

Cost Analysis of Human Papillomavirus Test and Pap Smear Test in Ministry of Health Malaysia

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INTRODUCTION

- Since 2019, the Ministry of Health Malaysia (MOH) has introduced a cervical cancer screening programme using the Human Papillomavirus (HPV) test at its primary care clinics.
- The programme was expanded in phases to increase access to the population in response to the World Health Organization's recommendations(1).
- The analysis of HPV test samples was processed by the MOH in-house laboratory (lab) and outsourced to private lab.
- Although inhouse and outsourced lab services were implemented, the cost comparisons of these methods have yet to be established.

OBJECTIVE

Estimate the cost for:

HPV screening (in-house lab services)

HPV screening (outsourced lab services)

Pap smear screening (outsourced lab services)

METHODOLOGY



- Mixed approach (activity-based and top-down costing)
- Relevant direct medical cost components (fixed, semifixed and variable costs) HPV screening were collected from seven clinics and one clinic for pap smears (Table 1).
- Costs incurred for in-house laboratory HPV analysis activities were collected from one MOH laboratory.
- Estimated contract service costs were obtained from expert interviews. HPV and Pap smear screening using outsourced laboratory services through contract which was inclusive of lab services (Table 1)
- Median costs were calculated using Microsoft Excel.

Table 1. Direct Medical Cost Components	
A. Fixed Costs (Capital)	
A1. Medical equipment	
A2. Office equipment	
A3. Vehicle	
A4. Information and communication technology (ICT)	
B. Fixed Cost (Overheads)	
B1. Utilities (electricity, water, sewerage, telephone and internet bills)	
B2. Non-clinical support (clinical waste management, cleaning, hospital information system, maintenance and repair work)	
B3. ICT	
C. Semifixed Costs (Staff Costs)	
D. Variable Costs	
D1. Consumables	
D2. Vehicle operating costs (fuel, toll and maintenance)	
D3. Contract service costs	
i) In-house lab services include loaned instrument placement on-site, lab reagents, lab consumables and HPV test kits.	
ii) Outsourced lab services include private lab personnel, specimen courier from district health offices to the private lab, lab reagents, lab consumables and HPV test kits.	

CONCLUSION

- The estimated cost of HPV tests using in-house laboratory services was the highest, followed by HPV and pap smear screening using outsourced laboratory services.
- The main cost driver found in this study was the cost of contract services, which could be optimised by leveraging the economies of scale.

RESULTS

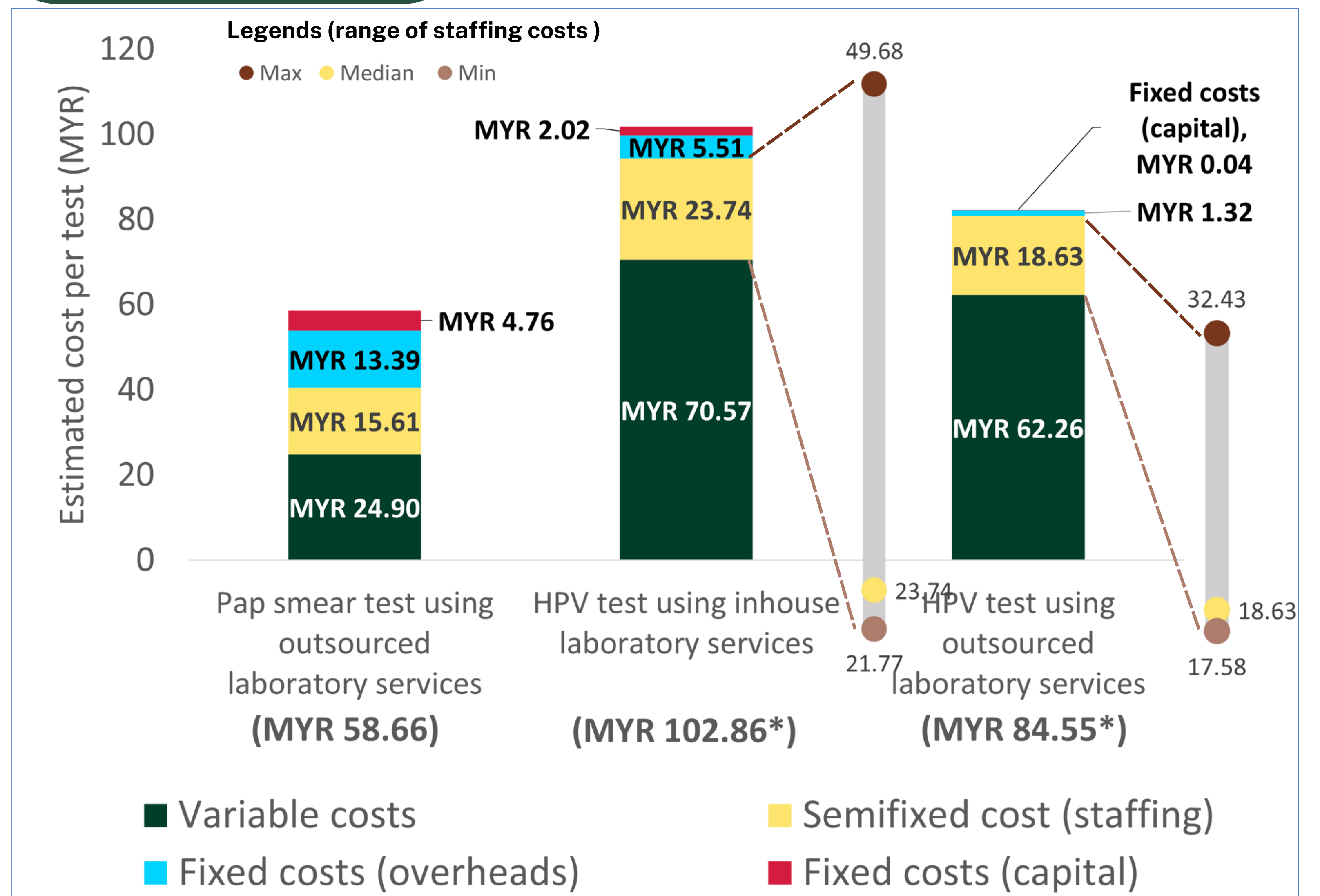


Figure 1. Comparison of cost by components and estimated total cost per test (in parenthesis)
* The sum of median cost of all components differed slightly from the estimated total cost per test (row median), as different methods were applied.

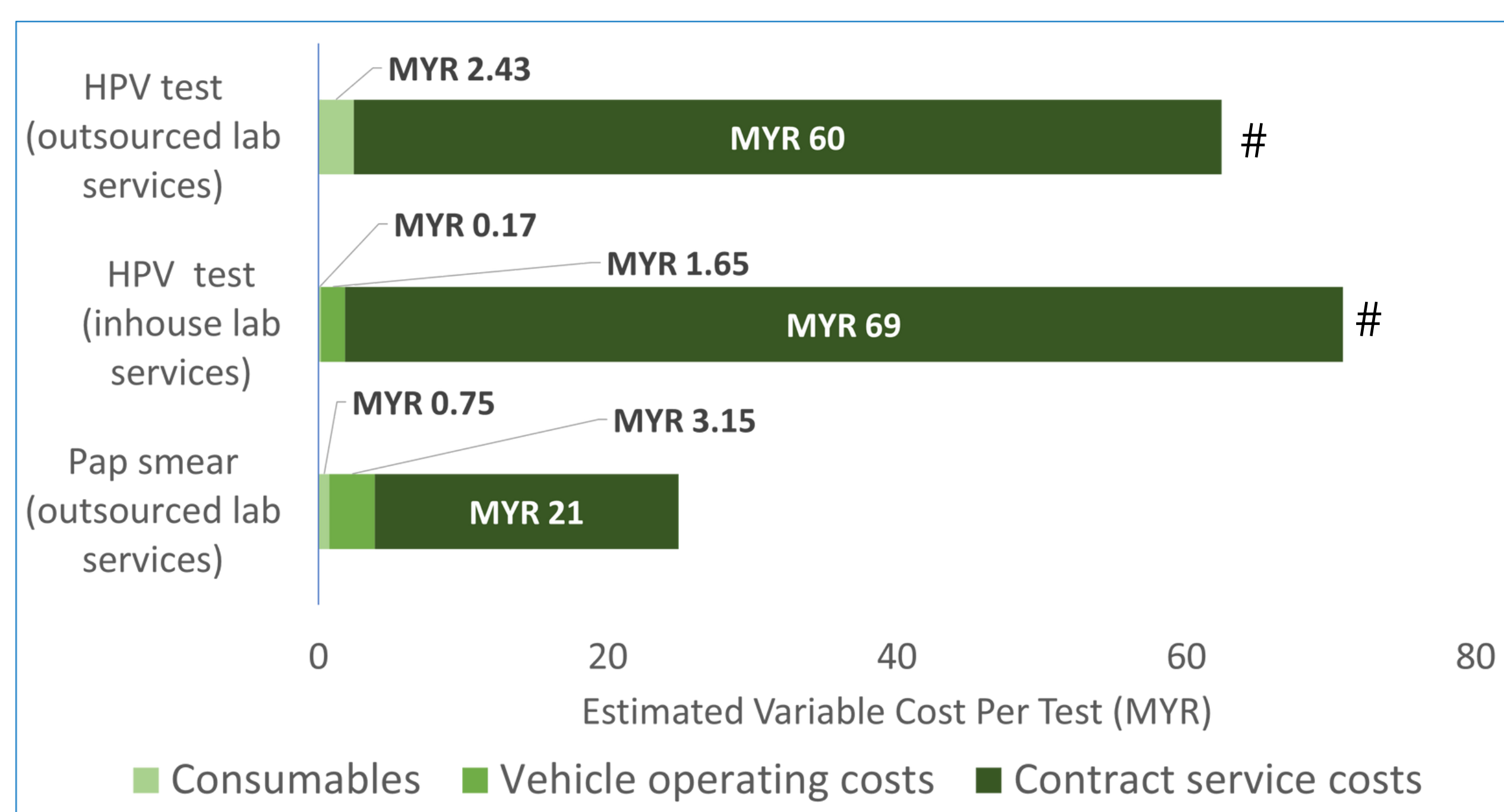


Figure 2. Comparison of variable cost per test between HPV test and pap smear test
The sum of median cost of all subcomponents differed slightly from the estimated Variable Costs (illustrated in Figure 1), as different methods were applied.

Main Cost Driver



DISCUSSION

1

Main Cost Driver

Our study vs **Other local studies**

The cost drivers identified in this study differ from those in other local studies (2, 3) because the contract service cost in this study included additional expenses beyond staffing.

2

The expansion of services has the potential to optimise screening costs through economies of scale.

3

Staffing costs can vary across facilities due to differences in work processes and the time needed to complete tasks.

4

The cost of pap smear screening using in-house lab services could be explored in future research.

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