

## Risk and Reward in the Information Society

Social and other issues

# Topics

- Digital Divide
- Accessibility
- Influence
- Environmental issues

# Digital Divide

- Technology, the internet, and digital communication tools are increasingly necessary for full participation in society
- Most of us and our peers participate in the digital economy to a reasonable degree
- It is easy to forget that we do not represent the majority.
- Many people are not able to take full advantage of technology, for one reason or another.

# Access to digital tools is required

- Job applications are online
- Ticket sales are online
- goods and services sales are online
  - ▶ Especially in smaller communities, as stores close
- Interaction with governments is online
- Give an example of how access to society has moved online in the past 10 years

# Access to digital tools is assumed

- When a private corporation or public service moves online, it is seen as progressive
  - ▶ Everyone needs a website
  - ▶ A city, school, business or government service with an old website is out of touch, difficult to interact with
    - With no website, it simply doesn't exist
  - ▶ Radio and other media encourage interaction through tweets and facebook, less now through telephone.

# Aside: public domain digital tools

- Shared Services Canada: Consolidating Email, Data Storage, internet infrastructure
  - ▶ Save money by reducing duplication
  - ▶ RCMP, CPIC, Stats Canada, had significant problems with shared services Canada
- Previous discussion around Canadian Common CV

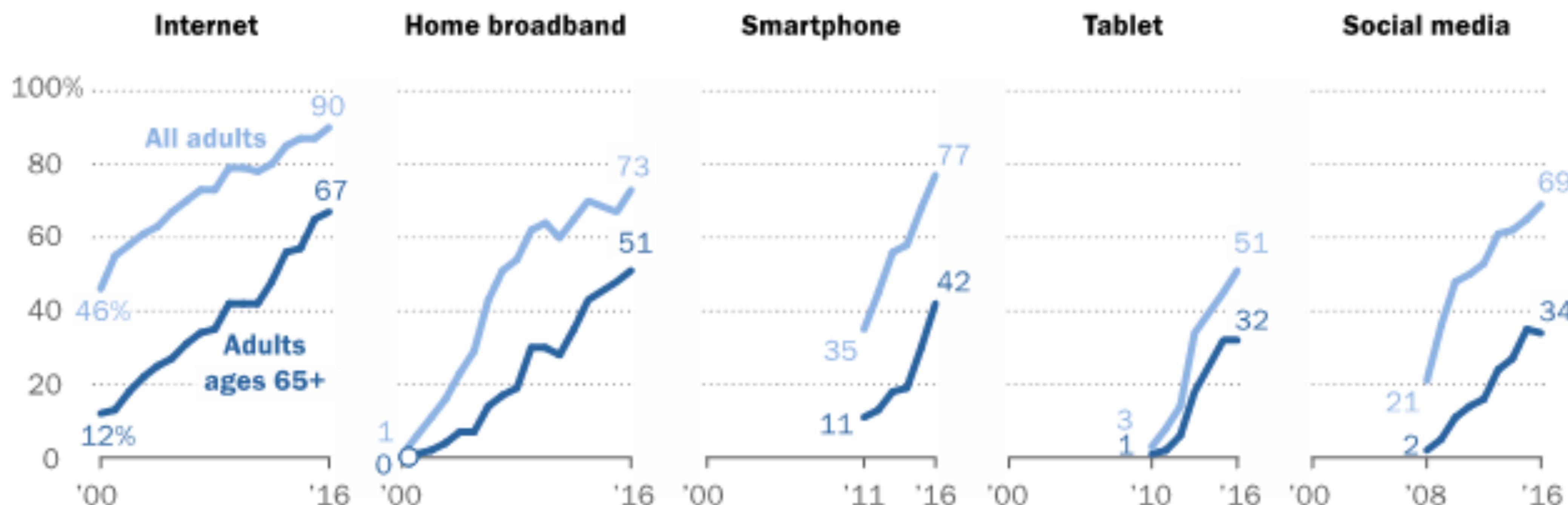
# Access to digital tools is not universal

- Poor people have less access than rich people
- Old people have less access than young people
- People in different cultures have different rates of access.
- First Nations people have less access than white people
- People living in small towns have less access than people living in cities
- People with disabilities have less access
  - ▶ Especially visual / cognitive disabilities

# Digital Divide: Age

**Smartphone adoption among seniors has nearly quadrupled in the last five years**

*% of U.S. adults who say they have or use the following*

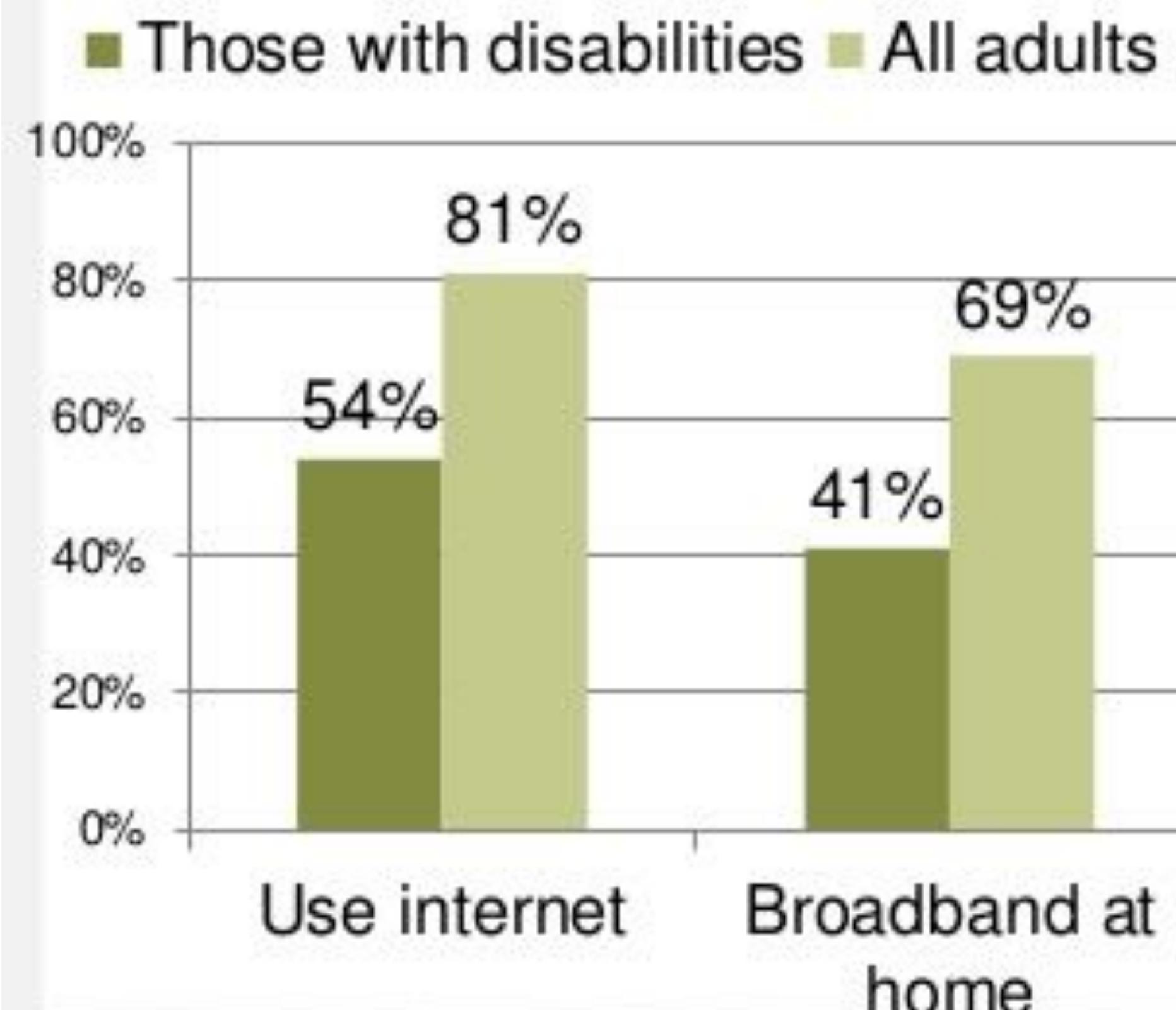


Source: Survey conducted Sept. 29-Nov. 6, 2016. Trend data are from previous Pew Research Center surveys.  
“Tech Adoption Climbs Among Older Adults”

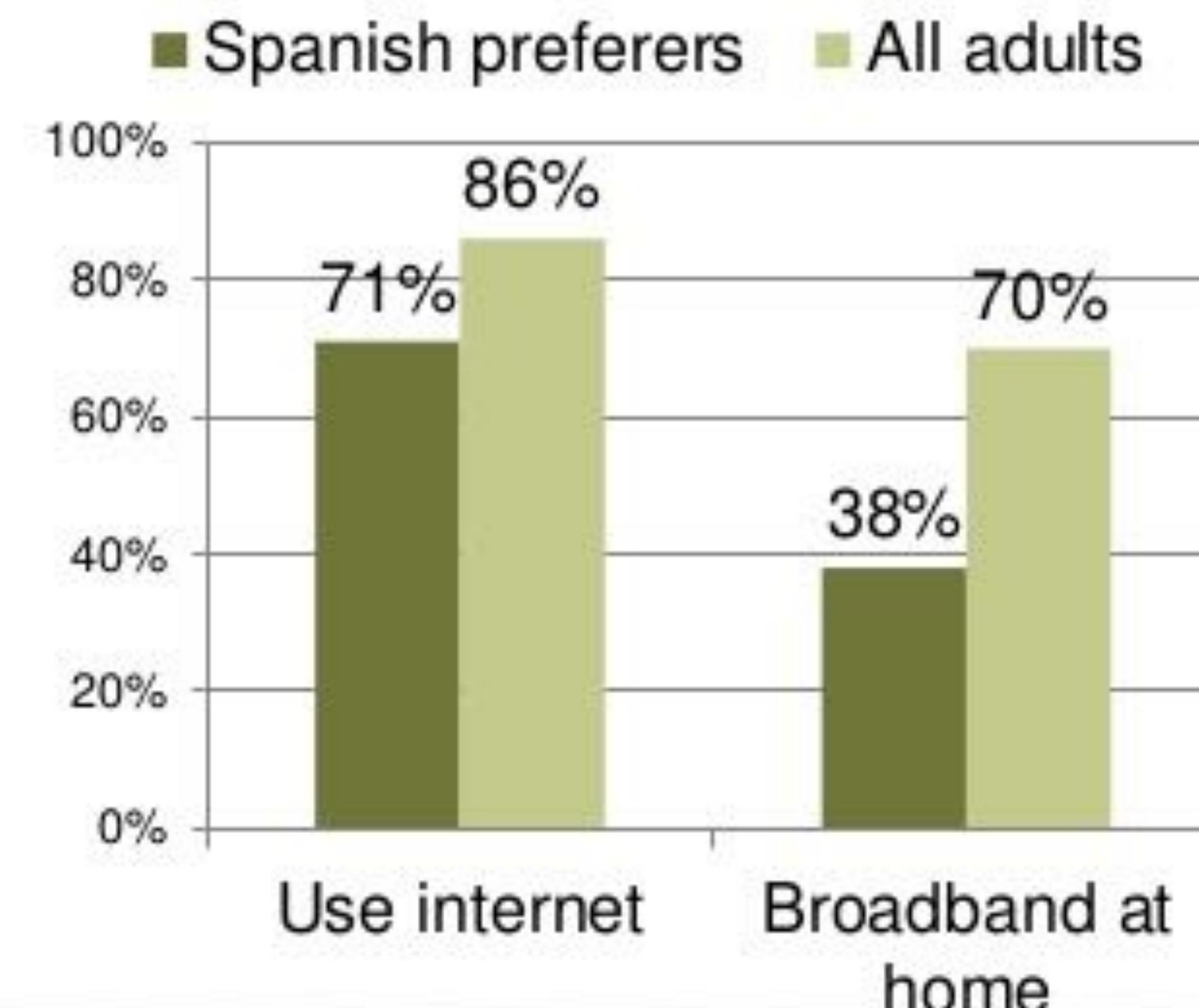
PEW RESEARCH CENTER

# Digital Divide: Disability

## Disability and language preference (Pew Research)

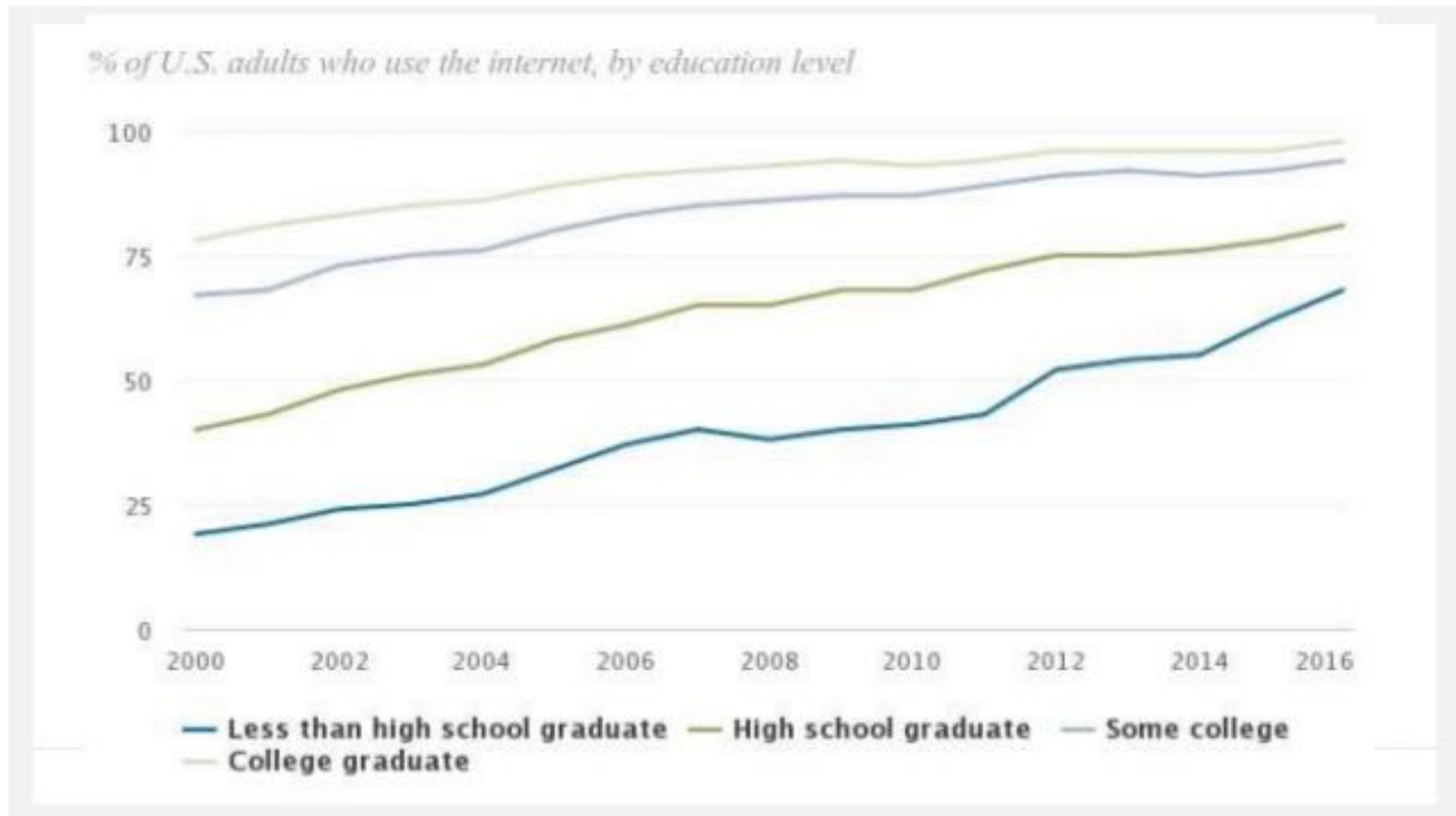


Sept. 2010 - <http://bit.ly/1b2G69P>



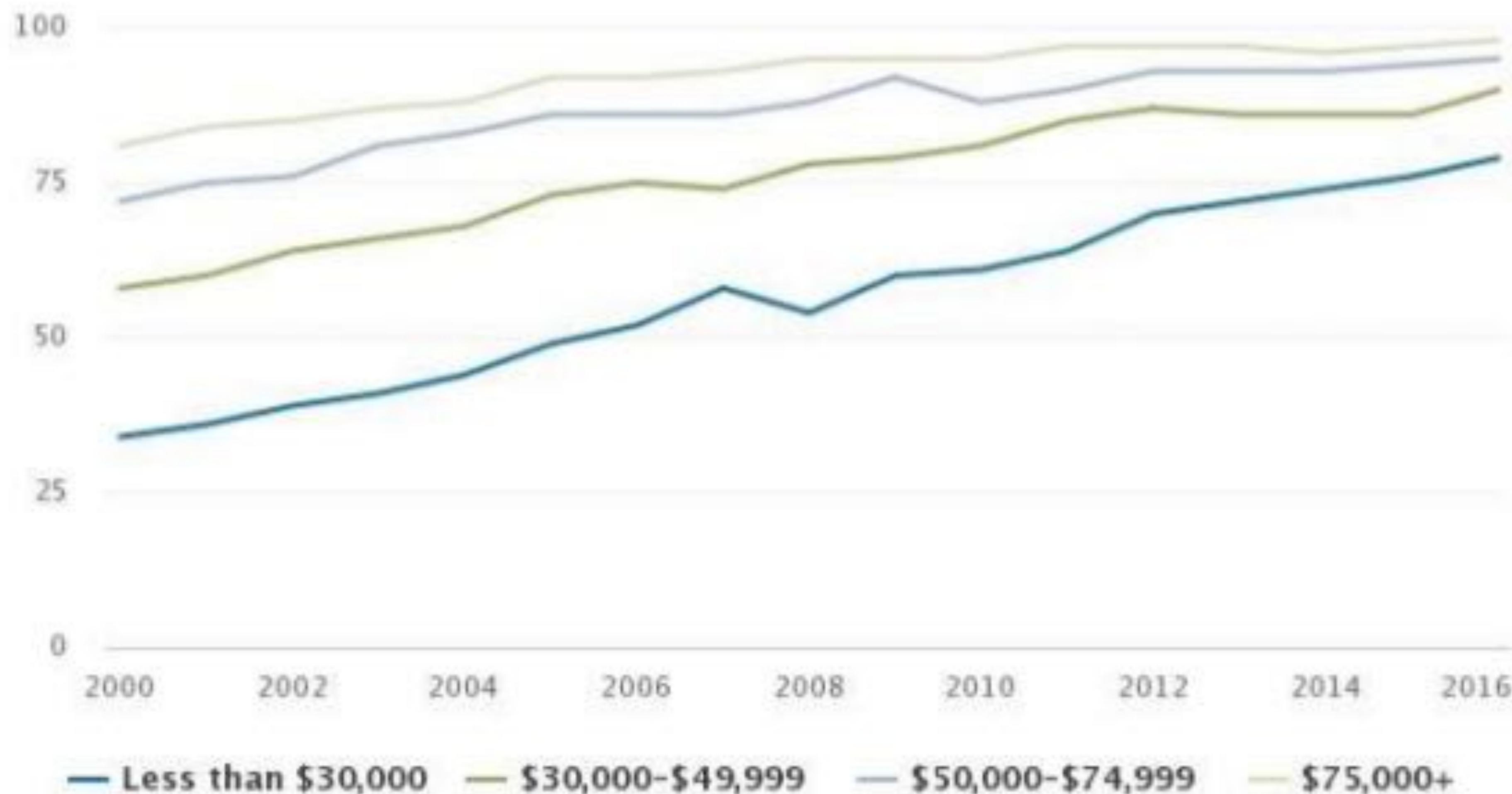
Sept. 2013 - unpublished

# Digital Divide: Education



# Digital Divide: Income

% of U.S. adults who use the internet, by income

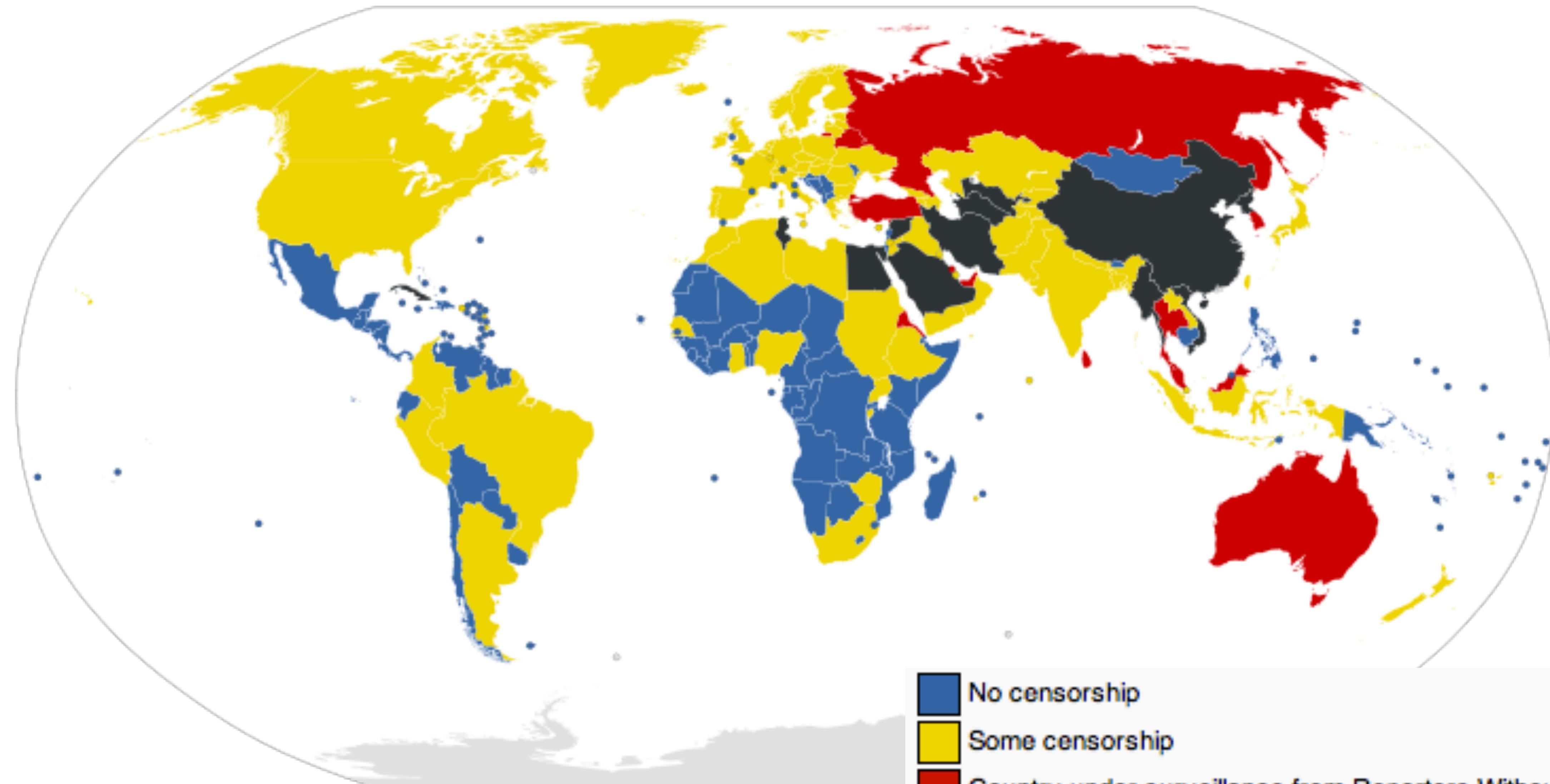


# International Access

- People living in developing nations have less access than people in developed nations
- People living in autocratic nations have less access than people in democratic nations
- People living in communist nations have less access than people in capitalist nations

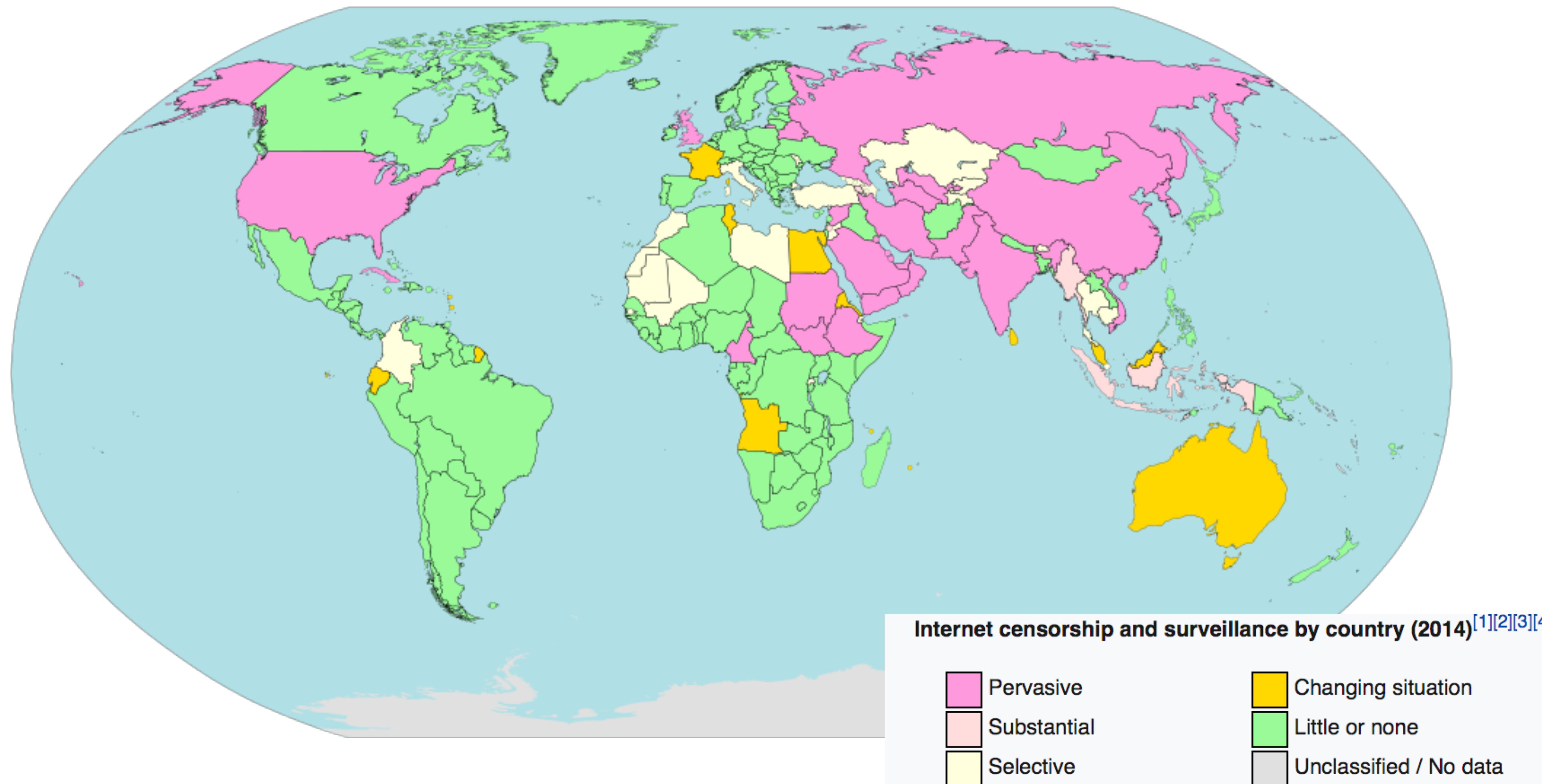


# Government Censorship 2004



- No censorship
- Some censorship
- Country under surveillance from Reporters Without Borders
- Most heavily censored nations

# Government Censorship 2014



# Government Censorship

- Great firewall of China
  - ▶ Block access to certain sites and online content
    - ◉ eg social media; Chinese “versions” appear
    - ◉ QQ, renren, wechat, weibo etc.
  - ▶ Encourage/discourage certain online activities
    - ◉ Chilling effect
- North Korea
  - ▶ Internet access only by special authorization

# Implications of the digital divide: Policy

- Markets, policy, politics and economics are increasingly decided by online conversations
  - ▶ Most-retweeted tweets are quoted as popular opinion
- If you are not online, how is your opinion represented?
- Many old-guard lobby groups still do most of their lobbying via telephone (e.g. NRA)
  - ▶ Can be more effective than an online survey
  - ▶ If you are online only, is your opinion ignored by lawmakers?

# Access to digital tools on campus

- All assignments have been required to be submitted to URcourses for years now
  - ▶ Early days of URcourses / CourseCentral, paper submission was allowed as a secondary access method
  - ▶ Can you assume everyone in class has a device?

# Universal access to computers and the internet

- Access is not the same as ability
  - ▶ Access = high speed to every home
  - ▶ Still have to have a computer and buy a subscription
- Should gov't pay for computers/subscriptions for poor?
  - ▶ Internet is necessary to function in today's society.
- Should gov't pay for free wifi? Under what restrictions?
- Q: Should universal internet access to be a liberty or claim-right?

# Effect of the Internet on Community

- Negative or Neutral
  - ▶ isolation from family, local friends, neighbours.
  - ▶ Reduces direct contact with customers and clients.
  - ▶ Internet addiction, game addition
  - ▶ Pretending to be someone else
  - ▶ Enabling destructive or dangerous behaviour

# Effect of the Internet on Community

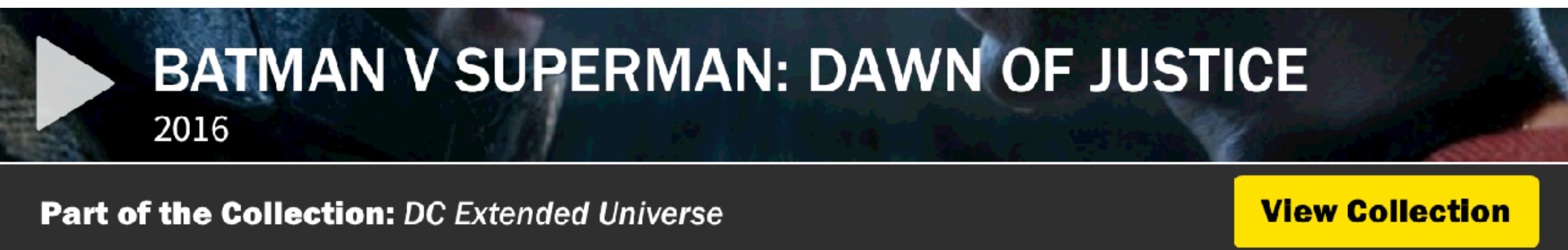
- Positive or Neutral
  - ▶ Contact with family, friends who are far away
  - ▶ Wider customer/associate base
  - ▶ Global associations focused on special interests.
  - ▶ formation of electronic relationships.
  - ▶ Mediating destructive or dangerous behaviour

# Online Ratings

- Much of the internet relies on recommendation from other users
  - ▶ Amazon, Uber, Ebay
  - ▶ Recommendation better than advertising
- Recommendation can be bought and sold
  - ▶ “Verified purchaser”
- How many rate a product or service? How many use ratings?

# Rotten Tomatoes

- Critics versus “ordinary people”
  - ▶ Ratings often wildly different
- Brigading
  - ▶ Inorganically inflating or deflating the rating of a product for reasons other than its quality



The image shows a screenshot of the Rotten Tomatoes movie page for "Batman v Superman: Dawn of Justice". At the top, there's a large play button icon followed by the movie title "BATMAN V SUPERMAN: DAWN OF JUSTICE" and the year "2016". Below the title, it says "Part of the Collection: DC Extended Universe" and has a "View Collection" button. The main content area features a large image of Batman and Superman facing each other. On the left, there's a "TOMATOMETER" section with a green asterisk icon and "27%", along with "Average Rating: 4.9/10", "Reviews Counted: 379", and "Fresh: 103". In the center, there's a "All Critics | Top Critics" section with a progress bar showing 27% filled in green. A critics' consensus is partially visible. On the right, there's an "AUDIENCE SCORE" section with a popcorn icon and "63%", along with "liked it", "Average Rating: 3.5/5", and "User Ratings: 230,742".

**BATMAN V SUPERMAN: DAWN OF JUSTICE**  
2016

Part of the Collection: DC Extended Universe

**View Collection**

**TOMATOMETER**  **27%**  
Average Rating: 4.9/10  
Reviews Counted: 379  
Fresh: 103

All Critics | Top Critics

Critics Consensus: *Batman v Superman: Dawn of Justice* smothers a potentially powerful story – and some of

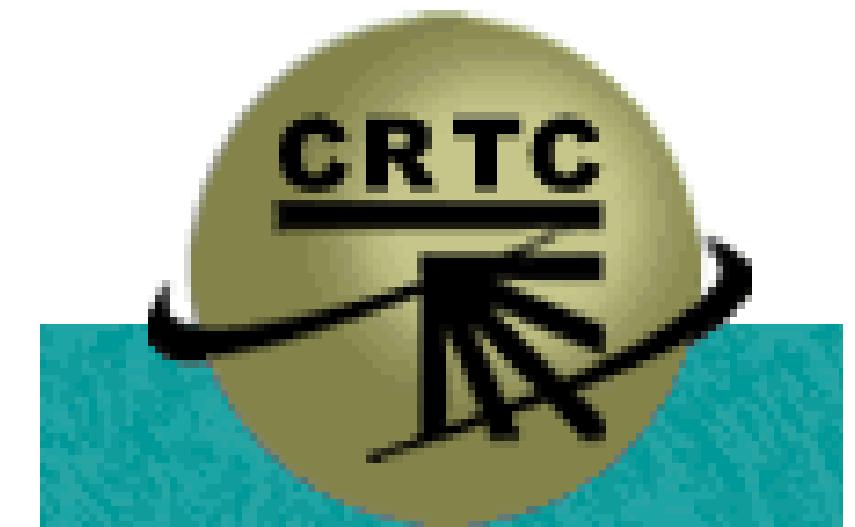
**AUDIENCE SCORE**  **63%**  
liked it  
Average Rating: 3.5/5  
User Ratings: 230,742

# Government Influence: Ratings

- Official Ratings help consumers make decisions
- Often managed and enforced by industry associations
- Rated content is usually directed at protecting children
  - ▶ Children should not be unknowingly exposed to certain themes or ideas
  - ▶ Violence, sex, drugs, language etc
  - ▶ Aside: “Common Sense Media” has detailed ratings and reviews based on specific metrics. Not just stuff to avoid but also stuff to pursue

# Canadian Broadcast regulations

- Canadian Radio-television and Telecommunications Commission
  - ▶ Government licenses broadcasters
- Canadian Broadcast Standards Council
  - ▶ Self-policing membership for radio and television



# Canadian regulation

- CRTC said early on
  - ▶ “we won’t regulate the internet”
  - ▶ Regulation is based on community standards, and on the internet there is a wide range of communities with their own standards
- Off-line rating systems for content
  - For sexual, violent, obscene content
  - Drugs, Alcohol, language
  - ▶ TV shows, movies (required)
  - ▶ video games (voluntary)

# Canadian TV Regulation

- C Children
- C8+ Children eight years and older
- G General programming,  
suitable for all audiences
- PG Parental guidance
- 14+ Viewers 14 year and older
- 18+ Adult programming



# Canada Movie regulation (provincial)



- all ages. occasional swearing, very innocent sex/nudity



- may not be suitable for all children



- < 14 if with an adult. violence, coarse language, sexually suggestive scenes



- < 18 if with an adult. horror, explicit violence, frequent coarse language and sexually suggestive scenes.



- <18 if with parent / responsible adult. sexually explicit, brutal violence, intense horror, disturbing scenes, frequent coarse language



- >18 only. predominantly sexually explicit activity.

# Gender and online culture

- Women experience online culture differently than men
  - ▶ Try having a female user name for a couple days.
- Women are held to different standards when participating in online culture
  - ▶ You’re not a “real” gamer
- Aggression toward women in online conversations manifests differently than aggression toward men
  - ▶ Harassment, Doxxing, mysoginy, death threats,

# Gender and Online Culture: Example

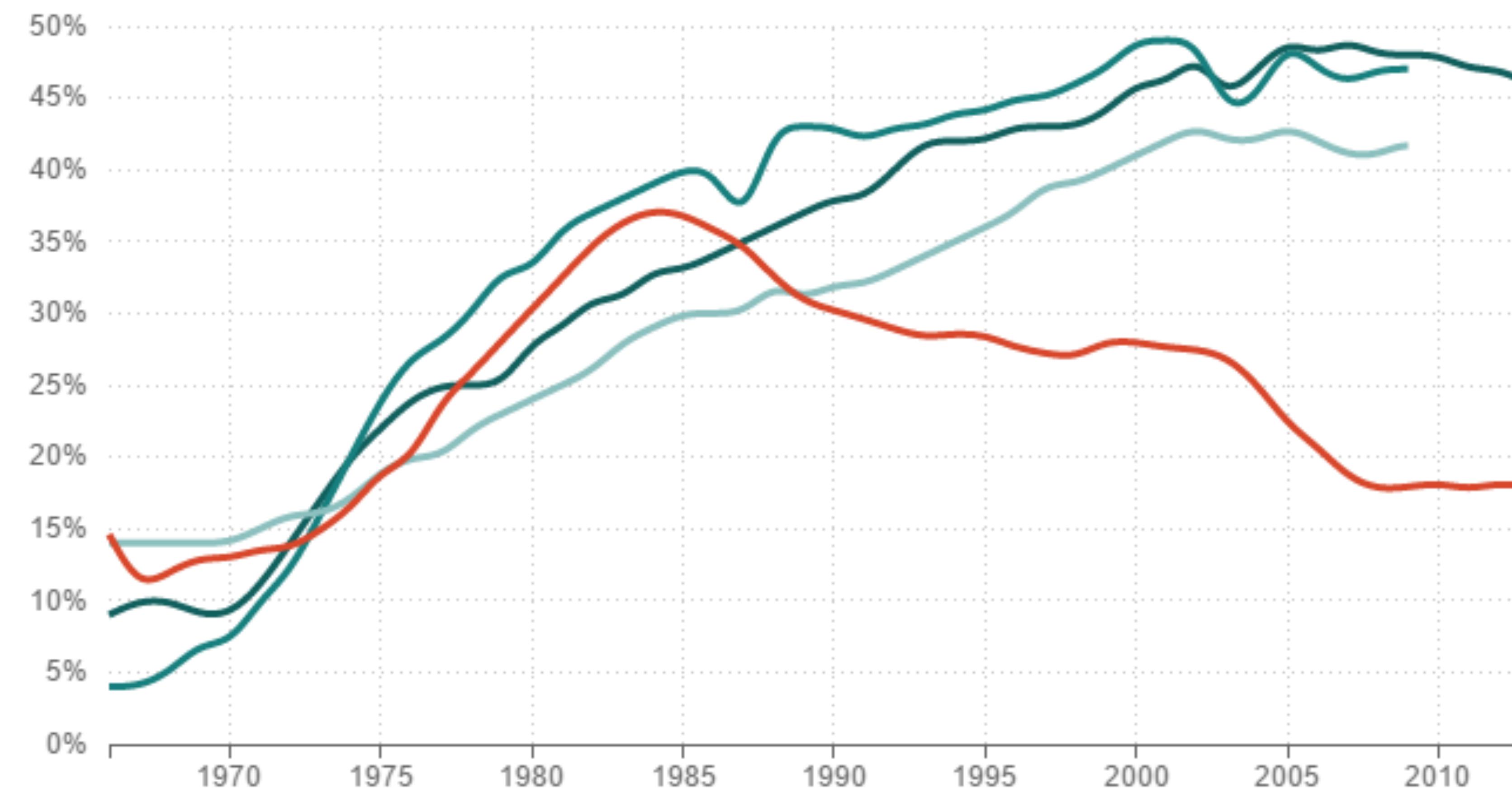
- Tropes vs women in video games
  - ▶ A well produced youtube series investigating women in games. A bit heavy-handed at times but no more so than a thousand other channels about other topics
  - ▶ Creator was relentlessly harassed, driven out of her own home by death threats
  - ▶ popular rebuttals are nit-picky and miss the point.
  - ▶ Irony: harassers limit legitimate critiques because people don't want to be seen to be associated with the attackers

# Gender and the tech industry

## What Happened To Women In Computer Science?

% Of Women Majors, By Field

■ Medical School ■ Law School ■ Physical Sciences ■ Computer science



# Influence

- The promise of the internet was distributed influence
  - ▶ An ordinary person could start a blog, publish a book, build a following, change opinion
- In reality, Powerful people find a way to stay in power
  - ▶ Lobbying for laws, influencing corporations, manipulating systems
  - ▶ Or am I just paranoid?

# Influence: Net Neutrality

- Premise: all bits should be equal
  - ▶ CanadaPost can't decide not to ship your package,
  - ▶ CanadaPost can't look inside your package to decide how fast to move it
- Premise: People should be able to pay a bit more to have their bits arrive faster.
  - ▶ CanadaPost has several market segments for different priorities.
  - ▶ There are people who will pay for speed, and there are people who would rather save money

# Net Neutrality: The complication

- Canada post doesn't also write letters to you
- Internet companies are often also media companies
- Zero-Rating: When an internet company doesn't charge you for bandwidth when using it's own media service
  - ▶ Eg: Shomi (now shut down)
    - Rogers/Shaw Netflix competitor
    - Free for Rogers/Shaw subscribers

# No Net Neutrality? MEO portugal provider

The screenshot shows a web browser window with the URL <https://www.meo.pt/internet/internet-movel/telemovel/pacotes-com-telemovel>. The page is displayed in English, as indicated by the Google Translate bar at the top.

The main content area features a banner for "Smart Net" with the offer "Offer of the 1st month of a Smart Net with 10GB / month additional <sup>(1)</sup>". Below this, there are several service categories:

- Messaging:** Includes icons for WhatsApp, Telegram, iMessage, Facebook, and others. Price: € 4.99 / month (from € 6.99/month), 1 month free. [To join](#)
- Social:** Includes icons for Facebook, Instagram, Twitter, Snapchat, Messenger, LinkedIn, and Pinterest. Price: € 4.99 / month (from € 6.99/month), 1 month free. [To join](#)
- Video:** Includes icons for YouTube, Netflix, and others. Price: € 4.99 / month (from € 6.99/month), 1 month free. [To join](#)
- Music:** Includes icons for Spotify, Deezer, and others. Price: € 4.99 / month (from € 6.99/month), 1 month free. [To join](#)
- Email & Cloud:** Includes icons for Gmail, Outlook, SAPO, OneDrive, and others. Price: € 4.99 / month (from € 6.99/month), 1 month free. [To join](#)
- MEO:** Shows icons for MEO apps. Text: "Free traffic to MEO apps already included in your tariff". [To join](#)

A red box highlights the text "zero-rating of competing on-brand services" in the MEO section.

# Net Neutrality: Why it's insidious

- Providers want to charge you extra for access to popular services
- Providers want to charge services extra for fast access to the internet
  - ▶ Seems like double-dipping
- Argument: these services take extra bandwidth so they should be supported more
- Counter-argument: these services already pay what you are asking for bandwidth.

# Net neutrality and deep packet inspection

- ISPs look at the content in each packet so they can decide what to charge, and if a customer has access or not
- preferential treatment
  - ▶ throttle content (or even block competitors / pirate)
  - ▶ Charge more for certain websites
  - ▶ Charge more for service leased to third party ISPs from wholesalers

# Canadian net neutrality issues

- Telus blocked union sites during a strike (2005)
- Shaw offers QoS upgrades to 3rd party subscribers (2006)
  - ▶ Speed up your internet for an extra \$10/month
- Bell throttles traffic to BitTorrent (2010)
  - ▶ Usage-based billing
- Rogers interrupted failed DNS lookups and replaces with sponsored search page
- April 2017, CRTC series of decisions supported net neutrality
  - ▶ ISP's can offer differential pricing, but only for speed rates, monthly data usage etc. not content

# Problems with net neutrality

- Requires government regulation
  - ▶ Problematic for some freedom people
- Some security protocols are limited by net neutrality
  - ▶ Fighting DDOS requires deep packet inspection, blocking of internet traffic based on content
- Net neutrality assumes content services can compete on a level playing field
  - ▶ FAANG companies dominate internet traffic.
  - ▶ Non-neutral net could promote smaller content services

# Canadian and US Video Game Ratings: The Entertainment Software Rating Board



# Spam: unsolicited mass email

- cheap/free to send, may impose costs on recipient
- objectionable content (political, ads, solicitations for funds, pornography, etc.).
- may contain a disguised return address.
- may pass through filters.
- invades privacy.
- creates a burden and on ISPs.
- Q: How do you handle spam?

# Spam Definitions?

- Unsolicited?
- Objectionable?
- Sent by a bot network?
- Sent to more than a million people?
- Definition will affect how we deal with it

# Spam Solutions?

- Technology: content filters.
  - ▶ May block good stuff; spammers make trickier stuff
- Social: Spam pledge
  - ▶ never buy spamvertised goods; one success is enough
- Law: make spam illegal
  - ▶ How to differentiate between legitimate mass business communication and spam?
  - ▶ how to handle jurisdictions
- Vigilantism: DDOS against spammers.

# American anti-spam law

- Controlling the Assault of Non-Solicited Pornography And Marketing Act (CAN\_SPAM) 2003
  - American email senders (and people sending to USA)
    - ▶ No false header information
    - ▶ No deceptive subject lines
    - ▶ Opt-out clearly displayed
    - ▶ Identify as an ad, sender's *physical* address displayed
  - Fines, in addition to other advertising law
  - Additional regulations on harvesting, dictionary attack, script attacks, relay attacks

# Canada Anti Spam Law 2014

- Applies to any message sent or received in Canada
  - ▶ Attempts to solve jurisdictional challenge
- Opt-in: a person must actively ask for emails to be sent
  - ▶ Unless there was a “previous business relationship”
  - ▶ Unless you publish your email address
  - ▶ Exemptions include governments and charities
- Identification, unsubscribe information must be present

# Environmental issues

- Where does tech get produced?
  - ▶ Same place everything else gets produced
    - Indonesia. China. Taiwan
  - ▶ Why?
    - Cheap labour, government support
- How does tech get from there to here
- How often do we need new tech
- What happened to tech when it's done?

# Foxconn

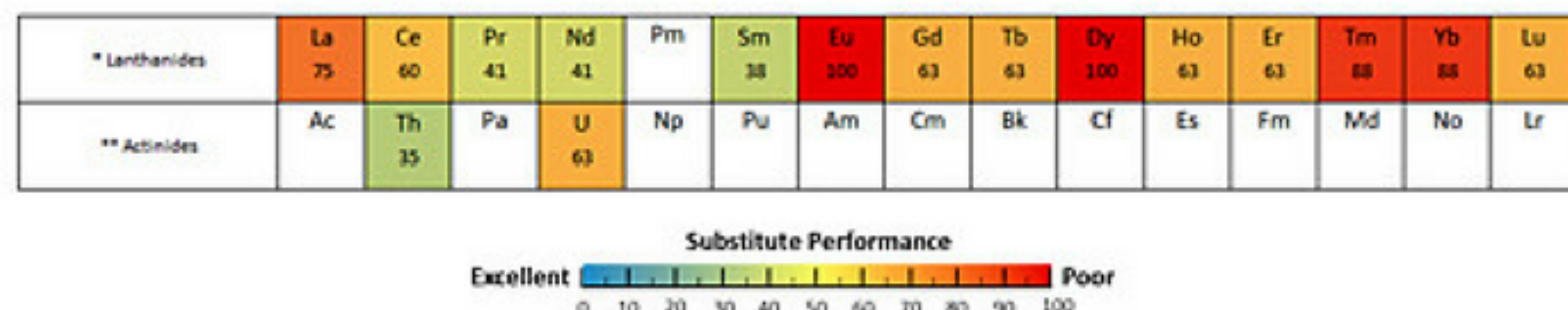
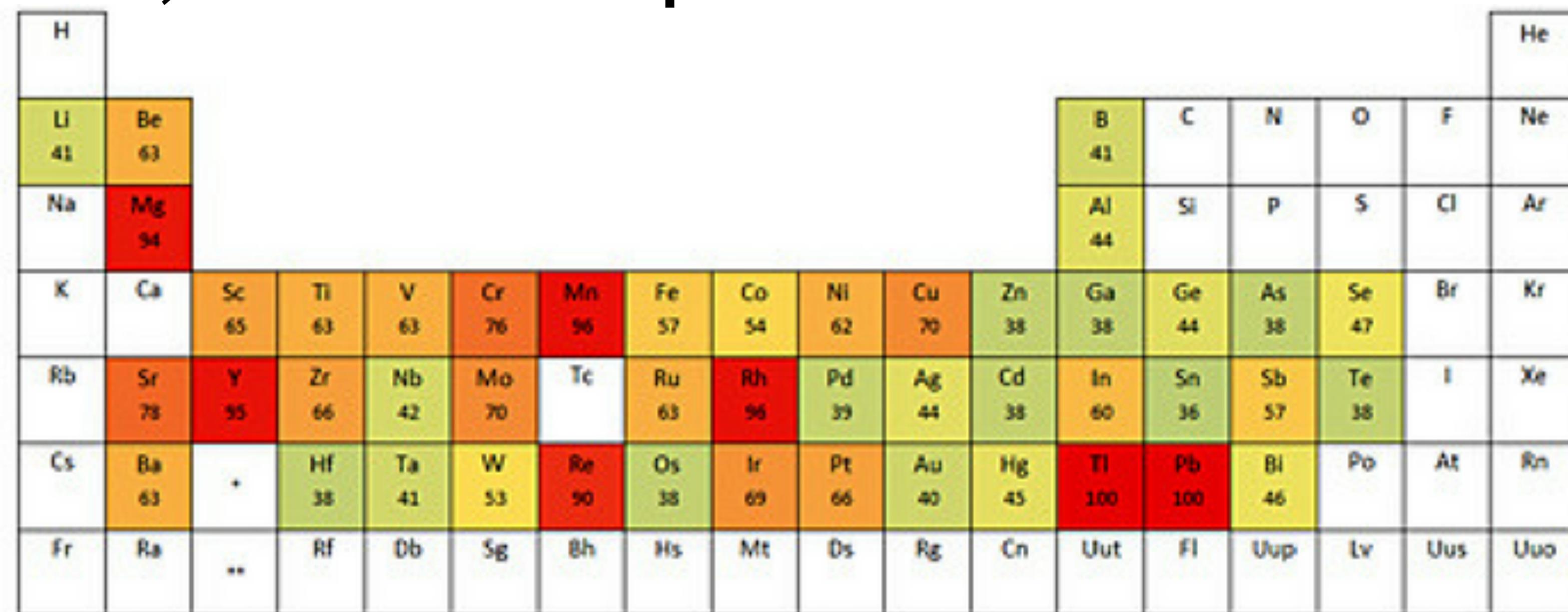
- Taiwanese tech production company. Factories in Shenzhen and other places
- Makes the devices sold by BlackBerry, Apple, Amazon, Nintendo, Sony, Microsoft
- 2012 controversy over worker suicides
  - ▶ Low wages, working past overtime limits
- Recent push to make things locally instead
  - ▶ “Made in USA” or perhaps “Assembled in USA”
  - ▶ Significantly more expensive

# Alternatives to Asian production

- If the cost of production could be reduced, production could be localized
- OR if people made and fixed their own
- Makerspaces
  - ▶ 3d printing, laser cutting, circuit design
  - ▶ Results are local, but more expensive and not as good as factory-built devices.

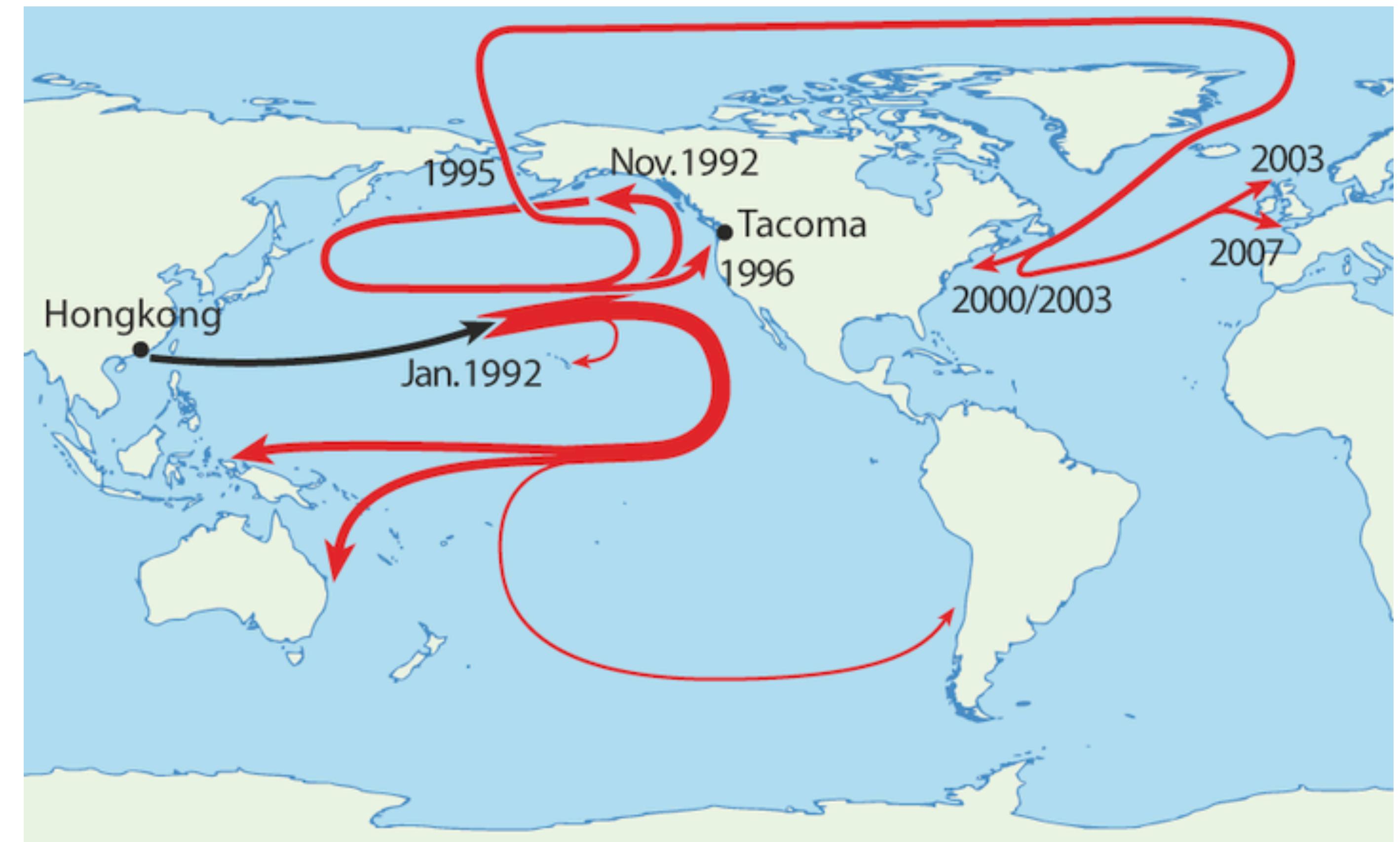
# Environmental Cost of Tech

- tech gadgets require specialized materials which are getting rarer, with no replacements



# Shipping Technology

- Large container ships crossing the oceans
- Trains and Trucks from ports

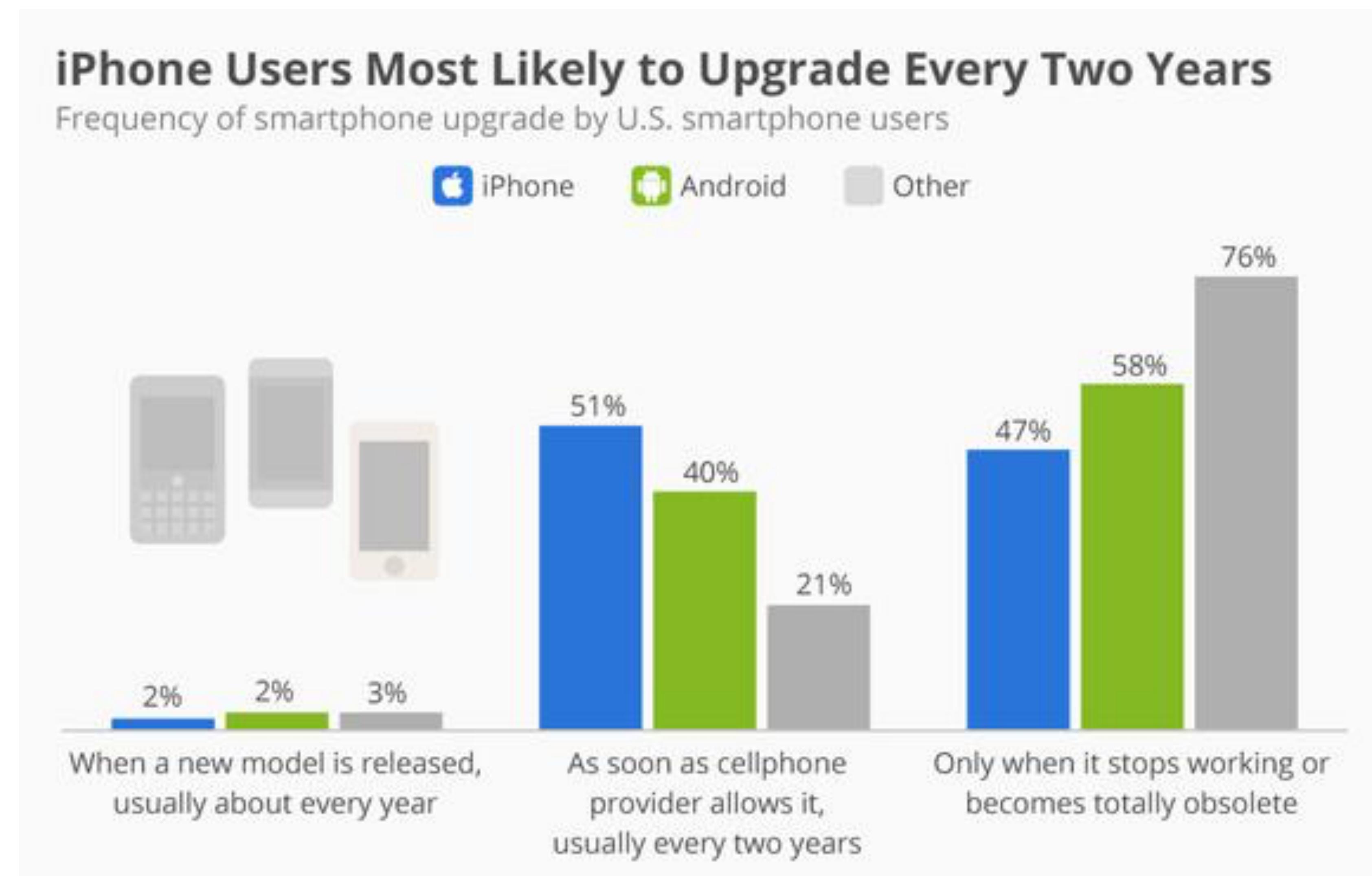


# Upgrade Fever

- People don't need a new phone every year!!
- Phones are made to break 1 week after warranty anyway!!

# Upgrade Fever

- People don't get a new phone every year!!



# Planned Obsolescence

- Designing a product with an artificially limited lifespan
  - ▶ Lightbulbs
- Repair prevention might be a form of planned obsolescence
  - ▶ adhesives and tamper-proof screws
- Style obsolescence: Changing the UI or the shape every cycle. Fashion demands it!
  - ▶ Tech reviewers criticize a phone if it looks too much like last year

# Hanlon's Razor and the Right to Repair

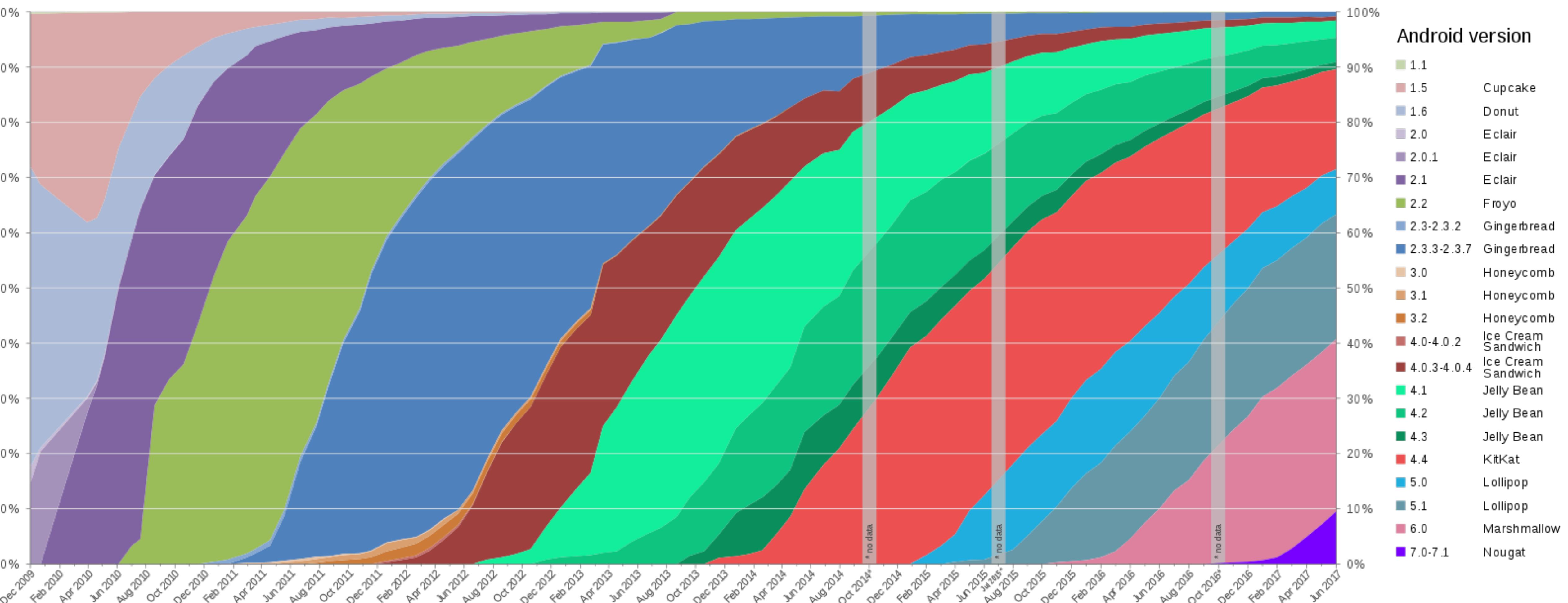
- Imagine that companies aren't evil, aren't deliberately implementing planned obsolescence...
  - ▶ What reasons could there be to limit the ability for an end-user to repair?
    - Protect users from dangerous materials or processes
    - Prevent users from making the problem worse
      - ◆ I tried to fix it but now it's on fire. Void warranty?
    - Aesthetics (size, exterior facing screws, etc)
    - Miniaturization

# Planned obsolescence and phones

- Not upgrading phones to the most recent OS is like planned obsolescence after the fact
  - Recent OS upgrades fix bugs and security holes.
  - Un-upgraded phones are at increased risk because the security holes fixed on other phones are well-known and exploitable.
- ▶ But older phones upgraded to newer OS may be slower
- Intentionally?

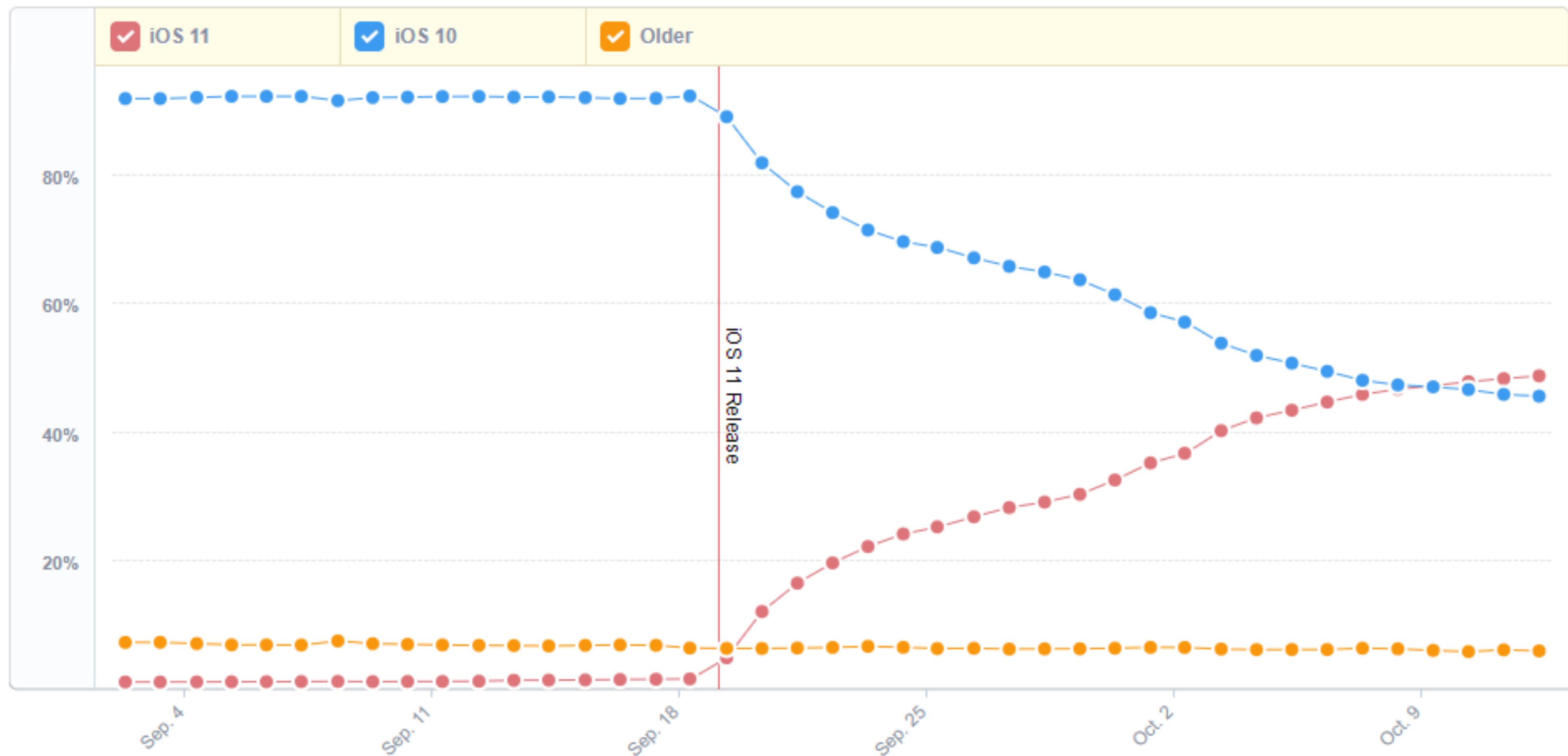
# Android OS adoption

- Many 2-year-old devices will never get nougat



# iOS os11 adoption

- All 5-year-old devices get ios11



# Modular phones

- Project Ara / Fairphone
- Allow phone components to be replaced like PC components can be replaced
  - ▶ Upgrade processor, ram, screen, camera, battery
- Goal: reduce e-waste by re-using the other components
- Problem: making it modular increases the complexity significantly, weakens the overall design

# End-Of-Life planning

- Large government projects have end-of-life plans
  - ▶ How long a project is expected to last
  - ▶ What to do when the project is over
    - eg. Data retention
    - eg. Esterhazy K1
- How do you build-in end-of-life planning to your software projects?
- What software users are most affected by end-of-life planning
  - ▶ Windows 95 on submarines

# Disposal of Tech

- Hoarding: people hold on to old tech “just in case”
  - ▶ Takes precious metals out of the economy
- Landfill
  - ▶ Precious metals gone forever
- Urban mining
  - ▶ Extracting and recycling precious metals out of garbage phones
- Tech recycling
  - ▶ Very expensive and difficult