

# HEALTH CARE: FACTS, FIGURES, CASE ANALYSIS

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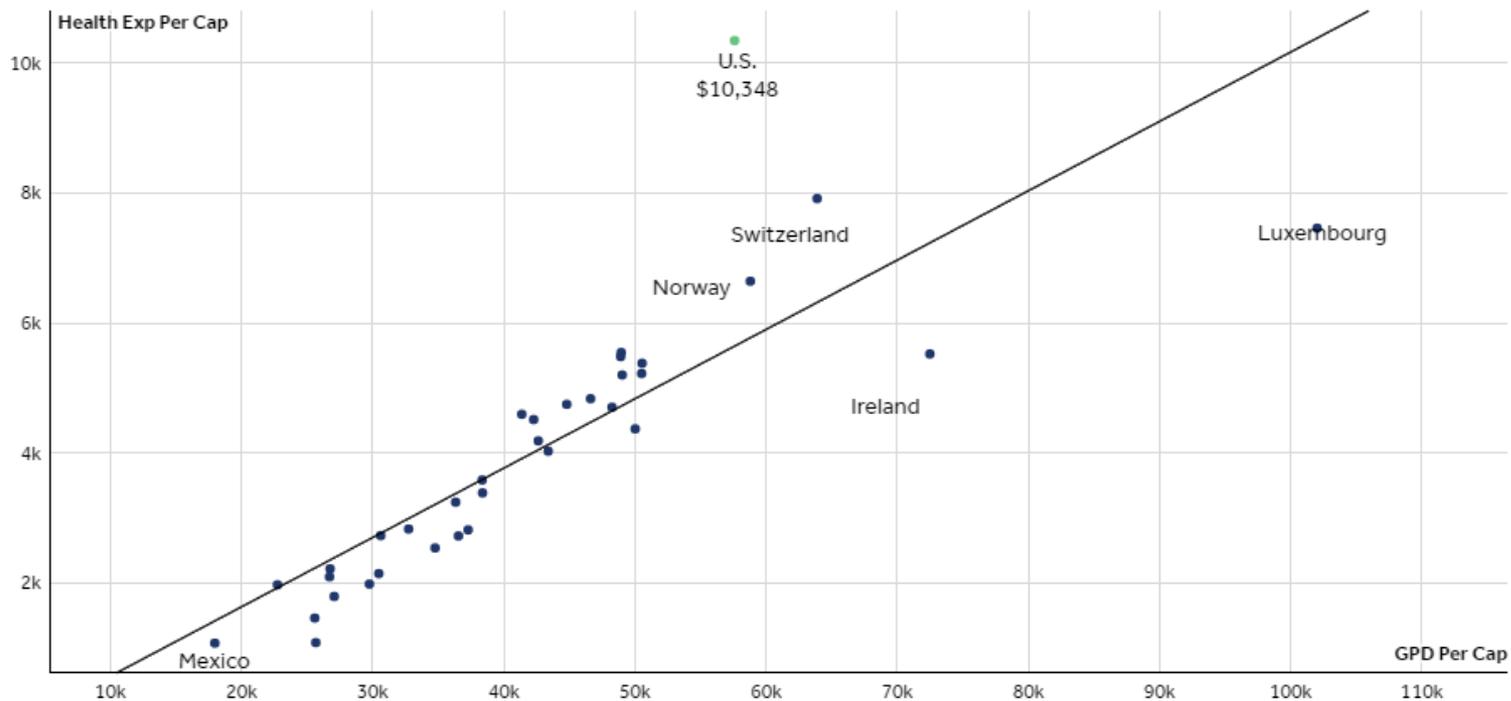
# Facts about health care

- From 1850 till now, the planet's living population increased by about 6 times. Why? Because Luis Pasteur (1822-1895) discovered bacteria...
- We currently alive represent about 7%... 10% of the total number of humans who have ever lived on Earth.

# Financial figures of health care

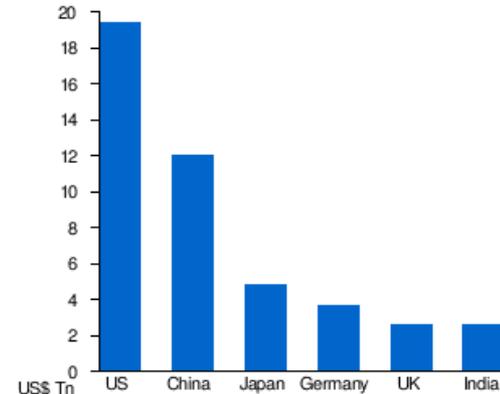
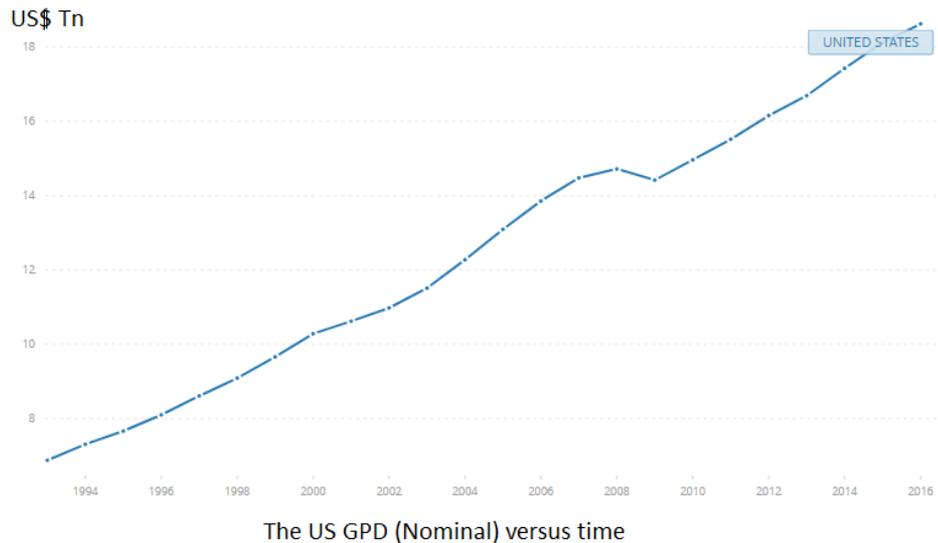
Relative to the size of its wealth, the U.S. spends a disproportionate amount on health care

Total health expenditures per capita/GDP per capita, U.S. dollars, PPP adjusted, 2016



# Financial figures of health care

Growth of the US economy (mean annual growth approx. 2.5%)

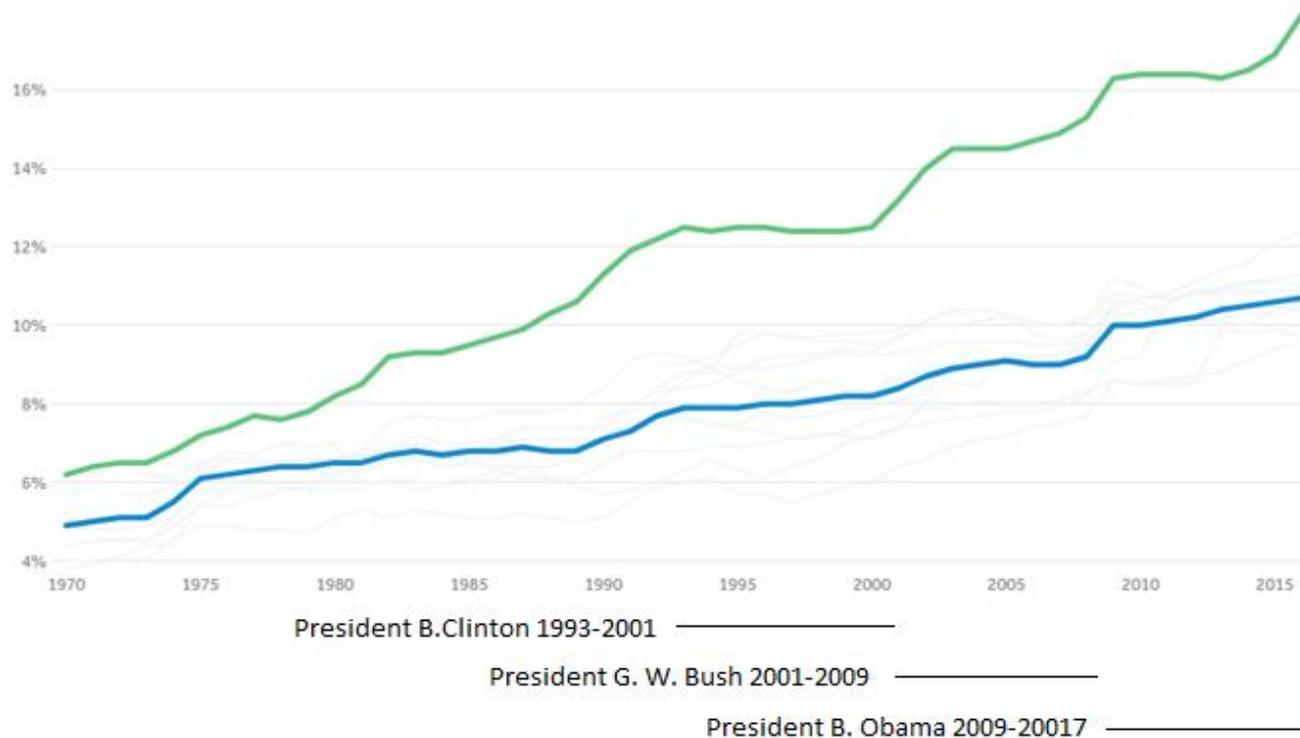


Largest economies by nominal GDP in 2017, not counting the economies of the European Union as one, according to [International Monetary Fund](#) estimates.

# Financial figures of health care

Since 1980, the gap has widened between U.S. health spending and that of other countries

Total health expenditures as percent of GDP, 1970 - 2016



# What happens in Silicon Valley now?



Larry Page



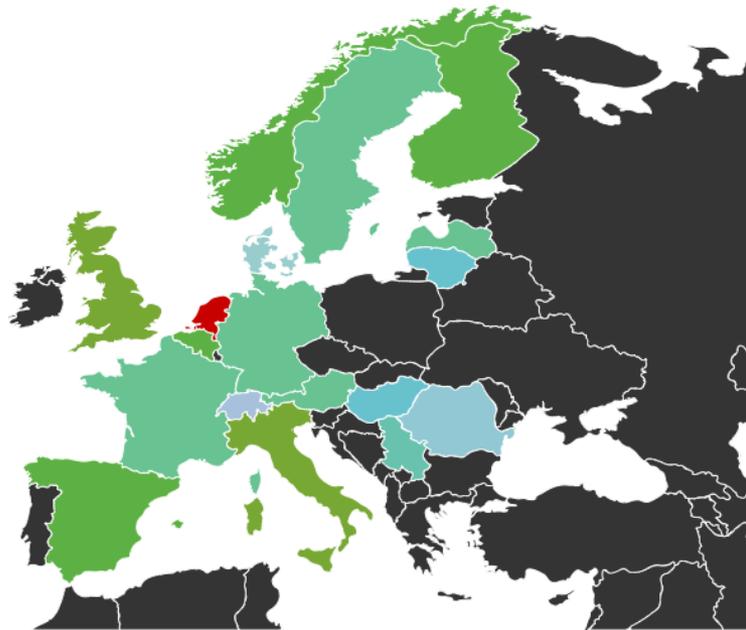
Mark Zuckerberg



Jeff Bezos

- Investments into health care technology companies:
  - Google - 857mln EUR
  - Facebook - 514mln EUR (plan is to invest up to 2.5bln EUR)
  - Amazon - 111mln EUR

# European case: FP7 project CenterTBI (30mIn EUR)



- 70 neuroscience centers
- More than 300 researchers
- Already collected more than 5600 TBI patients treatment and monitoring data

*Human Genome Project had 16mIn USD funding*

# Lithuanian case: Vittamed UAB

## Global health care problems:

- **Traumatic brain injury.** 2.5 million people suffer a TBI each year in the EU only, 75.000 will die.
- **Glaucoma.** Diagnosed for 80mln people (global epidemy). Annual costs of treatment (?) 2.5bln USD in the US only. Effective treatment does not exist.
- **Cardiac bypass surgery.** 0.5mln annual cases in the US and 0.186mln cases in the EU. Global costs 1.16bln USD. Post operative cognitive disfunction and deficit in 53%... 83% of cardiac surgery patients.

# Lithuanian case: Vittamed UAB

- Our inventions (more than 20 patents in the US, EU, Japan etc.) of non-invasive technologies for intracranial pressure measurement and monitoring and also for cerebrovascular autoregulation monitoring.



# Lithuanian case: Vittamed UAB

The Lancet Neurology Commission

## Traumatic brain injury: integrated approaches to improve prevention, clinical care, and research



Andrew I R Maas<sup>a</sup>, David K Menon<sup>a</sup>, P David Adelson, Nada Andelic, Michael J Bell, Antonio Belli, Peter Bragge, Alexandra Brazinova, András Büki, Randall M Chesnut, Giuseppe Citeria, Mark Coburn, D Jamie Cooper, A Tamara Crowder, Endre Czeiter, Marek Czosnyka, Ramon Diaz-Arrastia, Jens P Dreier, Ann-Christine Duhaime, Ari Ercole, Thomas A van Essen, Valery L Feigin, Guoyi Gao, Joseph Giacino, Laura E Gonzalez-Lara, Russell L Gruen, Deepak Gupta, Jed A Hartings, Sean Hill, Ji-yao Jiang, Naomi Ketharanathan, Erwin J O Kompanje, Linda Lanyon, Steven Laureys, Fiona Lecky, Harvey Levin, Hester F Lingsma, Marc Maegele, Marek Majdan, Geoffrey Manley, Jill Marsteller, Luciana Mascia, Charles McFadyen, Stefania Mandello, Virginia Newcombe, Aarno Palotie, Paul M Parizel, Wilco Peul, James Piercy, Suzanne Polinder, Louis Puybasset, Todd E Rasmussen, Rolf Rossaint, Peter Smielewski, Jeannette Söderberg, Simon J Stanworth, Murray B Stein, Nicole von Steinbüchel, William Stewart, Ewout W Steyerberg, Nino Stocchetti, Anneliese Synnott, Braden Te Ao, Olli Tenovuva, Alice Theadam, Dick Tibboel, Walter Videtta, Kevin KW Wang, W Huw Williams, Lindsay Wilson, Kristine Yaffe, for the IntTBI Participants and Investigators†‡



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## Benefit on optimal cerebral perfusion pressure targeted treatment for traumatic brain injury patients



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## Original Research Article

### Association between the outcome of traumatic brain injury patients and cerebrovascular autoregulation, cerebral perfusion pressure, age, and injury grades

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# Lithuanian case: Vittamed UAB

## Association of Severe Traumatic Brain Injury Patient Outcomes With Duration of Cerebrovascular Autoregulation Impairment Events



May 18, 2017

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Dear Dr. Ragauskas,

We are writing to inform you that your paper entitled “**Association of Severe TBI Patients' Outcomes with Duration of Cerebrovascular Autoregulation Impairment Events**” has been selected as the *Neurosurgery* Top Neurotrauma and Critical Care Paper of the Year. The competition for this honor was quite rigorous, and the committee reviewed all papers submitted to the Journal between June 2016 and June 2017 to make this selection. Congratulations!

**BACKGROUND:** Cerebrovascular autoregulation (CA) is an important hemodynamic mechanism that protects the brain against inappropriate fluctuations in cerebral blood flow in the face of changing cerebral perfusion pressure. Temporal CA failure is associated with worse outcomes in various acute neurological diseases. An integrative approach is presently used according to the existing paradigm for the association of series of temporal CA impairments with the outcomes of patients with traumatic brain injury (TBI).  
**OBJECTIVE:** To explore the influence of the duration of CA impairment events on severe TBI patient outcomes. Patient age was also included in the analysis of the prospectively collected clinical data.

# Final remarks

- Health technologies attract multi billion investments from private corporations and funds.
- A lot of global technological health care problems exist.
- Health care is a wide field for scientific knowledge based inventions and innovations.
- I personally don't see threats brought by present health care industry transformation.