



The Actuary And Social Justice

2020 CAS Annual Meeting

- Mary Frances Miller
- Tomantha Kyle
- Talithia Williams
- Jessica Leong



What We're Discussing Today

01

Defining The Issue Through The Actuary's Lens (Mary Frances)

02

Why Should You Care? (Tomantha Kyle)

03

How Other Professions Think Of This Issue (Talithia Williams)

04

What Can We Do? (Jessica Leong)



Defining The Issue

Mary Frances Miller

The US has many regulations to prevent disparate treatment...



- Title VII of the Civil Rights Act prohibits discrimination based on race, religion, national origin, age and sex



- Title VIII of the Civil Rights Act prohibits discrimination in housing based on race, religion, disability, family status etc.



- FTC regulates discrimination in lending practices



And Yet...

ONE SYSTEM, UNEQUAL ACCESS

The nation's decade-long economic expansion saw bank deposits more than double and commercial lending explode. Meanwhile, lending to Black-owned businesses cratered.

NASHVILLE BUSINESS JOURNAL
MUSIC CITY'S BUSINESS SOURCE

ECONOMY | THE OUTLOOK

Coronavirus Pandemic Threatens to Widen Racial Homeownership Gap

Tighter lending standards, virus's impact on Black Americans' health and employment could make it harder to buy a home or keep the one they have

THE WALL STREET JOURNAL
WSJ

The clearest message to emerge from the evidence in the Harvard case is that elite universities are very far from being able to achieve racially diverse student bodies using only race-neutral methods.

THE
NEW YORKER



Definitions

Unfair Discrimination

Origins



(mid-1800s) Origins of standard were rooted in fire insurance in order to avoid rich insureds from unfairly negotiating lower rates

Definition

1946

Rates shall not be “inadequate, excessive or unfairly discriminatory”

A rate structure is unfairly discriminatory if the insurance premium differences between insureds do not reasonably correspond to differences in expected insurance costs¹

1. <https://www.casact.org/pubs/forum/09wforum/miller.pdf>

Disparate Impact

Origins



1971 Griggs vs. Duke Power: Duke used employment tests that disparately impacted ethnic minorities without reasonable relationship to job performance

Definition

VII

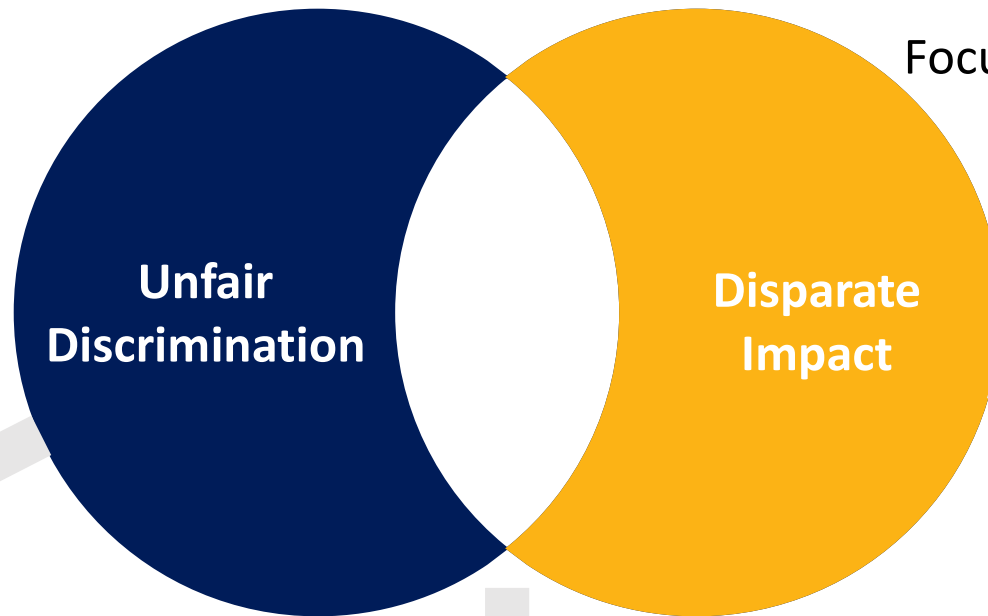
Disparate impact is a form of **indirect and unintentional** discrimination in which decisions disproportionately affect members of a protected group under Title VII



How Do These Standards Intersect?

Focus is on **INPUTS**

Focus is on **EFFECT**



**Unfair
Discrimination**

**Disparate
Impact**

**Unfairly Discriminatory but
no Disparate Impact**
e.g. using car color as a rating
variable if it has no
demonstrable relationship to
loss experience

**Disparate Impact but no
Unfair Discrimination**
e.g. no race variables, but
higher charges for certain
races

Unfairly Discriminatory AND Disparate Impact
e.g. using race as a rating variable and charging higher for some races



Disparate Impact In Insurance



We rely on data!



We only use verifiable rating variables, and stay away from race / ethnicity!



The data clearly show a difference!

 PROPUBLICA

In Illinois, 33 of 34 companies analyzed were charging more than 10% higher on average for liability premiums in minority zip codes than in white zip codes



No recruiter or employer would ever consciously apply disparate treatment

 Pew Research Center

Blacks and Hispanics are underrepresented in STEM, with the Actuarial profession at the top (bottom) of that list

Maybe it's time to rethink our

assumptions?



Historical Context

Tomantha Kyle



Poll Question

From what I know about the industry's practices, I am confident they are racially equitable.

- A. Strongly Agree
- B. Somewhat Agree
- C. Somewhat Disagree
- D. Strongly Disagree

These representations are approximations based on my review of the syllabi. They are not published by these schools



In May, Protests Erupted over Police Killings and Brutality...They Spread Globally and Continue Today

- The killing of George Floyd brought mainstream attention to the ongoing movement for racial justice.
- As of mid-June, more than 100 people have participated in a Black Lives Matter protest in the United States.
- Previous high-profile police killings include the March of 4.6M people in Washington, D.C. protesting the killing of George Floyd.
- While the recent protests have been unprecedented worldwide attention, they are part of a long string of Black lives lost to police brutality.

#SAYTHEIRNAME

AUTERIAN WOODS - SHEN JORDAN - EDWARDS - SARON BUNNEY - FERON - EDW
FOSTER - HAN - STEPHON - CLARION - ANIS - WONG - ROSE - WING - LEE - BON - TAY - LE - GUAN
PAMIE - LAO - TURNER - LEO - DOMINIQUE - CLAYTON - ON - MAT - ATHANAN - JEFFERSON
CHRISTOPHER - H - OWNE - FIELDS - MARCO - TIGER - CHRISTOPHER - E - M - MCCORMICK
ERICH - REASON - BINS - MICHAEL - BOREN - Z - O - DEAN - C - BREONNA - TAYLOR
GIARY - EN - TRUXILLO - S - RIC - DEN - MARCUS - N - S - E - M - ER - ANDR - WIL - Q - BELLY - SEM - DI
TERRELL - THOMAS - - - KEVIN - SMITH - S - - - ALPONTIE - STERLING
PHILANDO CASTILE - - - TERENCE CRUTCHER - - - PAUL O'NEAL





It's Bigger Than Police Violence...



Policing policies (incl. brutality) has been a focus. But recent events have highlighted that issues go beyond policing



The struggles of the Black community are not new and systematic oppression has a long history, laying the foundation for the systemic racism that exists today

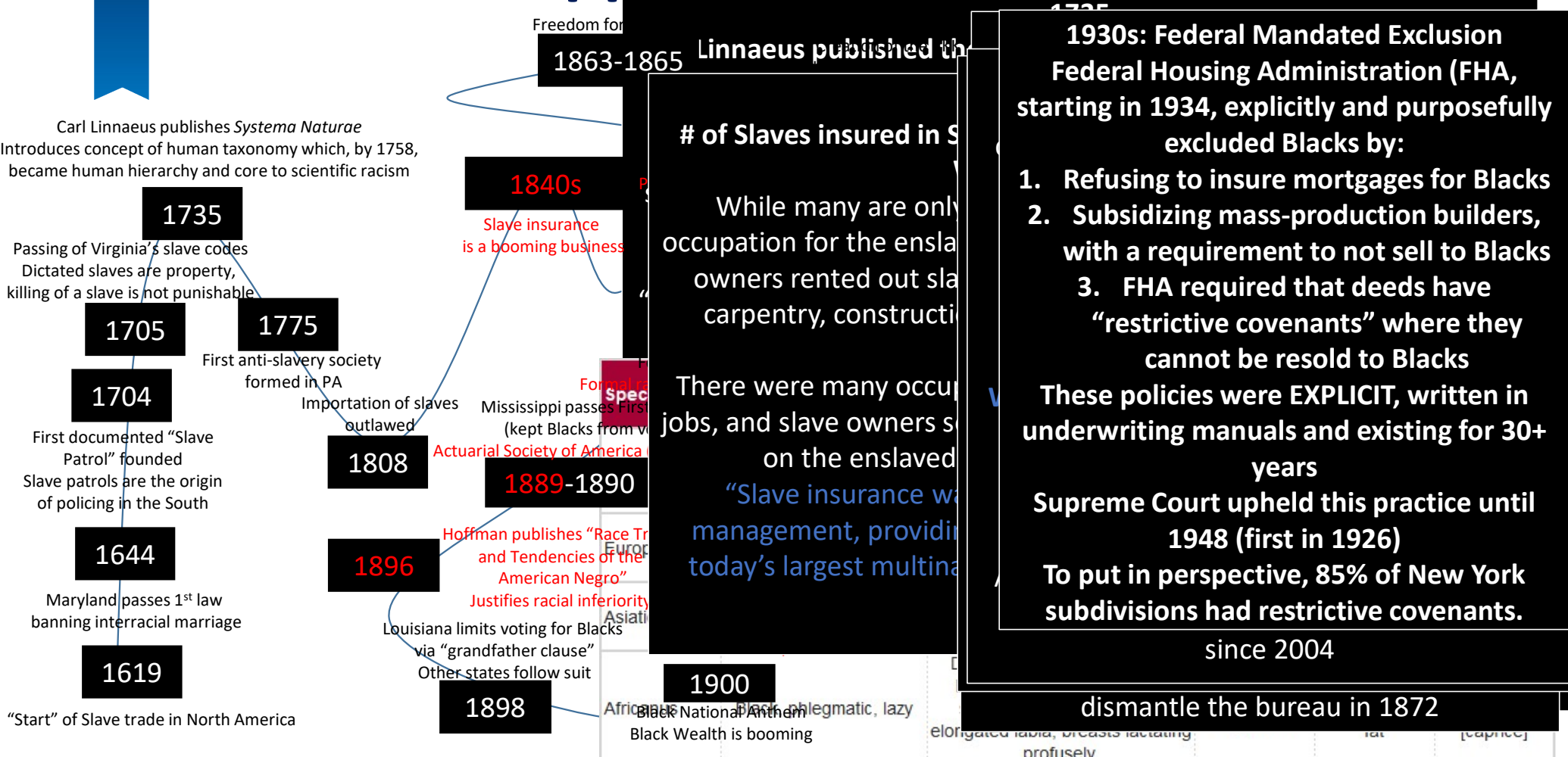


Black Lives Matter was founded in 2013 and at that time, the majority of American voters were opposed to BLM and most companies would not get involved

- **Today, 76% of Americans now agree that racism and discrimination is a big problem**

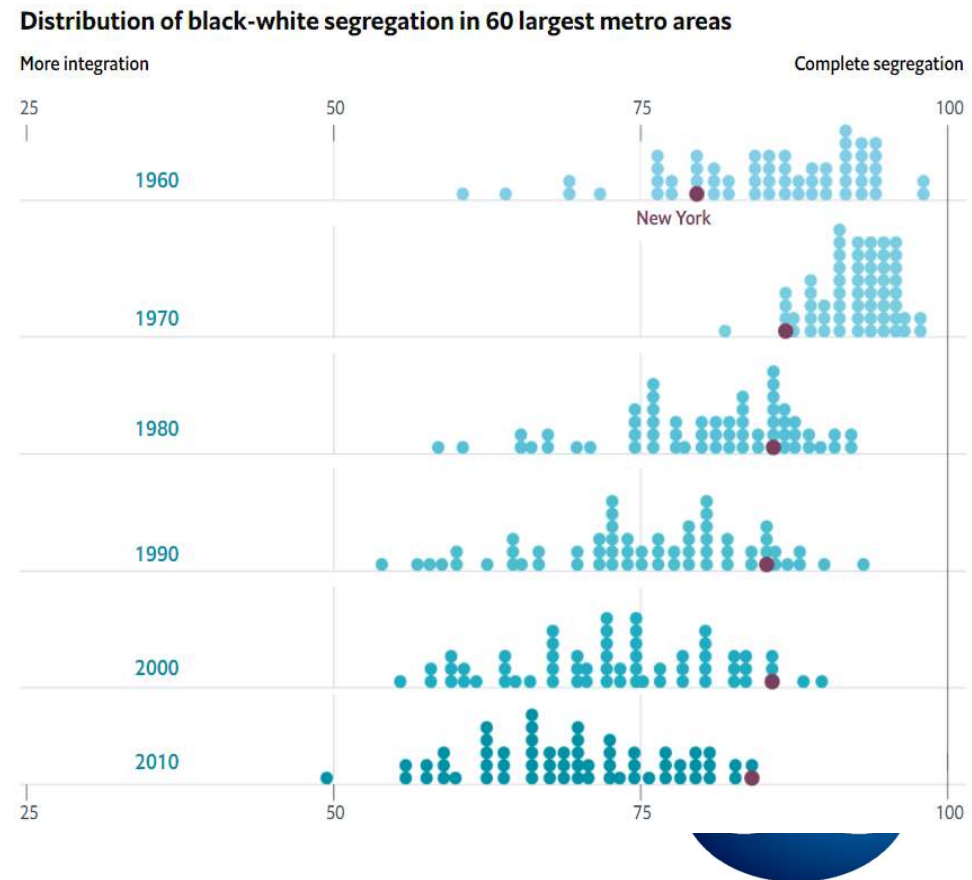


Timeline of Oppression and Progress



Insurance Industry Practices

- **Underwriting questions and restrictions**
 - Affordable/subsidized housing restrictions in property insurance
 - Felony restrictions
 - Did you know in some states you can be charged with a felony for releasing balloons?
- **Rating criteria**
 - Zip code – segregation is not behind us and is more prevalent in “progressive” areas
 - Home ownership – 2020 Black homeownership rates are lower than in the 1960s
 - Education
 - Profession
- **Product Delivery**
 - Checking Account Requirement
 - 7% of American households, and up to 20% of Black households, do not have a checking account





Poll Question

From what I know about the industry's practices, I am confident they are racially equitable.

- A. Strongly Agree
- B. Somewhat Agree
- C. Somewhat Disagree
- D. Strongly Disagree

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What Are Other Professions Doing?

Combating Algorithm Bias in the fight for Social Justice

Algorithmic Decision Making

PROs



- Handles large volumes of data (Google search, airline reservations)

- Avoids certain kinds of bias



Parole judges being more lenient after a meal



Hiring decisions based on the name



Human judgment in NYC Stop and Frisk policy

CONs

- Black Box can be hard to understand and make sense of



Values, biases and potential discrimination is often built into the training data

Limited ethnicities represented in facial mapping data.



Facebook's newsfeed algorithm, recidivism algorithms, genetic testing

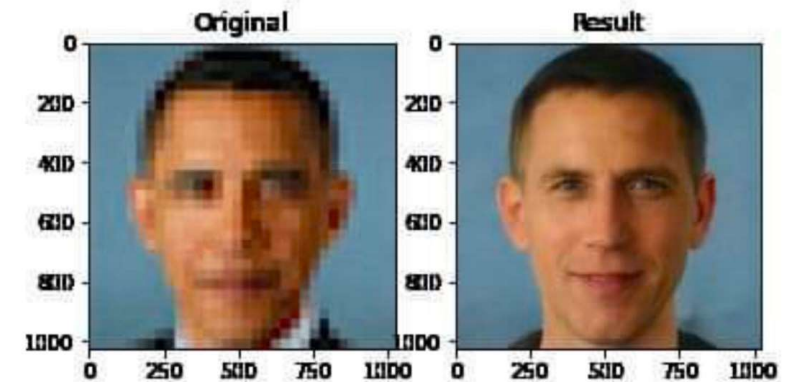


Algorithmic Decision Making Examples

PROs



CONs



- In mid 60's less than 10% of the big 5 orchestras were women
- Moved away from face-to-face to behind-the-screen auditions
- Success rate of female musicians increased by 160%



Bias in Healthcare Algorithms

- Oct 24, 2019, *Science* study showed how bias is scaled up and compounded by algorithms.
 - Software used to identify high-risk patients for complex health needs had been unintentionally but systemically discriminating against black people.
 - Researchers found the algorithm assigned consistently lower risk scores to black patients despite being equally as sick as their white counterparts.
- Hospitals and insurers use this algorithm to manage care for over 200 million people.





Bias in Healthcare Algorithms



- The algorithm assigned risk scores to patients based on total health-care costs accrued in 1 year
 - Given that higher health-care costs are associated with greater needs, this assumption seemed reasonable



- However, the data showed that the health care provided to black people cost an average of \$1,800 less per year than the care given to a white person with the same number of chronic health problems
 - This finding meant that the algorithm failed to identify less than half the number of black patients at risk of complicated medical needs as white people



Bias in Healthcare Algorithms

- The algorithm excluded race in their data, therefore the developers considered their algorithm to be “race-blind”
 - However, they did not account for embedded prejudice and that projected cost as a risk factor discriminates against black people



Bias Reduction Recommendations



- **Don't Ignore potential discrimination**

- Collect good data including race and gender stats
- Do regular reports and occasional audits
- Public disclosure of discrimination-related data



- **Make algorithms discrimination-aware**

- Set explicit objectives: want my black and white customers to be rejected at the same rate



- **Control info, timing & salience**

- When can you see the picture of Uber driver?



- **Keep experimental mindset**

- Airbnb withholding host pictures from ads
- Increase automation (e.g. AirBnB making *instant book* the default)



What Can We Do?

1. Education
2. Research
3. Leadership & Collaboration



1. Education (Poll Question)

We should include the topic of race in insurance:

1. In basic education
2. In professional education
3. As part of continuing education requirements

(There is a single check box and people can pick whichever ones they like)





2. Research



- In 2007 the Federal Reserve gave a “**Report to the Congress on Credit Scoring and Its Effects on the Availability and Affordability of Credit**”

The report concluded that “there is **no compelling evidence that any particular demographic group** has experienced **greater changes in credit availability or affordability** than other groups **due to scoring.**”

- **Studies:**

- FRB base model was re-estimated with samples limited to a **single race**. This reestimated model had **little effect on credit scores**
- The FRB found that “Blacks and Hispanics have **lower credit scores** than non-Hispanic whites and Asians”





2. Research (Poll Question)

In the **“Report to the Congress on Credit Scoring and Its Effects on the Availability and Affordability of Credit”**, the conclusion

1. Looks OK, given the study you describe. I’d like to find out more.
2. Does not look OK, given the study you describe. I’d like to find out more.
3. I don’t know

(You need to pick one of these three)





3. Leadership & Collaboration



NAIC Race and Insurance special committee

"Within the NAIC, we're seeing unprecedented discussions between our members and stakeholders on **race and its role in the design and pricing of insurance products**"

- Ray Farmer, NAIC president and director of the South Carolina Department of Insurance





3. Leadership & Collaboration (Poll Question)

The CAS should show leadership and collaborate on the topic of race in insurance

The CAS should not get involved in the topic of race in insurance

(You need to pick one of these statements)



QUESTIONS?

www.casact.org





Reference Materials

- “Algorithmic Bias and Fairness” CS519: Algorithms: Design, Analysis and Implementation – “Prasad Tadepalli, Professor, Computer Science Department - Oregon State University
- “**There is no such thing as race in health-care algorithms**” Editorial | [Volume 1, ISSUE 8](#), e375, December 01, 2019 The Lancet Digital Health Open Access Published: December, 2019 DOI: [https://doi.org/10.1016/S2589-7500\(19\)30201-8](https://doi.org/10.1016/S2589-7500(19)30201-8)



So What Has Changed?

- Awareness around issues and knowledge/acknowledgment of history has increased.
- But, more importantly, there has been a focus on how history has created our modern day world.
- Individuals are seeking “alternative” information, as American educational systems have perpetuated misinformation or ignored topics altogether
 - Companies are standing behind targeted programs that help Black people and are making clear cases for how they help all
- Professions are getting involved, getting educated, and are committing to action



The Banking Sector Has Moved to Action...

Citibank Launches \$1B Strategic Plan

“Addressing racism and closing the racial wealth gap is the most critical challenge we face in creating a fair and inclusive economy, and we know we can do it.”

Increase Black home ownership

JP Morgan: \$30B to Advance Racial Equity

“Systemic racism is a tragic part of America’s history. We can do more and do better to break down systems that have propagated racism and widespread economic inequality, especially for Black and Latinx people. It’s long past time that society addresses racial inequities in a more tangible, meaningful way..” - CEO Jamie Dimon

Become anti-racist

Increase access to credit

Expand banking access

Address affordable housing





Insurance related events

- 1840s: Slave insurance industry is booming; # insured slaves in the South rivals # of free whites insured in the North (top modern-day multi-national companies)
- 1881: Prudential is the first company to introduce formal, race-based pricing; major companies followed suit
 - Northern state legislatures ban racial discrimination; insurance companies pull out of those markets
- 1893: Southern Aid Life Insurance Company founded in Richmond, VA and was the first Black insurance company
 - Evolved out of Black mutual aid societies which date back to 1810
- 1896: Hoffman publishes “Race Traits and Tendencies of the American Negro”; “scientifically” justified racial segmentation
 - W.E.B. Du Bois and Howard University mathematician Kelly Miller contested conclusions of “statistical” study
- 1896: North Carolina Mutual Life Insurance Company founded in Durham, NC and is the largest black owned insurance company
- 1930s: Explicit federal segregation via the Public Works Administration and FHA – impacting where people can live (zip codes)
- 1932: First Black Actuary (non-exam) Asa T. Spaulding via Master’s from University of Michigan (popular university responsible for 5 of the first 11 Black actuaries)
- 1944: GI Bill passes, limits Black veteran access to >\$33 billion in mortgages. In NY/NJ < 100 of 67k mortgages insured under GI bill went to Black people. (homeownership)
- 1952: Robert J. Randall earns his FSA and becomes first Black fully credentialed Actuary
- 1960s-1980s: Scientific racism disavowed; Life insurance companies retire race-based mortality tables for new sales
 - Lawsuits settled in early 2000s addressed premium and benefit corrections for Blacks
- 2015: Consumer Federation of America publishes study: drivers in predominantly Black communities pay more for mandatory auto insurance (20-194% higher)
 - American Property Casualty Insurance Association counters and reaffirms that pricing is based on cost and credit is not discriminatory
- 2017: ProPublica article examined racial discrimination in auto insurance: found minority-dominant zip codes overcharged
- 2018: Consumer Federation of America writes to NAIC to urge them to tackle racial discrimination caused by zip code-based pricing
- 2019: H.R. 1756 Introduced: Preventing Credit Score Discrimination in Auto Insurance, Sponsor: Rashida Tlaib
- 2020: Approximately 1% of credentialed actuaries are Black (SOA and CAS)
 - NAIC announces special committee on race and insurance
 - Insurance Information Institute responds: believes it would be better to focus on industry diversity than the way carriers write insurance



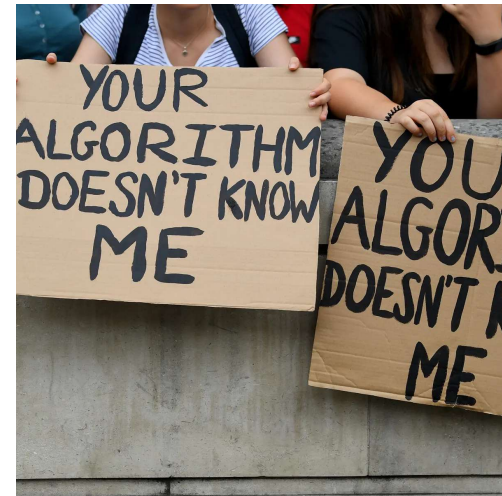
Transparency and Notification

- If the algorithm is opaque, there is no understanding or trust in the program, e.g., medical decisions, hiring decisions
- Many points of trust: algorithm, input, learning data, control surfaces, assumptions and models the algorithm uses, etc.
- Complete transparency makes it vulnerable to hacking. Does not guarantee scrutiny.
- Consumers might demand the right to be notified when using their information or demand excluding their personal information



Bias in Machine Learning

- Programs might be using protected attributes such as race and gender to make predictions
- Even if the protected attributes are not used, they could be using other “proxy” attributes which will have the same effect, e.g., zip code.
- Example: Predictive policing
 - Predicting the neighborhoods most likely to be involved in future crime based on crime statistics
 - Rational but may be indistinguishable from racial profiling
 - More police in the neighborhood lead to more arrests.
 - Could lead to positive feedback loops and become a self-fulfilling prophecy.





Discrimination in Online Markets

- Air-BnB Study: 20 profiles sent to 6400 hosts
 - The profiles are identical except 10 of them have names common to white people and the rest to blacks
 - Result: Requests for black-sounding names were 16% less successful
 - Discrimination was pervasive. Most of the people who rejected never hosted a black guest.
- Other areas of discrimination: credit, labor markets, housing.
- Discrimination also occurs in algorithmic decisions.
- Searches for black sounding names on Google were more likely to bring up ads about arrest records.
 - Why?
 - Learning from the past search data.

