Supplemental Table of Contents

Supplemental Table 17: Poisson regression model for incident fracture in the glomerular disease (excluding the 448 patients with >= 1 lupus diagnosis codes) and general pediatric cohorts

Supplemental Table 18: Poisson regression model for first fracture in the glomerular disease and general pediatric cohorts

Supplemental Table 19: Poisson regression model for first vertebral fracture in the glomerular disease and general pediatric cohorts

Supplemental Table 20: Poisson regression model for first hip/femur fracture in the glomerular disease and general pediatric cohorts

Supplemental Table 21: Poisson regression model for first diagnosis of avascular necrosis/osteonecrosis (AVN) in the glomerular disease and general pediatric cohorts

Supplemental Table 22: Poisson regression model for first diagnosis of slipped capital femoral epiphysis (SCFE) in the glomerular disease and general pediatric cohorts

Supplemental Table 23: Overall poisson regression model for incident fracture in the glomerular disease and general pediatric cohorts (not stratified by sex), limiting the glomerular disease cohort to patients at sites with a primary care network

Supplemental Table 24: The most frequent visit diagnoses for the general pediatric cohort (ranked by number of patients)

Supplemental material

Supplemental Table 1: Summary of analyses performed

Outcome	Cohort	Secondary analysis	Sensitivity analyses
Poisson regression analyses			
Any fracture	General pediatric		
Any fracture	Glomerular disease vs. general pediatric	+Evaluating person-time exposed to CKD	
Any fracture	Glomerular disease vs. general pediatric		Excluding lupus diagnosis
Any fracture	Glomerular disease vs. general pediatric		Restrict to sites with primary care network
Any fracture	Glomerular disease vs. general pediatric		Restrict to the first event
Any fracture	Nephrotic subcohort vs. general pediatric		
Vertebral fracture	Glomerular disease vs. general pediatric	+Evaluating person-time exposed to CKD	
Vertebral fracture	Glomerular disease vs. general pediatric		Restrict to the first event
Hip/femur fracture	Glomerular disease vs. general pediatric	+Evaluating person-time exposed to CKD	
Hip/femur fracture	Glomerular disease vs. general pediatric		Restrict to the first event
AVN	Glomerular disease vs. general pediatric	+Evaluating person-time exposed to CKD	
AVN	Glomerular disease vs. general pediatric		Restrict to the first event
SCFE	Glomerular disease vs. general pediatric	+Evaluating person-time exposed to CKD	
SCFE	Glomerular disease vs. general pediatric		Restrict to the first event
Cox proportional hazards regression of association of corticosteroid exposure with outcome			
Fracture	Glomerular disease		
Fracture	Nephrotic subcohort		
AVN	Glomerular disease		

Supplemental Table 2: Poisson regression model for incident fracture in the general pediatric cohort

	Incidence Rate Ratio	95% CI	P value
Age in years	**0.911**	**0.831, 1.000**	**0.050**
Age^2	**1.031**	**1.020, 1.042**	**<0.001**
Age^3	**0.999**	**0.998, 0.999**	**<0.001**
Male	**2.822**	**1.772, 4.493**	**<0.001**
Race			
White	1.000	—	—
Black or African American	1.266	1.167, 1.373	<0.001
Other	1.532	1.433, 1.637	<0.001
Asian American	0.816	0.748, 0.889	<0.001
Unknown	1.028	0.927, 1.140	0.597
Obese	1.171	1.100, 1.248	<0.001
Interaction between age and sex	**0.654**	**0.544, 0.787**	**<0.001**
Interaction between age^2 and sex	**1.050**	**1.028, 1.073**	**<0.001**
Interaction between age^3 and sex	**0.999**	**0.998, 0.999**	**<0.001**

Supplemental Table 3: Overall poisson regression model for incident fracture in the glomerular disease and general pediatric cohorts (not stratified by sex)

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**1.658**	**1.367, 2.011**	**<0.001**
Age in years	1.143	0.992, 1.316	0.065
Age^2	1.004	0.988, 1.020	0.631
Age^3	0.999	0.999, 1.000	0.013
Male	2.881	1.811, 4.583	<0.001
Race			
White	1.000	—	—
Black or African American	1.263	1.164, 1.369	<0.001
Other	1.514	1.417, 1.617	<0.001
Asian American	0.813	0.746, 0.886	<0.001
Unknown	1.024	0.925, 1.134	0.647
Obese	1.172	1.100, 1.247	<0.001
Interaction between age and sex	0.648	0.540, 0.778	<0.001
Interaction between age^2 and sex	1.052	1.030, 1.074	<0.001
Interaction between age^3 and sex	0.999	0.998, 0.999	<0.001
Interaction between cohort and sex	**0.676**	**0.529, 0.864**	**0.002**

Supplemental Table 4: Poisson regression model for incident fracture in the nephrotic subcohort and general pediatric cohort

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Nephrotic	**1.569**	**1.262, 1.951**	**<0.001**
Age in years	1.133	0.983, 1.305	0.084
Age^2	1.005	0.989, 1.021	0.540
Age^3	0.999	0.999, 1.000	0.009
Male	2.849	1.793, 4.526	<0.001
Race			
White	1.000	—	—
Black or African American	1.264	1.165, 1.370	<0.001
Other	1.522	1.424, 1.627	<0.001
Asian American	0.814	0.747, 0.887	<0.001
Unknown	1.025	0.925, 1.136	0.634
Obese	1.172	1.101, 1.248	<0.001
Interaction between age and sex	0.651	0.542, 0.782	<0.001
Interaction between age^2 and sex	1.051	1.029, 1.074	<0.001
Interaction between age^3 and sex	0.999	0.998, 0.999	<0.001
Interaction between cohort and sex	**0.665**	**0.502, 0.882**	**0.005**

Supplemental Table 5: Poisson regression model for incident fracture in the glomerular and general pediatric cohorts, evaluating person-time exposed to chronic kidney disease (CKD) in the glomerular cohort

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular CKD	**1.836**	**1.293, 2.608**	**0.001**
Glomerular non-CKD	**1.547**	**1.233, 1.941**	**<0.001**
Age in years	1.143	0.992, 1.316	0.064
Age^2	1.004	0.988, 1.020	0.633
Age^3	0.999	0.999, 1.000	0.013
Male	2.881	1.812, 4.580	<0.001
Race			
White	1.000	—	—
Black or African American	1.263	1.164, 1.369	<0.001
Other	1.514	1.418, 1.618	<0.001
Asian American	0.813	0.746, 0.886	<0.001
Unknown	1.024	0.925, 1.134	0.645
Obesity	1.171	1.100, 1.247	<0.001
Interaction between age and sex	0.648	0.540, 0.777	<0.001
Interaction between age^2 and sex	1.052	1.030, 1.074	<0.001
Interaction between age^3 and sex	0.999	0.998, 0.999	<0.001
Interaction between Glomerular CKD cohort and sex	**0.628**	**0.404, 0.977**	**0.039**
Interaction between Glomerular non-CKD cohort and sex	**0.697**	**0.528, 0.921**	**0.011**

Supplemental Table 6: Poisson regression model for incident vertebral fractures

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	—	—
Glomerular disease	**4.953**	**3.221, 7.617**	**<0.001**
Age in years	1.029	0.733, 1.446	0.868
Age^2	1.022	0.989, 1.057	0.194
Age^3	0.999	0.998, 1.000	0.065
Male	4.922	0.593, 40.874	0.140
Race			
White	1.000	—	—
Black or African American	0.996	0.806, 1.230	0.969
Other	2.094	1.531, 2.862	<0.001
Asian American	0.563	0.340, 0.933	0.026
Unknown	0.919	0.529, 1.595	0.763
Obese	1.395	1.106, 1.759	0.005
Interaction between sex and age	0.418	0.211, 0.827	0.012
Interaction between sex and age^2	1.107	1.036, 1.183	0.003
Interaction between sex and age^3	0.997	0.995, 0.999	0.002

Supplemental Table 7: Poisson regression model for incident hip and femur fractures

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	—	—
Glomerular disease	**2.235**	**1.343, 3.721**	**0.002**
Age in years	0.401	0.31, 0.517	<0.001
Age^2	1.112	1.081, 1.145	<0.001
Age^3	0.997	0.996, 0.998	<0.001
Male	2.356	1.992, 2.787	<0.001
Race			
White	1.000	—	—
Black or African American	1.873	1.54, 2.278	<0.001
Other	1.829	1.39, 2.408	<0.001
Asian American	0.763	0.588, 0.99	0.042
Unknown	0.648	0.385, 1.09	0.102
Obese	1.110	0.92, 1.339	0.276

Supplemental Table 8: Poisson regression model for avascular necrosis/osteonecrosis (AVN)

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	—	—
Glomerular disease	**56.163**	**40.696, 77.507**	**<0.001**
Age in years	1.123	1.088, 1.159	<0.001
Male	9.764	4.133, 23.067	<0.001
Race			
White	1.000	—	—
Black or African American	0.758	0.53, 1.085	0.130
Other	1.474	0.987, 2.2	0.058
Asian American	0.662	0.354, 1.235	0.195
Unknown	0.679	0.249, 1.856	0.451
Obese	1.262	0.911, 1.747	0.161
Interaction between age and sex	0.873	0.82, 0.931	<0.001
Interaction between cohort and sex	**0.385**	**0.21, 0.706**	**0.002**

Supplemental Table 9: Poisson regression model for slipped capital femoral epiphysis (SCFE)

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**3.355**	**1.922, 5.857**	**<0.001**
Age in years	5.468	3.933, 7.601	<0.001
Age^2	0.940	0.928, 0.953	<0.001
Male	1.483	1.152, 1.908	0.002
Race			
White	1.000	—	—
Black or African American	2.103	1.65, 2.682	<0.001
Other	1.477	0.987, 2.21	0.058
Asian American	0.812	0.515, 1.28	0.369
Unknown	0.131	0.018, 0.963	0.046
Obese	10.514	8.35, 13.24	<0.001

Supplemental Table 10: Poisson regression model for slipped capital femoral epiphysis (SCFE), evaluating person-time exposed to chronic kidney disease (CKD) in the glomerular cohort

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular CKD	**10.202**	**5.644, 18.439**	**<0.001**
Glomerular non-CKD	**0.752**	**0.246, 2.302**	**0.618**
Age in years	5.515	3.967, 7.667	<0.001
Age^2	0.940	0.928, 0.952	<0.001
Male	1.471	1.145, 1.89	0.003
Race			
White	1.000	—	—
Black or African American	2.090	1.64, 2.662	<0.001
Other	1.472	0.985, 2.198	0.059
Asian American	0.809	0.513, 1.276	0.362
Unknown	0.130	0.018, 0.954	0.045
Obese	10.479	8.316, 13.204	<0.001

Supplemental Table 11: Poisson regression model for avascular necrosis/osteonecrosis (AVN), evaluating person-time exposed to chronic kidney disease (CKD) in the glomerular cohort

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular CKD	**61.86**	**36.242, 105.587**	**<0.001**
Glomerular non-CKD	**50.097**	**34.815, 72.088**	**<0.001**
Age in years	1.122	1.087, 1.158	<0.001
Male	9.848	4.194, 23.124	<0.001
Race			
White	1.000	—	—
Black or African American	0.772	0.537, 1.111	0.164
Other	1.438	0.955, 2.165	0.082
Asian American	0.662	0.354, 1.235	0.195
Unknown	0.691	0.253, 1.886	0.471
Obese	1.257	0.904, 1.749	0.174
Interaction between age and sex	0.872	0.819, 0.929	<0.001
Interaction between Glomerular CKD and sex	**0.927**	**0.336, 2.559**	**0.884**
Interaction between Glomerular non-CKD and sex	**0.298**	**0.148, 0.599**	**0.001**

Supplemental Table 12: Poisson regression model for vertebral fracture, evaluating person-time exposed to chronic kidney disease (CKD) in the glomerular cohort

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular CKD	**9.101**	**4.888, 16.943**	**<0.001**
Glomerular non-CKD	**3.526**	**1.958, 6.348**	**<0.001**
Age in years	1.058	0.75, 1.492	0.749
Age^2	1.019	0.985, 1.054	0.270
Age^3	0.999	0.998, 1	0.104
Male	4.279	0.499, 36.706	0.185
Race			
White	1.000	—	—
Black or African American	0.99	0.802, 1.222	0.926
Other	2.07	1.511, 2.835	<0.001
Asian American	0.561	0.339, 0.929	0.025
Unknown	0.921	0.53, 1.601	0.771
Obese	1.399	1.11, 1.763	0.004
Interaction between sex and age	0.444	0.223, 0.887	0.021
Interaction between sex and age^2	1.099	1.027, 1.176	0.006
Interaction between sex and age^3	0.997	0.995, 0.999	0.005

Supplemental Table 13: Poisson regression model for hip and femur fractures, evaluating person-time exposed to chronic kidney disease (CKD) in the glomerular cohort

	Incidence Rate Ratio	95% CI	P value
Cohort **General pediatric** **Glomerular CKD** **Glomerular non-CKD**	**1.000** **2.151** **2.509**	**—** **0.694, 6.669** **1.459, 4.314**	**—** **0.185** **0.001**
Age in years	0.401	0.311, 0.518	<0.001
Age^2	1.112	1.08, 1.144	<0.001
Age^3	0.997	0.996, 0.998	<0.001
Male	2.351	1.987, 2.78	<0.001
Race White Black or African American Other Asian American Unknown	 1.000 1.872 1.814 0.761 0.646	 — 1.539, 2.277 1.377, 2.388 0.586, 0.987 0.384, 1.086	 — <0.001 <0.001 0.040 0.099
Obese	1.119	0.928, 1.35	0.238

Supplemental Table 14: Cox proportional hazards model evaluating the association between corticosteroid exposure and time to first fracture within the glomerular disease cohort

	Hazard Ratio	95% CI	P value
Steroid exposure	0.646	0.495, 0.843	0.001
Male	1.31	1.01, 1.7	0.045

Supplemental Table 15: Cox proportional hazards model evaluating the association between corticosteroid exposure and time to first fracture within the nephrotic subcohort

	Hazard Ratio	95% CI	P value
Steroid exposure	0.788	0.545, 1.14	0.207
Male	1.230	0.847, 1.78	0.280

Supplemental Table 16: Cox proportional hazards model evaluating the association between corticosteroid exposure and time to avascular necrosis/osteonecrosis (AVN) within the glomerular disease cohort

	Hazard Ratio	95% CI	P value
Steroid exposure	2.79	1.18, 6.61	0.020
Follow-up start age	1	1, 1	<0.001

Supplemental Table 17: Poisson regression model for incident fracture in the glomerular disease (excluding the 448 patients with >= 1 lupus diagnosis codes) and general pediatric cohorts

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**1.659**	**1.351, 2.036**	**<0.001**
Age in years	1.133	0.984, 1.305	0.083
Age^2	1.005	0.989, 1.021	0.537
Age^3	0.999	0.999, 1	0.009
Male	2.829	1.782, 4.489	<0.001
Race			
White	1.000	—	—
Black or African American	1.263	1.165, 1.37	<0.001
Other	1.514	1.417, 1.618	<0.001
Asian American	0.813	0.746, 0.886	<0.001
Unknown	1.025	0.925, 1.135	0.641
Obese	1.171	1.1, 1.247	<0.001
Interaction between age and sex	0.654	0.545, 0.785	<0.001
Interaction between age^2 and sex	1.051	1.029, 1.073	<0.001
Interaction between age^3 and sex	0.999	0.998, 0.999	<0.001
Interaction between cohort and sex	**0.682**	**0.528, 0.881**	**0.003**

Supplemental Table 18: Poisson regression model for first fracture in the glomerular disease and general pediatric cohorts

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**1.623**	**1.307, 2.015**	**<0.001**
Age in years	1.073	0.922, 1.249	0.359
Age^2	1.009	0.992, 1.026	0.283
Age^3	0.999	0.999, 1.000	0.004
Male	2.883	1.771, 4.693	<0.001
Race			
White	1.000	—	—
Black or African American	1.261	1.164, 1.366	<0.001
Other	1.507	1.403, 1.617	<0.001
Asian American	0.847	0.777, 0.924	<0.001
Unknown	1.033	0.932, 1.144	0.536
Obese	1.144	1.076, 1.217	<0.001
Interaction between age and sex	0.644	0.532, 0.778	<0.001
Interaction between age^2 and sex	1.054	1.031, 1.077	<0.001
Interaction between age^3 and sex	0.998	0.998, 0.999	<0.001
Interaction between cohort and sex	**0.710**	**0.542, 0.930**	**0.013**

Supplemental Table 19: Poisson regression model for first vertebral fracture in the glomerular disease and general pediatric cohorts

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	—	—
Glomerular disease	**5.551**	**3.515, 8.767**	**<0.001**
Age in years	0.911	0.633, 1.311	0.614
Age^2	1.034	0.997, 1.072	0.072
Age^3	0.999	0.998, 1	0.024
Male	4.371	0.49, 39.008	0.187
Race			
White	1.000	—	—
Black or African American	1.015	0.806, 1.279	0.900
Other	2.061	1.479, 2.872	<0.001
Asian American	0.646	0.38, 1.098	0.106
Unknown	0.881	0.465, 1.667	0.696
Obese	1.387	1.076, 1.787	0.011
Interaction between sex and age	0.440	0.212, 0.915	0.028
Interaction between sex and age^2	1.102	1.024, 1.186	0.009
Interaction between sex and age^3	0.997	0.995, 0.999	0.006

Supplemental Table 20: Poisson regression model for first hip/femur fracture in the glomerular disease and general pediatric cohorts

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	—	—
Glomerular disease	**2.241**	**1.255, 4.003**	**0.006**
Age in years	0.322	0.24, 0.433	<0.001
Age^2	1.139	1.101, 1.179	<0.001
Age^3	0.996	0.995, 0.997	<0.001
Male	2.311	1.921, 2.779	<0.001
Race			
White	1.000	—	—
Black or African American	1.872	1.496, 2.341	<0.001
Other	1.908	1.417, 2.57	<0.001
Asian American	0.849	0.639, 1.128	0.259
Unknown	0.697	0.387, 1.256	0.230
Obese	1.098	0.891, 1.352	0.381

Supplemental Table 21: Poisson regression model for first diagnosis of avascular necrosis/osteonecrosis (AVN) in the glomerular disease and general pediatric cohorts

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**50.893**	**31.542, 82.115**	**<0.001**
Age in years	1.114	1.063, 1.167	<0.001
Male	8.803	2.562, 30.245	0.001
Race			
White	1.000	—	—
Black or African American	0.860	0.527, 1.405	0.547
Other	1.608	0.867, 2.980	0.132
Asian American	0.524	0.196, 1.400	0.198
Unknown	0.628	0.152, 2.586	0.519
Obese	1.273	0.800, 2.028	0.309
Interaction between age and sex	0.887	0.808, 0.975	0.013
Interaction between cohort and sex	**0.371**	**0.150, 0.914**	**0.031**

Supplemental Table 22: Poisson regression model for first diagnosis of slipped capital femoral epiphysis (SCFE) in the glomerular disease and general pediatric cohorts

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**3.252**	**1.368, 7.732**	**0.008**
Age in years	6.879	4.154, 11.391	<0.001
Age^2	0.924	0.905, 0.944	<0.001
Male	1.427	1.006, 2.025	0.046
Race			
White	1.000	—	—
Black or African American	2.232	1.504, 3.313	<0.001
Other	2.066	1.170, 3.650	0.012
Asian American	0.868	0.466, 1.616	0.655
Unknown	0.274	0.037, 2.039	0.206
Obese	9.262	6.588, 13.022	<0.001

Supplemental Table 23: Overall poisson regression model for incident fracture in the glomerular disease and general pediatric cohorts (not stratified by sex), limiting the glomerular disease cohort to patients at sites with a primary care network

	Incidence Rate Ratio	95% CI	P value
Cohort			
General pediatric	**1.000**	**—**	**—**
Glomerular disease	**1.840**	**1.461, 2.315**	**<0.001**
Age in years	1.129	0.980, 1.301	0.093
Age^2	1.005	0.990, 1.021	0.500
Age^3	0.999	0.999, 1.000	0.007
Male	2.818	1.774, 4.475	<0.001
Race			
White	1.000	—	—
Black or African American	1.265	1.166, 1.371	<0.001
Other	1.523	1.426, 1.628	<0.001
Asian American	0.815	0.747, 0.888	<0.001
Unknown	1.029	0.929, 1.140	0.584
Obese	1.170	1.099, 1.246	<0.001
Interaction between age and sex	0.655	0.545, 0.786	<0.001
Interaction between age^2 and sex	1.050	1.028, 1.073	<0.001
Interaction between age^3 and sex	0.999	0.998, 0.999	<0.001
Interaction between cohort and sex	**0.520**	**0.381, 0.709**	**<0.001**

Supplemental Table 24: The most frequent visit diagnoses for the general pediatric cohort (ranked by number of patients)

Visit diagnosis	SNOMED-CT code	Rank
Patient encounter status	305058001	1
Well child visit	410620009	2
Needs influenza immunization	185903001	3
Child examination	243788004	4
Prevention status	243815002	5
Preventive procedure	169443000	6
Acute pharyngitis	363746003	7
Acute upper respiratory infection	54398005	8
Cough	49727002	9
Acute suppurative otitis media without spontaneous rupture of ear drum	14948001	10
Normal body mass index	35425004	11
Anemia screening	171201007	12
Allergic rhinitis	61582004	13
Fever	386661006	14
Viral disease	34014006	15
Otitis media	65363002	16
Upper respiratory infection	54150009	17
Eczema	43116000	18
Streptococcal sore throat	43878008	19
Vaccination needed	122541000119104	20