SECTION N SCOTTISH RENAL BIOPSY REGISTRY: SURVEY OF NATIVE RENAL BIOPSY IN SCOTLAND 2016

All centres in Scotland were able to provide date of birth, sex, indication for biopsy, major complications and main diagnosis for all native renal biopsies performed in the calendar year 2016.

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.

The total number of reported biopsies was 752 in 728 patients giving an incidence of 139.2 native kidney biopsies per million population (pmp) per year which is higher than the incidence of 130.1 pmp in 2015 and 127.1 pmp in 2014. This was the first year that 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.

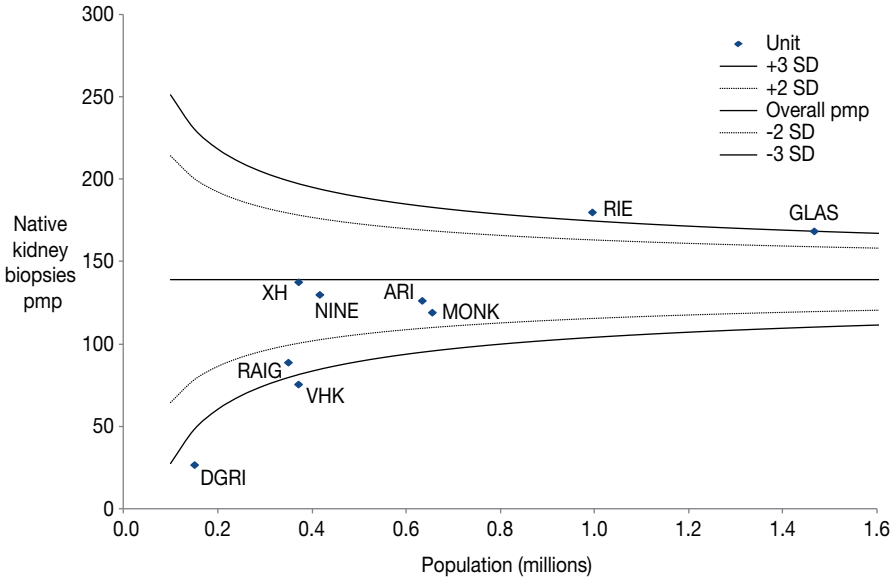
Total number of biopsies and total number of patients having native renal biopsy were expressed pmp for each centre based on the populations shown in N1.

N1 Number of native kidney biopsies 2016 by renal unit and NHS Board

Renal Unit	NHS 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	633150	80	5	75	69	126.4	109.0	59.1	57.5
XH	A&A	370560	51	0	51	51	137.6	137.6	59.0	43.1
DGRI	D&G	149520	4	0	4	3	26.8	20.1	60.4	100.0
GLAS	GG&C + FV	1465850	247	5	242	230	168.5	156.9	58.2	52.2
MONK	LAN	654490	78	1	77	72	119.2	110.0	55.1	55.1
NINE	TAY	415470	54	3	51	50	130.0	120.3	61.9	74.1
RAIG	HIGH + WI	348800	31	0	31	31	88.9	88.9	59.4	71.0
RIE	LOTH + BORD	994530	179	9	170	153	180.0	153.8	55.6	52.2
VHK	FIFE	370330	28	1	27	27	75.6	72.9	66.8	53.6
Scotland		**5402700**	**752**	**24**	**728**	**686**	**139.2**	**127.0**	**58.2**	**55.2**

The number of patients experiencing a renal biopsy in 2016 pmp for each centre was compared in a funnel plot (N2).

N2 Incidence per million population of native kidney biopsies in 2016 by renal unit

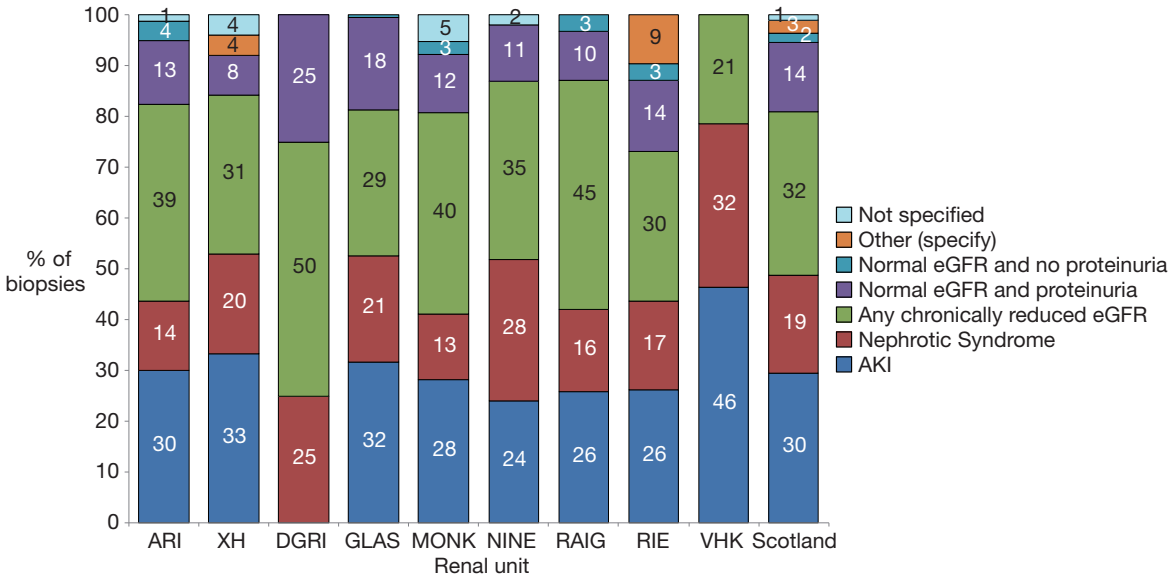


The incidence of native kidney biopsies per million population in 2016 was higher in units serving larger populations.

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 2016 by renal unit



Diagnosis

Nephrologists were asked to select the diagnosis that was the main explanation for the clinico-pathological features. A diagnosis was recorded in all cases.

In 8 cases the diagnosis was recorded as insufficient tissue for diagnosis (most of which had a further biopsy procedure).

For 12 biopsies the diagnosis was recorded as 'Chronic kidney disease (CKD) / chronic renal failure (CRF) - aetiology uncertain / unknown - histologically proven'.

9 biopsies were reported as 'Kidney biopsy result normal'.

Of the remainder a total of 53 different ERA/EDTA Primary Renal Diagnosis terms were recorded as the primary explanation for the clinical indication for native renal biopsy. In a further 6 cases the nephrologists felt that none of the ERA/EDTA terms were sufficient (recorded as 'other'). The diagnoses for all biopsies including patients having a second or subsequent biopsy are presented. The top 20 reported diagnoses are shown in table 2 in order of frequency along with the frequency in 2014 and 2015 the SRR annual reports for those years.

All recorded diagnoses and frequencies in renal unit can be viewed on the Scottish Renal Registry website:

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

N4 Most frequently recorded native kidney biopsy diagnoses recorded in 2016 by renal unit and compared with incidence 2014 and 2015

Centre	ARI	XH	DGRI	Glas	Monk	Nine	Raig	RIE	VHK	Scotland 2016	Scotland 2014	Scotland 2015
IgA nephropathy - histologically proven	5	5	2	39	13	10	6	23	1	104	101	101
Tubulointerstitial nephritis - histologically proven[a]	8	1	0	21	9	8	2	12	4	65	62	61
Microscopic polyangiitis - histologically proven	5	6	0	19	2	2	2	16	3	55	42	34
Membranous nephropathy - idiopathic	6	4	0	15	2	4	1	8	2	42	42	73
Primary focal segmental glomerulosclerosis (FSGS)	3	6	0	13	5	6	0	5	3	41	44	31
Minimal change nephropathy - histologically proven	1	4	0	14	2	1	1	6	2	31	35	28
Acute kidney injury	1	0	0	11	2	1	0	9	2	26	18	14
Granulomatosis with polyangiitis - histologically proven	2	3	0	13	0	4	0	1	0	23	34	33
Diabetic nephropathy in type II diabetes - histologically proven	4	1	0	9	4	0	1	4	0	23	30[b]	42[b]
Systemic lupus erythematosus / nephritis - histologically proven	0	0	0	13	1	1	3	4	0	22	28	39
Ischaemic nephropathy / microvascular disease - histologically proven	1	4	0	7	2	0	2	1	1	18	13	10
AL amyloid secondary to plasma cell dyscrasia	3	1	1	4	1	4	2	0	1	17	7	12
Henoch-Schönlein purpura / nephritis - histologically proven	3	0	0	5	3	0	1	3	0	15	0	10
Mesangial proliferative glomerulonephritis	0	1	0	5	1	0	0	8	0	15	9	6
Chronic hypertensive nephropathy - histologically proven	3	2	0	5	1	0	1	2	0	14	8	11

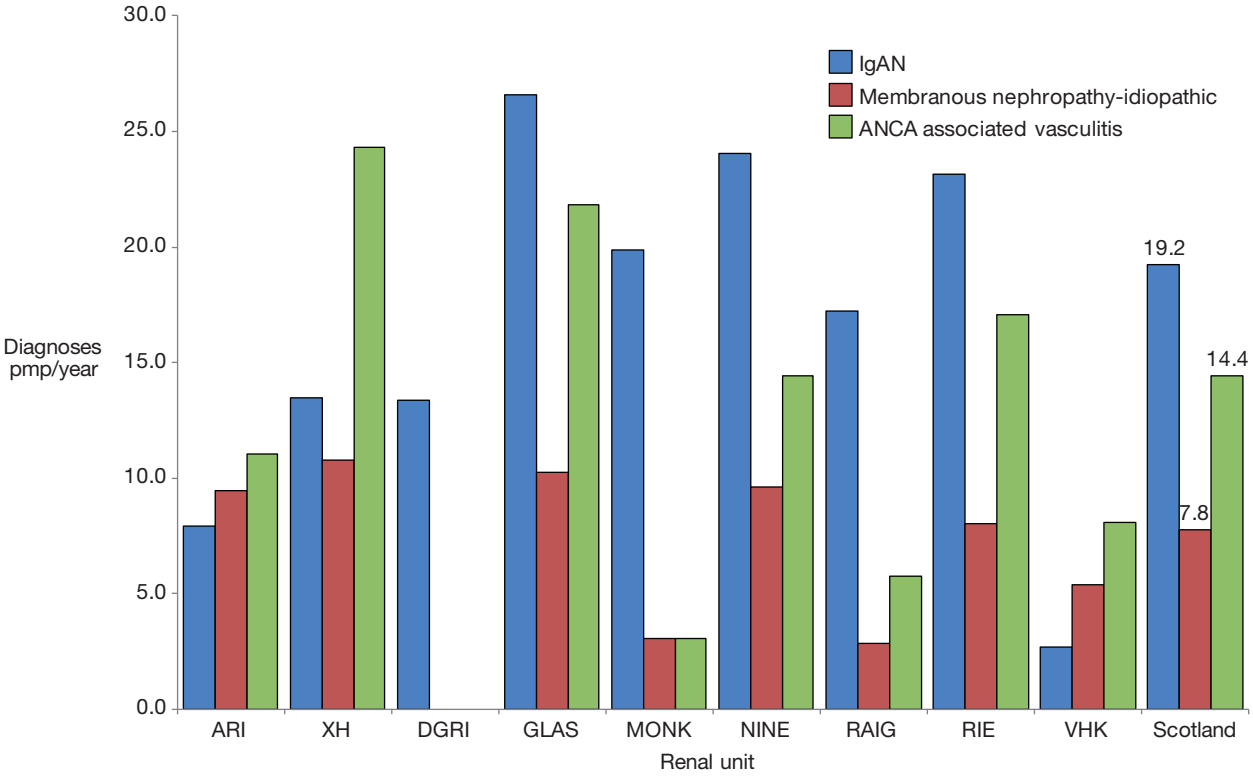
N4 Most frequently recorded native kidney biopsy diagnoses recorded in 2016 by renal unit and compared with incidence 2014 and 2015

Centre	ARI	XH	DGRI	Glas	Monk	Nine	Raig	RIE	VHK	Scotland 2016	Scotland 2014	Scotland 2015
Chronic kidney disease (CKD) / chronic renal failure (CRF) - aetiology uncertain / unknown - histologically proven	1	0	0	4	0	0	2	5	0	12	16	12
Glomerulonephritis - histologically indeterminate	1	0	0	4	4	0	0	2	0	11	16	7
Diabetic nephropathy in type I diabetes - histologically proven	3	2	0	0	3	0	0	0	1	9	[b]	[b]
Kidney biopsy result normal	0	0	0	1	1	2	0	5	0	9		8
Thin basement membrane disease	1	0	0	3	2	0	0	2	0	8		5

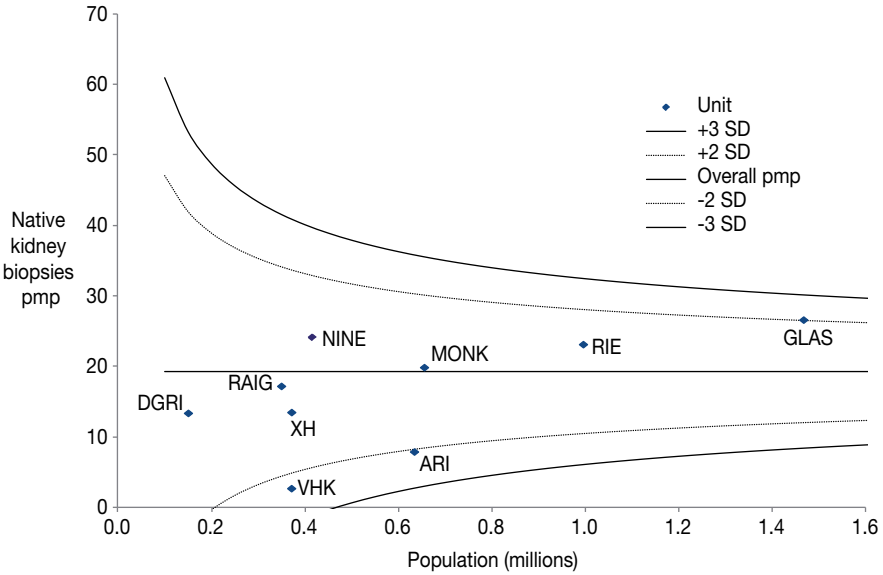
a. Not including tubulo-interstitial nephritis where a specific cause stated.
b. In previous years cases of type 1 and type 2 diabetic nephropathy were included together.

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.

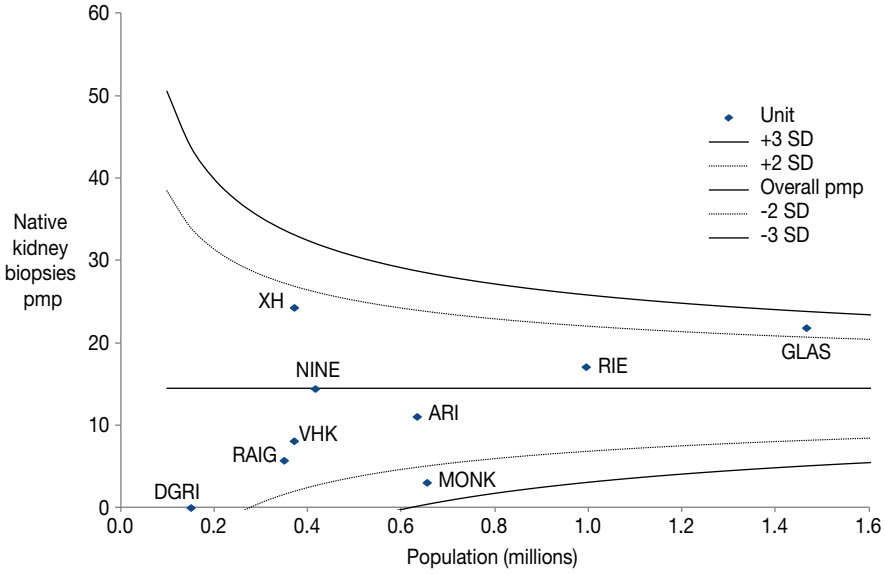
N5 Incidences per million population of selected biopsy diagnoses 2016



N6 Incidence per million population of biopsy diagnosis of IgA nephropathy by renal unit 2016



N7 Incidence per million population of biopsy diagnosis of ANCA associated vascilitides (AAV) by renal unit 2016



N8 Major complications of native kidney biopsies in 2016

Complication	n
Arteriography and embolisation	8
Arteriography no embolisation	0
Blood transfusion only	2
Clot obstruction managed conservatively	0
Clot obstruction requiring intervention	3
Death	0
Nephrectomy	0
Other please specify	1[a]
Surgery no nephrectomy	0
Total	**14**

a. Self-limiting post-procedure ileus.

Major complications were defined as shown in N8. There were 14 major complications (1.9%).