

# Economic Evaluation of Single Pill Combination Clopidogrel Aspirin versus Free Combination Clopidogrel plus Aspirin for Prevention of Cardiovascular Events after Acute Coronary Syndrome in China

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## INTRODUCTION

- The annual incidence of a cute coronary syndrome (ACS) is estimated around 3 million in China.
- Clopidogrel aspirin (SPC) was launched in China in 2022 and successfully listed in reimbursement list as the only SPC of the dual antiplatelet therapy (DAPT).

## METHODS

- Perspective:** Chinese public healthcare system
- Target population:** Patients after ACS treated with DAPT for 1 year as aligned with the indication.
- Model structure:** A two-part cost-effectiveness model was developed to assess the cost-effectiveness of SPC versus free combo. A short time (1 year) decision tree model was developed to project the short-term outcomes of the two treatments due to difference in the DAPT adherence rate (adherence (PDC $\geq$ 80%) and non-adherence (PDC < 80%), PDC: the proportion of days covered). A Markov model was developed to project the long-term outcomes (lifetime) that included 6 states: event free, post nonfatal (post NF), MI (0-1year), stable post-MI, post NF-IS (0-1 year), stable post-IS, death. The cycle length is one year. (Figure 1 & Figure 2)
- Model inputs**
  - In free combo arm, the adherence rate (20.93%), duration of treatment and event rates in adherence /non-adherence group for the first year respectively (Table 1) as well as transition probabilities of Markov model for the following years (Table 2) and costs (Table 3) were all obtained from a real-world study based on a local claim database<sup>[1]</sup>.
  - The mean adherence difference (11%) for SPC and free combo in chronic disease<sup>[4]</sup> was applied to obtain the adherence in Coplavix arm (31.93%).

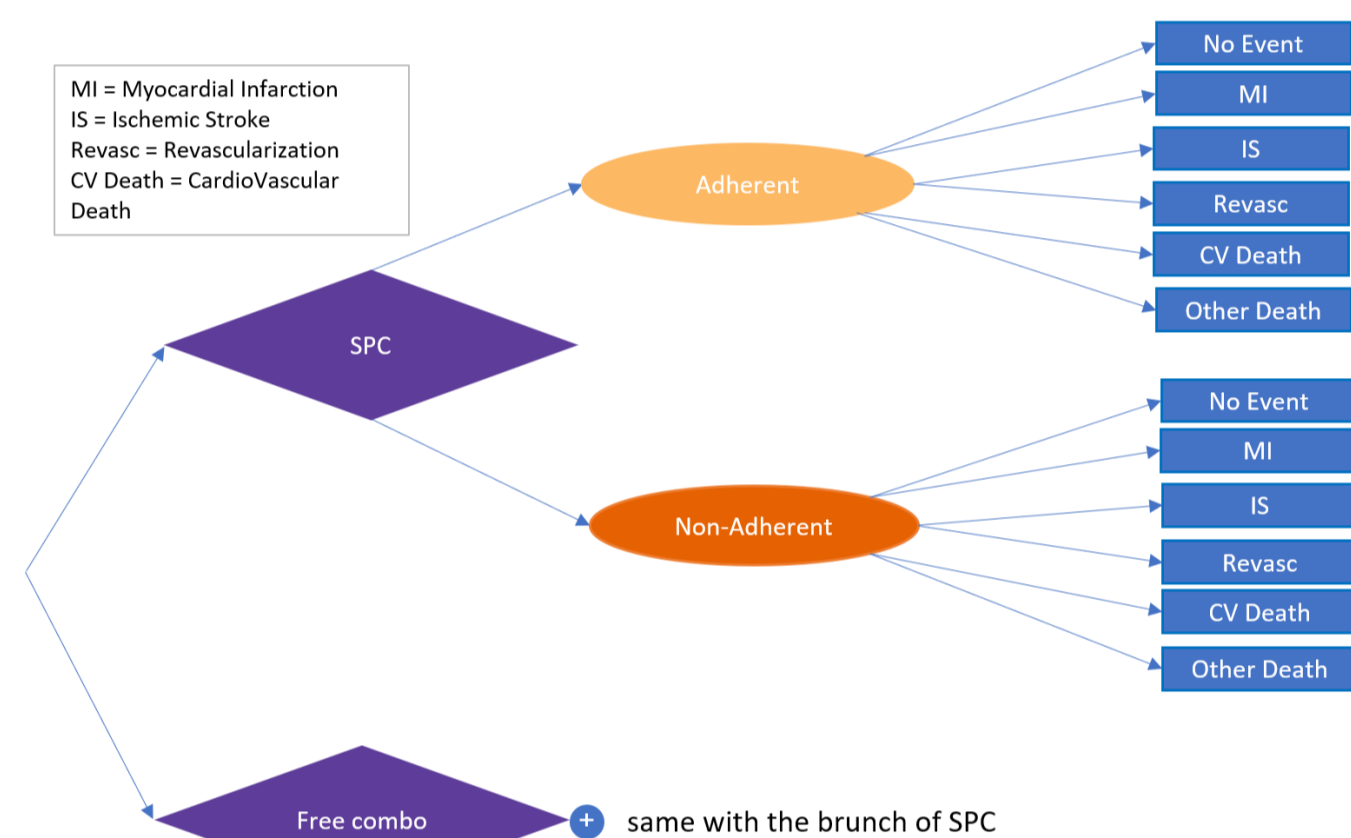


Figure 1 Decision Tree Model

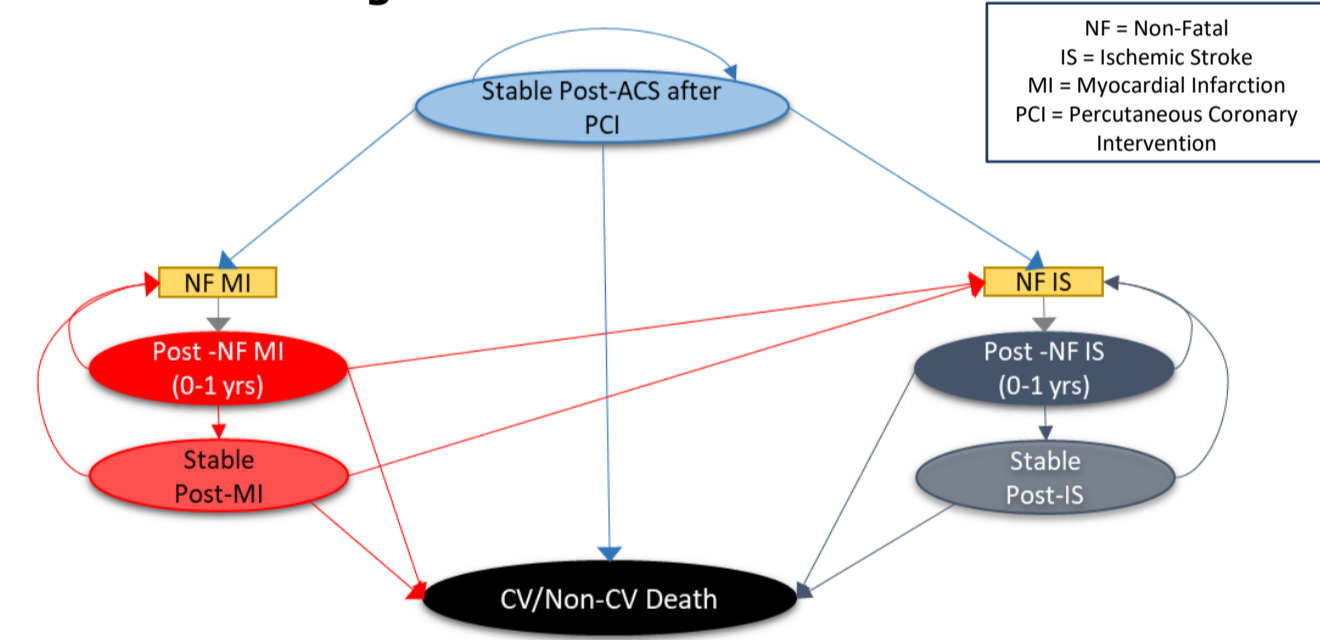


Figure 2 Markov Model

## OBJECTIVES

- To evaluate the lifetime cost-effectiveness of SPC versus free combination of clopidogrel plus aspirin for the prevention of cardiovascular events in ACS patients from the perspective of Chinese healthcare system.

- Both the event rates in short-term and transition probabilities in long-term were the same for two treatments, the key driver was the improvement in adherence rate.
- Utilities were obtained from literature<sup>[2,3]</sup> (Table 4).
- The discount rate was 5% for both costs and health outcomes.
- Sensitivity analyses**
  - One-way sensitivity analysis was conducted to test the uncertainty: clinical inputs were using 95% confidence interval, costs and health outcomes were using 0% to 8% as recommended by local guideline.
  - Probabilistic sensitivity analysis (PSA) was also adopted to verify the robustness.

Table 1 Clinical Inputs of Decision Tree Model

	Non-adherence	Adherence
Proportion in free combo arm <sup>[1]</sup>	79.07%	20.93%
Proportion in SPC arm <sup>[4]</sup>	68.07%	31.93%
Duration of treatment (days) <sup>[1]</sup>	320	130
Probability of MI <sup>[1]</sup>	1.11%	0.64%
Probability of IS <sup>[1]</sup>	2.96%	2.10%
Probability of Revascularization <sup>[1]</sup>	6.79%	4.11%
CV death <sup>[1]</sup>	2.36%	1.13%
Other death <sup>[1]</sup>	0.54%	0.54%

\*Drug price were obtained from local published online data

Table 4 Utilities

Event	Value
Stable <sup>[2]</sup>	0.82
MI <sup>[2]</sup>	0.67
Post-NF MI <sup>[2]</sup>	0.82
IS <sup>[2]</sup>	0.33
Post-NF IS <sup>[2]</sup>	0.52
Revascularization <sup>[3]</sup>	0.88

Table 2 Transition Probabilities of Markov Model

From State	Patient	To State					
		MI (0-1y)	Stable post-NF MI	IS (0-1y)	Stable post-NF IS	Event Free	CV Death
From State	Post NF-MI (0-1y)	9.47%	Remainder	2.81%	-	-	25.26%
	Stable Post NF-MI (> 1y)	5.46%	Remainder	0.56%	-	-	6.19%
	Post NF-IS (0-1y)	0.00%	-	8.85%	Remainder	-	11.10%
	Stable Post NF-IS (> 1y)	0.00%	-	2.73%	Remainder	-	6.19%
	Event Free	1.86%	-	1.50%	-	Remainder	6.19%
	CV Death	-	-	-	-	-	100%

Table 3 Costs

Drug*/Event type	Value (¥)
SPC	4.10 per pill
Clopidogrel	2.98 per pill
Aspirin	0.50 per pill
Maintenance treatment for stable patients <sup>[1]</sup>	4,447 per year
Treatment for MI <sup>[1]</sup>	35,270 per event
Maintenance treatment for MI (0-1 year) <sup>[1]</sup>	5,579 per year
Maintenance treatment for MI (>1 year) <sup>[1]</sup>	4,447 per year
Treatment for IS <sup>[1]</sup>	15,384 per event
Maintenance treatment for IS (0-1 year) <sup>[1]</sup>	7,016 per year
Maintenance treatment for IS (>1 year) <sup>[1]</sup>	6,950 per year
Revascularization <sup>[1]</sup>	62,308 per event
Treatment for bleeding <sup>[1]</sup>	15,786 per event
CV death <sup>[1]</sup>	37,168 per event

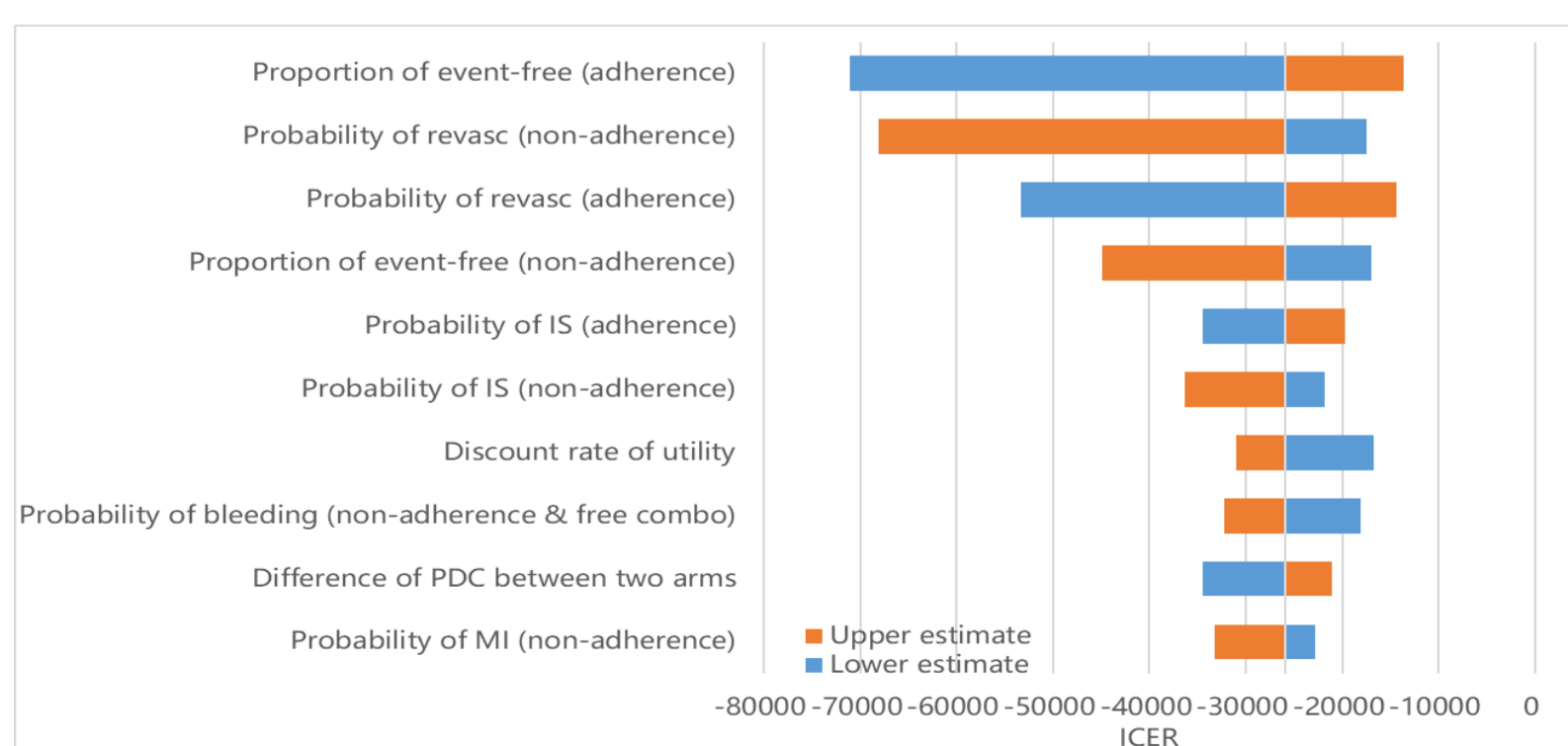
## RESULTS

### BASE CASE RESULTS

- Compared with free combo, treating patients with SPC resulted in a gained 0.022 QALYs and was associated with cost savings of 580.78 RMB per patient. SPC was a dominant therapy. (Table 5)

### SENSITIVITY ANALYSIS

- One-way sensitivity analysis showed the results were generally robust (Figure 3).
- 1000 times Monte-Carlo simulation results showed that patients treated with SPC could gain more QALY and save costs, which indicated that SPC was 100% dominant. (Figure 4).



\*Top 10 inputs that impact the results were displayed.

Figure 3 Tornado Diagram

Table 5 Base Case Results

	PSC	Free combo	Difference
<b>Health Outcomes</b>			
QALYs Per Patient	8.75	8.77	0.0225
LYs Per Patient	11.30	11.32	0.0195
Total Non-Fatal CV Events Per Patient	0.68	0.68	-0.0040
Total Fatal (CV) or Non-Fatal CV Events	1.01	1.01	-0.0052
<b>Costs (¥)</b>			
Cumulative Cost of Treatment	764.05	781.94	17.89
Cumulative Direct Costs	75,049.38	74,468.61	-580.78
<b>ICER</b>	<b>Dominant</b>		

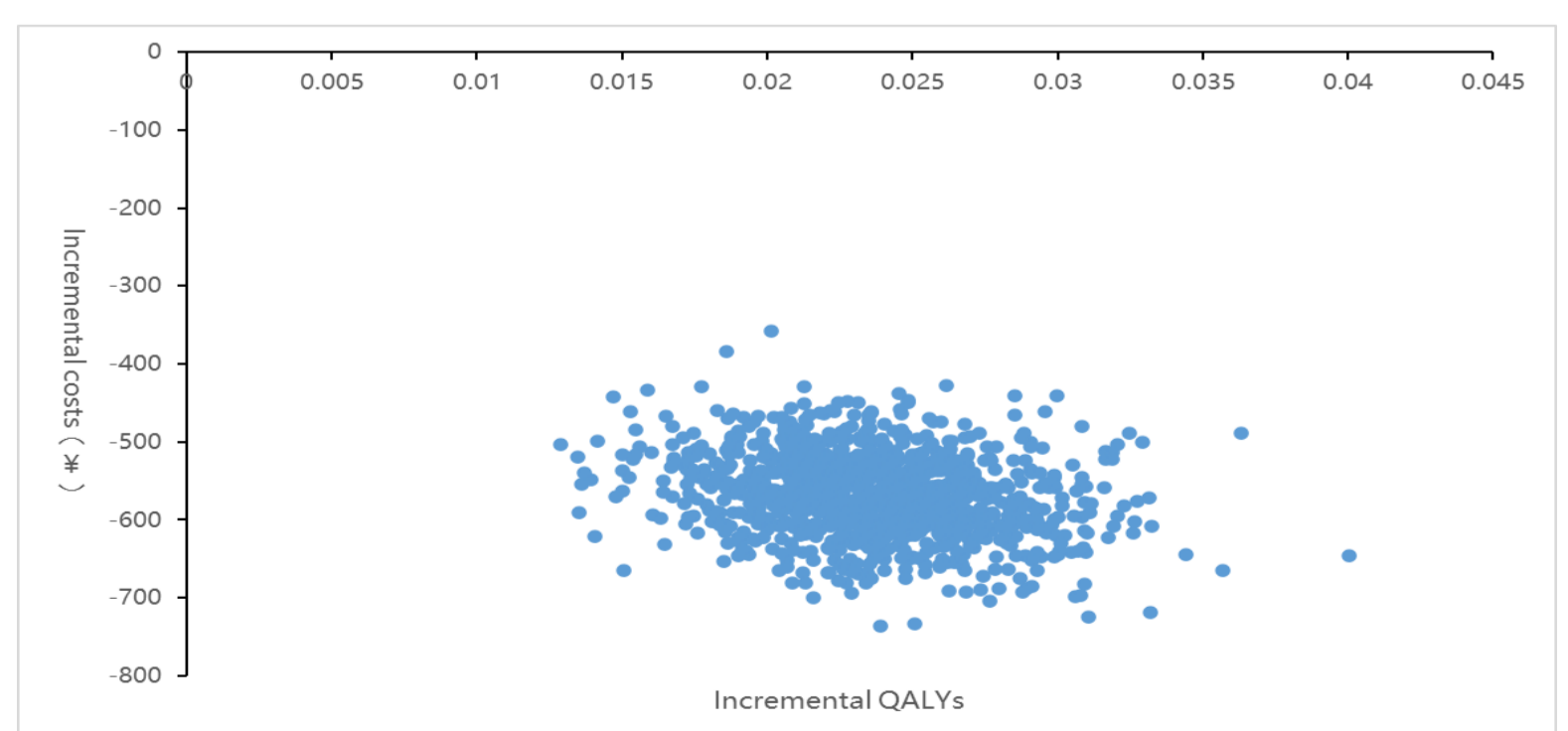


Figure 4 Incremental Cost-effectiveness Scatterplot

## CONCLUSION

Compared to free combo, SPC (Clopidogrel aspirin, tab in tab) was a dominant choice for ACS patients in China by preventing cardiovascular events and saving costs.

## REFERENCES

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