



# A Conceptual Model of Sex & Gender Influences on Health and Disease

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September 13, 2017

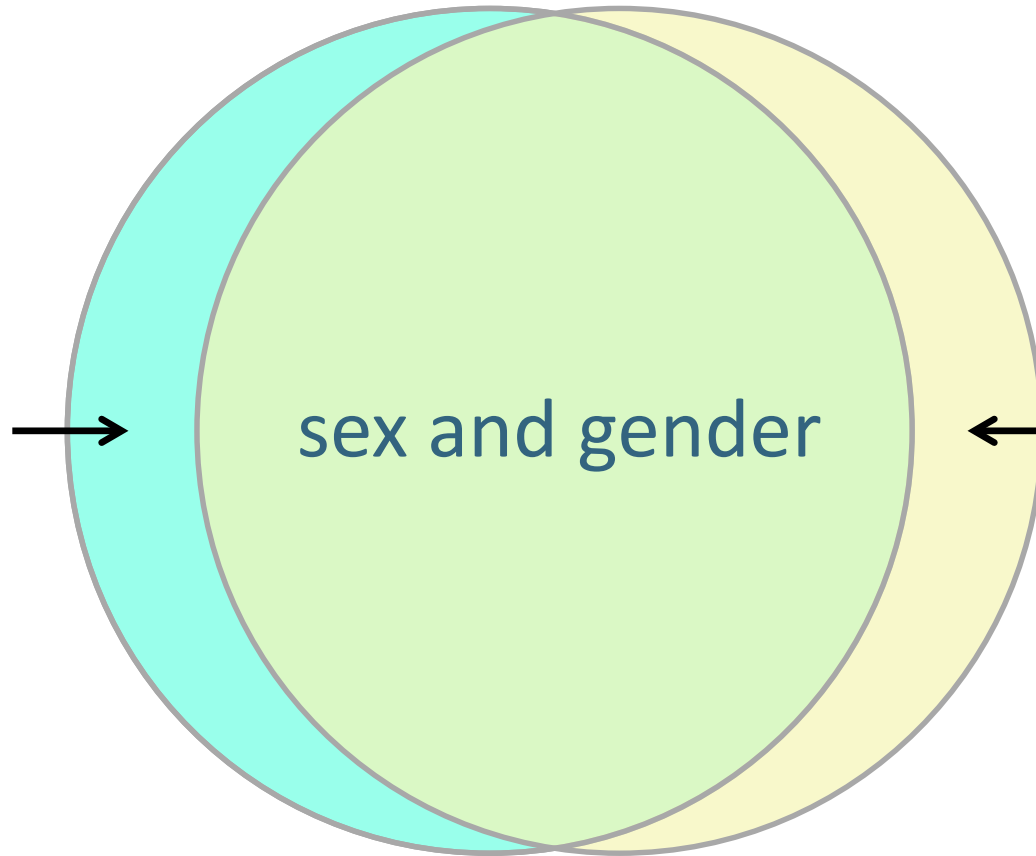


**National Institutes of Health**  
*Office of Research on Women's Health*

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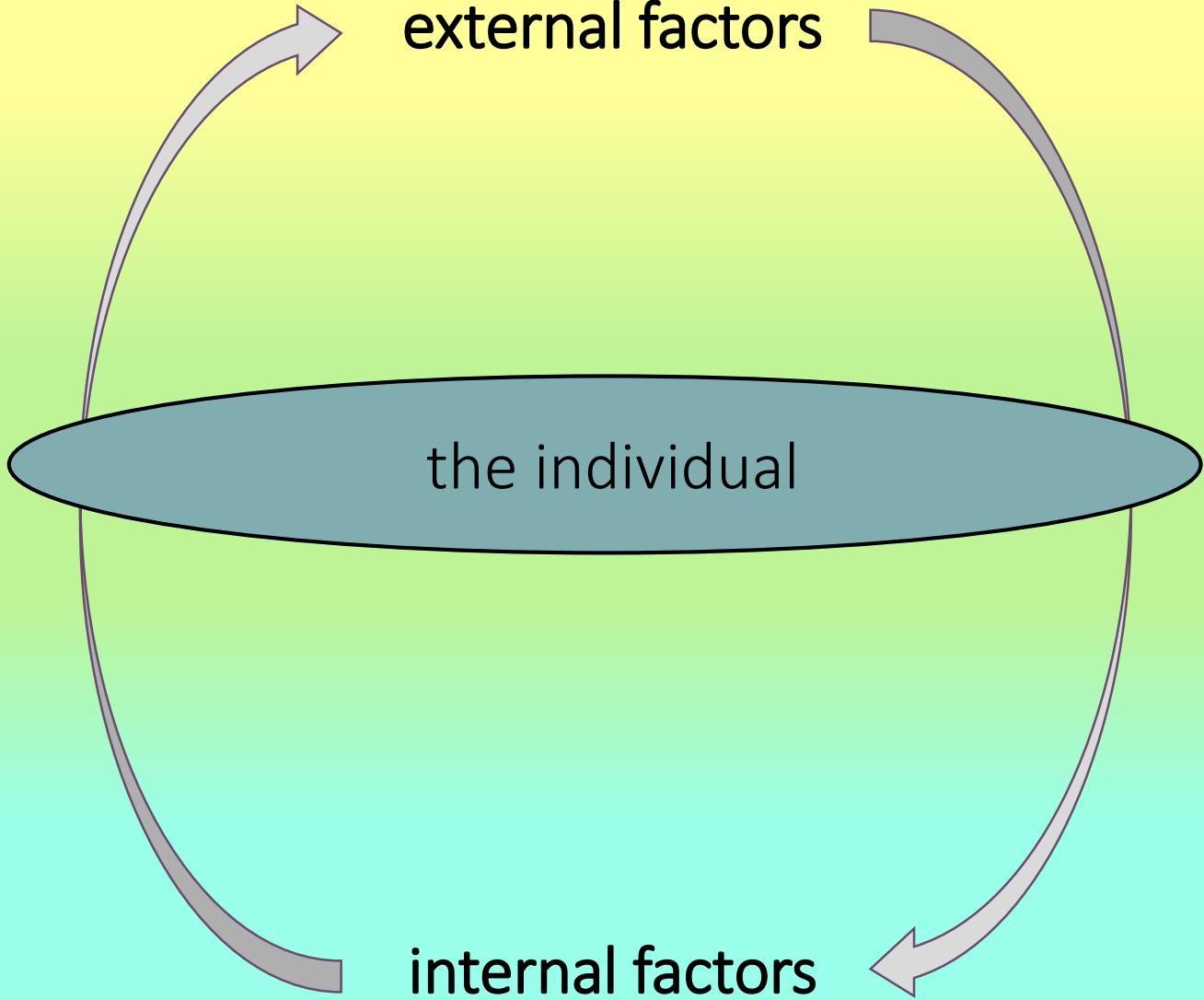
sex  
(biology)  
XX/XY



gender  
(social)  
women/men

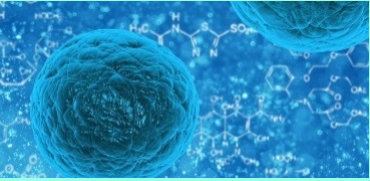
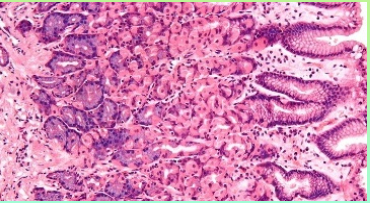


# Influences on the Health of Women



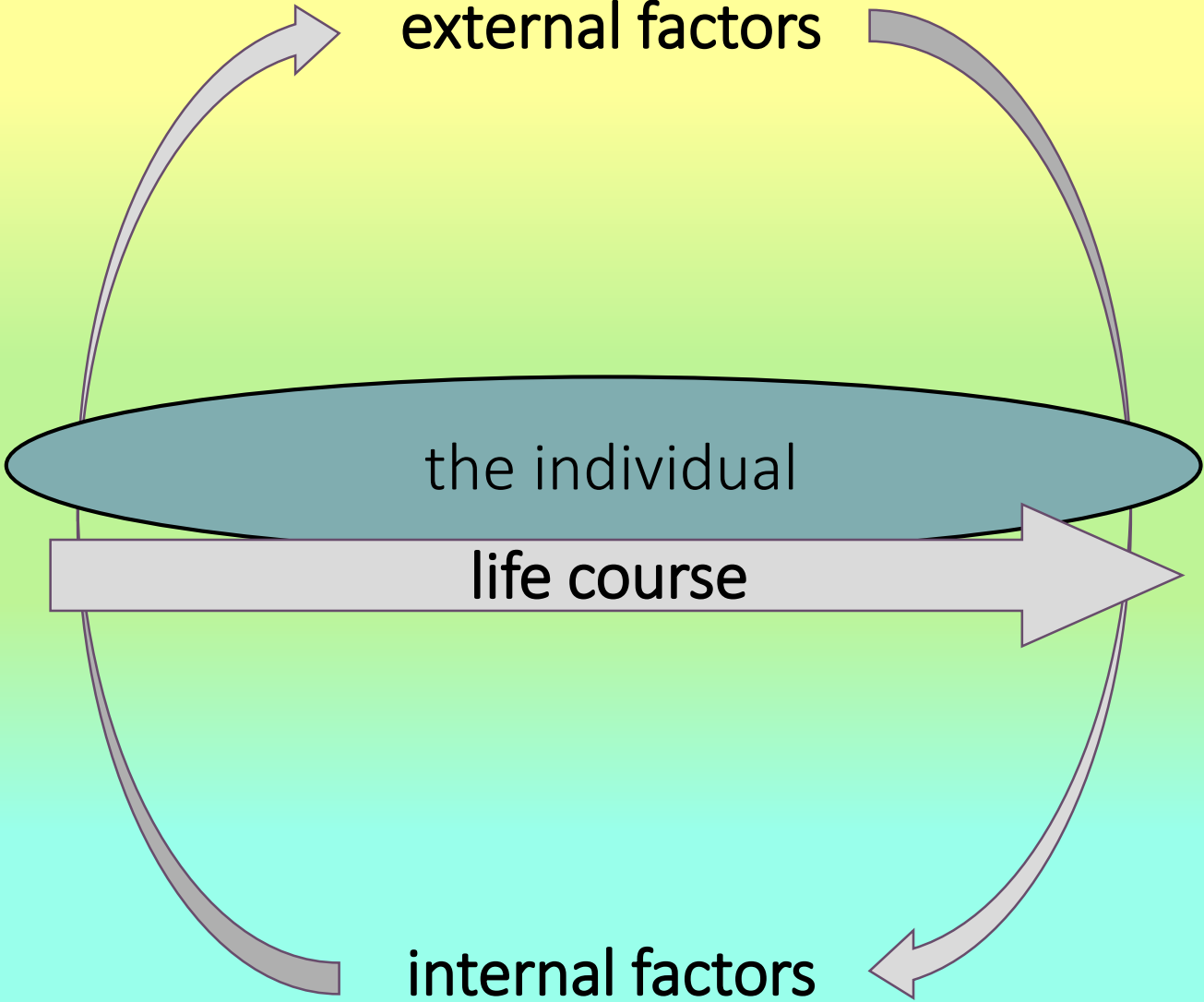
**organ systems**

<ul style="list-style-type: none"> <li>Circulation                     <ul style="list-style-type: none"> <li>- increased clotting tendency</li> <li>- Atherosclerosis</li> <li>- Enlargement of the aorta</li> </ul> </li> <li>Lungs                     <ul style="list-style-type: none"> <li>- Bronchospasm</li> </ul> </li> <li>Muscular                     <ul style="list-style-type: none"> <li>- Tremor</li> <li>- Pain</li> </ul> </li> <li>Hormonal                     <ul style="list-style-type: none"> <li>- High insulin</li> <li>- Insulin resistance</li> </ul> </li> <li>Joint pain</li> <li>Gastro-intestinal                     <ul style="list-style-type: none"> <li>- Nausea</li> <li>- Dry mouth</li> <li>- Dyspepsia</li> <li>- Diarrhea</li> <li>- Heartburn</li> <li>- Peptic ulcer</li> <li>- Cancer</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Central                     <ul style="list-style-type: none"> <li>- Lightheadedness</li> <li>- Headache</li> <li>- Sleep disturbances</li> <li>- Abnormal dreams</li> <li>- Irritability</li> <li>- Dizziness</li> <li>- Risk of blood restriction</li> </ul> </li> <li>Heart                     <ul style="list-style-type: none"> <li>- Increased or decreased heart rate</li> <li>- Increased blood pressure</li> <li>- Tachycardia</li> <li>- More (or less) arrhythmias</li> <li>- Coronary artery constriction</li> <li>- Coronary artery disease</li> </ul> </li> <li>During pregnancy, risks to child later in life                     <ul style="list-style-type: none"> <li>- Type 2 diabetes</li> <li>- Obesity</li> <li>- Hypertension</li> <li>- Neurobehavioral defects</li> <li>- Respiratory dysfunction</li> <li>- Infertility</li> </ul> </li> </ul>
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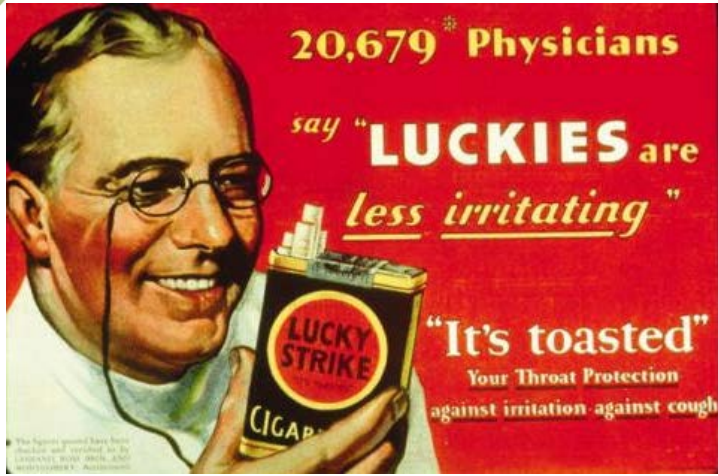


(Images: Wikimedia Commons; Pixabay, released under Creative Commons CC0; and National Institute of Environmental Health Sciences)

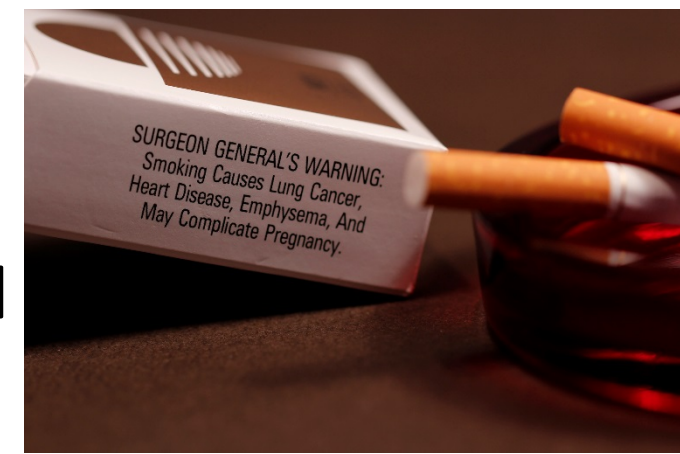
# Influences on the Health of Women



# Bio-Social Interactions with Sex Influences on Lung Cancer



social / environmental context

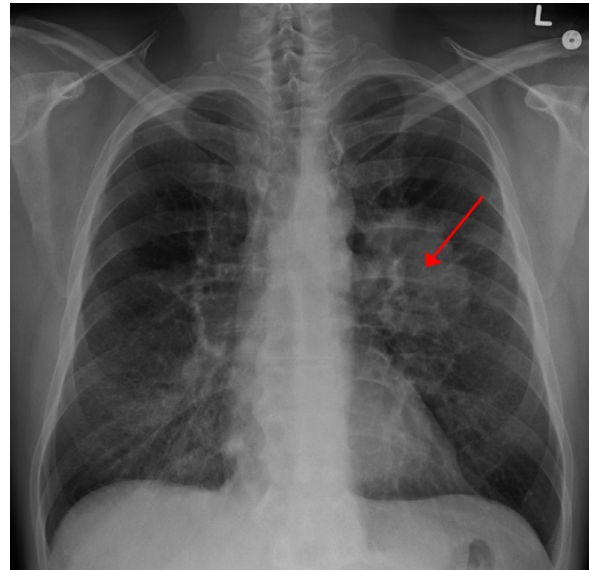


1 of 4 warnings since 1984: "SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy."

the individual

1969-1984: "Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health."

biology



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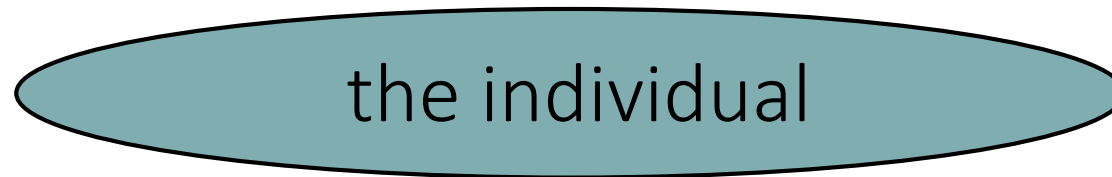
(Images: Wikimedia Commons; and *Ebony*, June, 1977, Vol. 32, No. 8, fair use, no known copyright)

# Bio-Social Interactions with Sex Influences on Heart Disease

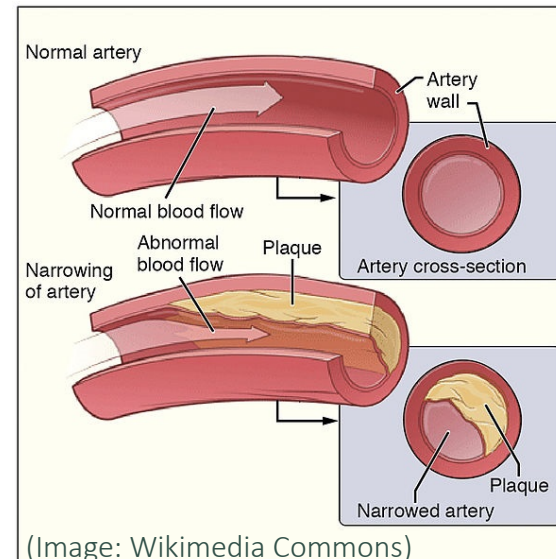


social /  
environmental  
context

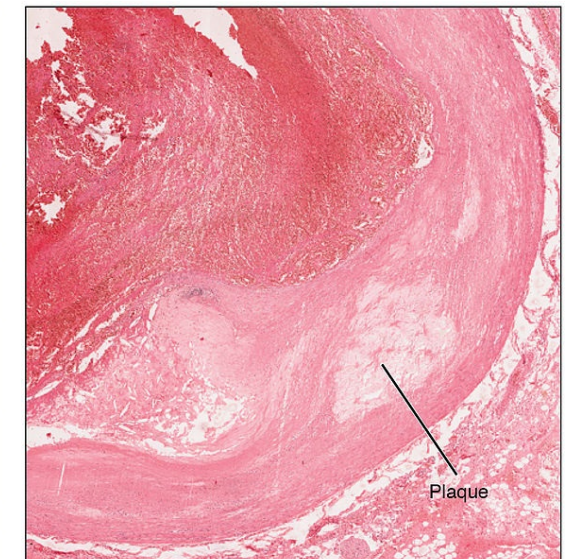
(Images: Pixabay, released under Creative Commons CC0)



biology



Artherosclerosis



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# Bio-Social Interactions with Sex Influences on Alzheimer's Disease



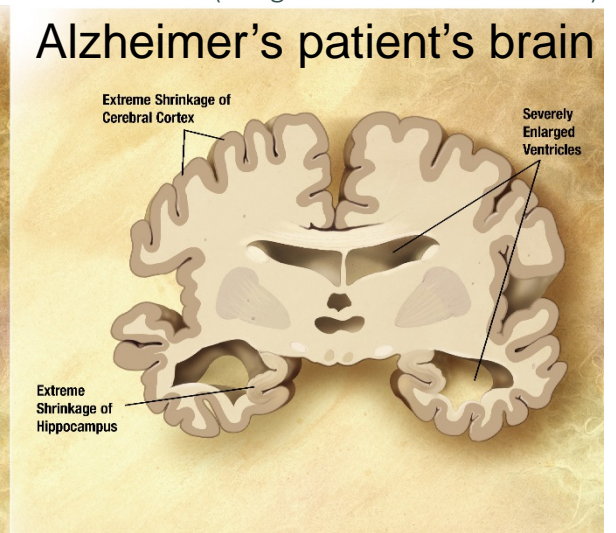
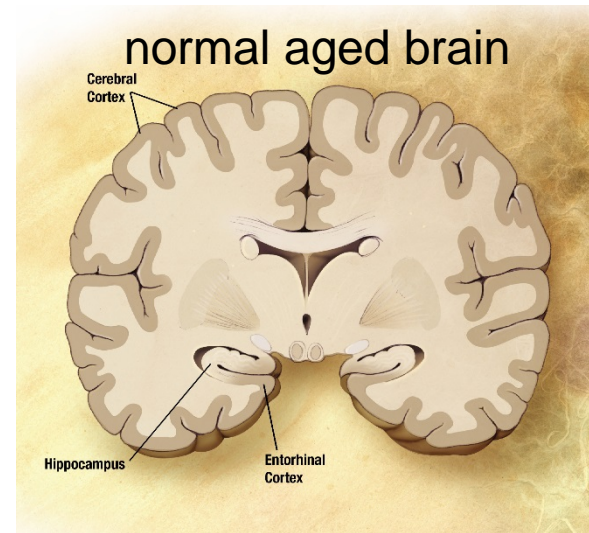
(Photo: *The Lancet Neurology*, April, 2016, Vol. 15)

Tony Craddock/Science Photo Library

social /  
environmental  
context

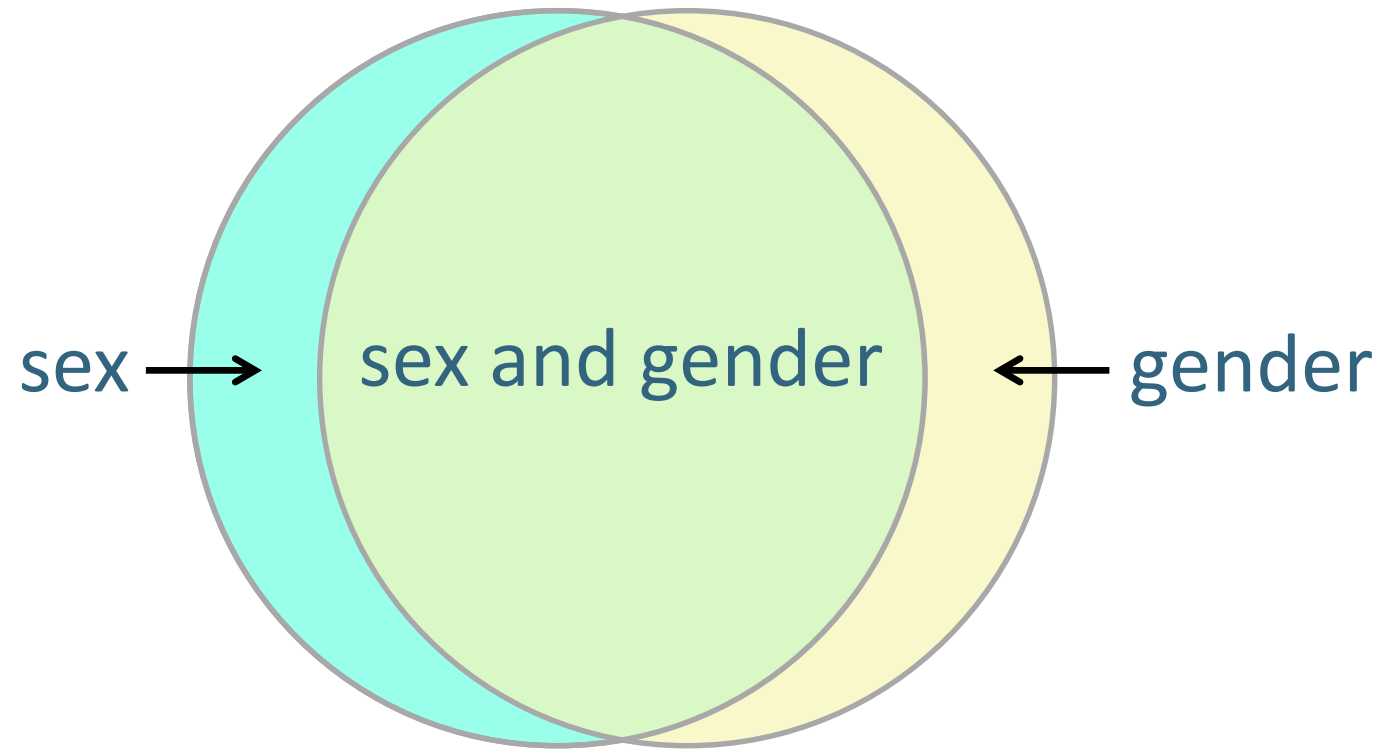
the individual

biology

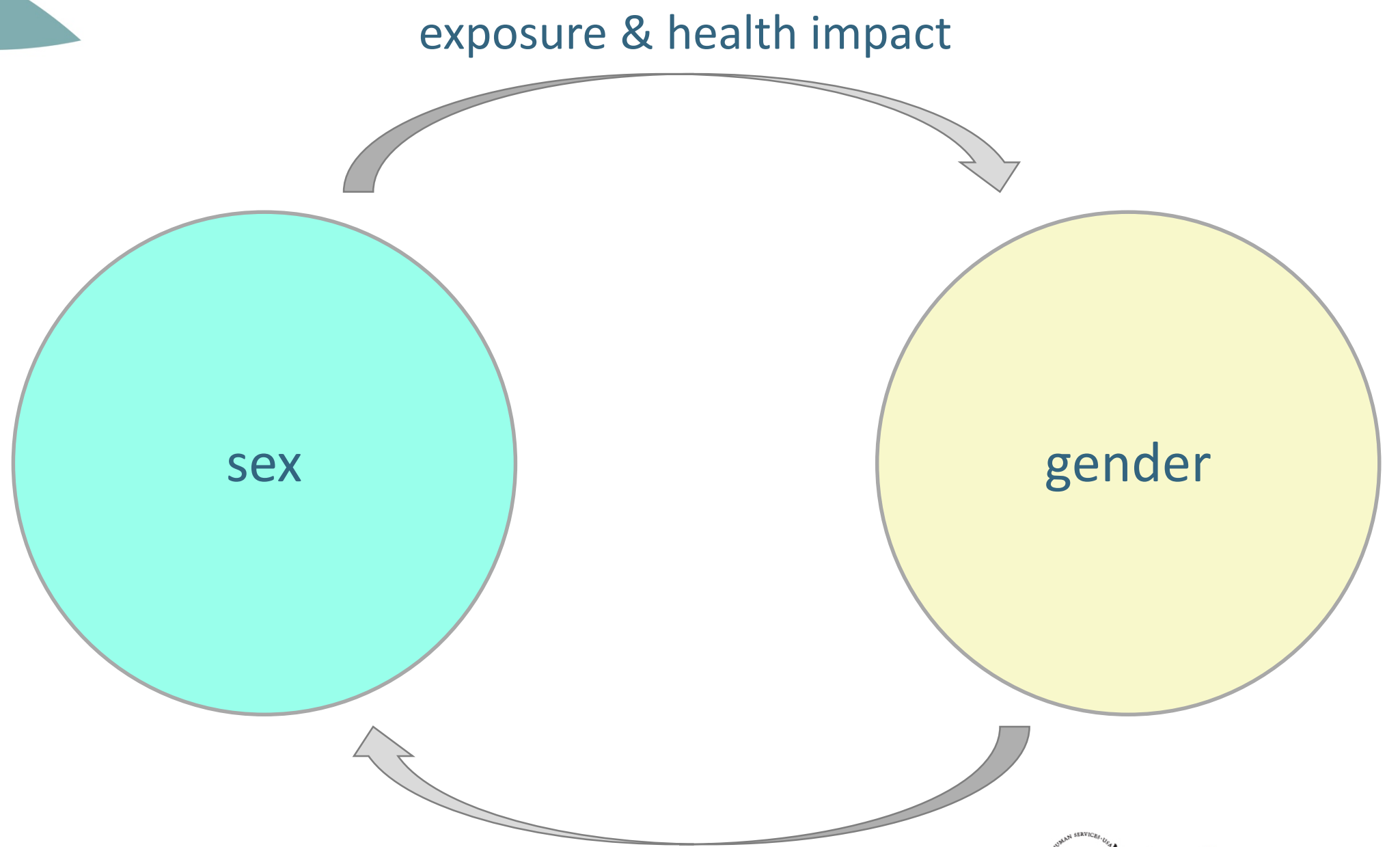


(Image: Wikimedia Commons)

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# Implications for Research

- The influences of sex and gender operate to some extent at every level of analysis.
- Controlling for the influences of sex and gender is insufficient.
- Recognizing where a body of research fits in the large model is critical.





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