

Scripps Research Alcohol Center Neuroscience Course

Health disparities in research & medicine, Sex as a biological variable

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The background consists of several axial MRI brain scans in shades of blue and purple. Overlaid on these scans are various technical parameters and text in a white, monospaced font. Some of the visible text includes 'FoV 199', '296*512s', 'Tra>Cor(6.1)>Sag(1.5)', 'W 128', 'C 66', 'AF', 'Chilom', 'Harmony', '4VA128', 'HFS', '+LPH', 'STUDY 1', '10/11/01', '18:41:30', '2 MA 10', 'AF', 'STUDY 1', '2 MA 10', 'RFP', '5cm', and 'R'.

What are health disparities & why
are we talking about them in a
neuroscience course?

Health disparities

Preventable differences in health outcomes that can be linked to social, economic, and environmental disadvantages. They can affect groups of people based on factors such as:

- Race or ethnicity
- Religion
- Socioeconomic status
- Gender
- Age
- Mental health
- Disability
- Sexual orientation or gender identity
- Geographic location



Differences in health outcomes

- How many people get certain diseases
- How severe the diseases are
- How many people have complications because of the diseases
- How many people die from a disease
- Whether people can get health care
- How many people get screened for a disease

Health disparities are driven by social & economic inequities



<https://www.kff.org/racial-equity-and-health-policy/issue-brief/disparities-in-health-and-health-care-5-key-question-and-answers/>

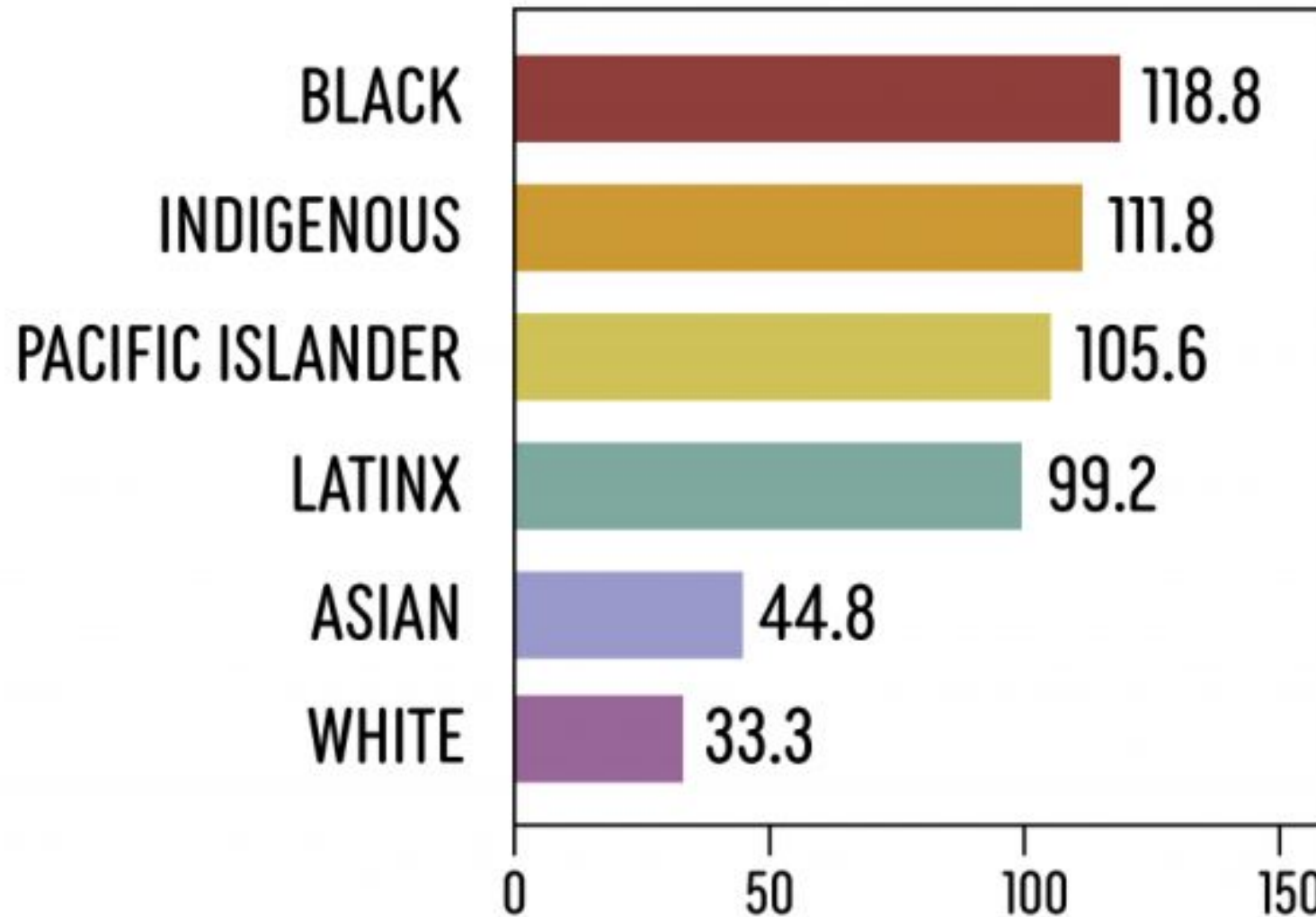


Health inequality & racism



- Structural or institutional racism
 - Embedded in policies, laws, and societal practices
- Cultural racism
 - The spread of the ideology that certain groups are inferior through language, values, media, and symbols
- Individual-level discrimination
 - Individuals or companies discriminate against racial groups, whether intentionally or not, but can result in worse access to employment, education, and medical care.

Example: Covid-19



<https://sitn.hms.harvard.edu/flash/2020/racial-disparities-in-covid-19/>

AGE-ADJUSTED COVID-19 DEATHS PER
100,000 AMERICANS THROUGH AUG 18, 2020

Example: Covid-19

MORE LIKELY TO:



NOT HAVE
ACCESS TO TESTING



LIVE IN
HIGH DENSITY



BE EXPOSED
TO POLLUTION



HAVE A PRE-EXISTING
CONDITION



BE AN ESSENTIAL
WORKER



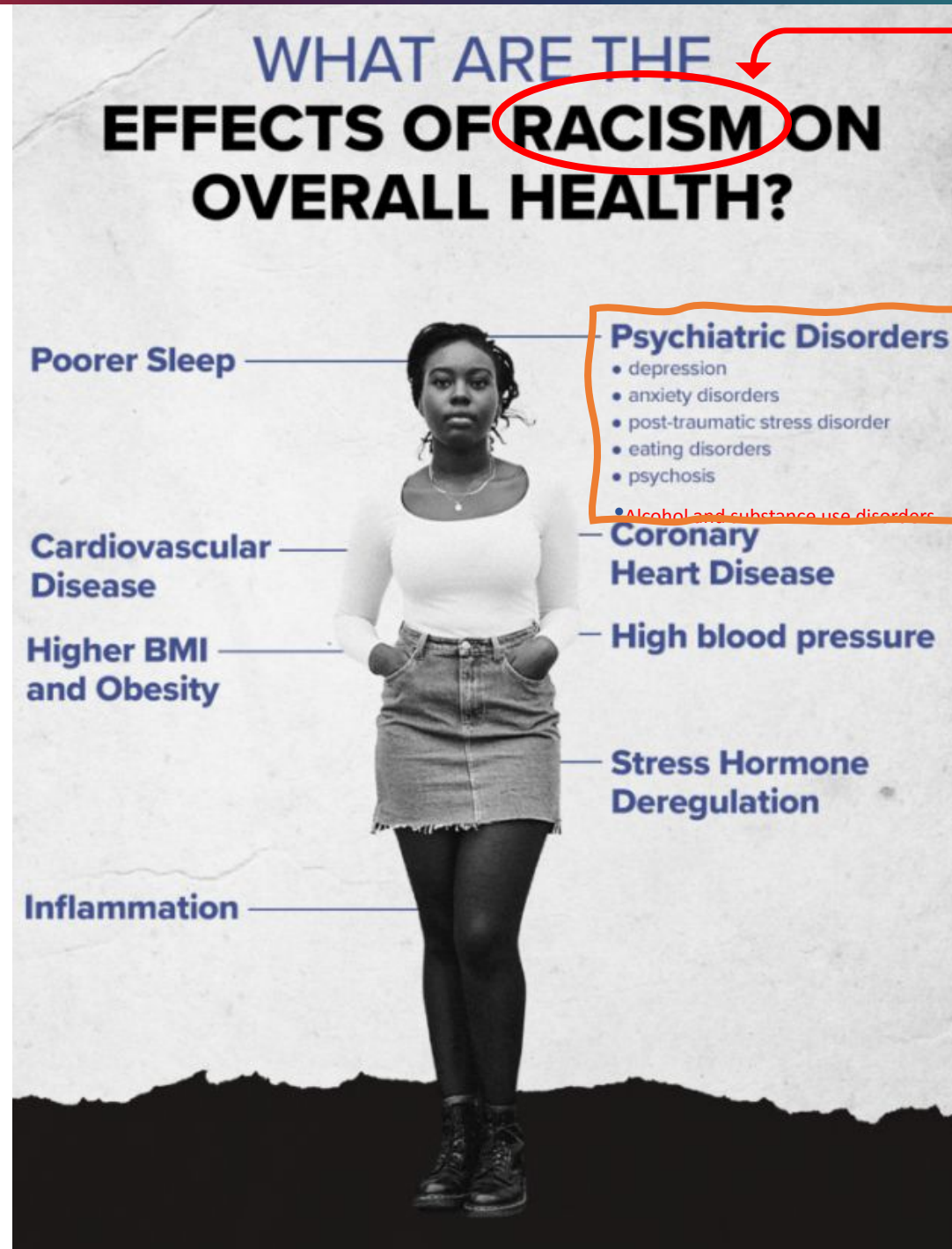
ON TOP OF

**A RACIAL BIAS
IN HEALTHCARE**

<https://sitn.hms.harvard.edu/flash/2020/racial-disparities-in-covid-19/>

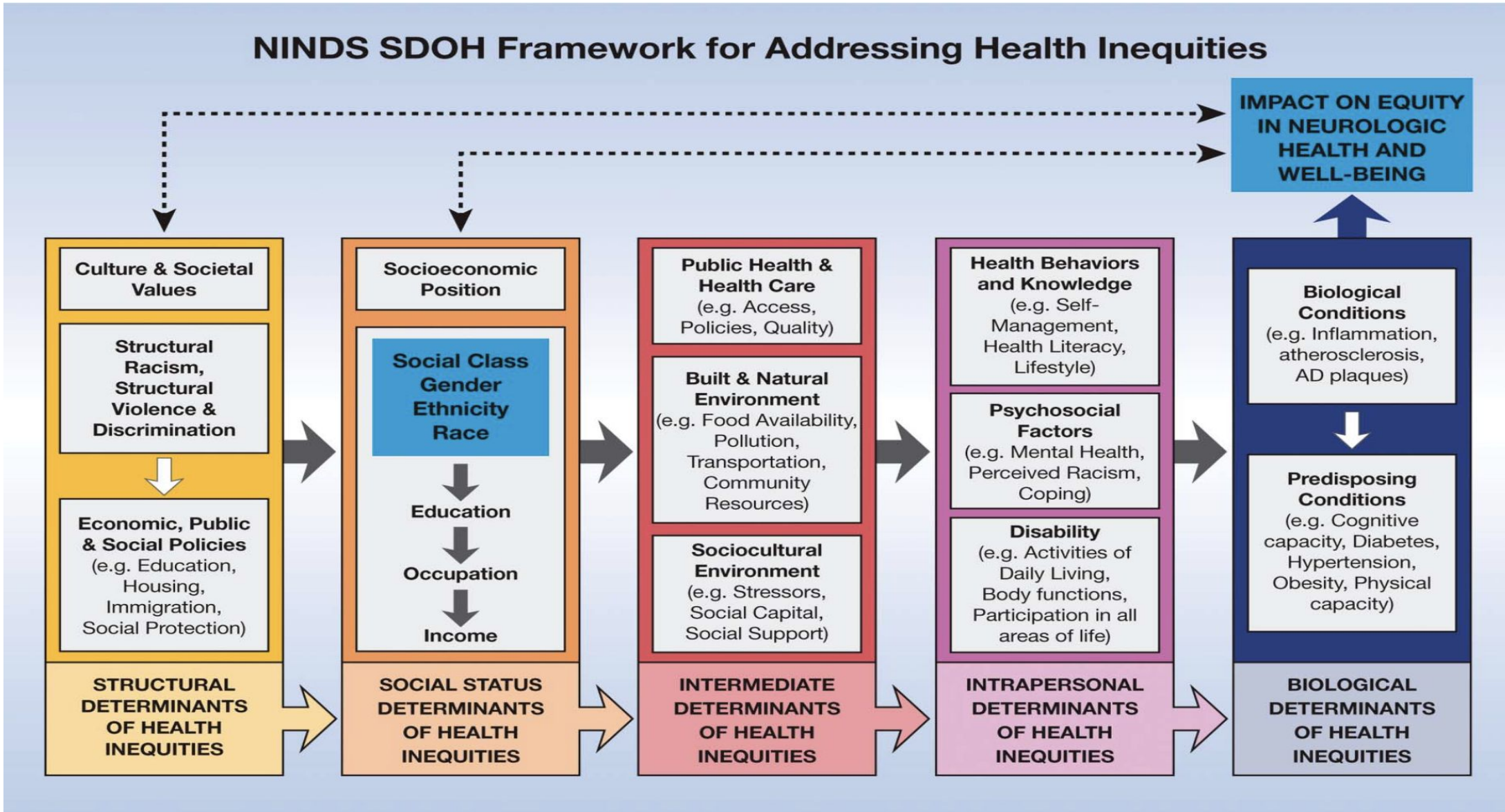
Neuroscience and health disparities

<https://www.medicalnewstoday.com/articles/effects-of-racism>



And other forms of discrimination

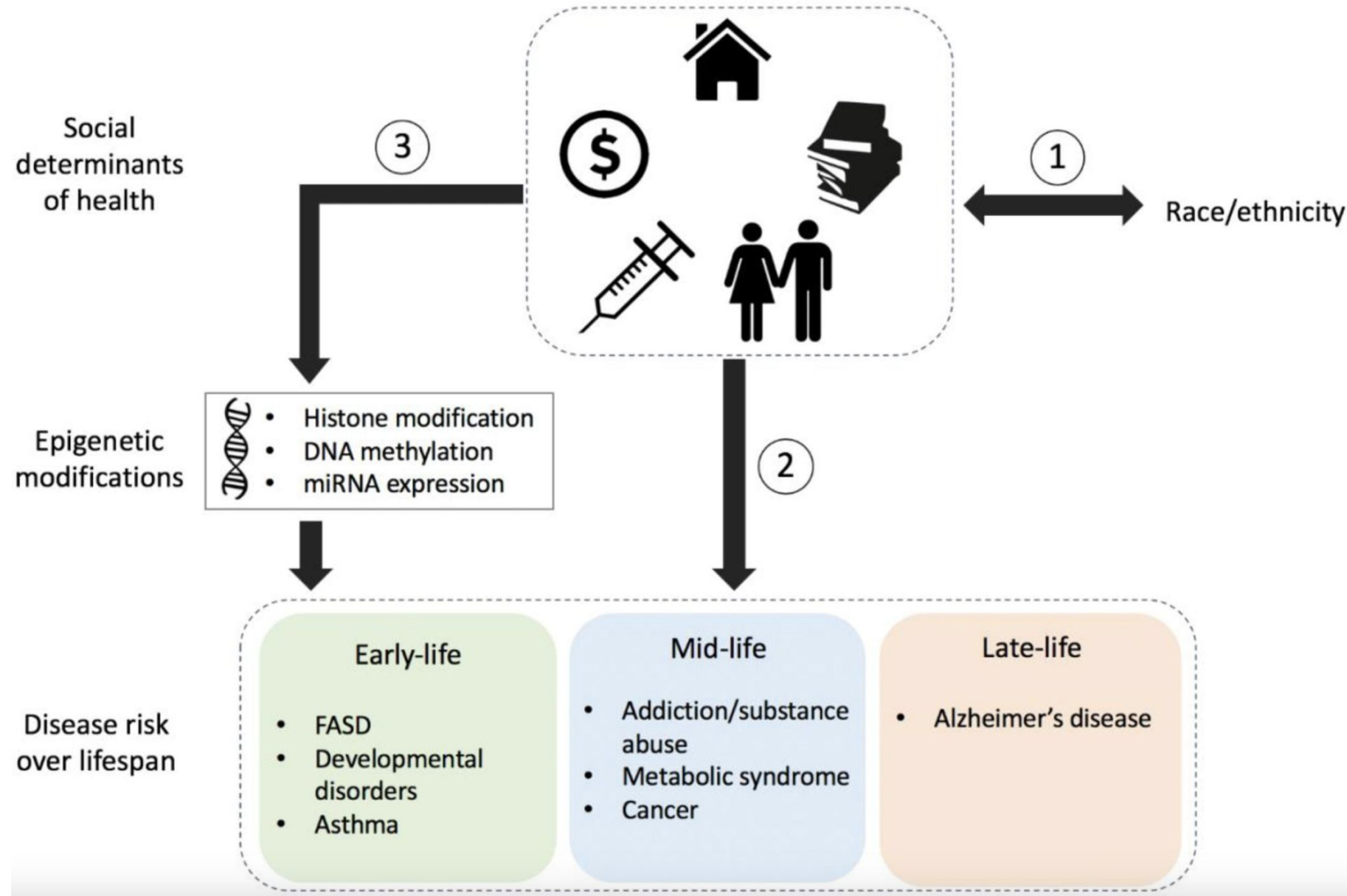
Determinants of Inequities in Neurologic Disease, Health, and Well-being: The NINDS Social Determinants of Health Framework



Griffith DM, et al., 2023. PMID: 37580154; PMCID: PMC10605947.

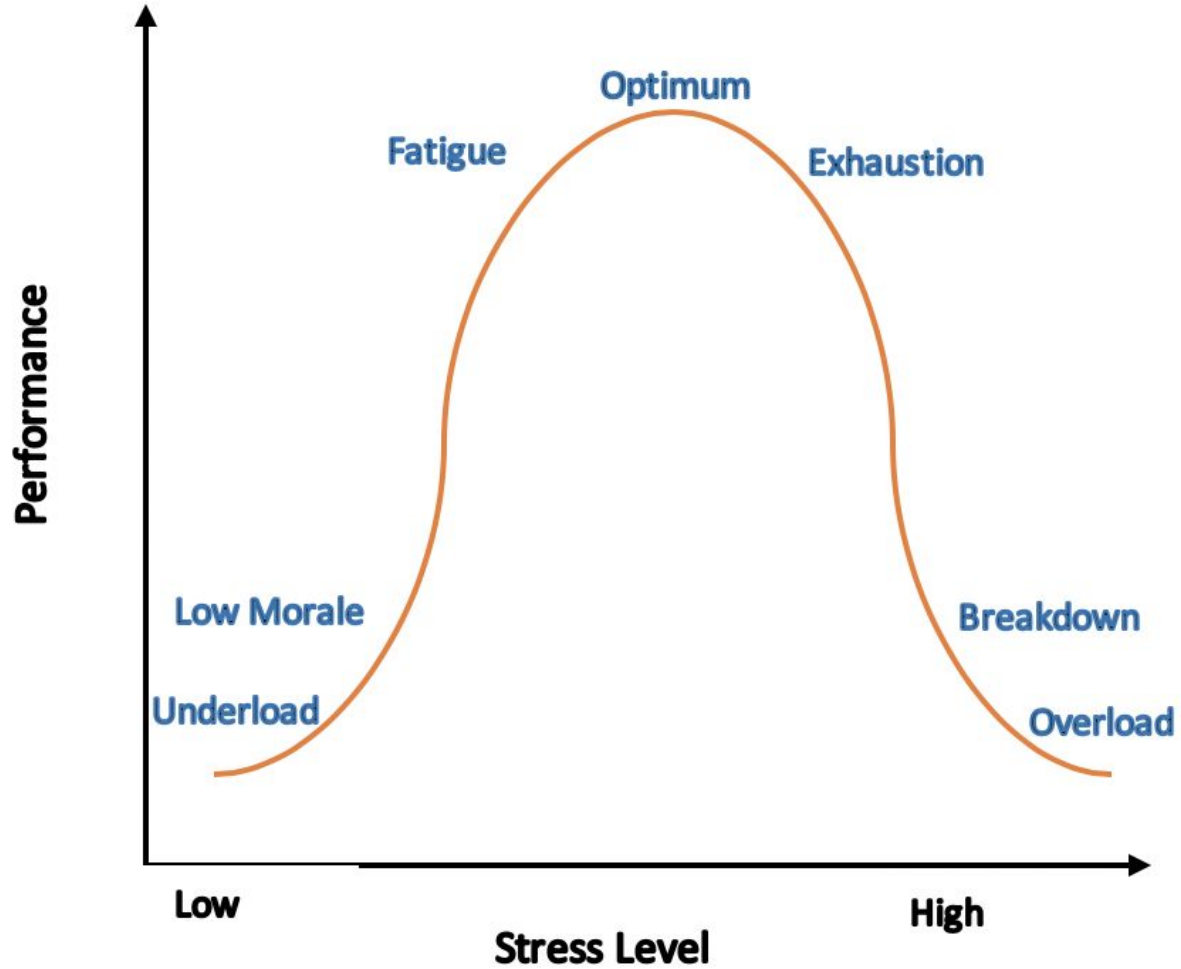
Role of biology in health disparities? Epigenetics

The social determinants of health may influence epigenetic modifications such as those to histones, DNA, or micro-RNA (miRNA), thereby influencing biological functions that have downstream effects on health and disease susceptibility throughout the life span.



Stress is an underlying
presence in most or all
of these factors!!!

Stress and health



- Too little stress leads to lethargy, lack of motivation, maybe even depression
- Some stress is optimal: you feel pumped and excited, healthy, motivated and in the zone (**EUSTRESS**)
- Too much stress and you tip in exhaustion, overload..and, guess what...sickness - increased risk of catching a cold for example (**DISTRESS**)

People with minoritized identities deal with many factors that lead to an enormous amount of stress (spend more time in distress than eustress?)

Health Disparities and Alcohol Use Disorder (AUD)

- Minoritized people *tend* to be less likely to drink alcohol than non-minoritized people (but when they do drink, they often drink more)
- Even if controlling for alcohol drinking levels, minoritized people often have worse outcomes of their alcohol use
- Increased rates of liver disease, heart disease, some cancers, suicides and violence, and fetal alcohol spectrum disorder have been reported (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3908714/>)
- BUT... we need more research!!!!

Toward health equity

- Everyone has a fair and just opportunity to attain their highest level of health
- An important goal of the National Institutes of Health (NIH) is to fund research to improve minority health and reduce health disparities, including a mandate to **train and develop a diverse scientific workforce**.
- This is important! Increased diversity has been shown to lead to more impactful research
 - Diversity brings unique lived experiences that enrich research
 - Diverse teams develop culturally sensitive methodologies, increasing research relevance and impact
 - Diversity reduces discrimination, prejudice, and microaggressions in STEM
 - Varied perspectives in diverse teams leads to more innovative research outcomes
 - Embracing diversity fosters systemic changes (breaking down barriers)

Community engaged research has shown amazing promise (community members as citizen scientists)

Research Society
on Alcohol
workshop I
attended
yesterday



Training / Education Methods

ALCOHOL RESEARCH WITH DIVERSE COMMUNITIES: UTILIZATION OF COMMUNITY ENGAGED RESEARCH METHODS TOWARDS HEALTH EQUITY

📅 Sun, June 23 | ⌚ 9:45 AM - 11:15 AM | 📍 Greenway D-G | 📁 Workshop

Sex as a Biological Variable

What does
this even
mean?

Why is it so
important?

First – a clarification

Sex

- A biological category based on reproductive, anatomical, and genetic characteristics, generally defined as male, female, and intersex.
- Sex is used when describing anatomical, chromosomal, hormonal, cellular, and basic biological phenomena.

Gender

- Socially constructed roles, behaviors, activities, and/or attributes that a given society associates with being male or female (both, fluid or neither).
- As a social construct, gender varies from society to society and can change over time.

Sex as a biological variable: what does it mean?

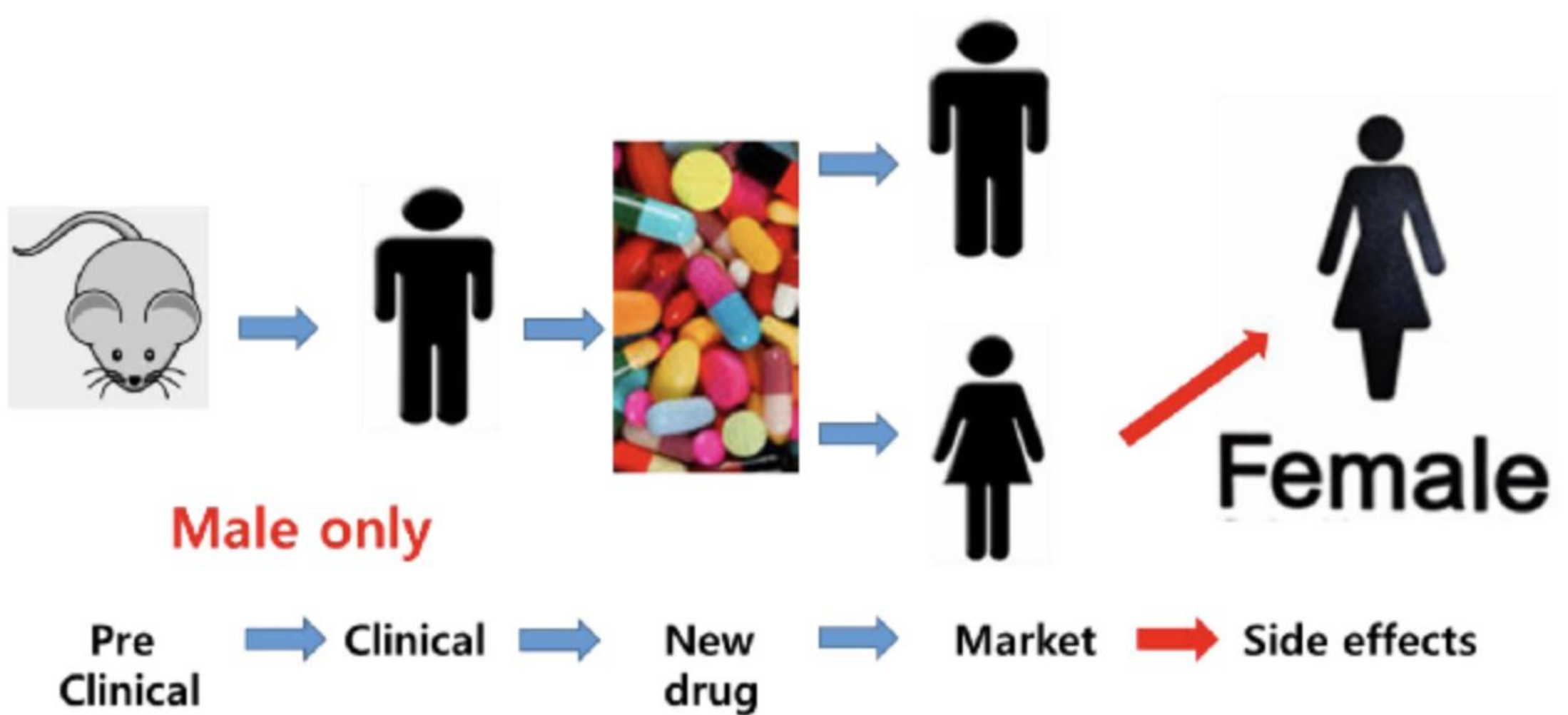
- Including BOTH males and females in clinical trials of medications/treatment and in clinical and preclinical (biomedical) scientific studies....and enough of each that the effects of the experimental manipulation can be analyzed statistically.
- Seems like a no-brainer, right??.....BUT
 - 1960s': Women's health needs considered low priority
 - 1960's: Thalidomide scandal
 - 1977: Women of childbearing potential excluded (possible danger in case of pregnancy, interactions with birth control and dumb things like exclusions if single or married to a man who has had a vasectomy)
 - 1980's: Women excluded from HIV drug trials

Reasons given for excluding females in clinical research

- Women are constantly called “hormonal” or “emotional”.
- Due to female hormones and the menstrual cycle, females have been categorized as more “variable” than males.
- A recent meta-analysis showed that physiological, cellular, hormonal, and behavioral measures are **equally variable** in males and females with males sometimes showing more variability than females!



Sex as a biological variable: why is it so important



National Institutes of Health Policies

- Women and minority groups weren't legally required to be included in clinical trials until the 1993 NIH Revitalization Act
- National Institutes of Health's 2016 Sex as a Biological Variable policy, which mandated the incorporation of male and female sexes into the analyses of all federally funded, model organism preclinical research.



Consider

Design studies that take sex into account, or explain why it isn't incorporated



Collect

Tabulate sex-based data



Characterize

Analyze sex-based data



Communicate

Report and publish sex-based data

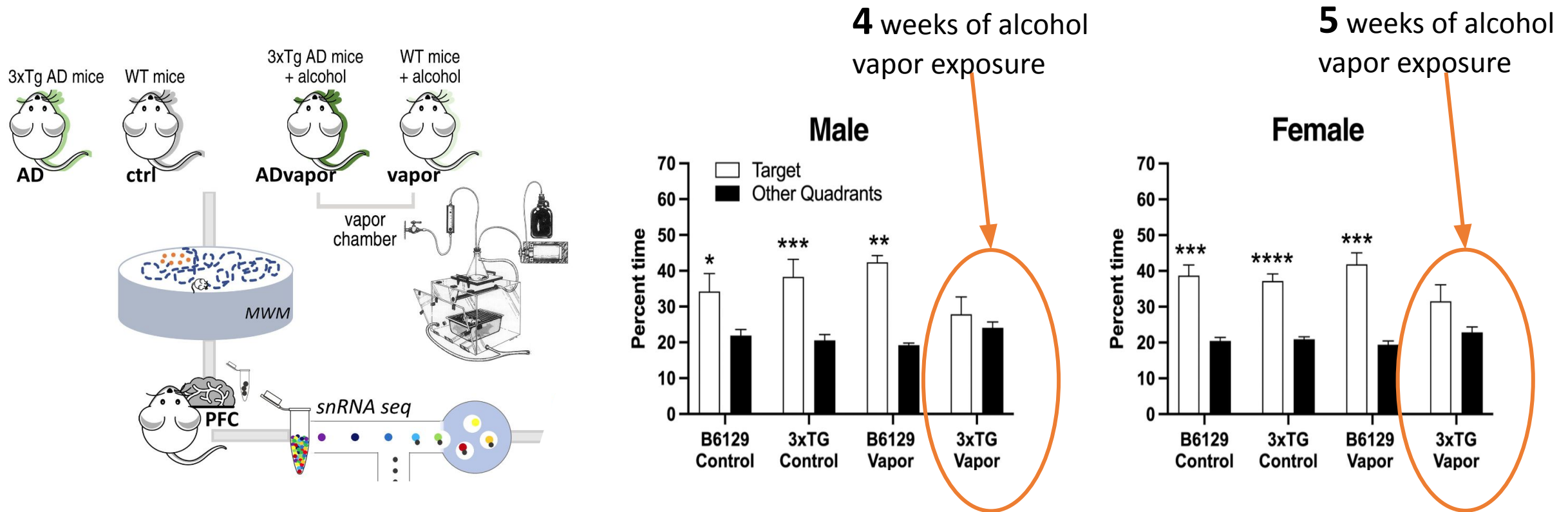
Reasons given for excluding females in preclinical research

Female rodents, with their 3-4 day estrus cycle are going to have more variable behavior than males (not supported in research, except research directly looking at hormones)

Including both sexes will double the amount of money each experiment costs!



Male mice are more sensitive to alcohol effects on Alzheimer's Disease progression



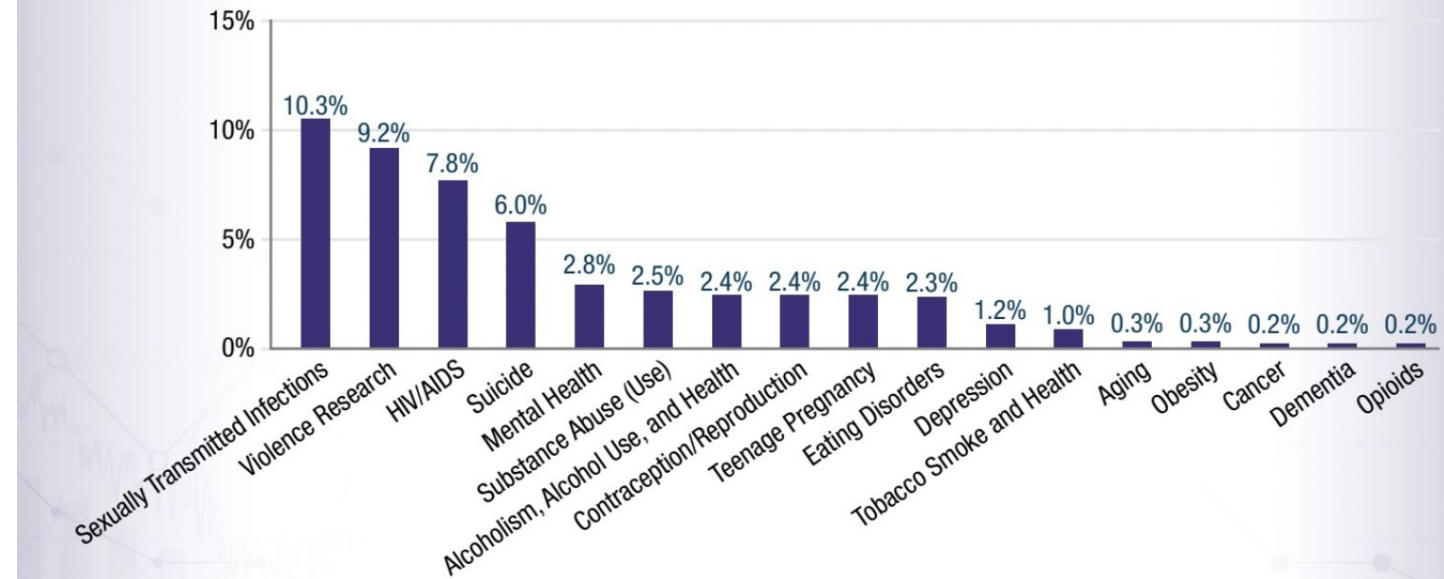
Repeated alcohol intoxication by alcohol vapor exposure hastens the onset of cognitive impairment in 3xTg-AD mice in the Morris water maze (MWM)

What still needs to be done?

Research on gender and sexual orientation minorities

- 2010: NIH began to systematically examine the state of lesbian, gay, bisexual, and transgender (LGBT) health
- 2016-2020: NIH strategic plan on the health and wellbeing of sexual and gender minorities

Figure 7. FY 2020, SGM Projects as a Percentage of All NIH Projects, by Selected Research, Condition, and Disease Categories (N = 500)





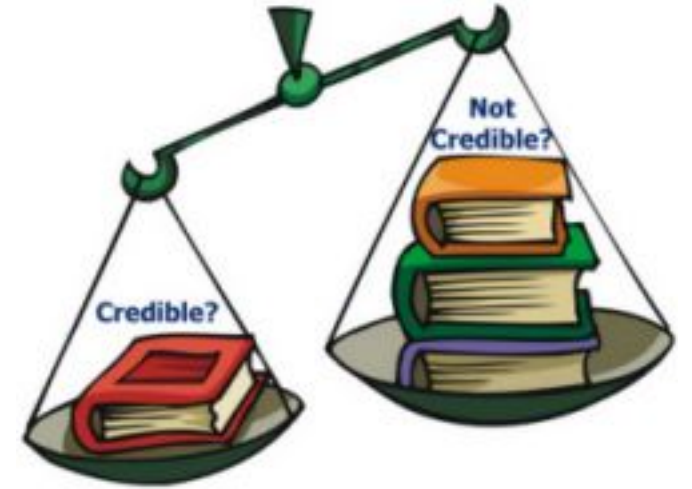
Break time!!!

WebLitLegit Reliable health information for teens



Things to look for

- Non-profit (not trying to sell you something)
- Website extensions - .gov, .edu are often reliable
- Compilations of published articles can be good
- Blogs, social media posts, and newspapers can be a great way to formulate your ideas, but you will need to dig in and find the original sources of the information to validate these.
- If in doubt, ask us!!!



- Examples (on your Week1 syllabus): <https://scholar.google.com/> ,
<https://www.jstor.org/>, <https://www.science.gov/>,
<https://pubmed.ncbi.nlm.nih.gov/>, <https://newsinhealth.nih.gov/>

Health Disparities Project

Purpose:

The Health Disparities Project is designed to help learn about the complex issues surrounding inequality in healthcare. It encourages students to look into how factors like income, location, race, and gender affect people's access to and quality of healthcare. The goal is to give students the tools they need to spot these injustices, understand why they happen, and come up with real ways to fix them. By promoting thoughtful analysis and compassion, this project aims to motivate future healthcare workers, leaders, and champions to strive for a fairer healthcare system for everyone.

Assignment Instructions:

- Decide what you think is important for other people to know and do about this issue.
- This is your opportunity to frame the issue for other people who may know quite a bit less or have a different take on the issue than you.
- You'll need to decide not only what you want to say, but how you want to say it.

The way that you do this is extremely flexible. Consider the format you think will be most effective given the following:

- The message you want to send (your social action)
- Your intended audience (your audience for this project is not our class; consider which segments of "the public" you want to engage with)

For instance, you could create a poster, visual art, power point, infographic, pamphlet, website, social media page, tik tok video, etc.
<https://www.canva.com/>
<https://jamboard.google.com>

Your project should include:

1. What the health disparity or inequity topic you chose
 - a. (ie. *The disproportionate impact of pollution and climate change on BIPOC and Latinx communities in the United States*)
2. Credible, substantive information about the problem, including causes and consequences
3. Potential solution/actions

Health Disparities and Inequities Project

Topics:

Choose a topic related to Health Disparities some may include but are not limited to:

1. **Access to Healthcare:** Differences based on geographical location, socioeconomic status, insurance coverage, and cultural barriers.
2. **Mental Health:** Stigma, lack of access to mental health services, and cultural competency of mental health providers impacting various communities differently.
3. **Chronic Diseases:** Higher rates of conditions like diabetes, asthma, and hypertension in marginalized populations due to factors including environment, economic instability, and stress.
4. **Maternal and Infant Health:** Disparities in maternal mortality rates, especially among Black women, and higher incidences of preterm birth and low birth weight in minority communities.
5. **Obesity and Nutrition:** Access to healthy foods and safe places to exercise can vary greatly by community, often correlating with higher obesity rates in low-income and minority neighborhoods.
6. **Substance Use and Addiction:** Cultural, societal, and economic factors contribute to varying rates of substance use and effectiveness of treatment among different groups.
7. **Environmental Health:** Exposure to pollutants, poor water quality, and inadequate housing disproportionately affect low-income and minority communities, impacting overall health.

Topics Related to Health Disparities and Popular Media:

1. **Representation in Media:** The impact of underrepresentation or misrepresentation of minority groups in television, films, and advertising on mental health and self-esteem.
2. **Digital Divide:** How disparities in access to digital technology and high-speed internet affect health information access, telehealth services, and health literacy.
3. **Health Messaging in Social Media:** The role of social media in spreading health information and misinformation, and how this impacts public health perceptions and behaviors differently across communities.
4. **Body Image and Media:** The influence of media on body image, eating disorders, and mental health, with a focus on how unrealistic standards disproportionately affect vulnerable populations.
5. **Celebrity Influence on Health Behaviors:** Examining the positive and negative impacts of celebrity endorsements and public health messaging on community health behaviors and choices.
6. **Gaming and Mental Health:** Investigating the links between video gaming culture, screen time, and mental health outcomes, including addiction, in diverse demographic groups.
7. **Advertising and Substance Use:** The effect of advertising alcohol, tobacco, and e-cigarettes in media on substance use rates among different age groups and communities.

Examples:

- [Climate Change: Ocean Acidification Wix Website](#)
- [Climate Change: Rural Conservations Facebook Group](#)

About Environmental Justice
The disproportionate impact of pollution and climate change on BIPOC and Latinx communities in the United States

What is Environmental Justice?
Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Fossil-fuel-generated air pollution and climate change surpass \$22 billion in health costs each year in the United States

107,000 premature deaths are caused each year from fossil fuel pollution

3 out of 5 African American & Latinx people in the U.S. live near a toxic waste site

56% of African American homes are exposed to about 84 percent more pollution than is created by their own consumption

68% of African American homes are located within 30 miles of a coal-fired power plant

Environmental Justice Solutions

- Self-Education:** Do research on the subject. Make the connections.
- Support:** Get to know the EJ advocates in your community.
- Accountability:** Hold your local and state officials accountable.
- Boycott:** Invest locally by shopping in small and minority-owned businesses.

Find out more about Environmental Justice at:
<https://www.greenpeace.org/usa/issues/environmental-justice/>
<https://www.epa.gov/sites/default/files/precipres.pdf>
<http://rainierbullet.com/>

LGBT HEALTH DISPARITIES prideinhealth +wellbeing

- 44%** HIDE their gender/sexuality in public -- usually or occasionally
- 34%** HIDE their sexuality/gender when accessing services
- 71%** choose not to switch out to a crisis support service as a result
- 11%** of the population identifies as LGBT
- 33%** had self-harmed (LGBT youth)
- 5x** more likely to attempt suicide (LGBT)
- 11x** more likely to attempt suicide (Transgender)
- 57%** diagnosed with depression (LGBT)
- 31%** of LGBT women 40 years and older had never had a mammogram
- 81%** of Trans patients felt comfortable discussing the Sexual Orientation & Gender Identity when their confidentiality was assured
- 60%** of LGBT patients feel a health system is willing to meet the needs of their diverse population of inclusion
- 59%** of LGBT patients view their healthcare provider as inclusive

Seeing Gender Neutral language on forms helped many.

Addressing LGBT health disparities is a public health priority. The American Public Health Association (APHA) has released a report titled "Addressing LGBT Health Disparities: A Public Health Priority." The report highlights the need for healthcare providers to create a safe and inclusive environment for LGBT patients. Key findings include:

- 44% of LGBT patients hide their gender/sexuality in public.
- 34% of LGBT patients hide their sexuality/gender when accessing services.
- 71% of LGBT patients choose not to switch out to a crisis support service as a result.
- 11% of the population identifies as LGBT.
- 33% of LGBT youth had self-harmed.
- LGBT youth are 5x more likely to attempt suicide.
- Transgender people are 11x more likely to attempt suicide.
- 57% of LGBT patients are diagnosed with depression.
- 31% of LGBT women 40 years and older had never had a mammogram.
- 81% of Trans patients felt comfortable discussing the Sexual Orientation & Gender Identity when their confidentiality was assured.
- 60% of LGBT patients feel a health system is willing to meet the needs of their diverse population of inclusion.
- 59% of LGBT patients view their healthcare provider as inclusive.

The Importance of MENTAL HEALTH AWARENESS

YOUR MENTAL HEALTH IS OUR PRIORITY

WE ARE HERE TO HELP

TAKE CARE OF YOUR MENTAL HEALTH

+1-31-456-7890



Teens address racial health disparities through art in Mia exhibit - MinnPost

Visit >