

# Using health economics to improve resource allocation decisions relating to *Clostridium difficile*

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# Economic Evaluation in 30 Seconds

- Framework for resource allocation
- Vital component of health services research



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# Constrained Budgets

- Resources are finite
- Wants are unlimited
- Do the right things, do things right and be fair



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# Choosing Interventions



- Guided by clinical advice
- Followed a logical process
- Included bundled interventions

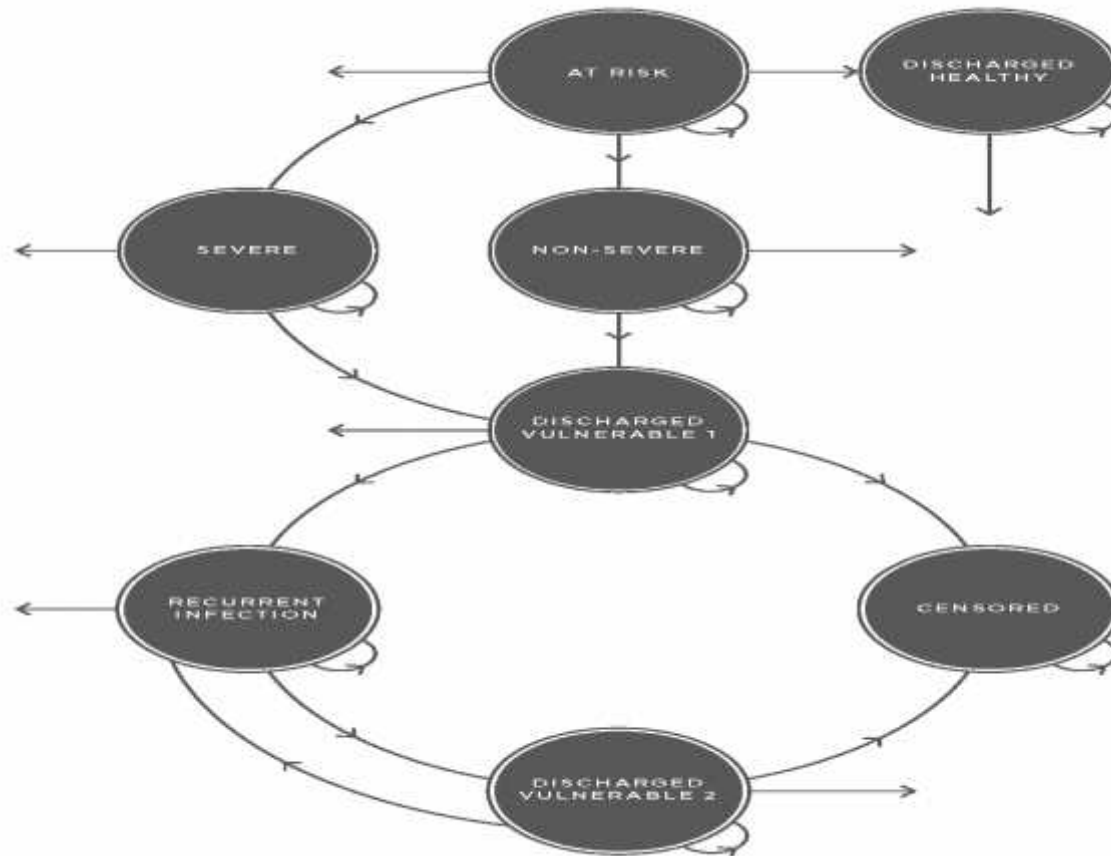


# Included Interventions



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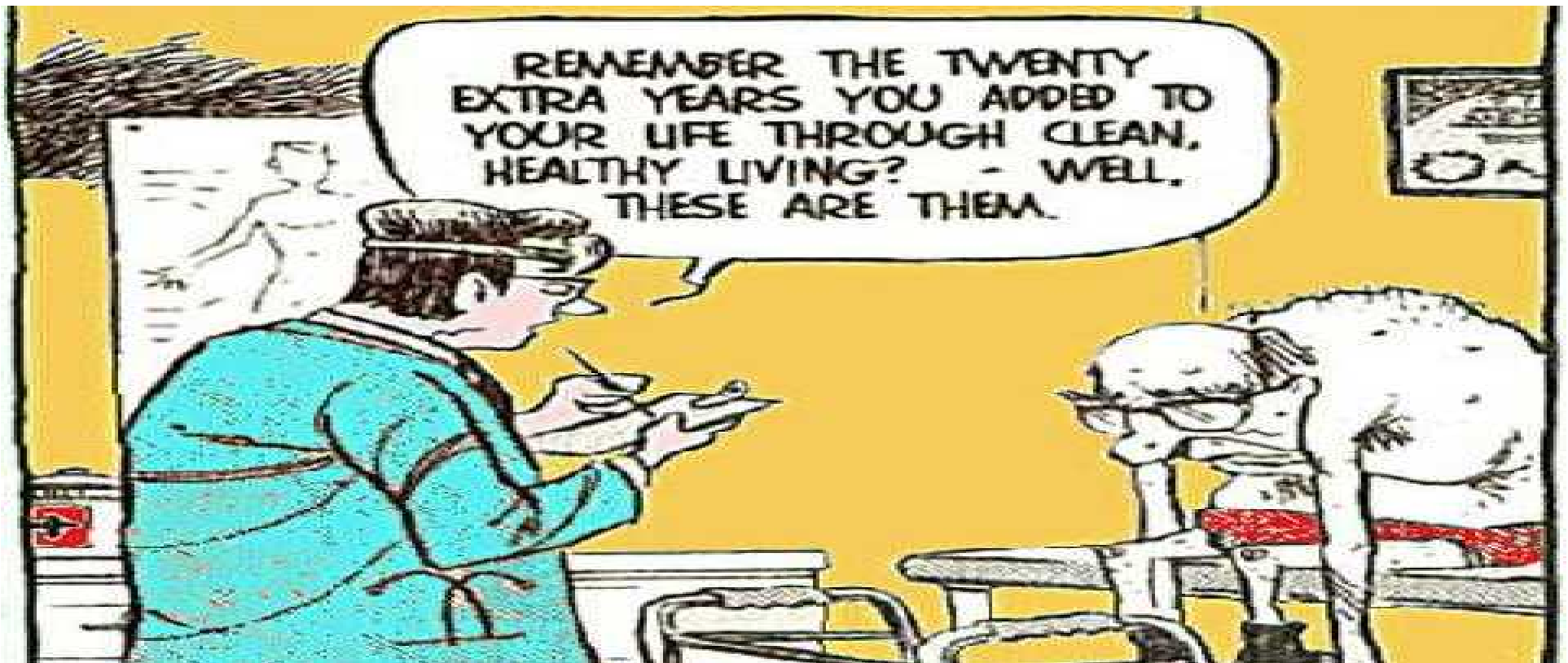
# Economic Model



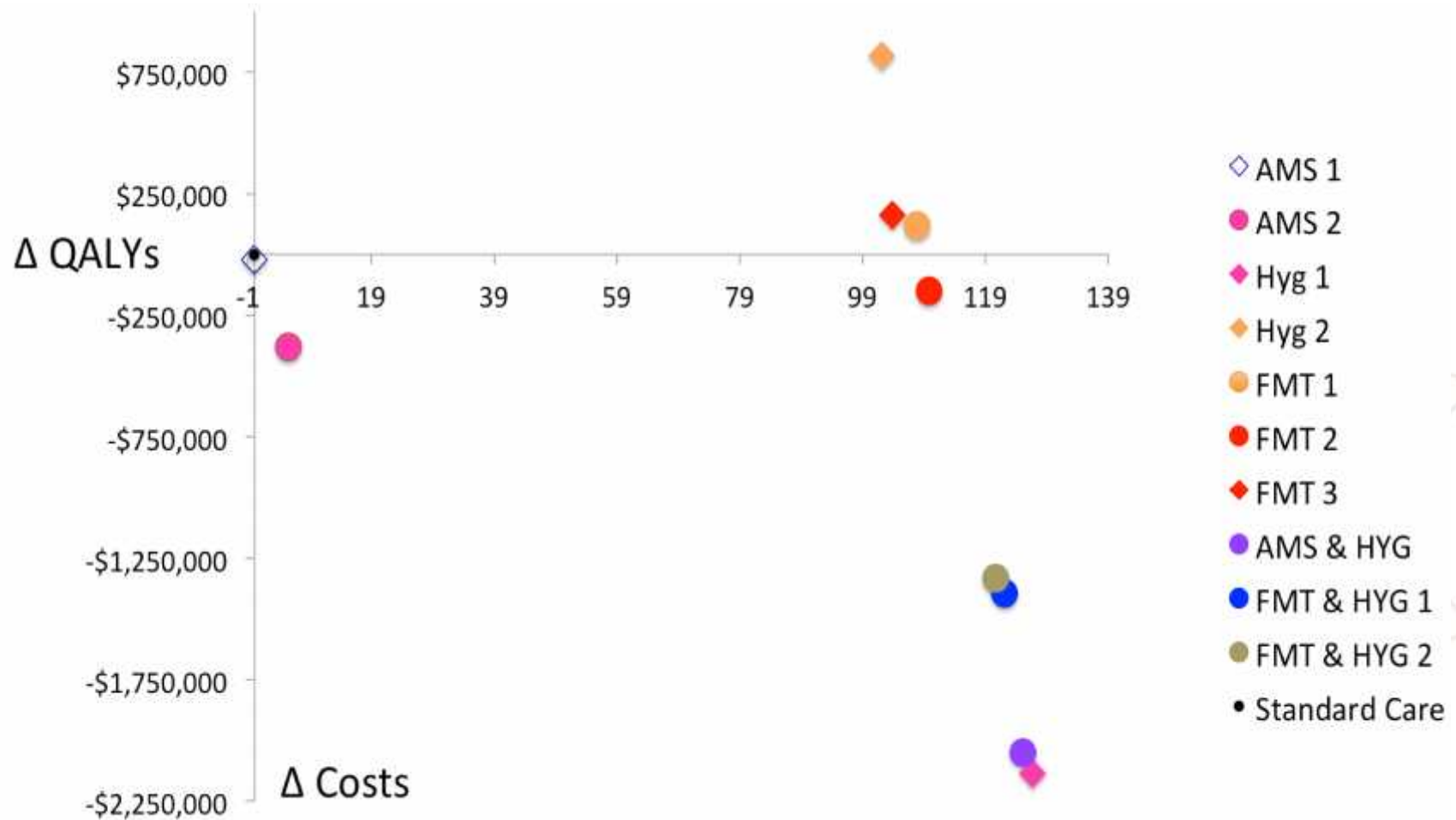
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# Data Collection

- Costs (infection and intervention)
- Intervention effectiveness
- Health utility data



# Baseline Results



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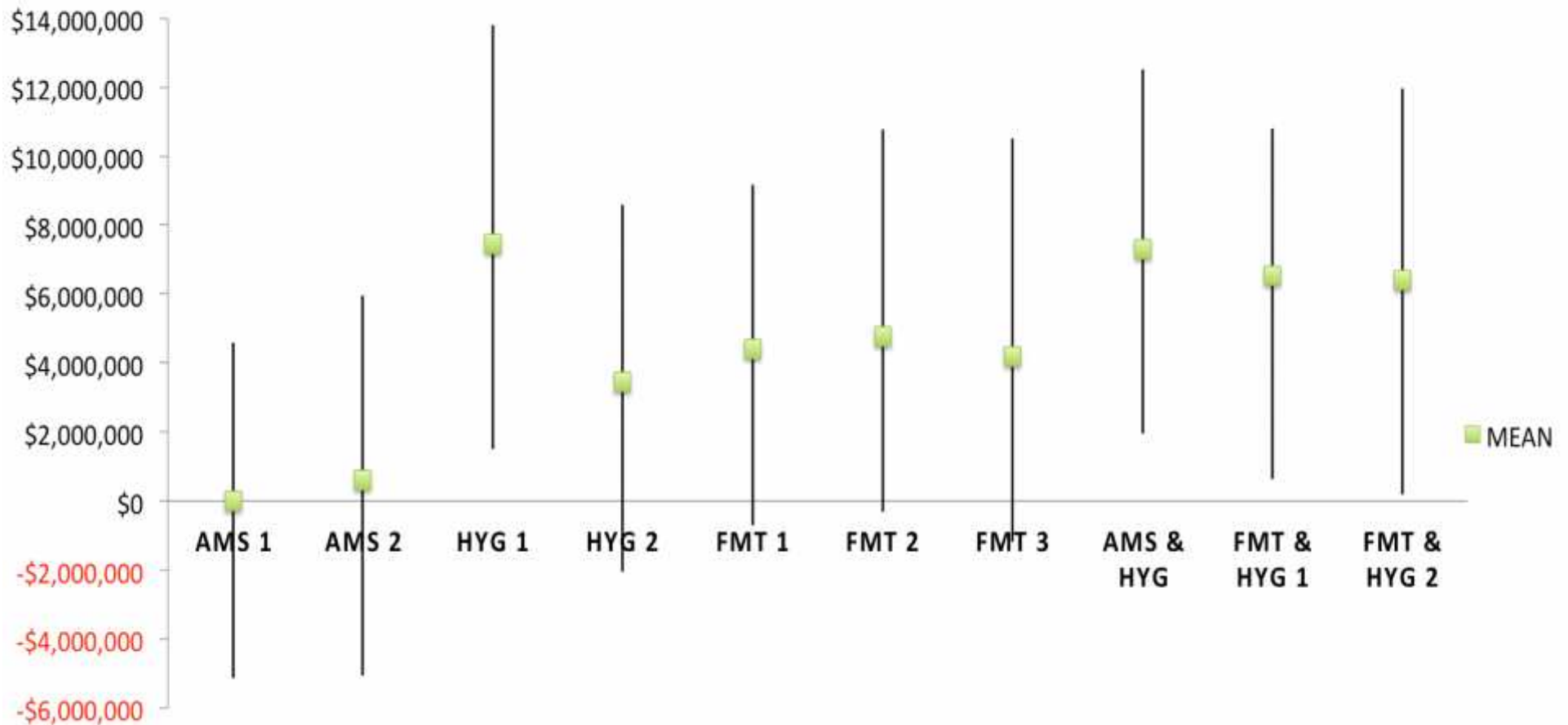
# Probabilistic Results

- Information needs to be relevant to decision-makers

Intervention	Percentage of MC Simulations	
	Cost-saving	Increase health benefits
Standard Care	Comparator	Comparator
AMS 1	51.61%	49.49%
AMS 2	69.84%	56.98%
HYG 1	99.89%	99.89%
HYG 2	12.69%	99.89%
FMT 1	42.49%	100%
FMT 2	59.55%	100%
FMT 3	41.96%	99.89%
AMS & HYG 1	99.89%	100%
FMT & HYG 1	99.29%	99.89%
FMT & HYG 2	97.87%	99.89%

# Probabilistic Results

- NMB much more useful for decision-makers



# Scenario Analysis

- Scenario analysis provides extra information
- Key values for parameters are altered
- Modelled the following scenarios:
  - WTP value for beds
  - Increased the LOS for infected patients
  - Increased the infection rate
  - Increased the mortality rate



# Scenario Analysis

Scenario	Optimal Intervention (Error probability)	Mean NMB (95% CI)
WTP cost for bed days	HYG 1 (0.74)	\$5,770,401 (\$5,678,579 - \$5,862,224)
Increased LOS	HYG 1 (0.64)	\$7,337,386 (\$7,238,532 - \$7,436,241)
Increased infection rate	AMS & HYG BUNDLE (0.56)	\$11,605,010 (\$11,480,838 - \$11,729,183)
Increased mortality rate	HYG 1 (0.64)	\$7,398,668 (\$7,295,752 - \$7,501,586)



# Interpretation of the Results

- Decision-maker perspective
- Assumption that improvement in health outcomes is valued



"It wasn't an easy decision for me to make.  
Lots of coin tossing went into it."



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# Real-World Influence

- 3 levels of decision-maker can benefit:
  - Clinical staff
  - Policy makers
  - Hospital-based decision-makers
- Bundled approaches work best
- What is included in a bundle is vital



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# Real-World Influence

- Infection control policy makers
  - Update policy guidelines
  - No economic evidence available until now, so needs to be used to update knowledge
- Hospital-based decision-makers
  - Use results to inform resource allocation
  - If current practice needs to be overhauled, use these findings as evidence



# Future Research Areas

- If I had an unlimited budget I would...
  - Standardise collection of CDI information
  - Collect better info about E-LOS due to infection
  - Add other interventions to the model



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# Limitations

- Model based results vs. trial based results
- Mixed quality evidence is inevitable
- No matter how politely you ask some private health providers for cost estimates...they will not give them to you!



# Strengths



A CALL FOR TRANSPARENCY



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# Conclusions

- Novel work, useful for various decision-makers
- Maintaining status quo is still a decision
- Ignoring cost-effective interventions  
= inappropriate use of scarce resources





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