

# Effects of phthalate exposure and health disparities on reproductive health outcomes at midlife

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Young EDC Scientist Showcase (YESS)

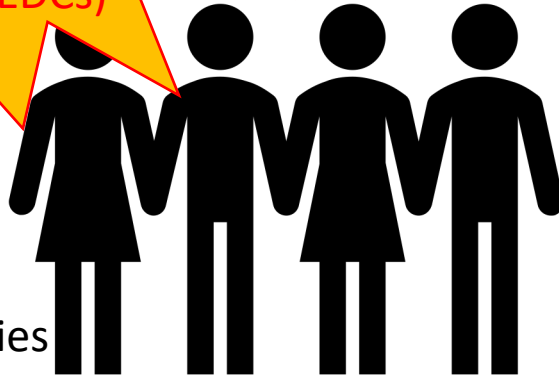
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# Midlife is a critical and understudied period in life

Endocrine  
Disrupting  
Chemicals (EDCs)



Health Disparities



40-59

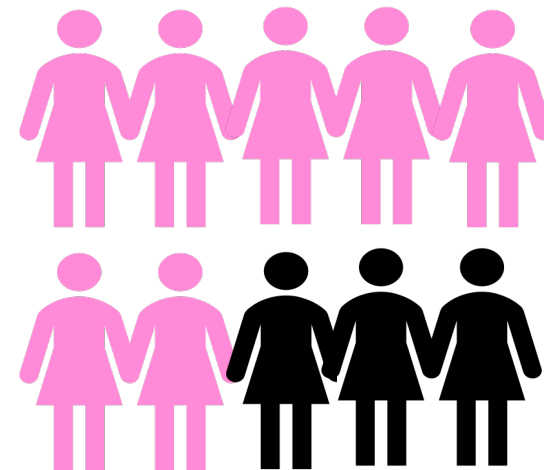
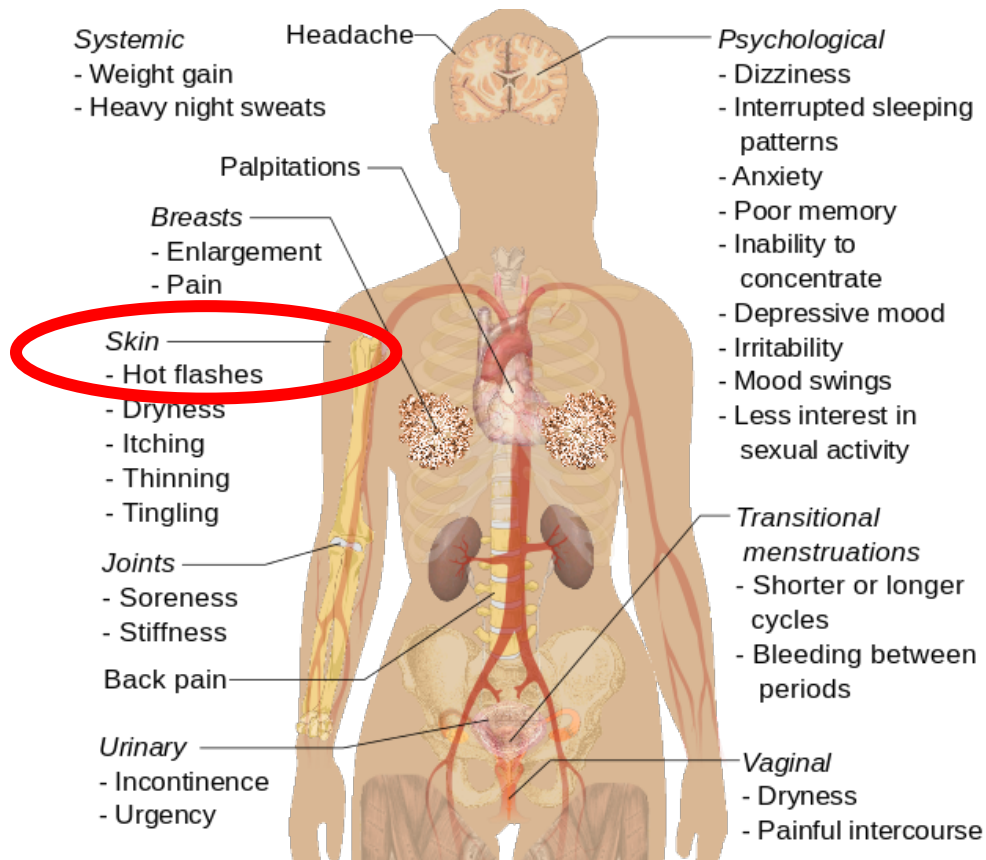


Physical and  
Mental decline



Menopause

# Menopause is a natural occurrence in midlife that is associated with several symptoms



**7/10** menopausal women experience hot flashes

## Reference:

[https://commons.wikimedia.org/wiki/File:Symptoms\\_of\\_menopause\\_\(vector\).svg](https://commons.wikimedia.org/wiki/File:Symptoms_of_menopause_(vector).svg)

# Health Disparities



# Phthalate Exposure in Midlife



Phthalates



➤ Age at menopause

➤ Sleep

➤ Hot flashes

# Disparities in Phthalate Exposure



Phthalates



- Increased use of personal care products by black women
- Higher exposure to DEHP feminine care products
- Increased levels in black pregnant women

# Purpose and Significance

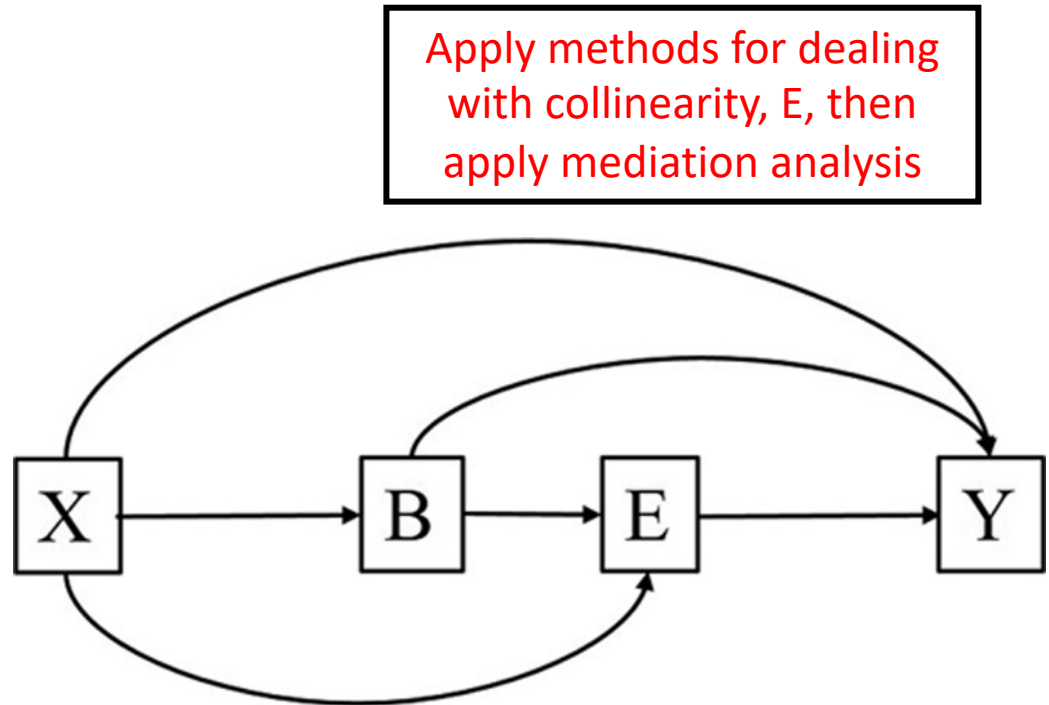
Not many studies look at environmental hazards and health disparities

Phthalate exposure is associated with experiencing hot flashes

Black women tend to have a higher burden of phthalate levels

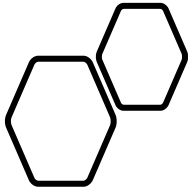
Phthalates are both the exposure and mediator in the health disparity – hot flash model

Conceptual  
model to  
describe  
environmental  
health  
disparities.



Bellavia et. al., Multiple mediators approach to study environmental chemicals as determinants of health disparities," *Environ. Epidemiol.*

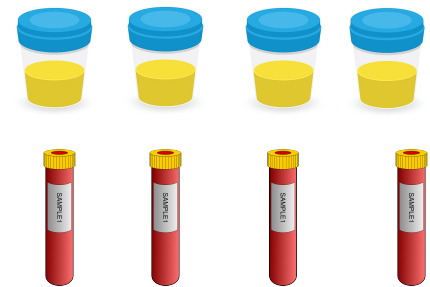
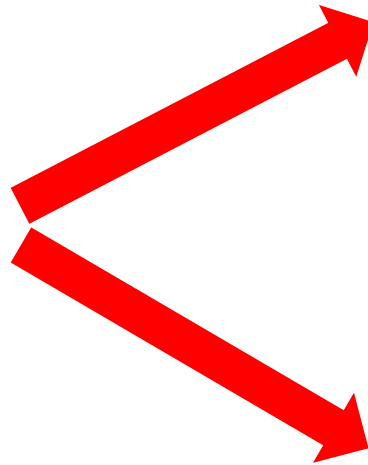




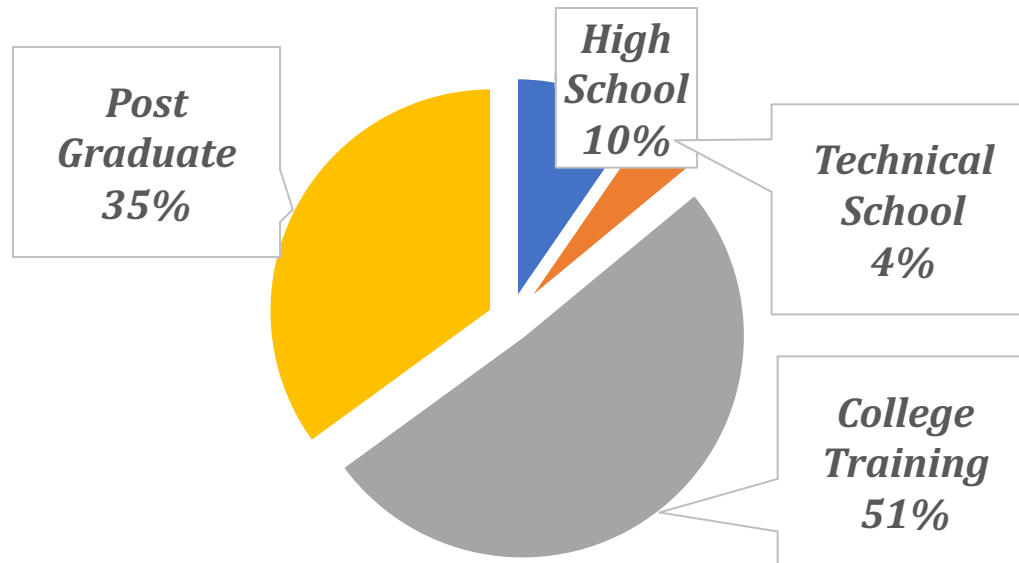
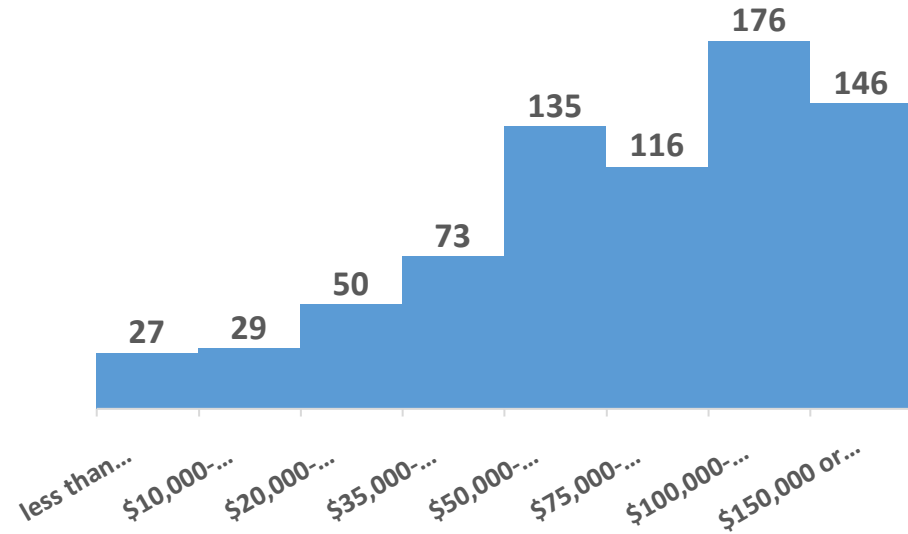
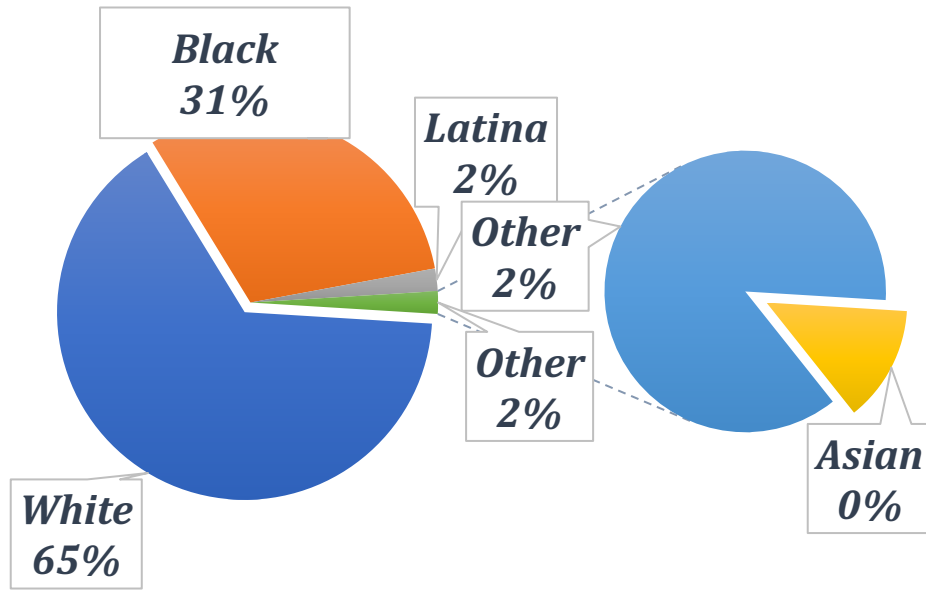
# Methods



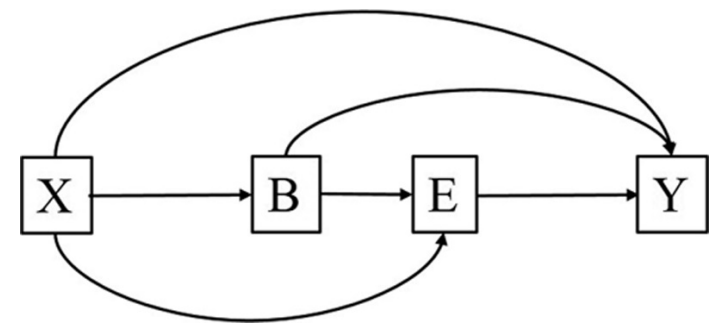
# Midlife Women's Health Study (MWHS)



# Characteristics of MWHS



# Study Variables



Y: Have you ever experienced hot flashes?

Yes

No

X: Race

B: Smoking Status

E: Phthalate Mixtures

# Preliminary Results



# Smoking and menopause are potential confounding factors

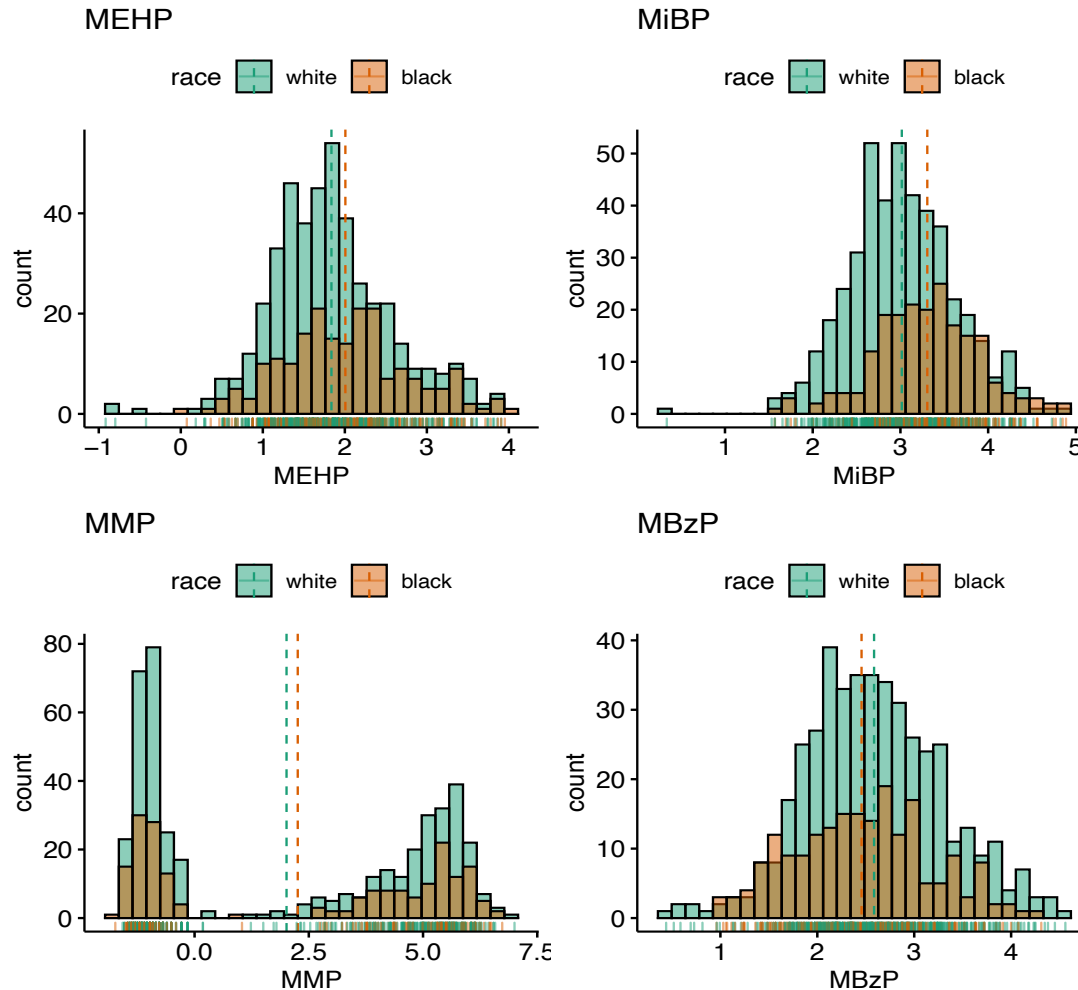
Ever experience hot flashes?			
Variable	Yes, N = 251 <sup>1</sup>	No/Don't Know, N = 317 <sup>1</sup>	p-value <sup>2</sup>
<b>Race</b>			0.4
white	184 (73%)	243 (77%)	
black	67 (27%)	74 (23%)	
<b>Income</b>			0.6
High Income	154 (61%)	204 (64%)	
Low Income	26 (10%)	35 (11%)	
Middle Income	71 (28%)	78 (25%)	
<b>Smoking Status</b>			<0.001
Current smoker	39 (16%)	27 (8.5%)	
Former smoker	106 (42%)	106 (33%)	
Never smoker	106 (42%)	184 (58%)	
<b>Menopausal Status</b>			<0.001
Peri-menopause	156 (62%)	73 (23%)	
Pre-menopause	95 (38%)	244 (77%)	

<sup>1</sup>Statistics presented: n (%)

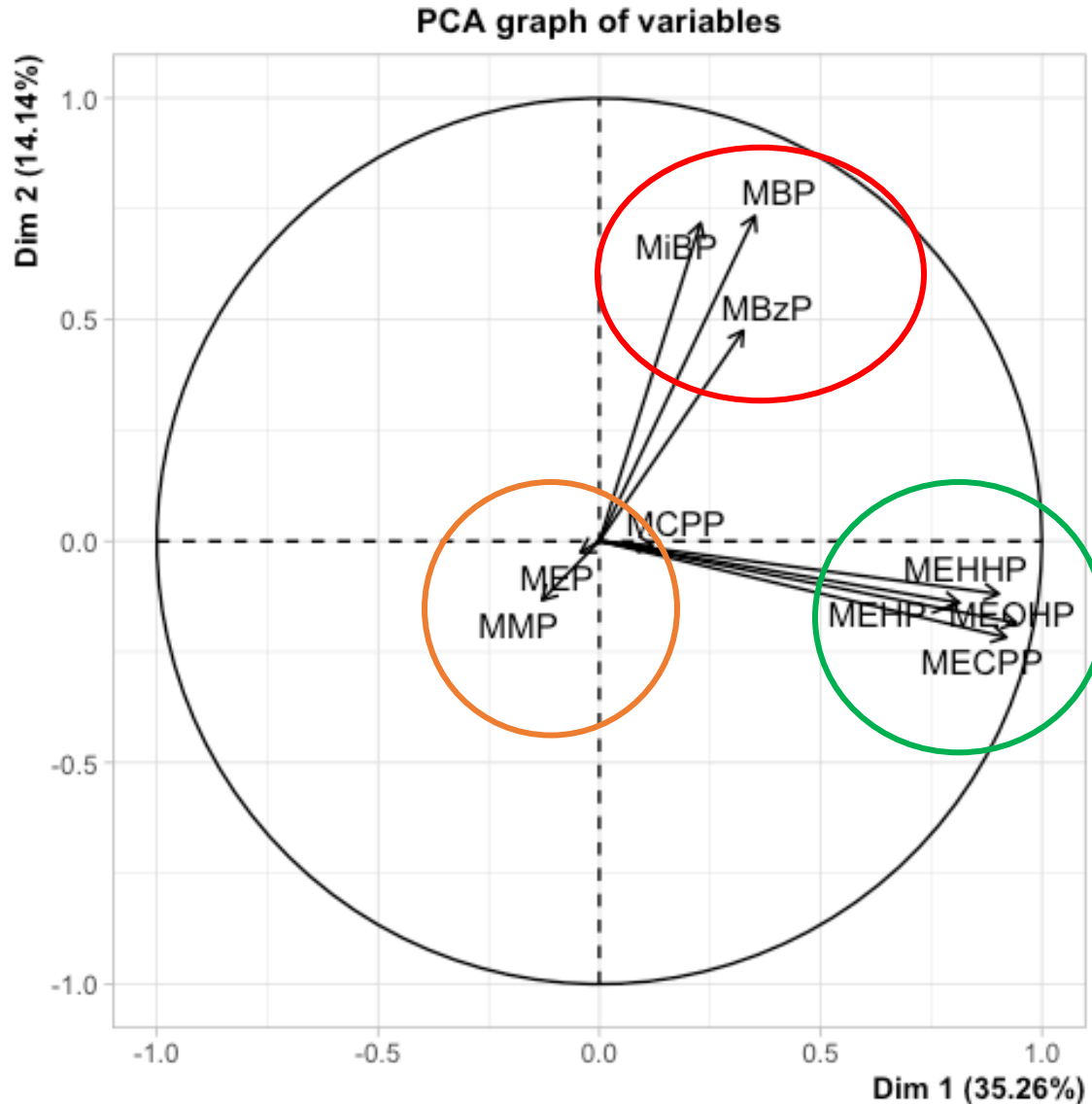
<sup>2</sup>Statistical tests performed: chi-square test of independence

- Smoking and menopausal status significantly associated with ever experiencing hot flashes
- 84% former or never smoked
- 62% perimenopausal
- 38% pre-menopausal

# Increased median phthalate metabolites levels in blacks compared whites

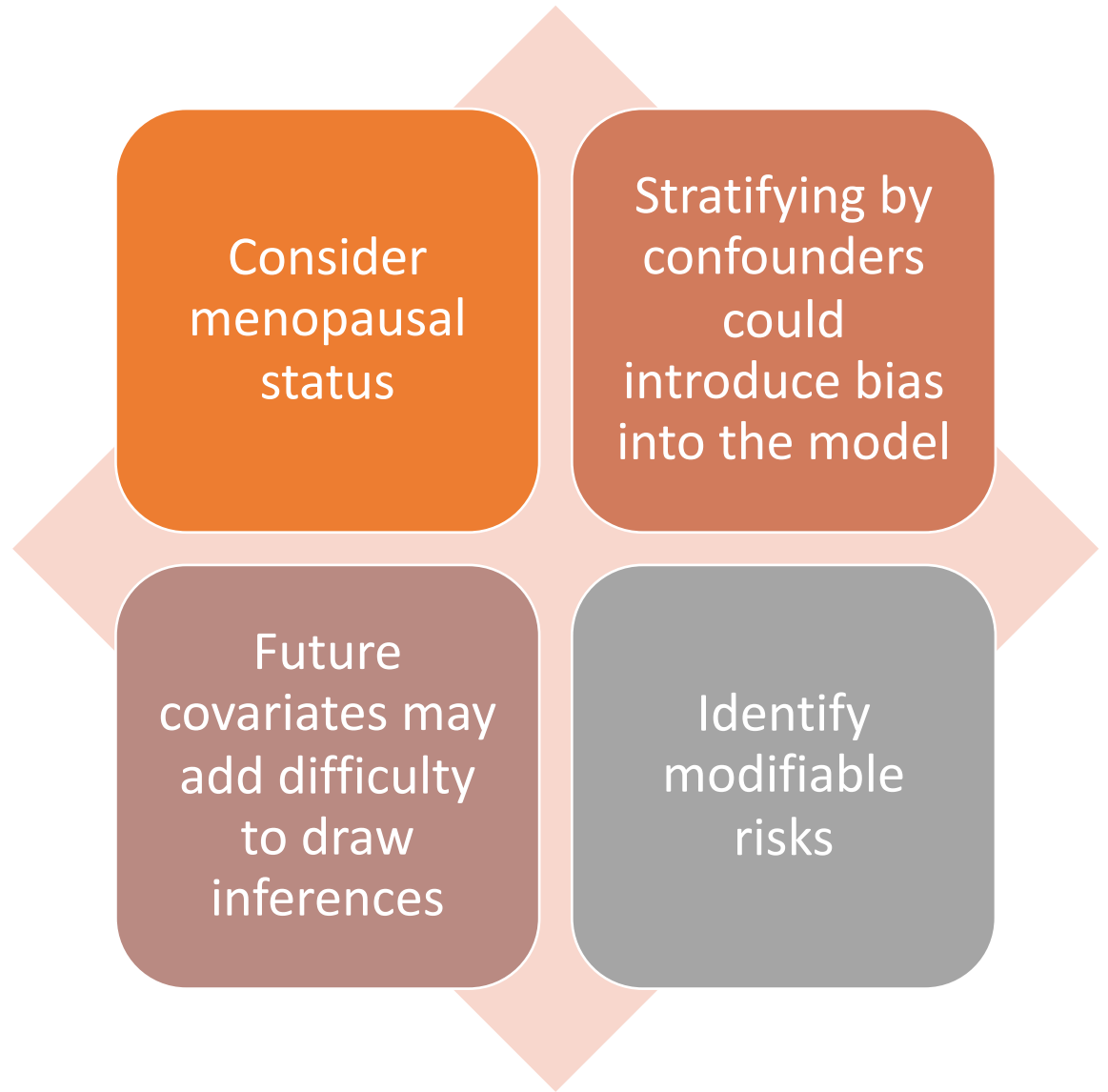


Principle component analysis (PCA) reduces the number of correlated metabolite variables





# Conclusions



## Future Works

Mediation  
analysis with  
PCs

Robust  
models for  
collinearity

Other health  
outcomes

Race  
Stratification

# The Big Picture



# Committee Members



**Dr. Rebecca Smith**



**Dr. Jodi Flaws**



**Dr. Diana  
Grigsby-Toussiant**



**Dr. Alexander Lipka**



**Collaborative on  
Health and the  
Environment**

**Participants of the Midlife  
Women's Health Study**





**Questions**

