

The US Health Disadvantage

Health Economics
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Health disadvantage

- US has lower life expectancy, higher mortality, higher infant mortality than most other developed countries
- Spend considerably more than other countries on medical care
- Many view these two facts as an indictment of the “unique inefficiency” of the US health care system

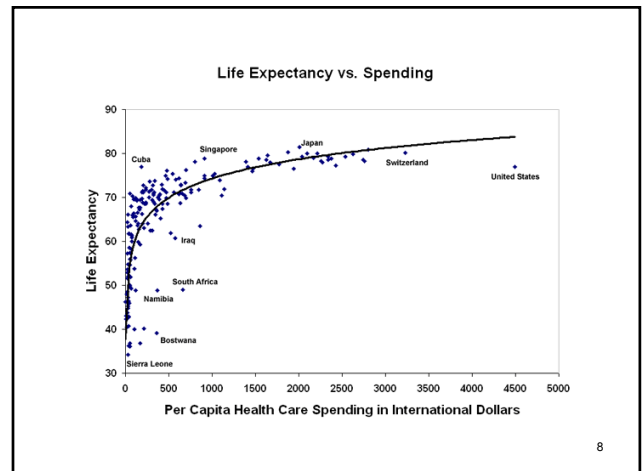
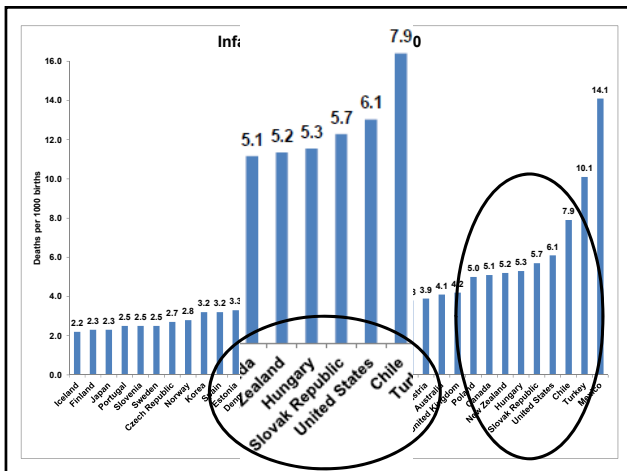
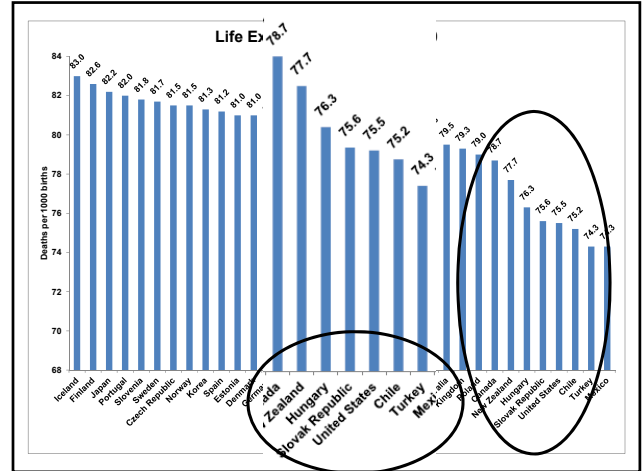
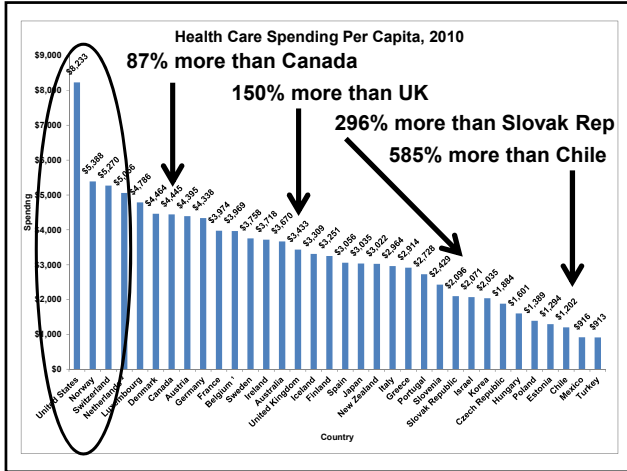
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- 2013 National Academy of Sciences report
- Thoughtful outline of the issue
- Helps summarize many of the topics we discussed throughout the semester

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Some basic facts

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SHORTER LIVES

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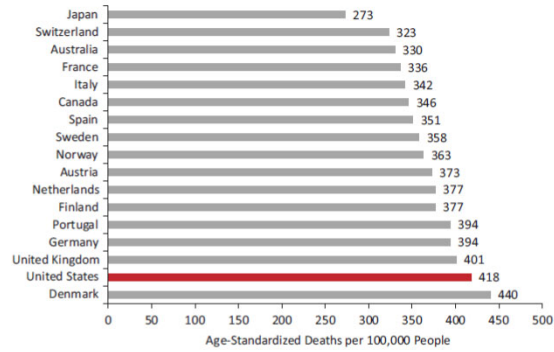


FIGURE 1-1 Mortality from noncommunicable diseases in 17 peer countries, 2008. SOURCE: Data from World Health Organization (2011a, Table 3).

TABLE 1-2 U.S. Death Rates Relative to 16 Peer Countries, 2008

| Cause of Death | Mortality Rate (per 100,000) | | |
|--|---------------------------------|-------------------------|-------------|
| | United States | Peer Countries (N = 16) | |
| | Death Rates | Unweighted Mean | Range |
| | Above Average | | |
| Cardiovascular diseases ^a | 155.7 | 133.6 | 97.4-174.9 |
| Neuropsychiatric conditions ^b | 39.2 | 28.1 | 7.2-48.4 |
| Respiratory disease | 34.3 | 21.0 | 12.7-34.4 |
| Infectious and parasitic diseases | 15.4 | 7.7 | 4.4-17.5 |
| Diabetes mellitus | 15.2 | 10.2 | 4.5-19.3 |
| Genitourinary diseases ^c | 12.3 | 7.2 | 3.0-12.2 |
| Endocrine disorders | 7.1 | 4.2 | 1.6-8.1 |
| Congenital anomalies | 4.3 | 3.3 | 2.6-4.0 |
| Musculoskeletal diseases ^d | 2.9 | 2.4 | 1.2-3.5 |
| Nutritional deficiencies | 1.0 | 0.7 | 0.1-2.0 |
| Skin diseases | 0.8 | 0.6 | 0.1-1.5 |
| Maternal conditions | 0.4 | 0.1 | 0.0-0.2 |
| Perinatal conditions | 7.1 | 3.7 | 1.3-5.9 |
| Unintentional injuries ^e | 35.5 | 20.4 | 13.7-38.6 |
| Intentional injuries | 17.3 | 11.4 | 5.6-20.2 |
| | Death Rates at or Below Average | | |
| Malignant neoplasms ^f | 123.8 | 127.3 | 106.5-157.7 |
| Digestive diseases ^g | 19.8 | 19.8 | 13.0-29.5 |
| Respiratory infections | 9.7 | 12.3 | 4.0-29.7 |
| Other neoplasms | 2.9 | 3.1 | 2.1-5.3 |
| Oral conditions ^h | 0.0 | 0.0 | 0.0-0.1 |
| Sense organ diseases ⁱ | 0.0 | 0.0 | 0.0 |

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TABLE 1-3 Life Expectancy at Birth in 17 Peer Countries, 2007

| Males | | | Females | | |
|----------------|-------|------|----------------|-------|------|
| Country | LE | Rank | Country | LE | Rank |
| Switzerland | 79.33 | 1 | Japan | 85.98 | 1 |
| Australia | 79.27 | 2 | France | 84.43 | 2 |
| Japan | 79.20 | 3 | Switzerland | 84.09 | 3 |
| Sweden | 78.92 | 4 | Italy | 84.09 | 3 |
| Italy | 78.82 | 5 | Spain | 84.03 | 5 |
| Canada | 78.35 | 6 | Australia | 83.78 | 6 |
| Norway | 78.25 | 7 | Canada | 82.95 | 7 |
| Netherlands | 78.01 | 8 | Sweden | 82.95 | 7 |
| Spain | 77.62 | 9 | Austria | 82.86 | 9 |
| United Kingdom | 77.43 | 10 | Finland | 82.86 | 9 |
| France | 77.41 | 11 | Norway | 82.68 | 11 |
| Austria | 77.33 | 12 | Germany | 82.44 | 12 |
| Germany | 77.11 | 13 | Netherlands | 82.31 | 13 |
| Denmark | 76.13 | 14 | Portugal | 82.19 | 14 |
| Portugal | 75.87 | 15 | United Kingdom | 81.68 | 15 |
| Finland | 75.86 | 16 | United States | 80.78 | 16 |
| United States | 75.64 | 17 | Denmark | 80.53 | 17 |

NOTE: LE = life expectancy at birth (years), or e⁰.
SOURCE: Ho and Preston (2011, Table 1).

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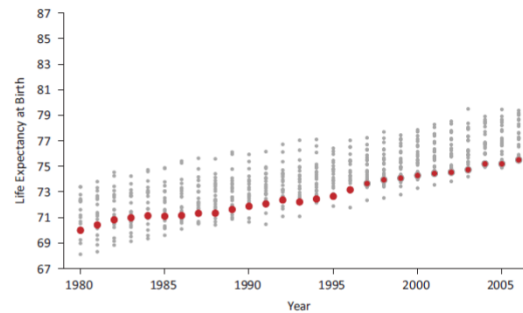


FIGURE 1-5 U.S. male life expectancy at birth relative to 21 other high-income countries, 1980-2006.

NOTES: Red circles depict life expectancy in the United States. Grey

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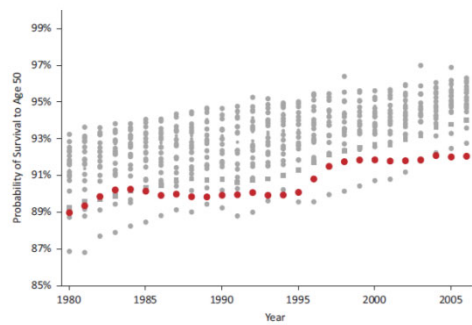


FIGURE 1-7 Probability of survival to age 50 for males in 21 high-income countries, 1980-2006.

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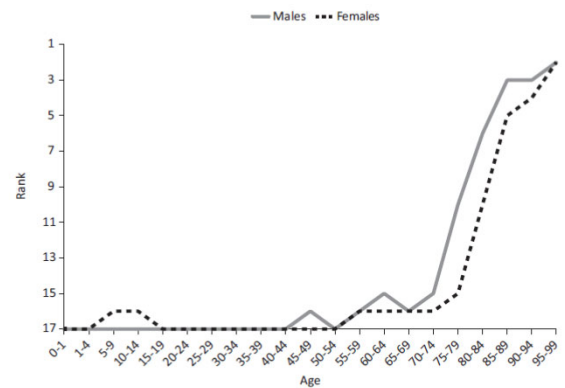


FIGURE 1-9 Ranking of U.S. mortality rates, by age group, among 17 peer countries, 2006-2008.

POORER HEALTH THROUGHOUT LIFE

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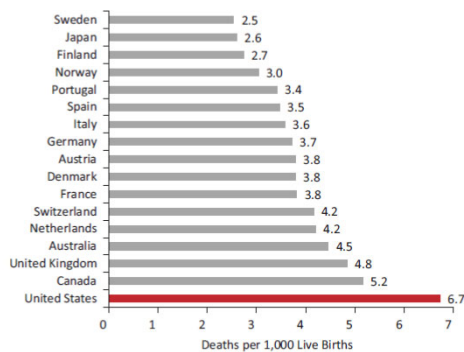


FIGURE 2-1 Infant mortality rates in 17 peer countries, 2005-2009.

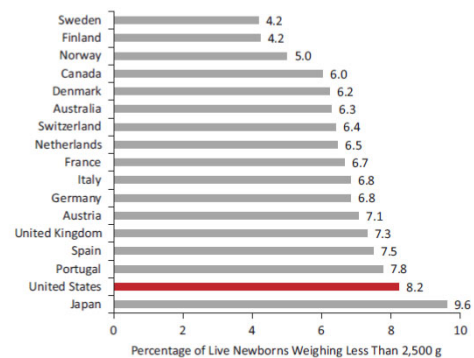


FIGURE 2-2 Low birth weight in 17 peer countries, 2005-2009.

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Ch. 4: Public health/Medical care

- US leading in health innovation
- Still has 10% of the population w/out insurance
- Many report not using care b/c of cost
- Differences in the quality of care across groups
- Poor access to care in inner cities/rural areas

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TABLE 4-1 Cost-Related Access Problems in the Past Year Among U.S. Patients with Complex Chronic Conditions, 2011

| Problem | Percentage of Respondents Reporting Access Problems in Selected Countries | | | | | | | | | | United States |
|---|---|--------|--------|---------|-------------|-------------|--------|--------|-------------|----------------|---------------|
| | Austria | Canada | France | Germany | Netherlands | New Zealand | Norway | Sweden | Switzerland | United Kingdom | |
| Difficulty paying or unable to pay medical bills | 8 | 8 | 5 | 6 | 14 | 11 | 7 | 4 | 8 | 1 | 27 |
| Cost-related access problems | 30 | 20 | 19 | 22 | 15 | 26 | 14 | 11 | 18 | 11 | 42 |
| Did not visit a doctor when had a medical problem | 17 | 7 | 10 | 12 | 7 | 18 | 8 | 6 | 11 | 7 | 29 |
| Did not get recommended test, treatment, or follow-up | 19 | 7 | 9 | 13 | 8 | 15 | 7 | 4 | 11 | 4 | 31 |
| Did not fill a prescription or skipped doses | 16 | 15 | 11 | 14 | 8 | 12 | 7 | 7 | 9 | 4 | 30 |

SOURCE: Data from Schone et al. (2011). Exhibit 11.

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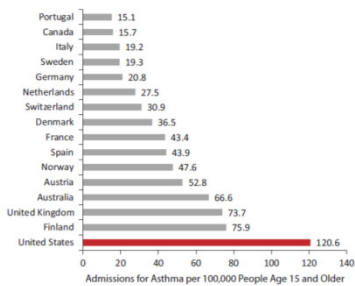


FIGURE 4-3 Hospital admissions for asthma in 16 peer countries.

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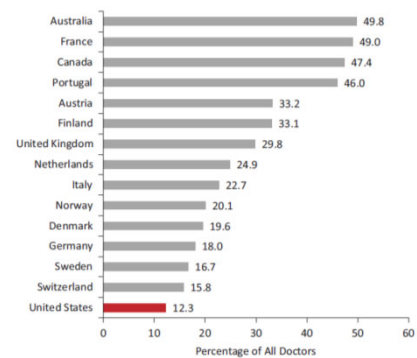


FIGURE 4-1 General practitioners as a proportion of total doctors in 15 peer countries, 2009.
SOURCE: Data from OECD (2011b, Figure 3.2.2).

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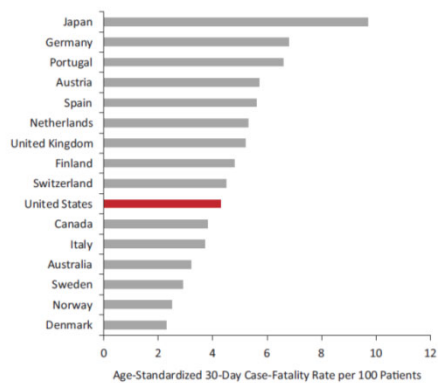


FIGURE 4-2 In-hospital case-fatality rates for acute myocardial infarction in 16 peer countries.

Table 1. Five-Year Relative Survival Rates for Cancer of Different Sites, US and European Cancer Registries*

| Site | 5-year survival rate (%) | |
|--------------------------|--------------------------|--------|
| | United States | Europe |
| Prostate | 99.3 | 77.5 |
| Skin melanoma | 92.3 | 86.1 |
| Breast | 90.1 | 79.0 |
| Corpus uteri | 82.3 | 78.0 |
| Colorectum | 65.5 | 56.2 |
| Non-Hodgkin lymphoma | 62.0 | 54.6 |
| Stomach | 25.0 | 24.9 |
| Lung | 15.7 | 10.9 |
| <hr/> | | |
| All malignancies (men) | 66.3 | 47.3 |
| All malignancies (women) | 62.9 | 55.8 |

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TABLE 1-6
FIVE-YEAR AGE-ADJUSTED CANCER SURVIVAL RATES,
UNITED STATES¹ AND SELECTED EUROPEAN COUNTRIES²

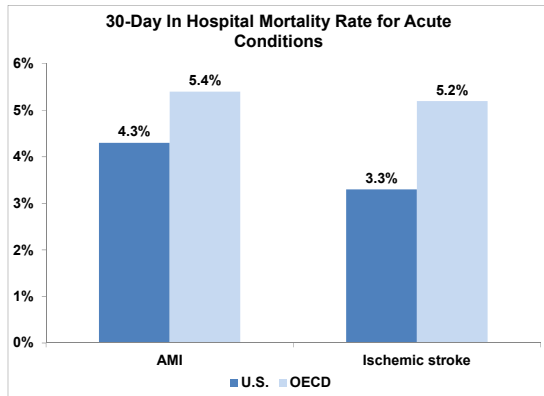
| | Breast (Female) | Cervical (Female) | Colon (Male) | Lung (Male) | Prostate (Male) | Thyroid (Female) |
|---------------|--------------------|----------------------|-----------------|----------------|--------------------|---------------------|
| United States | 82.8 | 69.0 | 61.7 | 12.0 | 81.2 | 95.9 |
| White | 83.9 | 71.8 | 62.5 | 12.0 | 82.7 | 95.7 |
| Black | 69.2 | 55.6 | 52.6 | 12.0 | 69.2 | 93.0 |
| England | 66.7 | 62.6 | 41.0 | 7.0 | 44.3 | 74.4 |
| Denmark | 70.6 | 64.2 | 39.2 | 5.6 | 41.0 | 71.7 |
| France | 80.3 | 64.1 | 51.8 | 11.5 | 61.7 | 81.0 |
| Germany | 71.7 | 64.1 | 49.6 | 8.7 | 67.6 | 77.0 |
| Italy | 76.7 | 64.0 | 46.9 | 8.6 | 47.4 | 77.0 |
| Sweden | 80.6 | 68.0 | 51.8 | 8.8 | 64.7 | 83.7 |
| Switzerland | 79.6 | 67.2 | 52.3 | 10.3 | 71.4 | 78.0 |

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Heart Attack Treatment, Canada vs. US

| Category | Canada | US |
|--------------------|--------|-------|
| • Angioplasty | 11.4% | 30.5% |
| • Bypass | 4.0% | 11.4% |
| • 5-year mortality | 21.4% | 19.6% |

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Conclusion

- \$ barriers a problem in US
- Many death categories not driven by medical care
- US does a good job once diagnosed
- Not such a good job preventing illness

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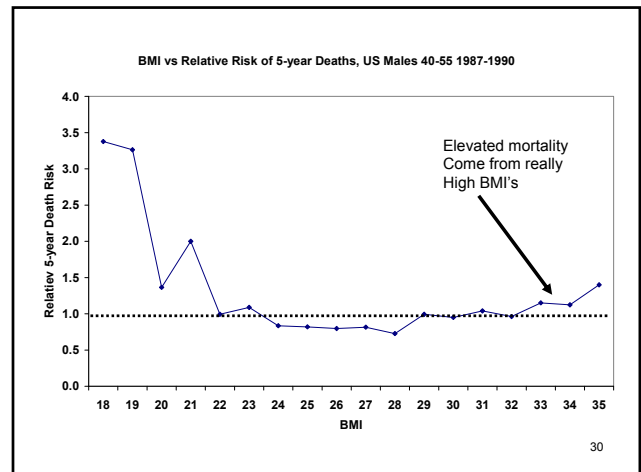
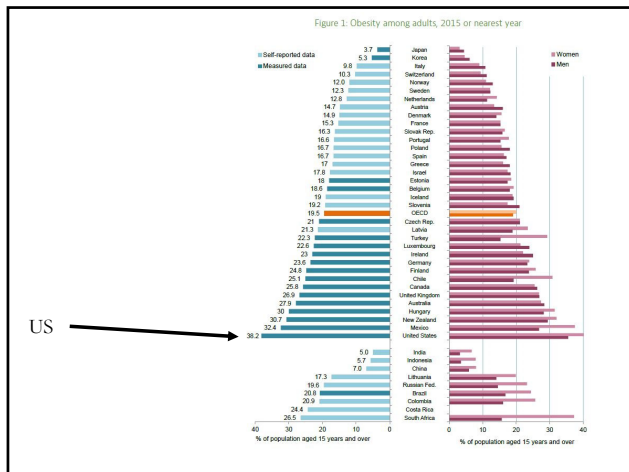
Ch. 5: Individual Behaviors

- US has much higher rates of obesity than the rest of the world
- US has high rates of some types of deaths
 - Gun violence, traffic fatalities, drug poisonings
- Can these individual behaviors explain the US Health disadvantage
- If yes – is this “caused” by the health care system?

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FIGURE 5-2 Prevalence of daily smoking in 17 peer countries.



| Country | Sample Size, No. | Women Aged 50–89 Years | | | |
|-----------------------------|------------------|---|-------------------------|-------------------------|-------------------------|
| | | BMI ≥ 25, % (95% CI) | BMI ≥ 30, % (95% CI) | BMI ≥ 35, % (95% CI) | BMI ≥ 40, % (95% CI) |
| | | Estimates based on self-reported height and | | | |
| Comparison countries | | | | | |
| Austria | 1840 | 57.0 (53.8, 60.2) | 21.0 (18.5, 23.8) | 4.7 (3.5, 6.3) | 1.5 (0.9, 2.6) |
| Belgium | 2933 | 53.2 (50.6, 55.8) | 17.7 (15.8, 19.7) | 4.1 (3.2, 5.2) | 0.8 (0.4, 1.3) |
| Czech Republic | 1768 | 67.7 (63.4, 71.7) | 22.8 (19.2, 26.7) | 4.6 (3.1, 6.9) | 1.0 (0.5, 2.1) |
| Denmark | 1756 | 43.7 (40.4, 47.1) | 13.0 (10.9, 15.5) | 3.0 (2.1, 4.3) | 0.6 (0.3, 1.3) |
| France | 2774 | 46.0 (42.7, 49.3) | 15.5 (13.0, 18.4) | 3.2 (2.3, 4.6) | 1.2 (0.6, 2.3) |
| Germany | 2885 | 54.8 (51.9, 57.6) | 15.8 (13.8, 17.9) | 4.4 (3.4, 5.7) | 1.4 (0.8, 2.2) |
| Israel | 2146 | 57.9 (48.7, 66.6) | 19.0 (13.9, 25.4) | 3.5 (2.0, 6.2) | 1.0 (0.3, 2.7) |
| Italy | 2751 | 53.2 (50.0, 56.4) | 15.9 (13.8, 18.3) | 3.1 (2.2, 4.2) | 0.6 (0.3, 1.1) |
| Netherlands | 2812 | 52.7 (49.8, 55.6) | 15.9 (14.0, 18.1) | 4.3 (3.3, 5.7) | 1.5 (0.9, 2.4) |
| Poland | 1681 | 68.3 (64.9, 71.6) | 27.3 (24.4, 30.5) | 6.2 (4.8, 8.1) | 1.1 (0.6, 1.9) |
| Spain | 1994 | 66.2 (63.2, 69.6) | 23.9 (21.2, 26.8) | 7.5 (6.0, 9.4) | 1.9 (1.1, 3.1) |
| Sweden | 2966 | 52.1 (49.1, 55.0) | 16.4 (13.8, 19.2) | 3.5 (2.6, 4.9) | 0.9 (0.5, 1.7) |
| Switzerland | 1615 | 41.4 (38.0, 44.9) | 12.5 (10.4, 15.0) | 3.1 (2.1, 4.6) | 0.7 (0.3, 1.6) |
| Average | 2302 | 55.0 (50.4, 56.2) | 18.2 (17.5, 19.1) | 4.2 (3.9, 4.7) | 1.1 (0.9, 1.3) |
| United States | 7526 | 61.9 (59.7, 64.0) | 31.0 (29.1, 32.9) | 12.3 (11.6, 13.2) | 5.1 (4.3, 6.0) |

US has an Enormous Fraction of Really high BMIs

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| Country | Women | | | |
|--|------------------------------|------------------------------|------------------------------|------------------------------|
| | 50–59 Years, PAF (95% CI) | 60–69 Years, PAF (95% CI) | 70–79 Years, PAF (95% CI) | 80–89 Years, PAF (95% CI) |
| Estimates based on self-reported height | | | | |
| Comparison countries | | | | |
| Austria | 0.13 (0.10, 0.19) | 0.18 (0.13, 0.23) | 0.08 (0.06, 0.14) | 0.06 (0.02, 0.16) |
| Belgium | 0.09 (0.07, 0.15) | 0.16 (0.11, 0.20) | 0.10 (0.08, 0.15) | 0.06 (0.02, 0.17) |
| Czech Republic | 0.10 (0.07, 0.17) | 0.19 (0.13, 0.25) | 0.14 (0.10, 0.21) | 0.07 (0.02, 0.18) |
| Denmark | 0.08 (0.06, 0.13) | 0.11 (0.06, 0.14) | 0.09 (0.07, 0.15) | 0.03 (0.01, 0.14) |
| France | 0.08 (0.06, 0.14) | 0.12 (0.08, 0.17) | 0.08 (0.06, 0.14) | 0.04 (0.01, 0.15) |
| Germany | 0.09 (0.08, 0.15) | 0.16 (0.11, 0.21) | 0.11 (0.09, 0.17) | 0.05 (0.01, 0.15) |
| Israel | 0.10 (0.06, 0.18) | 0.14 (0.09, 0.19) | 0.15 (0.10, 0.22) | 0.05 (0.00, 0.15) |
| Italy | 0.09 (0.07, 0.15) | 0.14 (0.10, 0.19) | 0.09 (0.07, 0.15) | 0.05 (0.01, 0.16) |
| Netherlands | 0.10 (0.08, 0.16) | 0.13 (0.08, 0.18) | 0.11 (0.08, 0.17) | 0.05 (0.01, 0.14) |
| Poland | 0.14 (0.11, 0.21) | 0.22 (0.16, 0.27) | 0.16 (0.13, 0.22) | 0.06 (0.02, 0.17) |
| Spain | 0.12 (0.10, 0.19) | 0.21 (0.15, 0.27) | 0.14 (0.11, 0.20) | 0.09 (0.03, 0.18) |
| Sweden | 0.09 (0.07, 0.16) | 0.13 (0.08, 0.17) | 0.10 (0.08, 0.16) | 0.05 (0.02, 0.16) |
| Switzerland | 0.06 (0.04, 0.10) | 0.11 (0.07, 0.16) | 0.09 (0.06, 0.14) | 0.05 (0.01, 0.14) |
| Average | 0.10 (0.08, 0.15) | 0.15 (0.11, 0.20) | 0.11 (0.09, 0.17) | 0.05 (0.02, 0.16) |
| United States | 0.20 (0.17, 0.27) | 0.23 (0.18, 0.28) | 0.14 (0.12, 0.19) | 0.06 (0.03, 0.16) |

In other Countries, About 10% Of deaths are Attributed to obesity

US is 20% 32

TABLE 3—Life Expectancy at Age 50 years With and Without All-Cause Mortality Attributable to Obesity, by Country and Sex: 2006

| Country | e_{50} for Women | | | e_{50} for Men | | |
|---|--------------------|-----------------|---------------------|------------------|-----------------|---------------------|
| | Actual | Without Obesity | Difference (95% CI) | Actual | Without Obesity | Difference (95% CI) |
| Estimates based on self-reported height and weight | | | | | | |
| Comparison countries | | | | | | |
| Austria | 33.96 | 34.67 | 0.71 (0.59, 1.07) | 29.39 | 30.39 | 1.00 (0.86, 1.23) |
| Belgium | 33.70 | 34.42 | 0.73 (0.61, 1.16) | 29.03 | 30.01 | 0.98 (0.82, 1.18) |
| Czech Republic | 31.24 | 32.25 | 1.01 (0.85, 1.40) | 26.04 | 27.38 | 1.34 (1.12, 1.57) |
| Denmark | 31.90 | 32.52 | 0.62 (0.52, 1.02) | 28.22 | 29.05 | 0.82 (0.68, 1.02) |
| France | 35.68 | 36.20 | 0.52 (0.43, 0.90) | 29.86 | 30.85 | 0.99 (0.82, 1.20) |
| Germany | 33.60 | 34.31 | 0.70 (0.60, 1.07) | 29.07 | 30.12 | 1.05 (0.85, 1.27) |
| Israel | 33.61 | 34.40 | 0.79 (0.61, 1.18) | 30.64 | 31.56 | 0.92 (0.71, 1.22) |
| Italy | 35.24 | 35.81 | 0.57 (0.49, 0.96) | 30.57 | 31.47 | 0.90 (0.73, 1.12) |
| Netherlands | 33.31 | 34.00 | 0.69 (0.59, 1.03) | 29.45 | 30.18 | 0.73 (0.61, 0.92) |
| Poland | 31.39 | 32.58 | 1.19 (1.02, 1.60) | 24.73 | 26.09 | 1.37 (1.21, 1.61) |
| Spain | 35.40 | 36.27 | 0.87 (0.72, 1.23) | 29.94 | 31.09 | 1.15 (0.95, 1.39) |
| Sweden | 34.10 | 34.73 | 0.63 (0.53, 1.01) | 30.45 | 31.17 | 0.72 (0.59, 0.92) |
| Switzerland | 35.33 | 35.83 | 0.50 (0.41, 0.84) | 31.14 | 31.93 | 0.79 (0.63, 0.99) |
| Average | 33.73 | 34.46 | 0.73 (0.63, 1.13) | 29.12 | 30.10 | 0.98 (0.86, 1.16) |
| United States | 32.95 | 34.23 | 1.28 (1.14, 1.70) | 29.20 | 30.81 | 1.61 (1.44, 1.82) |
| Estimates based on measured height and weight | | | | | | |

On previous slide

- For females –
 - Raw difference in life years after 50
 - US is 32.95
 - Avg. of rest is 33.75
 - Difference is eliminated when adjust for obesity
- In aggregate
 - Explains 42% of the gap for females, 65% for males

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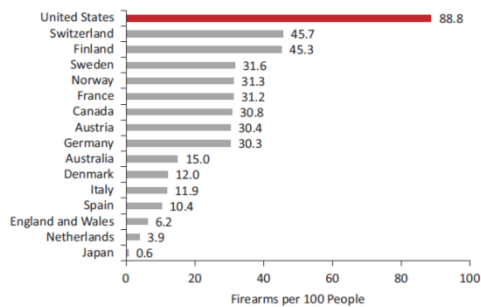


FIGURE 5-5 Civilian firearm ownership in 16 peer countries.

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Table 1. Estimated Contribution of 3 Major Causes of Injury Death to the Gap in Life Expectancy at Birth, 2012

| Cause of Death | United States | | Comparison Countries ^a | | Contribution to Life Expectancy Gap, y (%) |
|----------------------------|-------------------------|---------------|-----------------------------------|---------------|--|
| | Death Rate ^b | No. of Deaths | Death Rate ^b | No. of Deaths | |
| Men | | | | | |
| Major injury causes, total | 50.2 | 78 521 | 9.3 | 21 575 | 1.02 (48) |
| Drug poisonings | 16.1 | 25 110 | 2.7 | 5943 | 0.30 (14) |
| Firearm-related injuries | 18.4 | 28 836 | 1.1 | 2734 | 0.45 (21) |
| MVT crashes | 15.7 | 24 575 | 5.6 | 12 898 | 0.28 (13) |
| Other causes | 814.9 | 1 195 101 | 762.7 | 2 100 772 | 1.13 (52) |
| All causes | 865.1 | 1 273 622 | 772.0 | 2 122 347 | 2.15 (100) |

Raw difference between US and comparison countries in life expectancy: 2.15 years

Difference explained by three causes: drugs, guns, cars : 1.02

About half the difference for males are these three characteristics.

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Table 1. Estimated Contribution of 3 Major Causes of Injury Death to the Gap in Life Expectancy at Birth, 2012

| Cause of Death | United States | | Comparison Countries ^a | | Contribution to Life Expectancy Gap, y (%) ^c |
|----------------------------|-------------------------|---------------|-----------------------------------|---------------|---|
| | Death Rate ^b | No. of Deaths | Death Rate ^b | No. of Deaths | |
| Women | | | | | |
| Major injury causes, total | 19.3 | 31 469 | 3.4 | 8977 | 0.42 (19) |
| Drug poisonings | 10.1 | 16 390 | 1.6 | 3958 | 0.20 (9) |
| Firearm-related injuries | 2.9 | 4724 | 0.1 | 191 | 0.08 (4) |
| MVT crashes | 6.3 | 10 355 | 1.7 | 4828 | 0.14 (6) |
| Other causes | 605.4 | 1 238 041 | 490.9 | 2 145 412 | 1.82 (81) |
| All causes | 624.7 | 1 269 510 | 494.3 | 2 154 389 | 2.23 (100) |

Raw difference between US and comparison countries in life expectancy: 2.23 years

Difference explained by three causes: drugs, guns, cars : 0.42

About 20% of the difference for females are these three characteristics.

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Questions

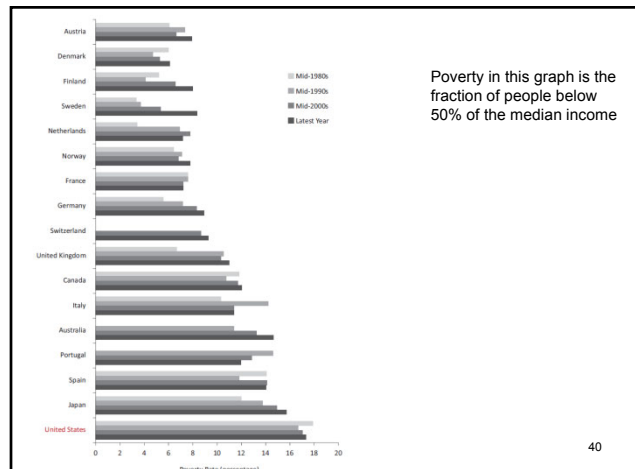
- Obesity, traffic deaths, drug poisonings and gun violence explain a large fraction of the US health disadvantage
- Is this
 - Caused by medical care system?
 - An indictment of the medical care system?
- What changes to the medical system would alter these outcomes?

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Chapter 6: Social factors

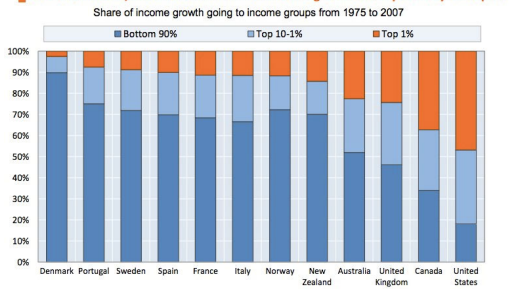
- Many variables correlated with mortality
 - Income, poverty, wealth, education, early child education
- What role do these variables play in the US health disadvantage?

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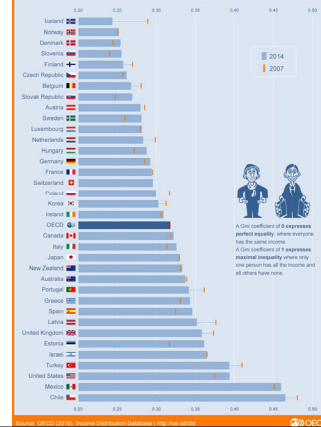
In some countries, one fifth or more of total income growth was captured by the top 1%



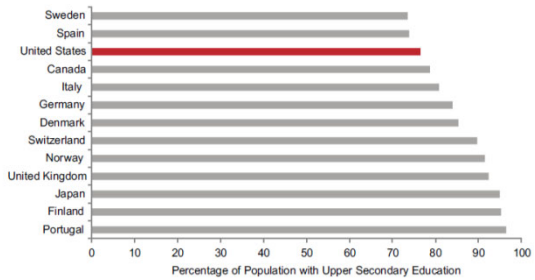
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Levels of income inequality

Gini coefficient of disposable income inequality (2007 & 2014), total population



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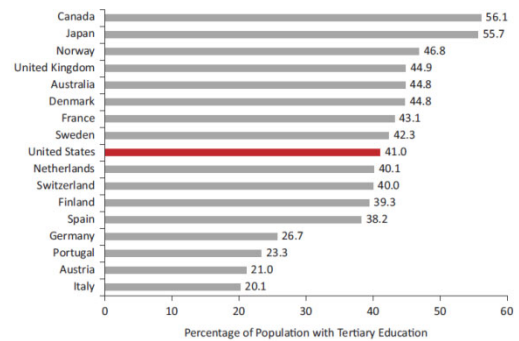


FIGURE 6-6 Percentage of adults aged 25-34 with a tertiary education in 17 peer

44

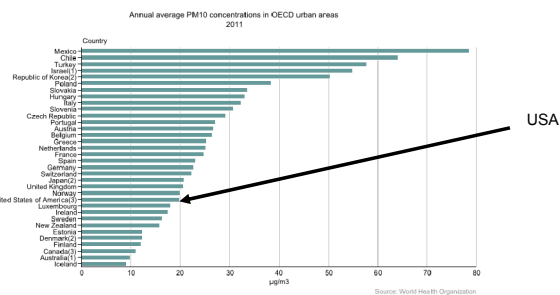
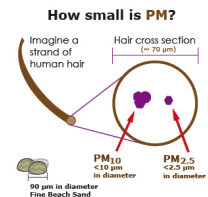
Ch. 7: Physical and Social Env.

- Physical factors
 - Pollution
 - Access to food, medical care
 - Built environment
- Social environmental
 - Neighborhood characteristics
 - Role of social capital and connectedness

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Air pollution

- Particulate matter is the pollution most closely correlated with mortality -- P10 and PM 2.5
- Daily mortality correlated with daily deaths
- Aggregate mortality correlated with levels



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Detailed examination: Infant mortality

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Chen et al.

- IMR – deaths within 1 year of birth/1,000
 - US is about 4.5
 - Scandinavia about 1.0
- Standard statistical value of life estimate
 - \$7 million
 - 4 million births/year in the US
 - Could spend \$21,000/birth to reduce IMR to Scandinavia levels and it would cost effective

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Why the difference?

- Sample composition? (e.g., what is a live birth?)
- Conditions at birth? (e.g., low birth weight)
- Time of the deaths (what is the gradient as a child ages through the first year)
- Demography – where are the differences biggest?

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Data

- Birth-level data from US, Austria and Finland
- Cell-level data (grouped) for Belgium and UK
- In US – 4 million births a year, 6 years, 24 million obs.

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TABLE 1—CROSS-COUNTRY SUMMARY STATISTICS

| | United States (1) | Austria (2) | Finland (3) | United Kingdom* (4) | Belgium* (5) |
|--|----------------------|----------------|----------------|------------------------|-----------------|
| Death within 1 year, per 1,000 births, full sample | 6.78 | 3.98 | 3.21 | 5.33 | 4.40 |
| Number of births | 24,484,028 | 466,227 | 339,312 | | |
| <i>Panel A. Main sample</i> | | | | | |
| Death within 1 year, per 1,000 births, restricted sample | 4.65 | 2.94 | 2.64 | 3.43 | 3.67 |
| Gestational age (weeks) | 38.8 | 38.6 | 39.4 | | |
| Birth weight (grams) | 3,332 | 3,345 | 3,550 | 3,368 | 3,310 |
| Number of births | 23,411,153 | 451,920 | 327,732 | 3,942,209 | 667,697 |
| <i>Panel B. Demographic sample</i> | | | | | |
| Death within 1 year, per 1,000 births, restricted sample | 4.55 | 2.94 | 2.63 | | |
| Gestational age (weeks) | 38.8 | 38.6 | 39.4 | | |
| Birth weight (grams) | 3,333 | 3,345 | 3,553 | | |
| Male infant (%) | 51.2% | 51.2% | 51.3% | | |
| Mother's age (years) | 27.40 | 28.75 | 29.51 | | |
| Mother is black [US] or immigrant [AU] (%) | 14.9% | 23.9% | — | | |
| Mother is married (%) | 65.3% | 65.3% | 59.9% | | |
| Mother has at least college degree (%) | 25.7% | 11.9% | 21.8% | | |
| Mother is "upper white collar" worker (%) | | | | | |
| Number of births | 23,113,240 | 451,920 | 292,786 | | |

Sample construction

- US – any baby born alive is in the denominator of the IFM
- Many other countries
 - Don't include low gestation
 - Don't include very low birth weight
 - Don't include children that die soon after birth
- US has high use of infertility treatments that increase multiple births and reduce birthweight
- Would overstate the US health disadvantage

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Definition of live birth

- All live births
 - US, Austria, Denmark, Finland, England
- ≥ 22 weeks, ≥ 500 grams
 - France
- ≥ 22 weeks, ≥ 500 grams, baby survives 24 hrs
 - Czech Republic

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Definitions of live births

- WHO report
 - “it has also been common practice in several countries (e.g. Belgium, France, Spain) to register as live births only those infants who survived for a specified period beyond birth”

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| Country | Live births | | |
|-------------------|-------------|---------------------|----------------------|
| | No | Rate ^a | |
| | | <500 g (per 10 000) | <1000 g (per 10 000) |
| Austria | 78 934 | 2.8 | 37.8 |
| Belgium | 76 872 | 0.4 | 33.2 |
| Canada | 204 521 | 10.8 | 45.2 |
| Czech Republic | 97 664 | 1.4 | 37.9 |
| Denmark | 64 521 | 2.2 | 33.1 |
| England and Wales | 639 721 | 6.1 | 49.4 |
| Estonia | 13 990 | 2.1 | 40.1 |
| Finland | 57 569 | 3.8 | 30.4 |
| Germany | 648 599 | 4.8 | 50.1 |
| Hungary | 95 118 | 6.1 | 61.0 |
| Ireland | 62 066 | 0.0 | 33.6 |
| Latvia | 20 355 | 0.0 | 28.5 |
| Lithuania | 29 480 | 1.0 | 28.2 |
| Luxembourg | 5469 | 0.0 | 1.9 |
| Malta | 3587 | 0.0 | 25.7 |
| Netherlands | 181 006 | 2.7 | 36.8 |
| Northern Ireland | 22 362 | 1.8 | 40.7 |
| Norway | 57 111 | 1.9 | 33.4 |
| Poland | 356 697 | 0.0 | 38.9 |
| Portugal | 109 356 | 0.6 | 35.7 |
| Scotland | 52 911 | 4.2 | 39.5 |
| Slovak Republic | 52 388 | 0.8 | 32.8 |
| Slovenia | 17 846 | 3.4 | 38.1 |
| Sweden | 100 158 | 1.5 | 27.4 |
| United States | 4 118 951 | 16.9 | 75.2 |

Variation in the registration of births at the borderline of viability and related problems compromise the validity of international rankings of industrialized countries by perinatal infant mortality

Joseph et al., British Medical Journal 2012

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How to hold all else constant

- Focus on singleton births
 - Delete twins, triplets, etc.
- Keep gestation ≥ 22 weeks
- Keep birth weight ≥ 500 grams

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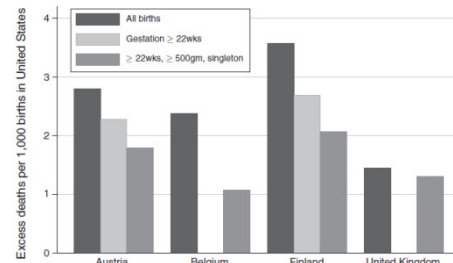


FIGURE 2. US IMR DISADVANTAGE: FULL SAMPLE AND RESTRICTED SAMPLES

Gap w/ Finland falls from 3.5 to 2 – definitions explains 43% of the difference

Gap w/ Belgium falls from 2.3 to 1 – definitions explains 31% of the difference

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Conditions at birth

- IMR driven in part by low birth weight/low gestation
- US has a much higher LBW rate than others
- If we control for BW, does that erase the difference

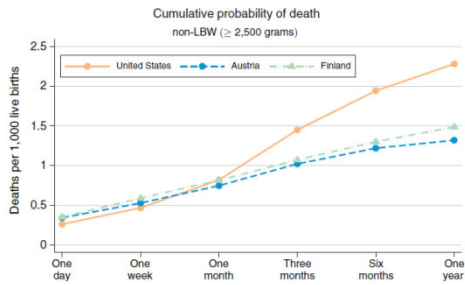
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Table 3

| Comp. Country | No Controls All deaths | Control for birthweight | | | |
|---------------|---------------------------|-------------------------|-------------------|------------------|------------------|
| | | All deaths | < 1 week | 1 week – 1 month | 1 month – 1 year |
| Finland | 2.008 (0.091) | 0.533 (0.088) | -0.276 (0.063) | 0.164 (0.033) | 0.647 (0.054) |
| Austria | 1.704 (0.082) | 1.140 (0.077) | -0.019 (0.056) | 0.068 (0.036) | 1.083 (0.043) |
| Belgium | 1.214 (0.033) | 0.781 (0.031) | 0.043 (0.021) | 0.091 (0.014) | 0.648 (0.020) |

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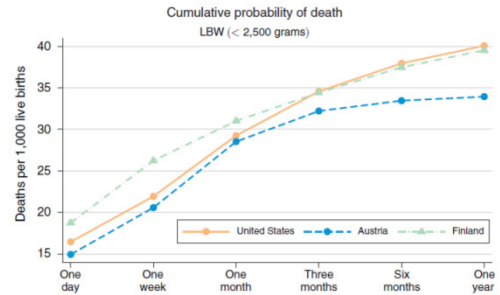
Panel A. Normal birth weight only ($\geq 2,500$ grams)



Mortality the same up through 1 month – very different afterwards

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Panel B. Low birth weight only ($< 2,500$ grams)



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TABLE 4—POSTNEONATAL CAUSE OF DEATH, BY COUNTRY

| Cause of death: | Congenital abnormalities and low birth weight (1) | Respiratory (2) | SIDS and other sudden deaths (3) | Accident (4) | Assault (5) | Other (6) |
|------------------------------|---|-----------------|----------------------------------|--------------|-------------|-----------|
| United States | 0.380 | 0.068 | 0.699 | 0.208 | 0.064 | 0.613 |
| Finland | 0.325 | 0.021 | 0.226 | 0.044 | 0.003 | 0.287 |
| Austria | 0.377 | 0.007 | 0.185 | 0.030 | 0.013 | 0.175 |
| <i>United States-Finland</i> | | | | | | |
| Raw difference | 0.055 | 0.047 | 0.473 | 0.164 | 0.061 | 0.326 |
| As share of Finland | 17% | 224% | 209% | 373% | 2,033% | 114% |
| <i>United States-Austria</i> | | | | | | |
| Raw difference | 0.003 | 0.061 | 0.514 | 0.178 | 0.051 | 0.438 |
| As share of Austria | 1% | 871% | 278% | 593% | 392% | 250% |

Notes: This table shows the difference in postneonatal mortality from each cause of death across countries. All means are computed on the sample of infants alive at one month. Means are in units of 1,000 deaths. Data for all countries cover 2000–2005; as described in the text, the sample is limited to singleton births at ≥ 22 weeks of gestation and ≥ 500 grams with birth weight and gestational age observed.

Raw difference is driven MOST by SIDS, Accidents, other

US: 1.520

Finland: 0.557

Austria: 0.390

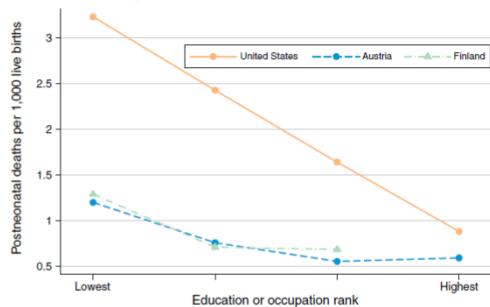
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Demography of the US Disadvantage

- Compare death trajectories over the 1st year for two groups
 - Advantaged: High educ/high occupation, white married and non-immigrant (in Austria)
 - Disadvantaged – all others
- Sample restricted to
 - Gestation ≥ 22 weeks
 - BW ≥ 500 grams
 - Singleton births

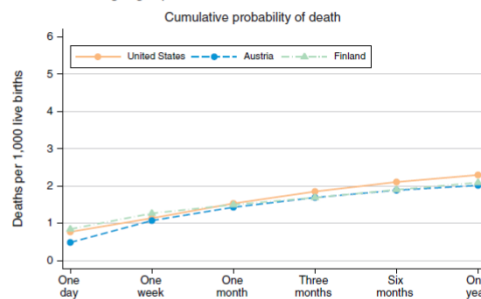
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Panel A. Cross-country



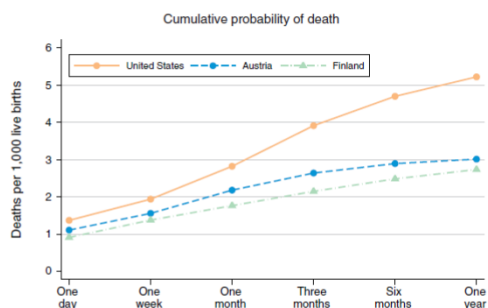
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Panel A. Advantaged group



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Panel B. Disadvantaged group



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TABLE 6—CROSS-COUNTRY DIFFERENCES IN POSTNEONATAL AND NEONATAL MORTALITY, BY GROUP

| | United States versus Austria (1) | United States versus Finland (2) |
|--|-------------------------------------|-------------------------------------|
| <i>Panel A. Postneonatal mortality</i> | | |
| United States | 1.357*** (0.046) | 0.920*** (0.064) |
| Advantaged | -0.093 (0.144) | -0.296** (0.129) |
| United States × advantaged | -1.146*** (0.145) | -0.941*** (0.130) |
| Observations | 23,505,784 | 23,347,108 |
| High SES, United States versus Europe | 0.126 | 0.853 |

Compare to Austria:

Disadvantaged mother in US: 1.357 higher IMR

Advantaged mother in the US: $1.357 - 0.093 - 1.146 = 0.188$

Compare to Finland:

Disadvantaged mother in US: 0.920 higher IMR

Advantaged mother in the US: $0.920 - 0.296 - 0.941 = -1.237$

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Recap

- Obesity
- Guns, traffic, drug poisonings
- Post birth mortality (many accidents)

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