

Budget Impact Analysis of Introducing Tofacitinib for the Treatment of Patients with Rheumatoid Arthritis in Hong Kong

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Introduction

- Tofacitinib is the first approved oral kinase inhibitors for the treatment of rheumatoid arthritis (RA)
- It is an effective, well-tolerated and cost-effective alternative to conventional RA treatments

Objective

To assess the budget impact of introducing tofacitinib to the public hospital formulary as a fully subsidised drug in Hong Kong between 2017 and 2021

Methods

Target population: The number of adult patients with RA on biologics or tofacitinib during 2017-2021 was estimated using linear regression from the number of patients on treatment for RA between 1st Jan 2009 and 31st Dec 2015

Budget impact model: Population-based budget impact model in compliance with the good practice for BIA from ISPOR¹

Model assumptions:

Clinical assumptions	<ul style="list-style-type: none"> Remission and treatment failure were disregarded Compliance rate was 100% for all RA treatments The retention rate was 80-100% for tofacitinib and 100% for other biologic therapy Patients who discontinued tofacitinib were switched to other biologics
Economic assumptions	<ul style="list-style-type: none"> Indirect costs were not considered Costs for treatment monitoring were not considered Costs of conventional synthetic DMARDs were neglected No change in medication cost over 5 years

- Using compound annual growth rate in 2013-2015, the market share for biologics and tofacitinib were projected by exponential regression
- Monetary values were expressed in HK\$ in 2017 and discounted at 4% per year

Competing alternatives:

Treatments	Dosage	Frequency	Route	Unit
Abatacept	500 mg (<60kg)	every 4 weeks	IV	250 mg/vial
	750 mg (60-100kg)			
Adalimumab	40 mg	every 2 weeks	SC	40 mg/injection
Certolizumab pegol	200 mg	every other week	SC	2*200 mg/vial
	400 mg			
Etanercept	50 mg per week	every week	SC	50 mg/injection
Golimumab	50 mg per month	every month	SC	50 mg/injection
Infliximab	3 mg/kg with methotrexate	every 8 weeks	IV	100 mg/vial
		Titrate up to 10 mg/kg or every 4 weeks if incomplete response		
Tocilizumab	Initial 4 mg/kg, up to 8 mg/kg	monthly	IV	80 mg/vial
				200 mg/vial
				400 mg/vial
Tofacitinib	5 mg bid	twice daily	PO	5 mg/tab

IV-intravenous; SC- subcutaneous; PO-oral

Outcome:

- The difference in healthcare expenditure in patients with RA with and without the introduction of tofacitinib over five years

Scenarios and sensitivity analysis:

	Eligible patients using tofacitinib (%)	Annual dropout of tofacitinib (%)*
Base-case scenario	33.3	20
Scenario 2	50	20
Scenario 3	100	20
Scenario 4	100	0

*Patients who stopped taking tofacitinib switched to biologics with corresponding market share in the same year

Abbreviations: BIA-Budget impact analysis; ISPOR- International Society for Pharmacoeconomic and Outcomes Research; Biologics includes abatacept, adalimumab, certolizumab pegol, etanercept, golimumab, infliximab, tocilizumab; DMARDs -Disease modifying anti-rheumatic drugs

Funding: Pfizer Corporation Hong Kong Limited [Grant number: RC170156]

Results

- The annual per patient cost of tofacitinib is HK\$74,214 and the cost for biologics ranges from HK\$64,350 to 115,700
- Without the introduction of tofacitinib, the annual governmental healthcare expenditure for RA therapy was HK\$147.9-190.6 million
- Introduction of tofacitinib to the public hospital formulary reduced health budget by HK\$33.1-39.9 million (17.3-20.3% reduction) with cumulative budget savings over 5 years being HK\$192.8 million (discounted) to HK\$208.8 million (undiscounted)

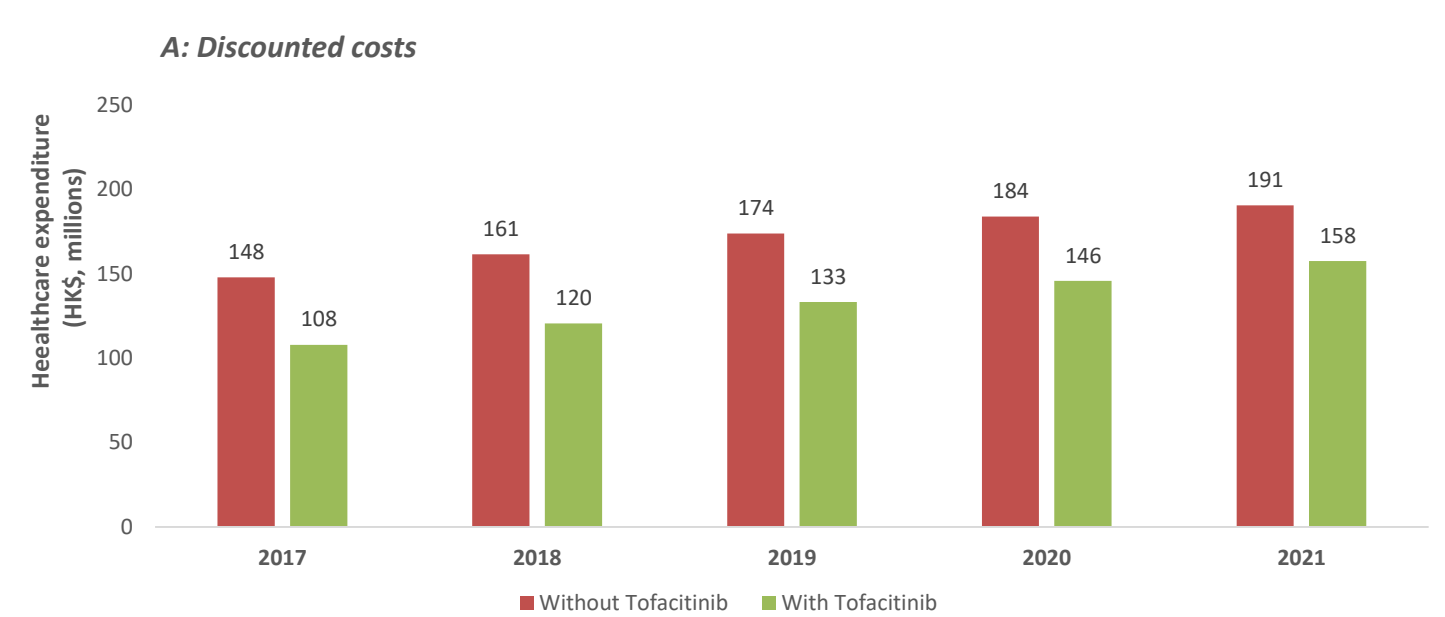


Figure 1. Annual budget after the introduction of tofacitinib in hospital formulary during 2017 - 2021 (Discounted costs)

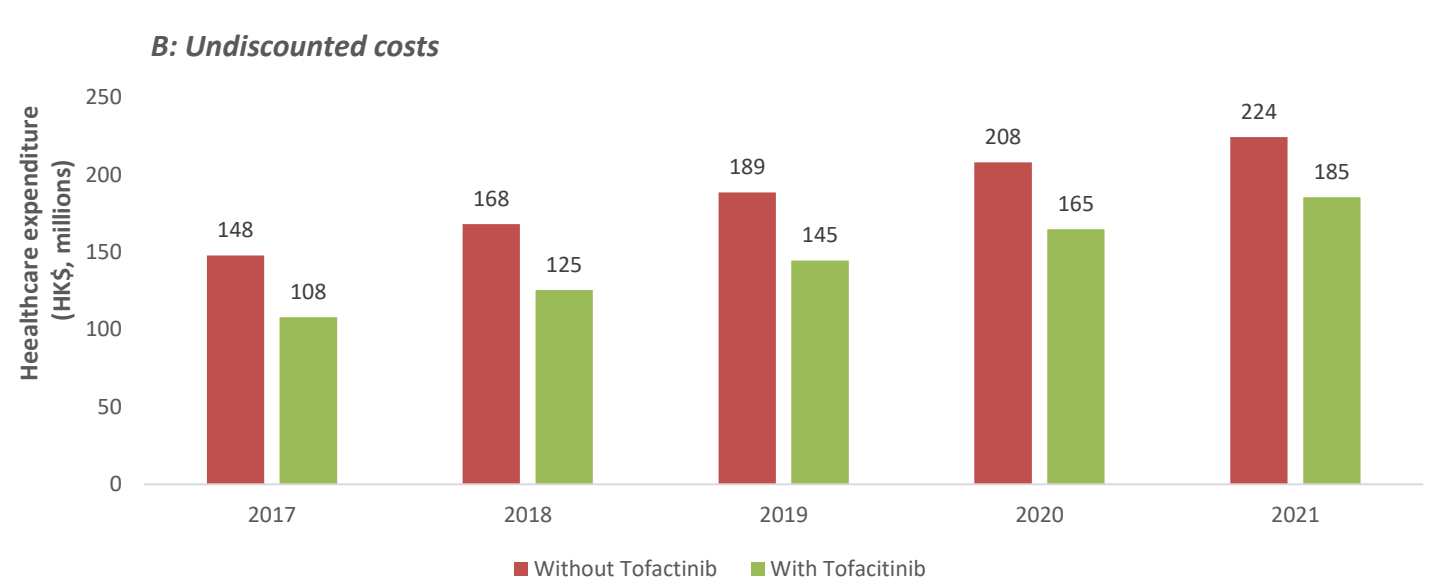


Figure 2. Annual budget after the introduction of tofacitinib in hospital formulary during 2017 - 2021 (Undiscounted costs)

- Introducing tofacitinib saved public healthcare expenditure with budget savings ranging from HK\$66.4-196.8 million under all scenarios between 2017 and 2021

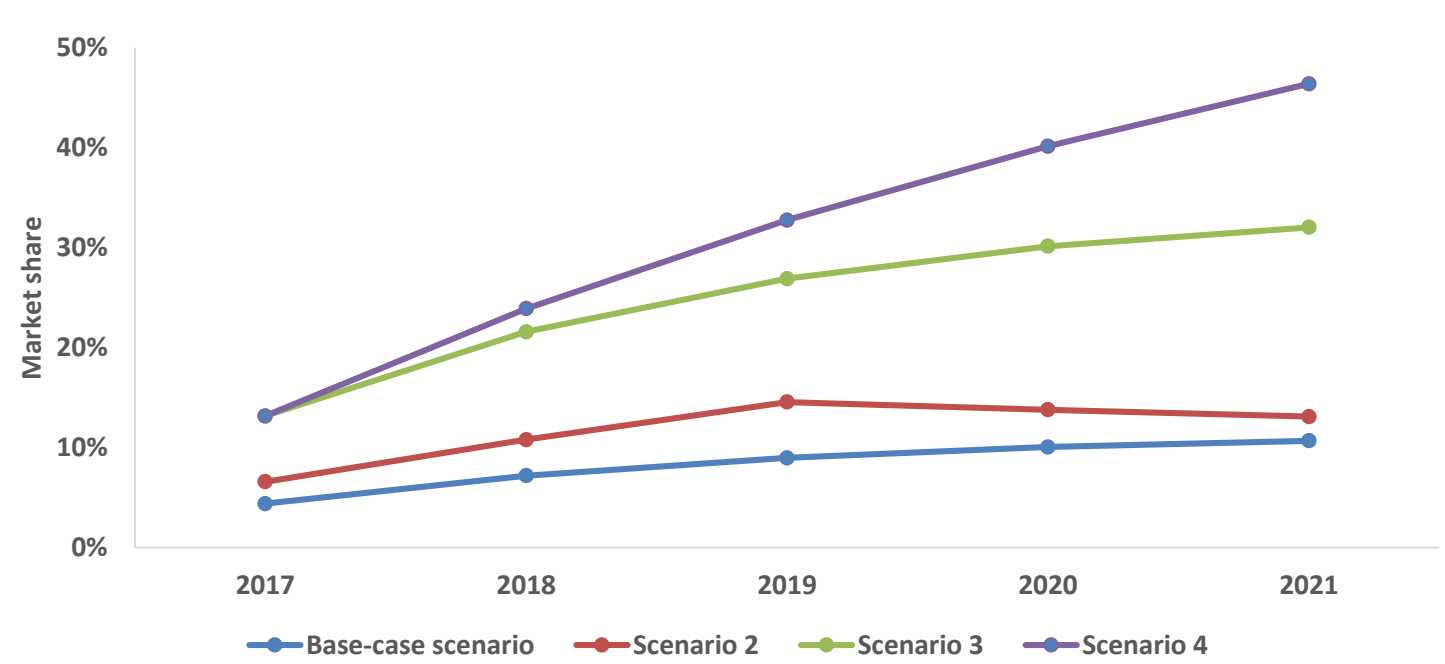


Figure 3. Projected market share of tofacitinib between 2017 and 2021 under different scenarios

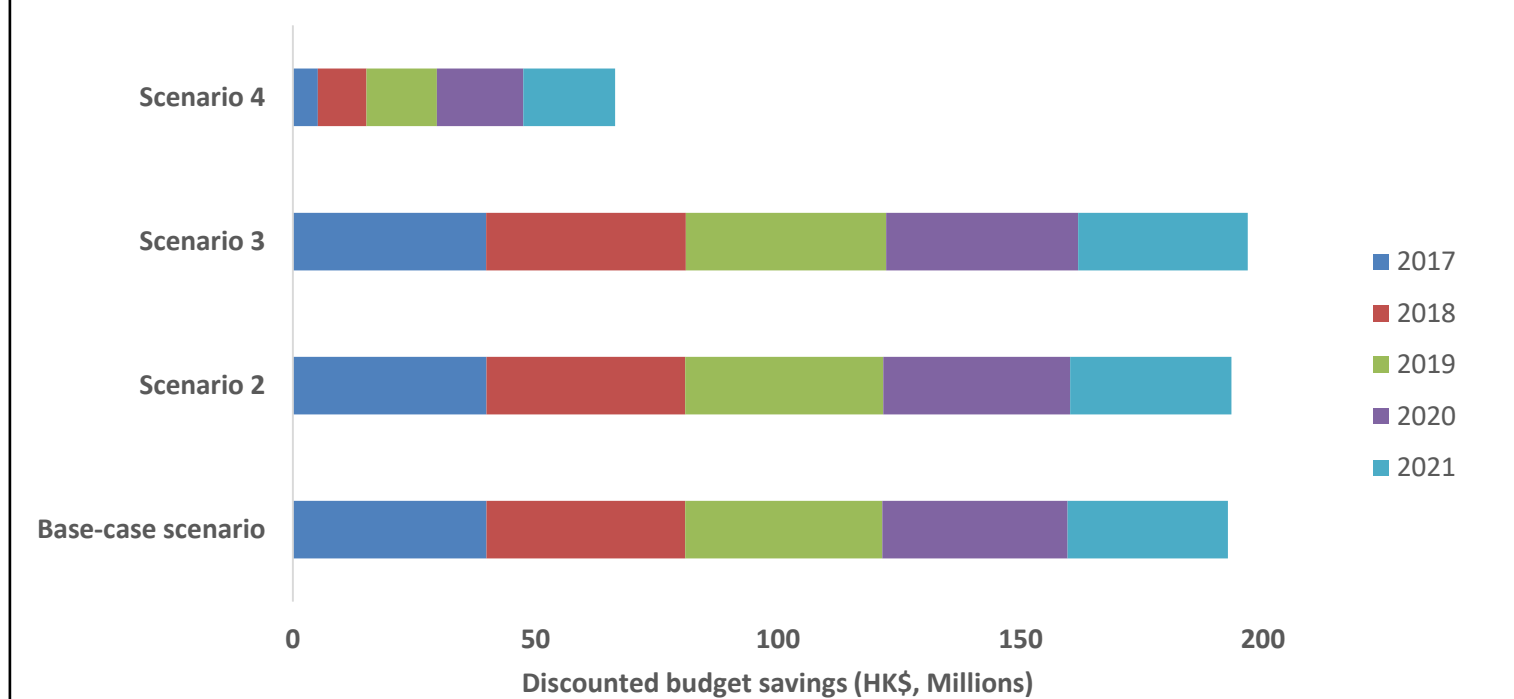


Figure 4. Change in healthcare expenditure, with and without the introduction of tofacitinib during 2017-2021 under different scenarios

Conclusion

Introduction of tofacitinib to the formulary for the treatment of patients with RA in Hong Kong is budget saving over five years given the current drug price

Reference:

1. Sullivan SD, Mauskopf JA, Augustovski F, et al. Budget impact analysis-principles of good practice: report of the ISPOR 2012 Budget Impact Analysis Good Practice II Task Force. *Value Health* 2014; 17(1): 5-14.