

# Effects of Comorbidities on Self-Reported Quality of Life in US Adults with Systemic Lupus Erythematosus (SLE): A Pooled Analysis of the 2016-2022 Medical Expenditure Panel Survey (MEPS)

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## BACKGROUND

- Systemic lupus erythematosus (SLE) is a chronic autoimmune disease with substantial disease burden, impacting about 0.07% to 0.14% of the US population.<sup>1,2</sup>
- Compared to the general population, patients with SLE
  - Broad impairment on health-related quality of life (HRQoL) spanning physical and psychological domains,<sup>3</sup> and
  - Experience higher rates of comorbidities such as renal, cardiovascular, and mental health disorders.<sup>4,5</sup>
- Current 2025 ACR SLE treatment guideline does not provide formal recommendations regarding management of comorbidities in SLE.<sup>6</sup>
- Understanding the impact of comorbidities on HRQoL is important for identifying comorbidities for prioritization in comprehensive SLE management strategy.

## OBJECTIVE

- To assess the effect of comorbidities on self-reported HRQoL outcomes among adults with SLE using data from a nationally representative survey

## METHODS

### Data source

- 2016-2022 Medical Expenditure Panel Survey (MEPS)
- Cross-sectional

### Patient inclusion criteria

- Adults with SLE diagnosis (ICD-10 code, M32),
- Positive MEPS survey weights, and
- ≥ 1 inpatient /emergency room (ER) visit, 2 outpatient visits, or 1 outpatient rheumatology visit associated with SLE diagnosis, or use of SLE-related medications

### Exposure

- 12 comorbidities reported in literature to be more common in SLE than general population<sup>4,5</sup>

### Outcomes

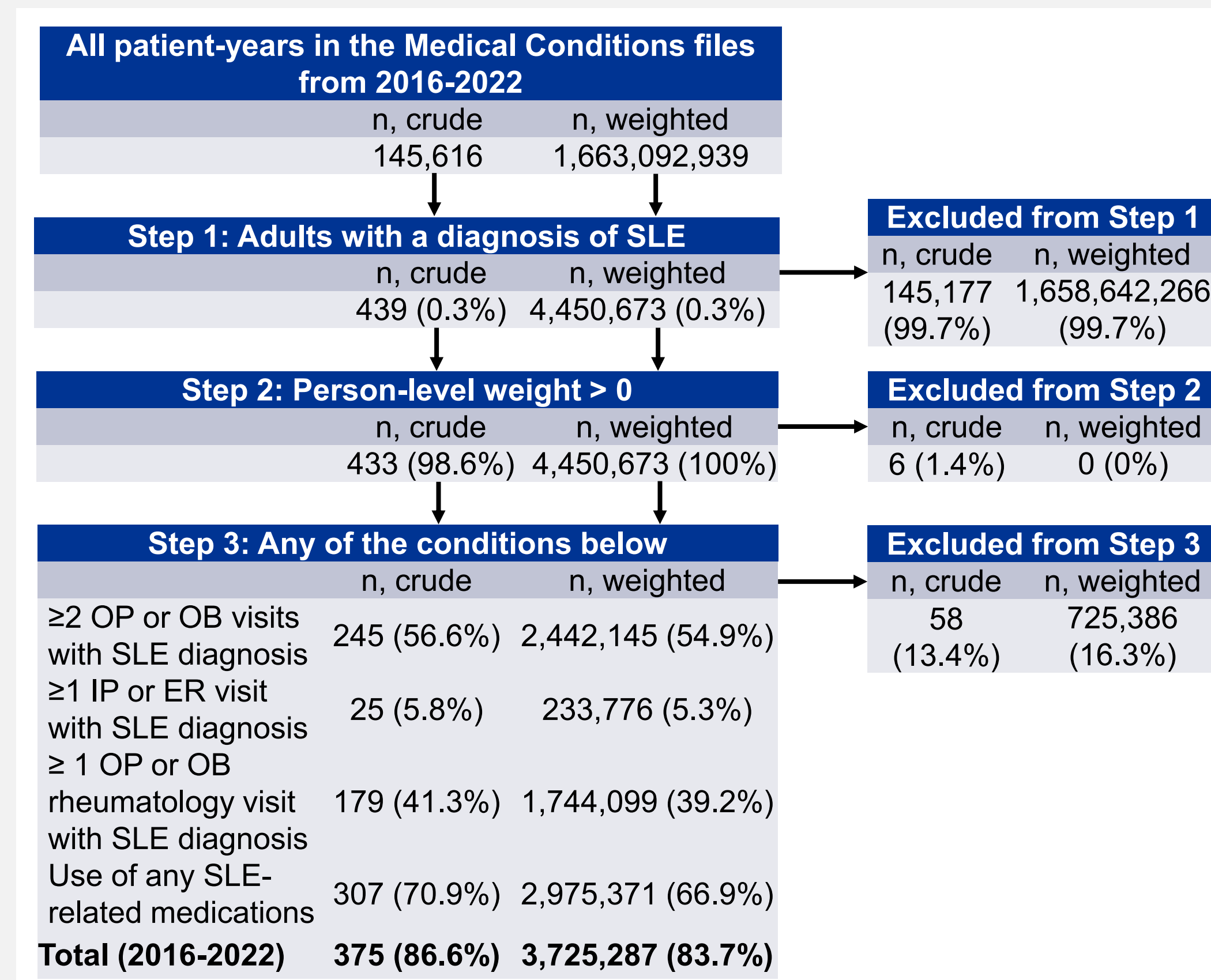
- Average marginal effect of each comorbidity on HRQoL outcomes was estimated using multivariable regressions, capturing all 10 comorbidities, age, sex, race/ethnicity, geographic region, marital status, insurance, years of education, and survey year as independent variables
- Veterans-RAND 12-Item Health Survey (VR-12) Physical Component Summary (PCS) and Mental Component Summary (MCS) scores (higher score = better health)
  - Ordinary linear regression (range = 0-100)
- Perceived health and perceived mental health
  - Ordered logistic regression (excellent, very good, good, fair, poor)

### Statistical analysis

- All statistical analyses accounted for survey structure by incorporating individual-level weights, sampling strata, and primary sampling unit variables.
- Benjamini-Hochberg procedure (false discovery rate = 0.10) was applied to reduce the risk of Type I error due to multiple comparisons.

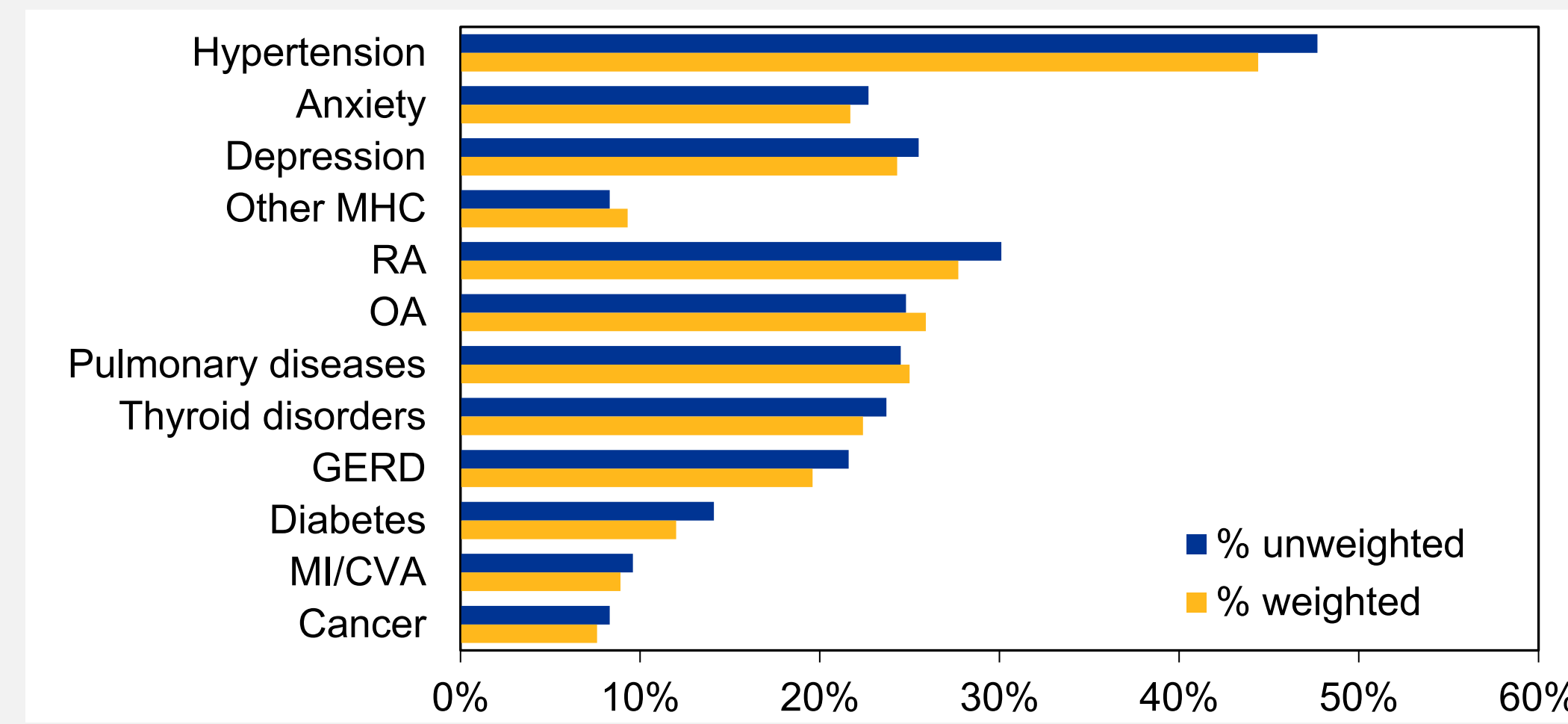
## RESULTS

Figure 1. Sample selection



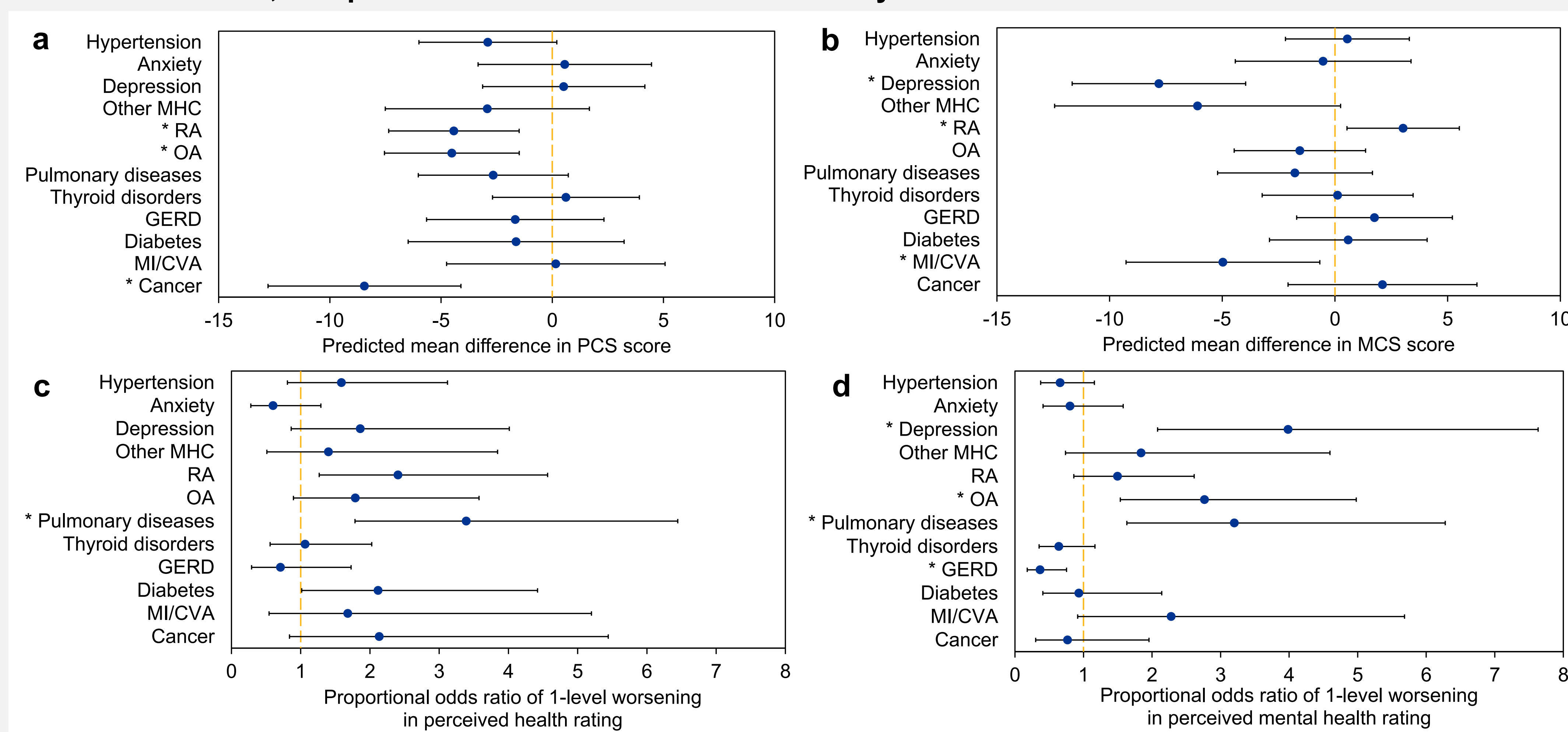
OB, office-based provider; OP, outpatient; SLE, systemic lupus erythematosus

Figure 2. Comorbidity distribution



GERD, gastroesophageal reflux disease; MHC, mental health conditions; MI/CVA, myocardial infarction/cerebrovascular accident; OA, osteoarthritis; RA, rheumatoid arthritis

Figure 3. Results from multivariable regression models on the association between each comorbidity and HRQoL outcome variables, compared to those without the comorbidity



GERD, gastroesophageal reflux disease; HRQoL, health-related quality of life; MCS, mental component summary; MHC, mental health conditions; MI/CVA, myocardial infarction/cerebrovascular accident; OA, osteoarthritis; PCS, physical component summary; RA, rheumatoid arthritis

\*Statistically significant after applying Benjamini-Hochberg procedure to adjust for multiple comparisons

Table 1. Baseline characteristics

Variable	Result
Sample size (n)	Unweighted: 375 Weighted: 532,184 per year
Age, mean (SE)	53.0 (0.9)
Female, n (%)	482,894 (90.7%)
Race/ethnicity, n (%)	
Hispanic	69,247 (13.0%)
Non-Hispanic White only	302,729 (56.9%)
Non-Hispanic Black only	114,716 (21.6%)
Non-Hispanic Asian only	13,886 (2.6%)
Non-Hispanic other race or multiple race	31,606 (5.9%)
Geographic region, n (%)	
Northeast	112,142 (21.3%)
Midwest	104,486 (19.9%)
South	219,429 (41.7%)
West	90,145 (17.1%)
Insurance coverage, n (%)	
<65 Any private	250,754 (47.1%)
<65 Public only	137,133 (25.8%)
<65 Uninsured	16,583 (3.1%)
65+ Edited Medicare only	48,020 (9.0%)
65+ Edited Medicare and private	58,901 (11.1%)
65+ Edited Medicare and other public only	15,907 (3.0%)
65+ No Medicare and any public/private	4,887 (0.9%)
Years of education, mean (SE)	13.7 (0.1)
Quan-Charlson Comorbidity Index, mean (SE)	1.4 (0.0)
VR-12 PCS score, mean (SD)	37.6 (13.6)
VR-12 MCS score, mean (SD)	46.5 (11.4)
General health status, n (%)	
Excellent	20,626 (3.9%)
Very good	96,870 (18.4%)
Good	156,570 (29.8%)
Fair	152,806 (29.1%)
Poor	98,444 (18.7%)
Mental health status, n (%)	
Excellent	104,092 (19.8%)
Very good	125,411 (23.9%)
Good	167,013 (31.8%)
Fair	102,827 (19.6%)
Poor	25,973 (4.9%)

MCS, mental component summary; PCS, physical component summary; SD, standard deviation; SE, standard error; VR-12, Veterans-RAND 12-Item Health Survey

## DISCUSSION

- Patient demographics were consistent with prior epidemiology estimates; Hispanic and Non-Hispanic Black individuals were modestly underrepresented.<sup>1,7</sup>
- SLE patients overall had average PCS and MCS scores less than 50, indicating poorer HRQoL in both physical and mental components compared to a standard US population
- Few comorbidities were independently associated with HRQoL reduction in SLE, contrasting with studies in generally asymptomatic conditions such as hypertension,<sup>8</sup> where numerous comorbidities drove HRQoL decline, suggesting that the baseline impact of SLE may limit the observable impact of additional comorbidities.
- Depression's significant association with decline in MCS score and perceived mental health were consistent with findings from European and Asian studies<sup>9-11</sup>
- Pulmonary diseases' association with decline in HRQoL were consistent worse SF-36 physical functioning and vitality scores associated with asthma and COPD<sup>12</sup>
- While no prior studies have reported the impact of OA and MI/CVA in SLE patients, these conditions aligned with the SLICC/ACR Damage Index, which were associated with persistently worsened physical HRQoL even among SLE patients who have achieved adequate treatment response in a post-hoc analysis of clinical trials in SLE.<sup>13</sup>

## LIMITATIONS

- Cross-sectional design limited interpretation to association and not causal estimations.
- Self-reported diagnoses were subject to recall bias and misclassification bias.
- Duration of SLE and comorbidities was not captured, potentially underestimating HRQoL impact as patients with long-standing disease may have become accustomed to disease-related HRQoL impairments.

## CONCLUSIONS

- Among patients with SLE, depression, OA, MI/CVA, pulmonary diseases, and cancer were associated with additional impairment on physical or mental aspects of patient-reported quality of life.
- While SLE's primary treatment objectives are to achieve SLE disease control, it is important for clinicians and population health decision makers to ensure appropriate management of these comorbidities to improve patients' overall quality of life.

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Disclosures: None