CS-5630 / CS-6630
Visualization
JavaScript Basics

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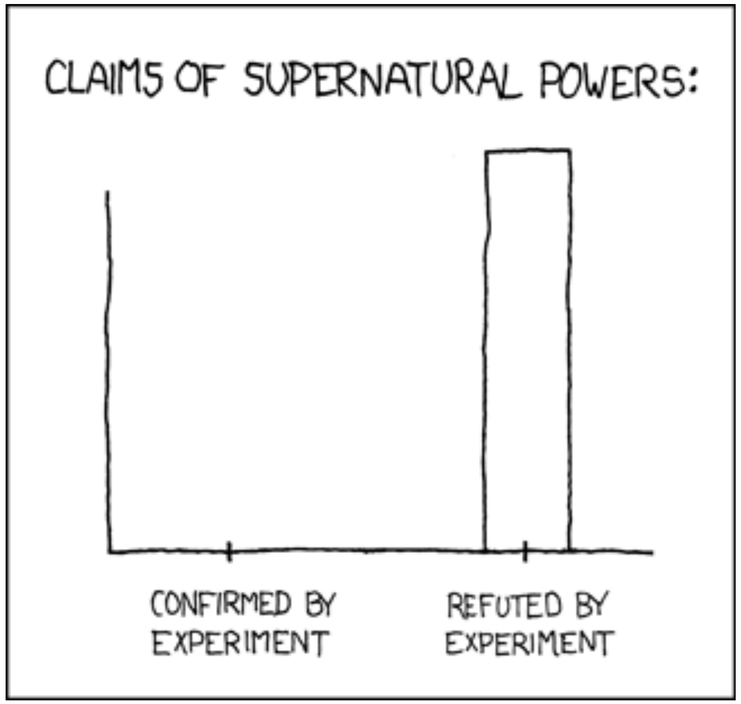
THE UNIVERSITY OF UTAH



[xkcd]

This Week

Homework1:

due Friday!

Readings:

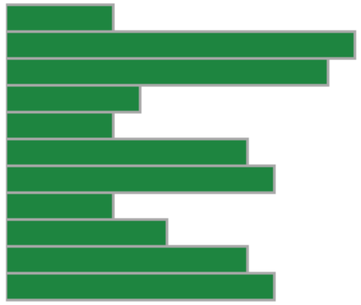
D3: Chapters 3, 4, 5 and 6

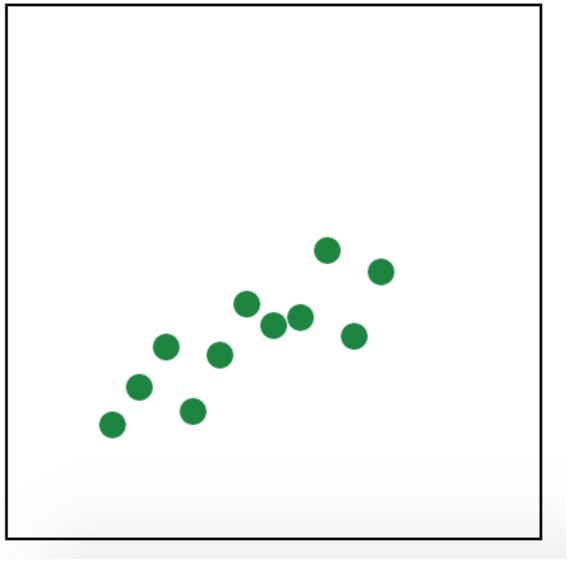
Lecture Thursday:

Intro D3

HW 1

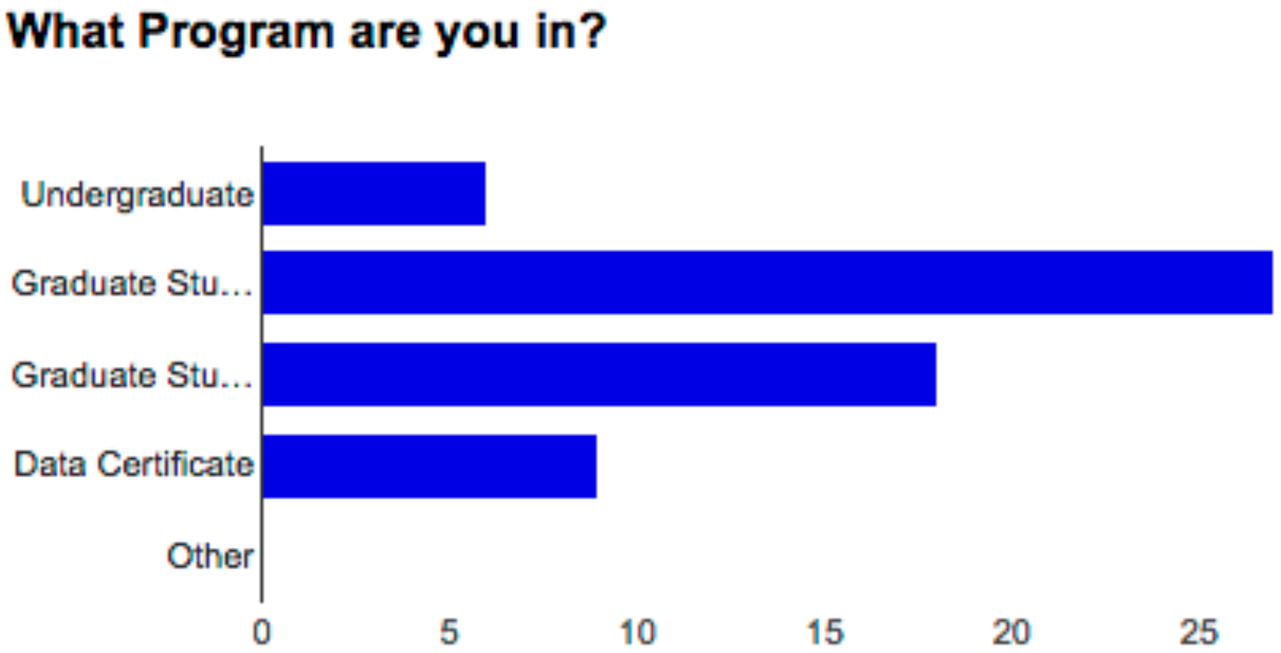
Questions?





Survey Results

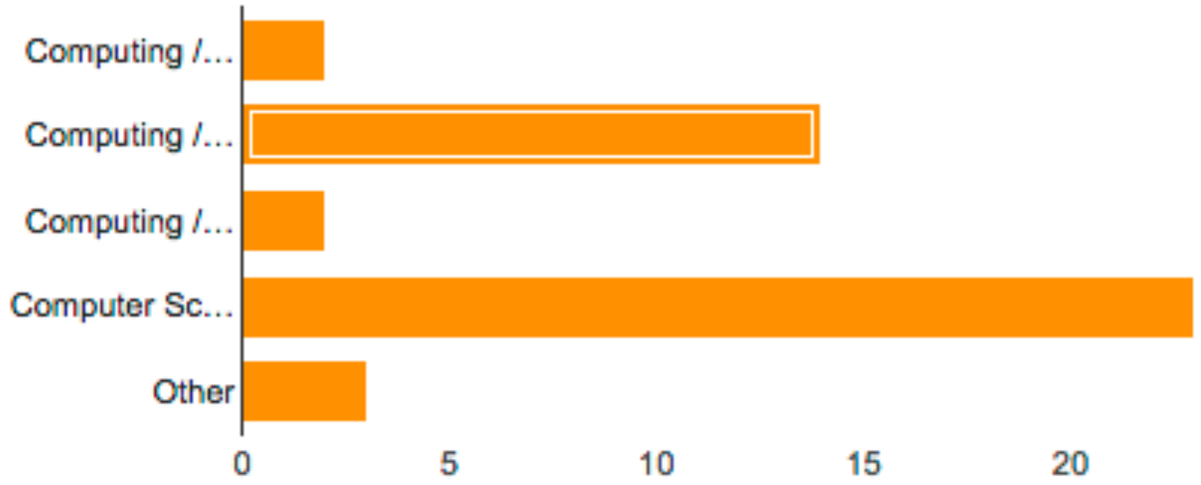
registered: 7 undergrads, 56 grads, 9 data certificate



Undergraduate	**6**	10%
Graduate Student / MS	**27**	45%
Graduate Student / PhD	**18**	30%
Data Certificate	**9**	15%
Other	**0**	0%

Tracks

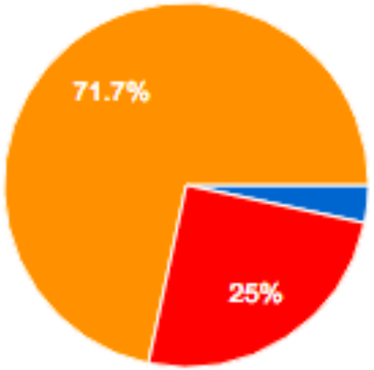
For CS Students: What degree and what track are you in?



Computing / Graphics Track	**2**	4.8%
Computing / Data Track	**14**	33.3%
Computing / Other Track	**2**	4.8%
Computer Science	**23**	54.8%
Other	**3**	7.1%

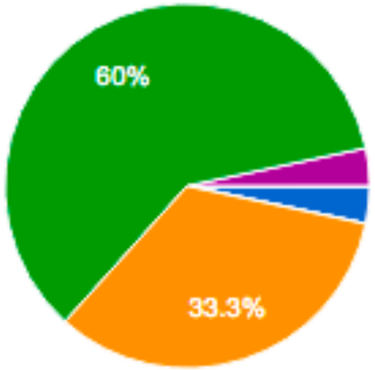
Demographics

Gender



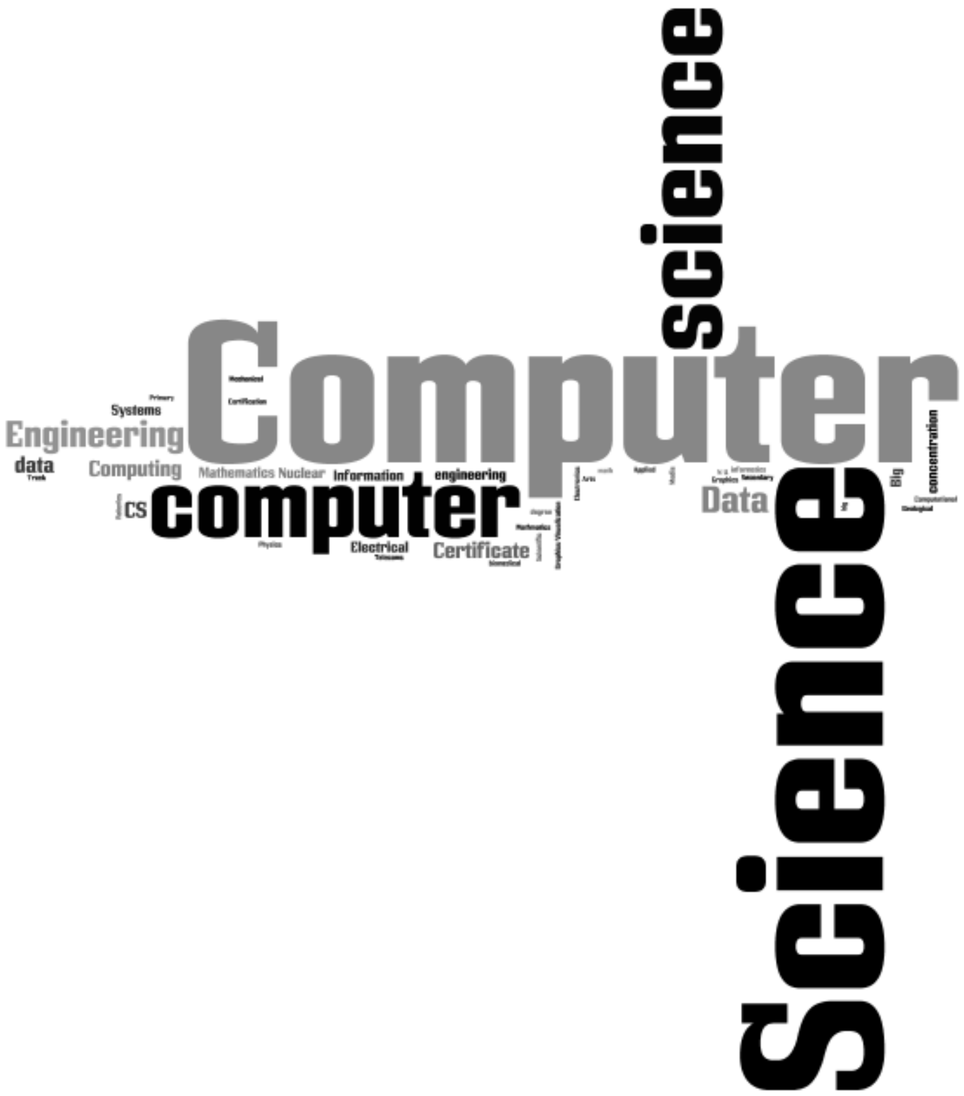
I prefer not to disclose	**2**	3.3%
Female	**15**	25%
Male	**43**	71.7%

Age

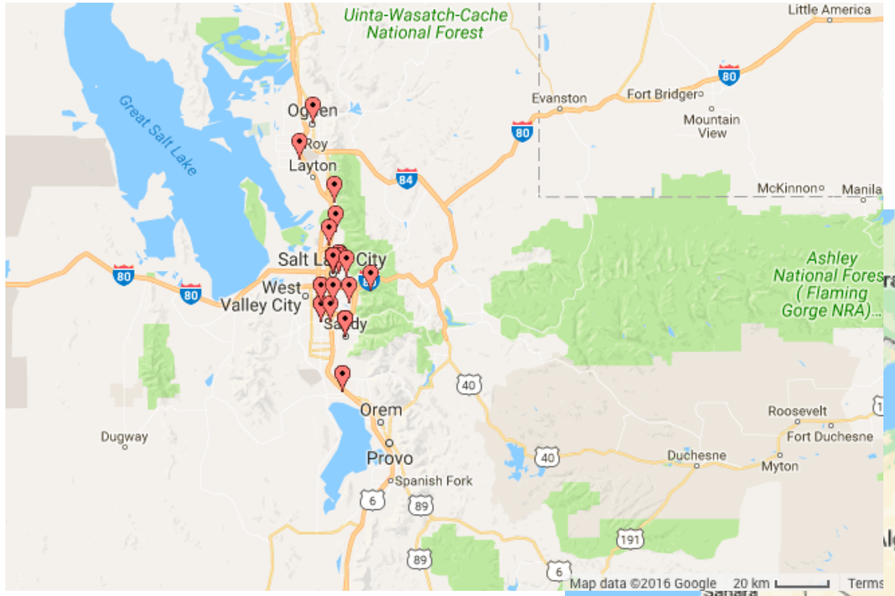


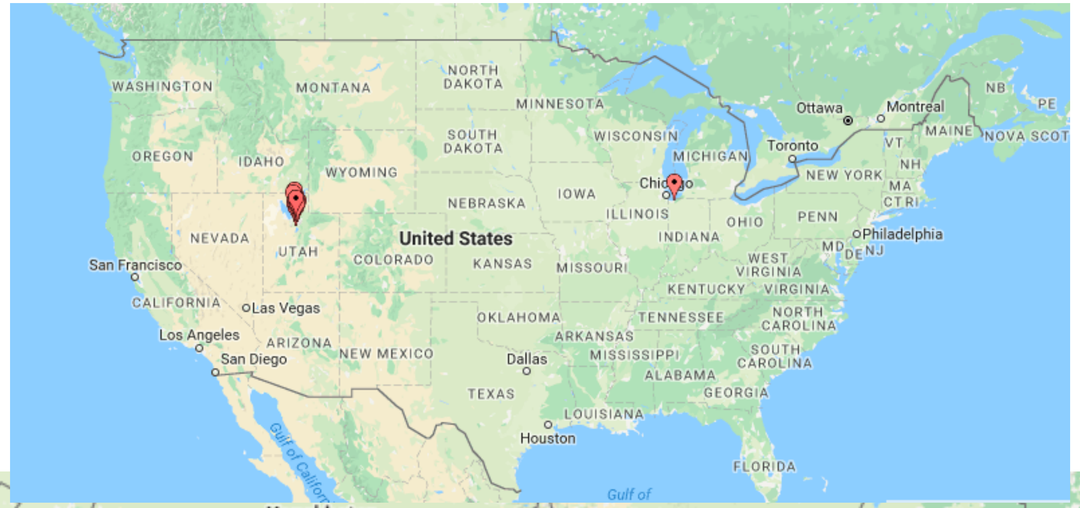
I prefer not to disclose	**2**	3.3%
Under 17	**0**	0%
18 to 24	**20**	33.3%
25 to 44	**36**	60%
45 to 64	**2**	3.3%
Over 65	**0**	0%

Concentrations



Where you're from





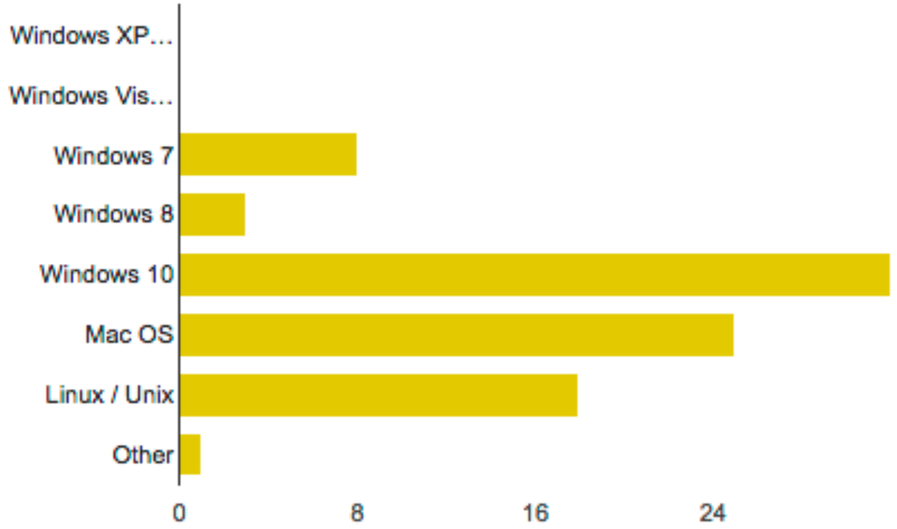
+ Peru

Computer / OS

What kind(s) of computer(s) do you own?

Desktop	**18**	30%
Laptop	**57**	95%
None	**0**	0%

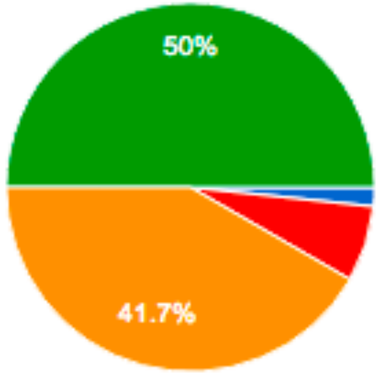
What operating system(s) do you run on your computer(s)?



Windows XP (we hope not!)	**0**	0%
Windows Vista (not really?)	**0**	0%
Windows 7	**8**	13.3%
Windows 8	**3**	5%
Windows 10	**32**	53.3%
Mac OS	**25**	41.7%
Linux / Unix	**18**	30%
Other	**1**	1.7%

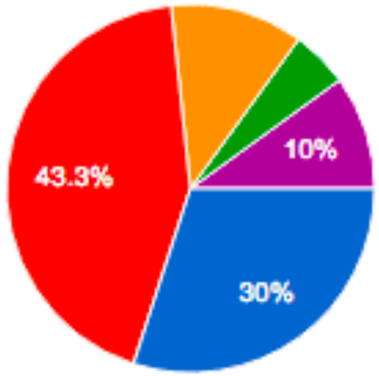
Programming Skills

How long have you been programming?



Less than 6 months	**1**	1.7%
Between 6 months and one year	**4**	6.7%
1 to 3 years	**25**	41.7%
Over 3 years	**30**	50%

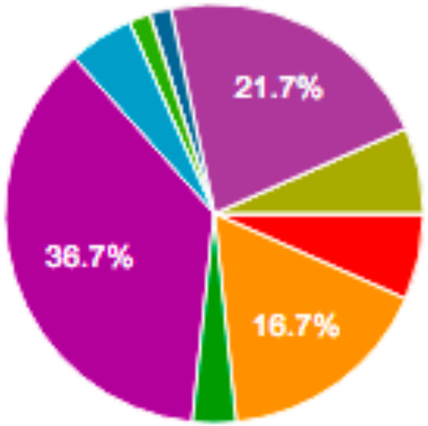
How often do you write code?



Daily	**18**	30%
Weekly	**26**	43.3%
Two or more times per month	**7**	11.7%
Once per month	**3**	5%
Less than once per month	**6**	10%

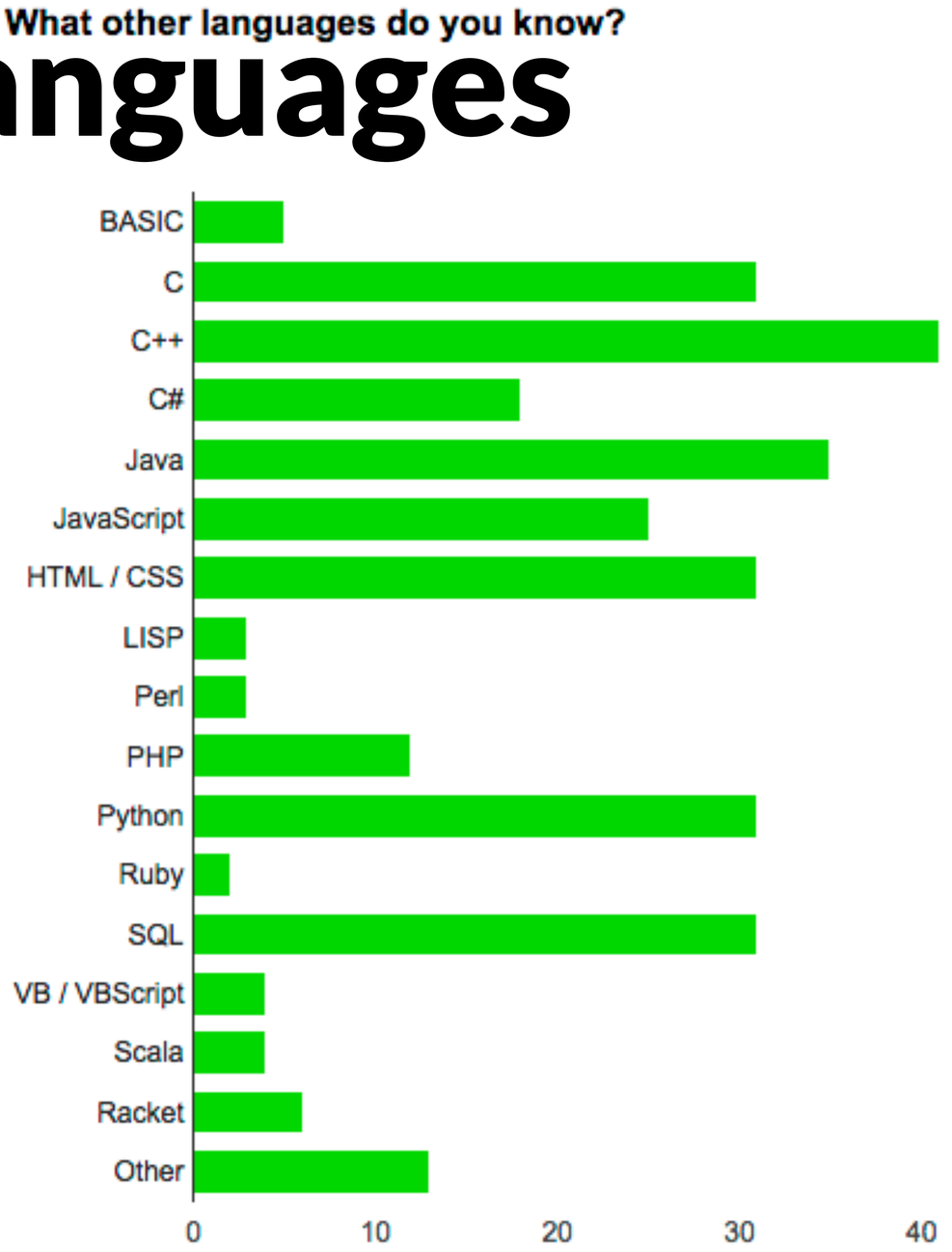
Primary Language

What is your primary programming language?



BASIC	**0**	0%
C	**4**	6.7%
C++	**10**	16.7%
C#	**2**	3.3%
Java	**22**	36.7%
JavaScript	**3**	5%
HTML / CSS	**0**	0%
LISP	**1**	1.7%
Perl	**0**	0%
PHP	**1**	1.7%
Python	**13**	21.7%
Ruby	**0**	0%
SQL	**4**	6.7%
VB / VBScript	**0**	0%

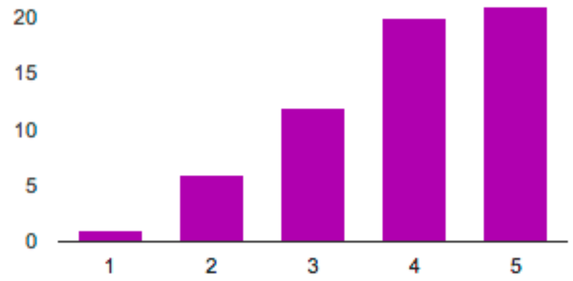
Other Languages



BASIC	**5**	8.3%
C	**31**	51.7%
C++	**41**	68.3%
C#	**18**	30%
Java	**35**	58.3%
JavaScript	**25**	41.7%
HTML / CSS	**31**	51.7%
LISP	**3**	5%
Perl	**3**	5%
PHP	**12**	20%
Python	**31**	51.7%
Ruby	**2**	3.3%
SQL	**31**	51.7%
VB / VBScript	**4**	6.7%
Scala	**4**	6.7%
Racket	**6**	10%
Other	**13**	21.7%

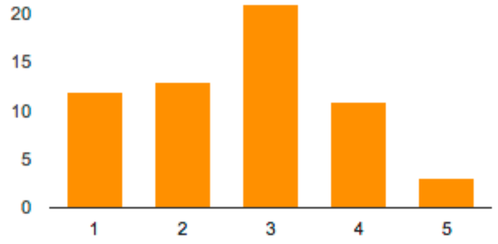
Your Comfort Zone

Overall, how comfortable are you with programming?



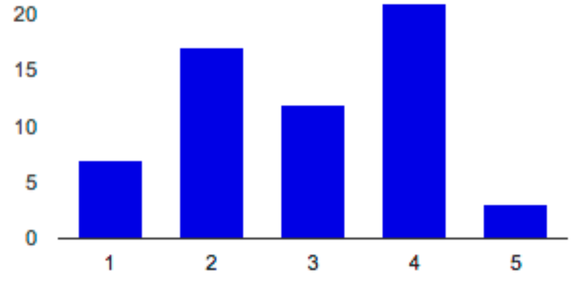
Less comfortable: 1	**1**	1.7%
2	**6**	10%
3	**12**	20%
4	**20**	33.3%
Very comfortable: 5	**21**	35%

How comfortable are you with design?



Less comfortable: 1	**12**	20%
2	**13**	21.7%
3	**21**	35%
4	**11**	18.3%
Very comfortable: 5	**3**	5%

Are you familiar with git for version control?



What is git?: 1	**7**	11.7%
2	**17**	28.3%
3	**12**	20%
4	**21**	35%
I am the Master of rebasing!: 5	**3**	5%

Why take this class?

I'm working with brain networks and using machine learning and topology to extract information.

I love analyzing data and presenting it as a story. I think a visualization course will help me a better communicator and help my readers to walk away from my story with insights and knowledge.

It is part of the requirement for the degree, but I am very excited to take it otherwise!

With the "Big Data" hype, […] information visualization is needed in order to understand these data.

What do you want to get out?

Soft Skill - Understand different elements of story telling using data visualization. Be a better story teller. Hard Skill - Be able to create visualization using D3

A deeper understanding of data visualization theory and D3 familiarity.

Some cool visualization techniques, especially for large scale data.

Insight, rather than skills, of how to do visualization.

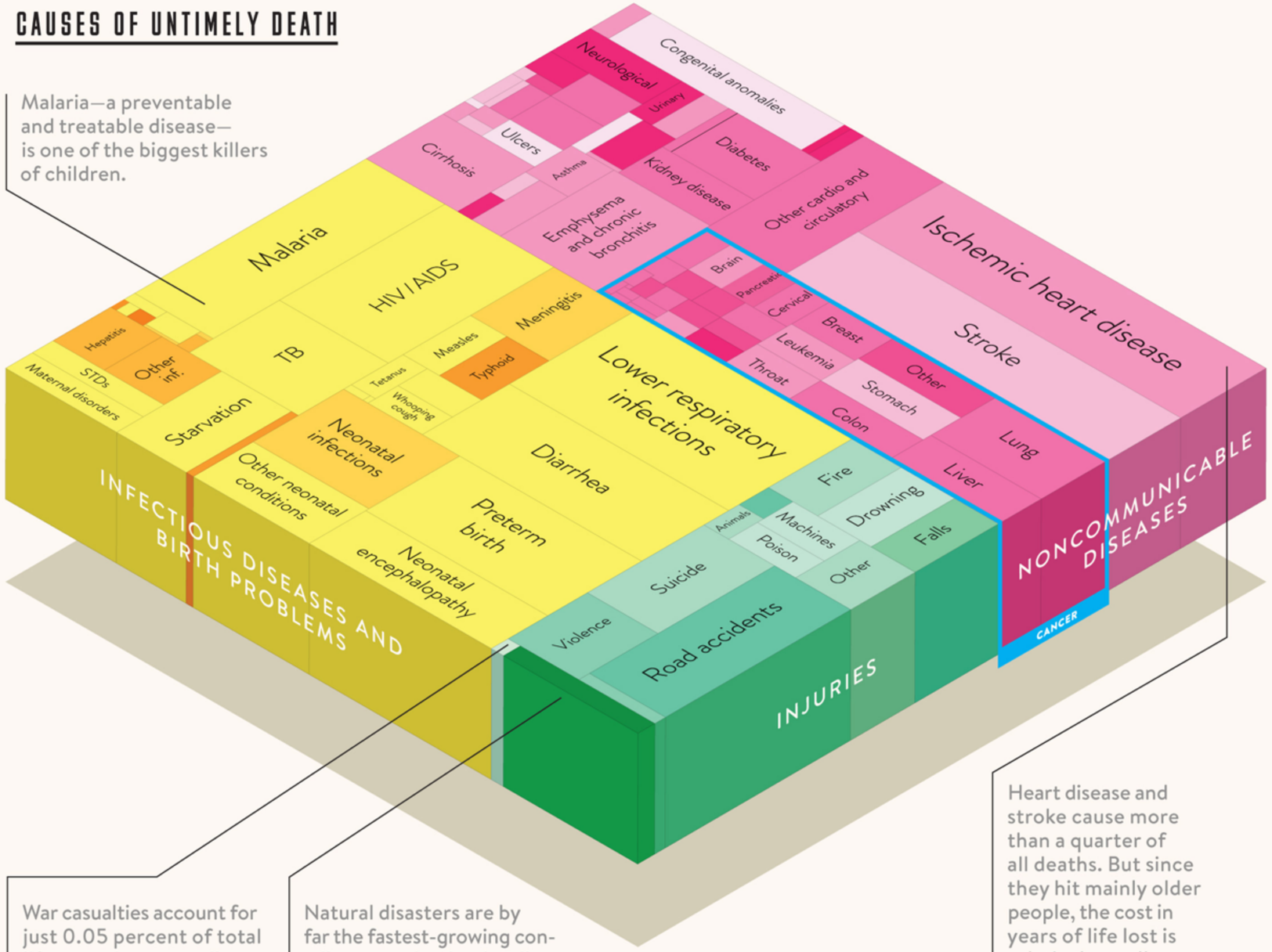
Design Critique

Design Excellence

“Well-designed presentations of interesting data are a matter of substance, of statistics, and of design.”

E. Tufte

CAUSES OF UNTIMELY DEATH



ANNUAL % CHANGE (2005 TO 2010)

INFECTIOUS DISEASES/BIRTH PROBLEMS

INJURIES

NONCOMMUNICABLE DISEASES

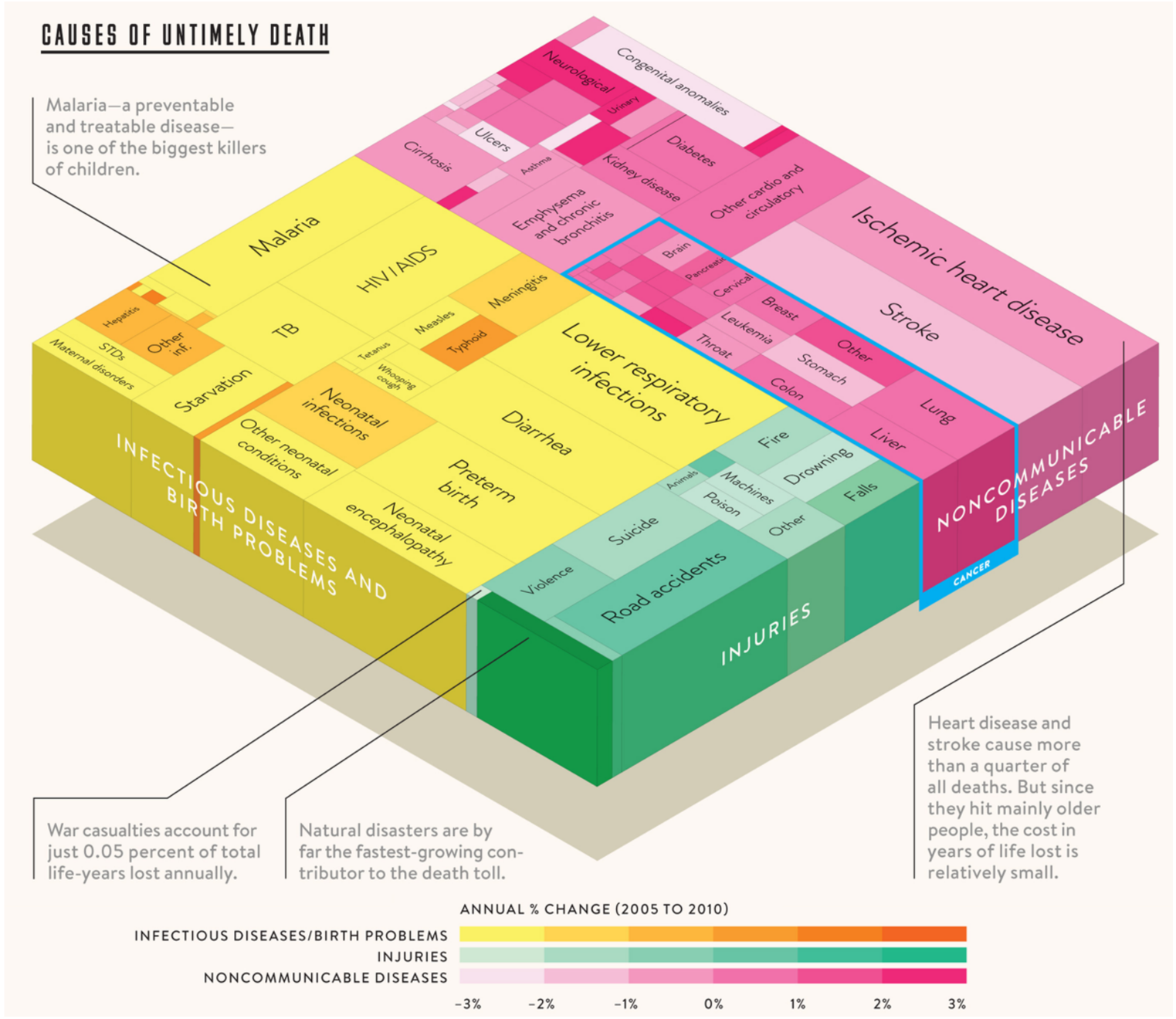
−3% −2% −1% 0% 1% 2% 3%

Graph of the Year?

"I love this graph because it shows that while the number of people dying from communicable diseases is still far too high, those numbers continue to come down. […] But there remains much to do to cut down the deaths in that yellow block even more dramatically. We have the solutions. But we need to keep up the support where they're being deployed […]“

-Bill Gates

http://goo.gl/W7ac3m

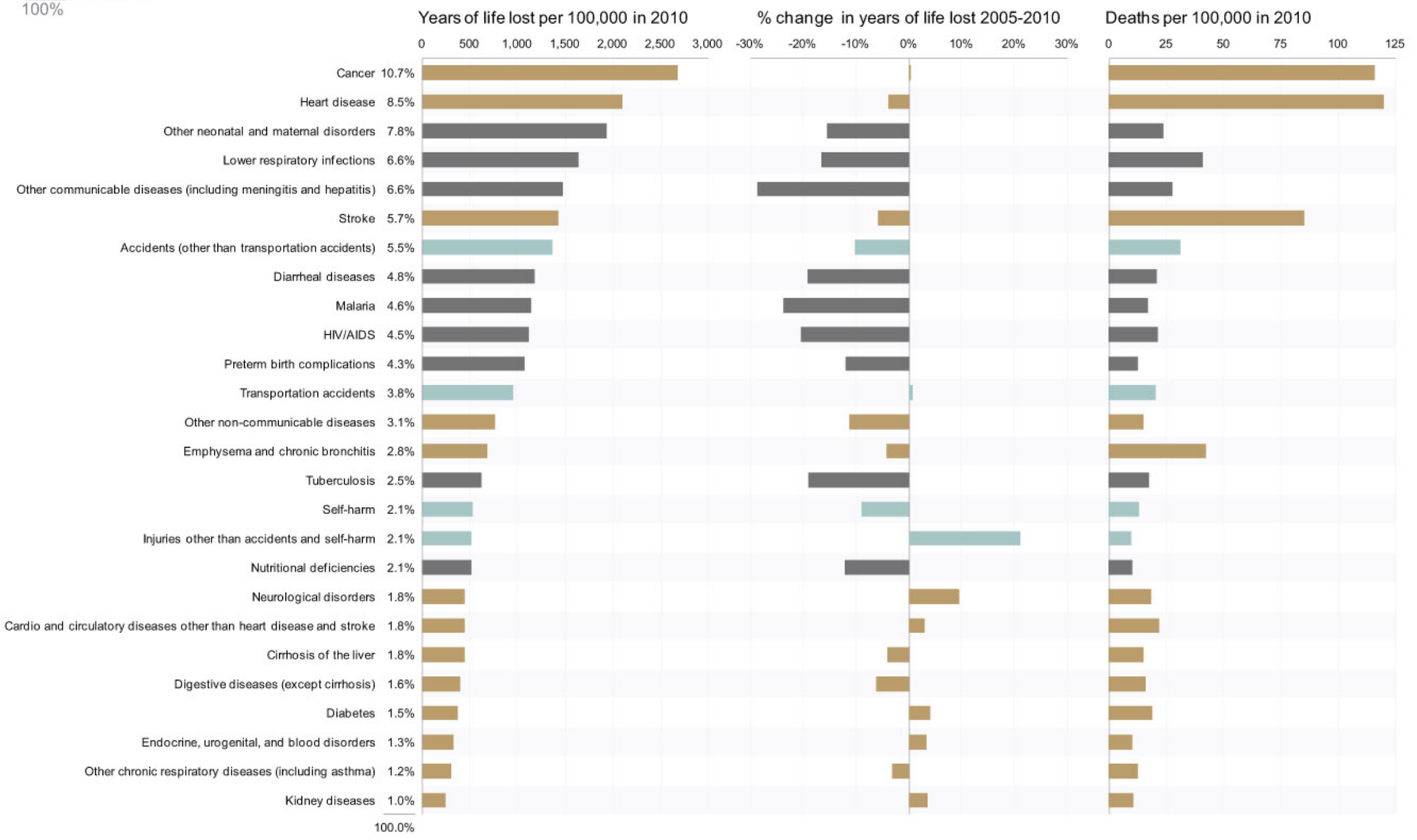


http://goo.gl/g6iTLb

Global Causes of Lost Life

44% Communicable, maternal, neonatal, and nutritional disorders
43% Non-communicable diseases
13% Injuries
100%

Comparing the number of deaths alone, as shown in the rightmost graph below, doesn't tell the entire story. Some causes of death have a greater effect on the young, which can be seen when comparing years of life lost in the leftmost graph.



Some causes of death contribute disproportionately to years of life lost because of their effect on the young. For example, malaria, while not huge in the number of deaths, is much more signficant in the number of years that are lost.

Two interesting changes reside in "Injuries other than accidents and self-harm." War, which accounted for only 0.05% of years of life lost, decreased since 2005 by 31.5% in years of life lost per 100,000 people. Natural disasters, which accounted for 0.65% of years of life lost, increased by 217% in years of life lost per 100,000.

Communicable, maternal, neonatal, and nutritional disorders (the gray bars) are often easier to prevent through healthcare than other causes of death. This reveals itself in the graph above by the fact that all of these disorders have decreased during this five year period.

The five forms of cancer that cause the most deaths are trachea/bronchus/lung (2.9%), stomach (1.4%), liver (1.4%), colon/rectum (1.4%), and breast (0.8%).

All cardiovascular and circulatory diseases combined account for 30% of deaths.

Redesign by Perceptual Edge