

Building an economic case for reducing limb amputations in PAD patients

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Abstract

A budget impact using NHS Data for 1.6m patients, of offering limb-salvage procedures instead of major lower-limb amputation as the primary procedure to treat chronic limb-threatening ischaemia. This model demonstrated substantial savings for the NHS without major cost increases. The net budget impact was influenced most by costs associated with index procedures and subsequent CTLI-related major lower-limb amputation.

Introduction

Steno-occlusive lower limb peripheral artery disease (PAD) is a major health problem and the main cause of lower-limb amputations worldwide.¹ An estimated 236 million people have PAD worldwide.² In the United Kingdom (UK), PAD affects 20% of people older than 60 years.³ Those with symptomatic PAD typically present with intermittent claudication or chronic limb-threatening ischaemia (CLTI).⁴ In many patients, care costs rise dramatically after a diagnosis of PAD due to the need for multiple hospital follow-up visits and lower-limb procedures or other cardiovascular events.

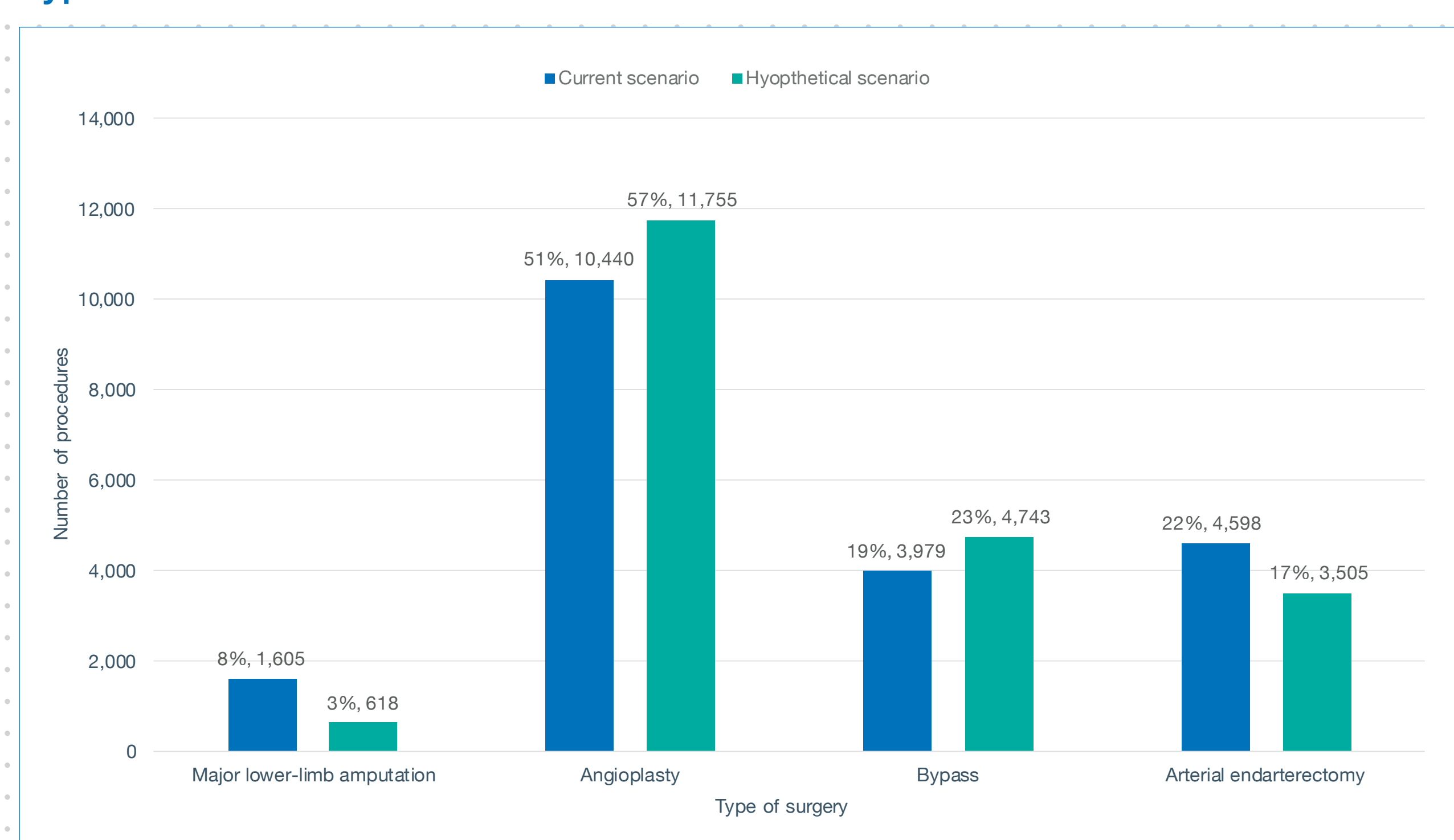
The budget impact of offering limb-salvage procedures instead of major lower-limb amputation as the primary procedure to treat chronic limb-threatening ischaemia (CLTI) is not well modelled. This study assessed the financial effects to the National Health Service (NHS) of making such changes.

Methodology

A budget impact model was developed. Model costs and rates of procedures were calculated from an NHS dataset of 1.6 million patients. The study population comprised patients in the UK National Vascular Registry (NVR) who underwent primary surgical procedures for CLTI in England and Wales in 2019–2021.

Two scenarios were tested: averaged rates of major lower-limb amputation, angioplasty, bypass surgery, or arterial endarterectomy set at 8%, 51%, 19%, and 22%, respectively (current scenario); and, based on best unit performances in the UK NVR, rates of 3%, 57%, 23%, and 17%, respectively (hypothetical scenario). The primary outcome was the net budget impact on selected care costs to the NHS over one year after the index procedure.

Figure 1 Numbers and proportions of index procedures by type in the current and hypothetical scenarios



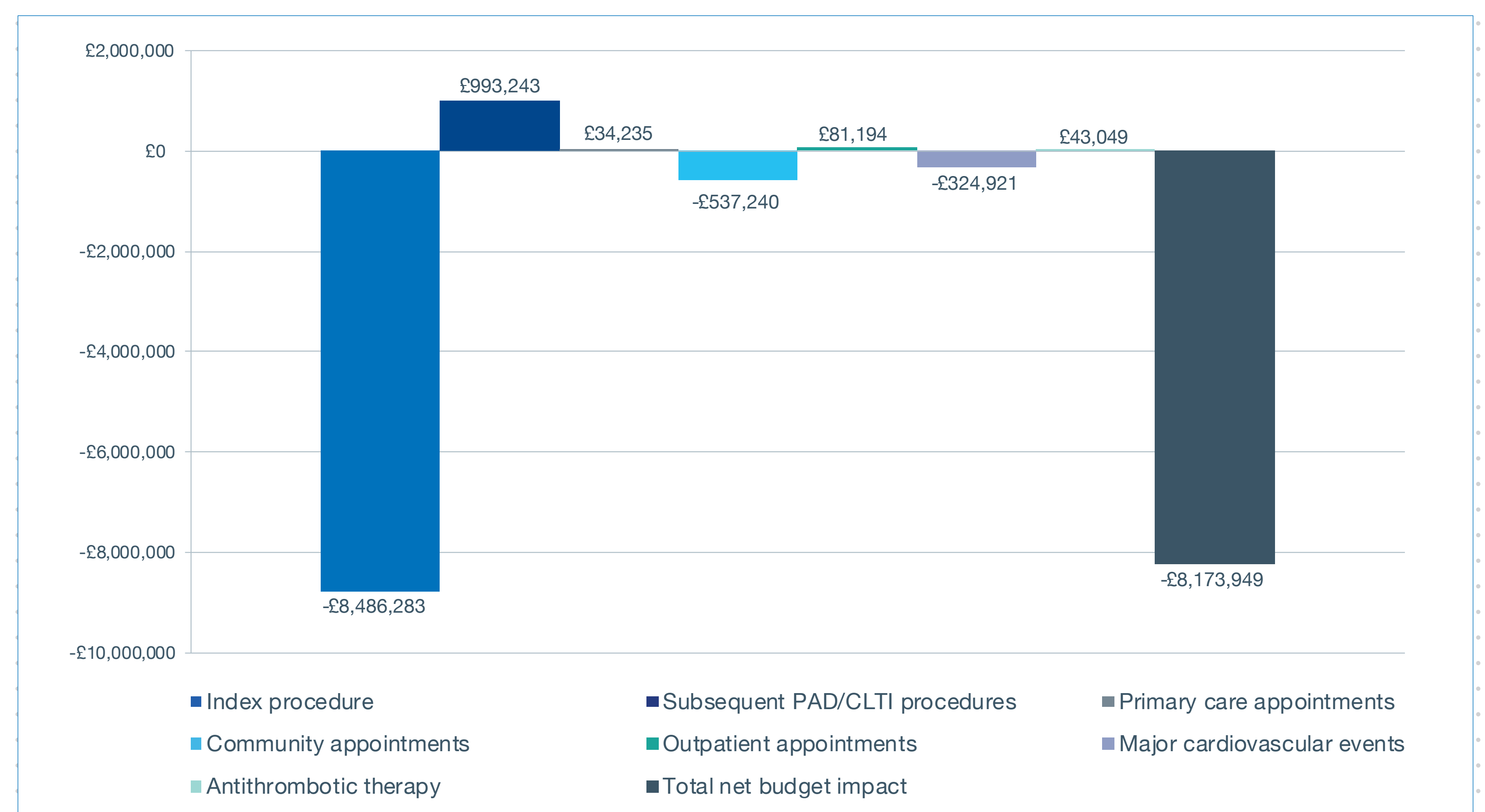
References

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Results

For 16,025 index procedures, total care cost over one year in the current scenario was £206,716,040. In the hypothetical scenario, costs would be reduced for index procedures (–£8,486,283), major cardiovascular events (–£324,921), and community care (–£537,240) and increased for subsequent CLTI-related surgery (£993,243). Therefore, the net saving to the NHS would be £8,173,949.

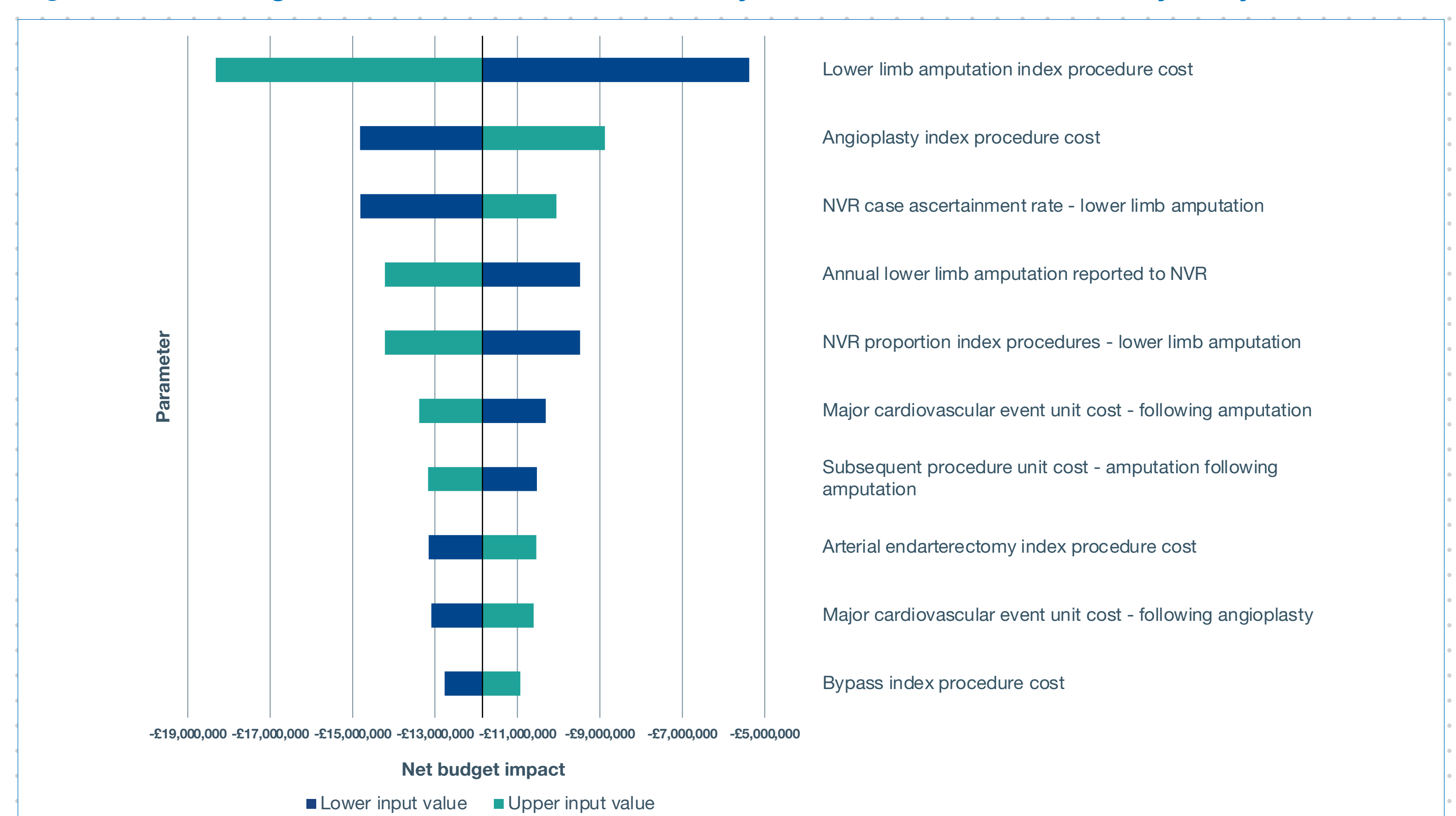
Figure 2 Annual incremental changes in cost in the hypothetical scenario



Sensitivity analysis

In the deterministic sensitivity analysis, the model was found to be robust in predictions irrespective of individual parameter uncertainty (Figure 3). The top parameters identified confirmed that the net budget impact was influenced most by costs associated with index procedures and subsequent CTLI-related major lower-limb amputation.

Figure 3 Ten strongest causes of variable uncertainty in the deterministic sensitivity analysis



Conclusion

A shift away from primary major lower-limb amputation towards revascularisation could lead to substantial savings for the NHS without major cost increases later in the care pathway, indicating that care decisions taken in hospitals have wider benefits.

Limitations

Hospitals in Scotland and Northern Ireland are encouraged to provide data, reporting is not mandatory, and they are submitted to a much lesser degree therefore the model is not representative of UK. There may also be regional differences in health care utilisation in the region of Kent from which the dataset was retrieved. Deterministic sensitivity analysis suggests that uncertainty does not impact the study's findings.

