Author's response to reviews

Title: Prevalence of Diminished Kidney Function based on National Kidney Foundation Diagnosed Chronic Kidney Disease in a representative sample of Middle and Older Age Adults in the Irish Population.

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Author's response to reviews:

As the named author and with discussion with other author I have engaged with the constructive comments made and we have attempted to address some of the reviewers’ comments and hope that these changes are satisfactory to allow publication of the manuscript.

Reference #1
Many thanks for your comments on the manuscript, Age groups in Table 1 summate to total N= 1098 as do original SLAN, N= 5147

Reference #2, many thanks for your careful assessment of the manuscript especially on your comments relating to accuracy and bias, following these comments I have altered the figures to try to graphically illustrate bias across the different methods of assessment of eGFR.

The abstract has been shortened and now includes 278 words only.

Major suggested revisions, these findings are consistent with previous literature, in that MDRD underestimates eGFR measurement thus resulting in a higher than expected proportion of subjects with Estimated CKD as mentioned by reviewer two, this is seen in NHANES, CREDIT Study etc, however this bias of MDRD is not well illustrated in the scatter plot in the original Figure 2A as the CKD EPI is represented on the X axis, I have therefore in response to these suggestions removed Figure 1 and replaced it with a box plot that shows limits of agreement between the 2 methods across different stages of renal function, which I feel improves the illustration of bias across the 2 methods. The line of agreement at CKD-EPI= MDRD is present also on this box plot and perhaps this better illustrates bias across the methods at different levels of renal function.

The original Figure 1 has been removed, Figure 2 has been replaced by 4 Bland Altman plots which show bias across the reporting of the two methods in men and women and also by age (thus allowing removal of Table 4 which is a
tabulated version of bias across different eGFR stages by CKD EPI- MDRD as suggested by Referee 2)

This leaves Table 1 description of the demography of the population, table 2 allowing the prevalence and 95% CI with better clarity of estimates using weighted and non weighted estimates for totals and removal of the proportions of albuminuria per GFR stage as suggested by reviewer.

Table 3 elements of bias across eGFR <=60, incorporating significance tests across these subgroups, removal of original table 4 which looked at numerical bias across different levels of eGFR.

Table 4 looking at associations across impaired renal function in this population survey, also simplified by removing the N= for each association as this is already mentioned in Table 1.

We are happy to give Kappa Statistics and Bland Altman Limits of Agreement and have already calculated these summary statistics as included below, however on looking at our data (which is similar to the data of others), the bias seen across the two methods of measurement is not constant and varies significantly at different levels of eGFR. As Bland Altman limits of agreement is a summary measure of all the data related bias, this does not well represent variation in the amount of bias depending on the level of eGFR and so we have not included it in the manuscript.

Level of agreement calculated using a Kappa statistic was 79.9% level of agreement between the 2 methods (expected agreement 43.2%, p<0.0001). Using Lin's concordance of correlation co-efficient the mean difference (standard error) across the CKD-EPI and MDRD was 0.18 (sd: 0.41) with the 95% CI Bland Altman limits of agreement: -0.628, 0.985


Other biochemical measurements were undertaken in this survey however as carefully noted by Reviewer 2 we do not incorporate serum albumin results in this manuscript as it has little relevance in this subject at population level so I have removed it from the methods. Exact methods of measuring urinary albumin is included.

Title is altered to reflect the older population as mentioned by Reviewer 2 and 3.

Units of measurement are standardised across the manuscript.

With respect to Referee 3, many thanks for your very relevant comments with regard to estimating the population based chronic kidney disease in Ireland, we have tried to optimise the manuscript taking your comments into account.

With respect to the population and limitations,

The title has been changed to specify the older nature of the population, as this
reflects the study population.

The abstract has been shortened and highlights the weighted estimates based on N=1068 population, weighted estimates were developed for population based estimates as correctly suggested by the reviewer so these are presented in the tables with weighted estimates only as totals, all weighted estimates have been re-analysed with some corrections as some weighted estimates in the abstract were based on 1160 subjects, an additional reference which further explains weighting estimates in surveys to allow population estimates has also been added to the manuscript, (Heering SG, West BT, Berghid PA. Applied survey data analysis. CRC Press)

Physical exercise and smoking were not statistically significantly associated with CDK and were not included in the model; this has been included in the discussion text

And this likely reflects the

Albuminuria is based on a once off urine sample and may be an overestimate however this may also be due to the older age demography of the population, this has been commented in the discussion text

Prevalence by Age

Both weighted and unweighted estimates are included, and Table 2 has been altered to include weighted and unweighted estimates which clarifies this better.

Weighting in itself carries an element of error and this error is increased when subgroups are defined, we use weighting to allow a population based estimate and a better explanation of weighting has been included in the manuscript.

The population studied are a higher risk group and so reflect the increased incidence however this is in concordance with other studies when age specific estimates are included.

Kind Regards
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