

Economic Burden of Systemic Lupus Erythematosus (SLE) Among Women in the USA: A Systematic Review

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Background

- Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by aberrant activation of innate and adaptive immune pathways, leading to widespread inflammation and multiorgan damage. The disease can affect the skin, joints, kidneys, cardiovascular system, and central nervous system, resulting in diverse and often debilitating clinical manifestations.
- SLE is a global disease and predominantly affects women of childbearing age, with a female-to-male ratio as high as 13:1 in this population, and ratios of 2:1 among children and the elderly. Disease onset typically occurs between 15 and 44 years, amplifying its clinical and socioeconomic impact during the most productive years of life.
- The clinical presentation can vary significantly among patients, making diagnosis challenging. Common symptoms include fatigue, joint pain and swelling, skin rashes, and fever. Severe cases may lead to complications such as lupus nephritis, cardiovascular disease, and neurological disorders.
- The economic burden of SLE is substantial, encompassing both direct costs (hospitalizations, medications, and outpatient care) and indirect costs (loss of productivity and work disability). However, evidence suggests wide variation in cost drivers, healthcare resource utilization patterns, and outcomes across disease severity, race, and pregnancy status.
- Given these disparities and the disproportionate burden on women, we conducted a systematic literature review (SLR) to synthesize recent U.S. evidence (2014–2024) on the economic and healthcare resource utilization impact of SLE among women.

Objective

- To synthesize evidence on the direct and indirect economic burden of Systemic Lupus Erythematosus (SLE) among women in the United States.

Methodology

Eligibility Criteria

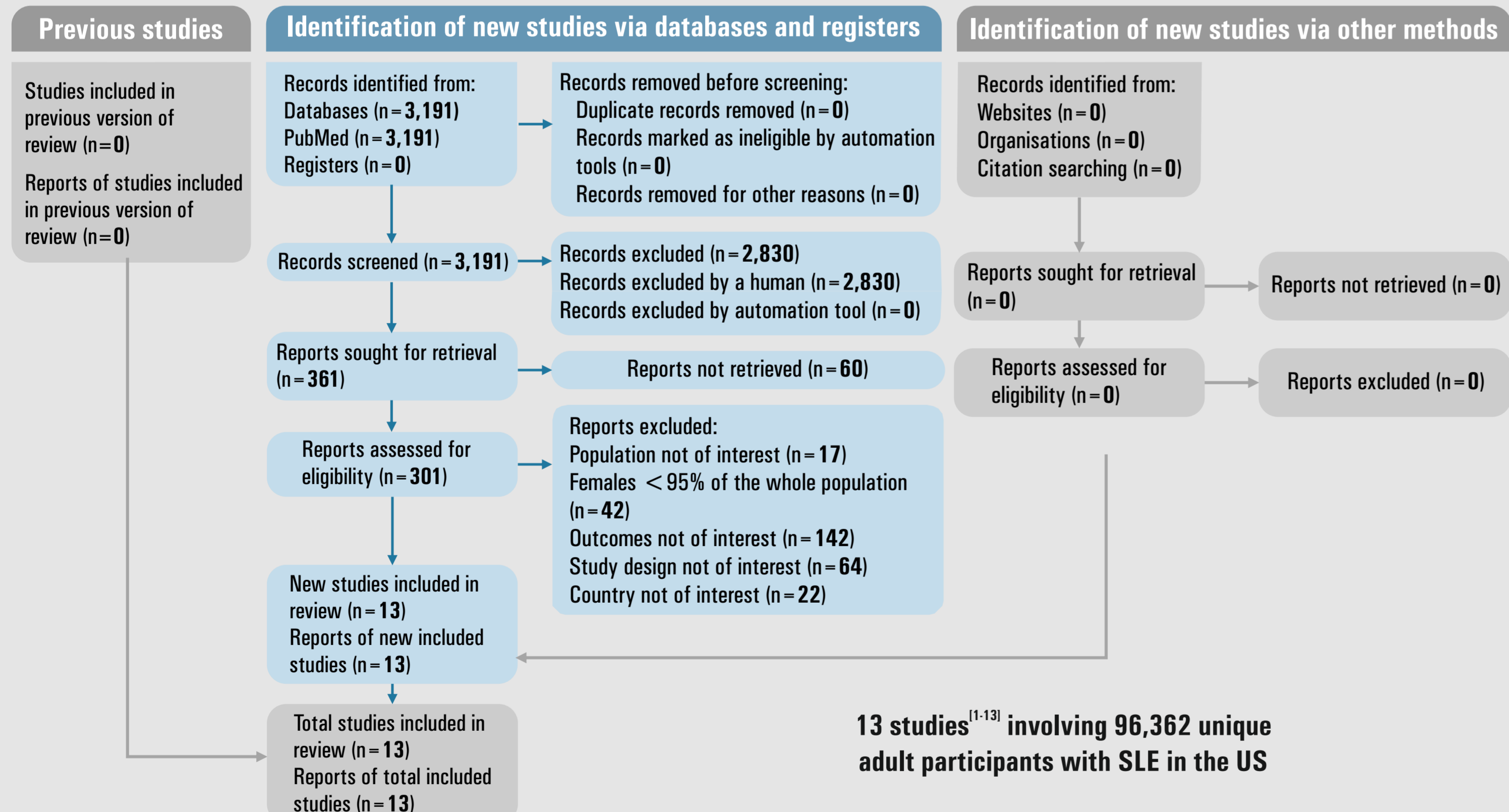
Facet	Inclusion
Participants	<ul style="list-style-type: none"> Female patients* from the US aged 15-65 years, suffering from SLE of any form or severity, including: <ul style="list-style-type: none"> All forms and severity of SLE (Mild SLE, Moderate SLE, Severe SLE, juvenile-onset SLE, etc) All forms of Cutaneous Lupus Erythematosus Lupus Nephritis Lupus involving other organ systems, including Neuropsychiatric Lupus, Hematologic Lupus, Cardiopulmonary Lupus, Gastrointestinal Lupus, Musculoskeletal Lupus, etc Overlap Syndromes (Involves features of SLE along with other autoimmune diseases such as rheumatoid arthritis, scleroderma, and Sjogren's syndrome.) Drug-Induced Lupus
Intervention and Comparators	No restriction based on interventions and comparators
Outcomes	<ul style="list-style-type: none"> Healthcare costs: Total costs, direct and indirect costs, productivity loss, other costs of illness Resource utilization: Hospitalisation, length of stay in hospital & ICU, OP visits, ER visits, utilization of lab, imaging and other tests etc.
Study design	<ul style="list-style-type: none"> Included: RWE studies including prospective/ retrospective observational studies, cohort studies, cross-sectional studies, etc; RCTs reporting costs or economic outcomes; burden of illness studies Excluded: Case-reports and case series; non-primary studies (such as reviews, editorials, case reports, etc) -

*Studies with ≥ 95% females were included; studies with < 95% female participants were excluded

The SLR adhered to the PRISMA 2020 guidelines

- Literature sources:** PubMed; reference lists of identified SLRs for additional potential studies
- Screening protocol:** Fully human, dual independent review with reconciliation; two levels (title-abstract, full-text)
- Data extraction:** Based on a standardized data extraction template.
- Risk of Bias:** Using appropriate scales, such as RoB 2 for RCTs and the Newcastle-Ottawa Scale for observational studies.

Results

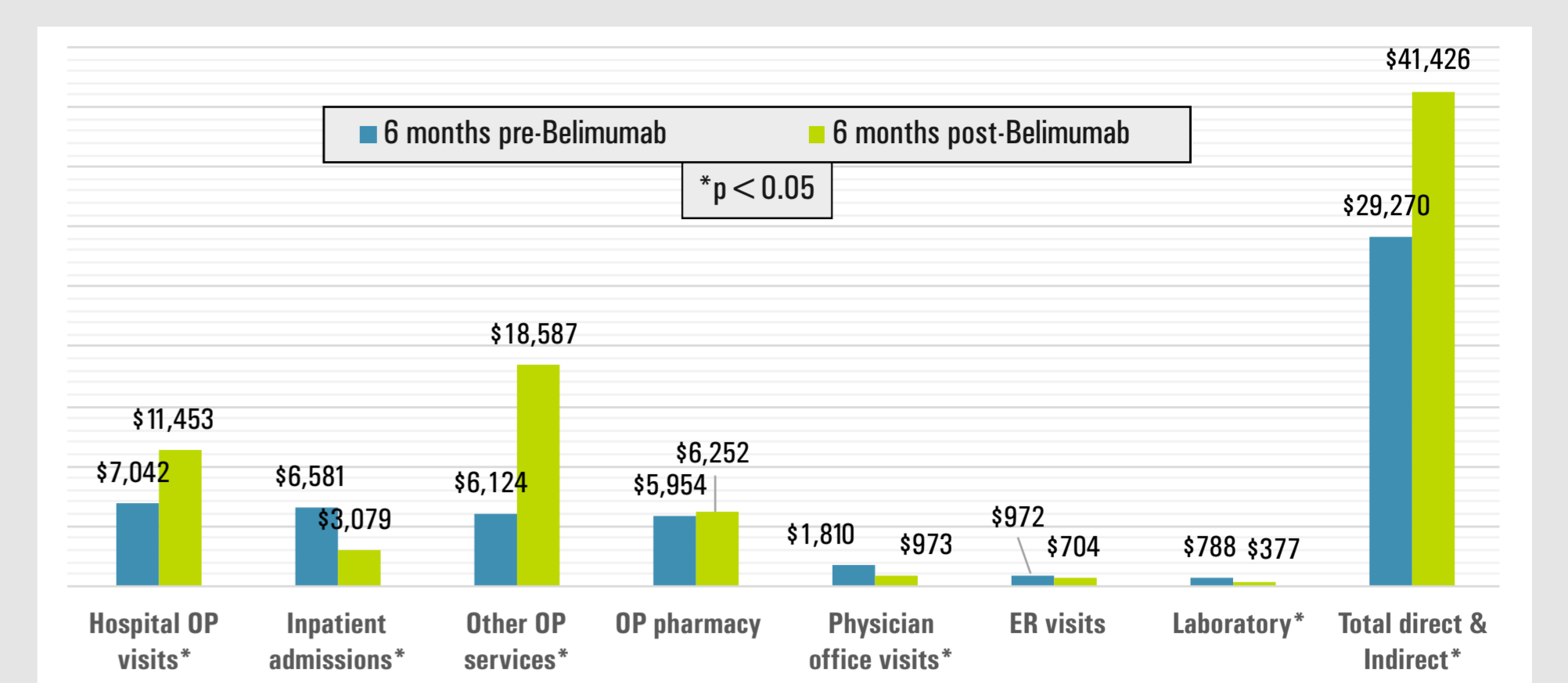


Study and Patient Characteristics

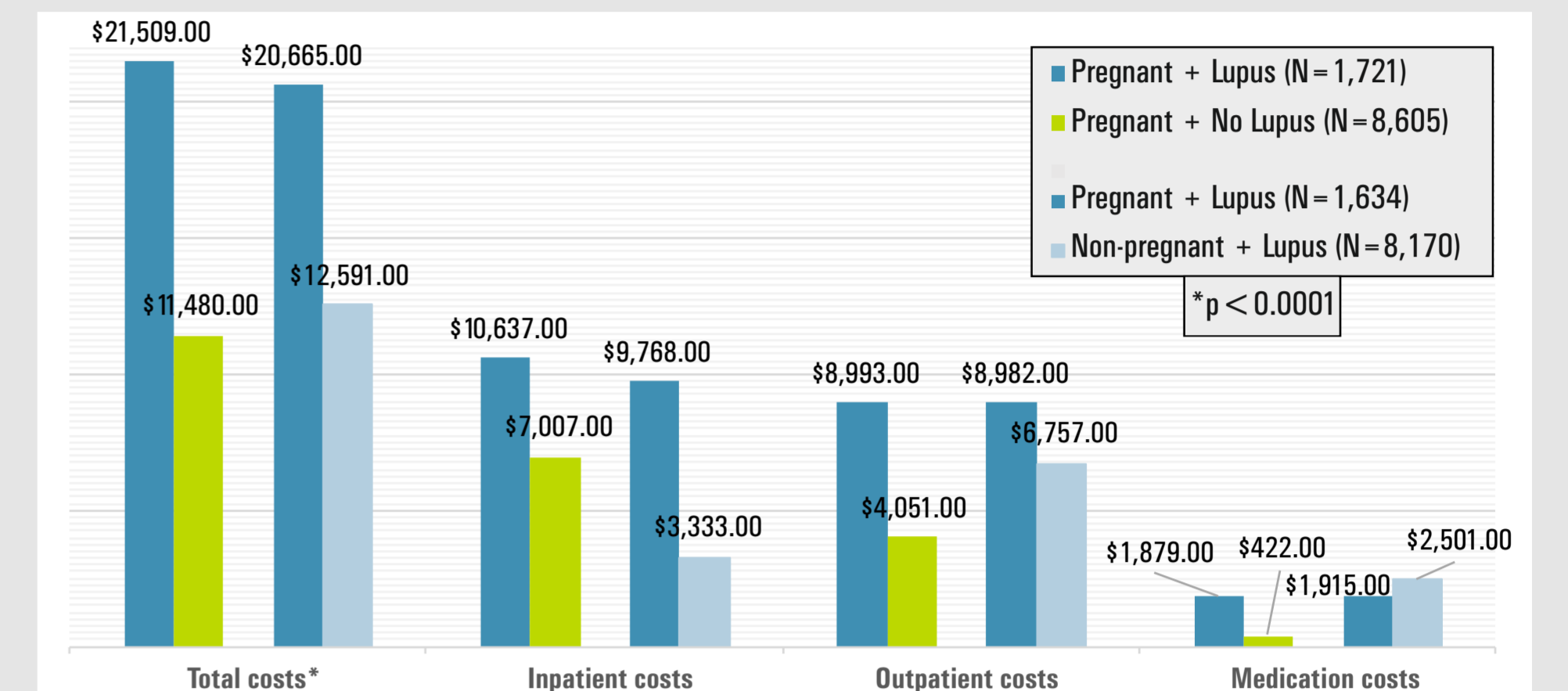
- Data Sources**
 - Hospital databases: 8 studies
 - Claims database (Medicaid Analytic eXtract, MAX): 4 studies
 - Survey: 1 study
- Study Design**
 - Prospective observational: 2 studies
 - Retrospective observational: 11 studies
- Type of Outcomes***
 - Healthcare resource utilization: 12 studies
 - Cost analysis: 3 studies
 - * 2 studies (Bell et al, 2020 and Ling et al, 2018) reported HRU and Costs
- Demographic Characteristics**
 - Gender Distribution:
 - 7/13 studies reported outcomes separately for female patients
 - 6/13 studies reported outcomes for mixed genders, but had ≥ 95% female participants
 - Females constituted 99.51% of the study population (95,889/96,362)
 - Age (years):
 - Mean reported in 10 studies: Range 19.4 to 52.8 years
 - Median age reported in 2 studies: 24.5 to 34.0 years
 - One study reported both mean and median
 - Not reported in 2 studies
 - Other parameters
 - Disease duration:
 - Reported by 4 studies
 - Mean disease duration ranged from 2.8 to 15.6 years
 - Disease severity:
 - Reported by 4 studies
 - No clear pattern
 - Race:
 - Reported by 8 studies
 - Most patients in our data set were African American (44%) followed by White (31%)

Healthcare Costs

- Bell et al, 2020:** Total direct and indirect costs among SLE patients increased significantly within 6 months of initiating belimumab, driven mainly by outpatient and hospital-based outpatient services, despite reduced costs from SLE-related hospitalizations.



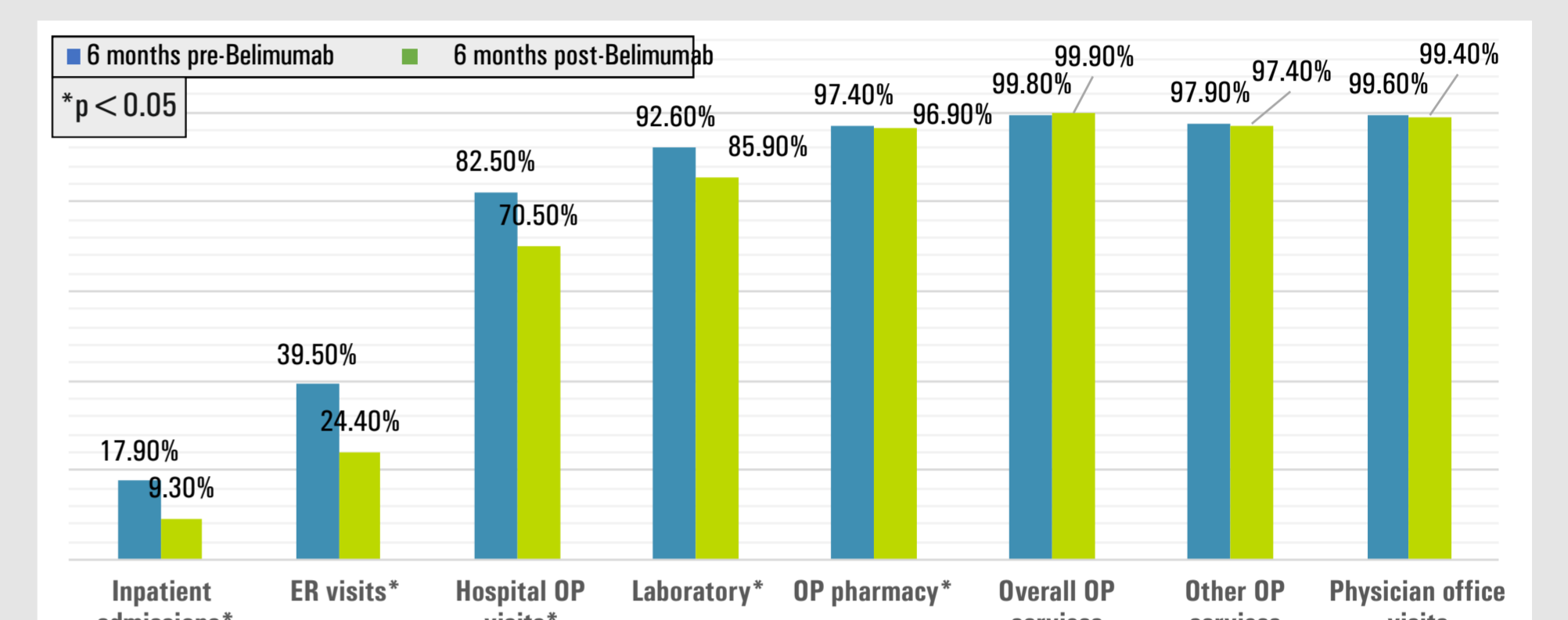
- Petri et al, 2018:** Pregnant women with SLE incurred significantly higher total direct healthcare costs than both pregnant women without lupus and non-pregnant women with lupus, driven by higher OP and IP costs; however, medication costs were higher among non-pregnant women with lupus.



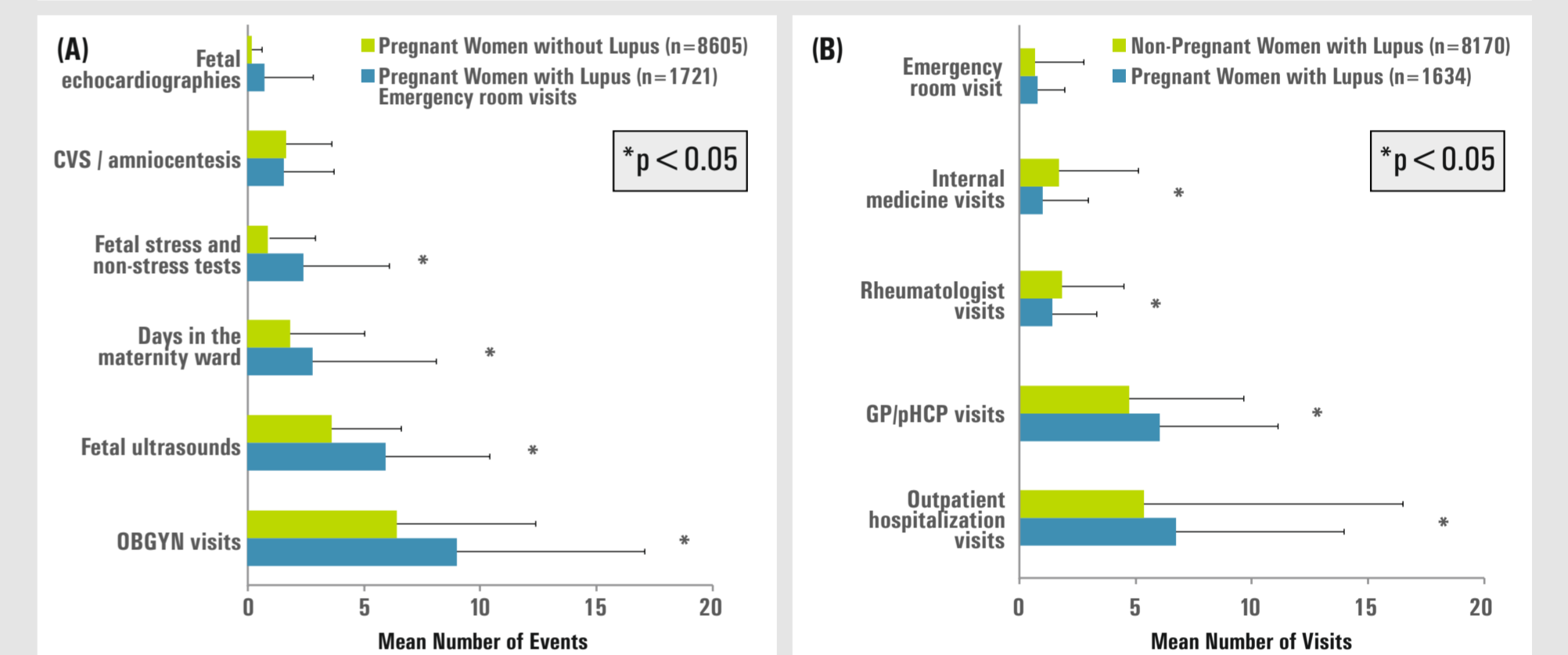
- Ling et al, 2018:** Median hospitalization costs were significantly higher among women with SLE compared to those without SLE (USD 11,146 vs 7,198; p < 0.001).

Healthcare Resource Utilization

- Bell et al, 2020:** The proportion of SLE patients using inpatient, emergency, hospital-based outpatient, laboratory, and pharmacy services decreased significantly within 6 months of initiating belimumab; however, no significant differences were observed in overall OP, physician, or other outpatient service use.



- Petri et al, 2015:** Pregnant women with SLE incurred significantly higher total direct healthcare costs than both pregnant and non-pregnant women without lupus, driven by greater outpatient and inpatient costs; however, medication costs were higher among non-pregnant women with lupus



- Chandler et al, 2023:** Outpatient, inpatient, and ER visit trends did not differ significantly by race among SLE patients (Black, White, Hispanic, Asian, and Others); however, White women with SLE had lower odds of persistently high-dose steroid use compared with other racial groups.

Underuse of preventive and cardiovascular care

- Chen et al, 2019:** Despite elevated CVD risk, SLE patients were 66% less likely (OR 0.34, 95% CI 0.34–0.35) to have lipids tested and 82% less likely (OR 0.18, 95% CI 0.18–0.18) to fill a statin prescription compared with patients with diabetes; they were also 11% less likely (OR 0.89, 95% CI 0.84–0.94) than general Medicaid patients to fill a statin prescription.

Hospitalization and ER visits:

- Chen et al, 2020:** patients with SLE had twice the hospitalization rate for atrial fibrillation (1.4 vs 0.7 per 1000 person-years) compared with matched general Medicaid patients.
- Chevet B et al:** SLE patients had a 2.5-fold higher risk of first hospitalization and were 2.7-fold more likely to experience a first ED visit than the general population; they were also more likely to be hospitalized following an ED visit.

Sex and age differences:

- Feldman et al, 2018:** Females with SLE had 33% more ED visits (IRR 1.33, 95% CI 1.11–1.59), 14% more outpatient visits (IRR 1.14, 95% CI 1.03–1.25), and 18% higher hospitalization rates (IRR 1.18, 95% CI 0.98–1.41; not significant) than males.
- Haro et al, 2020:** Young adults with childhood-onset SLE showed reduced HCRU after transfer to adult care, with fewer rheumatology-managed cases (74% vs 100%) and rheumatology visits in the past year (68% vs 94%), while ER visits and hospitalizations remained similar.

Impact of comorbidities and interventions

- Corcelles et al, 2015:** Among morbidly obese lupus patients, bariatric surgery reduced immunosuppressive therapy use at 3-year follow-up: 42% reported a reduction, and 19.0% discontinued steroids completely.

General observations

- Speyer (2020), Feldman (2020), and Fernandez (2020)** studies quantified HCRU among SLE patients but did not include external comparators or contextual analyses

Risk of bias:

- Based on the Newcastle–Ottawa Scale (NOS), seven studies were judged to have low, five moderate, and one high risk of bias

Discussion

- Cost burden:** Across more than 96,000 adults with SLE, women consistently demonstrated high direct and indirect costs, largely driven by outpatient and hospital-based services rather than inpatient stays. This pattern reflects a shift toward ambulatory, chronic disease management that remains resource-intensive despite advances in therapy.
- Pregnancy impact:** Costs increased substantially during pregnancy, emphasizing the added economic and care complexity for women of reproductive age and underscoring the need for early, coordinated multidisciplinary management.
- Preventive care gaps:** Underuse of lipid testing and statin therapy, despite elevated cardiovascular risk, suggests systemic inefficiencies in preventive care that may worsen long-term morbidity and cost trajectories.
- Healthcare utilization patterns:** SLE care is characterized by frequent outpatient visits and recurrent hospitalizations, with outpatient care emerging as the dominant driver of resource use. Persistent engagement with multiple specialists highlights the complexity of managing multisystem involvement.
- Equity considerations:** Racial differences in utilization were modest, but disparities in treatment intensity, particularly lower steroid exposure among White women, suggest inequities that warrant further evaluation.
- Population context:** Nearly all included participants were female, aligning with real-world disease distribution and reinforcing that the healthcare and economic burden of SLE in the U.S. is overwhelmingly borne by women.
- Limitations**
 - Most studies were retrospective and English-language, with heterogeneity in cost definitions, reporting periods, and data sources.
 - Indirect costs such as productivity loss and caregiver burden were underreported: total economic burden may be underestimated.

Conclusion

SLE continues to exact a heavy and complex toll on women's health and healthcare systems in the United States. **Economic costs** surge during pregnancy and remain dominated by outpatient and hospital-based services, while **resource utilization** reflects the relentless, multidisciplinary demands of chronic disease management. Closing preventive care gaps and addressing treatment inequities are essential steps toward reducing the human and financial weight of SLE in this high-risk population.

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