



Advancing NIH Research on the Health of Women: A 2021 Conference

Chronic Debilitating Conditions in Women: the Heart of the Matter

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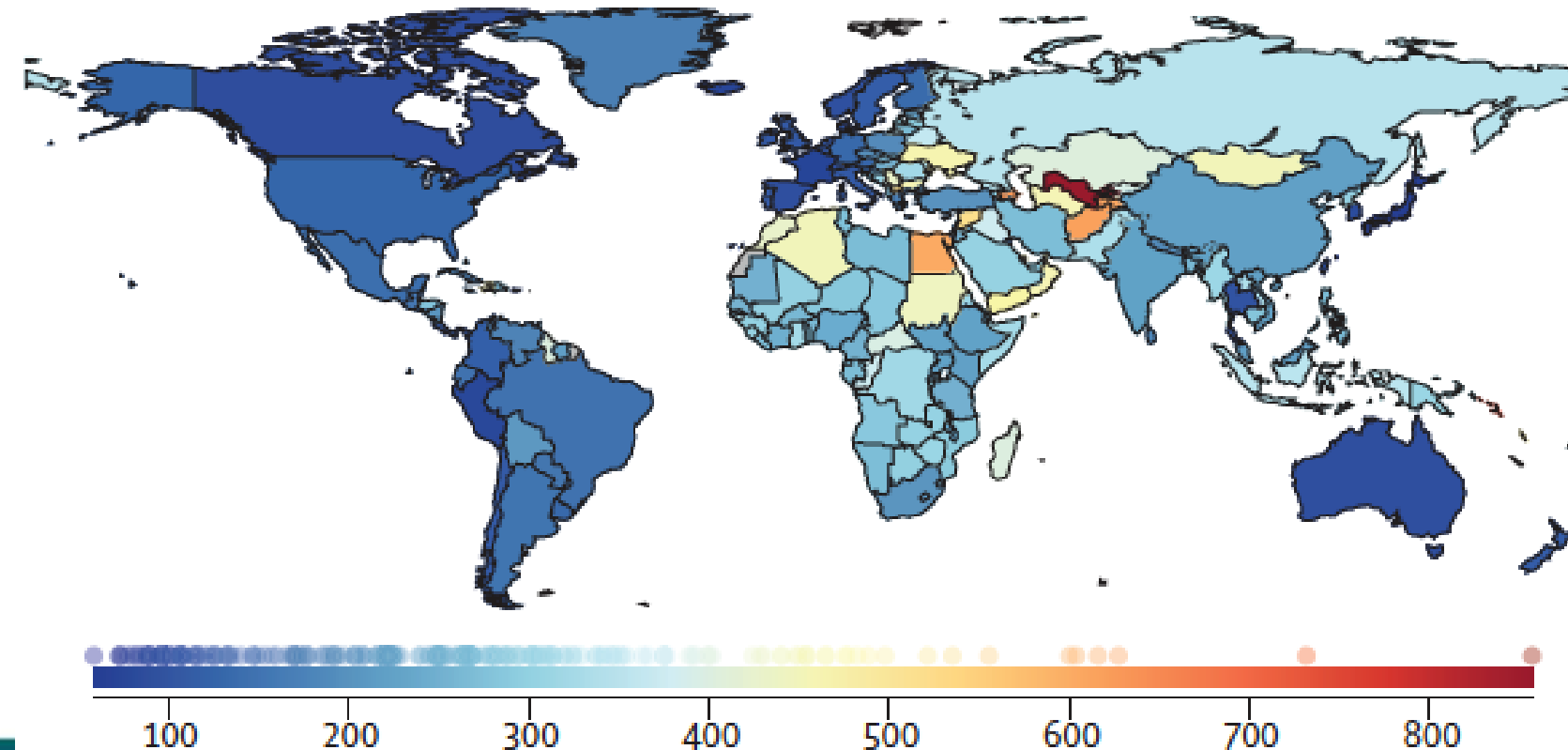
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The Global Burden of CVD Mortality in Women – CVD is the leading killer of women

Age-standardized CVD mortality in women 2019 (deaths per 100,000)



- There were an estimated **6.06 million deaths** (95% UI 5.62 to 6.41 million deaths) from cardiovascular disease in women in **1990**, rising to **8.94 million** (95% UI 7.92 to 9.71 million) in **2019**



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Heart disease is number 1 killer- also causes extensive morbidity

- And what about the other causes of death and illness?
 - Cancer
 - Diabetes
 - Depressive Disorders
 - Autoimmune diseases
 - Headache (e.g.migraine)
 - Musculoskeletal disorders
 - Autoimmune diseases
 - Alzheimers



Condition Type	Condition (2019 DALY)								
Female Specific	Cancers of the female reproductive tract* (900,843)	Dys-menorrhea/ Menstrual Abnormalities (289,608)	Fibroids* (64,009)	Endometriosis * and Adenomyosis (53,777)	Infertility* / Early Pregnancy Loss (26,355)	Polycystic Ovarian Syndrome (42,738)	Pelvic floor disorders, Organ prolapse (21,613)	Menopausal symptoms Pelvic Inflammatory Disease* Vulvodynia/Chronic gynecologic pain disorders – pelvic and vulvar Vaginitis	
More Common in Women/ Higher Morbidity for women	Depressive Disorders (1,704,524)	Migraine/ Headache (1,573,325)	Breast cancer* (1,387,670)	Sexually transmitted infections (37,316)	Rheumatoid Arthritis* (187,902)	Autoimmune diseases (*including RA) •SLE* •Sjögren’s Syndrome* •Scleroderma*	Temporomandibular Muscle/Joint Disorder (TMJD) Chronic Fatigue Syndrome* Fibromyalgia* Candidiasis Post-traumatic stress Irritable Bowel syndrome HPV infection Osteoporosis Fibromyalgia		
Occur in both sexes, higher morbidity/ potentially neglected in women	Unintentional Injuries (including intimate partner violence*) (2,050,026)	Alzheimers/ Dementia* (1,296,376)	Osteo-arthritis (1,257,042)	Endocrine, metabolic, blood, and immune disorders (853,247)	Recurrent UTI/ Interstitial Nephritis (201,529)	Multiple Sclerosis (143,123)	HIV (118,596)	Contraception- Exogenous hormone use- Neuropathy Overactive bladder/Incontinence Chronic pain including chronic pelvic pain	
High morbidity for women	Musculo-skeletal disorders (8,170,164)	Cardio-vascular Disease (7,538,622)	Mental Health (4,164,912)	Chronic respiratory diseases (3,643,271)	Substance Use Disorders (2,736,126)	Stroke (2,098,900)	Diabetes (2,010,853)	Chronic Kidney Disease (1,105,286)	Obesity/metabolic disease Comorbidity with aging

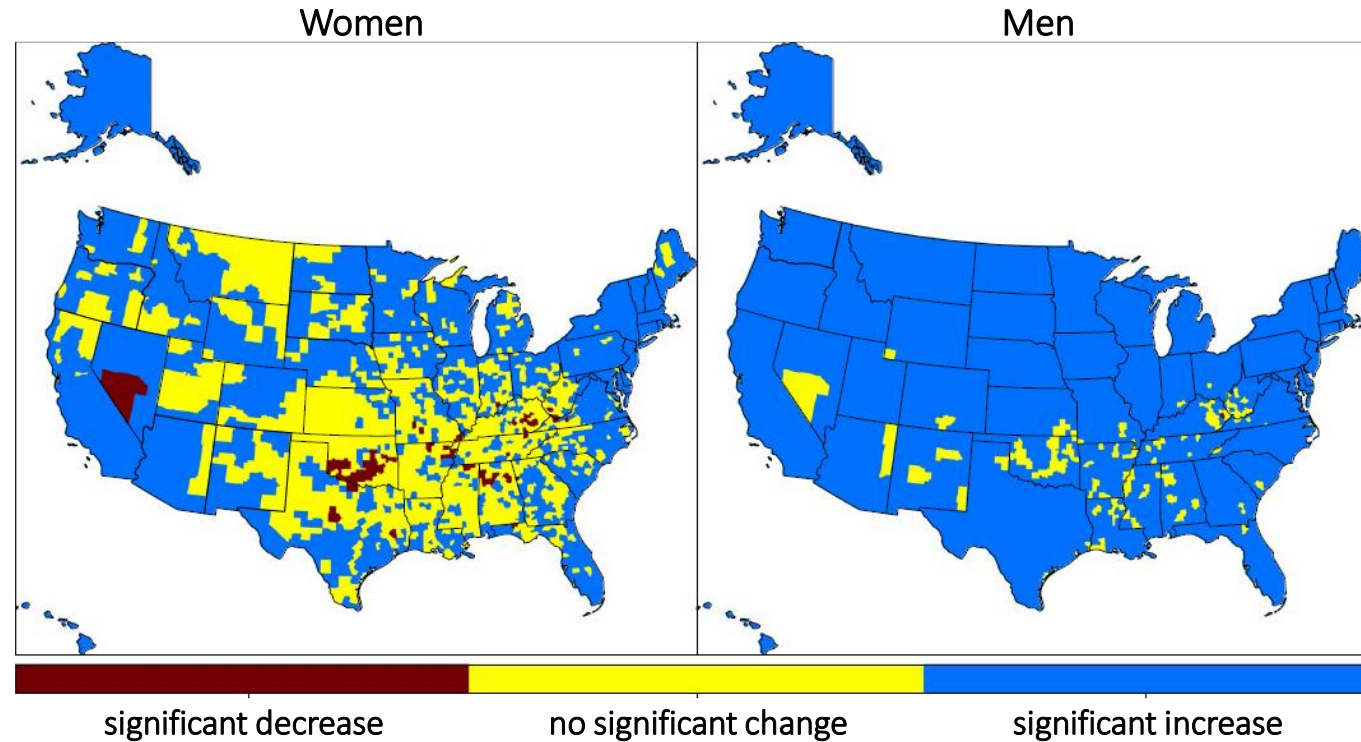
*Per MCS-WH reporting guidance, the following RCDC disease categories are particularly relevant to women's health



Problem

- Women's health is still very understudied
 - Treatments still based on data in men
 - Few sex specific treatment guidelines
 - In some cases progress is slowing or being reversed

From 1985 to 2010, gains in life expectancy occurred in fewer U.S. counties for women than men

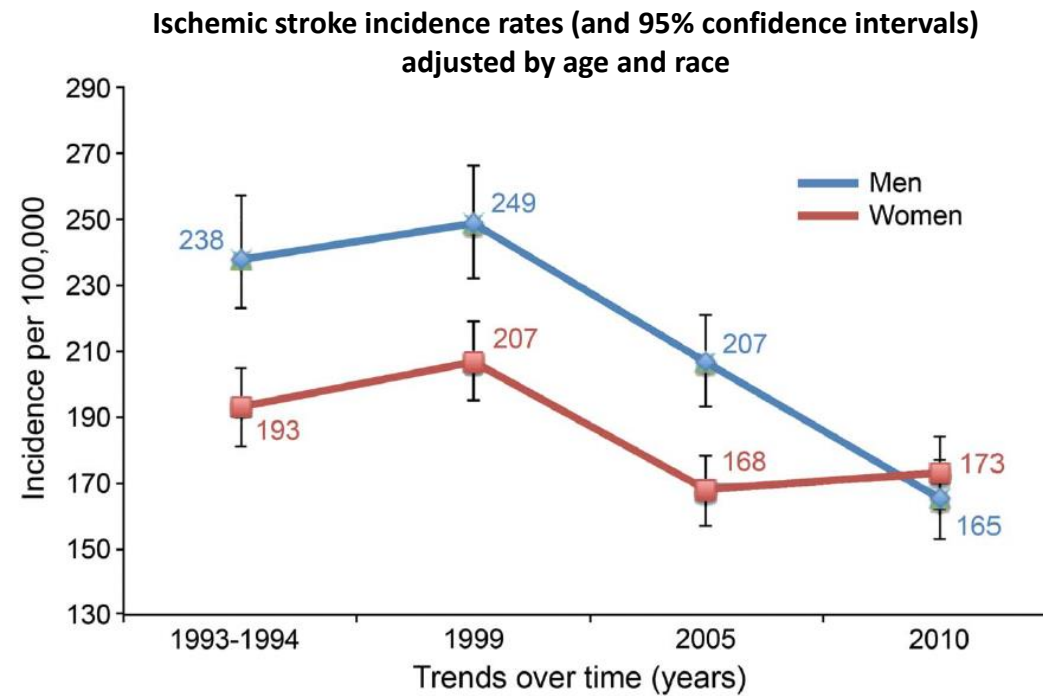


Wang et al. 2013. Left behind: widening disparities for males and females in US county life expectancy, 1985–2010. *Population Health Metrics* **11**: 8.



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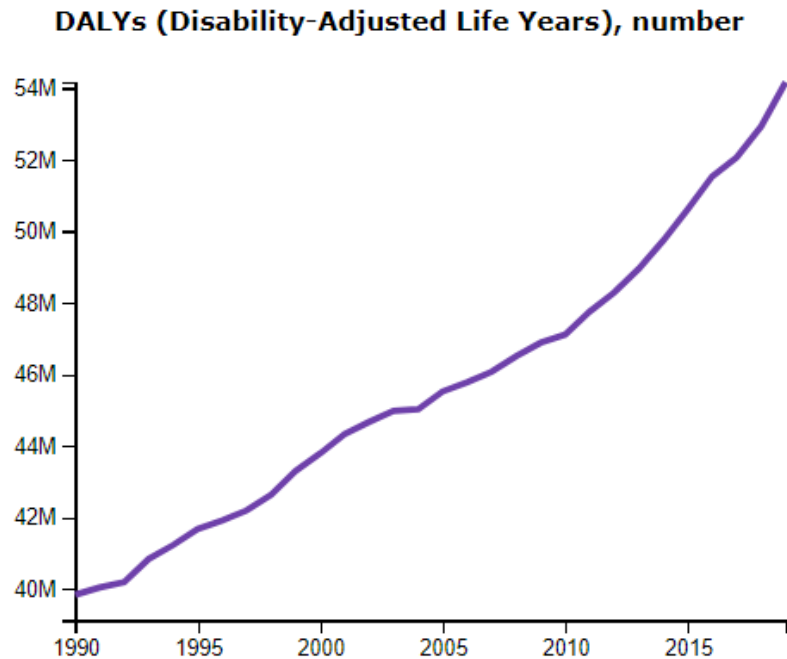
From 1993/94 to 2010, risk of stroke declined for men but not women



Madsen et al. 2017. Sex-specific stroke incidence over time in the Greater Cincinnati/Northern Kentucky Stroke Study. *Neurology* 89: 990-996.



Rising rates of chronic debilitating conditions in women



Legend

■ United States of America, Females, All Ages, All causes

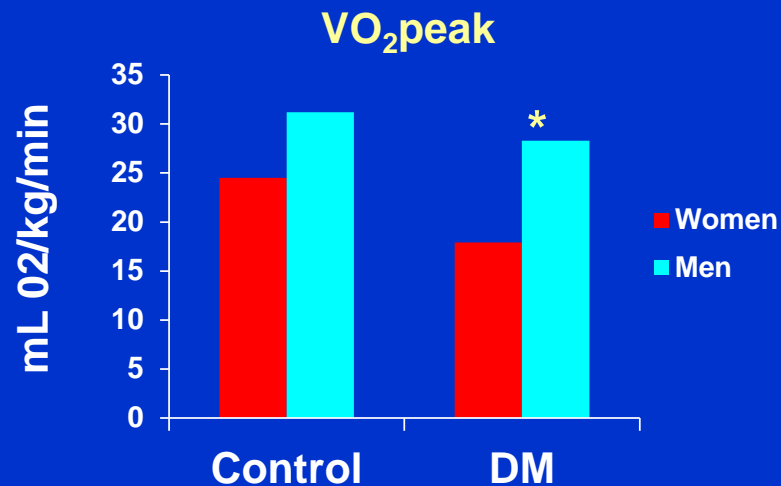
DALYs Definition:

DALYs = Disability Adjusted Life Years
The sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability.



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Impact on QOL is profound: Exercise Tolerance Is Less in Women Than in Men with Type 2 diabetes



	Nondiabetic Women (n=21)	Women with T2D (n=15)	Nondiabetic Men (n=13)	Men with T2D (n=14)
Peak exercise test ²				
VO _{2peak} (mL min ⁻¹)	1764.5 ± 400.0	1370.3 ± 154.4*,**	2462.1 ± 495.7	2257.4 ± 408.1***
VO _{2peak} (mL kg ⁻¹ min ⁻¹)	22.4 ± 5.2	18.0 ± 2.4*,**	28.1 ± 7.4	24.3 ± 6.0*
Peak RER	1.21 ± 0.07	1.17 ± 0.06	1.19 ± 0.07	1.22 ± 0.10
Tau 2 (s)	31.5 ± 11.9	37.1 ± 17.1	34.8 ± 9.2	45.1 ± 17.9***

* = p <0.05

Regensteiner and Reusch, MSSE 2015

Regensteiner and Reusch, J Phys 2021

Kobayashi et al, Am J. Cardiol, 2021,

Modulating Considerations

- **Intersectionality**
- **Life Course**
- **Sex vs Gender**
- **Multimorbidity**

Need to consider intersectionality

- There is even less known about women of color- need additional studies.
- Women of color, all older women have higher rates of chronic conditions than white women, all younger women; Few health disparity-focused studies relevant to diverse populations of women across the life course



Multidimensional Framework represents intersection of factors affecting the health of all women



HEALTH OF WOMEN ACROSS THE LIFE SPAN

Women in Context – **External** Factors

Such as *social determinants of health* including **gender**, environment, & policies

Preconception

In
Utero

Childhood

Adolescence

Adulthood

Biological Perspective – **Internal** Factors

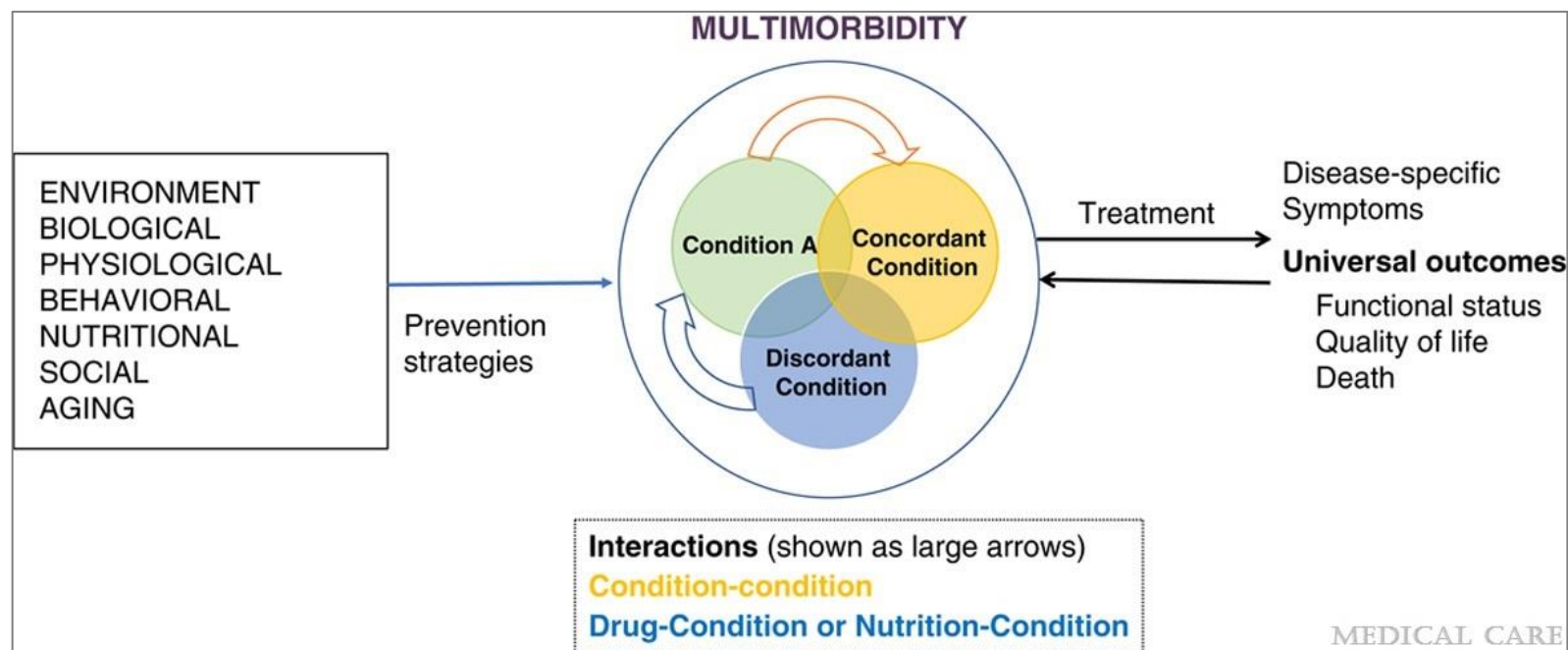
such as **sex** influences at genetic, molecular, cellular, & physiological levels

Interaction

Interaction



Conceptual Model of Multimorbidity



National Institutes of Health Advancing Multimorbidity Research Salive, Marcel E.; Suls, Jerry; Farhat, Tilda; Klabunde, Carrie N., Medical Care59(7):622-624, July 2021. doi: 10.1097/MLR.000000000000156,

Slide taken from NIDA presentation to ORWH.

Complex picture and so much remains unknown

- Need to know much more in order to provide evidence-based
 - Prevention
 - Treatment
 - Cure
- Research is needed- call to action for all of these diseases and conditions to reduce chronic debilitating conditions.
- Compelling clinical questions need to be answered.



Summary

- Chronic debilitating diseases are very common and contribute greatly to poor morbidity, mortality, function and quality of life in women
- However, these diseases remain understudied.
- Need for greater research focus on these diseases
- The Ludeman Center can lead the way
 - Fund more research on the health of women
 - Build the workforce of young scientists