

Does the provision of VMMC services for the next 5 years continue to represent a cost-effective use of HIV programme resources in Sub-Saharan Africa?

Results from five models.

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Modelling groups

- EMOD¹ – South Africa
- HIV Synthesis¹ – Setting scenarios across SSA
- Goals-ASM² – South Africa, Malawi, Zimbabwe (+ 9 other countries)
- Optima² – Malawi, South Africa, Zimbabwe
- Thembisa² – South Africa

¹ Individual based stochastic, ² Compartmental

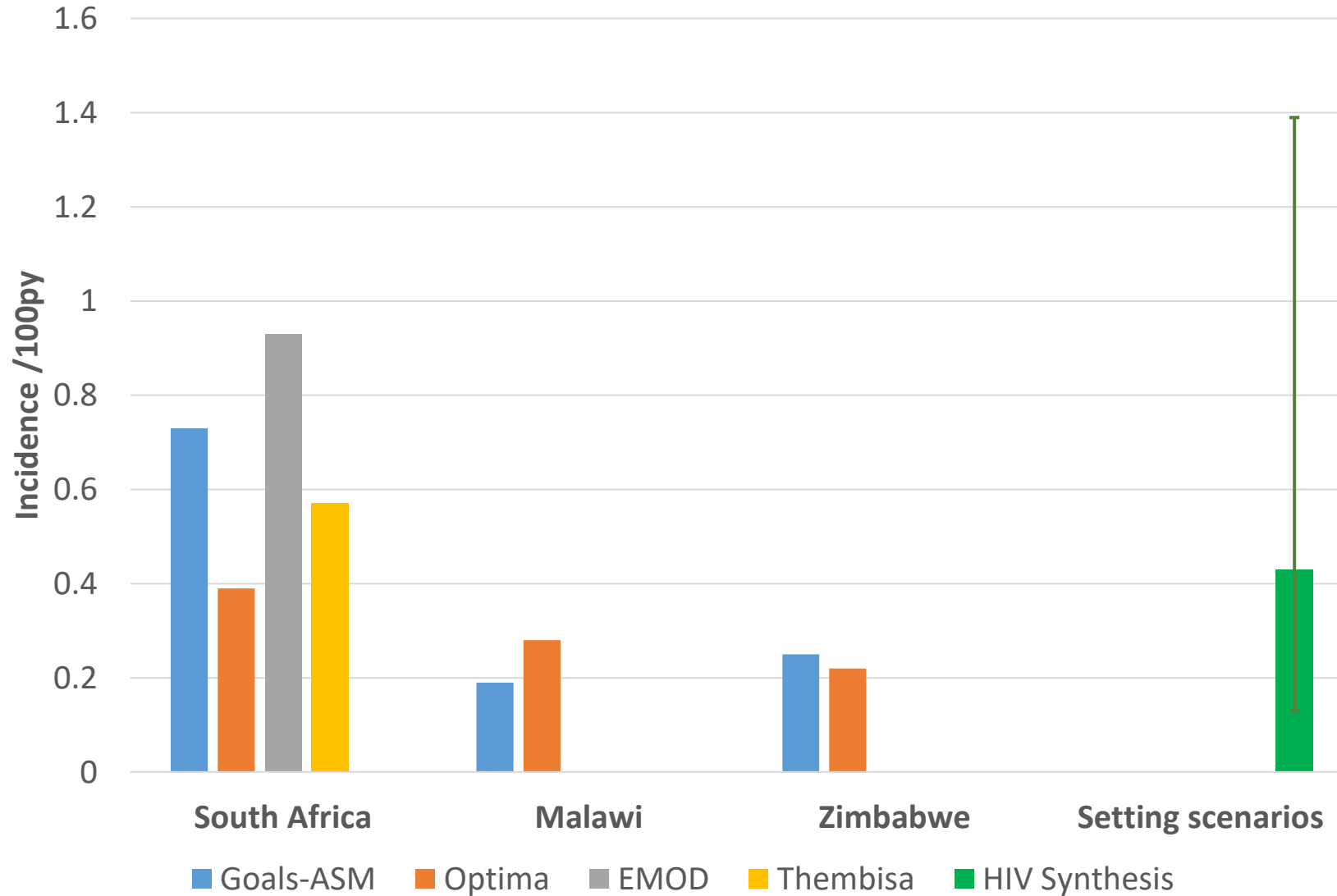
Question of interest

- Does the provision of VMMC services for the next 5 years continue to represent a cost-effective use of HIV programme resources in Sub-Saharan Africa?
 - No further VMMC
 - VMMCs continue at current rates for 5 years
- Results considered over time horizon of 50 years (focus on 50 years as health benefits of intervention are realized over long time periods; 20 years also considered)

Model alignment

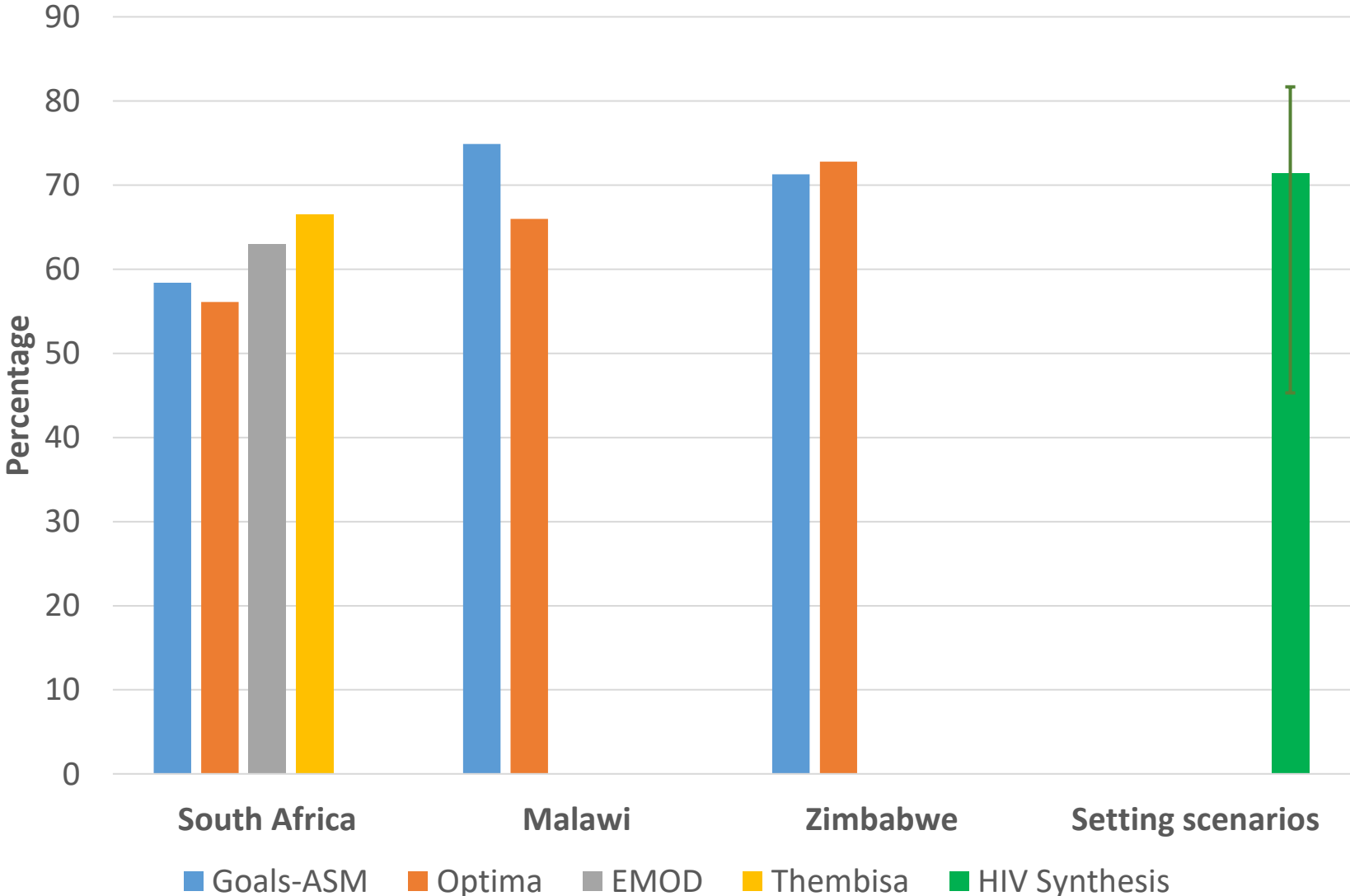
- All models aligned on the following:
 - Cost of VMMC, US \$90
 - 3% discounting of DALYs
 - % of all people living with HIV who are on ART remains constant from 2021
- Various survey data were used to inform initial VMMC rates and all models factored in background rates of traditional circumcision

Baseline outputs (2021): Incidence/ 100 p-yrs



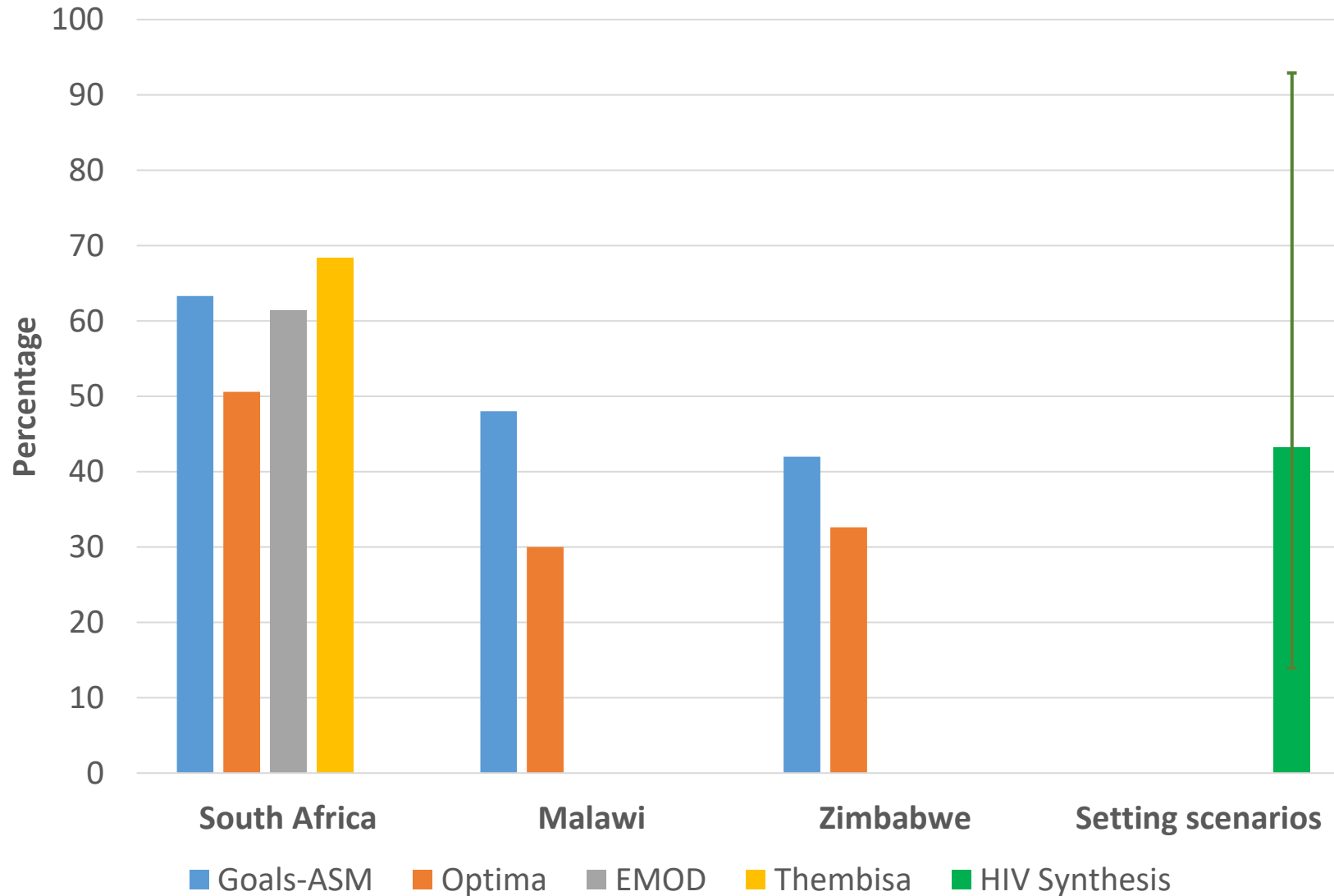
Baseline outputs (2021): % of HIV+ people with viral load <1000 copies/mL

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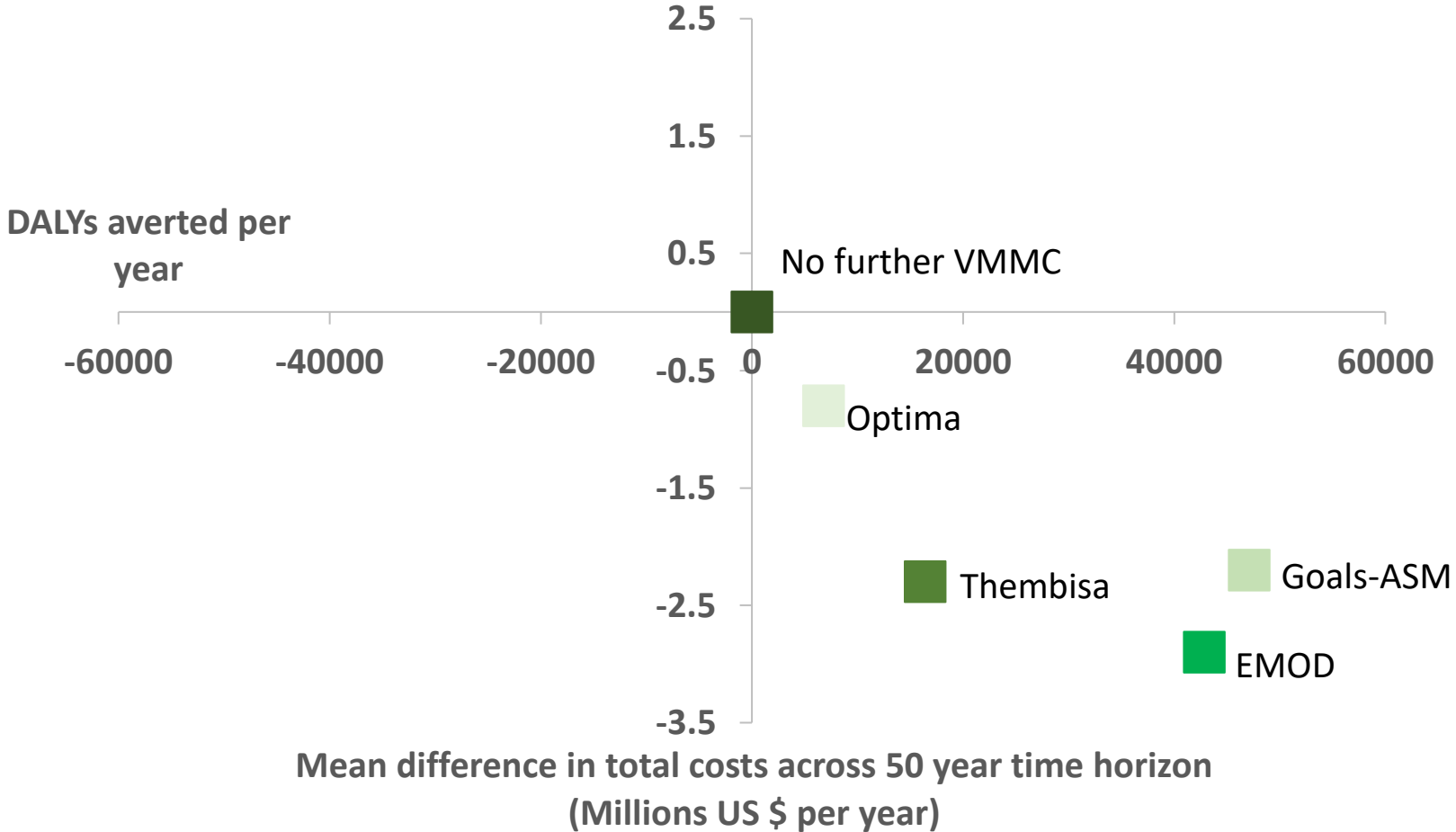


Baseline outputs (2021): % of men circumcised aged 15-49

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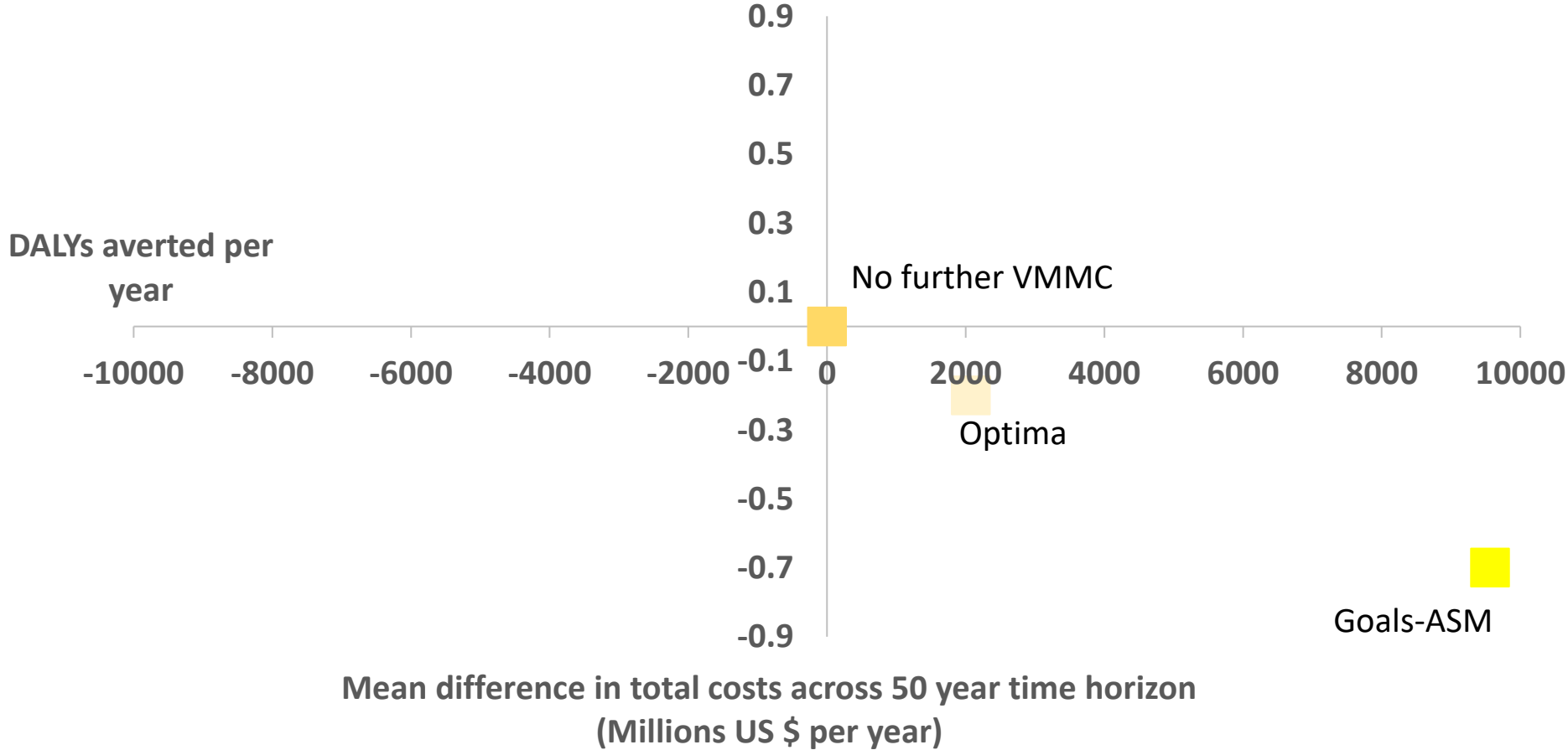
South Africa – Cost-effectiveness plane across 50 year time horizon



South Africa – Conclusions

- Across a 50 year time horizon, all models showed DALYs averted and costs saved with continuation of VMMC for 5 years
 - Continuation of VMMC for 5 years cost-saving in South Africa

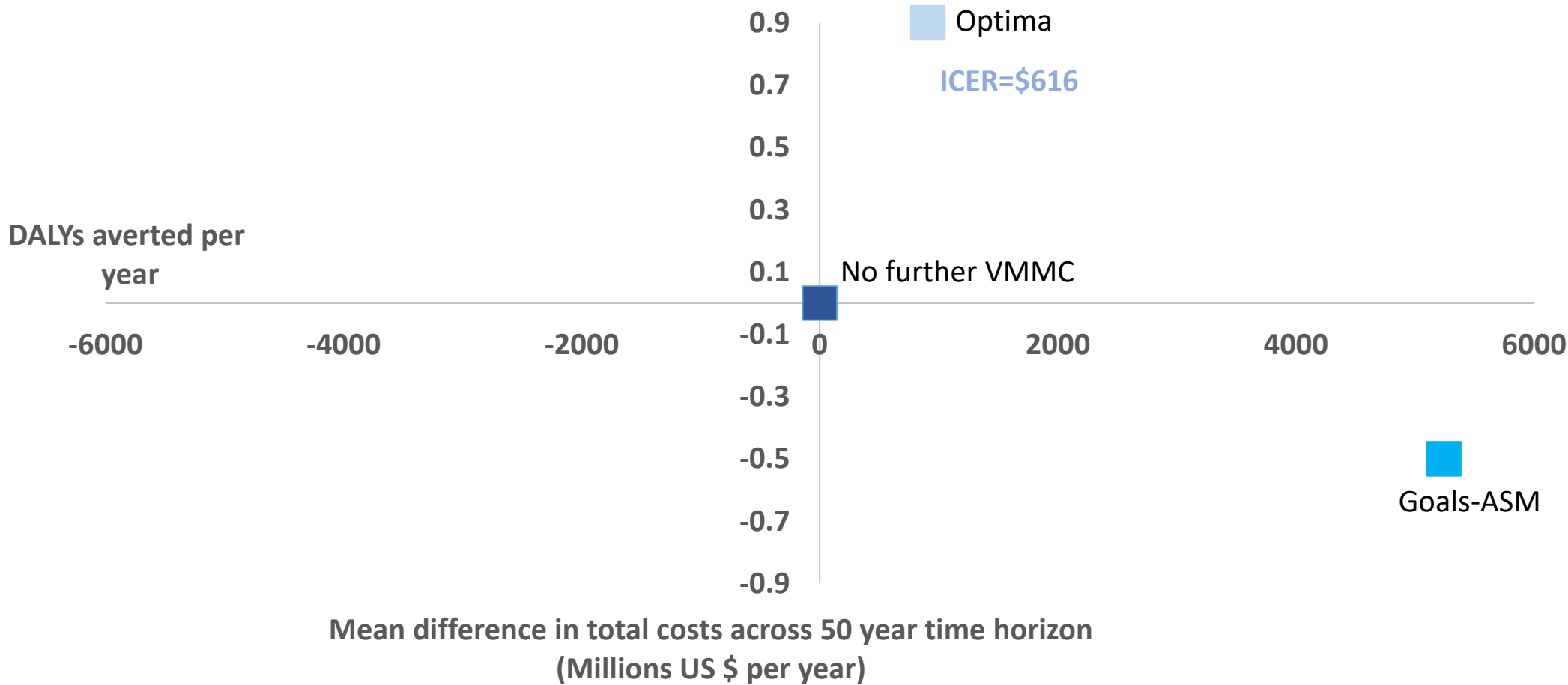
Malawi – Cost-effectiveness plane across 50 year time horizon



Malawi – Conclusions

- Across a 50 year time horizon, all models showed DALYs averted and costs saved with continuation of VMMC for 5 years
 - Continuation of VMMC for 5 years cost-saving in Malawi

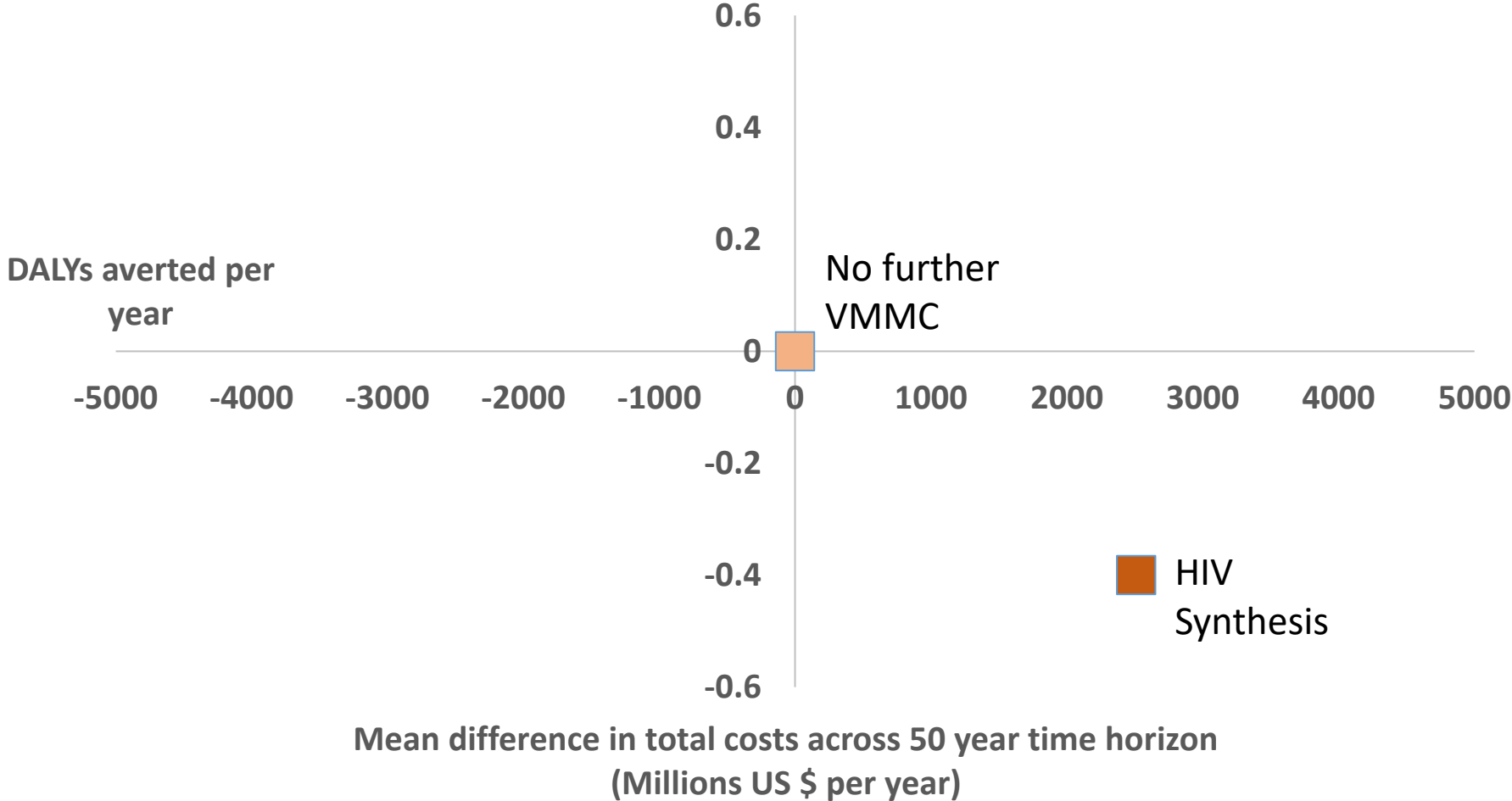
Zimbabwe – Cost-effectiveness plane across 50 year time horizon



Zimbabwe – Conclusions

- Differences in cost-effectiveness between Goals and Optima likely driven by differences in future incidence projected by the two models
- DALYs averted according to both models, but differences in costs across 50 years slightly higher with Optima
 - VMMC cost-saving according to Goals but not quite cost-effective according to Optima at the US \$500 threshold

HIV Synthesis – Cost-effectiveness plane across 50 year time horizon



HIV Synthesis Conclusions

- Considering the median setting scenario, across a 50 year time horizon, DALYs were averted, and costs were saved with continuation of VMMC for 5 years
- Continuation of VMMC for 5 years cost-saving across setting scenarios

HIV Synthesis – relationship between incidence and cost-effectiveness (100 scenarios)

| Incidence in 2021/100 person years | Percent of scenarios in which VMMC is cost effective |
|---|---|
| 0 – 0.2 | 75 |
| 0.21 – 0.30 | 81 |
| 0.30 – 0.50 | 88 |
| 0.50 – 1.00 | 93 |
| >1.00 | 90 |

- Incidence estimates from PHIA 2016: Malawi: 0.37/100py, Zimbabwe: 0.42/100py

HIV Synthesis – relationship between incidence and cost-effectiveness (100 scenarios)

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- VMMC remains cost-effective even in setting scenarios with incidence below 0.2/100 person years
- This increases to >90% when incidence is >1/100 person years (this threshold to be further defined with new model runs with further lowered stochastic effects)

Effect of varying assumptions

- Assuming 20% lower ART coverage in 2041, VMMC was found to be more cost effective in all settings
- Assuming a lower cost of VMMC (\$60), VMMC was found to be cost effective in all settings by all models
- Assuming a higher cost of VMMC (\$120), VMMC was found to be cost-effective in South Africa and Malawi by all models, though results for Zimbabwe were mixed

Summary:

VMMC is cost effective over a 50-year time horizon

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- South Africa: All models found continuation of VMMC to be cost-saving
- Malawi: All models found continuation of VMMC to be cost-saving
- Zimbabwe: Results were mixed. Continuation of VMMC was cost-saving according to Goals-ASM and nearing cost-effectiveness according to Optima
- Across a range of setting scenarios which mimic countries and regions in sub-Saharan Africa, cost-effectiveness of VMMC was dependent on HIV incidence. Even in setting scenarios with low HIV incidence, there was over a 75% chance of being cost-effective (HIV Synthesis)

Conclusions

- In all HIV incidence settings, VMMC has a strong likelihood of being cost-effective

Thank-you

Zimbabwe – future incidence prediction (assuming continuation of VMMC for 5 years)

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