

PRELIMINARY REPORT OF SYSTEM DYNAMICS MODELLING OF A CO-PAYMENT MECHANISM FOR BREAST CANCER PATIENTS IN MALAYSIA

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INTRODUCTION

Malaysia’s affordable public healthcare limits access to innovative therapies, which may push uninsured breast cancer patients toward costly private care and increase risk of financial toxicity.

Rakan KKM, a health financing model by the Ministry of Health (MOH), aims to provide affordable premium access while reinvesting revenue to strengthen public healthcare. This study evaluates its potential financial impact on the health system.

METHODOLOGY

- Perspective:** Payer
- Data sources:** Malaysia National Cancer Registry^{1,2}, peer-reviewed literatures & expert opinion
- Model:** System dynamics model simulating annual breast cancer incidence by stage with treatment pathways (*public, private, no-treatment*)
- Costs & Outcomes:** Reported in 2025 MYR (1 MYR = 0.23 USD), discounted at 3% per annum
- Validation:** Model structure & assumptions face-validated by clinical, policy and economic experts
- Scenario analysis:** 66.7% of private patients assumed to shift to *Rakan KKM* (2026–2035) due to financial toxicity

Parameter	Value	Source
Annual breast cancer incidence cases	5,650 – 6,760	
Early-stage breast cancer diagnosis	0.477 – 0.450	1,2
Locally advanced breast cancer diagnosis	0.298 – 0.328	
Metastatic breast cancer diagnosis	0.230 – 0.234	
Transition from early stage to locally advanced	0.034	3
Transition from locally advanced to metastatic	0.072	
Proportion seeking treatment in public healthcare	0.591	
Proportion seeking treatment in private healthcare	0.386	4
Proportion not seeking treatment	0.023	
Proportion switching from private to <i>Rakan KKM</i>	0.664	5
Private pharmacotherapy cost – early stage*	35,602 – 27,286	Institutional local data
Private pharmacotherapy cost – locally advanced*	50,353 – 38,592	
Private pharmacotherapy cost – metastatic*	66,566 – 51,017	
<i>Rakan KKM</i> pharmacotherapy cost – early stage*	12,446 – 9,538	
<i>Rakan KKM</i> pharmacotherapy cost – locally advanced*	19,900 – 15,251	
<i>Rakan KKM</i> pharmacotherapy cost – metastatic*	31,809 – 24,379	

Table 1. Input Parameters for System Dynamics Model
* Cost-related parameters discounted at 3% per annum

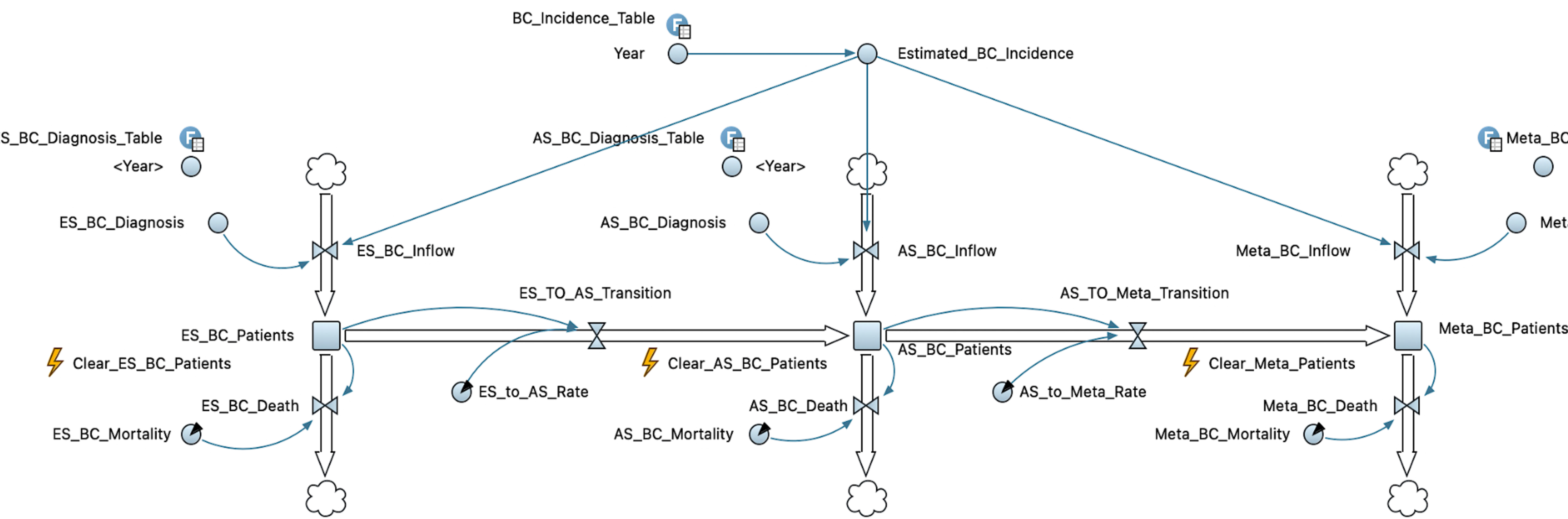


Figure 1. Schematic Illustration of System Dynamics Model

RESULTS

USD 8.5 Million
Estimated cumulative profit for MOH over 10 years

59.2% Out-of-Pocket Saving
Estimated out-of-pocket savings of USD 5,841 per *Rakan KKM* patient compared to treatment at private healthcare facilities

USD 95.2 Million
Estimated total OOP savings for *Rakan KKM* patients over 10 years

LIMITATIONS

- Model Simplification**

Does not fully capture patient heterogeneity
- Cost Estimation**

Referenced cost may differ from real-world procurement
- Scenario Assumption**

Patient flow may vary with behavioural & policy factors

CONCLUSION

Rakan KKM has the potential to be a cost-saving health financing strategy for breast cancer treatment in Malaysia by reducing system-wide healthcare cost, hence contributing to the sustainability of the overall healthcare system.

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