

# Healthcare Resource Utilization and Costs of Management of Lupus Nephritis in Adult and Juvenile Patients with Systemic Lupus Erythematosus

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## Background/Objectives

- LN is a serious manifestation of SLE, with considerable morbidity, including an increased risk of end-stage kidney disease (ESKD), that may impose a substantial economic burden on the healthcare system.
- For patients with refractory LN, disease outcomes may be worse compared to those without refractory disease,<sup>1,2</sup> further impacting costs and resource use.
- The objective of our study was to review and qualitatively summarize the evidence on costs and healthcare resource utilization (HCU) in patients with LN.



## Methods

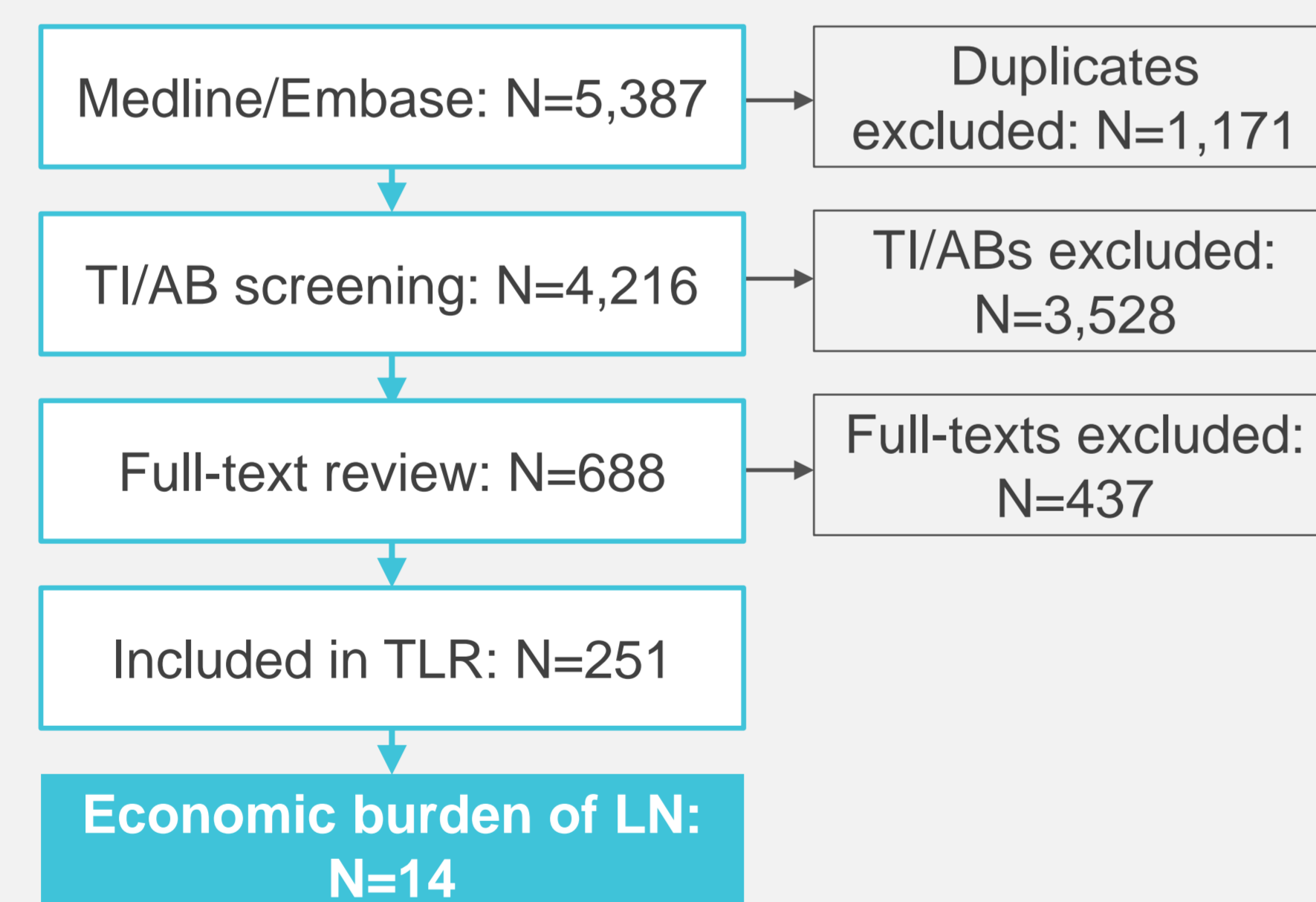
- A targeted literature review (TLR) was conducted in MEDLINE/Pubmed and Embase in adult and juvenile patients with diagnosed LN.
- Search strategies were developed to identify relevant peer-reviewed articles published in English between March 2012 and March 2022, and conference abstracts indexed in Embase since 2019.
- All records were screened by a single reviewer according to pre-specified inclusion and exclusion criteria.
- The current poster summarizes data on costs and HCU associated with management of adults and children with LN in clinical practice.



## Results

- Of 4,216 records identified in the medical databases, 14 studies<sup>3-16</sup> reported on real-world costs and HCU in patients with LN (Figure 1).
- The majority of studies were conducted in adult patients from the United States (USA) (n=9) or Sweden (n=2). The remaining studies included juvenile (n=1) or both adult and juvenile patients (n=2).

Figure 1. PRISMA diagram



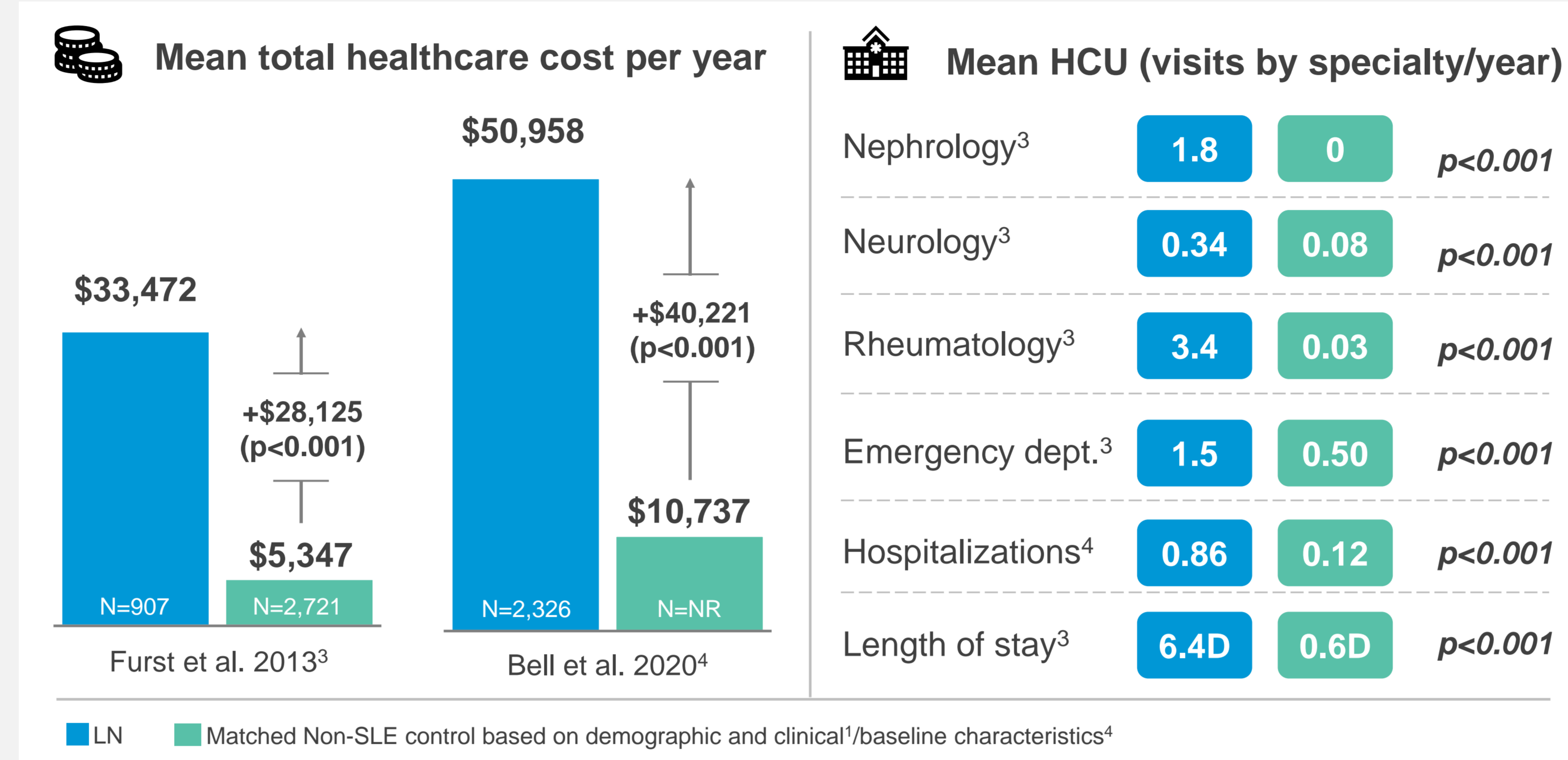
## Economic burden of LN in the USA

- In the USA, adult SLE patients with LN had significantly higher utilization of outpatient visit-related services and more hospitalization-based events per year with approximately 6-day longer length of stay (LOS), compared to matched patients without SLE<sup>3</sup> (Figure 2).
- Mean healthcare costs of LN management ranged from \$33,500 to \$51,000 per year,<sup>3-5</sup> roughly 5-7-times higher compared with matched non-SLE controls (p<0.05) (Figure 2).<sup>3,4</sup>
- The cost of care in LN was driven by inpatient stays<sup>3,6</sup> with one study reporting significantly higher average cost of hospitalization compared to patients with SLE without LN (\$11,200 vs \$9,109, respectively; p<0.001).<sup>7</sup>



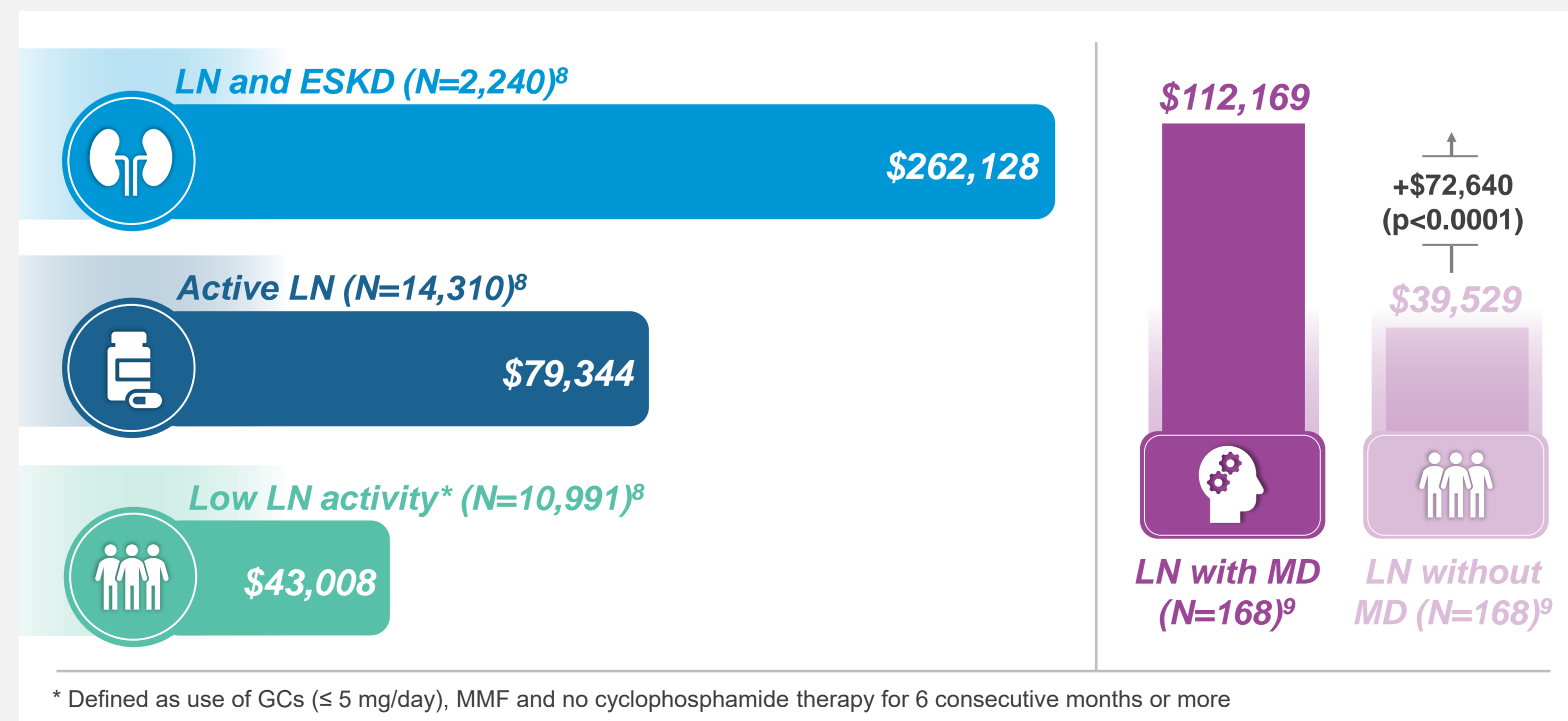
## Results (cont'd)

Figure 2. LN leads to significant excess healthcare costs and resource utilization compared to non-SLE controls.



- Active LN and ESKD further increased mean annual healthcare costs associated with LN to approximately \$79,000 and \$262,000, respectively<sup>8</sup> (Figure 3).
- Comorbid mental disorders (depression, anxiety, bipolar disorder or psychosis) significantly increased LN management cost by more than \$72,000 per patient/year compared to patients with LN without mental disorders (p<0.0001)<sup>9</sup> (Figure 3).

Figure 3. Active LN, development of ESKD and mental disorders (MD) are associated with significant mean annual all-cause healthcare cost increase for patients with LN.



\* Defined as use of GCs (≤ 5 mg/day), MMF and no cyclophosphamide therapy for 6 consecutive months or more

- When hospitalized, juvenile patients with LN had longer LOS by up to 1.6 days<sup>10,11</sup> on average compared to patients with SLE without LN receiving inpatient care (p=0.0001).<sup>10</sup>
- Mean hospitalization costs of juvenile LN was estimated at \$43,100 in 2006 and exceeded SLE-only inpatient care costs by \$14,600, driven by management of acute kidney failure, followed by kidney transplant and ESKD.<sup>11</sup>



## Results (cont'd)



## Economic burden of LN in Sweden

- Total direct costs and its components (inpatient, pharmaceutical) were significantly higher in patients with SLE with nephritis than in those without nephritis (p<0.05) (Table 1).<sup>12,13</sup>
- Patients with LN incurred higher mean annual total, direct and indirect cost (Swedish krona [SEK] 229,000) compared to SLE patients with arthritis (SEK 193,000) or with malar rash (SEK 182,000).<sup>12</sup>

Table 1. LN patients incur significantly higher direct and indirect healthcare costs and compared to patents with SLE only

| Outcome <sup>13</sup>  | SLE + LN (N=321) | SLE (N=1,023) | Cost/HCU increase         |
|------------------------|------------------|---------------|---------------------------|
| <b>Total cost</b>      | \$39,284         | \$33,369      | <b>+\$5,190</b> (p<0.05)  |
| <b>Direct cost</b>     | \$14,190         | \$10,188      | <b>+\$4,002</b> (<0.001)  |
| <b>Inpatient</b>       | \$8,243          | \$5,906       | <b>+\$2,337</b> (p=NR)    |
| <b>Outpatient</b>      | \$3,110          | \$2,220       | <b>+\$890</b> (p=NR)      |
| <b>Pharmaceuticals</b> | \$2,837          | \$2,062       | <b>+\$775</b> (p=NR)      |
| <b>Indirect cost</b>   | \$25,094         | \$23,181      | <b>+\$1,913</b> (p=0.003) |

\* Costs were adjusted to 2011 consumer price index and converted to 2011 USD with ECB currency exchange rate of 1 SEK = \$0.16 USD



## Conclusions

- Patients with LN have increased costs of care compared to patients with SLE only and controls without SLE in the US and Europe.
- The direct healthcare costs are especially increased in patients with active disease and those with ESKD.
- There is a high unmet need for effective therapies to treat LN, prevent its complications, and reduce economic burden on healthcare systems.



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## Author Disclosures and Acknowledgements

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