PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Trends in recording of diagnosis and prescribing in type 2 diabetes mellitus between 2000-2013 in primary care: a retrospective cohort study.
AUTHORS	Sharma, Manuj; Nazareth, Irwin; Petersen, Irene

VERSION 1 - REVIEW

REVIEWER	Tara Gomes St. Michael's Hospital Canada
REVIEW RETURNED	30-Oct-2015

GENERAL COMMENTS	The authors report an interesting, population-based study of both type 2 diabetes incidence/prevalence and use of drug therapy in a large primary care database in the UK. Overall, this is a well written, detailed manuscript that provides important clinical information regarding diabetes prevalence and therapy in the UK. My main comments refer to the methodology, potential database limitations, and interpretation. MAJOR COMMENTS: 1. Strengths and Limitations: The authors slightly overstate the novelty of this study as there have been other studies conducted in the UK (which they cite) and elsewhere (ie Lipscombe et al. (PMID: 17336651), Hux et al. (PMID 11874939) that look at identification of incident/prevalent diabetes and/or trends in medication use. It may be that this is the first study of its kind in the UK, and/or the first of its kind in the UK using primary care data. More explicit explanation of the novelty would strengthen this. 2. Introduction/Discussion: The authors describe in their introduction that in 2004, financial incentives were introduced that encouraged better recording of diabetes. If this is the case, given that the authors used primary care data for their diabetes definition, it is likely that their measures of incidence may have been impacted by increased documentation of diabetes in primary care records. Indeed – the authors found a 'peak' in T2DM incidence in 2004 (Table 1). More discussion is needed as to how financial incentives may have impacted the incidence rates, and what this means about the validity of the diabetes definition pre and post 2004. 3. Methods: The population is restricted to those practices which met the AMR and ACU standards of quality assurance. The authors do not report how many of the 550 practices are excluded based on this and whether there are some systematic differences in those that are excluded vs. included that may impact the generalizability of their findings (ie are more modern practices more likely to meet these standards, and also potentially more likely to prescribe newer agents or align with NICE guidelines?) 4. Methods: The validity of the T2DM definition is of key importance

	to the interpretation and value of this study – particularly the authors' ability to distinguish between Type 1 and 2 diabetes. The authors indicate that a sample of 500 records were reviewed to confirm validity of the definition, but do not report the findings of this validation. More information about this algorithm and its validity is needed to understand how well the authors are able to capture T2DM. 5. Definition of Main Outcomes: In the definition of incident diabetes, the authors exclude the first 9 months of practice registration. I assume that this was included in the definition of prevalent T2DM, however this is not clear from the text. Furthermore, the authors mention that "As previously" they accounted for deaths and patients who had left the practices, however I see no mention of how they handled these patients earlier in the manuscript. 6. Statistical Analysis: Some of the details on how analyses by person time were conducted are unclear. For example, person time is described as a calculation over the study period, however annual rates are reported. How is the person time contributed in each year calculated? 7. Discussion: In their discussion, the authors compare changes in trends of diabetes drug therapy and various reports and guidelines that have been released. Did the authors consider conducting an interventional time series analysis to determine whether these events had a significant impact on the trends? 8. Strengths and Limitations: As mentioned above, the authors should include a statement on the validity of their definition for T2DM. MINOR COMMENTS: 1. Abstract: the term PYAR is not defined 2. Abstract results: "Sulfonylureas reached a lot 41.4%" – year at which point the low was reached is not indicated. 3. Abstract conclusion: The authors mention a plateauing of rates in 2005. This is not described earlier in the abstract. I would suggest that this is added to the results in the abstract, or this conclusion is removed from the abstract. 4. The authors use the term "first recording" "new use" and "incidence" interchangeably throughout the manuscript. The term incidence would seem most appropriate for this study. 5. Prevalence calculation: The authors used the total number of T2DM patients who were issued any anti-diabetic medication as their denominator. Why not use the population of all T2DM patients as their denominator instead if reporting prevalence of use of these drugs among T2DM patients? 6. Discussion: The discussion of the various prescribing patterns of each class of diabetes drug is quite lengthy – I believe that the manuscript could be improved by consolidating this discussion somewhat. 7. Tables 1-2: Expanding the footnote to list out variables that were included in adjusted model would help clarify this analysis.

REVIEWER	C Böger University Hospital Regensburg, Germany
REVIEW RETURNED	15-Nov-2015

GENERAL COMMENTS	This is an excellently performed and written paper on the important topic of diabetes prevalence and incidence, and related drug prescription patterns.

	What is missing is how chronic kidney disease or kidney function impairment affects drug prescription patterns. If information is available on presence of CKD stage 3-5 then the authors should consider performing an analysis of drug prescription patterns stratified by presence of CKD stage 3-5. If this information is not available and perhaps beyone the scope of this current ms, then the authors should at least discuss issue. A further thing missing is a discussion of incidences and prevalences and drug prescription patterns in other European states. The authors put their results into context with US data, but not with European data. It would be nice to see if the UK data are more comparable to European data than it is to the US.

VERSION 1 – AUTHOR RESPONSE

REVIEWER 1

The authors report an interesting, population-based study of both type 2 diabetes incidence/prevalence and use of drug therapy in a large primary care database in the UK. Overall, this is a well written, detailed manuscript that provides important clinical information regarding diabetes prevalence and therapy in the UK. My main comments refer to the methodology, potential database limitations, and interpretation.
Response: Thank you, please find responses below to individual comments.

MAJOR COMMENTS FROM REVIEWER 1:

Q1. Strengths and Limitations: The authors slightly overstate the novelty of this study as there have been other studies conducted in the UK (which they cite) and elsewhere (i.e. Lipscombe et al. (PMID: 17336651), Hux et al. (PMID 11874939) that look at identification of incident/prevalent diabetes and/or trends in medication use. It may be that this is the first study of its kind in the UK, and/or the first of its kind in the UK using primary care data. More explicit explanation of the novelty would strengthen this.

Response to Q1. We have now amended our statement on the novelty of this manuscript to read as follows;

Strengths and Limitations Page 4; Point 1: “This is, to our knowledge, the first study to examine both changes in rates of incident and prevalent diagnosis of type 2 diabetes mellitus and anti-diabetic prescribing patterns using “real world” UK primary care data between 2000-2013.”

Discussion; Strengths and Limitations of this study Page 19 Para 4: “This is the first study, to our knowledge, to detail changes in recording of diagnoses as well as prescribing for T2DM using UK primary care data between 2000-2013. We have also provided insight into factors that may have driven these changes.”

Q2. Introduction/Discussion: The authors describe in their introduction that in 2004, financial incentives were introduced that encouraged better recording of diabetes. If this is the case, given that the authors used primary care data for their diabetes definition, it is likely that their measures of incidence may have been impacted by increased documentation of diabetes in primary care records. Indeed – the authors found a ‘peak’ in T2DM incidence in 2004 (Table 1). More discussion is needed as to how financial incentives may have impacted the incidence rates, and what this means about the validity of the diabetes definition pre and post 2004.

Response to Q2: Thank you for raising this point. The financial incentives introduced in 2004 as part of QOF may have led to better recording of parameters such as BMI, smoking, blood pressure, creatinine etc. among diabetics. It is unlikely that QOF alone could explain the rising number of diabetic diagnostic and prescription codes being used (upon which our identification and classification algorithm was based – see further details in response to comment 4) or indeed in turn changes in incidence rates observed in the study. The significance of QOF financial incentives has been clarified in the introduction as we appreciate it may have been misleading previously.

Introduction; P5 Para 1: "The NHS quality and outcomes framework (QOF), introduced as part of the GP contract in 2004 offers several financial incentives to encourage better monitoring and effective management of several diseases in primary care including diabetes."

However, we do appreciate that we cannot exclude any possible impact of QOF on incidence rates and therefore we have now added the below in discussion;

Discussion; P16 Para 2: "The increase in incidence observed in 2004 in this study could also relate to the introduction of incentivised payments in the UK as part of the quality and outcomes framework for better monitoring of patients with T2DM."

Q3. Methods: The population is restricted to those practices which met the AMR and ACU standards of quality assurance. The authors do not report how many of the 550 practices are excluded based on this and whether there are some systematic differences in those that are excluded vs. included that may impact the generalizability of their findings (i.e. are more modern practices more likely to meet these standards, and also potentially more likely to prescribe newer agents or align with NICE guidelines?).

Response to Q3: In general, practices are not excluded on the ground of ACU and AMR standards. Thus in this study only one practice was completely excluded on this account. The ACU and AMR dates impact from when we can reliably use the data (1, 2). Thus, the study by Horsfall et al. demonstrated that some practices did not fully use their computer systems in the early 1990's and if we include data before they have reached an acceptable computerised usage (ACU) the incidence and prevalence is likely to be underestimated.

1. Horsfall L, Walters K, Petersen I. Identifying periods of acceptable computer usage in primary care research databases. Pharmacoepidemiol Drug Saf 2013;22(1):64-9. doi: 10.1002/pds.3368
2. Maguire A, Blak BT, Thompson M. The importance of defining periods of complete mortality reporting for research using automated data from primary care. Pharmacoepidemiol Drug Saf 2009;18(1):76-83. doi: 10.1002/pds.1688

4. Methods: The validity of the T2DM definition is of key importance to the interpretation and value of this study – particularly the authors' ability to distinguish between Type 1 and 2 diabetes. The authors indicate that a sample of 500 records were reviewed to confirm validity of the definition, but do not report the findings of this validation. More information about this algorithm and its validity is needed to understand how well the authors are able to capture T2DM.

Response to Q4: We acknowledge that information provided about our algorithm was insufficient. We have added a key reference which details the basis of our methodological approach for our algorithm and have now amended the relevant section in the methods as follows;

Methods; Study Population and Period- P8 Para 1: "We developed an algorithm to identify individuals with diabetes based on whether they had at least two of the following records; 1) a diagnostic code for

diabetes 2) supporting evidence of diabetes e.g. screening for diabetic retinopathy or 3) treatment for diabetes. The first record of any of these three was considered as the date of diagnosis. As some Read codes are non-specific we sought to distinguish diabetics as Type 2 based on age at diagnosis, types of treatment and timing of the diabetes diagnosis (18). For example, diabetics aged ≥35 at time of diagnosis, on non-insulin anti-diabetic treatment or being managed without treatment were classified as Type 2. Diabetics diagnosed <35 years of age and on insulin were classified as Type 1. A sample of 500 complete electronic healthcare records for individuals with diabetes were reviewed manually in THIN to assess if our clinical classification algorithm for diabetes type based on parameters above had identified diabetes type correctly. In all 500 cases, manual assignment of diabetes type based on clinical assessment of the entire record and algothmic assignment led to equivalent classification."

18. Royal College of General Practitioners. Coding, Classification and Diagnosis of Diabetes; 2011. http://www.sdrn.org.uk/sites/sdrn.org.uk/files/nhs%20diagnosis%20classification%20report.pdf (accessed 6 June 2015).

5. Definition of Main Outcomes: In the definition of incident diabetes, the authors exclude the first 9 months of practice registration. I assume that this was included in the definition of prevalent T2DM, however this is not clear from the text. Furthermore, the authors mention that "As previously" they accounted for deaths and patients who had left the practices, however I see no mention of how they handled these patients earlier in the manuscript.

Response to Q5: Thank you for highlighting this omission in the text. The reviewer is correct that the 9 months of practice registration criterion applied only to analysis of incidence and not prevalence. We have now corrected the text as follows (below and in Q6) which will hopefully clarify the omissions;

Methods; Definition of Main Outcomes; P8 Para 2; Incidence of T2DM: "We excluded those who had their first recording of T2DM made within the first nine months of practice registration as these were more likely to be prevalent cases.(19) We accounted for deaths and patients who had left the practices in our denominator (follow-up time)."

Methods; Definition of Main Outcomes; P9 Para 1; Prevalence of T2DM: "For our analysis on prevalence ….. All individuals registered with a general practice between 2000-2013 having accounted for deaths and patients who had left the practices were included in our denominator."

Q6. Statistical Analysis: Some of the details on how analyses by person time were conducted are unclear. For example, person time is described as a calculation over the study period, however annual rates are reported. How is the person time contributed in each year calculated?

Response to Q6: An overall rate of first recording of type 2 diabetes mellitus is specified in Table 1 for both men "4.19 (4.17 to 4.21)" and women "3.72 (3.70 to 3.74)". In this rate, person time of all participants between 2000 and 2013 (as the reviewer has highlighted) was used as the denominator with the total number of new cases being used as the numerator.
In the analysis we presented by year, only the person time for follow up in that particular year contributed to the denominator and, of course, only the number of new cases diagnosed in that particular year contributed to the numerator.
We have revised the statistical analysis sections to reflect a clearer description of above as well as issues raised in Q5;

Methods; Statistical Analysis; P10 Para 2; "The overall crude incidence of T2DM was estimated per 1000 person years at risk (PYAR). This was determined by totalling the number of patients with a first

recording of T2DM during between 2000-2013 and dividing by the total person years of follow up for all patient records for this period. We also determined crude incidence rates by age, gender, social deprivation (Townsend Score) and calendar year by restricting the person years of follow up to the respective category in question. Person time was measured from the latest of: the date of registration plus nine months or 1st January 2000 to the earliest of: date of first recording of T2DM, date of death, date patient left the practice, last date of data collection from that practice or 31st Dec 2013. Multivariable Poisson regression analysis with (log) person time as an offset was used to analyse changes in incidence by age, gender, social deprivation and calendar year whilst controlling for the other respective variables.
The overall crude prevalence of T2DM was calculated by dividing the total number of patients with T2DM by the total number of GP registered patients between 2000-2013 accounting for deaths and patients who had left the practices. Crude prevalence by age, gender, social deprivation and calendar year was also determined. Multivariable Poisson regression analysis was used to analyse changes in prevalence of T2DM and also the effect of age, gender, social deprivation and calendar year whilst controlling for the other respective variables."

Q7. Discussion: In their discussion, the authors compare changes in trends of diabetes drug therapy and various reports and guidelines that have been released. Did the authors consider conducting an interventional time series analysis to determine whether these events had a significant impact on the trends?

Response to Q7: Thank you for this suggestion. We did look into time series analyses, but we felt that these are best applied when there is a specific and strong intervention. In our situation the changes over time may be influenced by several factors.
We have been careful to be clear to the reader of this limitation in the study.

Strengths and Limitations Page 4; Point 3: "Although, several explanations for the factors that might have triggered changes in prescribing patterns of anti-diabetic medications over time are provided, there is no means of determining the exact rationale behind prescribing decisions without gathering more detailed information on prescribing for each therapeutic category.

Discussion; Strengths and Limitations of this study Page 19 Para 4: "We have also provided insight into factors that may have driven these changes.."

Q8. Strengths and Limitations: As mentioned above, the authors should include a statement on the validity of their definition for T2DM.

Response to Q8: We have included further detail of our algorithm and its validity earlier (see response to Q4) and in the strengths and limitations section of the discussion I have now also included the following:

Discussion; Strengths and Limitations of this study Page 19 Para 4: "Though our algorithm for identification of patients with T2DM utilized several variables in addition to diagnostic codes such as treatment and time of diagnosis, there still remains a risk of some misclassification of T2DM."

MINOR COMMENTS FROM REVIEWER 1:

Q1. Abstract: the term PYAR is not defined

Response to Q1: We have now spelled out this acronym in both the abstract and main text in full.

Q2. Abstract results: "Sulfonylureas reached a lot 41.4%" – year at which point the low was reached is

not indicated.

Response to Q2: We have revised this sentence and it now reads;

Abstract P2: “In 2013, metformin prescribing peaked; 83.6% (95% CI 83.4-83.8) while sulphonylureas reached a low 41.4% (95% CI 41.1-41.7).”

Q3. Abstract conclusion: The authors mention a plateauing of rates in 2005. This is not described earlier in the abstract. I would suggest that this is added to the results in the abstract, or this conclusion is removed from the abstract.

Response to Q3: We have removed the reference to “plateauing of the rate” and revised the abstract conclusion to read as follows;

Abstract P3: “Prevalent cases of T2DM more than doubled between 2000-2013 while the number of incident cases increased more steadily.”

We have left the greater detail regarding plateauing of the rate for later in the manuscript as suggested.

Q4. The authors use the term “first recording” “new use” and “incidence” interchangeably throughout the manuscript. The term incidence would seem most appropriate for this study.

Response to Q4: In order to minimize this confusion, we have now reviewed the manuscript to ensure we use the term “incidence” consistently. However, we have clarified in our methods section that when we use incidence, we refer to rate of first recording of type 2 diabetes mellitus in primary care records in our methods section.

Methods; Definition of Main Outcomes; Incidence of T2DM P8 Para 2: “The date at which the first recording of T2DM was made was classified as the index date for diagnosis. Therefore, our use of the term incidence with respect to T2DM in this study refers to the first record of T2DM to appear in a patient’s electronic primary care record in the THIN database.“

Q5. Prevalence calculation: The authors used the total number of T2DM patients who were issued any anti-diabetic medication as their denominator. Why not use the population of all T2DM patients as their denominator instead if reporting prevalence of use of these drugs among T2DM patients?

Response to Q5: Thank you for raising this point and it was in fact one we discussed in detail within our team. Given that nearly 25% of type 2 diabetes as shown in our study are managed without medication, this change only served to reduce the percentage prescribing of the less commonly used medicines e.g. GLP-1 analogues to negligible levels. What we really want to demonstrate is treatment choices among those that require treatment and hence we have chosen this denominator.

Q6. Discussion: The discussion of the various prescribing patterns of each class of diabetes drug is quite lengthy – I believe that the manuscript could be improved by consolidating this discussion somewhat.

Response to Q6: We have revised and shortened the discussion in light of this comment. Please see tracked changes for consolidation/deletions in the main manuscript of material in the discussion particularly within the section on prescribing patterns mentioned by the reviewer (P17 Para 3 to p19 Para 3).

Q7. Tables 1-2: Expanding the footnote to list out variables that were included in adjusted model would help clarify this analysis.

Response to Q7: We have expanded both footnotes as suggested;
Table 1 footnote P22: "* adjusted for other variables considered; ageband, townsend quintile, calendar year respectively"

Table 2 footnote P23: "*adjusted for other variables considered; gender, ageband, townsend quintile and calendar year respectively"

REVIEWER 2

MAJOR COMMENTS FROM REVIEWER 2

This is an excellently performed and written paper on the important topic of diabetes prevalence and incidence, and related drug prescription patterns.
Response: Thank you, please find responses below to individual comments;

Q1. What is missing is how chronic kidney disease or kidney function impairment affects drug prescription patterns. If information is available on presence of CKD stage 3-5 then the authors should consider performing an analysis of drug prescription patterns stratified by presence of CKD stage 3-5. If this information is not available and perhaps beyond the scope of this current ms, then the authors should at least discuss issue.

Response to Q1: This is a very important clinical point, unfortunately we do not have access to the information on CKD stages at this time. However, we have now included a discussion in the manuscript to highlight that further analysis of prescribing patterns among clinically relevant subgroups such as those at different stages of CKD is needed;

Discussion; Strengths and Limitations of this study Page 20 Para 1: "Equally, prescribing patterns in important clinical subgroups such as patients with chronic kidney disease was not explored here and should be addressed in future work."

Q2. A further thing missing is a discussion of incidences and prevalences and drug prescription patterns in other European states. The authors put their results into context with US data, but not with European data. It would be nice to see if the UK data are more comparable to European data than it is to the US.

Response to Q2: Thank you for raising this point. We appreciate the comparison with Europe was insufficient previously. We have now added some discussion (and references) on comparison with European countries to the main text from studies conducted in Denmark and Germany. Please see three added sections below;

Discussion P17 Para 1: "The rise in prevalence of T2DM described in this study was similar to that reported by Diabetes UK and the International Diabetes Federation in 2013.(23-25) Prevalence rates of T2DM observed in this study in the UK are similar to what has been observed elsewhere in other European countries such as Denmark and Sweden but lower than that observed in Germany and in the US particularly in recent years. (26,27)"

Discussion P17 Para 2: "This significant selection of metformin over other therapies in the United Kingdom suggests an adherence, particularly for treatment initiation, to cost-effective care as

published via periodic updates by NICE. This reliance on metformin for first line therapy has also been evident in other studies conducted in Germany and Denmark in particular.29,30”

Discussion P18 Para 4: “GLP-1 analogues were the first anti-diabetic treatments to become available that could induce weight loss, however we have shown that prescribing in UK primary care particularly as add-on therapy after metformin remains very low (1.1%). This is in considerable contrast to prescribing in Denmark where a study examining data between 2000-2012 provided evidence of nearly 7% of patients with T2DM on metformin having GLP-1 therapy added on.”

VERSION 2 – REVIEW

REVIEWER	Carsten Böger Department of Nephrology, University Hospital Regensburg, Germany
REVIEW RETURNED	11-Dec-2015

GENERAL COMMENTS	The authors have addressed the reviewer comments adequately.

Correction

Sharma M, Nazareth I, Petersen I. Trends in incidence, prevalence and prescribing in type 2 diabetes mellitus between 2000 and 2013 in primary care: a retrospective cohort study. *BMJ Open* 2016;6:e010210.

The data in the original Table 2 showed proportional distribution by gender, social deprivation and age within the dataset rather that population prevalence. We have now replaced this information with estimates of prevalence and the updated Table 2 (see below). Table 2 now includes prevalence estimates by calendar year (as before) as well as prevalence estimates by gender, age and quintiles of Townsend deprivation

Table 2 Prevalence of type 2 diabetes mellitus per 100 individuals by calendar year and by socio-demographic factors for 2013 only

	Prevalence of Type 2 Diabetes in 2013 by socio-demographic factors Percentage Prevalence (95% CI)	Adjusted PR (95% CI)*
Gender		
Men	5.91 (5.88 to 5.94)	1
Woman	5.11 (5.08 to 5.14)	0.79 (0.79 to 0.80)
Age, years		
0–9	0.03 (0.02 to 0.03)	0.01 (0.01 to 0.01)
10–19	0.14 (0.13 to 0.15)	0.03 (0.03 to 0.04)
20–29	0.6 (0.58 to 0.62)	0.15 (0.15 to 0.16)
30–39	1.65 (1.62 to 1.68)	0.42 (0.41 to 0.43)
40–49	3.70 (3.66 to 3.75)	1
50–59	7.76 (7.69 to 7.82)	2.16 (2.13 to 2.20)
60–69	12.95 (12.85 to 13.04)	3.73 (3.67 to 3.79)
70–79	18.75 (18.61 to 18.88)	5.48 (5.40 to 5.56)
80–89	19.29 (19.11 to 19.46)	5.69 (5.60 to 5.78)
90–99	13.44 (13.14 to 13.75)	4.07 (3.96 to 4.19)
Townsend Quintile		
1	5.00 (4.95 to 5.04)	1
2	5.52 (5.47 to 5.56)	1.11 (1.10 to 1.13)
3	5.67 (5.63 to 5.72)	1.31 (1.30 to 1.33)
4	5.94 (5.89 to 5.99)	1.53 (1.51 to 1.54)
5	6.25 (6.19 to 6.31)	1.75 (1.73 to 1.78)
Annual Prevalence of Type 2 Diabetes between 2000–2013		
Year		
2000	2.39 (2.37 to 2.41)	1
2001	2.60 (2.58 to 2.62)	1.10 (1.08 to 1.11)
2002	2.84 (2.83 to 2.86)	1.20 (1.19 to 1.21)
2003	3.11 (3.09 to 3.13)	1.32 (1.30 to 1.33)
2004	3.40 (3.38 to 3.42)	1.44 (1.43 to 1.45)
2005	3.66 (3.64 to 3.67)	1.55 (1.53 to 1.56)
2006	3.88 (3.86 to 3.90)	1.64 (1.63 to 1.65)
2007	4.10 (4.08 to 4.12)	1.73 (1.71 to 1.74)
2008	4.33 (4.32 to 4.35)	1.82 (1.81 to 1.84)
2009	4.56 (4.54 to 4.58)	1.91 (1.90 to 1.93)
2010	4.78 (4.76 to 4.80)	2.01 (1.99 to 2.02)
2011	4.98 (4.96 to 5.00)	2.08 (2.07 to 2.10)
2012	5.17 (5.15 to 5.19)	2.16 (2.14 to 2.18)
2013	5.32 (5.30 to 5.34)	2.21 (2.19 to 2.23)

*PR (prevalence ratios) mutually adjusted for other variables considered; gender, age band, Townsend quintile respectively.
**For figure displaying data above consult online supplementary appendix 2.

for 2013 (the last year of our study period). Related changes have been made to the method, results and discussion section where relevant.

(1) **METHODS/Definition of main outcomes/Prevalence of T2DM** should read:
For our analysis on prevalence of T2DM by calendar year, we included as our numerator all individuals who had a record of T2DM on or before 1st January in the given year and as our denominator we included all patients registered to a general practice on or by 1st January in the given year.

To estimate prevalence by age, gender and social deprivation, we identified numerators and denominators as described above. Given age changed with time we focused on data from 2013 and calculated age at 1st January 2013. Gender and social deprivation were considered as fixed variables.

(2) **METHODS/Statistical Analysis paragraph 2** should read:
The crude prevalence of T2DM for each year was calculated by dividing the number of all individuals recorded as having T2DM on or before 1st January of that year by the total number of patients registered to a general practice on or by 1st January of that year. Multivariable Poisson regression analysis was used to estimate prevalence ratios of T2DM by year adjusted for age, gender and social deprivation as well as mutually adjusted ratios for age, gender and social deprivation for 2013.

(3) **RESULTS/Prevalence of T2DM** from second sentence should read:
Prevalence of T2DM in 2013 was 5.11 per 100 women and 5.91 per 100 men (Prevalence Ratio (PR) 0.79, 95% CI 0.79 to 0.80) (Table 2) and highest among individuals in the most deprived areas (Townsend quintile 5 vs Townsend quintile 1; (PR 1.75, 95% CI 1.73 to 1.78)). The prevalence increased with age. The highest prevalence for T2DM was seen in the 80–89 years age band: 19.29 per 100 individuals (95% CI 19.11 to 19.46). In comparison to individuals aged 40–49, the adjusted prevalence ratio for 80–89 years age band was 5.69, (95% CI 5.60 to 5.78) (Table 2).

(4) **DISCUSSION/Paragraph 1** from third sentence should read:
Data from 2013 showed women were 21% less likely to have T2DM than men and those who were most socially deprived were 75% more likely to have T2DM, as compared to those least deprived. Individuals aged 80–89 years had the highest adjusted prevalence of T2DM, which was nearly six times higher than individuals aged 40–49 years.

BMJ Open 2016;**6**:e010210corr1. doi:10.1136/bmjopen-2015-010210corr1