The Burden of Cancer: Update 2004

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Bloomberg School of Public Health
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# US Mortality, 2001

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause of Death</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart Diseases</td>
<td>700,142</td>
<td>29.0</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
<td>553,768</td>
<td>22.9</td>
</tr>
<tr>
<td>3</td>
<td>Cerebrovascular diseases</td>
<td>163,538</td>
<td>6.8</td>
</tr>
<tr>
<td>4</td>
<td>Chronic lower respiratory diseases</td>
<td>123,013</td>
<td>5.1</td>
</tr>
<tr>
<td>5</td>
<td>Accidents (Unintentional injuries)</td>
<td>101,537</td>
<td>4.2</td>
</tr>
<tr>
<td>6</td>
<td>Diabetes mellitus</td>
<td>71,372</td>
<td>3.0</td>
</tr>
<tr>
<td>7</td>
<td>Influenza and Pneumonia</td>
<td>62,034</td>
<td>2.6</td>
</tr>
<tr>
<td>8</td>
<td>Alzheimer’s disease</td>
<td>53,852</td>
<td>2.2</td>
</tr>
<tr>
<td>9</td>
<td>Nephritis</td>
<td>39,480</td>
<td>1.6</td>
</tr>
<tr>
<td>10</td>
<td>Septicemia</td>
<td>32,238</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Change in the US Death Rates* by Cause, 1950 and 2001 (Rate per 100,000)

* Age-adjusted to 2000 US standard population.

90% OF ALL CANCERS OCCUR AFTER AGE 45

USA

2000

2050

China: 2000

China

China: 2050

Source: U.S. Census Bureau, International Data Base.

*Per 100,000, age-adjusted to the 2000 US standard population.
† Hispanic is not mutually exclusive from whites, African Americans, Asian/Pacific Islanders, and American Indians.
2004 Estimated US Cancer Deaths*

- **Men**: 290,890
- **Women**: 272,810

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; bronchus</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Prostate</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Pancreas</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Leukemia</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Esophagus</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Liver &amp; intrahepatic bile duct</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Kidney</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>All other sites</td>
<td>21%</td>
<td></td>
</tr>
</tbody>
</table>

25% Lung & bronchus
15% Breast
10% Colon & rectum
6% Ovary
6% Pancreas
4% Leukemia
3% Non-Hodgkin lymphoma
3% Uterine corpus
2% Multiple myeloma
2% Brain/ONS
24% All other sites

ONS=Other nervous system.
Cancer Death Rates*, for Men, US, 1930-2000 (Rate per 100,000)

*Age-adjusted to the 2000 US standard population.
Cancer Death Rates*, for Women, US, 1930-2000 (Rate per 100,000)

*Age-adjusted to the 2000 US standard population.
Understanding the Molecular Basis of Cancer

Cancer arises from the accumulation of genetic changes.
ENVIRONMENT AND CHANGING CANCER RATES

- STOMACH
- BREAST

Incidence per 100,000

Japanese

Hawaii, First Generation Migrants

Hawaii, Second Generation Migrants

Hawaii, Caucasians

- Stomach (male)
- Breast (female)
- Prostate
- Colon (male)
Tobacco
Incidence of Lung Cancer (Males)

China: 3 million deaths in 2025

GLOBOCAN (IARC 1998)
Incidence of Lung Cancer (Females)
Tobacco Use in the US, 1900-2000

Per capita cigarette consumption

Male lung cancer death rate

Female lung cancer death rate

30 YEARS

*Age-adjusted to 2000 US standard population.

Tobacco Use in the US, 1900-2000

Per capita cigarette consumption

Male lung cancer death rate

*Age-adjusted to 2000 US standard population.

TOBACCO ADVERTISING IN US

$9,700,000,000 IN 2000

$1 MILLION PER HOUR
Impact of Increasing Price on Smoking Among Canadian Teenagers

Teenage smoking

Real tobacco price

Real cigarette price index

Smoking prevalence (%)

Year

Mélihan-Cheinin P & Hirsch A, 1997
Smoking Prevalence, 1995-2003, Selected States and Maryland

- FL levels of smoking higher in 2003 than in 1995
- CA spending on tobacco control reached a low in 1995-96.
- MA may be beginning a rebound in tobacco use
- MD making progress but may relapse with cut-back of media campaign
Health Consequences of Tobacco Use

- Each year tobacco kills 3 million people worldwide, by 2020–2030, tobacco will be responsible for 10 million deaths per year
  - 70% will occur in developing countries
- Half of all long-term smokers will be killed by tobacco
  - half of these will die in middle age, losing 20–25 years of life
- Less than 10% of all smokers start after the age of 20.
Obesity
Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI $\geq$30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1986

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1987

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
**Obesity Trends* Among U.S. Adults**

**BRFSS, 1988**

(*BMI \geq 30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1989

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1991

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1992

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1993

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

[Map showing obesity trends across the U.S.]

Legend:
- No Data
- <10%
- 10%–14%
- 15%–19%
Obesity Trends* Among U.S. Adults

BRFSS, 1994

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1995

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 1996
(*BMI ≥30, or ~ 30 lbs overweight for 5′ 4” woman)
<table>
<thead>
<tr>
<th>No Data</th>
<th>&lt;10%</th>
<th>10%–14%</th>
<th>15%–19%</th>
<th>≥20</th>
</tr>
</thead>
</table>

(*BMI ≥30, or ~30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1998

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1999

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 2000

(*BMI ≥30, or ~30 lbs overweight for 5′ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 2001

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 2002

(*BMI \(\geq 30\), or \(~ 30\) lbs overweight for 5’ 4” woman)

Source: Behavioral Risk Factor Surveillance System, CDC
Obesity Trends* Among U.S. Adults
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

1989

2002

Source: Behavioral Risk Factor Surveillance System, CDC
Obesity as a Modifier of Environmental Exposures

• Trends extend even further back; during WWII 35-40% of draft age white males were judged to be malnourished.

• Major issue is that we have very little science based data on obesity as a modifier of environmental exposures.
### Maryland Health Rank (Rate), 1998 and 2003

<table>
<thead>
<tr>
<th>Year</th>
<th>Current Tobacco Use</th>
<th>No Exercise</th>
<th>&lt;5 Fruits and Veggies</th>
<th>Overweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>31/32&lt;sup&gt;nd&lt;/sup&gt; (22.4%)</td>
<td>36/37&lt;sup&gt;th&lt;/sup&gt; (66.2%)</td>
<td>49&lt;sup&gt;th&lt;/sup&gt; (69.9%)</td>
<td>14&lt;sup&gt;th&lt;/sup&gt; (34.4%)</td>
</tr>
<tr>
<td>2002</td>
<td>23/24&lt;sup&gt;th&lt;/sup&gt; (77.0%)</td>
<td>28&lt;sup&gt;th&lt;/sup&gt; (57.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>40&lt;sup&gt;th&lt;/sup&gt; (20.1%)</td>
<td>46&lt;sup&gt;th&lt;/sup&gt; (71.1%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: CDC.Wonder.gov

Prevalence is the proportion of adults reporting

GREEN = GOOD
RED = BAD
Maryland Cancer Mortality and Incidence Statistics: UPDATE AND SOME GOOD NEWS
Maryland Cancer Mortality: 1999-2001

- LUNG AND BRONCHUS: 28.1%
- COLON AND RECTUM: 10.8%
- BREAST: 7.9%
- PROSTATE: 5.5%
- PANCREAS: 5.2%
- OTHER: 19.5%
- LEUKEMIA: 3.2%
- NHL: 3.3%
- PANCREAS: 5.2%
- MELANOMA: 1.3%
- ORAL: 1.4%
- KIDNEY: 1.9%
- STOMACH: 2.1%
- BLADDER: 2.1%
- LIVER: 2.3%
- MM: 2.2%
- OVARY: 2.3%
- ESOPHAGUS: 2.5%
- BLOOD: 2.0%
## Cancer Mortality Change in Maryland 1989-93 to 1999-2001

<table>
<thead>
<tr>
<th></th>
<th>Rank Among States and DC</th>
<th>Average Annual % Change</th>
<th>Lives NOT Lost to Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; to 16&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-1.4%</td>
<td>6,730</td>
</tr>
<tr>
<td>Lung/bronchus</td>
<td>13&lt;sup&gt;th&lt;/sup&gt; to 18&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-1.1%</td>
<td>1,510</td>
</tr>
<tr>
<td>Colon/rectum</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; to 8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-2.2%</td>
<td>1,190</td>
</tr>
<tr>
<td>Prostate (male)</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; to 11&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-3.7%</td>
<td>1,520</td>
</tr>
<tr>
<td>Breast (female)</td>
<td>11&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-2.2%</td>
<td>770</td>
</tr>
</tbody>
</table>

All Cancers in MD is now 138% of Utah’s rate (compared to 210% in 1989-93)

Source: http://wonder.cdc.gov

Kanarek, 2004