



Public Health
England

Protecting and improving the nation's health

Chronic kidney disease prevalence model

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Background

The chronic kidney disease (CKD) prevalence model provides estimates of total CKD prevalence for adults aged 16 and over in England.

The model estimates the expected prevalence of CKD stage 3-5, defined as moderate–severe CKD with an estimated glomerular filtration rate (GFR) < 60ml/min/1.73m². The modification of diet in renal disease (MDRD) equation was used to estimate GFR.

The model was developed using data from the Health Survey for England (HSE) – 2009 and 2010 and the 2011 Census. The estimates have been adjusted for age, sex, ethnicity and household tenure. As with all modelled data there is a degree of uncertainty around the estimates, therefore 95% credible intervals (CI) have been calculated that give a plausible range in which the true value is likely to be contained.

The model was developed at the University of Southampton. Full details of the model methodology can be found on the 'National cardiovascular intelligence network' (NCVIN) website.

CKD stage 3-5 estimates have been produced at local authority (LA) lower level, LA upper level, clinical commissioning group (CCG), region and for the whole of England. The estimates are available to download at: www.ncvin.org.uk

Current prevalence of CKD in England

It is expected that 2.6 million people (95% CI: 2.3–3.0) aged 16 years and older are living with CKD stage 3-5 (diagnosed and undiagnosed). This is equal to 6.1% (95% CI: 5.3-7.0%) of the population of this age group.

Key information

It is expected that 2.6 million people aged 16 years and older in England have CKD stage 3-5. This is equal to 6.1% of the population of this age group.

CKD stage 3-5 prevalence is higher in women than in men, 7.4% versus 4.7%.

There is a clear association between increasing age and higher CKD stage 3-5 prevalence; with 1.9% of people aged 64 and under estimated to have CKD stage 3-5, 13.5% of people aged 65-74 and 32.7% of people aged 75 and over.

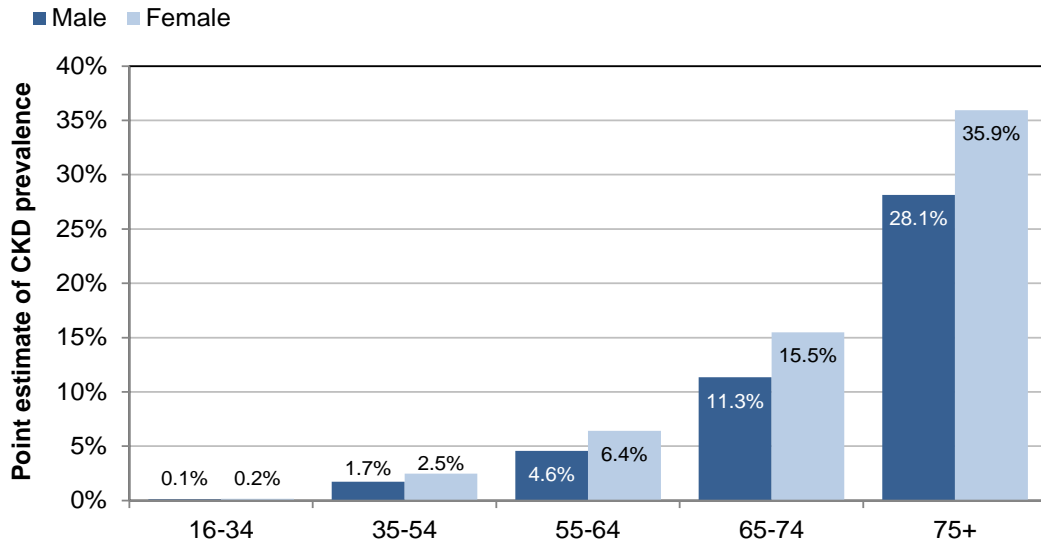
At CCG level, CKD stage 3-5 prevalence ranges from 2.9% to 8.6%. CKD stage 3-5 prevalence is higher in the north and the southern and eastern coastal regions and is lower in the London region.

Comparisons with the 2011/12 Quality and Outcomes Framework suggest that 71% of adults who have CKD stage 3-5 are on CKD registers.

Based on current CKD prevalence applied to the ageing population, prevalence of CKD stage 3-5 is expected to increase to 3.2 million people in 2021 and 4.2 million in 2036.

CKD stage 3-5 prevalence is higher in women than in men, at 7.4% versus 4.7%. There is a clear association between increasing age and higher CKD prevalence; with 1.9% of people aged 64 and under having CKD stage 3-5, 13.5% of people aged 65-74 and 32.7% of people aged 75 and over (Figure 1). The difference between the CKD stage 3-5 prevalence in females compared to males increases with older age groups.

Figure 1. Summary of expected CKD stage 3-5 prevalence in England



At CCG level, CKD stage 3-5 prevalence ranges from 2.9% to 8.6%.

CCGs with the highest expected total prevalence of CKD were NHS North Norfolk (East), NHS Eastbourne, Hailsham and Seaford (South East) and NHS Fylde and Wyre (North West) (Table 1). CCGs with the lowest expected prevalence were NHS Tower Hamlets, NHS City and Hackney, and NHS Lambeth (all London) (Table 2).

The quintiles of CKD stage 3-5 prevalence are shown in Map 1, with the highest quintiles mainly situated in the north and along the southern coastal and eastern coastal regions, and lowest quintiles in London.

The expected prevalence largely reflects the age structure of the population, with CKD stage 3-5 highest in CCGs that have a high percentage of elderly people.

Map 1. Map of expected CKD stage 3-5 prevalence

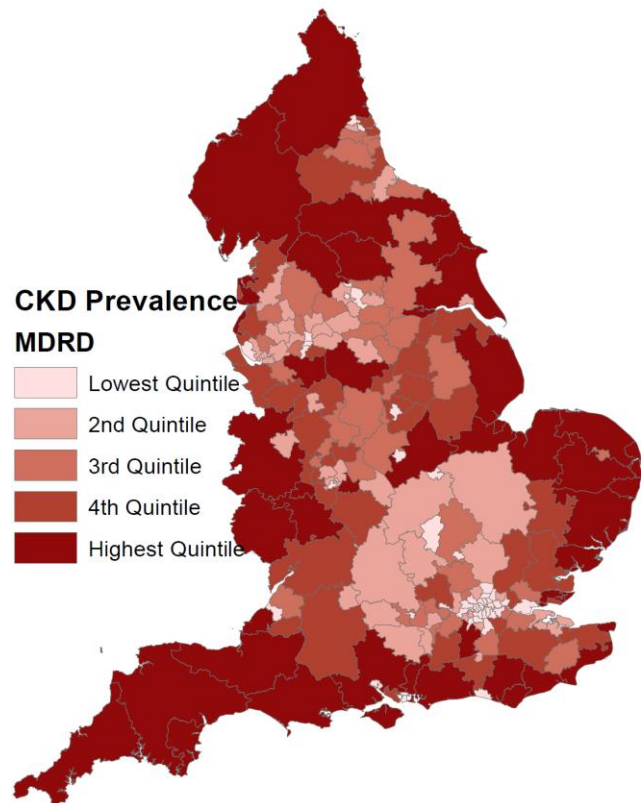


Table 1. CCGs with the highest expected total CKD stage 3-5

CCG Name	Number of people with CKD	% people with CKD	Lower CI	Upper CI
North Norfolk	12,301	8.6	5.9	11.3
Eastbourne, Hailsham & Seaford	12,825	8.5	4.7	12.2
Fylde & Wyre	11,276	8.3	5.8	10.7
Southport and Formby	7,819	8.2	4.6	11.9
Coastal West Sussex	32,042	8.1	4.7	11.6
South Devon and Torbay	17,661	8.0	5.0	10.2
Isle of Wight	9,260	8.0	5.0	11.1
Hastings & Rother	11,782	7.9	3.1	12.4
West Norfolk	11,121	7.9	4.3	11.5
Lincolnshire East	15,343	7.8	5.5	10.3

Table 2. CCGs with the lowest expected total CKD stage 3-5

CCG Name	Number of people with CKD	% people with CKD	Lower CI	Upper CI
Tower Hamlets	5,924	2.9	1.6	4.2
City and Hackney	6,301	3.1	1.9	4.3
Lambeth	7,989	3.2	2.0	4.3
Central Manchester	5,247	3.2	0.6	6.0
Southwark	7,765	3.3	1.8	4.7
Islington	5,895	3.4	2.5	4.1
Newham	8,164	3.4	2.3	4.6
Hammersmith and Fulham	5,402	3.5	2.4	4.4
Wandsworth	9,075	3.5	2.2	4.8
Haringey	7,520	3.7	2.5	4.8

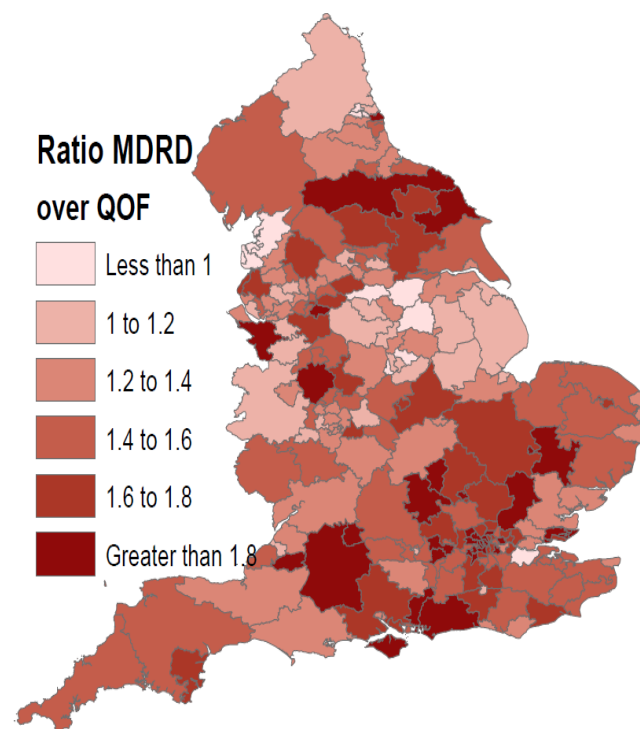
Comparison against QOF estimates

Comparisons between the modelled estimates and the 2011/12 Quality and Outcomes Framework (QOF) suggest that 71% of adults who have CKD stage 3-5 are included on CKD registers. It is therefore estimated that there are approximately 750,000 adults with CKD who have not been diagnosed and registered.

In order to calculate which CCGs have the greatest disparity between the modelled estimates and the QOF estimates, the ratio of estimated prevalence divided by the observed prevalence was calculated (Map 2).

A large number of CCGs with the highest ratio are located in the London area, despite having some of the lowest expected CKD stage 3-5 prevalence. Although the expected prevalence of CKD stage 3-5 is low in many London locations, the proportion of people with unregistered CKD stage 3-5 is frequently the highest.

Map 2: Ratio of modelled CKD stage 3-5 prevalence estimates against 2011/12 QOF recorded CKD stage 3-5 prevalence

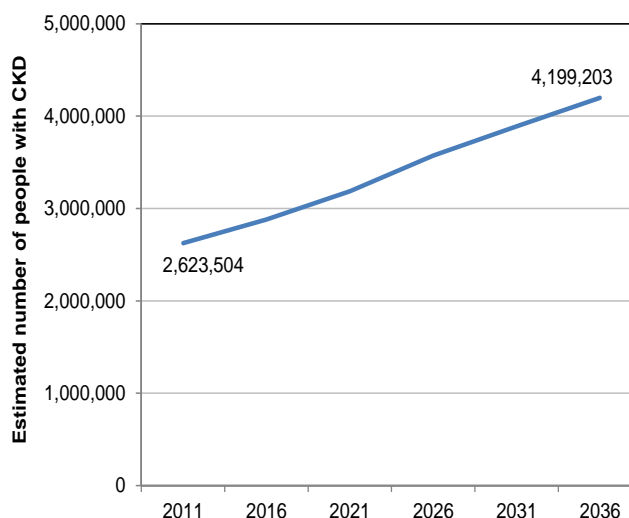


Future prevalence of CKD in England

Based on the projected population increase and assuming no change in the age – specific prevalence of CKD stage 3-5 and no improvement in the prevention and management of CKD stage 3-5, estimates of CKD prevalence have been calculated up to 2036.

Between 2011 and 2036 the prevalence of CKD stage 3-5 among people aged 16 years and over is expected to increase to 4.2 million or 8.3%. Prevalence of CKD stage 3-5 is not expected to increase uniformly across England with some CCGs expected to see the prevalence of CKD increase by over 50% between 2011 and 2036 due to significant increases in age (Table 3).

Figure 2: Projections of growth in expected number of people in England with CKD stage 3-5, 2011 – 2036



Source: 2012-based Subnational Population Projections for England

Table 3: CCGs with the highest expected increase in prevalence (%)

CCG	2011 (%)	2036 (%)	Increase
Milton Keynes	4.8	7.6	57.5%
Halton	5.6	8.8	57.2%
West London (K&C & QPP)	4.2	6.5	55.9%
Northumberland	7.0	10.8	54.6%
Telford & Wrekin	5.5	8.5	54.3%
Newbury and District	5.9	9.1	54.1%
South East Staffs	6.6	10.1	53.0%
Cannock Chase	6.1	9.3	52.8%
Wiltshire	6.6	10.1	52.0%
Harrogate and Rural District	7.1	10.7	51.1%

Table 4: CCGs with the lowest expected increase in prevalence (%)

CCG	2011 (%)	2036 (%)	Increase
Barking & Dagenham	4.7	4.9	3.9%
Redbridge	5.5	5.8	4.3%
Bradford City	4.0	4.4	10.2%
Birmingham CrossCity	5.8	6.5	12.6%
Sandwell and West Birmingham	5.4	6.2	15.1%
Birmingham South and Central	5.2	6.0	15.6%
Luton	5.1	5.9	15.9%
Hillingdon	5.4	6.3	16.2%
Harrow	6.1	7.2	16.9%
Bristol	5.0	5.9	18.3%

Contact

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