

How much does therapeutic inertia in type 2 diabetes cost the UK? A modeling evaluation of economic burden

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Background and aim

- Diabetes is a chronic metabolic disease that accounts for a substantial and increasing healthcare burden worldwide, with significant morbidity and mortality arising from associated complications.
- The costs of treating diabetes-related complications account for approximately 80% of total diabetes-related expenditure, and approximately 10% of the National Health Service (NHS) annual budget in the UK is estimated to be spent on the disease.¹
- Numerous studies have shown that controlling blood glucose levels, and thereby maintaining glycemic control, is crucial for reducing the incidence of long-term diabetes-related complications and alleviating the economic burden on both healthcare systems and employers.^{2,3}
- However, the failure to intensify therapy in a timely manner to address poor glycemic control, known as therapeutic inertia, remains highly prevalent in the UK, with a large proportion of patients with type 2 diabetes (T2D) maintaining therapies despite blood glucose levels exceeding recommended targets.⁴
- The potential cost savings of timely intensification of patients with poor glycemic control from the perspective of the healthcare payor are therefore substantial.
- The aim of the present modeling analysis was to quantify the economic burden of poor glycemic control due to therapeutic inertia in the UK.

Methods

- Cost outcomes were projected over a range of time horizons (3 years to patient lifetimes) using the validated, long-term IQVIA CORE Diabetes Model (version 9.0).
- Baseline cohort characteristics were based on data from The Health Improvement Network (THIN) primary care database, with a baseline glycated hemoglobin (HbA_{1c}) of 8.2% (66 mmol/mol).
- Immediate treatment intensification, whereby patients were brought to an HbA_{1c} level of 7.0% (53 mmol/mol), was compared with a delay in treatment intensification of 3 or 5 years.
- A discount rate of 3.5% *per annum* was applied, in line with recommendations from the National Institute for Health and Care Excellence (NICE).
- Population-level estimates of economic burden were calculated based on the patient-level averages from the model and on published epidemiological studies and common glycemic targets in the UK.^{5,6}
- Costs (expressed in 2018 pounds sterling [GBP]) captured direct costs associated with the treatment of diabetes-related complications, and indirect costs associated with loss of workplace productivity based on published days off work estimates.⁷

Results

- Patient-level projections from the model indicated that earlier intensification was associated with reduced costs across all scenarios (Table 1).
- In the UK, 1,163,547 patients with T2D were estimated to have poor glycemic control.^{5,6}

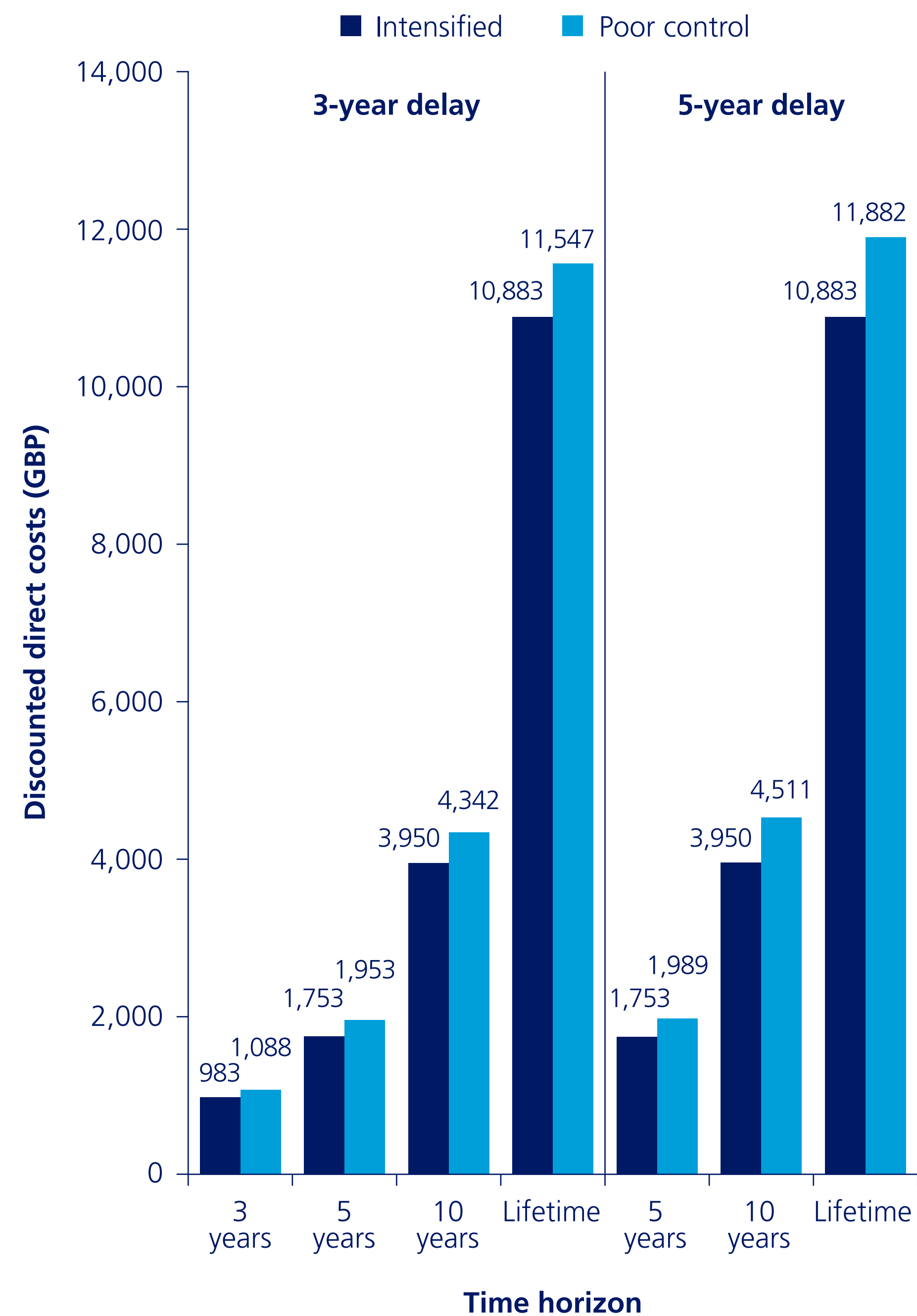
Table 1 Patient-level costs associated with reaching glycemic targets versus poor glycemic control

Scenario	Discounted combined costs (GBP)		
	Intensified	Poor control	Difference
Baseline HbA_{1c} 8.2%, 3-year intensification delay			
3-year time horizon	5,588	6,493	−905
5-year time horizon	11,210	12,722	−1,512
10-year time horizon	13,482	15,144	−1,662
Lifetime time horizon	20,339	22,364	−2,025
Baseline HbA_{1c} 8.2%, 5-year intensification delay			
5-year time horizon	11,210	13,081	−1,872
10-year time horizon	11,210	13,081	−1,872
Lifetime time horizon	20,339	22,934	−2,594

GBP, 2018 pounds sterling; HbA_{1c}, glycated hemoglobin. Values are means.

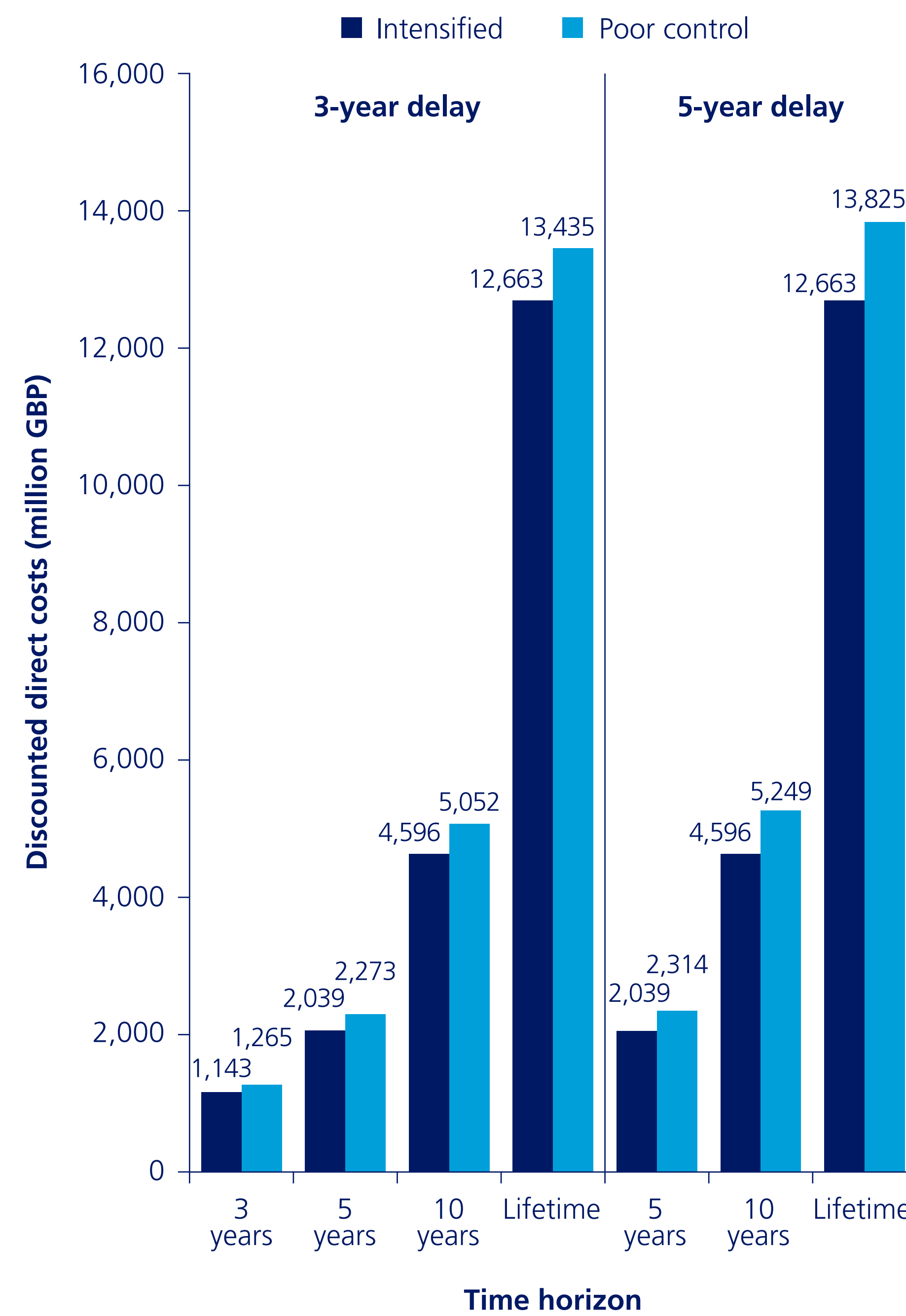
- Based on these estimates, 3 years of poor glycemic control (HbA_{1c} 8.2%) were projected to increase the cost of complications by GBP 122 million and add GBP 930 million to lost productivity costs compared with good glycemic control (HbA_{1c} 7.0%) over a 3-year time horizon (Figures 1 and 2).
- An intensification delay of 5 years resulted in the addition of GBP 275 million and GBP 1,904 million of complication and lost productivity costs, respectively, over a 5-year time horizon.
- Over patient lifetimes, direct and indirect costs were estimated to increase by GBP 772 million and GBP 1,584 million, respectively, with an intensification delay of 3 years, and GBP 1,162 million and GBP 1,857 million with an intensification delay of 5 years (Figures 1 and 2).

Figure 1 Patient-level direct costs associated with reaching glycemic targets versus poor glycemic control



GBP, 2018 pounds sterling; T2D, type 2 diabetes. Values are based on a population of 1,163,547 patients with T2D failing to meet glycemic targets.

Figure 2 Population-level direct costs associated with reaching glycemic targets versus poor glycemic control



GBP, 2018 pounds sterling; T2D, type 2 diabetes. Values are based on a population of 1,163,547 patients with T2D failing to meet glycemic targets.

Discussion

- Therapeutic inertia was projected to account for a substantial economic burden in the UK, with population-level estimates indicating that delays in treatment intensification cost the NHS hundreds of millions of pounds even over the short term.
- The present study displays the importance of timely intensification in alleviating the incidence of diabetes-related complications and their associated costs, as well as the costs associated with lost workplace productivity.
- These findings are likely to also yield significant benefits in terms of patient life expectancy and quality of life that are not captured in the present study.
- It should be noted that modern treatment for T2D often takes a more holistic approach than solely glycemic control, including the management of body weight, blood pressure, serum lipid levels, and hypoglycemia risk.
- Nonetheless, these factors are also likely to be improved with timely intensification and are therefore likely to lead to further benefits in both cost and clinical outcomes.

Conclusion

- The economic burden associated with poor glycemic control in T2D in the UK is substantial, even in the short term.
- Minimizing therapeutic inertia could reduce this economic burden over both the short and long term.