SECTION N SCOTTISH RENAL BIOPSY REGISTRY: SURVEY OF NATIVE RENAL BIOPSY IN SCOTLAND 2017

All centres in Scotland were able to provide date of birth, sex, indication for biopsy, main diagnosis and major complications for all native renal biopsies performed in the calendar year 2017.

Diagnosis was selected from the 2012 ERA/EDTA primary renal diagnosis codes (http://www.era-edta-reg.org/prd.jsp) with the addition of 'Complement 3 glomerulopathy', 'Kidney biopsy result normal' and 'Insufficient histological evidence from kidney biopsy for diagnosis'. Indication for biopsy, operator and major complications were selected from pre-defined codesets. Units were also asked to indicate if this was the first biopsy for this diagnosis.

The total number of reported biopsies was 651 in 632 patients giving an incidence of 120.0 native kidney biopsies per million population (pmp) per year which is lower than the incidences of 139.2 pmp in 2016, 130.1 pmp in 2015 and 127.1 pmp in 2014. Centres were asked to indicate if this was the first biopsy ever with this diagnosis to take account of patients having repeat biopsies to monitor disease. 588 patients were having their first renal biopsy for this diagnosis meaning that 63 biopsies were repeat biopsies. This compares with 686 patients having first renal biopsy in 2016.

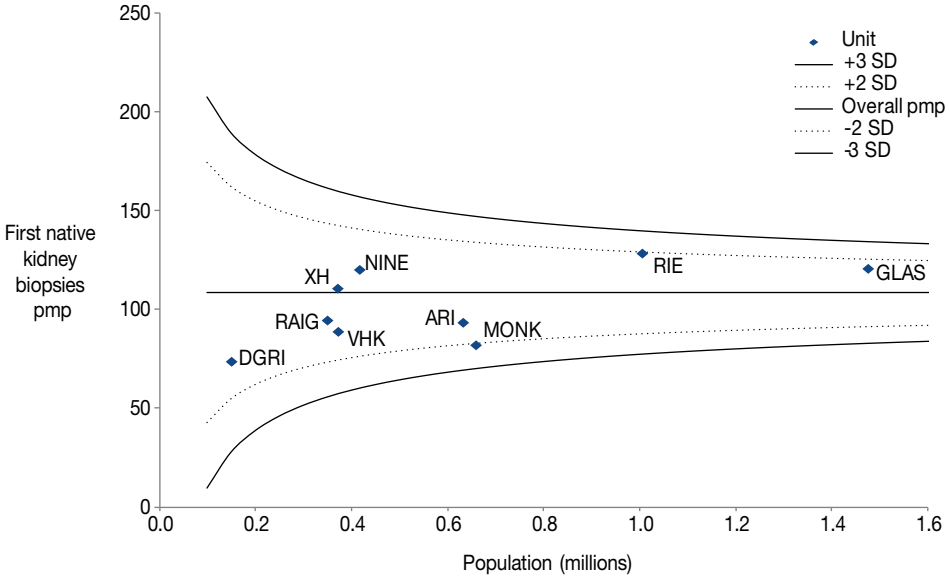
Total number of biopsies and total number of patients having native renal biopsy were expressed pmp for each centre based on the populations shown in N1. Repeat native biopsy was commonest in RIE.

N1 Number of native kidney biopsies 2017 by renal unit and NHS Health Board

Renal Unit	NHS Health Board	Population 2016	Total native biopsies	Second or subsequent biopsies	Number patients having biopsy	No. of pts having 1st renal biopsy	Native biopsies pmp/yr	Patients having first renal biopsy pmp/yr	Mean age at biopsy (yrs)	% Male
ARI	GRAM + SHET + ORKN	631460	65	0	65	59	102.9	93.4	57.8	50.8
XH	A&A	370410	41	0	41	41	110.7	110.7	58.8	63.4
DGRI	D&G	149200	13	1	12	11	87.1	73.7	59.4	69.2
GLAS	GG&C + FV	1474690	186	2	184	178	126.1	120.7	60.3	52.2
MONK	LAN	658130	58	1	57	54	88.1	82.1	57.0	51.7
NINE	TAY	416090	54	3	51	50	129.8	120.2	53.0	53.7
RAIG	HIGH + WI	348940	34	0	34	33	97.4	94.6	61.3	50.0
RIE	LOTH + BORD	1004470	166	11	155	129	165.3	128.4	54.0	56.6
VHK	FIFE	371410	34	1	33	33	91.5	88.9	58.8	44.1
Scotland		**5424800**	**651**	**19**	**632**	**588**	**120.0**	**108.4**	**57.4**	**53.8**

The number of patients experiencing a first renal biopsy in 2017 pmp for each centre was compared in a funnel plot (N2).

N2 Incidence per million population of first native kidney biopsies in 2017 by renal unit

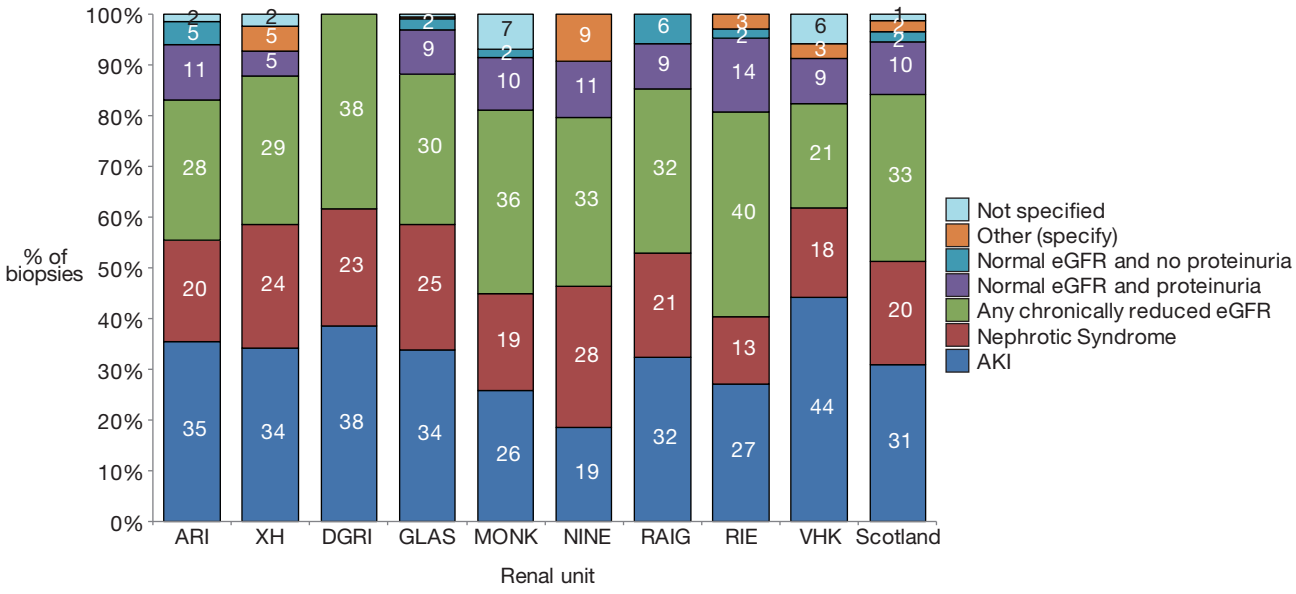


The incidence of native kidney biopsies per million population in 2017 was highest in the two units serving the largest populations similar to 2016.

Indication for biopsy

Indication for native renal biopsy using pre-defined indication terms was expressed per million population and shown in N3.

N3 Indication for native kidney biopsy in 2017 by renal unit



Diagnosis

Nephrologists were asked to select the diagnosis that was the main explanation for the clinic-pathological features of each biopsy. A diagnosis was recorded in all but 4 cases.

In 1 case the diagnosis was recorded as 'Insufficient tissue for diagnosis' and in 3 cases there was no kidney tissue obtained. In 7 cases the diagnosis was recorded as 'Insufficient histological evidence from kidney biopsy for diagnosis'. Most of these patients had a further biopsy. For 23 biopsies the diagnosis was recorded as 'Chronic kidney disease (CKD) / chronic renal failure (CRF) - aetiology uncertain / unknown - histologically proven'. 7 biopsies were reported as 'Kidney biopsy result normal'.

Of the remainder, a total of 48 different ERA/EDTA Primary Renal Diagnosis terms were recorded as the primary explanation for the clinical indication for native renal biopsy. In a further 12 cases the nephrologists felt that none of the ERA/EDTA terms were sufficient (recorded as 'other'). The diagnoses for first biopsies are presented in table N4. If the first biopsy produced insufficient tissue and was repeated the subsequent diagnosis is presented. The top 20 reported diagnoses are shown in table N4 in descending order of frequency along with the frequency for first biopsies in 2016 and all biopsies (ie not just first biopsies) in 2015.

All recorded diagnoses and frequencies in each centre for 2017 can be viewed on the Scottish Renal Registry website:

http://www.srr.scot.nhs.uk/Biopsy-Registry/Main.html

N4 Most frequent 20 recorded native kidney biopsy diagnoses recorded in 2017 by renal unit and compared with incidence 2015 and 2016. In 2017 and 2016 only first renal biopsies for this diagnosis are included

Centre	ARI	XH	DGRI	Glas	Monk	Nine	Raig	RIE	VHK	Scotland 2017	Scotland 2016	Scotland 2015
IgA nephropathy - histologically proven	4	5	1	18	7	2	6	17	6	66	104	101
Tubulointerstitial nephritis - histologically proven[a]	7	4	0	25	3	7	4	8	5	63	65	61
Microscopic polyangiitis - histologically proven	4	4	1	13	1	2	1	12	3	41	55	34
Membranous nephropathy - idiopathic	4	2	0	17	2	4	1	5	2	37	42	73
Minimal change nephropathy - histologically proven	2	1	1	10	4	4	2	7	1	32	31	28
Primary focal segmental glomerulosclerosis (FSGS)	5	2	0	7	0	7	2	7	1	31	41	31
Diabetic nephropathy in Type II diabetes - histologically provena[b]	2	4	1	11	5	3	1	3	0	30	23	42
Ischaemic nephropathy / microvascular disease - histologically proven	0	2	0	14	3	2	0	3	1	25	18	10
Acute kidney injury	1	4	1	3	3	0	0	11	0	23	26	14
Chronic kidney disease (CKD) / chronic renal failure (CRF) - aetiology uncertain / unknown - histologically proven	7	1	0	2	4	2	2	3	2	23	12	12
Systemic lupus erythematosus / nephritis - histologically proven	3	2	0	4	3	4	2	3	2	23	22	39
Chronic hypertensive nephropathy - histologically proven	1	0	1	4	3	0	0	10	0	19	14	11
Granulomatosis with polyangiitis - histologically proven	1	2	1	6	1	0	0	2	0	13	23	33
Renal amyloidosis[c]	2	1	0	4	0	0	1	4	1	13	18	10
Mesangial proliferative glomerulonephritis	1	1	1	3	0	0	0	4	1	11	15	6

N4 Most frequent 20 recorded native kidney biopsy diagnoses recorded in 2017 by renal unit and compared with incidence 2015 and 2016. In 2017 and 2016 only first renal biopsies for this diagnosis are included

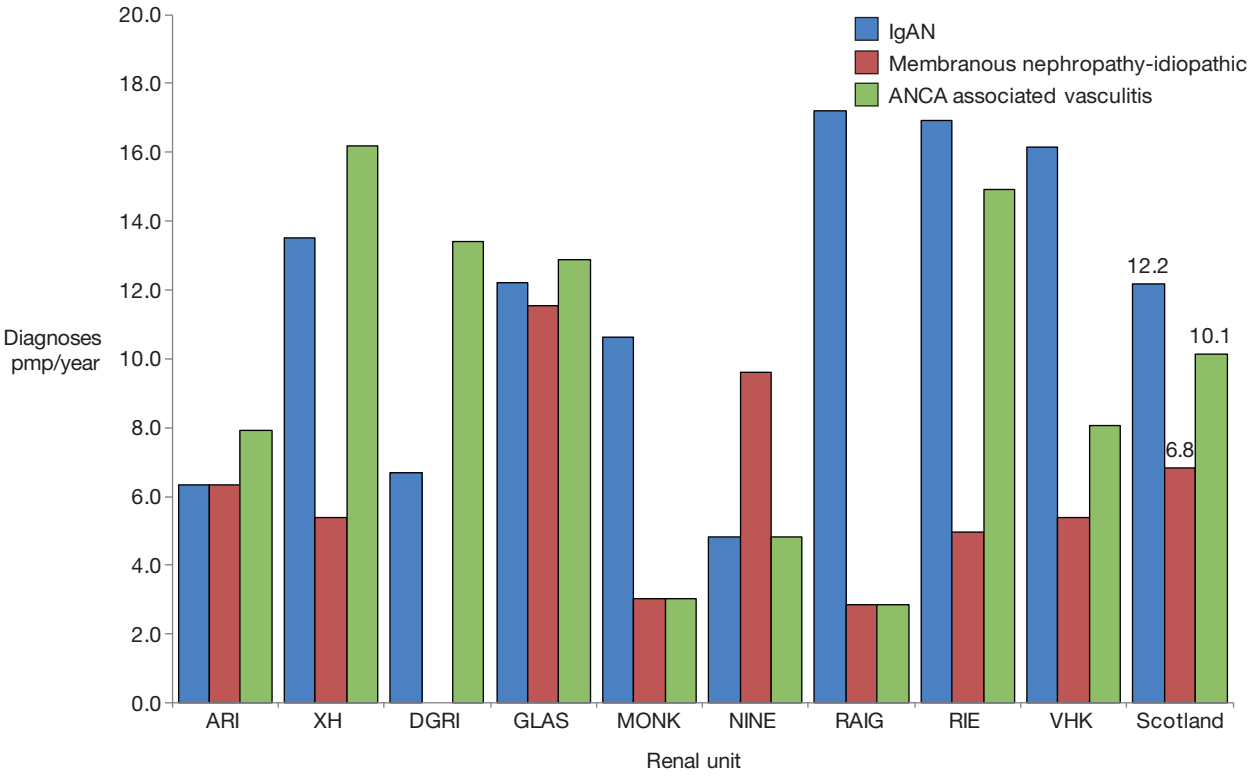
Centre	ARI	XH	DGRI	Glas	Monk	Nine	Raig	RIE	VHK	Scotland 2017	Scotland 2016	Scotland 2015
Henoch-Schönlein purpura / nephritis - histologically proven	1	0	0	0	1	1	2	2	2	9	15	8
Light chain deposition disease	3	0	0	0	0	0	1	5	0	9	1	6
Mesangiocapillary glomerulonephritis type 1	0	0	1	1	0	1	2	2	0	7	1	7
Focal and segmental proliferative glomerulonephritis	0	0	0	6	0	0	0	0	0	6	5	11
Myeloma cast nephropathy - histologically proven	0	0	0	4	0	0	1	1	0	6	4	7

a. Not including tubulo-interstitial nephritis where a specific cause stated.
b. In 2015 cases of type 1 and type 2 diabetic nephropathy were included together.
c. AA amyloid, AL amyloid and 'renal amyloidosis' combined.

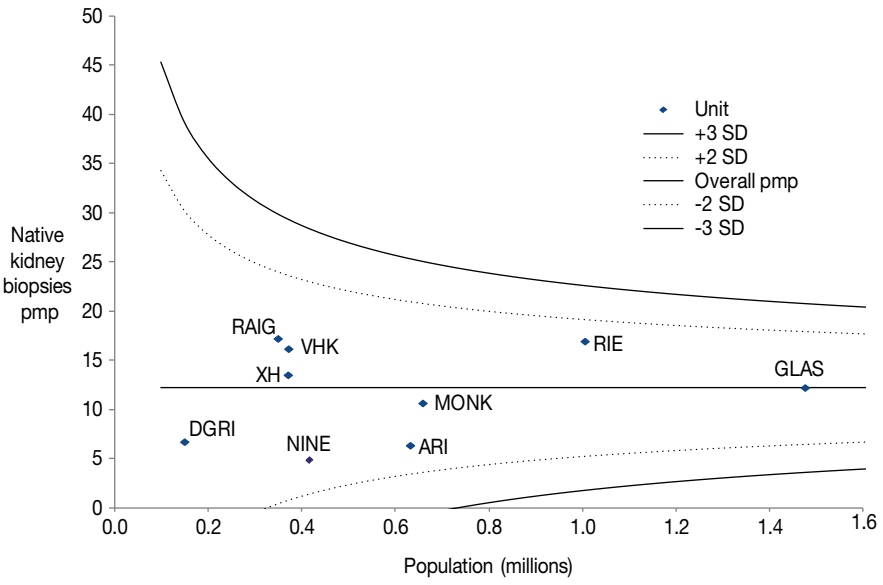
There have been marked reductions in the incidence of IgA nephropathy, granulomatosis with polyangiitis and idiopathic membranous nephropathy.

The incidences of IgA nephropathy, idiopathic membranous nephropathy and ANCA associated vasculitis (a combination of granulomatosis with polyangiitis, microscopic polyangiitis and Churg Strauss syndrome) were expressed pmp and compared between centres in N5. Funnel plots of the incidence of IgAN and ANCA associated vasculitis are shown in N6 and N7 respectively.

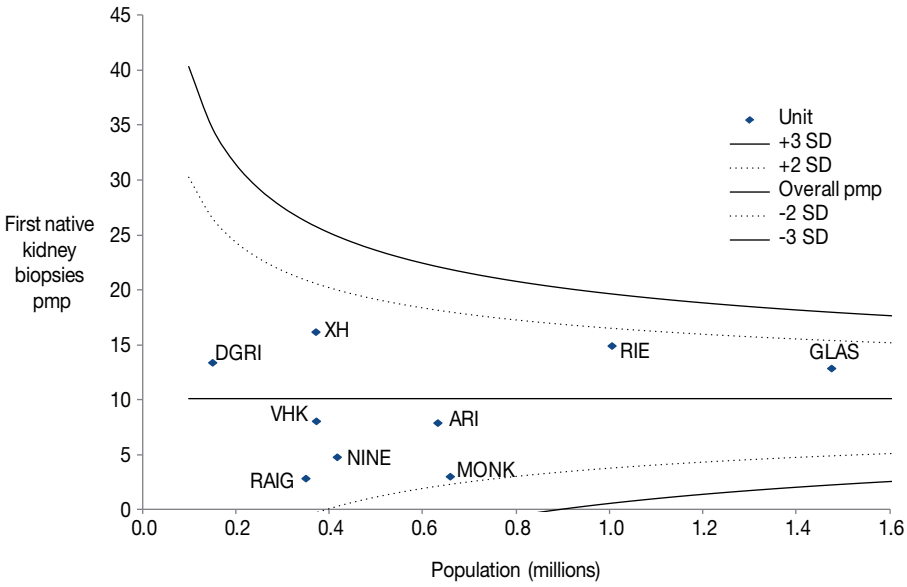
N5 Incidences per million population of selected first native biopsy diagnoses 2017



N6 Incidence per million population of biopsy diagnosis of IgA nephropathy by renal unit 2017



N7 Incidence per million population of biopsy diagnosis of ANCA associated vascilitides (AAV) by renal unit 2017



Complications

Major complications were defined as shown in N8. There were 19 major complications (2.9%) compared with 43/2160 biopsies (2.0%) between 2014 and 2016 inclusive.

N8 Major complications of kidney biopsies 2014 to 2017

Complication	2014		2015		2016		2017		2014-2017	
	n	%	n	%	n	%	n	%	n	%
Arteriography no embolisation	1	0.15	6	0.83	8	1.06	8	1.23	23	0.82
Arteriography and embolisation	2	0.29	2	0.28	0	-	7	1.08	11	0.39
Blood transfusion only	7	1.03	3	0.41	2	0.27	3	0.46	15	0.53
Clot obstruction managed conservatively	1	0.15	1	0.14	0	0.00	1	0.15	3	0.11
Clot obstruction requiring intervention	0	-	0	-	3	0.40	0	-	3	0.11
Death	1	0.15	1	0.14	0	-	0	-	2	0.07
Nephrectomy	0	-	0	-	0	-	0	-	0	-
Other please specify	1	0.15	3	0.41	1	0.13	0	-	5	0.18
Surgery no nephrectomy	0	-	0	-	0	-	0	-	0	-
Total number of complications	13	1.91	16	2.20	14	1.86	19	2.92	62	2.21
Total number of native biopsies	**682**		**726**		**752**		**651**		**2811**	

* Percentage is expressed as number of complications as a proportion of total biopsies in that time period.