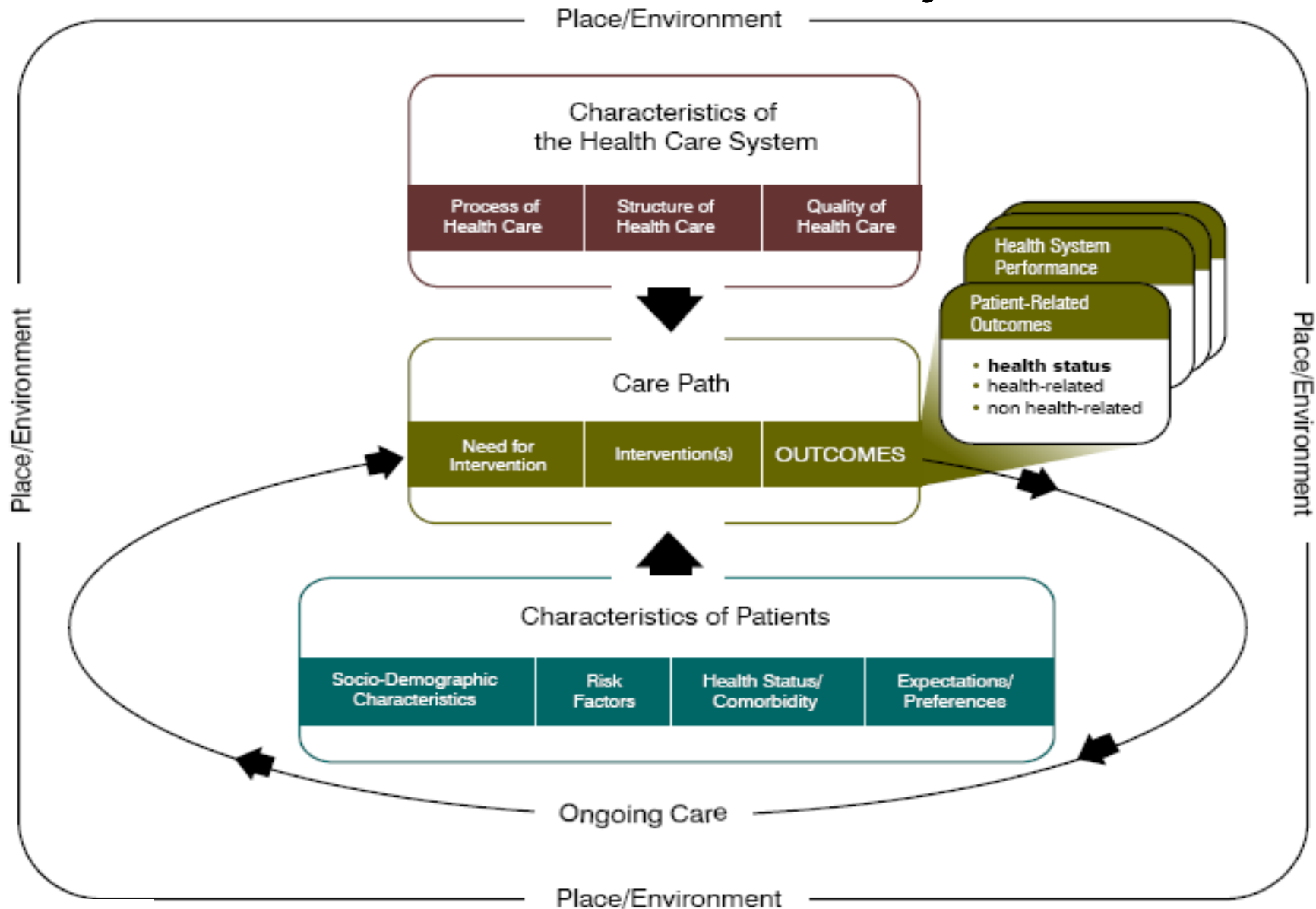
- **Deming**: post WW II concern with product quality in manufacturing
- father of the field of statistical process quality control
- 50 years later: not yet implemented in health care

Definition - Health Outcome



health outcome \equiv change in health status attributable to a health intervention (for an *individual*)

Stat Can / CIHI Outcomes Analysis Framework



Patient Reported Outcomes in the US and UK



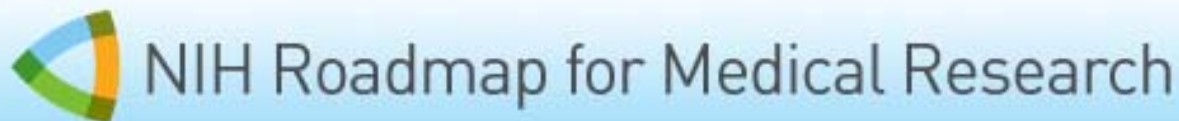
NHS goes to the PROMS

“It is crazy that we are 60 years into the NHS and measuring outcomes on only a handful of things”

Bruce Keogh

Office of Portfolio Analysis and Strategic Initiatives (OPASI)

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Roadmap Home

Roadmap Initiatives

Funding Opportunities

Funded Research

FAQ

Back to: [Roadmap Home](#) > [Initiatives](#) > [Re-engineering the Clinical Research Enterprise](#)

NIH to Develop Network for Quantifying Patient-Reported Outcomes

Words, Paragraphs, Stories

- Words
 - » in hospital death rates,
 - » adjusted for age / sex / co-morbidity
 - » for named hospitals
- Paragraphs
 - » adjustments for a broader range of patient characteristics
 - » correlations with hospital and surgical team characteristics
 - » health status as well as mortality follow-up
- Stories
 - » what factors (Pt, team, hospital, neighbourhood) are most important in accounting for better outcomes

Small Area Variations

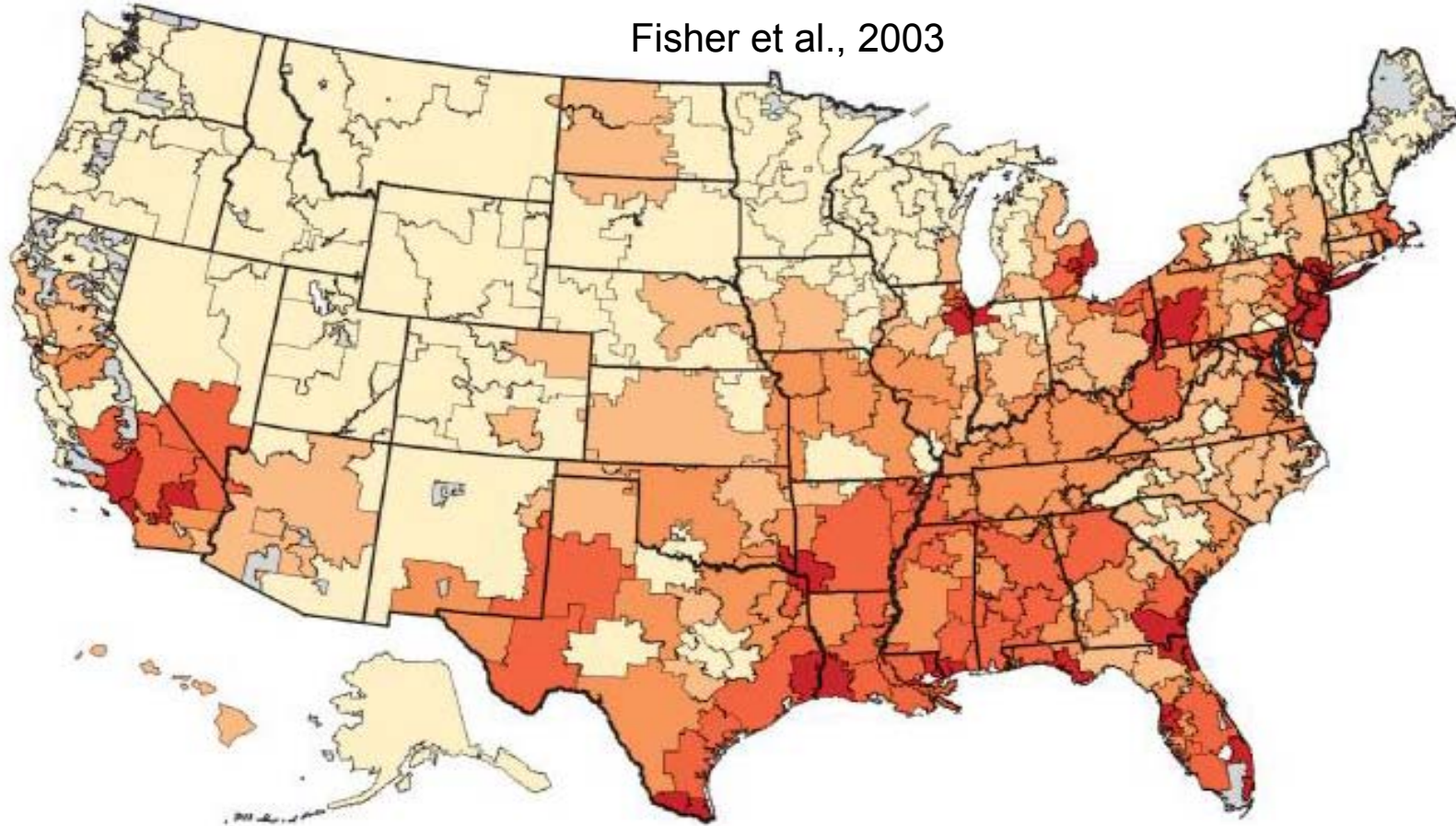
- Dartmouth and ICES Atlases
- McMaster CHEPA, early 1990s
- “appropriateness” / “30% of surgeries are unnecessary”
- CDM presentation, early 1990s
- mid 1990s health care budget cuts

Small Area Variations

- John Wennberg, MD, MPH, (is) a Dartmouth Medical School expert in geographic variation in health care delivery In one analysis, for example, he found that, despite a lack of discernable improvements in health in the higher-spending locations, 70 percent of the children who grew in Stowe, Vermont, had tonsillectomies by age 15, but only 10 percent of the children from Waterbury did. Similarly, some 50 percent of men in Portland, Maine, had prostate surgery by age 85, compared to about 10 percent of the men in Bangor. And twice as many people had heart surgery in Des Moines, Iowa, as in Iowa City.
- (<http://www.ihl.org/IHI/Topics/Improvement/ImprovementMethods/ImprovementStories/ImprovementTipFindMudaandRootitOut.htm>)

Medicare Spending Varies Widely Across the U.S., both per capita, and using an “end of life” spending index

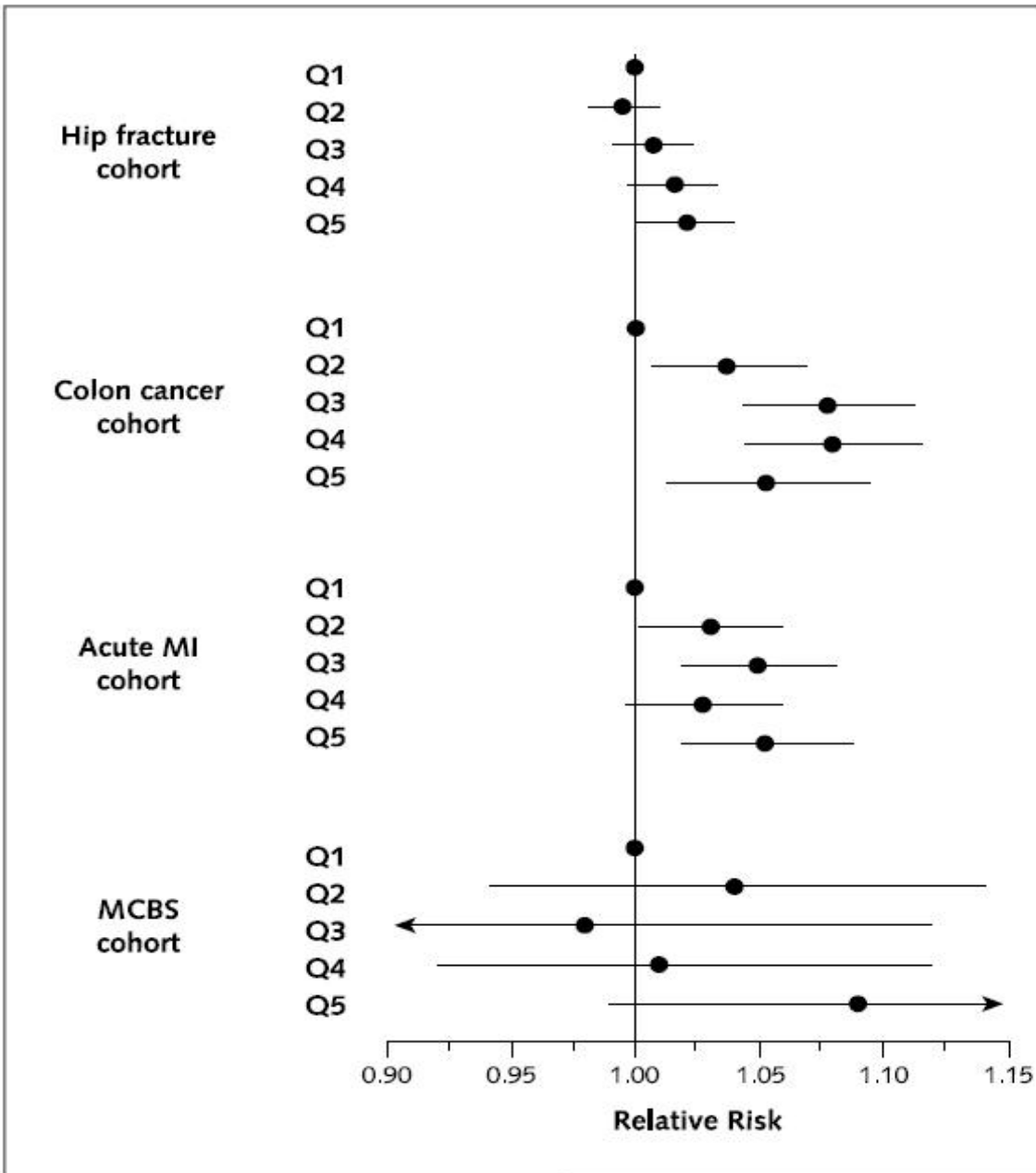
Fisher et al., 2003



Attributes of U.S. HRRs in Different Quintiles of the EOL-EI*

Variable	Quintile of EOL-EI					Ratio (Highest to Lowest)
	1 (Lowest)	2	3	4	5 (Highest)	
EOL-EI, \$ [†]	9074	10 636	11 559	12 598	14 644	1.61
Per capita Medicare spending, \$ [‡]	3922	4439	4940	5444	6304	1.61

Figure 1. Adjusted relative risk for death during follow-up across quintiles of Medicare spending.



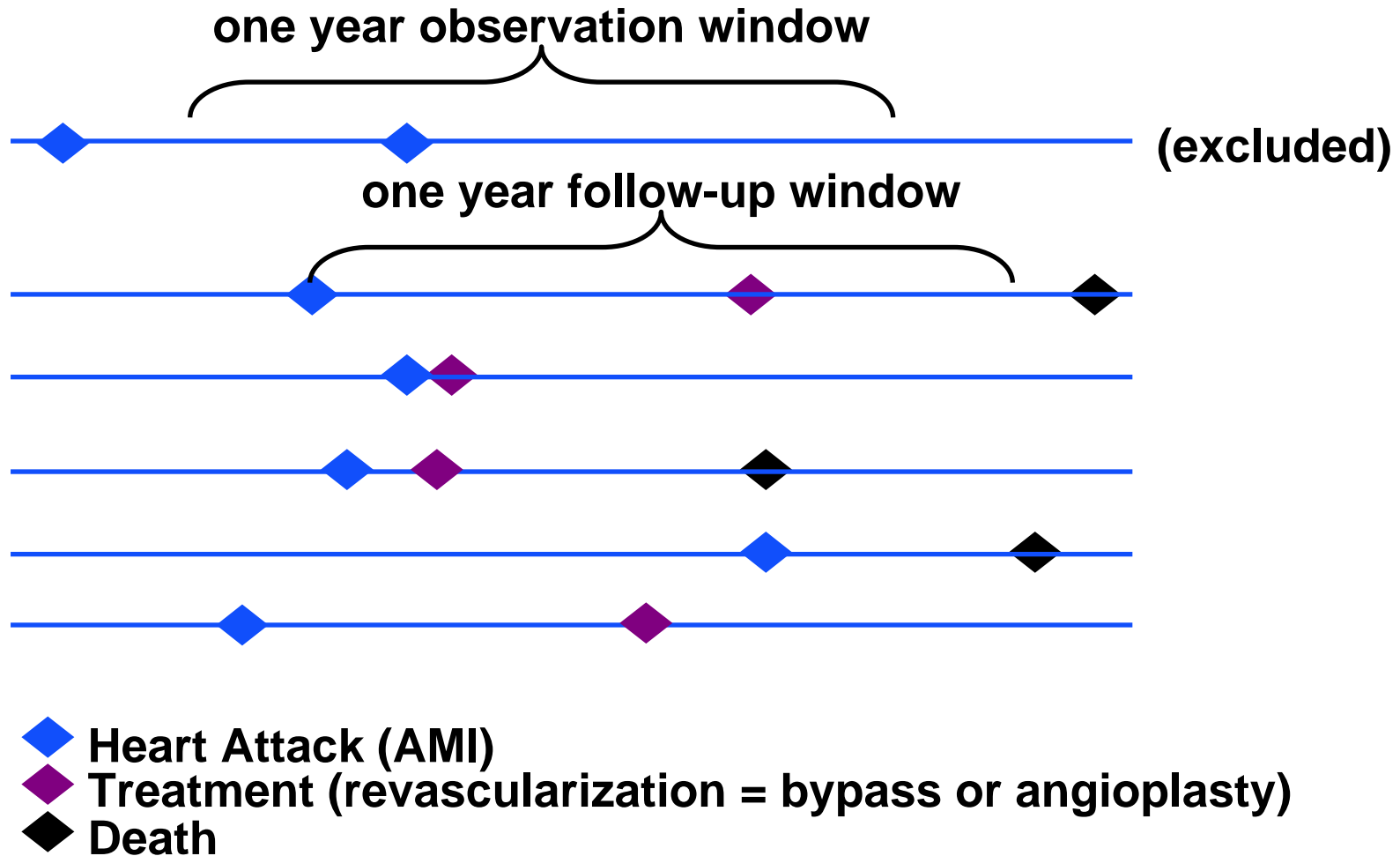
Fisher et al. Medicare Analysis (cont'd)

Q1 to Q5: quintiles (fifths) of “hospital referral regions” with increasing levels of an index of Medicare spending (based on “end of life” expenditures)

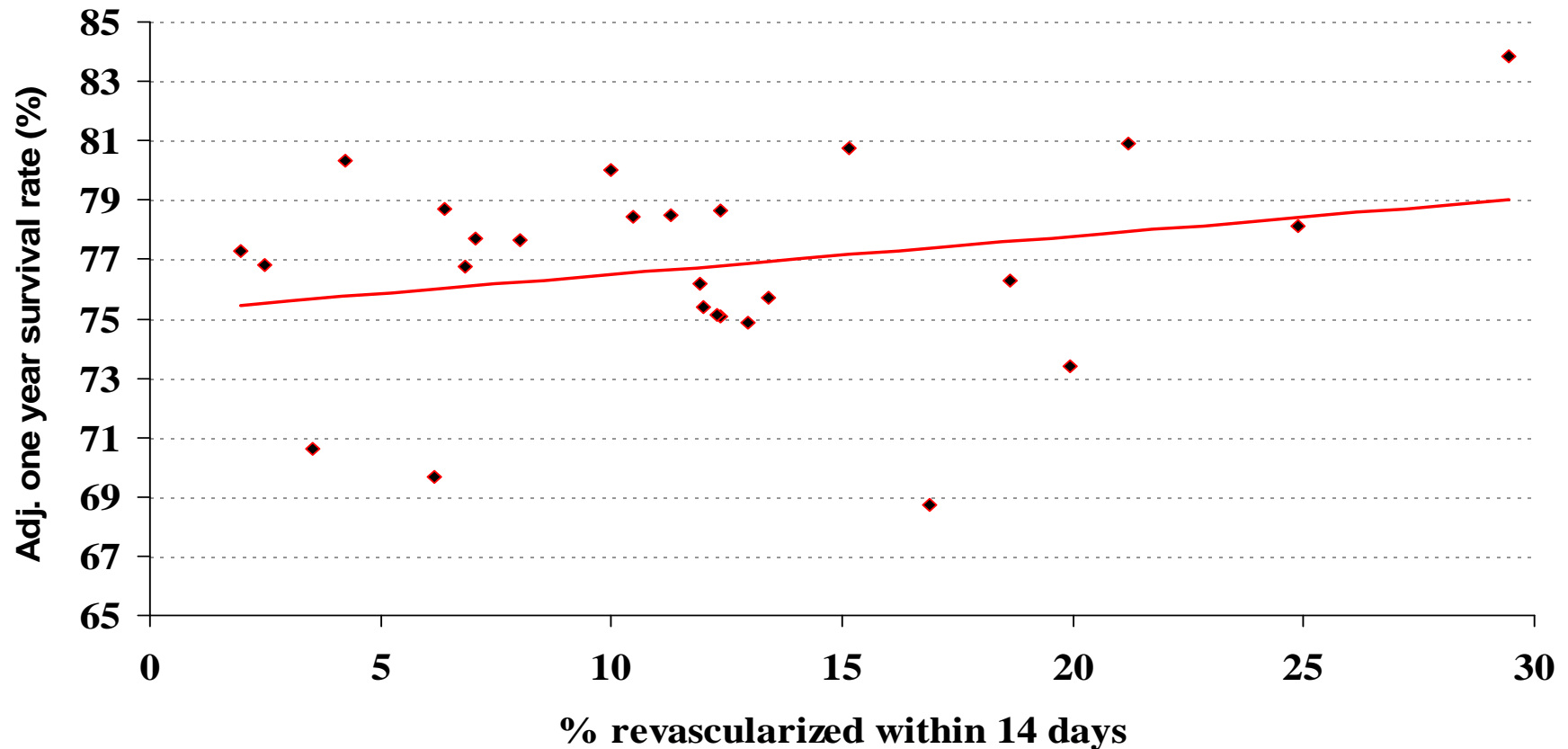
Cohorts: subsets of the Medicare population with selected conditions (MCBS = Medicare Beneficiary Survey)

Conclusion: if anything, more spending increases mortality

Underlying Person-Oriented Information for Heart Attack / Revascularization Analysis



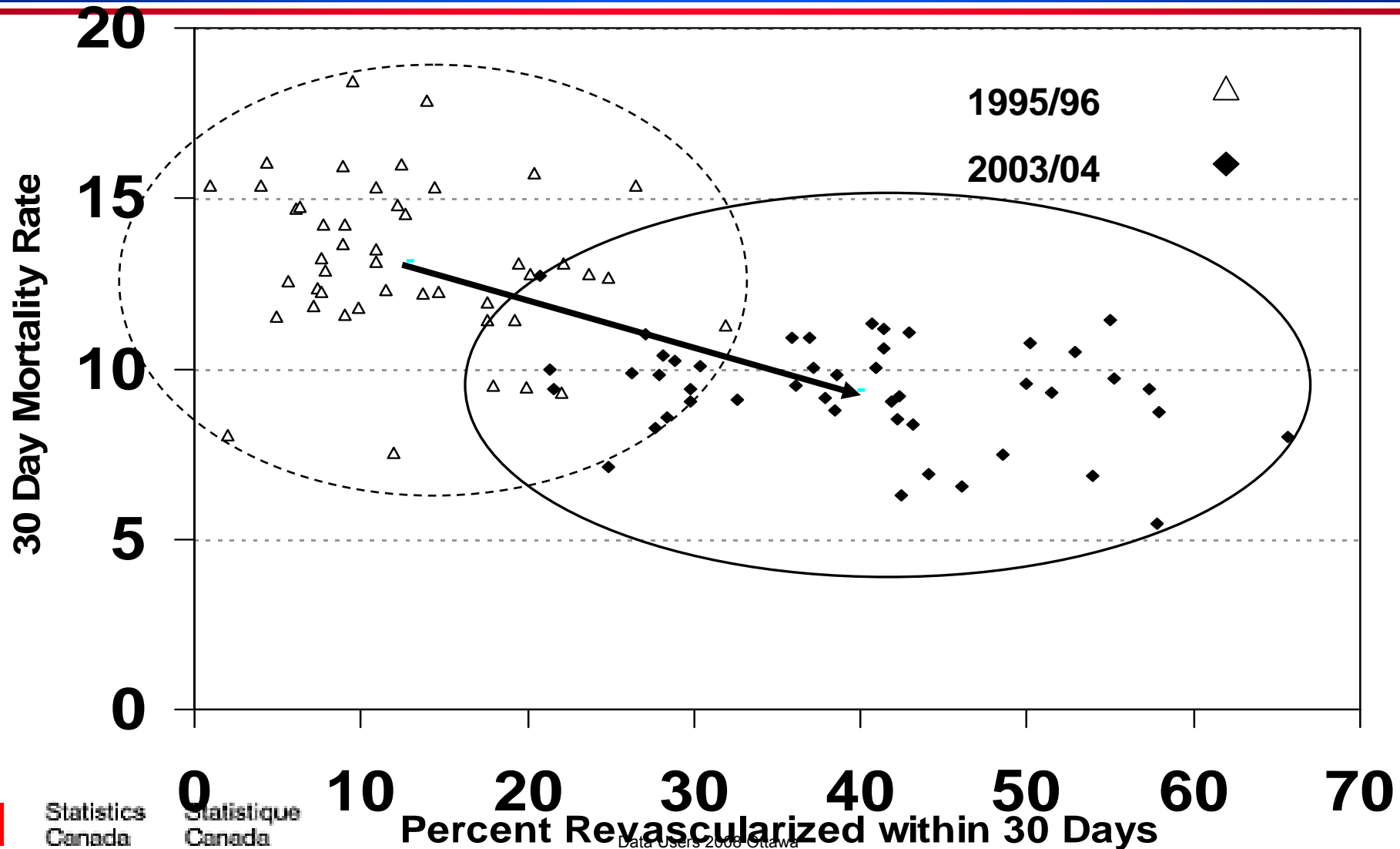
Heart Attack Survival in Relation to Treatment by Health Region, Four Provinces, 1995-96



Johansen, 2001



Heart Attack Survival in Relation to Treatment by Health Region, Seven Provinces, 1995/96 to 2003/04



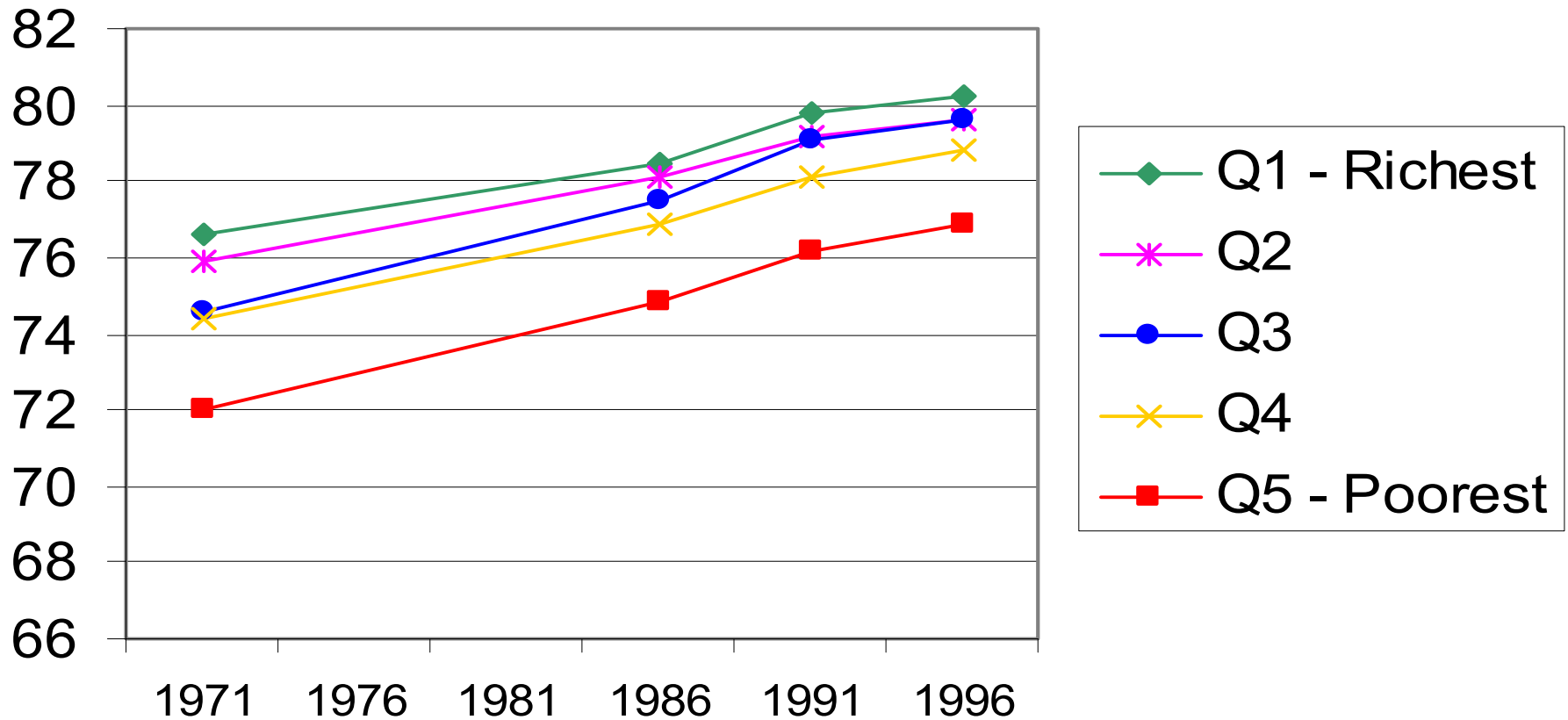
What's Wrong with this Picture

- revascularization → longer term survival + relief of symptoms
 - » 30 day mortality endpoint not sufficient
- what about other aspects of treatment, e.g. thrombolysis
- what about risk factors – obesity, physical fitness, smoking, hypertension, lipids
- n.b. in related analysis, co-morbidity (Charlson Index) included

Words, Paragraphs, Stories

- Words
 - » revascularization rates vary substantially across health regions
 - » so do survival rates after AMI
- Paragraphs
 - » there is at best a weak correlation between revascularization and survival
- Stories
 - » what factors (social determinants, other aspects of the acute treatment episode, post-MI Rx and behaviour change) are most important in accounting for better outcomes

Health Inequalities – Urban Life Expectancy at Birth, By Income Quintile, Canada



Source: Wilkins et al, Statistics Canada, mortality and census data

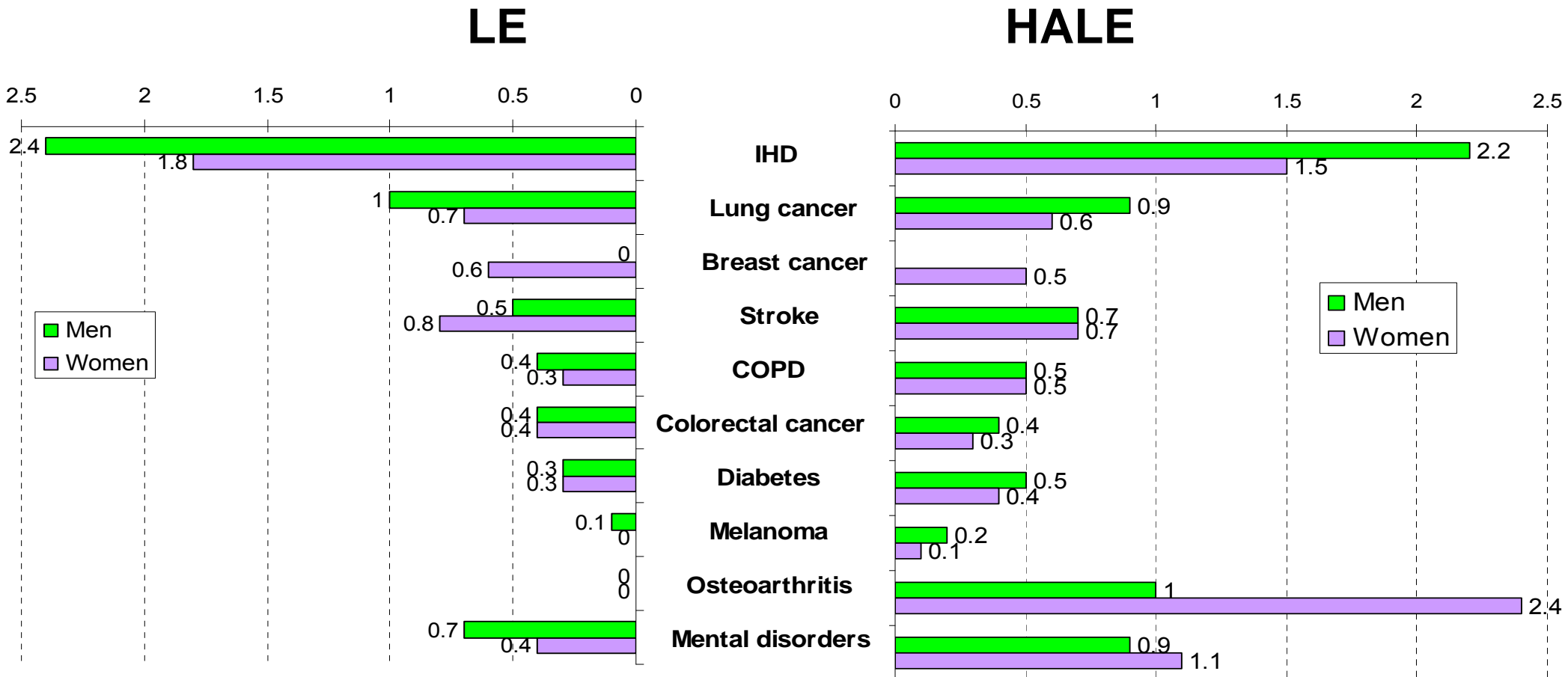
Data Users 2008 Ottawa



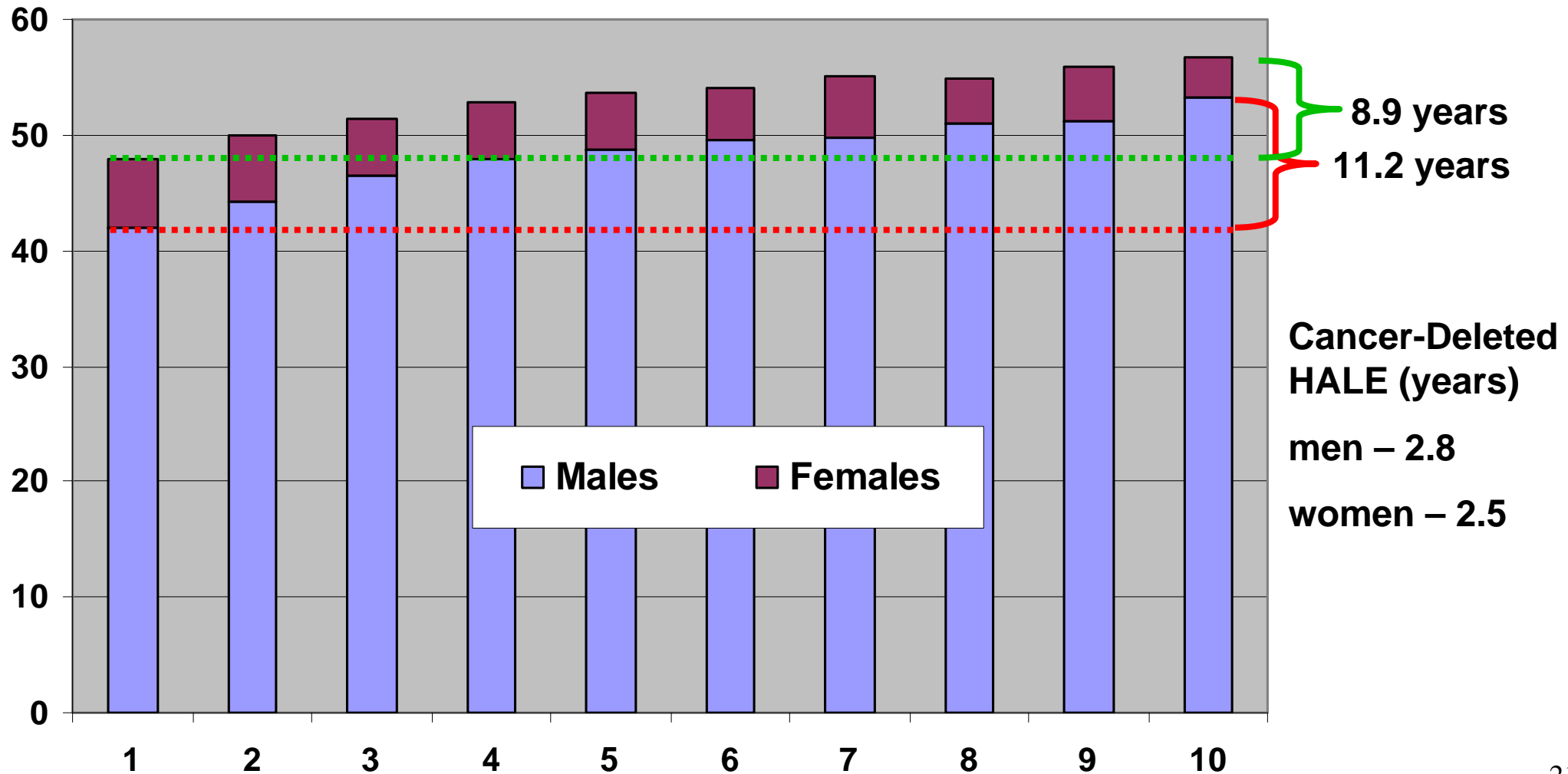
Statistics
Canada

Statistique
Canada

Changes in Life Expectancy (LE) and Health-Adjusted Life Expectancy (HALE) by “Cause”



Health Inequalities – HALE at Age 25 by Sex and Income Decile



Words, Paragraphs, Stories

- Words
 - » small area (ecological) death rates by SES
 - » survey-based patterns of health status by SES
- Paragraphs
 - » construction of HALE by individual-level SES measures
 - » multivariate analysis of mortality rates across SES and other factors
- Stories
 - » Senate (Keon): how to take a “whole of government” approach to addressing the major factors re health inequalities
 - » WHO Commission question for Canada: what interventions would have how much effect on inequalities over a generation?



LHAD: Longitudinal Health and Administrative Data Initiative

- (simple) idea: build a more analytically powerful database of longitudinally **linkable** individual level data
 - » bring together a wide range of administrative data on health care encounters – client registry, hospitals, Rx
 - » plus over 500,000 Statistics Canada health survey responses (where consent to link with provincial health care records has been given) – NPHS, CCHS, CHMS
 - » plus vital events (births, deaths) and cancer registry
 - » using sophisticated record linkage methodology
- extreme care to protect confidentiality
- apply to an agreed set of priority analytical projects

LHAD -- Mechanisms

- governed by MoUs between Statistics Canada and each provincial health ministry
 - » common MoU for all provinces (mostly)
 - » specifically pursuant to the Federal Statistics Act and province-specific legislation
 - » LHAD Steering Committee to oversee both analytical priorities and data flows
 - provincial representatives appointed by Deputy + Vital + Ca + CIHI; co-chaired by Statistics Canada and Ontario
 - » use data already flowing to CIHI where ever possible
 - » all other data, especially nominal data and health insurance numbers, flowing directly from provinces to Statistics Canada



LHAD - Potentials

- recall AMI and revascularization scatter plot
 - » beyond 30 day in hospital mortality (link to death certificates)
 - » add risk factors – e.g. obesity, smoking, physical activity, socio-economic status, functional status
- priority research projects per steering committee
 - » end of life care; impacts of mental health problems on health care utilization; aboriginal health; ambulatory care sensitive conditions; and cancer survival and health care utilization.
- broader research community

Concluding Comments

- major progress over the past decade in development of health information
- excellent initiatives underway, including those based on record linkage
 - » LHAD, and census – mortality linkage
- we are now well beyond only “words”, and well into having “paragraphs”; but many of the most important “stories”, while tantalizingly close, remain to be told