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MODELING DIAGNOSTIC TESTING STRATEGIES FOR SARS-COV-2 TO MINIMIZE SOCIETAL COSTS AND RETURN PEOPLE TO WORK

Sofia Zavala, MD, MSc[1]; Gary Cox, MD[1]; Robert W. Belknap, MD[2]; Becky A. Smith, MD[1]; Sara S. Lewis, MD, MPH[1]; Christopher R. Polage, MD[3]; Nicholas A. Turner, MD, MHS[1]; Jason E. Stout, MD, MHS[1]

1: Division of Infectious Diseases and International Health, Duke University Medical Center; 2: Denver Health and Hospital Authority and Division of Infectious Diseases, University of Colorado; 3: Department of Pathology, Duke University Medical Center.

INTRODUCTION

Risk calculation for SARS-CoV-2 infection has changed with the shift to more transmissible but less virulent strains.

Economic burden of lost work due to isolation exceeds the economic burden of morbidity in young and healthy adults.

Testing strategies must adapt to the changing epidemiology.

METHODS

Modeled six testing strategies to estimate societal costs for symptomatic COVID among people 18-49 years old.

Costs included: testing, lost wages, hospitalization costs for index, secondary and tertiary cases.

One-way sensitivity analyses for:
(1) positivity rate 1-80%
(2) RAg sensitivity 20-80%

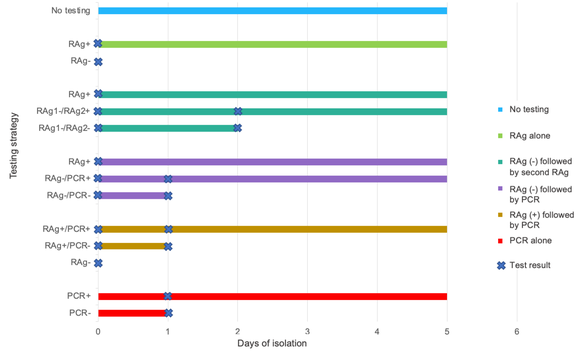
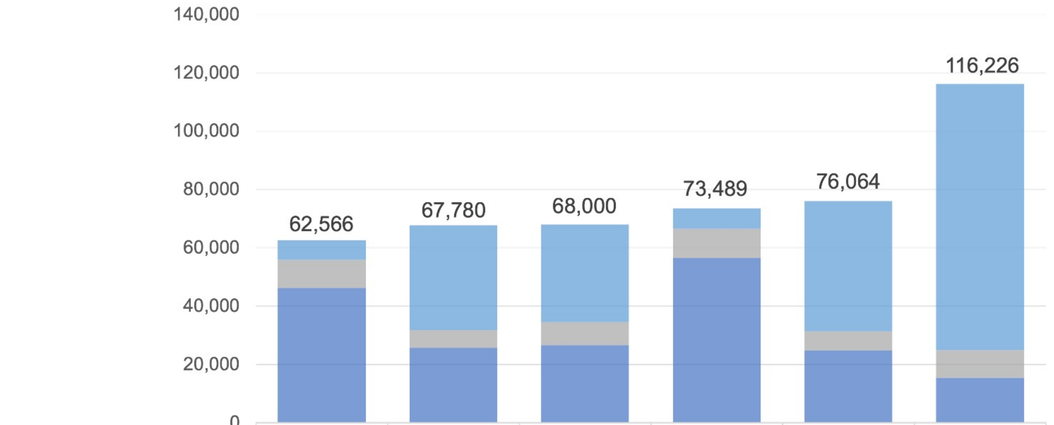


Figure 1: Isolation by testing strategy
RAg = rapid antigen test, PCR = polymerase chain reaction



	RAg alone	RAg (-) followed by PCR	PCR alone	RAg (+) followed by PCR	RAg (-) followed by RAg	No testing
Cost of index case	6,700	36,058	33,439	7,011	44,695	91,246
Cost of secondary cases	9,598	5,968	7,996	9,924	6,566	9,503
Cost of tertiary cases	46,267	25,754	26,564	56,554	24,803	15,477

Figure 2: Average costs by testing strategy for 100 individuals at a prevalence of 5%
Costs are expressed in USD. The total cost for each strategy is listed at the top of each bar. RAg = rapid antigen test, PCR = polymerase chain reaction

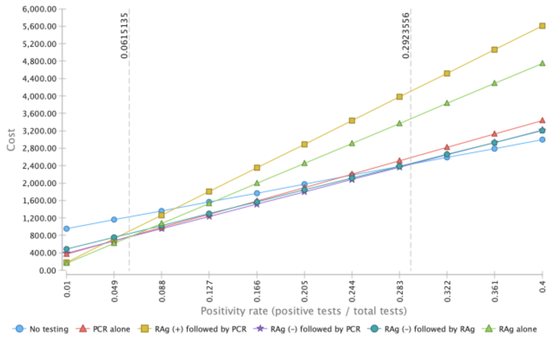


Figure 3: Sensitivity analysis for positivity rate
Costs expressed in USD. RAg = rapid antigen test, PCR = polymerase chain reaction

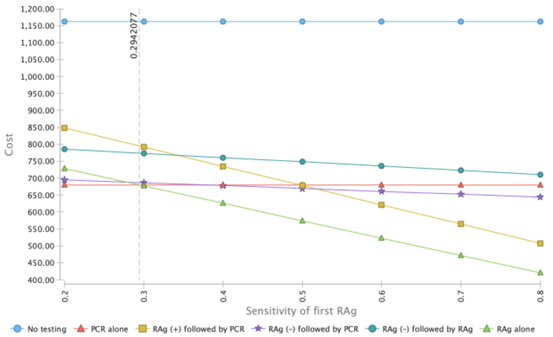


Figure 4: Sensitivity analysis for RAg sensitivity
Costs expressed in USD. RAg = rapid antigen test, PCR = polymerase chain reaction

RESULTS

At a positivity rate of 5%:
- RAg alone was the least expensive strategy
- PCR alone was cheapest if RAg sensitivity <29%.

At a positivity rate >6%:
- RAg(-)/PCR was the cheapest strategy, followed by PCR alone

At a positivity rate >29%:
- Isolation without testing was cheapest, followed by RAg(-)/PCR and serial RAg

CONCLUSIONS

A single rapid test with moderate sensitivity was the cheapest strategy in relatively young, healthy people.

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Contact information:
Sofia Zavala
Email: Sofia.Zavala.Monzon@duke.edu