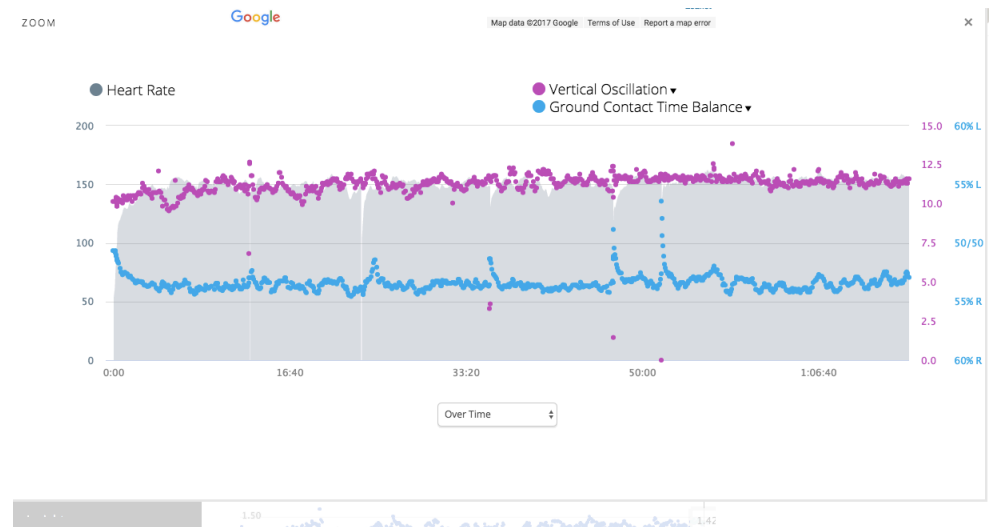


Change in mathematical thinking

- Changes in work, technology, commerce and social life.
- Pattern: Data is more prevalent in all aspects of life than ever before. We collect more and use it more than ever.
 - Individual level example: running biomechanical data
 - Work level example: standardized testing
 - Commerce and social life: spending trends, browsing trends

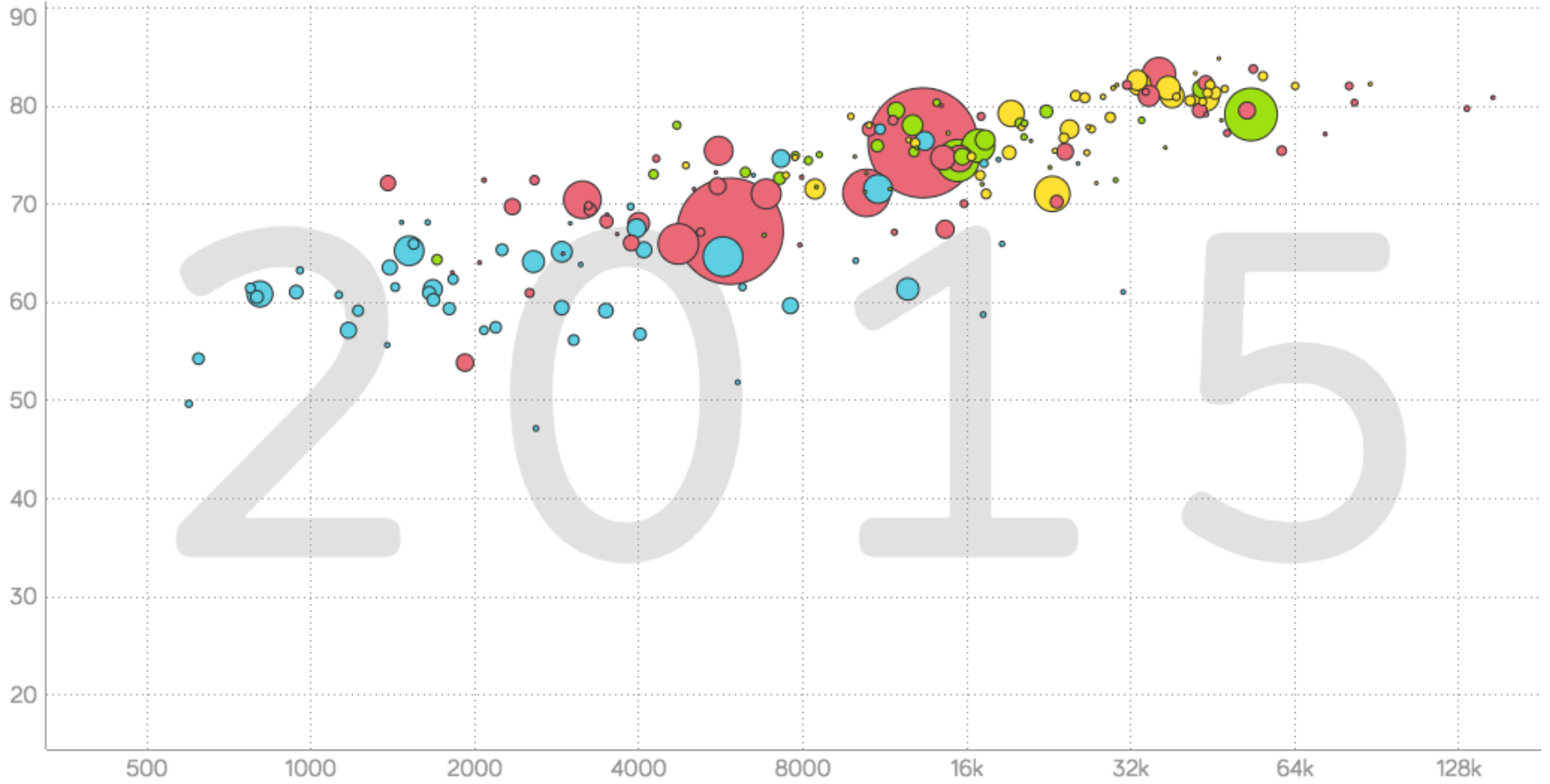
Intersection with technology



Big data and the Data driven Society

- “Data used to be scarce and now it is everywhere.” (UN Data Forum – Data Literacy: What, Why and How? Dr. Delia North)
- Claim of Big Data: Large open data sets can be used to create a better world. (Lohr, 2013)
 - UN Statistical Commission
 - UN World Data Forum – January 2017
 - UN 2030 agenda for sustainable development
 - Data drives decision making, tracking progress and accountability along the 17 indicators (United Nations, 2015)

Life expectancy, years ?



Income per person, GDP/capita in \$/year adjusted for inflation & prices ?

▲ DATA DOUBTS

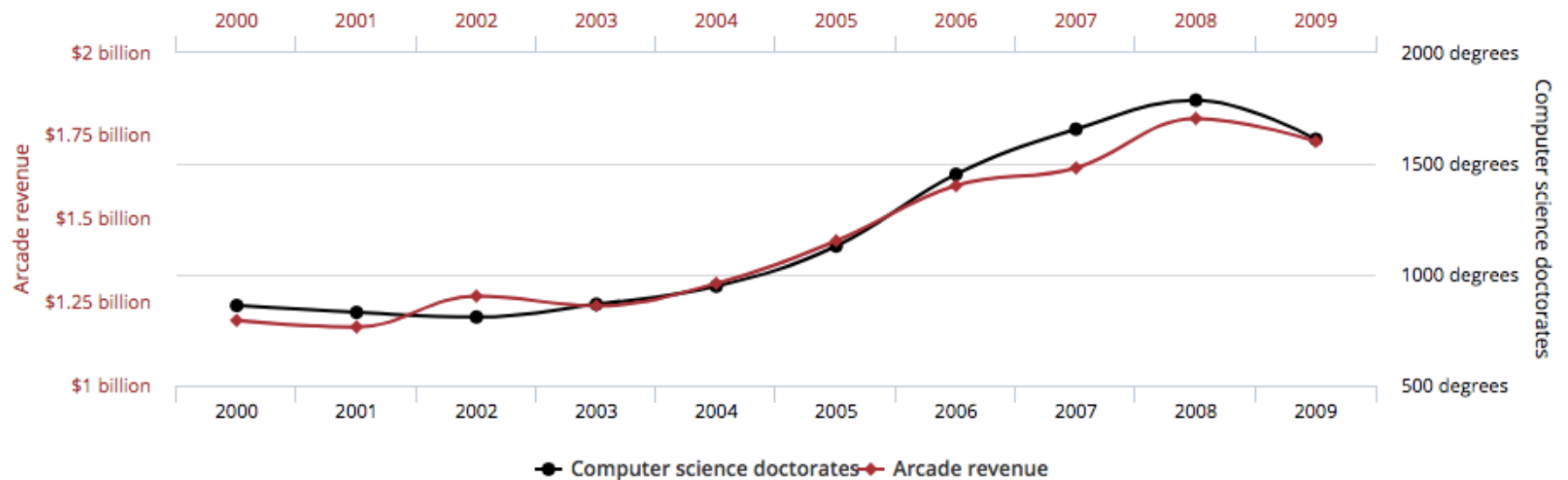
(Rosling, H. and gapminder.org)

Data Literacy

- Data Literacy has become essential in the new era of data collection and use
- Components of Data Literacy integrate mathematical thinking (Slater, 2016)
 - Examples
 - Examining data in context
 - Basic statistical abilities
 - Being able to ask questions in relation to data and make predictions
 - Inductive reasoning
 - Correlation vs. causation

Total revenue generated by arcades correlates with Computer science doctorates awarded in the US

Correlation: 98.51% ($r=0.985065$)

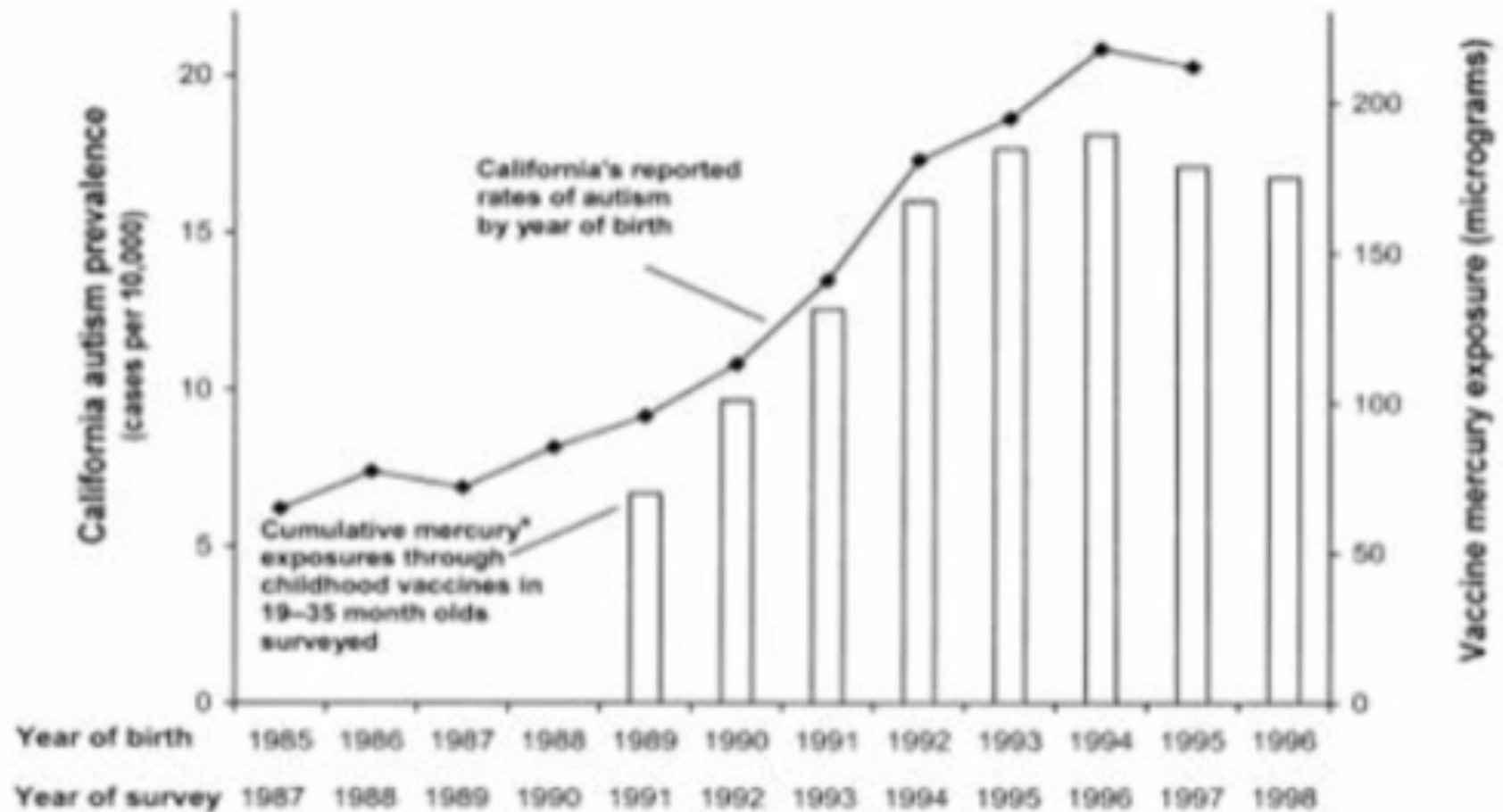


Data sources: U.S. Census Bureau and National Science Foundation

tylervigen.com

<http://www.tylervigen.com/spurious-correlations>

California Autism prevalence correlates with vaccine mercury exposure



(Bellinga and Gillebaart 2017)

Data Literacy and Education

- Educating the public
 - Fighting Data ignorance by bringing data into journalism (Bellinga and Gillebaart 2017), (Thorp, J. (2012)
 - Making data accessible and exciting. (Rosling 2010)
 - gapminder.org
- Educating young people
 - Data Driven Society starts with data savvy youth (Ercegovac 2015)
 - Integration of statistics and data into everyday learning
 - Shifting paradigm in education to student exploration and discovery

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