# Diabetes in the UK: 2019

Author list:

C.A.Whicher1, S. O’Neill2, R.I.G Holt3

1 Southern Health NHS Foundation Trust, Research & Development Dept. Tom Rudd Unit, Moorgreen Hospital, Botley Rd, West End Southampton, SO30 3JB, UK

2 Diabetes UK, Wells Lawrence House, 126 Back Church lane, London, E1 1FH, UK

3Human Development and Health, Faculty of Medicine, University of Southampton, Tremona Road, Southampton, SO16 6YD, UK

**Email:**

Clare.whicher@southernhealth.nhs.uk

**Corresponding Author**

1 **Clare Alexandra Whicher.** Southern Health NHS Foundation Trust, Research & Development Dept. Tom Rudd Unit, Moorgreen Hospital, Botley Rd, West End Southampton, SO30 3JB, UK. Clare.whicher@southernhealth.nhs.uk

## Novelty Statement

* This paper provides a state-of-the-nation report on diabetes in the UK
* 7% of the UK population have diabetes
* Uptake of diabetes structured education is poor
* Less than one half of people with diabetes receive all eight annual health checks.
* Diabetes is responsible for 530 myocardial infarctions and 175 amputations every week.
* The NHS spends at least £10 billion a year on diabetes, equivalent to 10% of its budget; 80% is spent treating complications.
* One in six hospital in-patients has diabetes.
* Annual state-of-the-nation reports will allow an assessment of the changing epidemiology of diabetes in the UK

## Abstract

Aim

Diabetes impairs the quality of life of people living with the condition and is a major public health concern. The aim of this paper is to create a state-of-the nation report of diabetes in the UK.

Methods

Diabetes UK collates information about diabetes from diverse sources. This paper synthesises these data to create a national report.

Results

7% of the UK population are now living with diabetes. Approximately one million people have undiagnosed type 2 diabetes. 40,000 children have diabetes and more than 3,000 children are diagnosed every year. 49% and 90% of people with type 1 diabetes and type 2 diabetes were offered structured education respectively but only 7.6% and 10.4% attended respectively. 28% of people with diabetes reported having issues obtaining medication or equipment for self-management. 57% of people with type 1 diabetes and 42% of people with type 2 diabetes do not receive all eight annual health checks. 40% of people with diabetes have diminished psychological wellbeing. A third of people have a microvascular complication at the time of diagnosis of type 2 diabetes. Diabetes is responsible for 530 myocardial infarctions and 175 amputations every week. The NHS spends at least £10 billion a year on diabetes, equivalent to 10% of its budget; 80% is spent treating complications. One in six hospital in-patients has diabetes.

Conclusion

Diabetes continues to place a significant burden on the individual with diabetes and wider UK society. This report will be updated annually to understand how diabetes is changing across the UK.

## Introduction

In the United Kingdom (UK) someone is diagnosed with diabetes every two minutes and one in 15 people now have diabetes. Sensationalist headlines report more than 500 people with diabetes die prematurely every week, the NHS spends £19,000 a minute on diabetes and diabetes causes an amputation every hour [1]. While these shocking statistics rightly grab our attention, there are many more facts and figures concerning all aspects of living with diabetes that deserve consideration, for example, over two thirds of people with diabetes do not fully understand their diagnosis. Every year, Diabetes UK collates information about diabetes from diverse sources and the intention of this paper is to provide a state of the nation report mainly using data from 2017-2018 unless specified. The intention is that this reported will be updated yearly to describe how the situation is changing and allow comparisons with previous reports.

## Prevalence and type of diabetes

4.7 million people in the UK have a diagnosis of diabetes of whom 90% have type 2 diabetes [2, 3]. This number has more than doubled in the past 20 years and Diabetes UK predicts that by 2030 this number will exceed 5.5 million [2, 4]. The number of people living with diabetes equates to 7% of the UK population and this is broadly the same across the four nations (table 1) [5]. About 8% of people currently living with a diagnosis of diabetes have type 1 diabetes with other types such as monogenic diabetes accounting for the remaining 2% [3]. In 2013 six in ten people were asymptomatic at time of a diagnosis of type 2 diabetes and it is estimated that around one million people have undiagnosed type 2 diabetes [2].

### Risk of type 2 diabetes

12.3 million people in the UK are at increased risk of type 2 diabetes [6]. South Asian and African-Caribbean people are two to four times more likely to develop type 2 diabetes than white European people [7]. Overweight and obesity are responsible for 80-85% of an individual’s risk of developing type 2 diabetes. 68% of men and 59% of women were overweight or obese in the UK in 2015 [8]. In England and Scotland only 67% of men and 55% of women are meeting recommended physical activity levels - two and a half hours a week of moderate activity such as swimming, cycling or walking on the flat [9]. In June 2016 the roll out of the Healthier You: NHS Diabetes Prevention Programme (DPP) began and the programme is now available nationwide. Between 2017/18 the DPP enrolled 103,000 individuals and programme model estimates that by the fifth year of the programme 18,000 cases of type 2 diabetes will have been prevented or delayed amongst the five year cohort [10].

## Children and diabetes

Around 40,000 children under 18 years of age have diabetes in the UK and more than 3,000 children are diagnosed every year [3, 11-13]. The majority are between the ages of 10 and 14 years of age at diagnosis [11]. 90% of children have type 1 diabetes and 18% of these children are diagnosed in diabetic ketoacidosis (DKA) [11]. The first children with type 2 diabetes were diagnosed in the UK in 2000. These, along with monogenic diabetes, cystic fibrosis related diabetes or undefined diabetes make up the remaining 10% [11]. A survey done at the turn of the millennium suggested around 20 children were known to have monogenic diabetes in the UK but this number has steadily grown with the introduction of reliable diagnostic services [14].

14% of the issues raised with the Diabetes UK advocacy service in 2017 were to do with schools. Anecdotally these include school staff refusing to take responsibility for insulin injections, children with diabetes not being allowed to attend extra curricula activities such as school trips or sporting events and in some cases children being excluded from school when first diagnosed until a full time care assistant can be employed. These major issues led to the Diabetes UK Schools Campaign.

## Management and access to technology

People with diabetes spend around three hours with a healthcare professional each year; for the remaining 8,757 hours they must manage their diabetes for themselves. People who go on diabetes education courses have lower blood glucose levels, improved health and fewer complications [15]. DAFNE, a diabetes education course for people with type 1 diabetes, reduces blood glucose levels and serious hypoglycaemic episodes [15]. The X-PERT and DESMOND courses for type 2 diabetes increase attendees’ self-management skills and confidence, lower blood glucose levels and reduce cardiovascular risk factors [15]. The diabetes transformation fund has led to 94,000 additional places on education courses being available [10]. 49% of people with type 1 diabetes were offered structured education with 7.6% attending while 90% of people with type 2 diabetes were offered structured education with 10.4% attending [3].

It is concerning that 28% of people with diabetes reported having issues obtaining the medication or equipment necessary for self-management. In particular, one in four people are not being prescribed the required number of glucose test strips [15]. One in 20 of the problems addressed by the Diabetes UK advocacy service in 2017 related to access to strips. The 2017-18 NHS Digital: National Diabetes Insulin pump audit states that 12,900 people with type 1 diabetes and 1,760 people with type 2 diabetes are using pump therapy [16]. The Freestyle Libre became available through the NHS in November 2017 in certain geographical areas for people with type 1 diabetes who met clinical criteria. National arrangements were made in England from March 2019 to reduce the regional variation in availability. Since then the number of Freestyle Libre prescriptions in England have increased by 50%, which is an important step for empowering individuals’ self-management [17].

NICE recommends that people with diabetes require eight annual basic health checks but 57% of people with type 1 diabetes and 42% of people with type 2 diabetes do not receive all eight each year [3]. Whilst further work is needed to ensure that all people with diabetes receive all eight recommended checks, the National Diabetes Audit has demonstrated improvements in the achievements rates over the past 10 years. Fewer than one in five people with type 1 diabetes and two in five with type 2 diabetes are meeting the recommended treatment targets for these eight areas [3]. People of working age and younger are almost half as likely to achieve treatment targets as their older counterparts [3]. There has been a greater than 10% improvement in HbA1c in people with type 1 diabetes and in blood pressure control in people with type 2 diabetes between 2011-12 and 2016-17 [3].

## Life with diabetes

Diabetes is a chronic disease and affects multiple aspects of a person’s life. Here we will discuss how living with diabetes can affect individuals’ mental health, work and personal lives.

### Mental health

Around 40% of people with diabetes struggle with their psychological wellbeing with seven in ten reporting feeling overwhelmed by the demands of living with diabetes [18]. Three quarters of those who have felt overwhelmed by their diabetes said this affected how well they could manage their condition [18]. When asked, 64% sometimes or often feel down because of their diabetes but almost eight out of ten people said that their diabetes team rarely or never helped them to talk about their emotional wellbeing [15, 18]. Less than a quarter of people with diabetes feel they receive the emotional and psychological treatment they need from the NHS and 30% of GPs agreed that current resources to support the mental health of people with diabetes are currently inadequate [18]. Three quarters of people living with diabetes who wanted specialist mental health support could not access it [18]. It is therefore not surprising that 33% of people contacting the Diabetes UK helpline in 2017 and 2018 were doing so for emotional support. The NHS spends an extra 50% treating the physical health of someone who has type 2 diabetes and poor mental health compared to someone with type 2 diabetes and no mental health problems [18].

### Work and driving

37% of people with diabetes feel diabetes has caused them a problem at work [15]. People with type 1 diabetes are twice as likely as people with type 2 diabetes to experience this with one in five people with type 1 diabetes reporting discrimination at work. The Diabetes UK advocacy service helped deal with 1,593 practical work related problems in 2017 [15]. This accounted for 30% of all problems that went through the service with driving relating issues accounting for another 17%. In the next State of the Nation report we aim to report on the number of DVLA refusals/revocations for licences.

### Sex and pregnancy

Both men and women with diabetes are more likely to have sexual problems yet only 15-20% of men are asked about their sexual health during their annual review [19]. 5% of the 941,349 pregnancies in the UK in 2016 were in women with diabetes [20]. 3,500 pregnancies were in women with type 1 diabetes and 2,400 in women with type 2 diabetes [20]. 41, 000 pregnancies had gestational diabetes which is increasing in line with the prevalence of obesity and more pregnancies in older women [20]. Compared to women without diabetes, women with diabetes are five times more likely to have a pre-term baby, three times more likely to have a caesarean section and twice as likely to have a baby weighing more than 4 kg [21]. Babies of women with diabetes are five times more likely to be stillborn and three times more likely to die in their first three months of life [21].

## Complications

Complications may start to develop five to six years before a diagnosis of type 2 diabetes and currently one in three people have a microvascular complication at the time of a diagnosis of type 2 diabetes. This compares with the up to 50% with complications at diagnosis reported by the United Kingdom Prospective Diabetes Study in 1999 [22].

### Cardiovascular disease

Each year in the UK, diabetes causes more than 27,000 myocardial infarctions (530 per week) and 100,000 cases of heart failure (~2000 per week) [23]. Cerebrovascular accidents are twice as likely in people with type 2 diabetes and 3.5 times more likely in people with type 1 diabetes [23]. Diabetes causes more than 35,600 strokes each year in the UK which equates to one in five of all strokes [23]. 25% of people in hospital for a stroke, myocardial infarction or heart failure have diabetes [23]. Compared to people without diabetes, people with type 2 diabetes are 2.5 times more likely to have a myocardial infarction and develop heart failure [23]. People with type 1 diabetes are four times more likely to have a myocardial infarction and 4.5 times more likely to experience heart failure [23].

### Foot disease

Studies suggest that between 70,000 and 90,000 people with diabetes in the UK have a foot ulcer in any given week [24]. Diabetes is responsible for 175 amputations every week and this adds up to more than 9000 leg, toe or foot amputations every year [25]. Someone with diabetes is 20 times more likely to experience an amputation than someone without diabetes [26]. In one year the diabetes transformation fund has led to 185 staff appointed to foot care teams across 80 hospitals [10]. It is hoped that this will lead to improved numbers of proper foot checks for people with diabetes. Currently less than two thirds of people with serious foot problems have a foot check within 24 hours of being admitted to hospital [27]. Four out of ten people with a foot ulcer will die within five years and around half of all people who experience a major amputation will die within two years [24].

### Retinopathy

Diabetes is leading cause of preventable sight loss and more than 1,700 people have their sight seriously affected by diabetes every year in the UK [25]. Diabetes is responsible for 5% of all sight loss in the UK and 7% of people who are newly registered blind in England and Wales have lost their sight because of diabetes [28]. 14% of working age people with severe visual impairment have diabetes [29]. Almost half of people with type 1 diabetes and a quarter of people with type 2 diabetes have some form of diabetic retinopathy. After living with the disease for 20 years almost all people with type 1 diabetes and two thirds of people with type 2 diabetes will have some degree of retinopathy [28, 30]. As well as diabetes specific eye disease, diabetes increases the risk of glaucoma by 1.5 times and doubles the risk of cataract [31].

### Kidney disease

At least 10,300 people in the UK have end stage renal disease (ESRD) primarily because of diabetes as reported on the renal registry [32]. A further 12,350 have ESRD and diabetes, but diabetes is not listed as being the main cause. There are more than 22,650 people with diabetes in the UK who need dialysis or a kidney transplant [12]. In other words, more than one in three people who need dialysis or a kidney transplant have diabetes and one in five people with diabetes will need treatment for their kidney disease during their lifetime [12]. People with diabetes are five times more likely to need dialysis or transplantation than the general population [12].

## Health service delivery

### Diabetes and the NHS

When last reviewed, the NHS was spending at least £10 billion a year (£27 million a day) on diabetes equivalent to 10% of its entire budget [1]. 80% of this is spent treating complications. In 2018/19 there were 55 million items prescribed for people with diabetes, compared with 33 million a decade ago [33].

### Diabetes care in hospital

People with diabetes are twice as likely to be admitted to hospital and one in six people in a hospital bed has diabetes [27, 34] but in some hospitals people with diabetes make up 25% of all inpatient beds [27]. The diabetes transformation fund has led to 96 additional inpatient specialist nurse and related staff in hospitals [10]. This should improve the current situation where more than a fifth of hospitals do not have a dedicated diabetes inpatient specialist nurse [27]. Nearly two fifths of people treated with insulin experience an insulin error during their hospital stay and 1 in 25 in-patients with type 1 diabetes develop DKA during their hospital stay [27]. Almost one fifth of people with diabetes have a hypoglycaemic episode and 1.3% have a severe hypoglycaemic episode during their hospital stay [27]. 28% of people who felt they needed to see a specialist diabetes team whilst in hospital reported that they did not [27].

## How does the UK compare to the rest of Europe?

In 2014, the Euro Diabetes Index compared diabetes care across 30 European countries and placed the UK 4th after Sweden, the Netherlands and Denmark [35]. This index considers the quality of diabetes care by combining data across six domains into a single index. The UK performed well on case finding, the range and reach of services, access to treatment, procedures and outcomes due to the UK’s established national guidelines, comprehensive audits including in sub-speciality areas and national eye screening programme. The UK performed poorly regarding prevention of Type 2 diabetes but since the Euro Diabetes Index report in 2014, the UK Diabetes Prevention Programme has been rolled out.

The Scottish Care Information – Diabetes Collaboration (SCI-DC) delivers a world leading fully integrated shared electronic patient record, which provides clinical information, support for diabetes screening services and the provision of data for national and local audit programmes. This supports care across primary and secondary Care and includes specialty modules for paediatrics, podiatry, diabetes specialist nursing and dietetics[36].

## Conclusion

The number of individuals, their families and carers affected by diabetes continues to increase across the UK and more than 13 million people are thought to be at risk of or have undiagnosed type 2 diabetes. Diabetes is impacting multiple aspects of individuals’ lives and a significant proportion of people with diabetes are also managing diabetes complications. Greater access to education, technology and inpatient diabetes teams is being seen thanks to transformation funding and it is hoped that this will result in less of the NHS’s budget being spent on complications and instead spent on care to prevent these in the first place.

Acknowledgments: Some of the material presented in this report has also been published on the Diabetes UK website <https://www.diabetes.org.uk/resources-s3/2019-11/facts-stats-update-oct-2019.pdf>.

## References

1. N. Hex, C.B., D. Wright, M. Taylor and D. Varley, *Estimating the current and future costs of Type 1 and Type 2 diabetes in the UK, including direct health costs and indirect societal and productivity costs.* Diabetic medicine, 2012. **29**: p. 855-862.

2. *England's prescribing data*. [cited 2019 11th November]; Available from: <https://openprescribing.net/>.

3. *National Diabetes Audit Report 1 Care Processes and Treatment Targets 2017-18 - NHS Digital*. [cited 2019 11th November]; Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/national-diabetes-audit/report-1-care-processes-and-treatment-targets-2017-18-short-report>.

4. Masso Gonzalez, E.L., Johansson, S., Wallander, M.A. & Garcia Rodriguez, L.A., *Trends in the prevalence and incidence of diabetes in the UK.* J Epidemiol Community Health, 2009: p. 1-5.

5. Department of Health (2007). Working together for better diabetes care. Clinical case for change: Report by Sue Roberts, N.D.f.D.

6. NHS Digital. *Statistics on obesity, physical activity and diet*. [cited 2019 11th November]; Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-obesity-physical-activity-and-diet/statistics-on-obesity-physical-activity-and-diet-england-2019/final-page>.

7. Ntuk UE, et al., *Ethnic-Specific Obesity Cufoffs for Diabetes Risk: Cross-sectional Study of 490,288 UK Biobank Participants.* Diabetes Care, 2014. **37**(9): p. 2500-7.

8. Ng, M., *Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013.* Lancet, 2014. **384**(9945): p. 766-81.

9. British Heart Foundation. *BHF Physical activity statistics*. [cited 2019 11th November]; Available from: <https://www.bhf.org.uk/-/media/files/publications/research/bhf_physical-activity-statistics-2015feb.pdf>

10. NHS England. NHS England impact analysis of implementing NHS Diabetes Prevention Programme, 2016 to 2021 [cited 2019 11th November]; Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/08/impact-assessment-ndpp.pdf>.

11. RCPCH. *National Paediatric Diabetes Audit*. [cited 2019 11th November]; Available from: <https://www.rcpch.ac.uk/sites/default/files/2018-03/npda_hospital_admissions_report_part_2_2012-15.pdf>.

12. NHS Digital. *National Diabetes Audit, 2015-16. Report 2a: Complications and mortality*. [cited 2019 11th November]; Available from: <https://files.digital.nhs.uk/pdf/4/t/national_diabetes_audit__2015-16__report_2a.pdf>.

13. Scotland, N. *Scottish Diabetes survey 2016*. 2016; Available from: <http://www.diabetesinscotland.org.uk/Publications/Scottish%20Diabetes%20Survey%202016.pdf>.

14. Ehtisham S, et al., *First UK suvery of Paediatric Type 2 and MODY.* Arch Dis Child, 2004. **89**: p. 526-529.

15. Diabetes UK. *The future of diabetes*. [cited 2019 11th November]; Available from: <https://www.diabetes.org.uk/resources-s3/2017-11/1111B%20The%20future%20of%20diabetes%20report_FINAL_.pdf>.

16. NHS Digital. *National Diabetes Insulin Pump Audit*. 2017-18 [cited 2019 11th November]; Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/national-diabetes-audit/national-diabetes-audit---insulin-pump-report-2017-18>.

17. Winkley K1, T.S., Sivaprasad S, Chamley M, Stahl D, Ismail K, Amiel SA., *The clinical characteristics at diagnosis of type 2 diabetes in a multi-ethnic population: the South London Diabetes cohort (SOUL-D).* Diabetologia., 2013. **56**(6): p. 1272-81.

18. Diabetes UK. *Too Often Missing: Making emotional and psychological support routine in diabetes care*. 2019 [cited 2019 11th November]; Available from: <https://www.diabetes.org.uk/resources-s3/2019-05/Full%20Report_Too%20Often%20Missing_Diabetes%20UK_May%202019.pdf>.

19. Hackett G, Cole N, and Bhartia M, *The response to testosterone undecanoate in men Type 2 diabetes is dependent on achieving threshold serum levels (the BLAST study).* International Journal of Clinical Practice, 2014. **68**(2): p. 203-215.

20. NICE.org.uk. *Overview | Diabetes in pregnancy: management from preconception to the postnatal period | Guidance | NICE*. [cited 2019 11th November]; Available from: <https://www.nice.org.uk/guidance/ng3>.

21. CEMACH. *Diabetes in pregnancy: are we providing the best care? Findings of a national enquiry* 2007 [cited 2019 20th November]; Available from: <https://www.publichealth.hscni.net/sites/default/files/Diabetes%20in%20Pregnancy-%20are%20we%20providing%20the%20best%20care.pdf>.

22. King P, et al., *The UK Prospective Diabetes Study (UKPDS): clinical and therapeutic implications for type 2 diabetes.* Br J Clin Pharmacol., 1999. **48**(5): p. 643-648.

23. Digital, N. *National Diabetes Audit Report 2A: Complications and Mortality Royal College of Physicians Sentinel Stroke National Audit Programme (SSNAP)*. 2016 [cited 2019 20th November ]; Available from: <https://www.strokeaudit.org/results/Clinical-audit/National-Results.aspx>.

24. NICE. *Diabetic foot care in England: an economic study*. 2017; Available from: <https://www.evidence.nhs.uk/document?id=1915227&returnUrl=Search%3Fq%3DDiabetic%2BAmputation&q=Diabetic+Amputation>.

25. Public Health England. *Diabetes Foot Care profiles*. Available from: <https://fingertips.phe.org.uk/profile/diabetes-ft>.

26. Holman N, Young RJ, and Jeffcoate WJ, *Variation in the incidence of amputation of the lower limb in England.* Diabetologia, 2012.

27. Digital, N. *National Diabetes Inpatient Audit England and Wales, 2017*. 2017; Available from: <https://files.digital.nhs.uk/pdf/s/7/nadia-17-rep.pdf>.

28. RNIB. *The State of the Nation Eye Health 2016*. 2016 [cited 2019 20th November ]; Available from: <https://www.rnib.org.uk/sites/default/files/RNIB%20State%20of%20the%20Nation%20Report%202016%20pdf.pdf>.

29. Liew G, *A comparison of the causes of blindness certifications in England and Wales in working age adults (16–64 years), 1999–2000 with 2009–2010.* BMJ Open, 2014.

30. Scanlon PH, *The English national screening programme for sight threatening diabetic retinopathy.* Journal of Medical Screening, 2008. **15**(1): p. 1-4.

31. Becker C, et al., *Cataract in patients with diabetes mellitus-incidence rates in the UK and risk factors.* Eye (Lond), 2018. **32**(6): p. 1028-1035.

32. Stephanie J MacNeill, D.F., Katharine Evans, James F Medcalf (2018) UK Renal Registry 20th Annual report: Chapter 2 UK Renal Replacement Therapy Adult Prevalence in 2016: National and Centre-specific Analyses.

33. Digital, N. *Prescribing for Diabetes in England 2008/09 -2018/19*. Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/prescribing-for-diabetes/2008-09---2018-19/results-and-charts>.

34. Sampson MJ, et al., *Total and excess bed occupancy by age, specialty and insulin use for nearly one million diabetes patients discharged from all English Acute Hospitals.* Diabetes Res Clin Pract, 2007. **77**(1): p. 92-8.

35. Powerhouse, H.C. *Euro Diabetes Index*. 2014 [cited 2019 9th December]; Available from: <https://healthpowerhouse.com/media/EDI-2014/EDI-2014-report.pdf>.

36. *Scottish Care Information Diabetes Collaboration*. [cited 2019 9th December]; Available from: <https://www.sci-diabetes.scot.nhs.uk/>.

**Table 1: Prevalence of diabetes in the four nations of the United Kingdom [5]**

|  |
| --- |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Country**  | **Prevalence of diabetes**  | **Estimated numbers living with undiagnosed type 2 diabetes** | **Estimated numbers at risk of type 2 diabetes** |
| *England*  | >3,222,500 | >860,000 | 10,300,000 |
| *Northern Ireland* | >96,100 | >11,000 | 340,000 |
| *Scotland*  | >295,700  | >35,000 | 1,000,000 |
| *Wales* | >194,600 | >60,000 | 600,000 |

 |
|  |