

# Comparing Strategies for Reducing Myocardial Infarction Rates in HIV Patients

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## Background

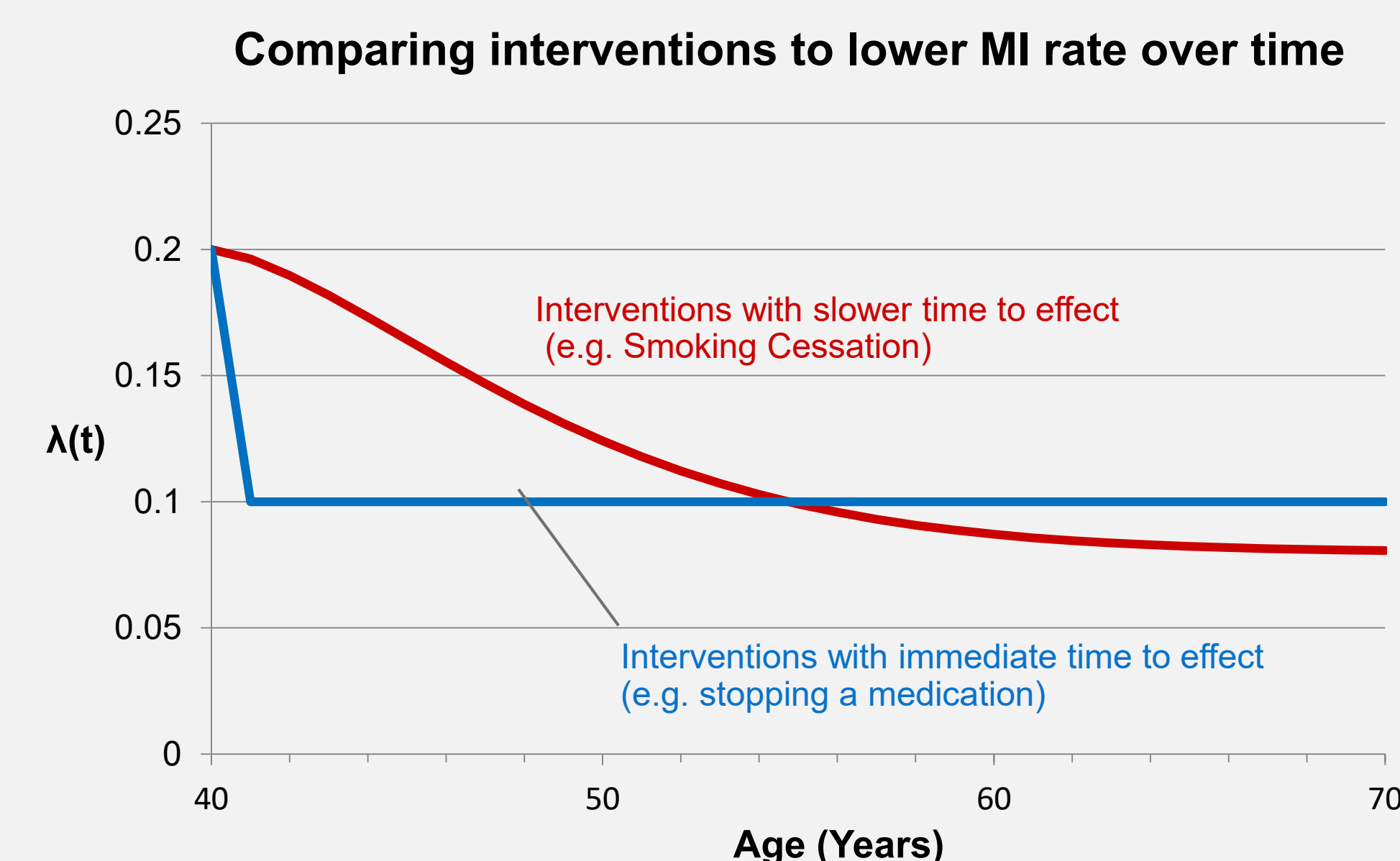
- The HIV population is aging and studies show higher rates of myocardial infarctions (MI) with HIV compared to general population
- Abacavir has also been associated in some but not all studies with an increased risk of cardiovascular (CV) events
- To assess the relative impact of various interventions to reduce MI risk in HIV patients, we created a model to compare the impacts of intervention that address traditional risk factors vs. the replacement of abacavir with a different antiretroviral
- While other HIV antiretrovirals have also been associated with increased MI risk (e.g., some protease inhibitors), this model used the data on abacavir as an example of a modifiable risk factor that could be compared with the traditional modifiable risk factors for MI

## Study Aim

- To help physicians prioritize the selection of interventions to reduce the MI rate in HIV patients
- To model the estimated impact of different interventions, including interventions that address traditional risk factors as well as replacing abacavir, on predicted MI rates

## Methods

- Common strategies for reducing MI rates in HIV patients were compared using a decision tree model which was simulated over 10 years. These interventions included:
  - smoking cessation counseling,
  - substitution of abacavir with an alternative agent,
  - anti-hypertensive medication use
  - lipid-lowering medication use
- Assumptions about the effectiveness of interventions were based on publications from the HIV or general population, all adjusted for sex, age, and presence of the four risk factors
- The base case was a 50 year old HIV positive male on an abacavir containing regimen who is also a smoker, with hypertension and hyperlipidemia
- This model highlights the potential impact of addressing each intervention on it's own
- The interventions were compared based on published data on the probability of success of changing the risk factor and the impact of changing it when successful:
  - For counseling to smoking cessation, the impact was based on published quit rates following counseling, 36.5% after one year and 10% annual relapse rate
  - For the substitution of ABC, treating hypertension and hyperlipidemia, we applied a 100% success rate which assumes patient's adherence and compliance with the dosing and prescription
- The expected number of MI is calculated by numerically integrating MI incidence rates over a 10-year time period



## Results

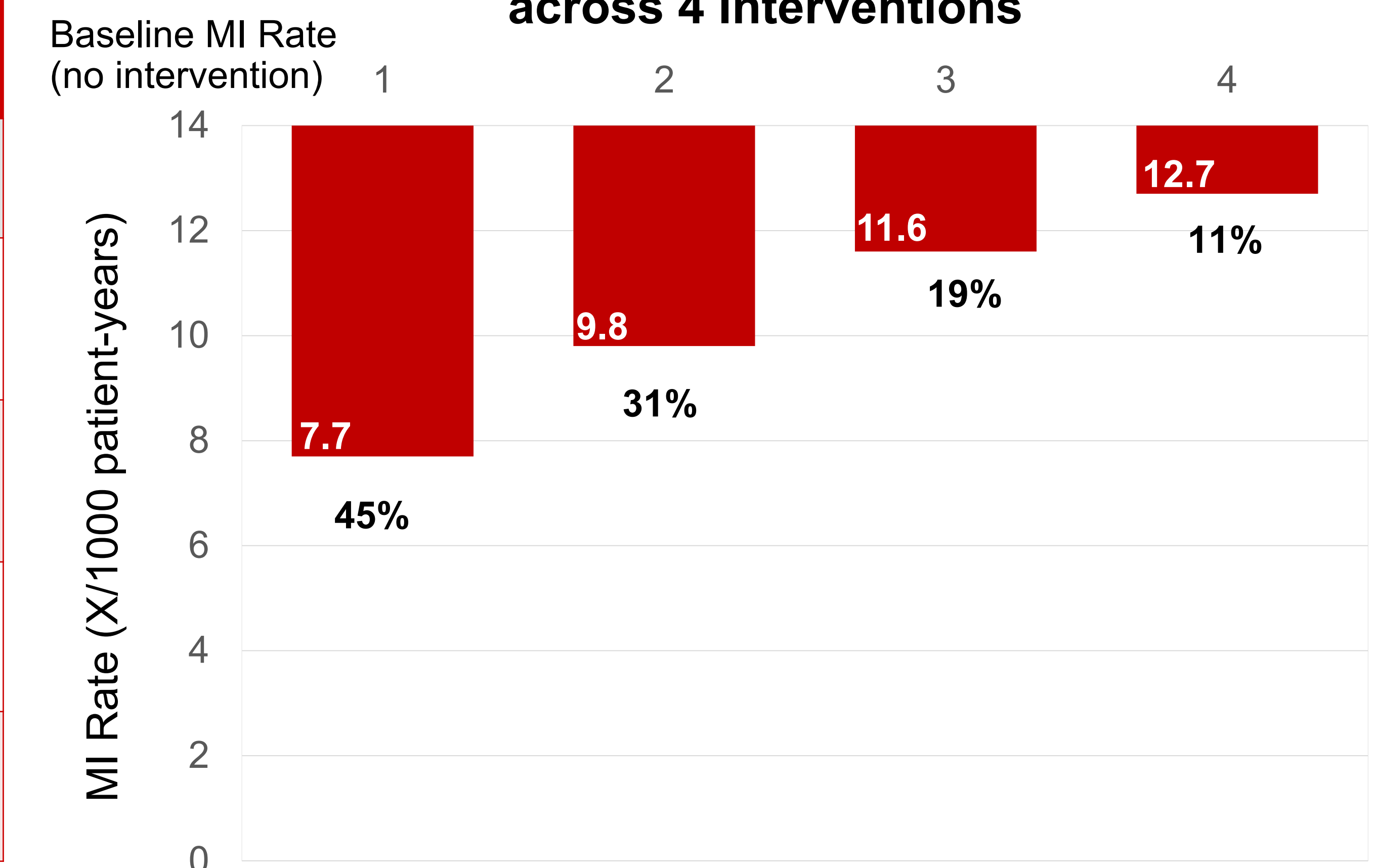
- Compared to no MI intervention, abacavir substitution prevented more MIs than counseling about smoking
  - In the base case of 50-year old HIV positive male smokers with hypertension and hyperlipidemia, who only replaced abacavir, there was a 45% reduction in the MI rate compared to those who continued abacavir
  - Men who are counseled and treated for smoking cessation which resulted in an 11% MI rate reduction versus those who did not attempt smoking cessation in 10 years
- Treating hypertension and hyperlipidemia resulted in 19% and 31% reductions in MI risk, respectively (see Table)

## Intervention Type

**HIV+ Patient Base Case Profile:** 50 years old, Male, On Abacavir, Smoker, w/ Hypertension, w/ Hyperlipidemia

- Abacavir substitution with an alternative antiviral without association to higher MI rate [1][2][3]
- Prescribing anti-hyperlipidemia medication [4][8]
- Prescribing anti-hypertensive medication [4][7][8]
- Counseling including standard treatment for smoking cessation such as nicotine patch and varenicline [4][5][6]

## MI Rate Reduction (%) Comparison across 4 Interventions



## Conclusion

- By incorporating the impact of CV risk factor modification based on real world data, this model suggests that replacing abacavir, which can be accomplished in most patients, has a greater impact on MI risk than interventions solely based on modifying each of three traditional risk factors, one at a time.
- Similarly, achieving 100% success with anti-lipemic and antihypertensive agents in practice is challenging, underscoring that our calculations may have over-estimated the effect of such interventions
- While this model does not account for all tobacco risks, such as the effect of tobacco on increased cancer, findings highlight the role that abacavir substitution can have on MI risk over time compared to antismoking, hypertension and lipid lowering interventions
- Interventions to address all CV risk factors are warranted and are at least additive when successful

## References

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