Research and Funding Direction: We should advocate for an NIH Institute for Trauma Research

Or Clinical Research Tasseomancy

Timothy C. Fabian, M.D., FACS
April Trauma Systems Conference
April 18, 2017
Bethesda, MD
The art of tea leaf reading is known as Tasseomancy.
# 10 Leading Causes of Death by Age Group, United States – 2014

<table>
<thead>
<tr>
<th>Rank</th>
<th>&lt;1</th>
<th>1-4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Congenital Anomalies 4,746</td>
<td>Unintentional Injury 1,1216</td>
<td>Unintentional Injury 730</td>
<td>Unintentional Injury 11,836</td>
<td>Unintentional Injury 17,357</td>
<td>Unintentional Injury 16,048</td>
<td>Malignant Neoplasms 44,334</td>
<td>Malignant Neoplasms 115,282</td>
<td>Heart Disease 469,722</td>
<td>Heart Disease 614,348</td>
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<tr>
<td>2</td>
<td>Short Gestation 4,173</td>
<td>Congenital Anomalies 395</td>
<td>Malignant Neoplasms 436</td>
<td>Suicide 425</td>
<td>Suicide 5,079</td>
<td>Suicide 6,569</td>
<td>Malignant Neoplasms 11,267</td>
<td>Heart Disease 34,791</td>
<td>Heart Disease 74,473</td>
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<tr>
<td>3</td>
<td>Maternal Pregnancy Comp. 1,574</td>
<td>Homicide 364</td>
<td>Congenital Anomalies 192</td>
<td>Malignant Neoplasms 416</td>
<td>Homicide 4,144</td>
<td>Homicide 4,159</td>
<td>Heart Disease 10,368</td>
<td>Unintentional Injury 20,610</td>
<td>Unintentional Injury 18,030</td>
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<tr>
<td>4</td>
<td>SIDS 1,545</td>
<td>Malignant Neoplasms 321</td>
<td>Homicide 123</td>
<td>Congenital Anomalies 156</td>
<td>Malignant Neoplasms 1,587</td>
<td>Malignant Neoplasms 3,624</td>
<td>Suicide 6,706</td>
<td>Suicide 8,767</td>
<td>Chronic Low. Respiratory Disease 124,993</td>
<td>Cerebrovascular 113,308</td>
<td>Unintentional Injury 136,053</td>
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<tr>
<td>5</td>
<td>Unintentional Injury 1,101</td>
<td>Heart Disease 149</td>
<td>Heart Disease 89</td>
<td>Homicide 156</td>
<td>Heart Disease 953</td>
<td>Heart Disease 3,341</td>
<td>Homicide 2,588</td>
<td>Liver Disease 8,027</td>
<td>Diabetes Mellitus 13,342</td>
<td>Alzheimer’s Disease 92,604</td>
<td>Cerebrovascular 133,103</td>
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<tr>
<td>6</td>
<td>Placenta Cord. Membranes 565</td>
<td>Influenza &amp; Pneumonia 109</td>
<td>Chronic Low. Respiratory Disease 58</td>
<td>Heart Disease 122</td>
<td>Congenital Anomalies 377</td>
<td>Liver Disease 725</td>
<td>Liver Disease 2,882</td>
<td>Diabetes Mellitus 6,062</td>
<td>Liver Disease 12,792</td>
<td>Diabetes Mellitus 54,161</td>
<td>Alzheimer’s Disease 93,541</td>
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<tr>
<td>7</td>
<td>Bacterial Sepsis 544</td>
<td>Chronic Low. Respiratory Disease 57</td>
<td>Influenza &amp; Pneumonia 57</td>
<td>Chronic Low. Respiratory Disease 71</td>
<td>Influenza &amp; Pneumonia 199</td>
<td>Diabetes Mellitus 709</td>
<td>Diabetes Mellitus 1,999</td>
<td>Cerebrovascular 5,349</td>
<td>Cerebrovascular 11,727</td>
<td>Unintentional Injury 48,295</td>
<td>Diabetes Mellitus 76,488</td>
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<tr>
<td>8</td>
<td>Respiratory Distress 460</td>
<td>Septicemia 53</td>
<td>Cerebrovascular 45</td>
<td>Cerebrovascular 43</td>
<td>Diabetes Mellitus 181</td>
<td>HIV 533</td>
<td>Cerebrovascular 1,745</td>
<td>Chronic Low. Respiratory Disease 4,402</td>
<td>Suicide 7,527</td>
<td>Influenza &amp; Pneumonia 44,836</td>
<td>Influenza &amp; Pneumonia 55,227</td>
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<tr>
<td>9</td>
<td>Circulatory System Disease 444</td>
<td>Benign Neoplasms 38</td>
<td>Benign Neoplasms 43</td>
<td>Influenza &amp; Pneumonia 41</td>
<td>Chronic Low. Respiratory Disease 178</td>
<td>Cerebrovascular 579</td>
<td>HIV 1,174</td>
<td>Influenza &amp; Pneumonia 2,731</td>
<td>Septicemia 5,709</td>
<td>Nephritis 39,957</td>
<td>Nephritis 48,146</td>
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<tr>
<td>10</td>
<td>Neonatal Hemorrhage 441</td>
<td>Perinatal Period 38</td>
<td>Septicemia 33</td>
<td>Benign Neoplasms 38</td>
<td>Cerebrovascular 177</td>
<td>Influenza &amp; Pneumonia 549</td>
<td>Influenza &amp; Pneumonia 1,225</td>
<td>Septicemia 2,514</td>
<td>Influenza &amp; Pneumonia 5,590</td>
<td>Septicemia 29,124</td>
<td>Suicide 42,773</td>
</tr>
</tbody>
</table>

**Data Source:** National Vital Statistics System, National Center for Health Statistics, CDC.

**Produced by:** National Center for Injury Prevention and Control, CDC using WISQARS™.
Injuries Cost the U.S. $671 Billion in 2013

Over two-thirds of these costs were due to nonfatal injuries

- Nonfatal Injury: $457 Billion (68%)
- Fatal Injury: $214 Billion (32%)

*Lifetime medical and work loss costs of injury, United States, 2013*

AHRQ 2008 Top 10 Healthcare Costs

$ Billion

- Normal Childbirth
- Back Problems
- Osteoarthritis
- Type 2 Diabetes
- HBP
- Asthma
- Mental Disorders
- Cancer
- Trauma
- Heart Conditions

0 10 20 30 40 50 60 70 80
Federal Medical Research Budgets

- NIH $31 Billion (81%)
- CDC $7 Billion (18%)
- AHRQ $470 Million (1%)
NASEM Recommendation #7

- To strengthen trauma research and ensure that the resources available for this research are commensurate with the importance of injury and the potential for improvement in patient outcomes, the White House should issue an executive order mandating the establishment of a National Trauma Research Action Plan.
Public Law 94–282
94th Congress

An Act

To establish a science and technology policy for the United States, to provide for scientific and technological advice and assistance to the President, to provide a comprehensive survey of ways and means for improving the Federal effort in scientific research and information handling, and in the use thereof, to amend the National Science Foundation Act of 1950, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the “National Science and Technology Policy, Organization, and Priorities Act of 1976”.

TITLE I—NATIONAL SCIENCE, ENGINEERING, AND TECHNOLOGY POLICY AND PRIORITIES
• The US Congress established the Office of Science and Technology Police (OSTP) in 1976 with a mandate to advise the President on the effects of science and technology.

• *Advancing Basic and Applied Science*: Launched with approximately **$100 million in the President’s Fiscal Year (FY 2014 Budget, the BRAIN initiative** ultimately aims to help researchers find new ways to treat, cure, and even prevent brain disorders, such as Alzheimer’s disease, epilepsy, and **traumatic brain injury**.

• **Wouldn’t NASEM Zero Preventable Deaths fit in nicely?**
WASHINGTON — On the fourth floor of the Eisenhower Executive Office Building, the staff of the White House chief technology officer has been virtually deleted, down from 24 members before the election to, by Friday, only one.
PLEASE think inside ME
Global Trends (% change) 2007-2012

Source NIH; adapted from NEJM, 2014
Rise in Federal Funding Doubtful

- Continued resolutions
- Sequestration
- Congressional divide
NIH Appropriations, FY 2003-15

- Actual Dollars
- Inflation-adjusted Dollars
- Sequestration
- Inflationary Losses

Billions

2003 2005 2007 2009 2011 2013 2015 2017
<table>
<thead>
<tr>
<th>Year of trial start</th>
<th>Total No. of Trials</th>
<th>National Institutes of Health</th>
<th>Industry</th>
<th>Other US Federal Agency</th>
<th>All Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>9208</td>
<td>1189 (12.9)</td>
<td>4516 (49.0)</td>
<td>229 (2.5)</td>
<td>3397 (36.9)</td>
</tr>
<tr>
<td>2007</td>
<td>10275</td>
<td>1035 (10.1)</td>
<td>4950 (48.2)</td>
<td>265 (2.6)</td>
<td>4163 (40.5)</td>
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<tr>
<td>2008</td>
<td>11650</td>
<td>1039 (8.9)</td>
<td>5359 (46.0)</td>
<td>278 (2.4)</td>
<td>5078 (43.6)</td>
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<tr>
<td>2009</td>
<td>12507</td>
<td>1062 (8.5)</td>
<td>5469 (43.7)</td>
<td>300 (2.4)</td>
<td>5807 (46.4)</td>
</tr>
<tr>
<td>2010</td>
<td>12903</td>
<td>1062 (8.2)</td>
<td>5325 (41.3)</td>
<td>311 (2.4)</td>
<td>6324 (49.0)</td>
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<tr>
<td>2011</td>
<td>13514</td>
<td>949 (7.0)</td>
<td>5424 (40.1)</td>
<td>304 (2.2)</td>
<td>6955 (51.5)</td>
</tr>
<tr>
<td>2012</td>
<td>13909</td>
<td>935 (6.7)</td>
<td>5135 (36.9)</td>
<td>290 (2.1)</td>
<td>7668 (55.1)</td>
</tr>
<tr>
<td>2013</td>
<td>14221</td>
<td>951 (6.7)</td>
<td>5017 (35.3)</td>
<td>306 (2.2)</td>
<td>8084 (56.8)</td>
</tr>
<tr>
<td>2014</td>
<td>14618</td>
<td>873 (6.0)</td>
<td>5274 (36.1)</td>
<td>292 (2.0)</td>
<td>8295 (56.7)</td>
</tr>
<tr>
<td>% Difference (95% CI)</td>
<td>-6.9 (-7.7 to -6.2)</td>
<td>-13.0 (-14.2 to -11.7)</td>
<td>-0.5 (-0.1 to 0)</td>
<td>19.9 (18.6 to 21.1)</td>
<td></td>
</tr>
<tr>
<td>Absolute difference, No. (%)</td>
<td>5410 (58.8)</td>
<td>-316 (-26.6)</td>
<td>758 (16.8)</td>
<td>63 (27.5)</td>
<td>4898 (144.2)</td>
</tr>
</tbody>
</table>

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*a* Data as of June 26, 2015.

*b* One trial may have more than 1 funding source.

*c* Unless otherwise indicated.

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*d* Comparisons yielded *P* values of <.001 unless otherwise indicated.

*e* Comparisons are between the year 2006 and 2014.

*f* *P* = .01.
TRUMP'S BUDGET

- Dept. of Defense
- Homeland Security
- Veteran Affairs
- Social Security Administration

- EPA
- State Dept.
- Agriculture Dept.
- Labor Dept.
- Health and Human Services
- Army Corps of Engineers
- Commerce Dept.
- Education Dept.
- HUD
- Transportation Dept.

SOURCE: OFFICE OF MANAGEMENT AND BUDGET
Fig. 1: President Trump’s FY 2018 Discretionary Levels (Billions of Dollars)

Sources: Office of Management and Budget, Congressional Budget Office
• Reduces NIH by $5.8 billion to $25.9 billion
• Eliminates the Fogarty International Center
• Consolidates AHRQ within NIH
• Reduces administrative costs to research funding
Clinical Research
I think it says we’re in trouble.
when nothing goes right...
go left.
Industry Supported Research

GLOBAL MEDICAL DEVICE MARKET
GEOGRAPHICAL SEGMENTATION

USD 298 Billion (2013)

Exhibit 1a. Firearms Manufactured (1986-2012)
Possibly a bridge

Clinical Research
DEFENSE BUDGET

$561B

Trump’s proposed addition

$54B
Clinical Research

Best Bet for the Near Future
Seed Corn
Impact of Managed Care on Medical Education and Research

James C. Thompson, M.D.

From the Department of Surgery, The University of Texas Medical Branch, Galveston, Texas

Genesis 41:
  v. 35 And let them . . . lay up corn . . .
  v. 36 . . . that the land perish not through the famine.

"In the Bible, we are admonished to lay up corn so that the land would not perish through famine. If we fail to invest in future education and research, we may have a medical famine."