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THE IMPACT OF MULTIPLEX RESPIRATORY PATHOGEN PCR TESTING AT A LARGE ACADEMIC INSTITUTION

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BACKGROUND / INTRODUCTION

- Individuals with respiratory infections are often prescribed needless antibiotics and spend unnecessary time in the hospital¹
- Diagnosis of a specific respiratory pathogen with polymerase chain reaction (PCR) testing can reduce costs and total length of stay (LOS) for patients with positive results^{2,3}
- The goal of this study is to determine whether the results of PCR testing for respiratory pathogens impact antibiotic days of therapy (DOT), LOS, and cost at Lehigh Valley Health Network (LVHN)*

*Data taken from Muhlenberg and Cedar Crest hospitals.

METHODS

Data for all patients who had the NxTAG[®] Respiratory Pathogen Panel (see Figure 1 for details) performed in 2019 at LVHN were obtained and the following information was reviewed.

Data relating to DOT, LOS, and cost were analyzed to find differences between the two groups regarding these variables.

Figure 1. NxTAG[®] Respiratory Pathogen Panel Targets (US-IVD)⁴

Viral Targets		
Influenza A	Rhinovirus/Enterovirus	Adenovirus
Influenza A H1	Parainfluenza virus 1	Coronavirus HKU1
Influenza A H3	Parainfluenza virus 2	Coronavirus NL63
Influenza B	Parainfluenza virus 3	Coronavirus 229E
Respiratory Syncytial Virus A	Parainfluenza virus 4	Coronavirus OC43
Respiratory Syncytial Virus B	Human Metapneumovirus	Human Bocavirus
Bacterial Targets		
<i>Chlamydia pneumoniae</i>	<i>Mycoplasma pneumoniae</i>	

RESULTS

Table 1. Demographics	Positive Target	Negative Target	P-Value
Number of Patients	1547	3954	-
Number of Patients Receiving ICU Care	340	1289	-
Age (years)	67.51 (0-104)	68.01 (1-106)	0.19
Sex			0.02
Female	863 (55.8%)	2002 (50.6%)	-
Male	684 (44.2%)	1952 (49.4%)	-
Race			0.27
American Indian or Alaska Native	2 (0.1%)	3 (0.07%)	-
Asian	17 (1%)	34 (0.9%)	-
Black or African American	57 (4%)	223 (6%)	-
Multi-racial	73 (5%)	132 (3%)	-
Native Hawaiian or Other Pacific Islander	1 (0.06%)	2 (0.05%)	-
Other	53 (3%)	121 (3%)	-
Not Recorded	16 (1%)	61 (2%)	-
White or Caucasian	1328 (86%)	3378 (85%)	-
Influenza A-Matrix	359	-	-
Rhinovirus or Enterovirus	537	-	-
Other Virus	651	-	-

Figure 2. Positive Testing's Impact on Stay Length and Antibiotic Days of Therapy

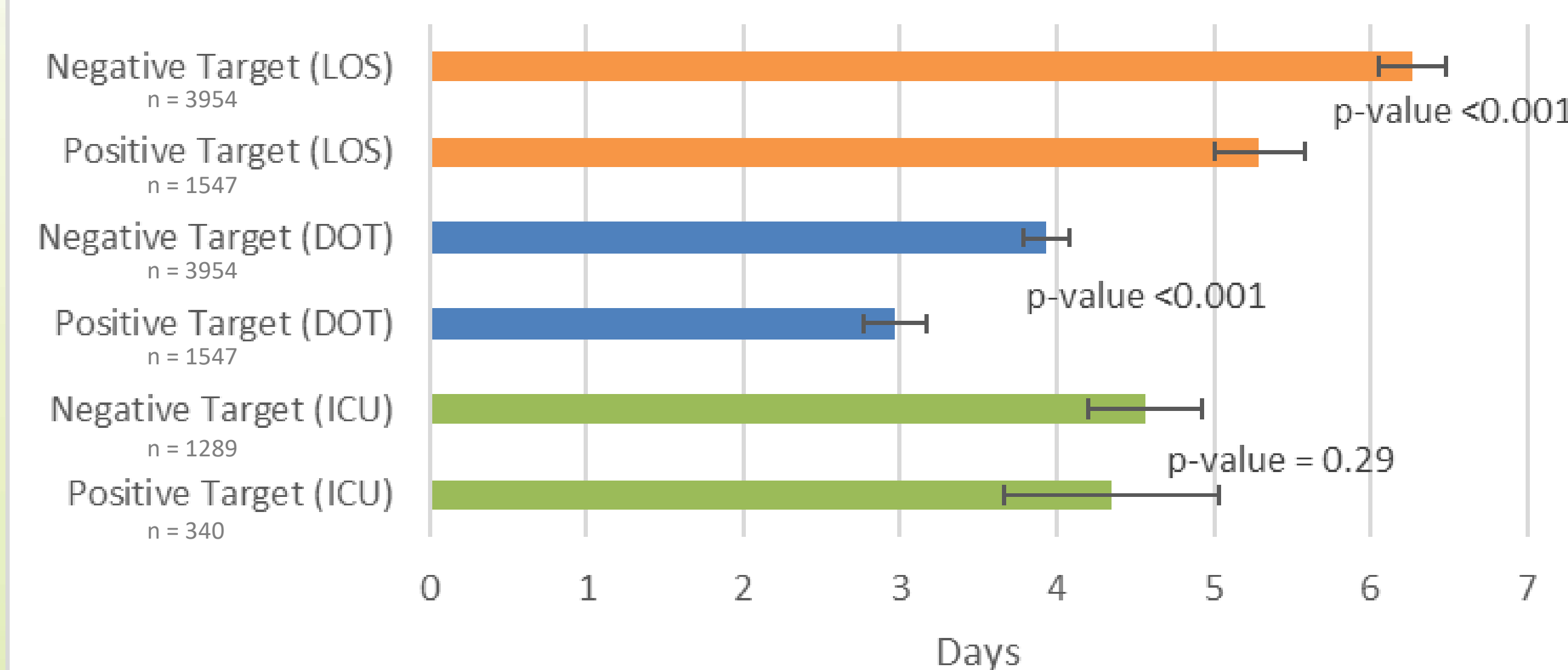
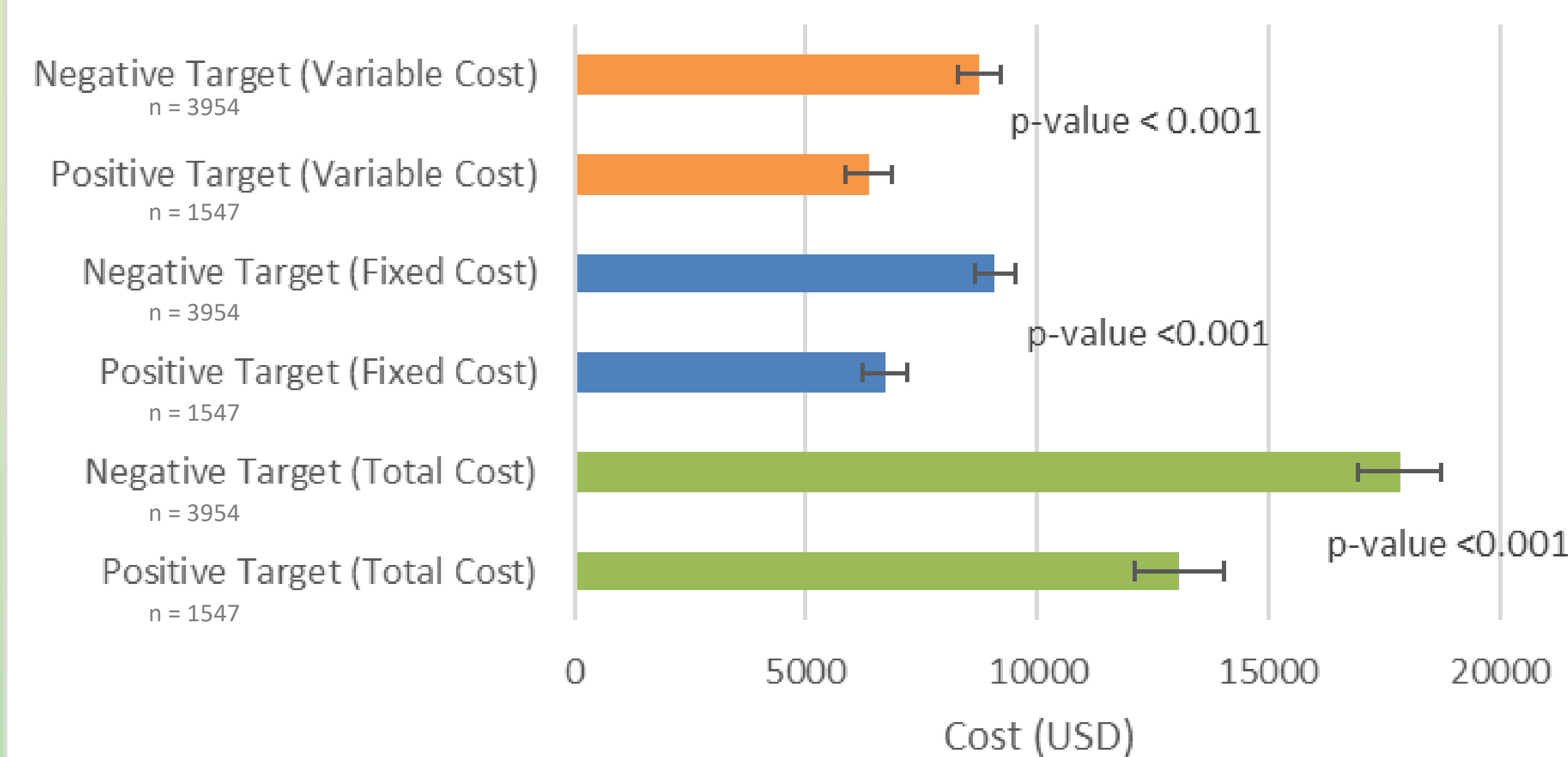


Figure 3. Positive Testing's Impact on Cost



CONCLUSIONS

- A positive PCR test for respiratory viruses resulted in lower LOS, fewer DOT, and a reduction in fixed, variable, and total costs at LVHN
- A positive PCR test does not influence time spent in ICU care
- The targets most commonly identified through the comprehensive respiratory PCR testing were influenza a-matrix and rhinovirus/enterovirus

DISCUSSION

- These findings suggest that prescribers may have reacted to the PCR test results in a way that led to the desired outcomes (shorter LOS, less antibiotic use, and decreased costs)
- An alternative explanation is that individuals with negative test results had illnesses that required more antibiotics use, longer hospitalization, and were more expensive to care for
- Limitations for this research included analyzing only a single year of data of the respiratory panel and did not evaluate which antibiotics were used
- Strengths for this research included the large sample size and the ability to obtain direct and indirect costs

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