American College of Rheumatology
Empowering Rheumatology Professionals

Health Disparities in SLE in the United States

the lupus initiative
Eliminating Health Disparities in Lupus

WELCOME

Before we get started…

ABOUT THIS PROJECT

- The presentation is designed to be easily incorporated into medical school lectures on a variety of topics; they are tailor-made for the classroom setting, and easy to digest
- The PowerPoint presentation is designed for medical students M3 and M4

DRUGS AND DOSES

When prescribing medications, the physician is advised to check the product information sheet accompanying each drug to verify conditions of use and to identify any changes in drug dosage schedule of contra-indications.

USE OF PROFESSIONAL JUDGMENT

This activity, including all educational links, is intended to be used as a tool to assess the base knowledge of the learner.
The information presented relates to basic principles of diagnosis and therapy, and is meant in no way to substitute for an individual patient assessment based upon the healthcare provider's examination of the patient and consideration of laboratory data and other factors unique to the patient.

ACR DISCLOSURE STATEMENT

The American College of Rheumatology is an independent, professional organization that does not endorse specific procedures or products of any pharmaceutical/biotech concern.

SUPPORT

The project described is, in part, supported by the Centers for Disease Control and Prevention under Cooperative Agreement Number NU58 DP006138. Its contents are solely the responsibility of its developers/authors. Points of view or opinions do not, therefore, necessarily represent official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

FACULTY REPORTED DISCLOSURES

[To be filled in once we get disclosures]

Learning Objectives

- Understand the health disparities in lupus incidence, prevalence, severity, and long-term morbidity and mortality by age, race/ethnicity, sex, and social determinants of health status
- Discuss the disparities in health outcomes and healthcare delivery in lupus
- Recognize the factors associated with health disparities in lupus
- Identify ways to reduce health disparities in lupus

Definition of Health Disparities

- **Health disparities** are the differences in the incidence, prevalence, mortality, and burden of disease and other adverse health conditions that exist among specific population groups in the United States
- **Healthcare disparities** refer to differences in access to or availability of facilities and services

- National Institutes of Health

Disparities in Lupus Prevalence and Incidence

- Black women are 3 times more likely to develop lupus than White women
- Affects up to 1 in 250 Black women in the United States
- Hispanic, Asian, and Native American populations are also more likely to develop lupus
- Women are 9 times more likely to develop lupus than men

Helmick CG, Felson DT, Lawrence RC, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part I. Arthritis Rheum. 2008;58(1):15-25.

Chakravarty EF, Bush TM, Manzi S, Clarke AE, Ward MM. Prevalence of adult systemic lupus erythematosus in California and Pennsylvania in 2000: estimates obtained using hospitalization data. Arthritis Rheum. 2007;56(6):2092-2094.

Fessel WJ. Epidemiology of systemic lupus erythematosus. Rheum Dis Clin North Am. 1988;14(1):15-23.

Disparities in Lupus Disease Burden

- Specific racial/ethnic minorities are more likely to develop lupus at a younger age and to have more severe manifestations at onset
- Black females with incident lupus were 4-6 years younger than their White counterparts

McCarty DJ, Manzi S, Medsger TA Jr, Ramsey-Goldman R, LaPorte RE, Kwoh CK. *Arthritis Rheum*. 1995;38(9):1260-1270.

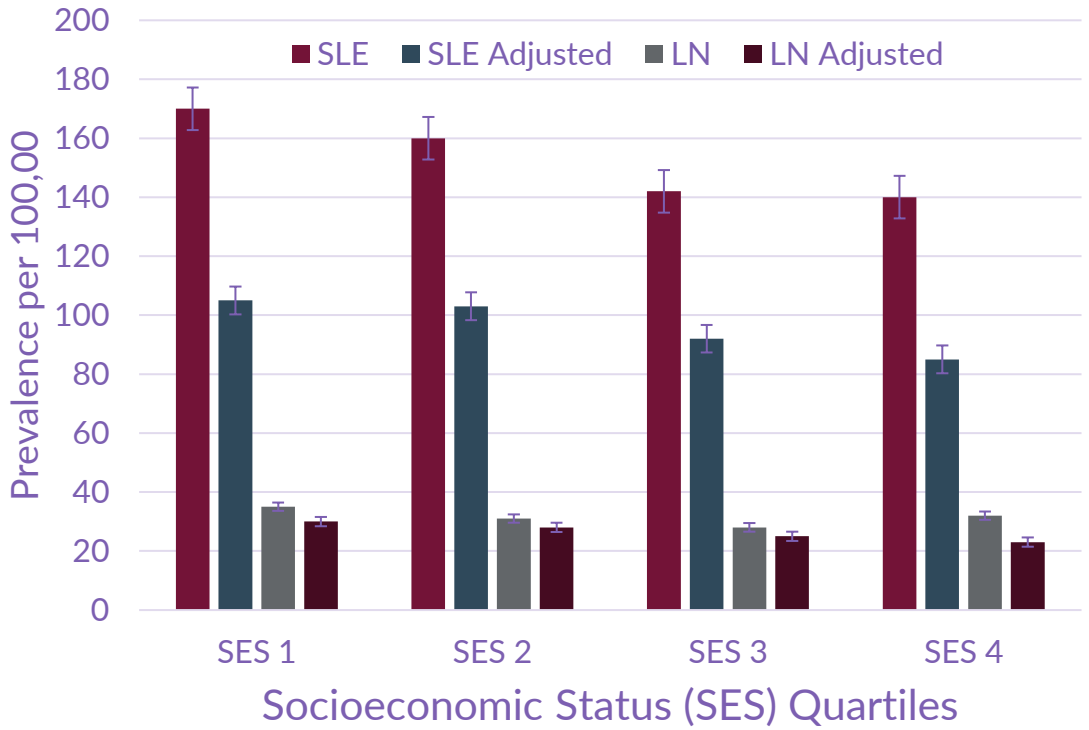
Cooper GS, Parks CG, Treadwell EL, et al. *Lupus*. 2002;11(3):161-167.

Izmirly PM, Parton H, Wang L, et al. Arthritis & Rheumatology 2021;73(6):991-6

Disparities in Lupus Prevalence

- U.S. Medicaid enrollees from 2000-2004
- Lupus and Lupus Nephritis prevalence highest in the ZIP code areas of lowest SES, even after adjusting for age, race/ethnicity and others
- Unclear whether area level factors, such as environmental exposures, affect development of SLE or, alternatively, if people affected with SLE lose their incomes and must move to lower SES areas

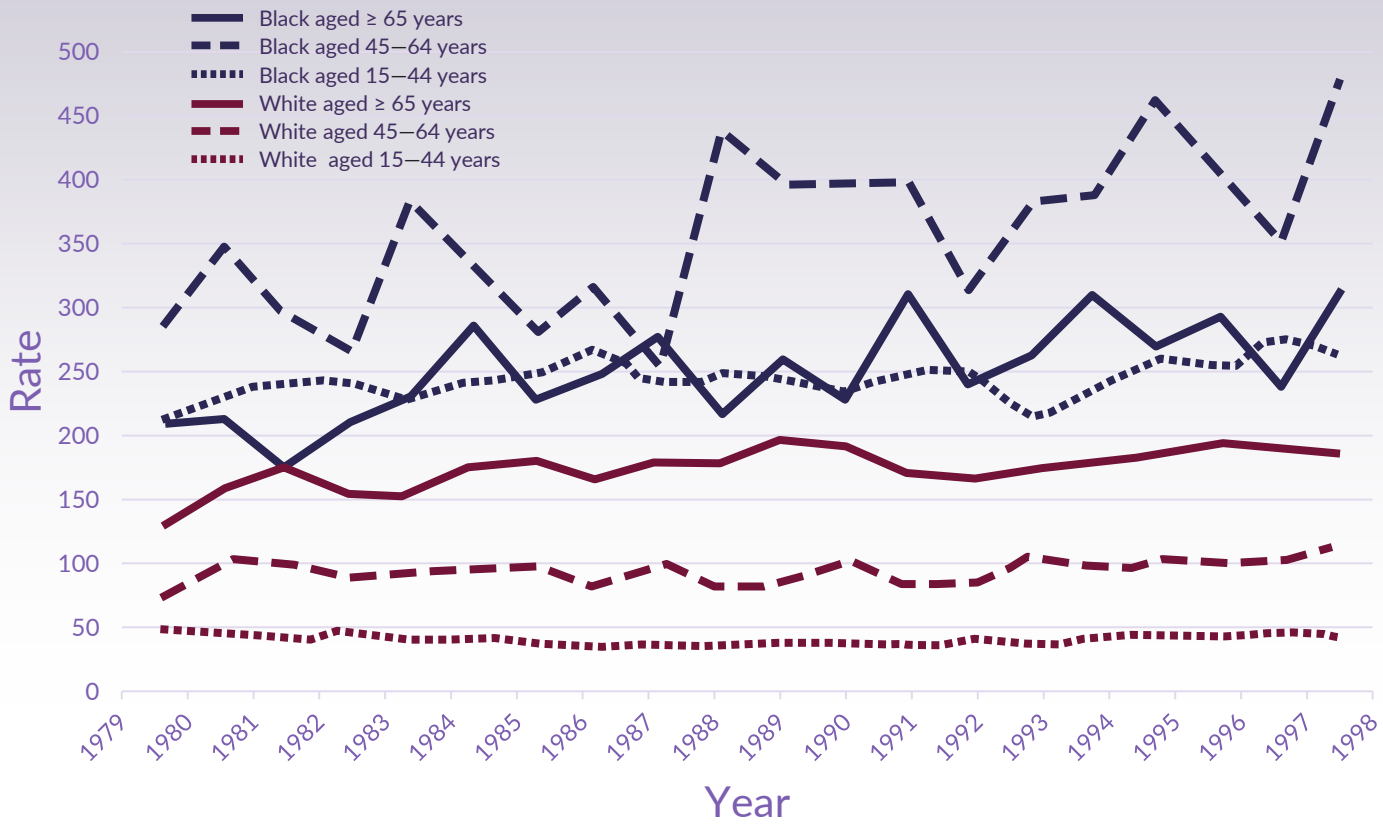
Prevalence of Systemic Lupus Erythematosus (SLE) and Lupus Nephritis (LN) Stratified by Socioeconomic Status (SES) Quartile, Crude and Adjusted*

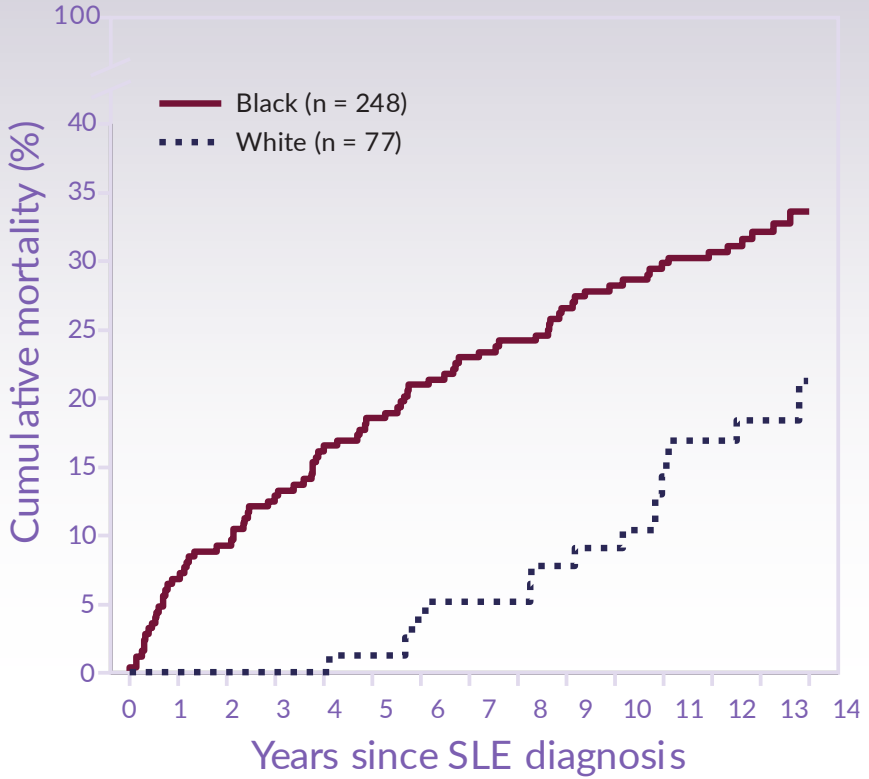


(SES 1 (lowest): ≤ −1.62, SES 2: >1.62 and ≤−0.72, SES 3: >0.72 and ≤0.26, SES 4 (highest): >0.26), crude and adjusted by age group, sex and race/ethnicity

Feldman CH, Hiraki LT, Liu J, et al. *Arthritis Rheum*. 2013;65(3):753-763. doi: 10.1002/art.37795.

Unadjusted SLE Death Rates for White and Black Women: U.S. Centers for Disease Control and Prevention





Feldman CH, Hiraki LT, Liu J, et al. Epidemiology and sociodemographics of systemic lupus erythematosus and lupus nephritis among U.S. adults with medicaid coverage, 2000-2004. Arthritis Rheum. 2013;65(3): 753-763. doi: 10.1002/art.37795.

Disparities in Lupus Outcomes—Mortality

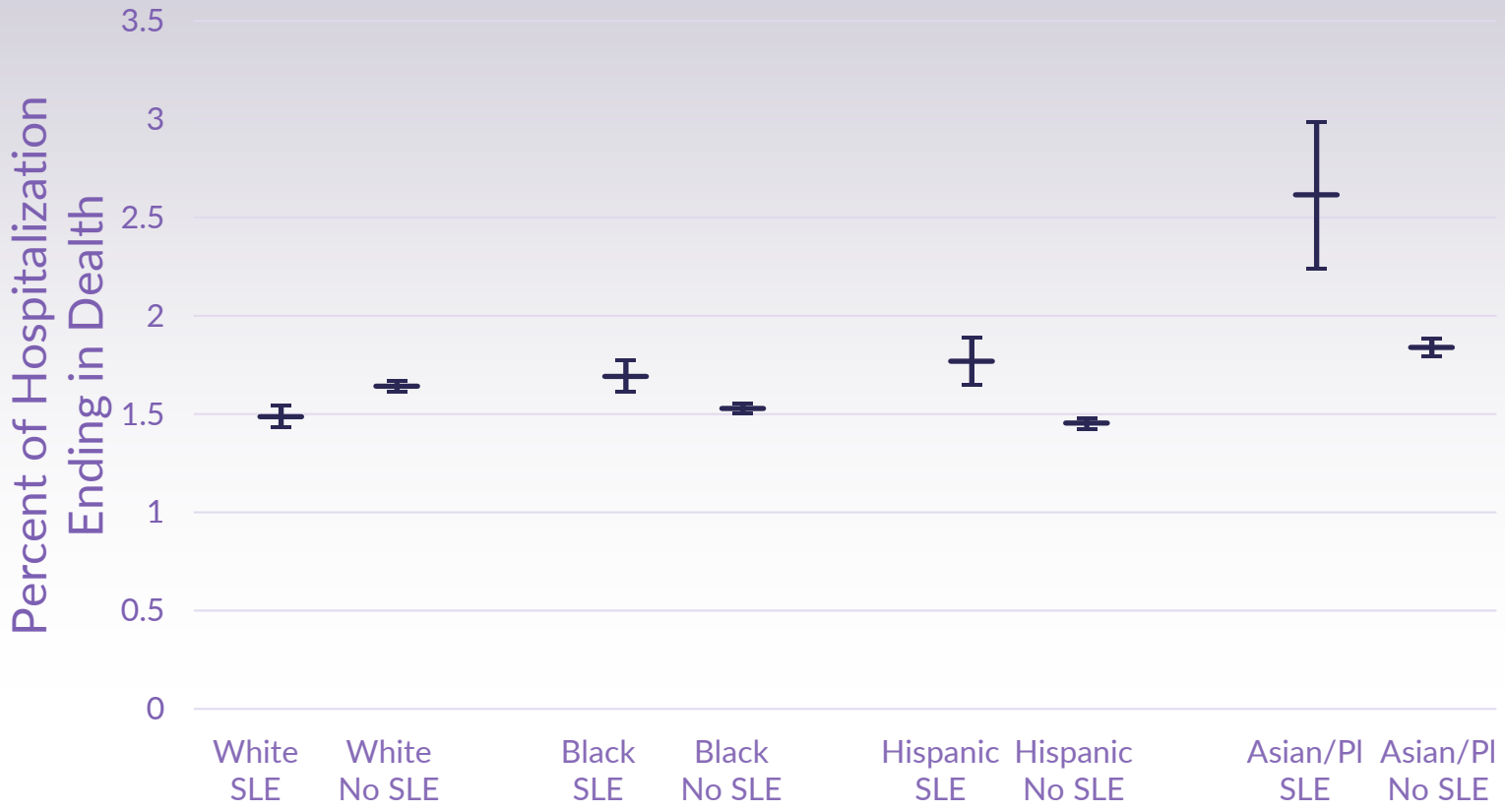
- Specific racial/ethnic minorities with lupus have mortality rates at least 3 times as high as White individuals
- Among Black women, death rates were highest and increased most (69.7%) among those aged 45-64 years from 1979 to 1998
- Compared with White individuals with SLE, the cumulative SLE mortality was significantly higher among black individuals, with deaths occurring sooner after diagnosis and at a mean age approximately 13 years younger.

McCarty DJ, Manzi S, Medsger TA Jr, Ramsey-Goldman R, LaPorte RE, Kwoh CK. Incidence of systemic lupus erythematosus. Race and gender differences. Arthritis Rheum. 1995;38(9):1260-1270.

Cooper GS, Parks CG, Treadwell EL, et al. Differences by race, sex and age in the clinical and immunologic features of recently diagnosed systemic lupus erythematosus patients in the southeastern United States. Lupus. 2002;11(3):161-167.

Unadjusted and Adjusted hospital mortality in hospitalized SLE By Race

Higher Death Rates for Racial/Ethnic minorities



Centers for Disease Control and Prevention (CDC). MMWR Morb Mortal Wkly Rep. 2002;51:371-374.

Centers for Disease Control and Prevention (CDC). Racial disparities in mortality associated with systemic lupus erythematosus—Fulton and DeKalb Counties, Georgia, 2002–2016. MMWR Morb Mortal Wkly Rep. 2019:68 68(18);419–422.

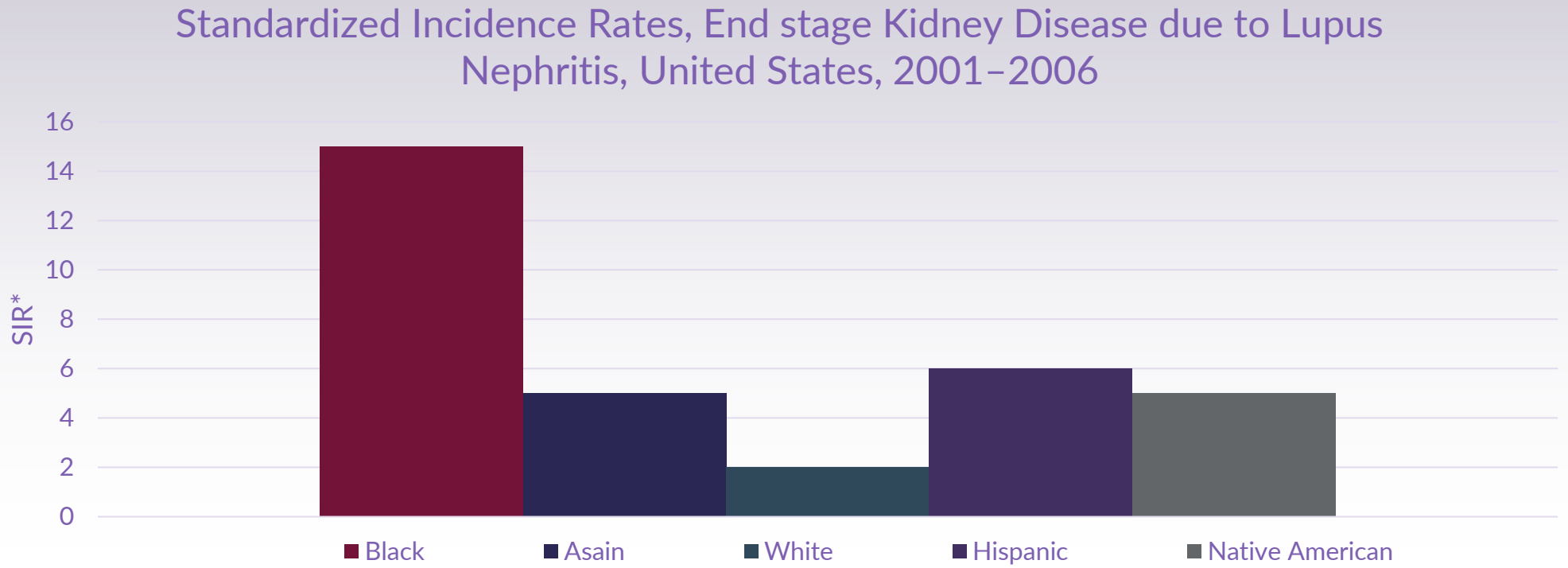
Disparities in Lupus Outcomes—Mortality

- Poverty is also associated with higher mortality in lupus
- It is challenging to disentangle the effects of poverty from race/ethnicity
- In some studies, accounting for poverty diminishes or eliminates racial/ethnic disparities in lupus mortality

Centers for Disease Control and Prevention (CDC). MMWR Morb Mortal Wkly Rep. 2002;51:371-374.

Centers for Disease Control and Prevention (CDC). Racial disparities in mortality associated with systemic lupus erythematosus—Fulton and DeKalb Counties, Georgia, 2002–2016. MMWR Morb Mortal Wkly Rep. 2019:68 68(18);419–422.

Disparities in Lupus Outcomes— End stage Kidney Disease (ESKD)



* Standardized incidence rate: end-stage renal disease cases/million person-years.

Durán S, Apte M, Alarcón GS; LUMINA Study Group. Poverty, not ethnicity, accounts for the differential mortality rates among lupus patients of various ethnic groups. J Natl Med Assoc. 2007;99(10):1196-1198.

Ward MM, Pyun E, Studenski S. Long-term survival in systemic lupus erythematosus. Patient characteristics associated with poorer outcomes. Arthritis Rheum. 1995;38(2):274-283.

Alarcón GS, McGwin G Jr, Bastian HM, et al. Systemic lupus erythematosus in three ethnic groups. VII [correction of VIII]. Predictors of early mortality in the LUMINA cohort. LUMINA Study Group. Arthritis Rheum. 2001;45(2):191-202.

Disparities in Lupus Outcomes—Infections

Using the Medicaid data for the years 2000–2006, people with SLE were identified

- There were 9,078 serious infections in 5,078 SLE patients and 3,494 infections in 1,825 patients with lupus nephritis
- In multivariable-adjusted models, increased risks of infection were seen in:
  - Black individuals as compared to White individuals: Hazard Ratio, 1.14 [95% confidence interval, 1.06–1.21]
  - Men as compared to women: Hazard Ratio, 1.33 [95% confidence interval, 1.20–1.47]

Costenbader KH, Desai A, Alarcón GS, et al. Trends in the incidence, demographics, and outcomes of end- stage renal disease due to lupus nephritis in the US from 1995 to 2006. Arthritis Rheum. 2011;63(6):1681- 1688.

Feldman CH, Hiraki LT, Winkelmayer WC, Marty FM, Franklin JM, Kim SC, Costenbader KH: Serious Infections Among Adult Medicaid Beneficiaries With Systemic Lupus Erythematosus and Lupus Nephritis. Arthritis & Rheumatology 2015, 67(6):1577-1585

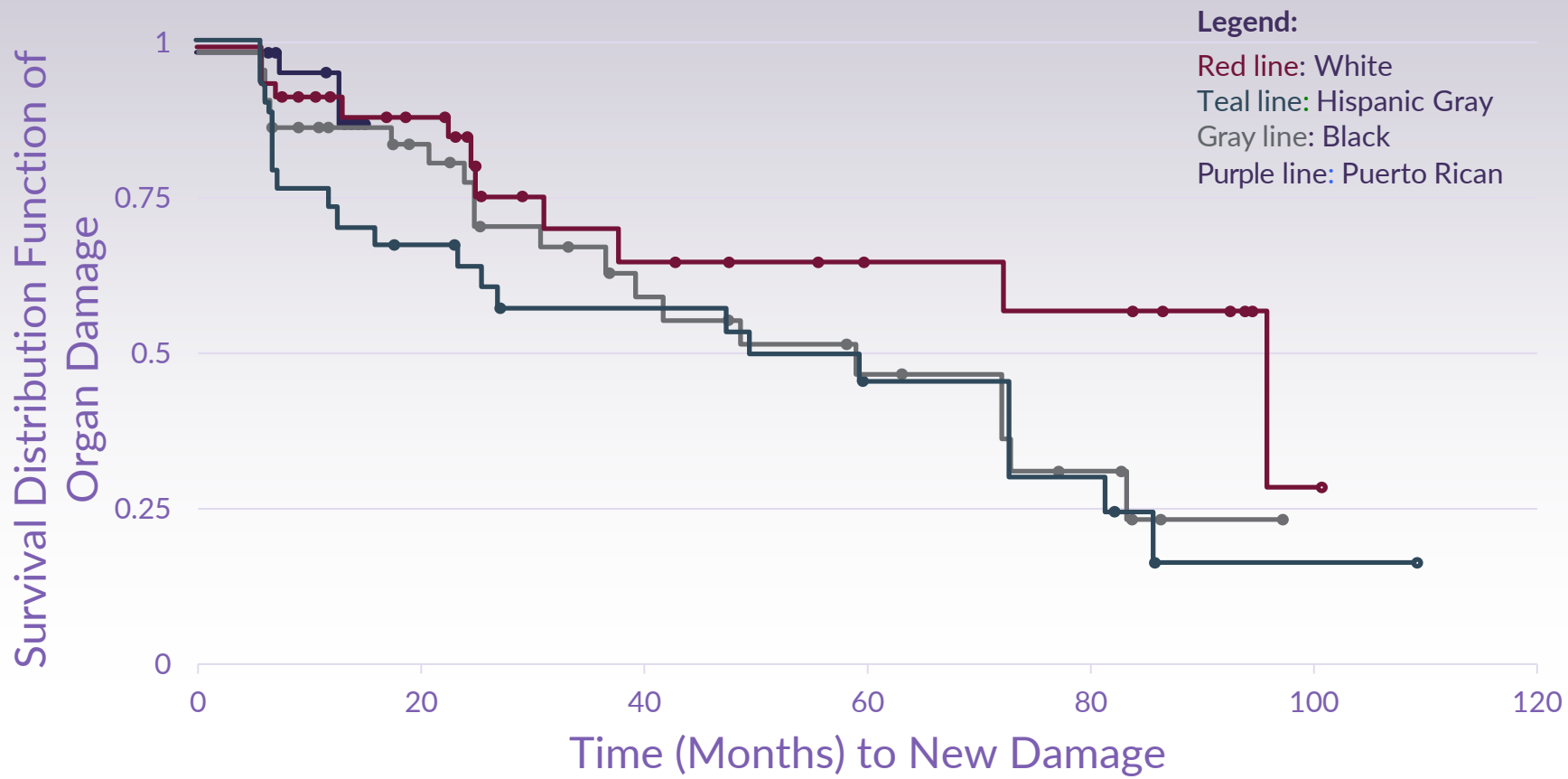
Disparities in Lupus Outcomes—Health care utilization for Hospitalization with Infections

- 1998-2016 US National Inpatient Sample data used to examine outcomes of serious infection hospitalizations in SLE
- Rates of pneumonia, sepsis/bacteremia, urinary tract infection (UTI), skin and soft tissue infections (SSTIs), and opportunistic infections (OIs) all increased in SLE patients over time
- In multivariable-adjusted models, compared to White SLE patients, Black SLE patients hospitalized for serious infection had significantly higher odds of:
  - higher hospital charges
  - a longer hospital stay
  - discharge to a non-home facility (nursing home or a long-term facility)

Singh JA, Cleveland JD: Hospitalized Infections in Lupus: A Nationwide Study of Types of Infections, Time Trends, Health Care Utilization, and In-Hospital Mortality. Arthritis Rheumatol 2021, 73(4):617-630.

Disparities in Lupus Outcomes—Damage

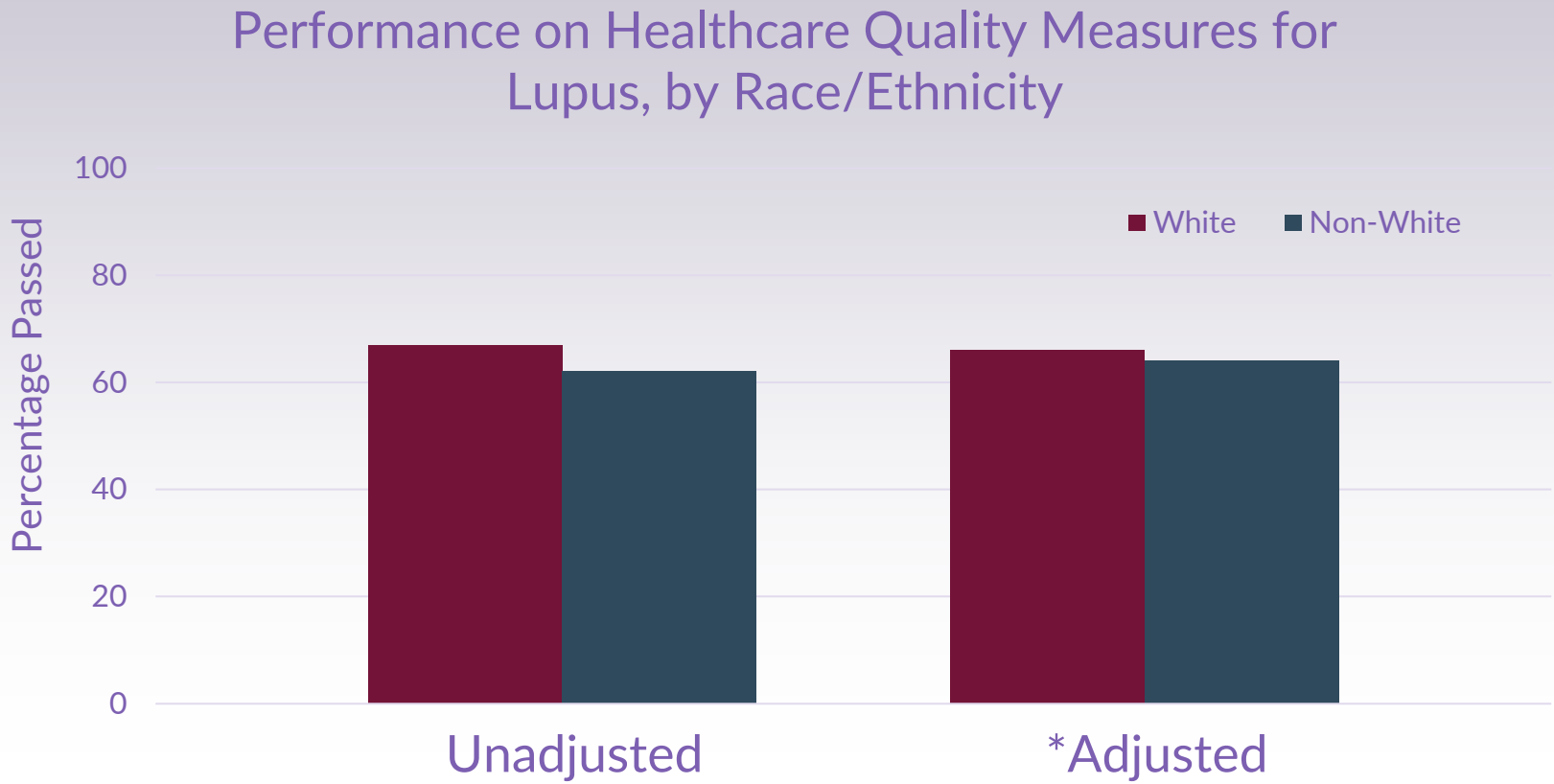
Racial/ethnic minorities develop damage earlier



Yazdany J, Trupin L, Tonner C, et al. Quality of care in systemic lupus erythematosus: application of quality measures to understand gaps in care. J Gen Intern Med. 2012;27(10):1326-1333.

Disparities in Healthcare

Racial/ethnic minorities are less likely to receive recommended healthcare for lupus

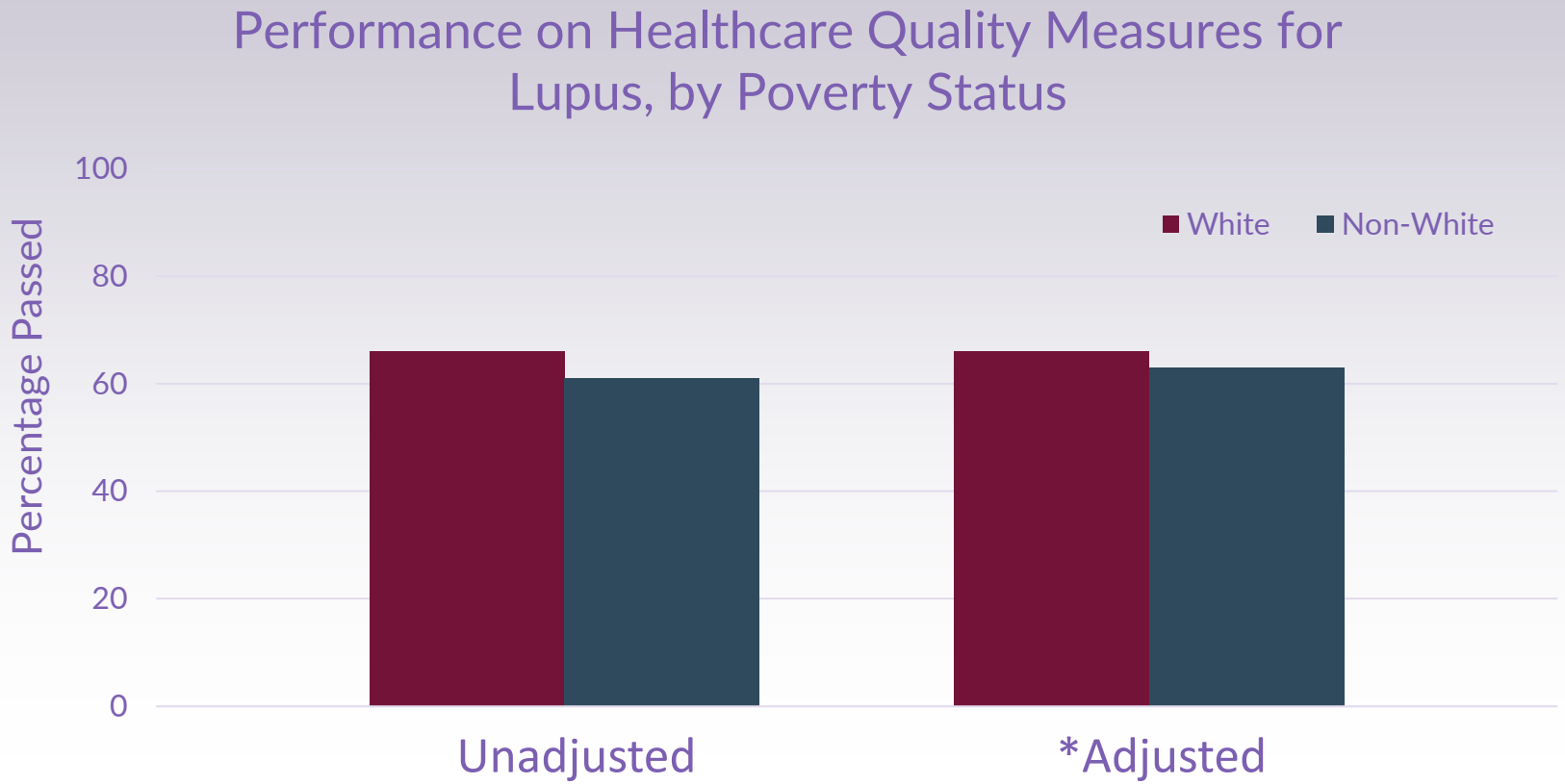


*Adjusted for age, race/ethnicity, disease duration, healthcare utilization, and health insurance.

Yazdany J, Trupin L, Tonner C, et al. Quality of care in systemic lupus erythematosus: application of quality measures to understand gaps in care. J Gen Intern Med. 2012;27(10):1326-1333

Disparities in Healthcare (cont.)

Low-income individuals are less likely to receive recommended healthcare for lupus

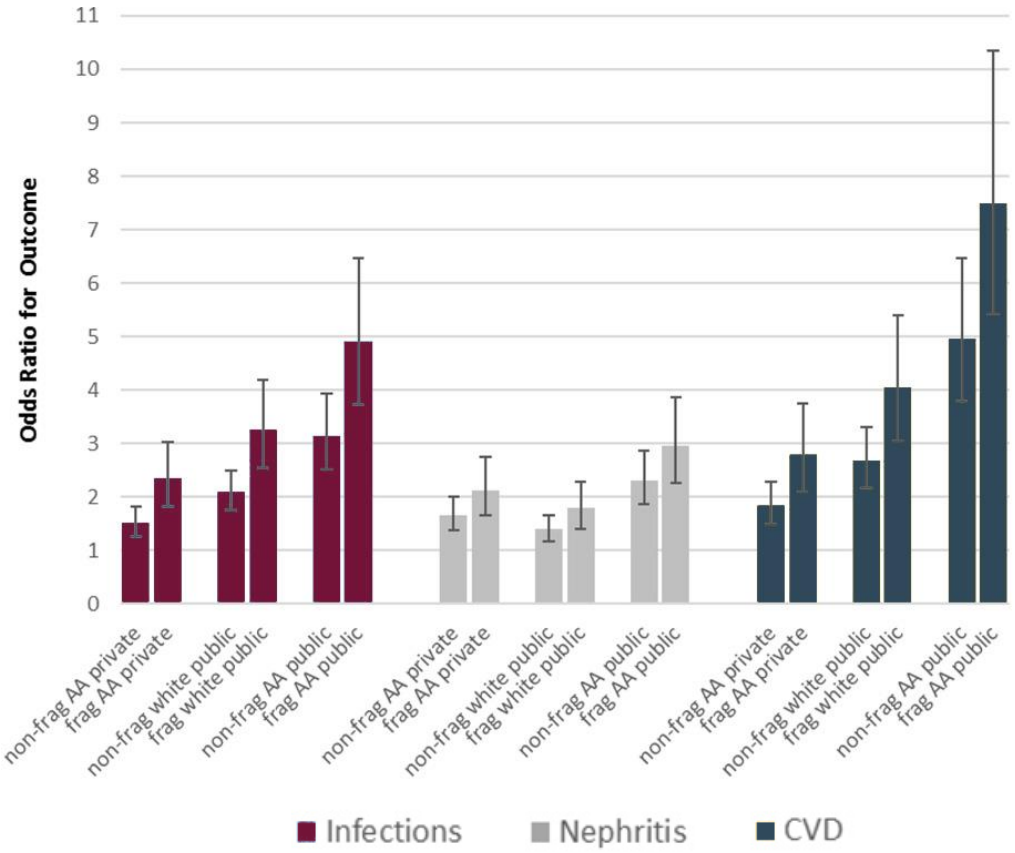


*Adjusted for age, poverty, disease duration, healthcare utilization, and health insurance.

Yazdany J, Trupin L, Tonner C, et al. Quality of care in systemic lupus erythematosus: application of quality measures to understand gaps in care. J Gen Intern Med. 2012;27(10):1326-1333

Disparities in Healthcare related to fragmented care

- 4,276 SLE patients
- Blacks experienced more care fragmentation compared to white
  - odds ratio [OR] 1.66, 95% confidence interval [CI], 1.44-1.97
- Fragmented care associated with increased risk of
  - Infections: OR 1.57, 95% CI 1.30-1.88
  - cardiovascular disease: OR 1.51, 95% CI 1.23-1.86
  - end-stage renal disease: OR 1.34, 95% CI 1.05-1.70
  - Nephritis: OR 1.28, 95% CI 1.07-1.54
  - Stroke: OR 1.28, 95% CI 1.01-1.62



*AA = African-American

Walunas TL, Jackson KL, Chung AH, Mancera-Cuevas KA, Erickson DL, Ramsey-Goldman R, Kho A. Disease Outcomes and Care Fragmentation Among Patients With Systemic Lupus Erythematosus. Arthritis Care Res (Hoboken). 2017 Sep;69(9):1369-1376. doi: 10.1002/acr.23161

Disparities in Healthcare

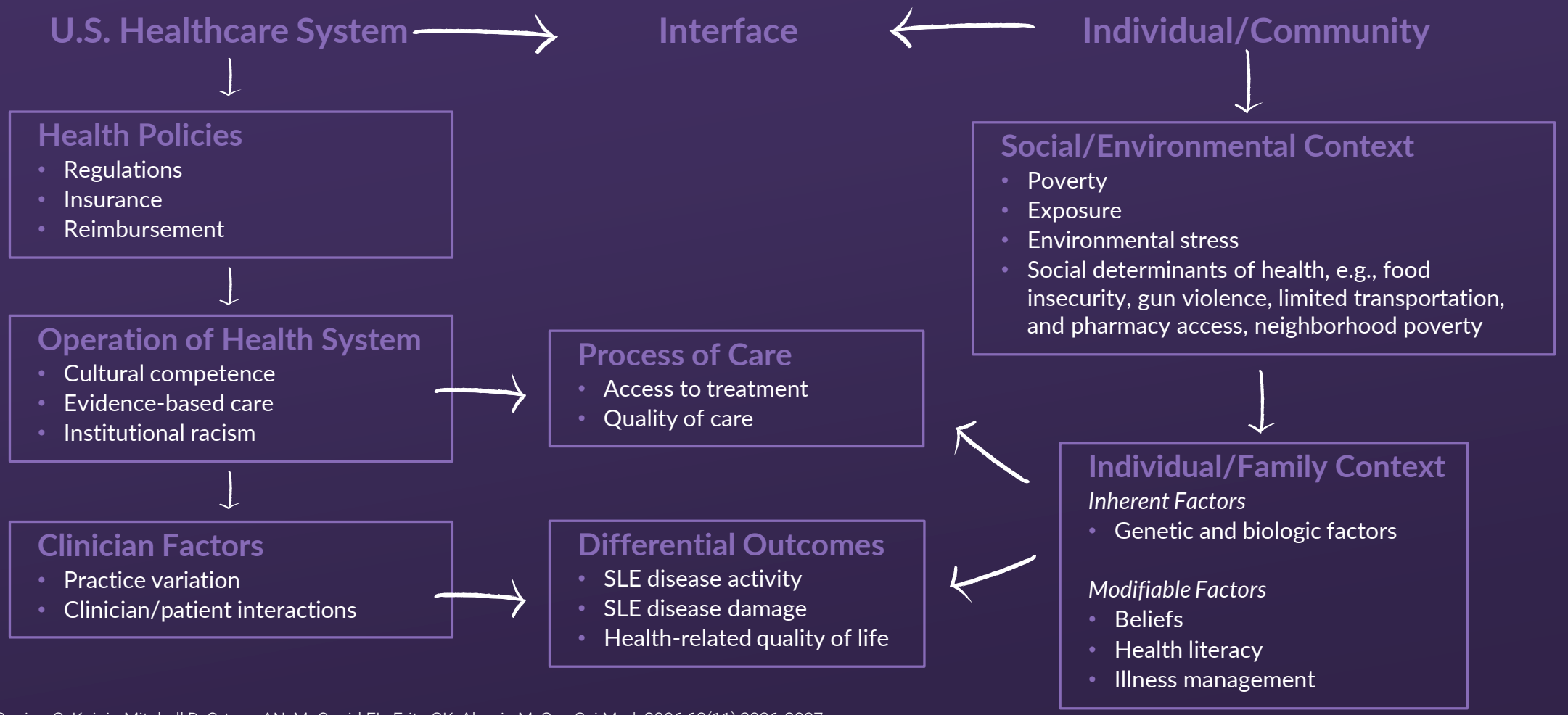
Differences in healthcare quality for lupus among racial/ethnic minorities and those living in poverty may reflect poorer access to healthcare

- Controlling for the presence and type of health insurance and other factors (age, race/ethnicity, disease duration healthcare utilization) eliminated differences in quality of care for minorities and low-income individuals

Yazdany J, Trupin L, Tonner C, et al. J Gen Intern Med. 2012;27(10):1326-1333.

What Underlies These Disparities?

Causes of Health Disparities—A Framework



Adapted from Canino G, Koinis-Mitchell D, Ortega AN, McQuaid EL, Fritz GK, Alegria M. Soc Sci Med. 2006;63(11);2926-2937.

Understanding Lupus Health Disparities

"The reality is that to get to the root cause of disparities, it is not going to be just one factor. For example, poor health literacy perpetuates health disparities, as does a lack of access to care, a lack of access to a regular provider, and a lack of access to a medical home. No single factor can be considered to be the root cause of disparities."

- Anne Beal, Institute of Medicine

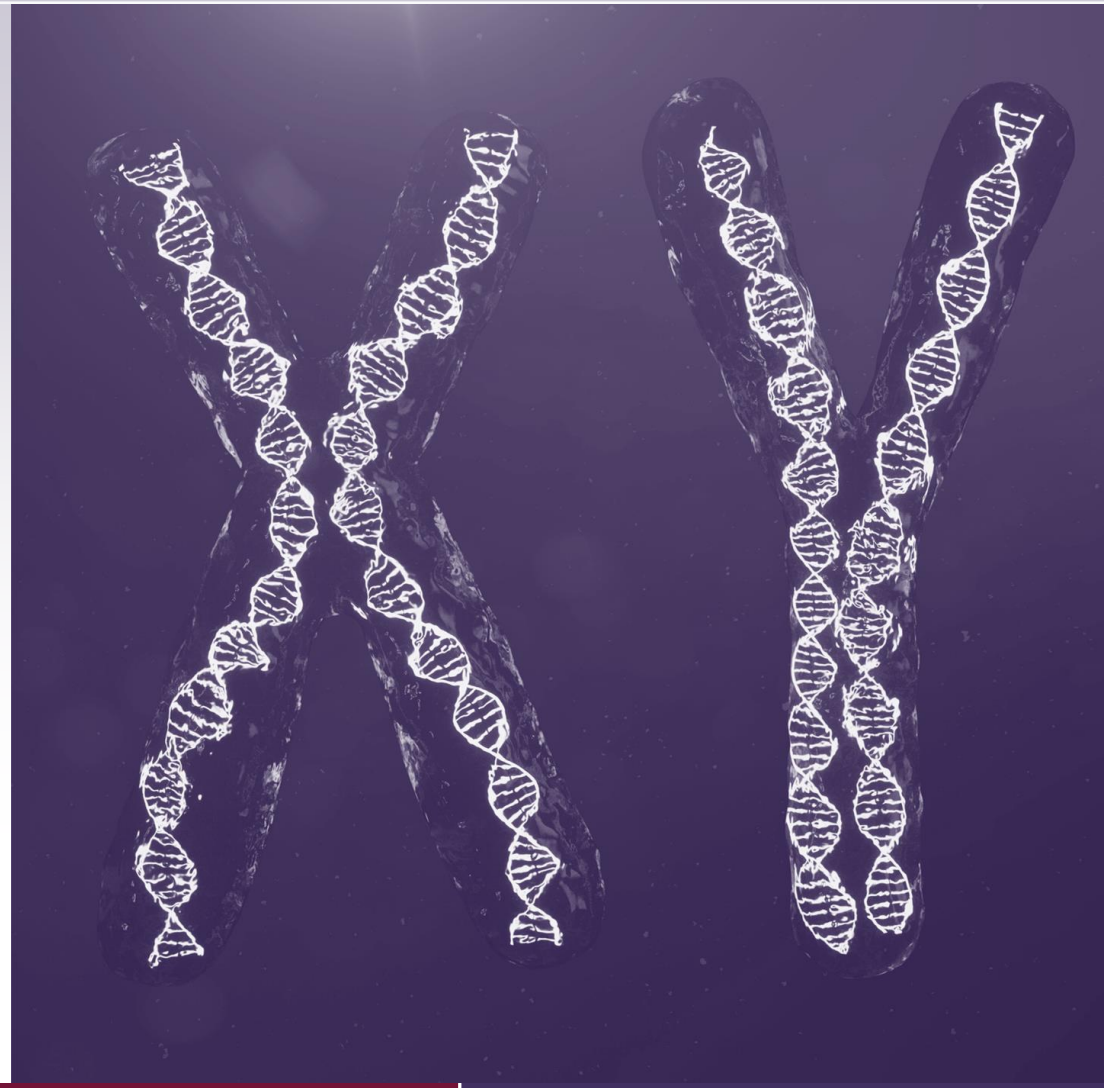
The Role of Genetics in Disparities

- Genome-wide association studies (GWAS) have identified more than > 100 genetic risk loci for lupus
- Thirty-four novel variants identified in a recent study.
- New loci included the immune checkpoint receptor CTLA4, the TNF receptor-associated factor TRAF3 and the type I interferon gene cluster on 9p21
- Studies have found susceptibility genes that are common in multiple racial/ethnic groups
  - Research is ongoing to understand differences in genetic risk factors across populations
  - Such information may one day allow more targeted, personalized treatment strategies that reduce disparate health outcomes

Deng Y, Tsao BP. Nat Rev Rheumatol. 2010;6(12):683-692;
Wang Y, Zhang Z, Lin H et al. Nature Communications 2021: 12 :772

The Role of Genetics in Disparities

- Women are more likely to develop lupus than men across all ages
  - Lupus is increased among men with Klinefelter's syndrome (XXY), suggesting genetic susceptibility and a role of X chromosome specifically
  - TLR7 is located on the X chromosome and is likely an important gene leading to increased SLE susceptibility
  - High female-to-male ratio in SLE incidence peaks during the childbearing years, suggesting that factors related to reproductive hormones play a role



Scofield RH, Bruner GR, Namjou B, et al. Arthritis Rheum. 2008;58(8):2511-2517.
Strickland FM, Hewagama A, Lu Q, et al. J Autoimmun. 2012;38(2-3):J135-J143

Social Determinants of Health Disparities

- **CDC**: Social determinants of health (SDOH) are conditions in the places where people live, learn, work, and play that affect a wide range of health and quality-of life-risks and outcomes.
- Biologic mechanisms that contribute to health disparities are influenced by a complex interplay of socioeconomic, cultural, and environmental factors
- Socioeconomic disparities in lupus incidence and outcomes strongly suggest that factors beyond genetics or innate biology underlie health disparities

Demas K, Costenbader K. Curr Opin Rheumatol. 2009;21(2):102-109.;
CDC Definition of SDOH: https://www.cdc.gov/socialdeterminants/index.htm

Poverty and Outcomes in Lupus

- Higher mortality
- Greater disease activity
- More disease-related damage
- Poorer physical function
- Worse health-related quality of life
- Higher rates of depression after disease onset

Ward MM, Pyun E, Studenski S. Arthritis Rheum. 1995;38:274-283. Uribe AG, McGwin G Jr, Reveille JD, Alarcón GS. Autoimmun Rev. 2004;3(4):321-329.

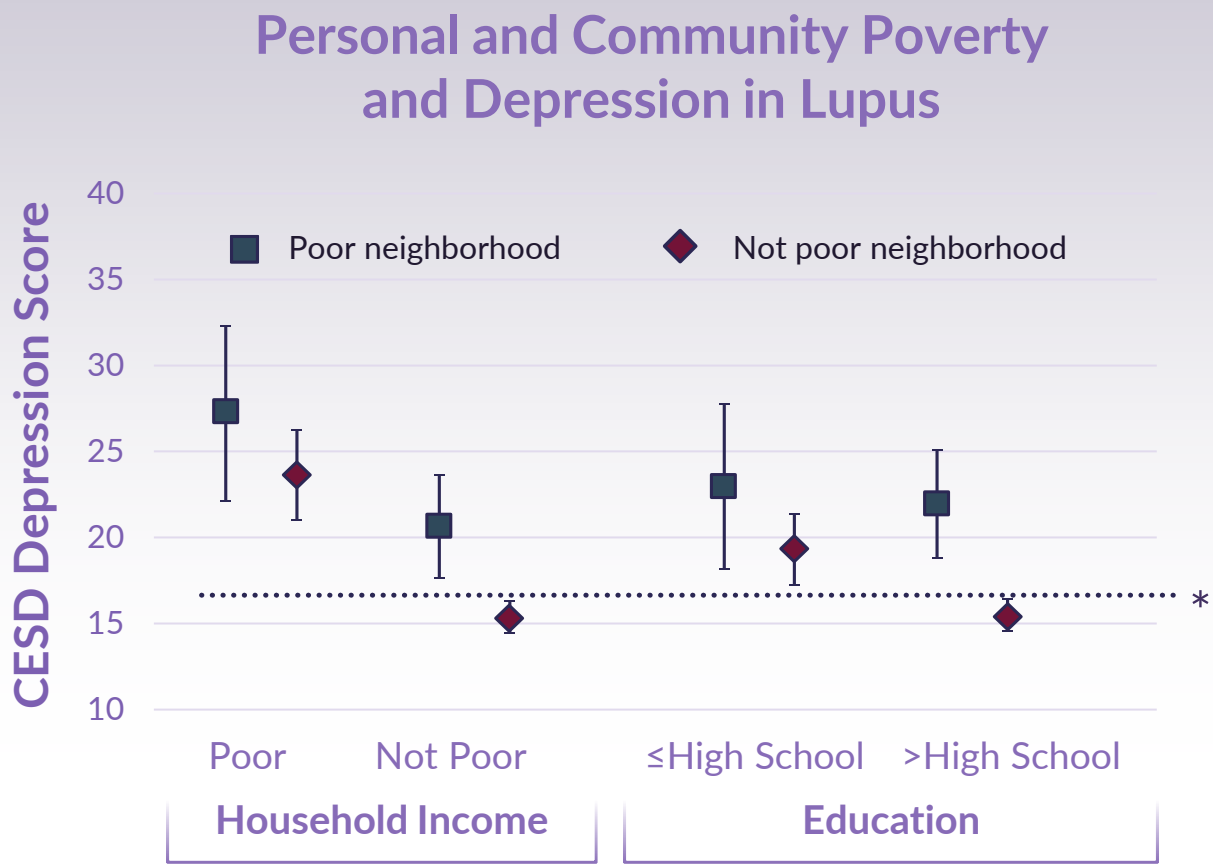
CDC. MMWR Morb Mortal Wkly Rep. 2002;51:371-374.

Korbet SM, Schwartz MM, Evans J, Lewis EJ, Collaborative Study Group. J Am Soc Nephrol. 2007;18:244-254.

Trupin L, Tonner MC, Yazdany J, et al. J Rheumatol. 2008;35(9):1782-1788.

Poverty and Outcomes in Lupus

- **The neighborhood effect:** personal poverty and living in a poor neighborhood both lead to worse lupus outcomes, including physical function and depression symptoms
- Mechanisms unclear, but hypotheses include:
  - Lack of resources for a healthy life (e.g., healthy food, healthcare)
  - Fewer supportive social networks
  - Stressors, such as violence, safe living conditions, psychological safety and well-being, psychological stress



Trupin L, Tonner MC, Yazdany J, et al. The role of neighborhood and individual socioeconomic status in outcomes of systemic lupus erythematosus. J Rheumatol. 2008;35(9):1782-1788.

**Indicative of clinically significant depressive symptoms.*

The Role of Environmental Factors

- Differential exposures among racial/ethnic minorities and the poor may contribute to health disparities
- Examples include:
  - Smoking is associated with worse lupus outcomes and is more prevalent among minorities and the poor
  - Poverty is associated with poor diet, which can lead to comorbidities, such as obesity or hypertension, which are associated with poorer lupus outcomes
  - Racism at personal, societal and institutional levels can lead to psychological stress, anxiety, depression, all of which increase the risk of lupus flares and poor outcomes

Ward MM, Studenski S. *Arch Intern Med*. 1992;152(10):2082-2088.

Ginzler EM, Felson DT, Anthony JM, Anderson JJ. *J Rheumatol*. 1993;20(10):1694-1700.

The Role of Healthcare—Access

- Low-income individuals with lupus are less likely to see a lupus specialist (rheumatologist) for healthcare
- Low-income individuals enrolled in the Medicaid program travel significantly farther to see a physician for lupus, suggesting geographic barriers to care
- Access to pharmacy and to transportation to get to a physician are more limited in low-income individuals that can interfere with healthcare access

Yazdany J, Gillis JZ, Trupin L, et al. Arthritis Rheum. 2007;57(4):593-600.
Gillis JZ, Yazdany J, Trupin L, et al. Arthritis Rheum. 2007;57(4):601-607

The Role of Healthcare—Trust

- Black individuals with lupus were less willing to receive potent immunosuppressive medications for kidney disease than White individuals living with lupus
- This racial/ethnic difference was mediated by less trust in physicians and lower perceived medication effectiveness
- Blacks in the U.S. are more likely to perceive racism in healthcare
- Higher perceived racism in Blacks in the U.S. is associated with higher levels of depression in SLE
- Structural racism and Implicit bias in healthcare teams and systems can erode the trust of racial minorities in healthcare systems

Vina ER, Masi CM, Green SL, Utset TO. Rheumatology (Oxford). 2012;51(9):1697-1706; Vina ER, Hausman RM, Tuset TO et al. LupusScience & Medicine 2015;2:e000110.

The Role of Healthcare—Delivery

Disparities in healthcare quality may arise from:

- Insurance coverage and type*
- Inadequate cultural competency of providers
- Poor patient-provider communication
- Bias and discrimination
- Patient preference for less-aggressive treatment*
- Poor adherence*
- Language barriers
- Lack of participation in clinical trials*
- Inadequate diversity of the healthcare workforce

*These factors have been documented as sources of disparities in healthcare quality in studies of lupus

Yazdany J, Trupin L, Tonner C, et al. J Gen Intern Med. 2012;27(10):1326-1333.

Vina ER, Masi CM, Green SL, Utset TO. Rheumatology (Oxford). 2012;51(9):1697-1706.

Uribe AG, Ho KT, Agee B, et al. Lupus. 2004;13(8):561-568.

Reducing Health Disparities in Lupus

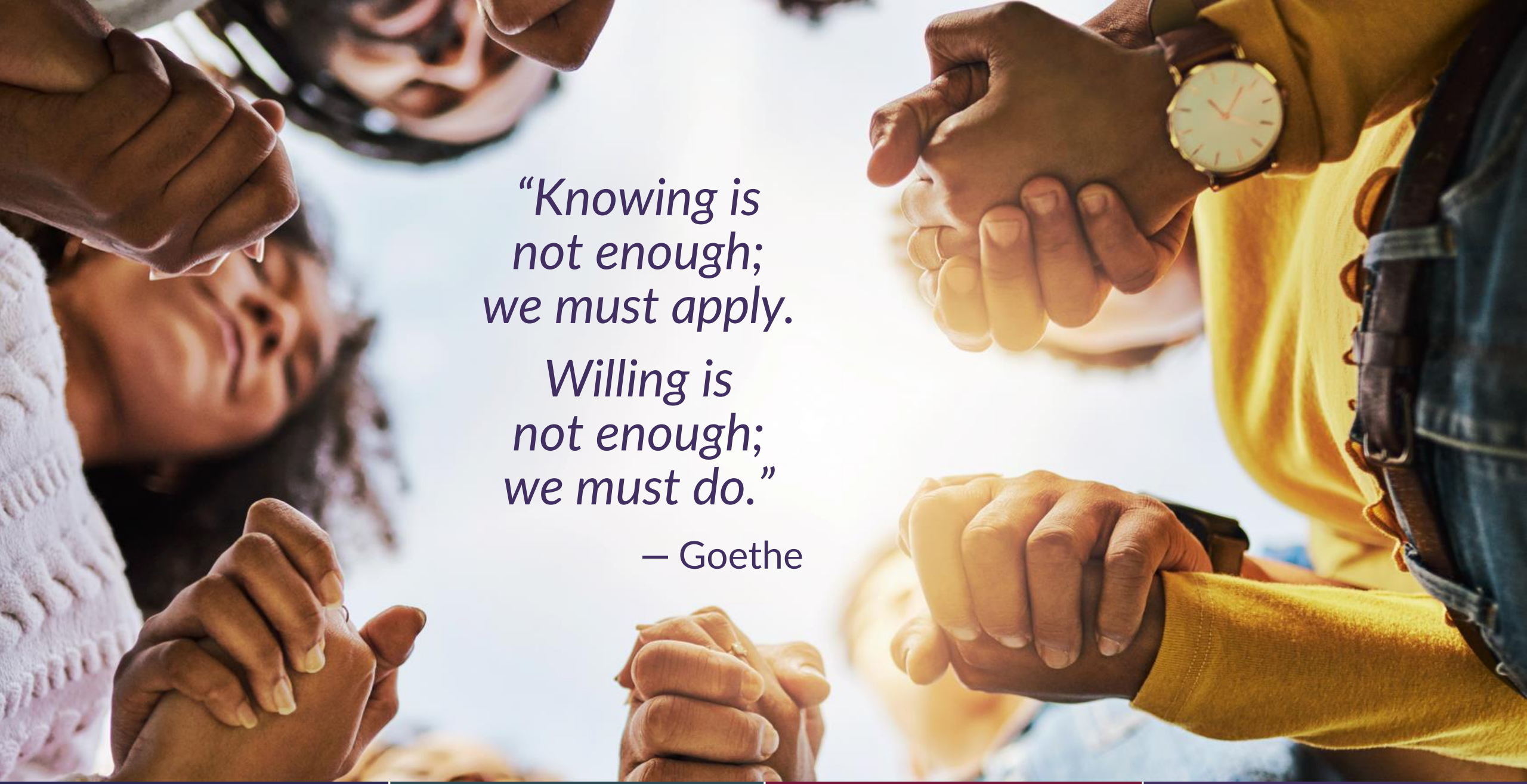
Health disparities in lupus have complex causes and therefore require broad and multidisciplinary solutions at the individual, community, healthcare system, and population levels

- *Educate* – improve awareness of the disease among providers and the public
- *Collect data* – promote consistent, reliable, and longitudinal data collection to identify the nature and extent of lupus disparities
- *Intervene* – develop and target initiatives to improve health and healthcare for lupus and measure changes over time

Reducing Health Disparities in Lupus

- *Access* – expand access to appropriate healthcare for lupus
- *Train* – train healthcare providers regarding the impact of health disparities and the relevance of cultural and linguistic competency
- *Engage* – meaningfully engage communities to develop strategies to mitigate negative social determinants of health, which can then prevent and/or help early and more effective treatment of serious infections in people with low socio-economic status and/or racial/ethnic minorities

Feldman CH, Hiraki LT, Winkelmayer WC, et al. Arthritis & Rheumatology 2015, 67(6):1577-1585


"Knowing is not enough; we must apply.
Willing is not enough; we must do."
— Goethe

American College of Rheumatology
Empowering Rheumatology Professionals

the lupus initiative
Eliminating Health Disparities in Lupus

Visit: https://thelupusinitiative.org/

The project described is, in part, supported by the Centers for Disease Control and Prevention under Cooperative Agreement Number NU58 DP006138. Its contents are solely the responsibility of its developers/authors. Points of view or opinions do not, therefore, necessarily represent official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services