

Economic benefit of reduced waiting times for elective surgeries: A Systematic Literature Review

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INTRODUCTION

Due to constrained healthcare resources, policymakers often implement waiting lists, particularly for elective surgeries.<sup>1</sup> However, prolonged waiting can exacerbate patient discomfort, increase pain and anxiety, and impair daily functioning.<sup>2</sup> This creates pressure on policymakers to reduce waiting times for these procedures.

OBJECTIVE

This systematic literature review aims to explore the modeling techniques, common surgeries, and value drivers in studies evaluating the cost-effectiveness of reducing waiting times for elective surgeries.

METHODS

We carried out a systematic search of the MEDLINE/PubMed and Embase/Scopus databases. Eligibility criteria included studies focusing on elective surgery and economic evaluation of waiting times. Due to the heterogeneity of the studies, the findings of each study were presented as a narrative synthesis, with a thematic analysis conducted to present various modeling techniques used in different settings.

RESULTS

Nine articles met the inclusion criteria, covering elective surgery procedures in the musculoskeletal system (4 articles), cardiovascular system (2 articles), ophthalmic system (1 article), and gastrointestinal tract (2 articles) (**Table 1**).

Table 1: Included studies reporting the use of economic models in different elective surgeries

Included studies	Country	Type of economic analysis	Elective surgery
<b><i>Musculoskeletal</i></b>			
Saleh <i>et al.</i> 1997	USA	CEA	Total hip arthroplasty revision
Mather <i>et al.</i> 2014	USA	CUA	Total knee arthroplasty
Mari <i>et al.</i> 2016	FRA	CUA + CEA	Total knee arthroplasty
Karnon <i>et al.</i> 2018	AUS	CUA + CEA	Total knee arthroplasty
<b><i>Cardiovascular</i></b>			
Ribera <i>et al.</i> 2018	ESP	CUA	Transcatheter aortic valve implantation
Peel <i>et al.</i> 2022	CAN	CUA + CEA	Transcatheter aortic valve implantation
<b><i>Ophthalmic</i></b>			
Boyd <i>et al.</i> 2019	NZL	CUA	Cataract surgery
<b><i>GI tract</i></b>			
Cohen <i>et al.</i> 2017	BRA	CUA + CEA	Bariatric surgery
Davis and Saunders 2020	CAN	CEA	Bariatric surgery

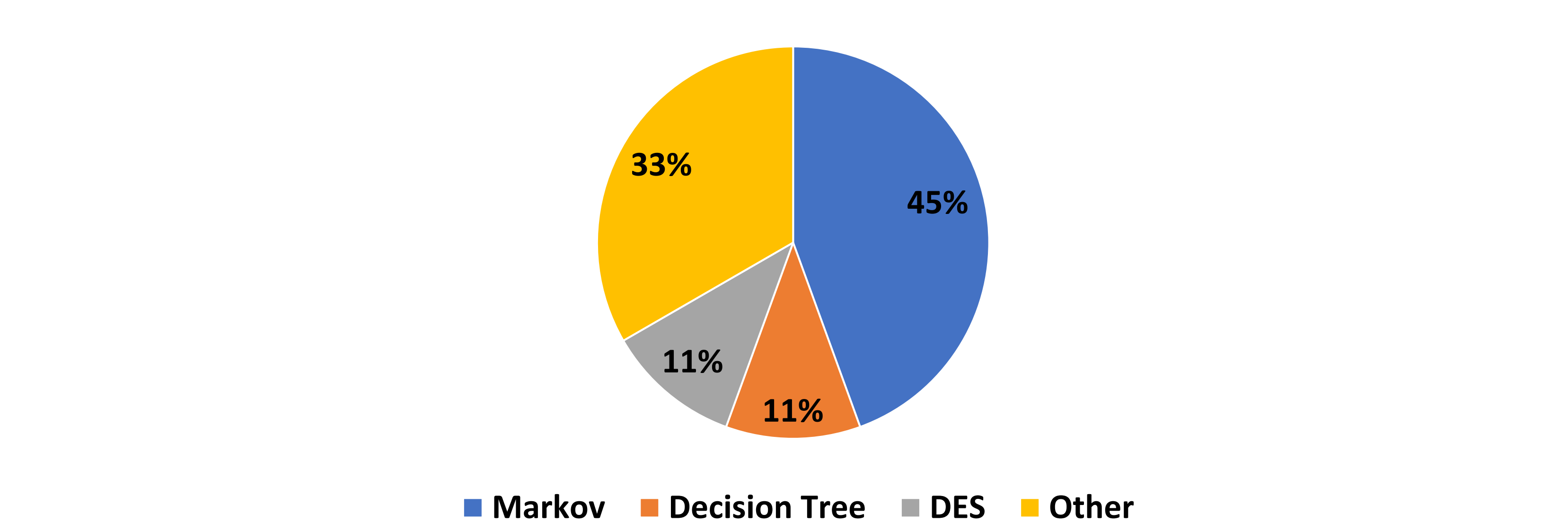
GI: Gastrointestinal, CEA: Cost-effectiveness analysis, CUA: Cost-utility analysis

THEMATIC ANALYSIS

TYPES OF ECONOMIC MODEL USED

Of the nine models, four were Markov models, and two were using a combination of Markov and decision tree models (**Figure 1**). Almost all the models were conducted in high-income countries.

Figure 1: Type of economic models used in the included studies (percentage of studies using each type)

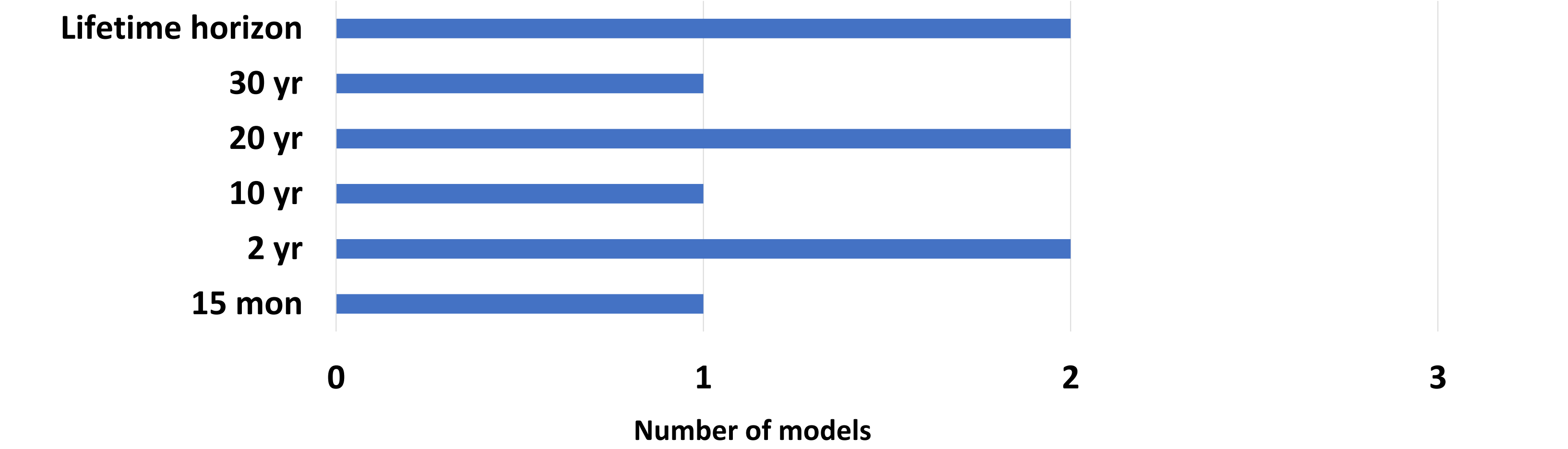


Eight of the nine models adopted a cohort design, allowing for population-level comparisons of early versus late surgery outcomes. However, only two models accounted for population-specific subgroups.

TIME HORIZONS

The selection of time horizons in models varied, with six favoring long-term horizons extending beyond 10 years. Two of these models used lifetime horizons (**Figure 2**).

Figure 2: Time horizons of the included models



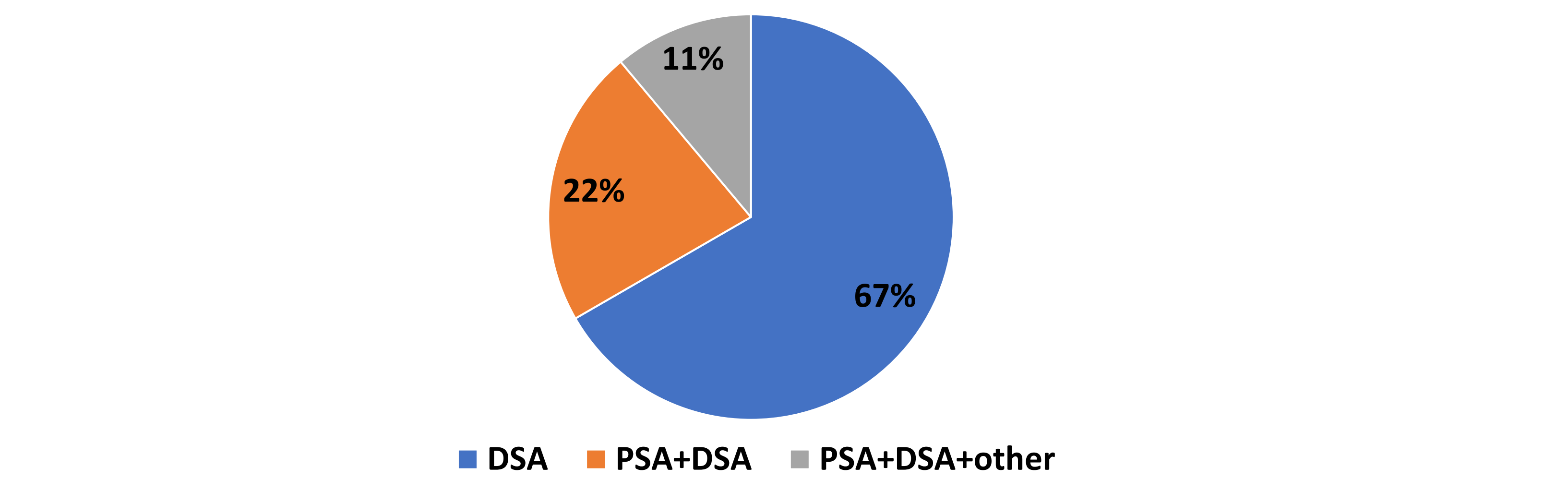
SOCIETAL AND CAREGIVER BURDEN CONSIDERATION

The societal and caregiver burdens were rarely considered in the included models, with only one study mentioning them.<sup>3</sup>

TYPE OF SENSITIVITY ANALYSIS CONDUCTED

Six models exclusively used deterministic sensitivity analysis (DSA), while two incorporated both DSA and probabilistic sensitivity analysis (PSA). One model integrated DSA, PSA, and an additional sensitivity analysis technique (**Figure 3**).

Figure 3: Types of sensitivity analysis conducted in different models (percentage of studies using each type)



CONSIDERATION OF VALUE DRIVERS

Many models considered patients’ mortality and reduced life expectancy due to extended waiting, regardless of the cause. However, none accounted for patients becoming ineligible for surgery over time due to disease progression or complications. Maintenance costs incurred by patients during long waiting periods were widely considered across most models.

Table 2: Value drivers considered in different models

Included studies	Was the value driver considered in the model?		
	Improvement in QoL during the reduced waiting time	Improvement on the long term QoL	Reduction in utility
<b><i>Musculoskeletal</i></b>			
Saleh et al. 1997	No*	No*	No*
Mather et al. 2014	Yes	Yes	Yes
Mari et al. 2016	Yes	No*	Yes
Karnon et al. 2018	Yes	No*	Yes
<b><i>Cardiovascular</i></b>			
Ribera et al. 2018	No*	Yes	No*
Peel et al. 2022	No*	No*	No*
<b><i>Ophthalmic</i></b>			
Boyd et al. 2019	Yes	No*	No*
<b><i>GI tract</i></b>			
Cohen et al. 2017	Yes	No*	No*
Davis and Saunders 2020	No*	No*	No*

QoL: quality of life  
\*“No” indicates that the value driver was not considered or was not mentioned in the study

In both short- and long-term scenarios, patients shows notable improvements in their quality of life, particularly in physical health, emotional well-being, social interactions, and overall satisfaction with their healthcare experience (**Table 2**).

CONCLUSION

This review suggests that reducing waiting times for elective surgeries is highly cost effective and often cost saving. It also provides a methodological framework that can be readily adapted to analyze the impact of reducing waiting times in various settings.

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