

## **Supplementary Material**

### **Methods**

#### **SLE-related conditions**

The presence of the following SLE-related conditions was used in the definition of moderate SLE flares:

- Acute pancreatitis
- Arthritis/arthralgia
- Chorioretinitis
- Demyelinating syndrome/acute inflammatory demyelinating polyradiculoneuropathy
- Dry eye/tear film insufficiency
- Episcleritis/scleritis
- Hemolytic anemia
- Hepatitis (non-viral)
- Ischemic necrosis of bone
- Nephritis
- Renal impairment other than nephritis or end stage renal disease
- Low white blood cell count (leukopenia, neutropenia, lymphocytopenia)
- Lupus enteritis/colitis
- Lymph node enlargement
- Mononeuropathy/polyneuropathy
- Myalgia/myositis
- Myelopathy

- Myocarditis
- Pericarditis
- Pleurisy/pleural effusion
- Pseudotumor cerebri
- Rash
- Seizure
- Urticaria
- Uveitis
- Vasculitis (excluding aortitis)

The presence of the following SLE-related conditions was used for the definition of severe SLE flares:

- Any moderate SLE-related condition
- Acute confusional state/psychosis
- Aortitis
- Arterial/venous thrombosis
- Aseptic meningitis
- Cardiac tamponade
- Cranial neuropathy
- Intestinal pseudo-obstruction
- End stage renal disease
- Optic neuritis

## Supplementary Tables

Supplementary Table 1. ICD-9-CM and ICD-10-CM renal diagnosis codes

ICD9-CM	Description
580	Acute glomerulonephritis with lesion of proliferative glomerulonephritis
580.4	Acute glomerulonephritis with lesion of rapidly progressive glomerulonephritis
580.8	Acute glomerulonephritis with other specified pathological lesion in kidney
580.81	Acute glomerulonephritis in diseases classified elsewhere
580.89	Acute glomerulonephritis with other specified pathological lesion in kidney
581	Nephrotic syndrome with lesion of proliferative glomerulonephritis
581.1	Nephrotic syndrome with lesion of membranous glomerulonephritis
581.2	Nephrotic syndrome with lesion of membranoproliferative glomerulonephritis
581.3	Nephrotic syndrome with lesion of minimal change glomerulonephritis
581.8	Nephrotic syndrome with other specified pathological lesion in kidney
581.81	Nephrotic syndrome in diseases classified elsewhere
581.89	Nephrotic syndrome with other specified pathological lesion in kidney
581.9	Nephrotic syndrome with unspecified pathological lesion in kidney
582	Chronic glomerulonephritis with lesion of proliferative glomerulonephritis

582.1	Chronic glomerulonephritis with lesion of membranous glomerulonephritis
582.2	Chronic glomerulonephritis with lesion of membranoproliferative glomerulonephritis
582.4	Chronic glomerulonephritis with lesion of rapidly progressive glomerulonephritis
582.8	Chronic glomerulonephritis with other specified pathological lesion in kidney
582.81	Chronic glomerulonephritis in diseases classified elsewhere
582.89	Chronic glomerulonephritis with other specified pathological lesion in kidney
582.9	Chronic glomerulonephritis with unspecified pathological lesion in kidney
583	Nephritis and nephropathy, not specified as acute or chronic, with lesion of proliferative glomerulonephritis
583.1	Nephritis and nephropathy, not specified as acute or chronic, with lesion of membranous glomerulonephritis
583.2	Nephritis and nephropathy, not specified as acute or chronic, with lesion of membranoproliferative glomerulonephritis
583.4	Nephritis and nephropathy, not specified as acute or chronic, with lesion of rapidly progressive glomerulonephritis
583.6	Nephritis and nephropathy, not specified as acute or chronic, with lesion of renal cortical necrosis
583.7	Nephritis and nephropathy, not specified as acute or chronic, with lesion of renal medullary necrosis

583.8	Nephritis and nephropathy not specified as acute or chronic with other specified pathological lesion in kidney
583.81	Nephritis and nephropathy, not specified as acute or chronic, in diseases classified elsewhere
583.89	Nephritis and nephropathy, not specified as acute or chronic, with other specified pathological lesion in kidney
583.9	Nephritis and nephropathy, not specified as acute or chronic, with unspecified pathological lesion in kidney
584.5	Acute kidney failure with lesion of tubular necrosis
584.6	Acute kidney failure with lesion of renal cortical necrosis
584.7	Acute kidney failure with lesion of renal medullary [papillary] necrosis
584.8	Acute kidney failure with other specified pathological lesion in kidney
584.9	Acute kidney failure, unspecified
585.1	Chronic kidney disease, Stage I
585.2	Chronic kidney disease, Stage II
585.3	Chronic kidney disease, Stage III
585.4	Chronic kidney disease, Stage IV
585.5	Chronic kidney disease, Stage V
585.6	End stage renal disease

585.9	Chronic kidney disease, unspecified
586	Renal failure, unspecified
791	Proteinuria
<b>ICD10-CM</b>	<b>Description</b>
M3214	Glomerular disease in systemic lupus erythematosus
M3215	Tubulo-interstitial nephropathy in systemic lupus erythematosus
N00	Acute nephritic syndrome
N000	Acute nephritic syndrome with minor glomerular abnormality
N001	Acute nephritic syndrome with focal and segmental glomerular lesions
N002	Acute nephritic syndrome with diffuse membranous glomerulonephritis
N003	Acute nephritic syndrome with diffuse mesangial proliferative glomerulonephritis
N004	Acute nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis
N005	Acute nephritic syndrome with diffuse mesangiocapillary glomerulonephritis
N006	Acute nephritic syndrome with dense deposit disease
N007	Acute nephritic syndrome with diffuse crescentic glomerulonephritis
N008	Acute nephritic syndrome with other morphologic changes
N009	Acute nephritic syndrome with unspecified morphologic changes
N01	Rapidly progressive nephritic syndrome

N010	Rapidly progressive nephritic syndrome with minor glomerular abnormality
N011	Rapidly progressive nephritic syndrome with focal and segmental glomerular lesions
N012	Rapidly progressive nephritic syndrome with diffuse membranous glomerulonephritis
N013	Rapidly progressive nephritic syndrome with diffuse mesangial proliferative glomerulonephritis
N014	Rapidly progressive nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis
N015	Rapidly progressive nephritic syndrome with diffuse mesangiocapillary glomerulonephritis
N016	Rapidly progressive nephritic syndrome with dense deposit disease
N017	Rapidly progressive nephritic syndrome with diffuse crescentic glomerulonephritis
N018	Rapidly progressive nephritic syndrome with other morphologic changes
N019	Rapidly progressive nephritic syndrome with unspecified morphologic changes
N02	Recurrent and persistent hematuria
N020	Recurrent and persistent hematuria with minor glomerular abnormality
N021	Recurrent and persistent hematuria with focal and segmental glomerular lesions
N022	Recurrent and persistent hematuria with diffuse membranous glomerulonephritis
N023	Recurrent and persistent hematuria with diffuse mesangial proliferative glomerulonephritis
N024	Recurrent and persistent hematuria with diffuse endocapillary proliferative

	glomerulonephritis
N025	Recurrent and persistent hematuria with diffuse mesangiocapillary glomerulonephritis
N026	Recurrent and persistent hematuria with dense deposit disease
N027	Recurrent and persistent hematuria with diffuse crescentic glomerulonephritis
N028	Recurrent and persistent hematuria with other morphologic changes
N029	Recurrent and persistent hematuria with unspecified morphologic changes
N03	Chronic nephritic syndrome
N030	Chronic nephritic syndrome with minor glomerular abnormality
N031	Chronic nephritic syndrome with focal and segmental glomerular lesions
N032	Chronic nephritic syndrome with diffuse membranous glomerulonephritis
N033	Chronic nephritic syndrome with diffuse mesangial proliferative glomerulonephritis
N034	Chronic nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis
N035	Chronic nephritic syndrome with diffuse mesangiocapillary glomerulonephritis
N036	Chronic nephritic syndrome with dense deposit disease
N037	Chronic nephritic syndrome with diffuse crescentic glomerulonephritis
N038	Chronic nephritic syndrome with other morphologic changes
N039	Chronic nephritic syndrome with unspecified morphologic changes
N04	Nephrotic syndrome



N040	Nephrotic syndrome with minor glomerular abnormality
N041	Nephrotic syndrome with focal and segmental glomerular lesions
N042	Nephrotic syndrome with diffuse membranous glomerulonephritis
N043	Nephrotic syndrome with diffuse mesangial proliferative glomerulonephritis
N044	Nephrotic syndrome with diffuse endocapillary proliferative glomerulonephritis
N045	Nephrotic syndrome with diffuse mesangiocapillary glomerulonephritis
N046	Nephrotic syndrome with dense deposit disease
N047	Nephrotic syndrome with diffuse crescentic glomerulonephritis
N048	Nephrotic syndrome with other morphologic changes
N049	Nephrotic syndrome with unspecified morphologic changes
N05	Unspecified nephritic syndrome
N050	Unspecified nephritic syndrome with minor glomerular abnormality
N051	Unspecified nephritic syndrome with focal and segmental glomerular lesions
N052	Unspecified nephritic syndrome with diffuse membranous glomerulonephritis
N053	Unspecified nephritic syndrome with diffuse mesangial proliferative glomerulonephritis
N054	Unspecified nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis
N055	Unspecified nephritic syndrome with diffuse mesangiocapillary glomerulonephritis
N056	Unspecified nephritic syndrome with dense deposit disease

N057	Unspecified nephritic syndrome with diffuse crescentic glomerulonephritis
N058	Unspecified nephritic syndrome with other morphologic changes
N059	Unspecified nephritic syndrome with unspecified morphologic changes
N06	Isolated proteinuria with specified morphological lesion
N060	Isolated proteinuria with minor glomerular abnormality
N061	Isolated proteinuria with focal and segmental glomerular lesions
N062	Isolated proteinuria with diffuse membranous glomerulonephritis
N063	Isolated proteinuria with diffuse mesangial proliferative glomerulonephritis
N064	Isolated proteinuria with diffuse endocapillary proliferative glomerulonephritis
N065	Isolated proteinuria with diffuse mesangiocapillary glomerulonephritis
N066	Isolated proteinuria with dense deposit disease
N067	Isolated proteinuria with diffuse crescentic glomerulonephritis
N068	Isolated proteinuria with other morphologic lesion
N069	Isolated proteinuria with unspecified morphologic lesion
N07	Hereditary nephropathy, not elsewhere classified
N070	Hereditary nephropathy, not elsewhere classified with minor glomerular abnormality
N071	Hereditary nephropathy, not elsewhere classified with focal and segmental glomerular lesions

N072	Hereditary nephropathy, not elsewhere classified with diffuse membranous glomerulonephritis
N073	Hereditary nephropathy, not elsewhere classified with diffuse mesangial proliferative glomerulonephritis
N074	Hereditary nephropathy, not elsewhere classified with diffuse endocapillary proliferative glomerulonephritis
N075	Hereditary nephropathy, not elsewhere classified with diffuse mesangiocapillary glomerulonephritis
N076	Hereditary nephropathy, not elsewhere classified with dense deposit disease
N077	Hereditary nephropathy, not elsewhere classified with diffuse crescentic glomerulonephritis
N078	Hereditary nephropathy, not elsewhere classified with other morphologic lesions
N079	Hereditary nephropathy, not elsewhere classified with unspecified morphologic lesions
N08	Glomerular disorders in diseases classified elsewhere
N17	Acute kidney failure
N170	Acute kidney failure with tubular necrosis
N171	Acute kidney failure with acute cortical necrosis
N172	Acute kidney failure with medullary necrosis
N178	Other acute kidney failure

N179	Acute kidney failure, unspecified
N18	Chronic kidney disease
N181	Chronic kidney disease, stage 1
N182	Chronic kidney disease, stage 2 (mild)
N183	Chronic kidney disease, stage 3 (moderate)
N184	Chronic kidney disease, stage 4 (severe)
N185	Chronic kidney disease, stage 5
N186	End stage renal disease
N189	Chronic kidney disease, unspecified
N19	Unspecified kidney failure

**Supplementary Table 2. Patient attrition**

<b>Inclusion Criteria</b>	<b>N</b>	<b>% Remaining</b>
1. Met SLE diagnosis criteria during the study period; and index date during the identification period	53,373	
2. Age $\geq$ 18 years on index date	46,140	86.5
3. Continuous health plan enrollment during the baseline period, and follow-up period	15,928	34.5
4. No ICD-10 diagnosis code for M32.0 during the study period	15,392	96.6
<b>Final overall SLE sample size<sup>a</sup></b>	15,392	100.0
LN cohort	2916	18.9
Non-LN cohort	8747	56.8

<sup>a</sup>Patient numbers for the LN and Non-LN cohorts do not total the final overall SLE sample size as patients with historical LN, and those who developed LN during the study were excluded

ICD, international classification of diseases; LN, lupus nephritis; SLE, systemic lupus erythematosus