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THE 55TH ANNUAL CANADIAN
REINSURANCE CONFERENCE



CANADIAN REINSURANCE / CONGRÈS CANADIEN DE
CONFÉRENCE / RÉASSURANCE

The Health/Wealth Relationship U.S. Perspective

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Manulife Reinsurance



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Agenda

- 1) Differences in Mortality by Income in the U.S.
- 2) Underlying Drivers of Differences in the U.S.
- 3) Conclusions and Implications for Industry



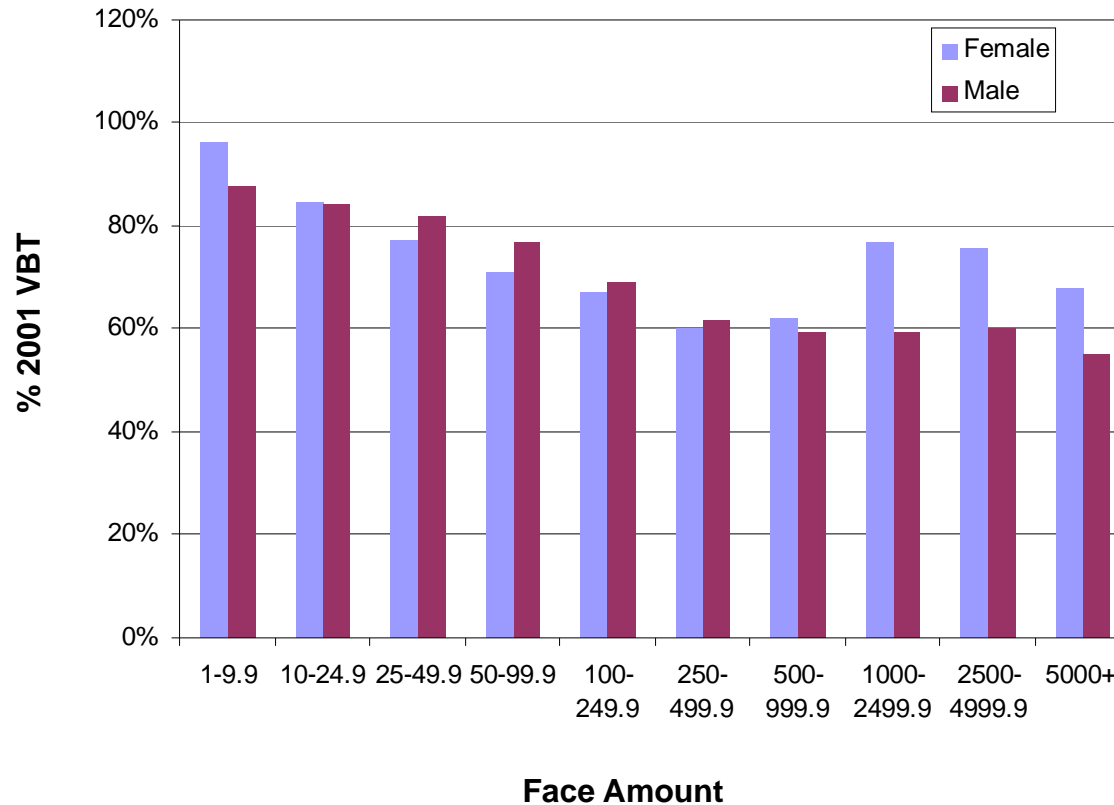
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Life Insurance Data

SOA 2005-07 ILEC Study



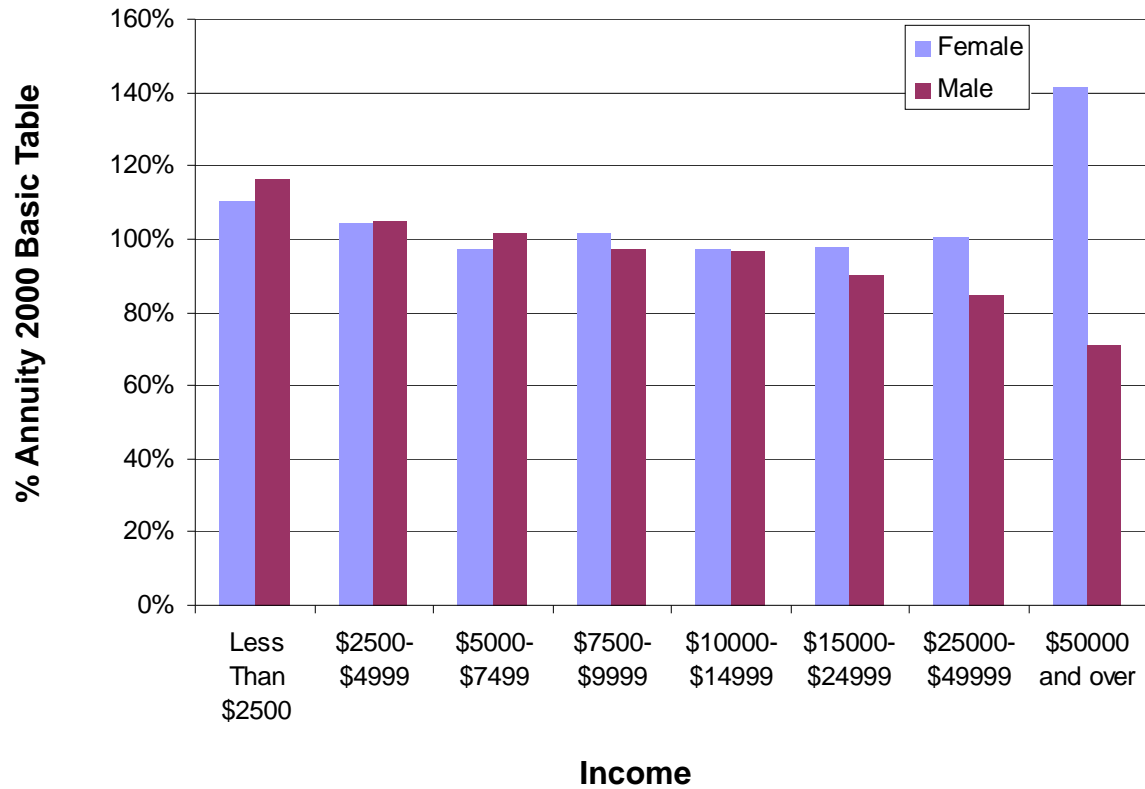
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Payout Annuity Data

SOA 2000-04 Payout Annuity Study Results for "Refund Period Certain" Annuities



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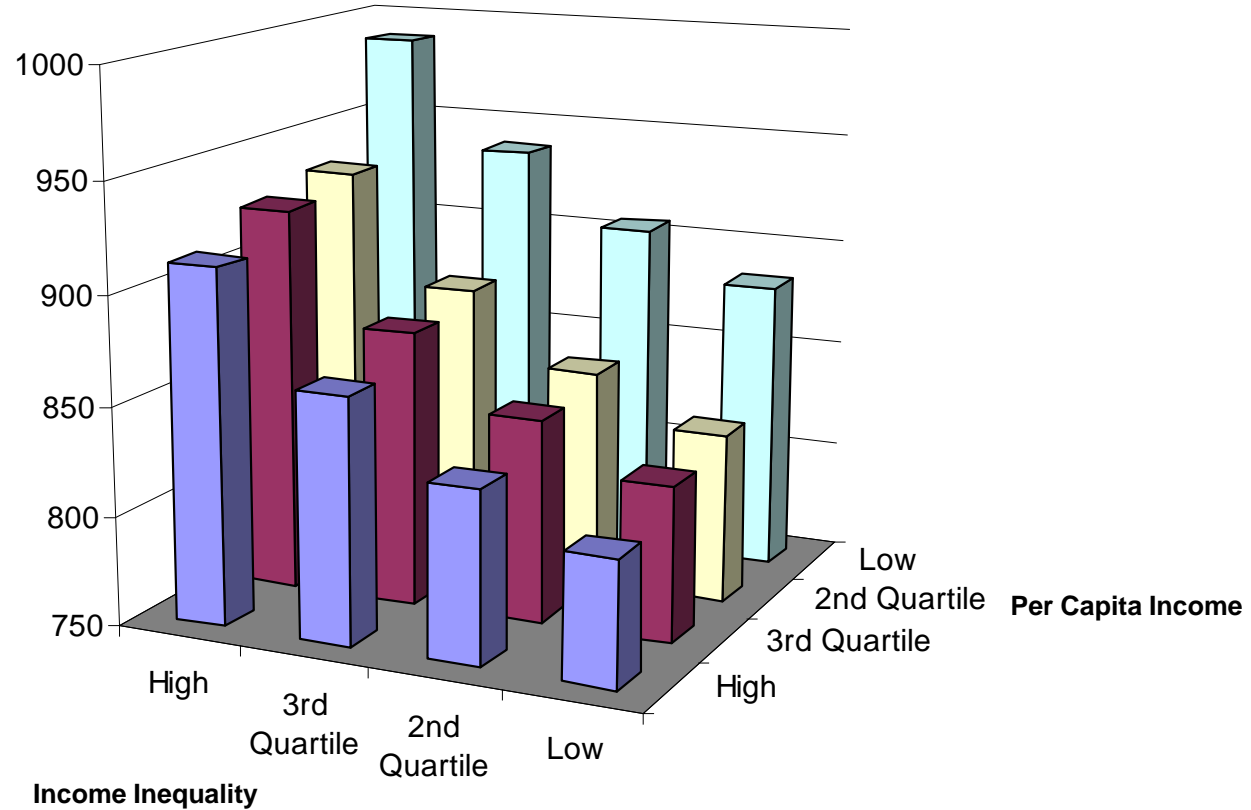
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Mortality Data by County

1990 Census Data by County for 48 Contiguous States

Age and Gender
Adjusted Total
Mortality per 100,000



Source: McLaughlin, D and Stokes, C. Income Inequality and Mortality in US Counties: Does Minority Racial Concentration Matter? *American Journal of Public Health*, January 2002, Vol 92, No. 1 pp. 99-104

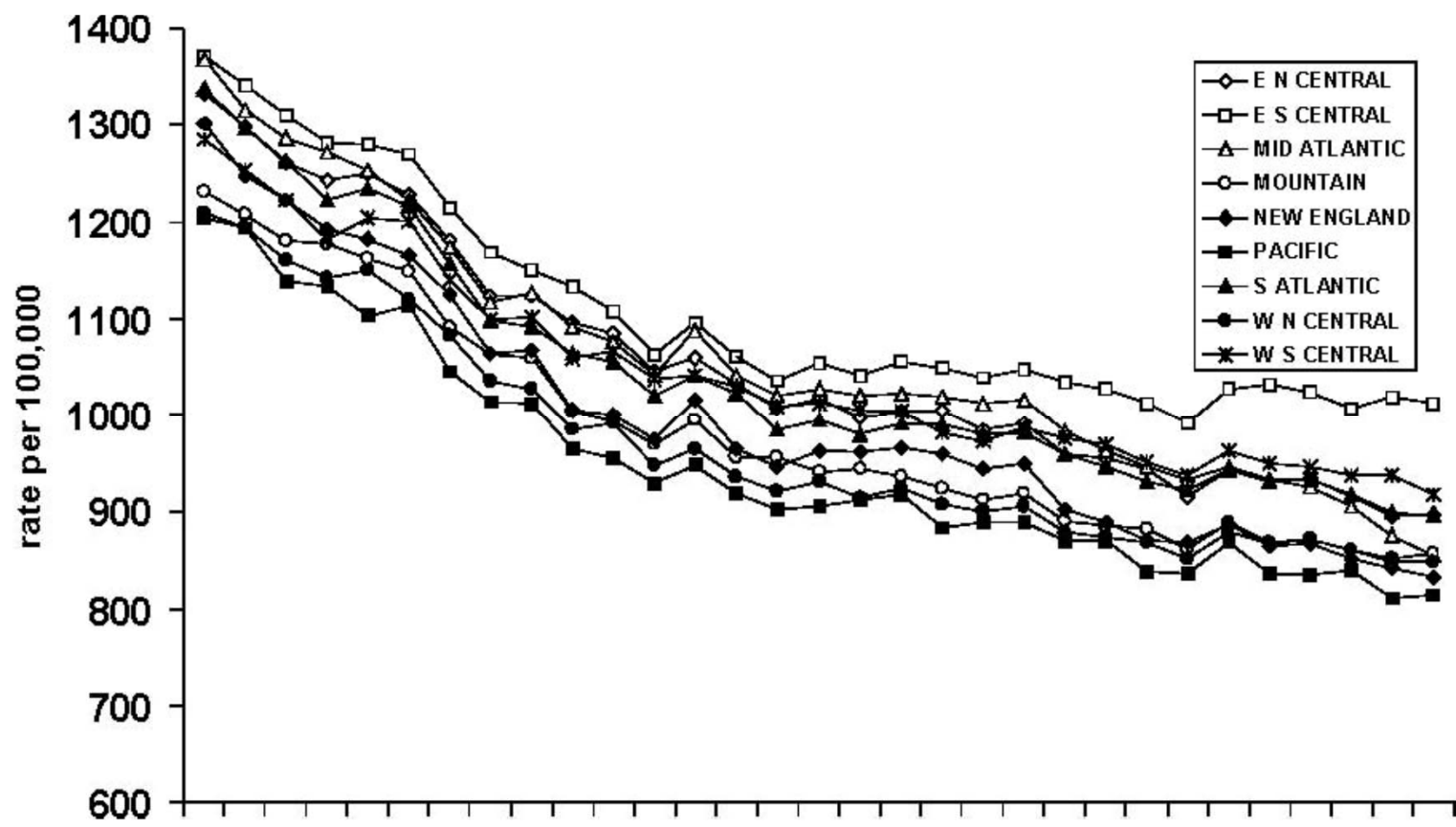


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30 Year Trend in All Cause Mortality by Region 1968-1998



Source: Lynch J, Harper S, Smith GD, Ross N, Wolfson M, Dunn, J. US regional and national cause-specific mortality and trends in income inequality: descriptive findings. *Demographic Research*, June 2002.

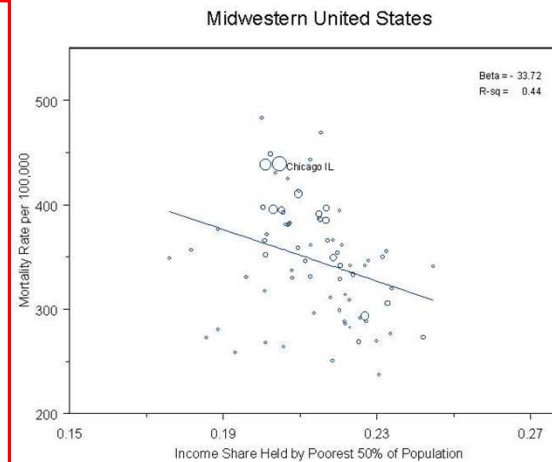
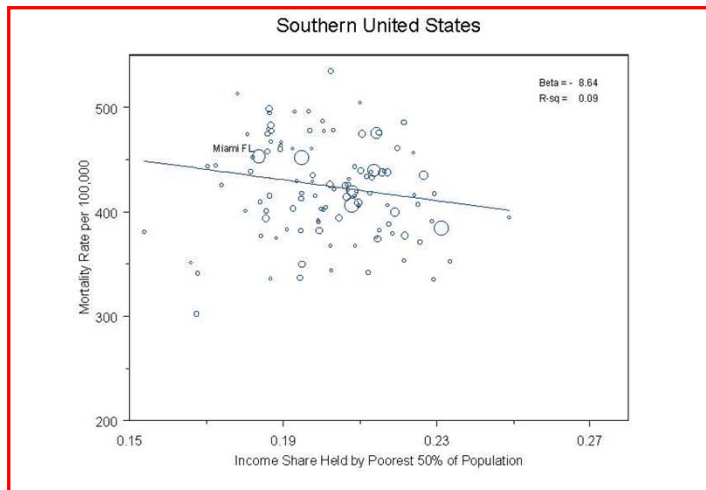
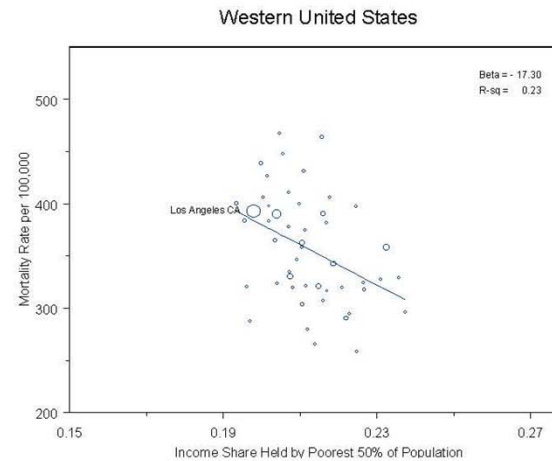
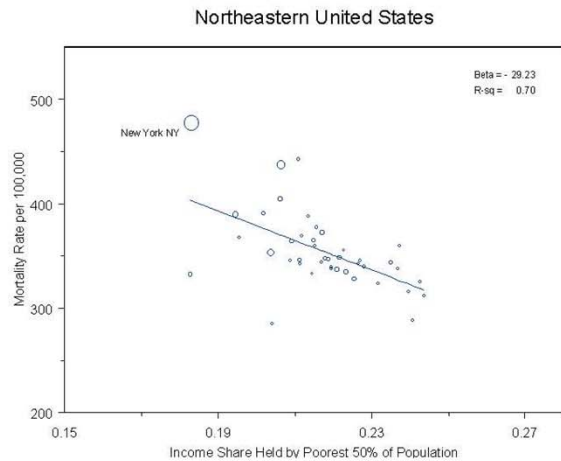


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Regional Differences in Income Inequality Effect



Source: Lynch J, Harper S, Smith GD, Ross N, Wolfson M, Dunn, J. US regional and national cause-specific mortality and trends in income inequality: descriptive findings. *Demographic Research*, June 2002.

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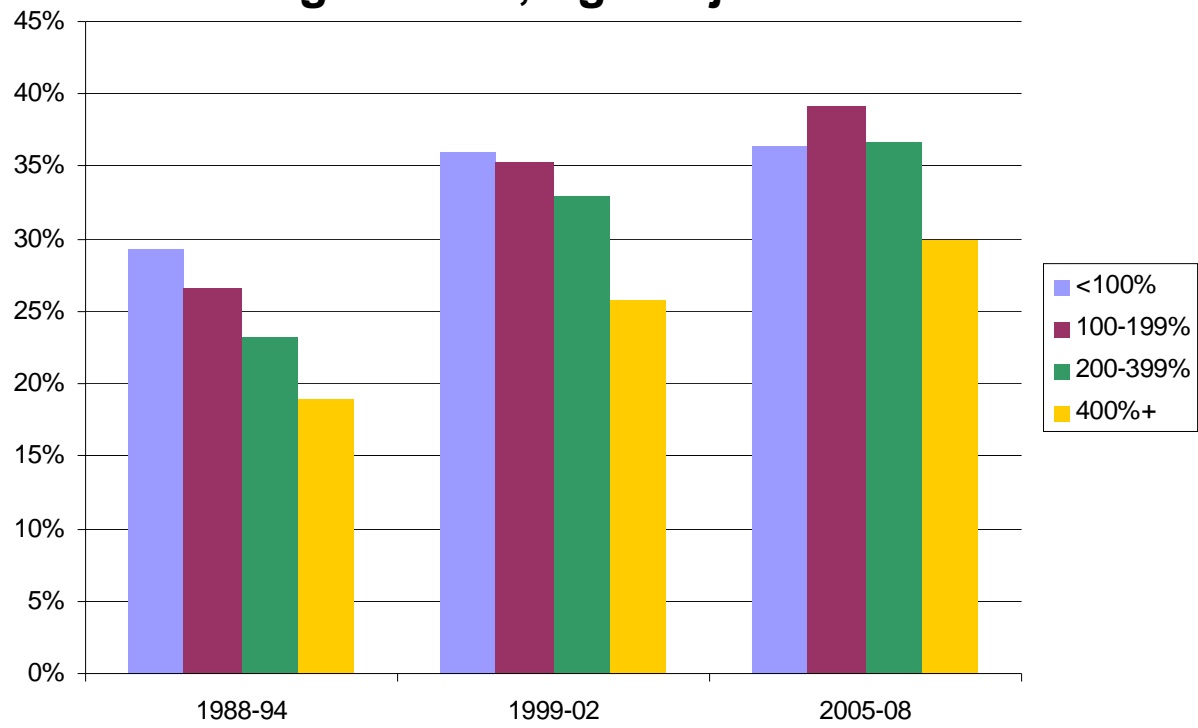


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Obesity

Percentage of Population Obese By Income as a Percent of Poverty Level Ages 20-74, Age Adjusted



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



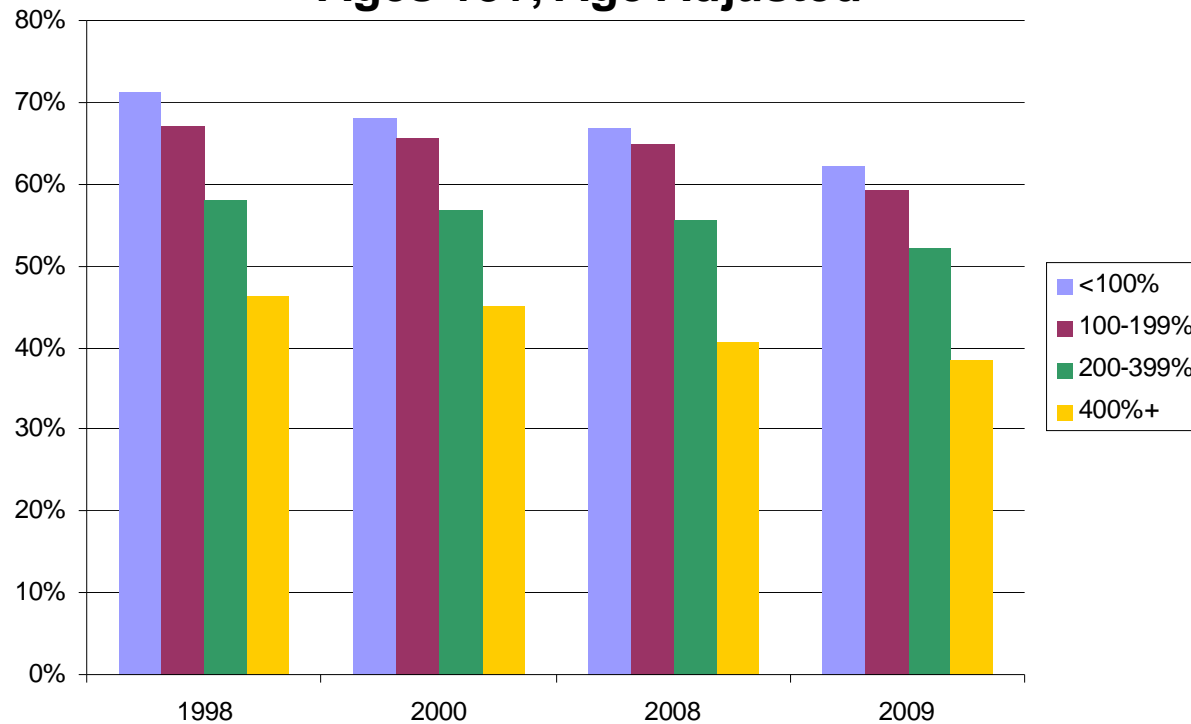
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Inactivity

Percentage of Population Meeting Neither Aerobic Activity Nor Muscle-Strengthening Guidelines By Income as a Percent of Poverty Level Ages 18+, Age Adjusted



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



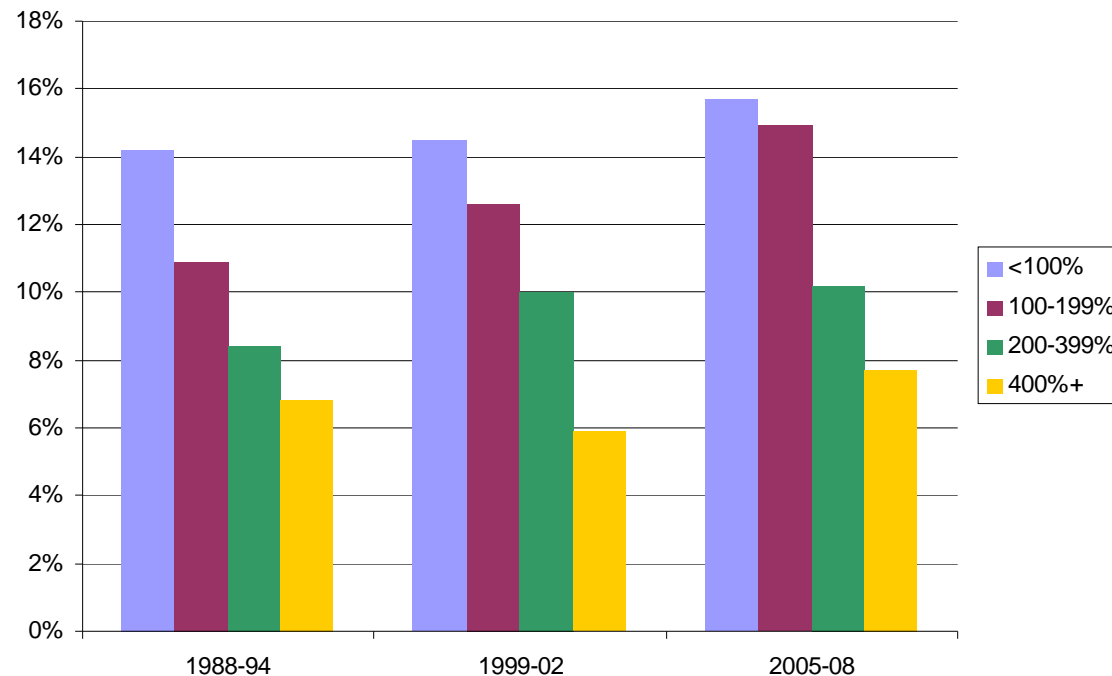
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Diabetes

Percentage of Population With Diabetes By Income as a Percent of Poverty Level Ages 20+, Age Adjusted



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



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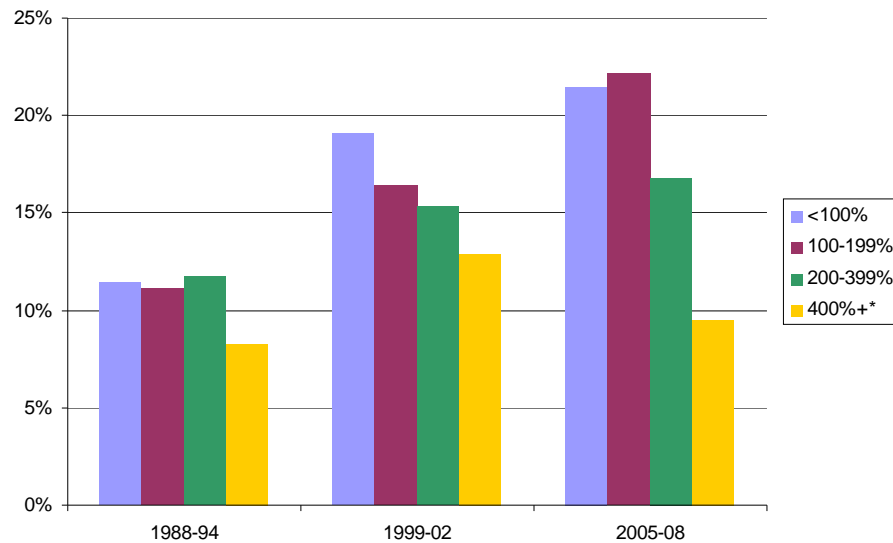
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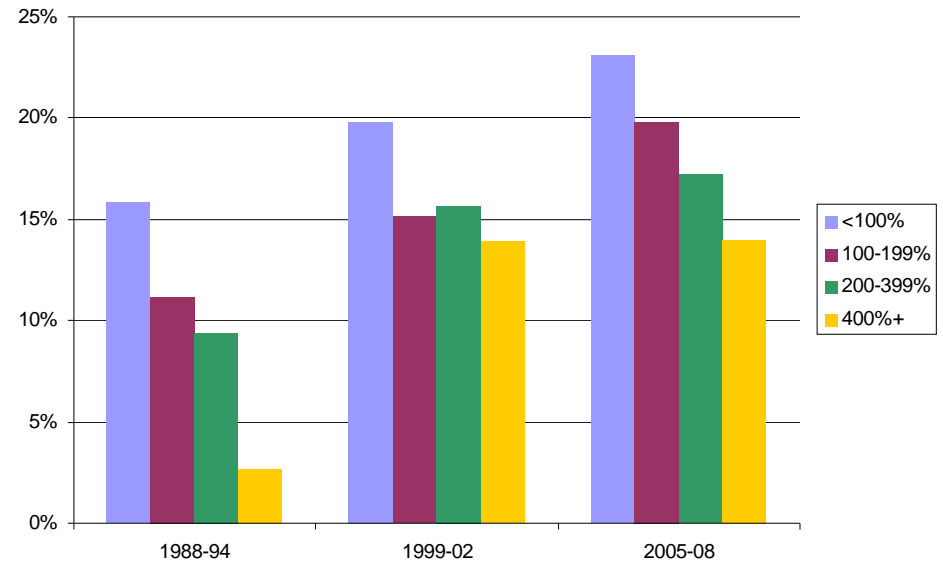
Obesity in Children and Adolescents

Percentage Obese By Income as a Percent of Poverty Level

Ages 6-11



Ages 12-19



* - Sample Size Small, Confidence Interval 20-30%

Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



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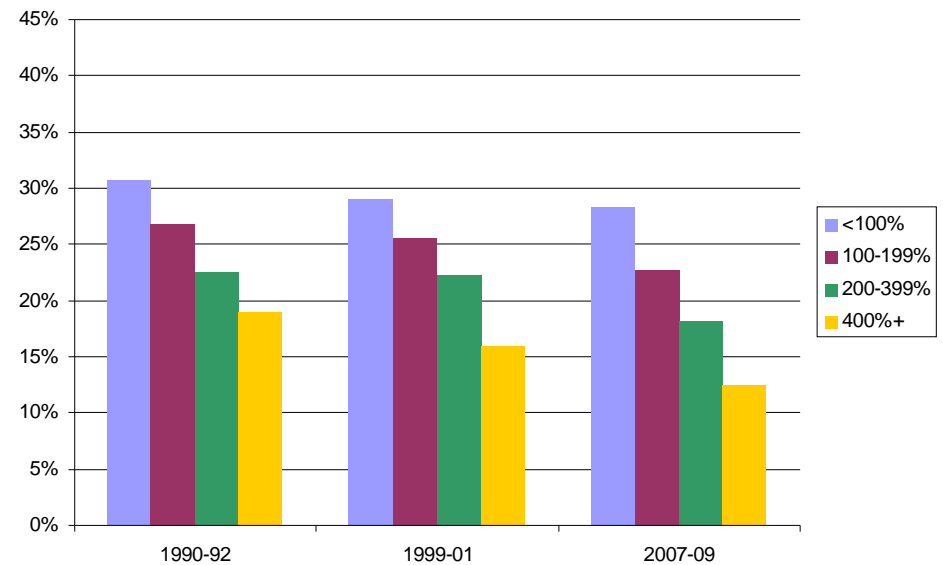
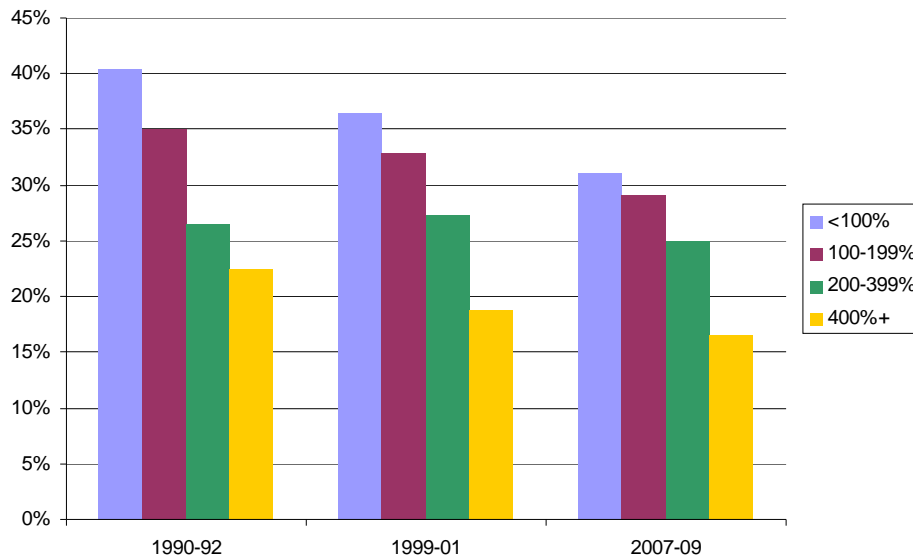


Smoking

Percentage Smoking By Income as a Percent of Poverty Level Ages 18+, Age Adjusted

Male

Female



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



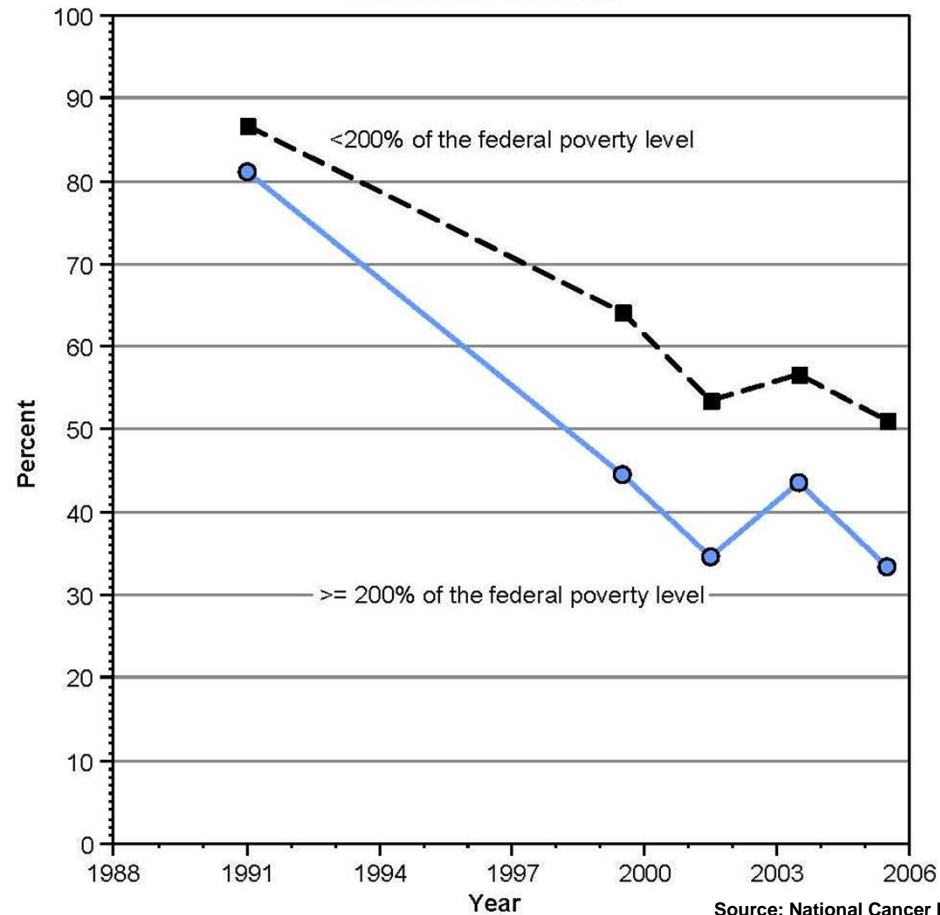
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Secondhand Smoke

Figure PSS5: Percentage of nonsmokers exposed to secondhand smoke^ by poverty income level: 1988-2006



Source: National Cancer Institute, *Cancer Trend Report 2009/2010 Update*



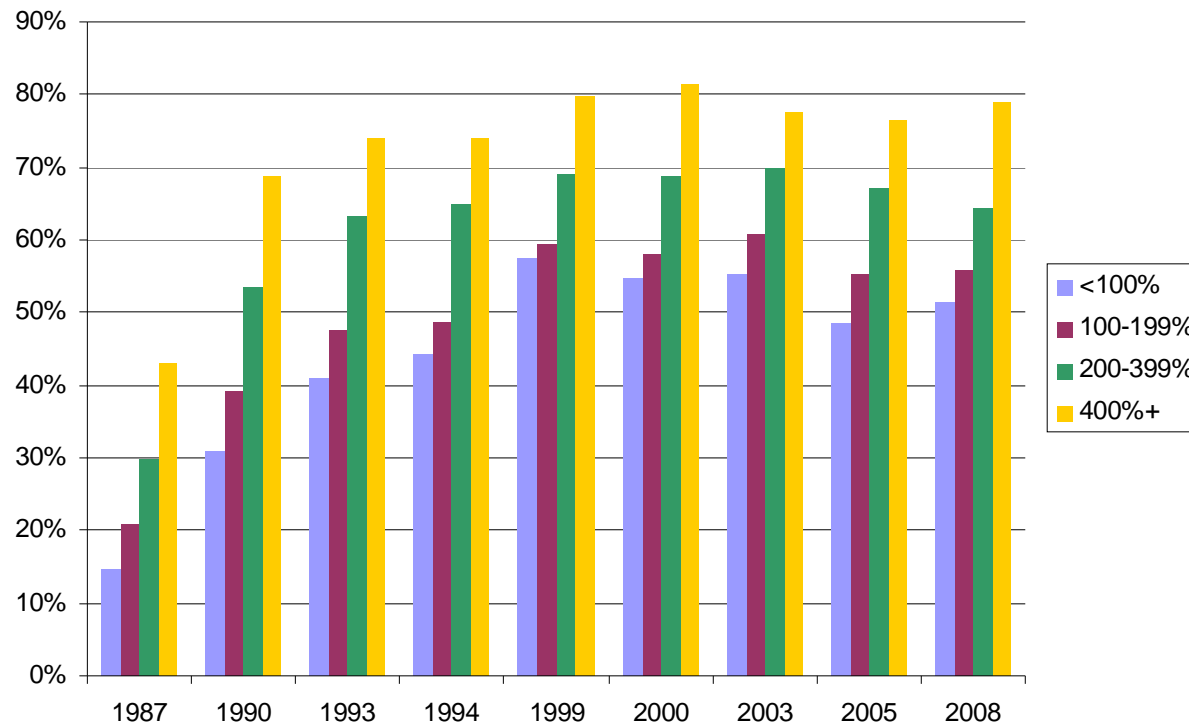
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Mammography

Percentage of Women Ages 40+ Who Have Had a Mammogram in the Past 2 Years by Income as a Percent of Poverty Level



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



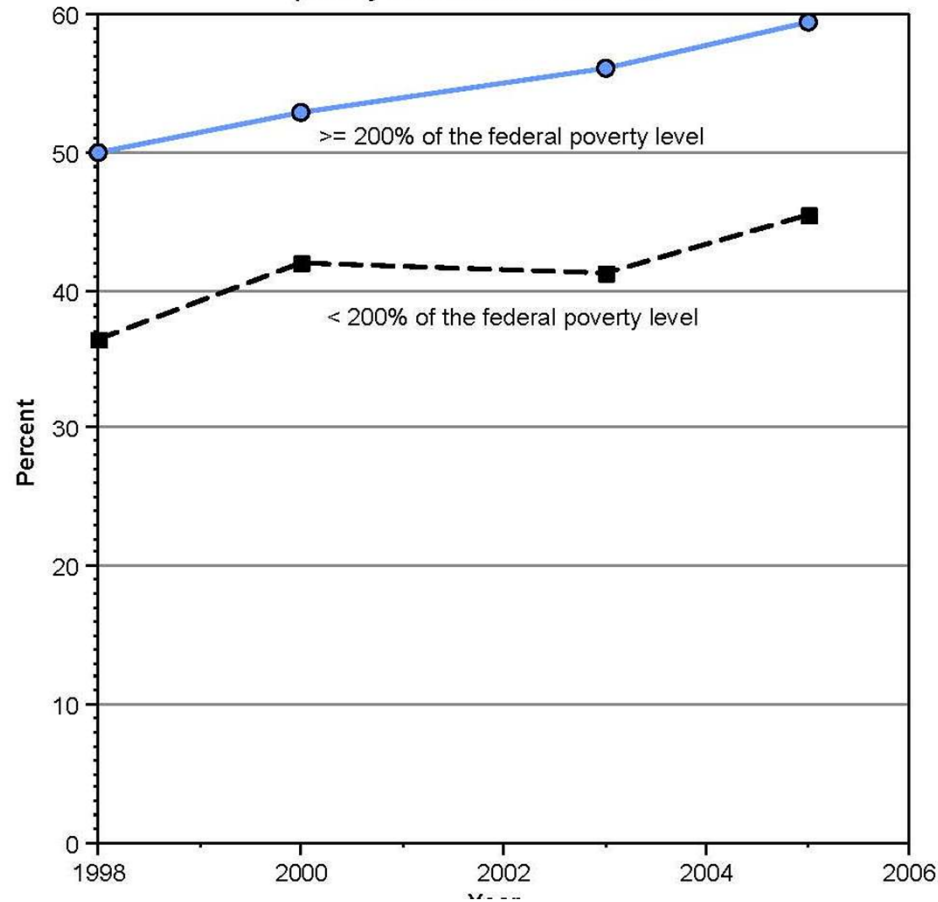
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Colorectal Screening

Figure SCO8: Colorectal test use rates^ for adults aged 50 years and older by poverty income level: 1987-2005



Source: National Cancer Institute, *Cancer Trend Report 2009/2010 Update*



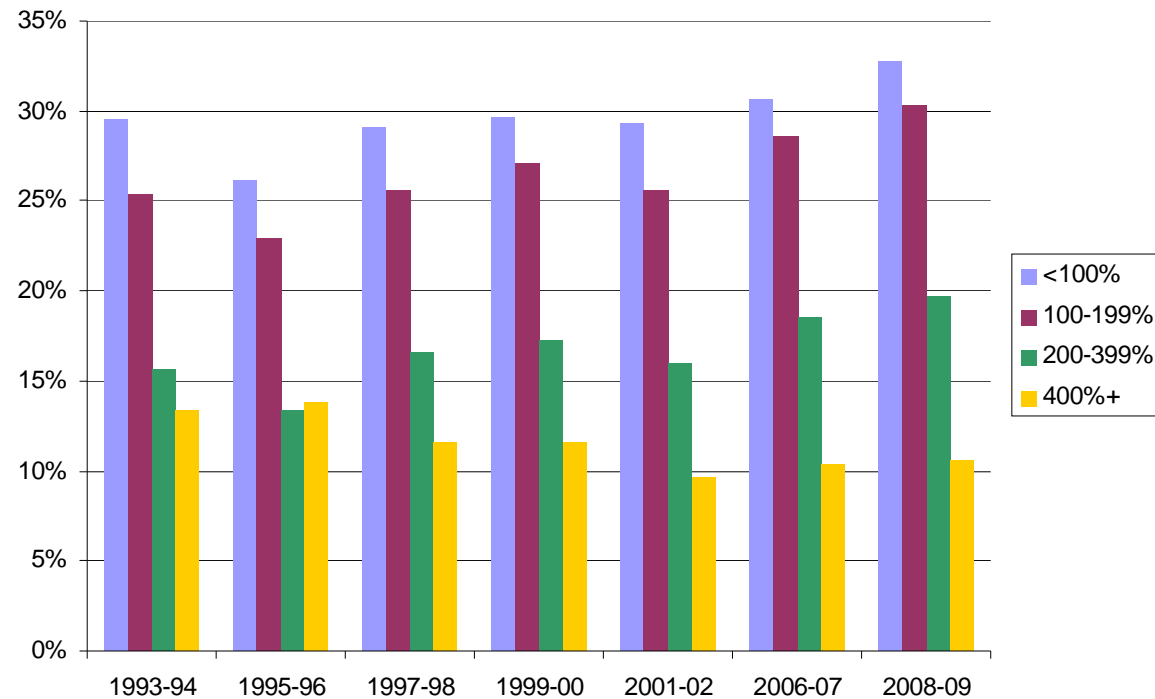
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Use of Health Care

Percentage of Population With No Usual Source of Health Care By Income as a Percent of Poverty Level Ages 18-64, Age Adjusted



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



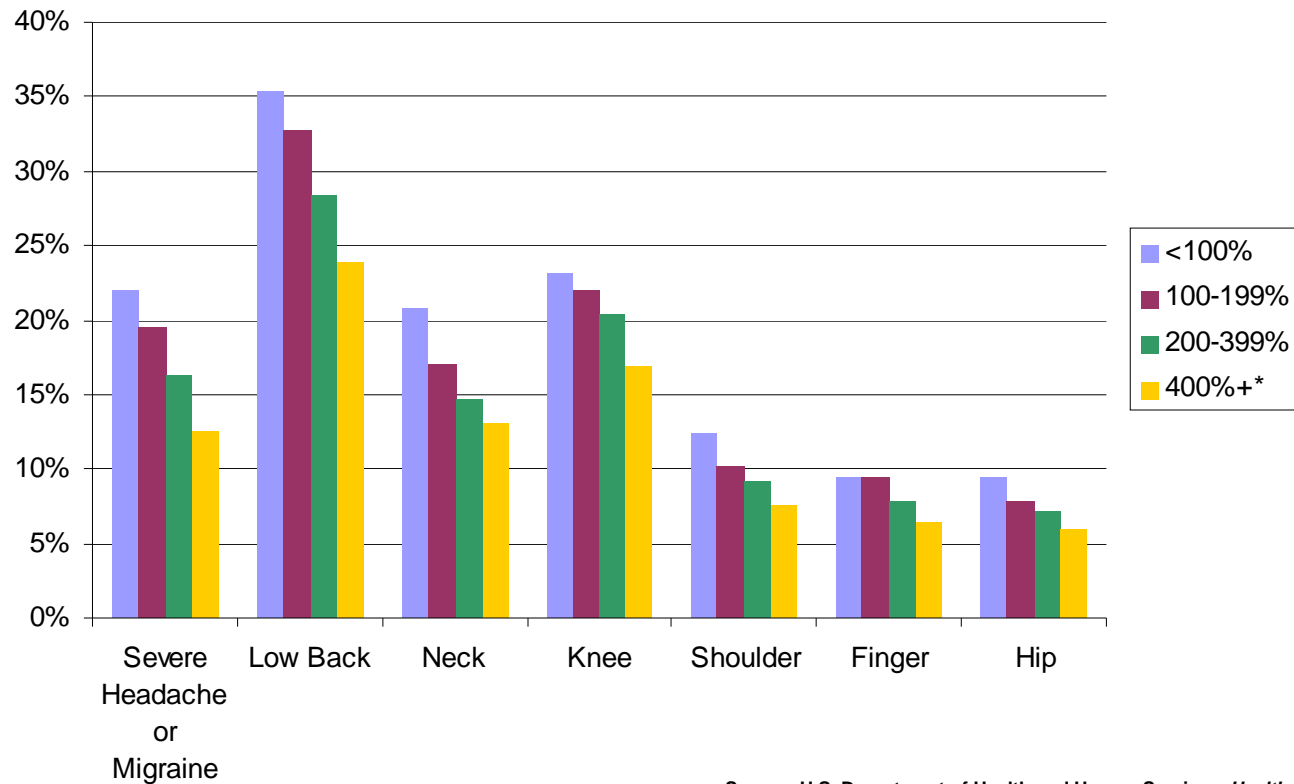
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Pain

Percentage Reporting Pain - 2009 By Income as a Percent of Poverty Level Ages 18+, Age Adjusted



Source: U.S. Department of Health and Human Services, *Health, United States, 2010*



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Conclusions

No Reason to Think Differences in Mortality by Income Will Diminish in Future

- Trends in Underlying Factors Show Little to No Narrowing of Differences
- Underlying Factors Indicate Many Causes of Differences in Mortality - Focusing on One Issue Will Not Solve the Problem



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Implications for Our Industry

Insurers and Reinsurers Ignore Heterogeneity of US Population at Their Own Risk

- Be Wary of Using Overall Experience To Introduce New Product to New Market
 - E.g. Critical Illness, Simplified Issue
- Market/Distribution May Explain More of Experience Differences from One Company to Another than Understood
- General Topic Could Benefit from an Actuarial Perspective and Research



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