

CROSS

JOHNS HOPKINS
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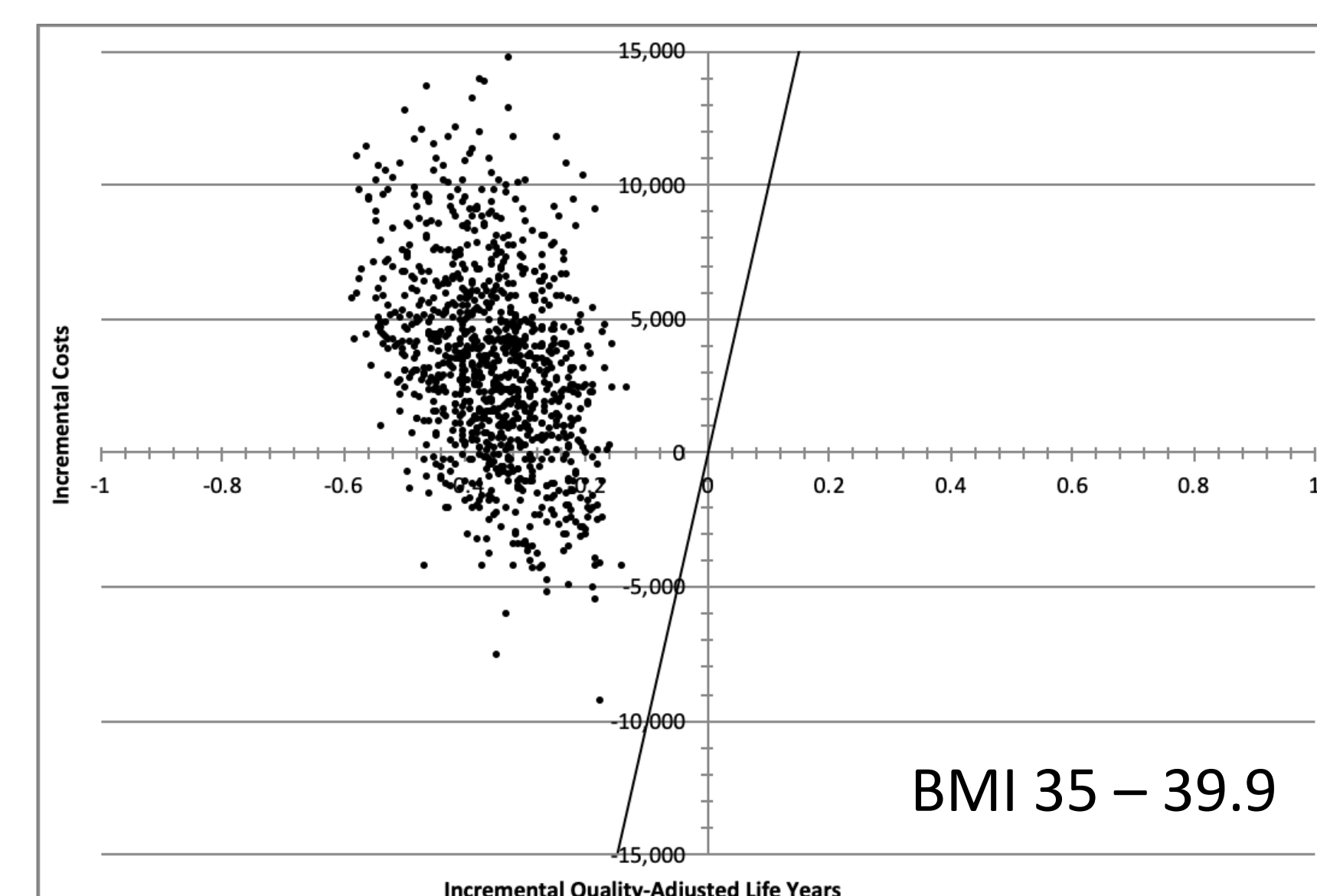
*These authors contributed equally

Medical treatment is often the frontline intervention for weight loss, with bariatric surgery considered the most effective treatment for morbid obesity.¹⁻³ Endoscopic sleeve gastroplasty (ESG) is a recently developed minimally invasive weight loss procedure whereby sutures are placed endoscopically to reduce stomach volume. The objective of this study is to assess the cost-effectiveness of ESG, compared to traditional surgical alternative of laparoscopic sleeve gastroplasty (LSG).⁴

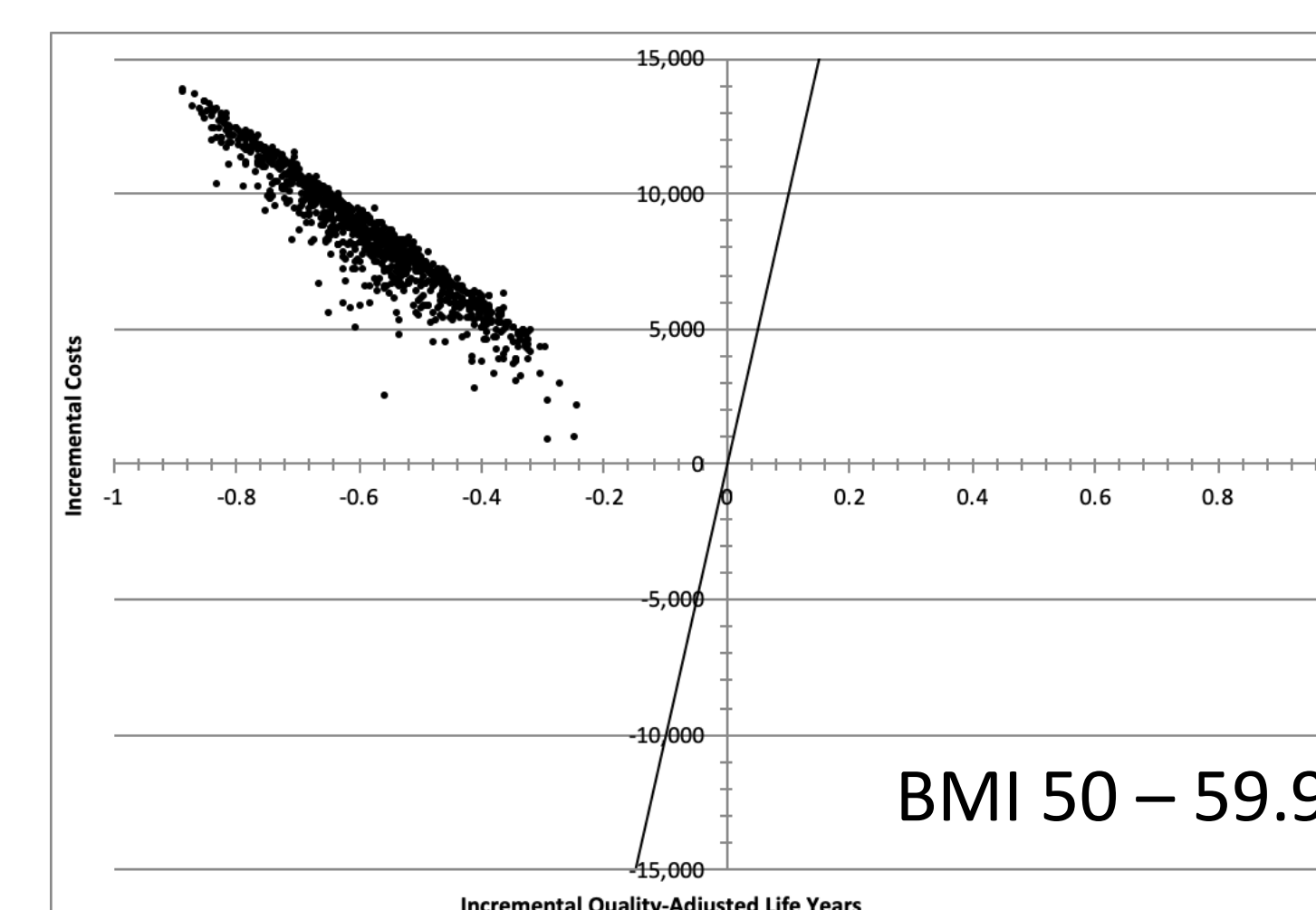
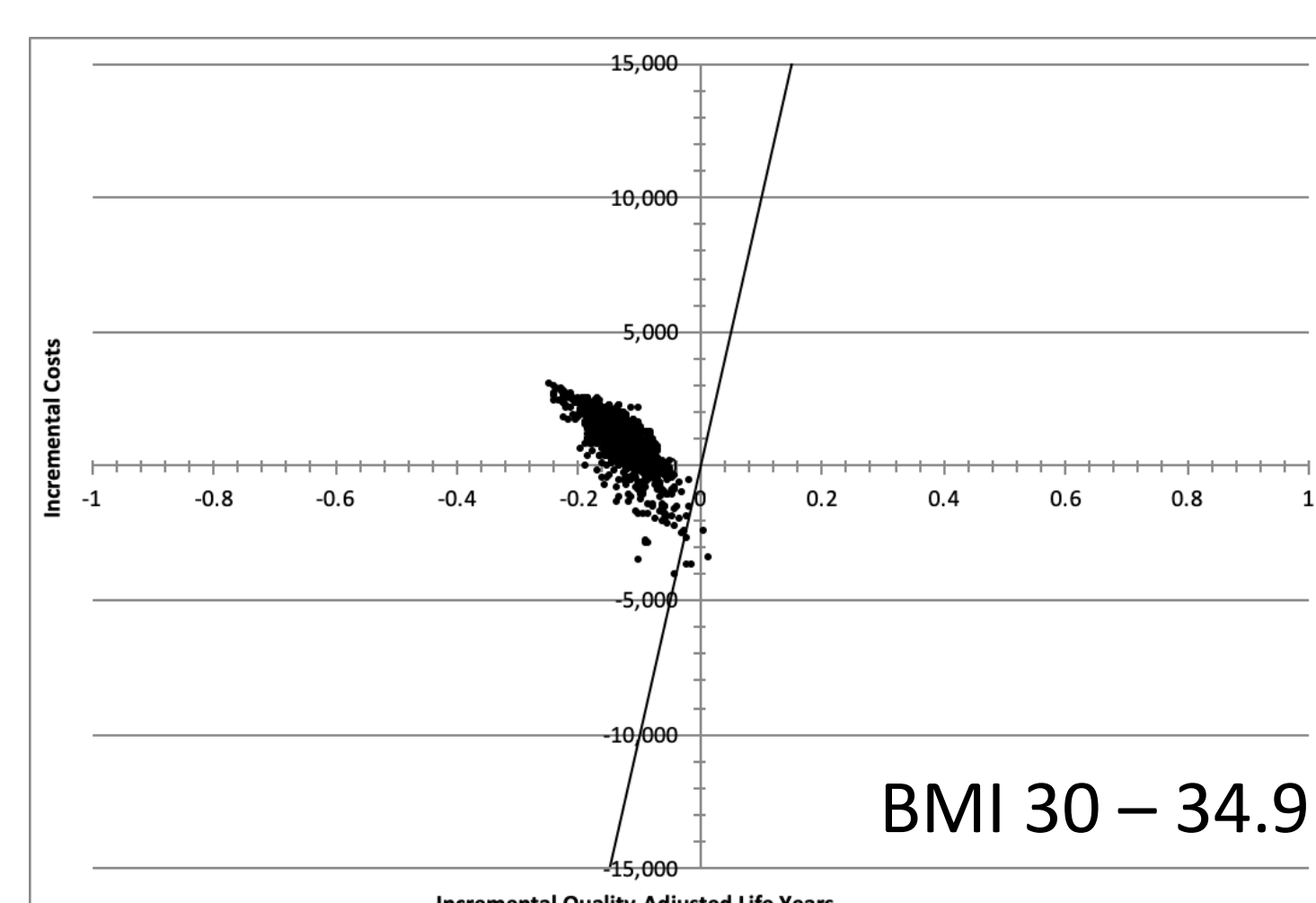
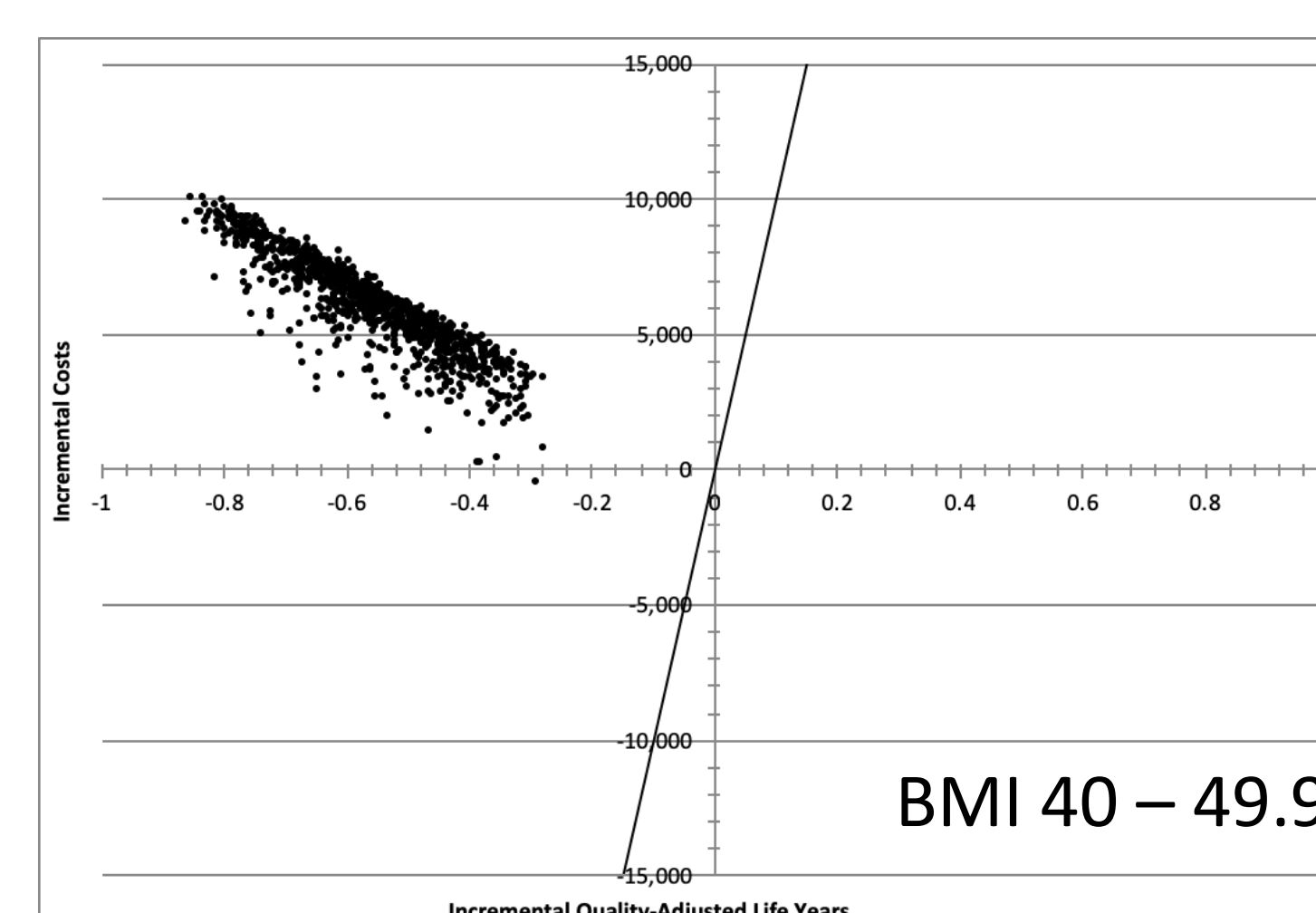
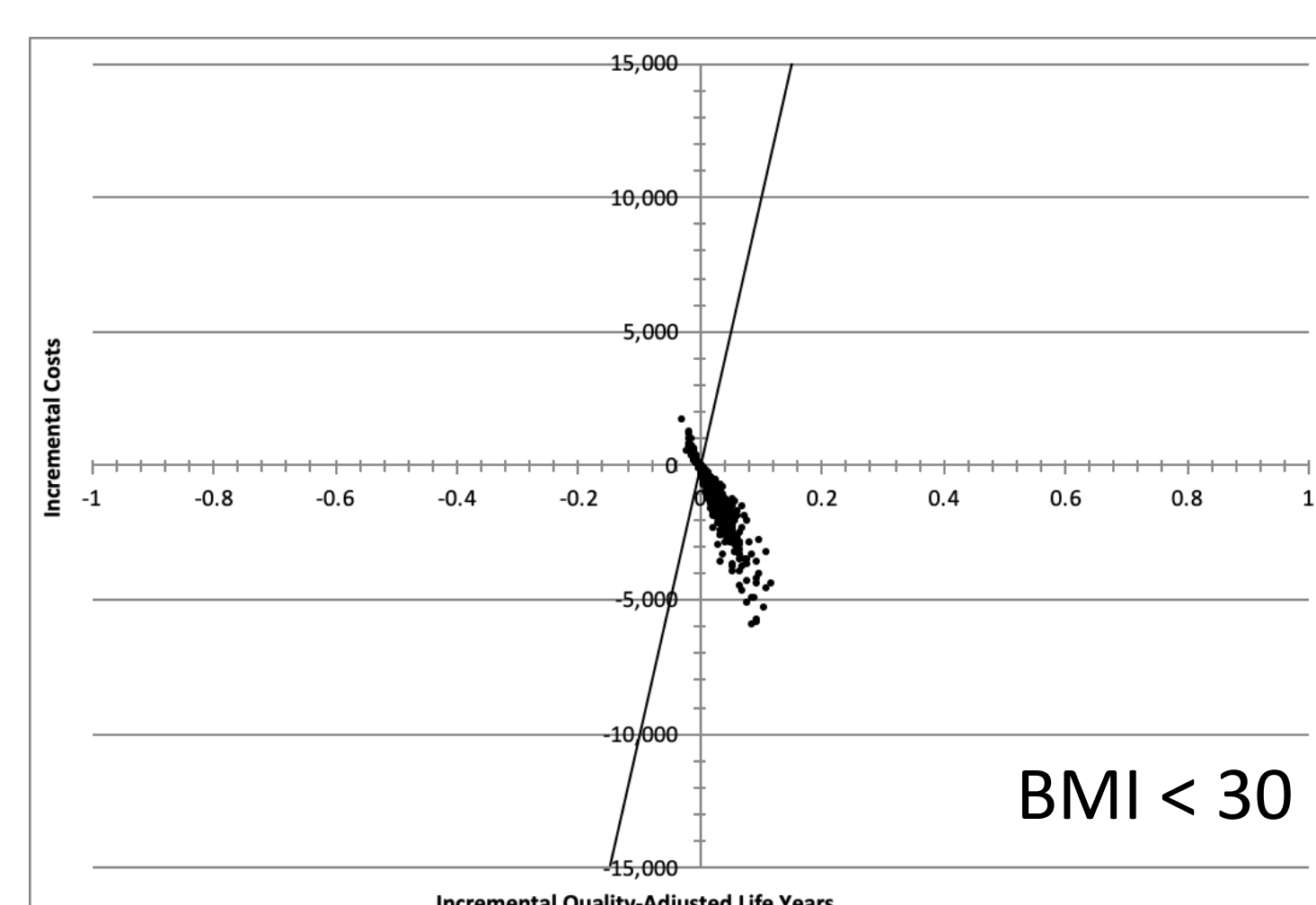
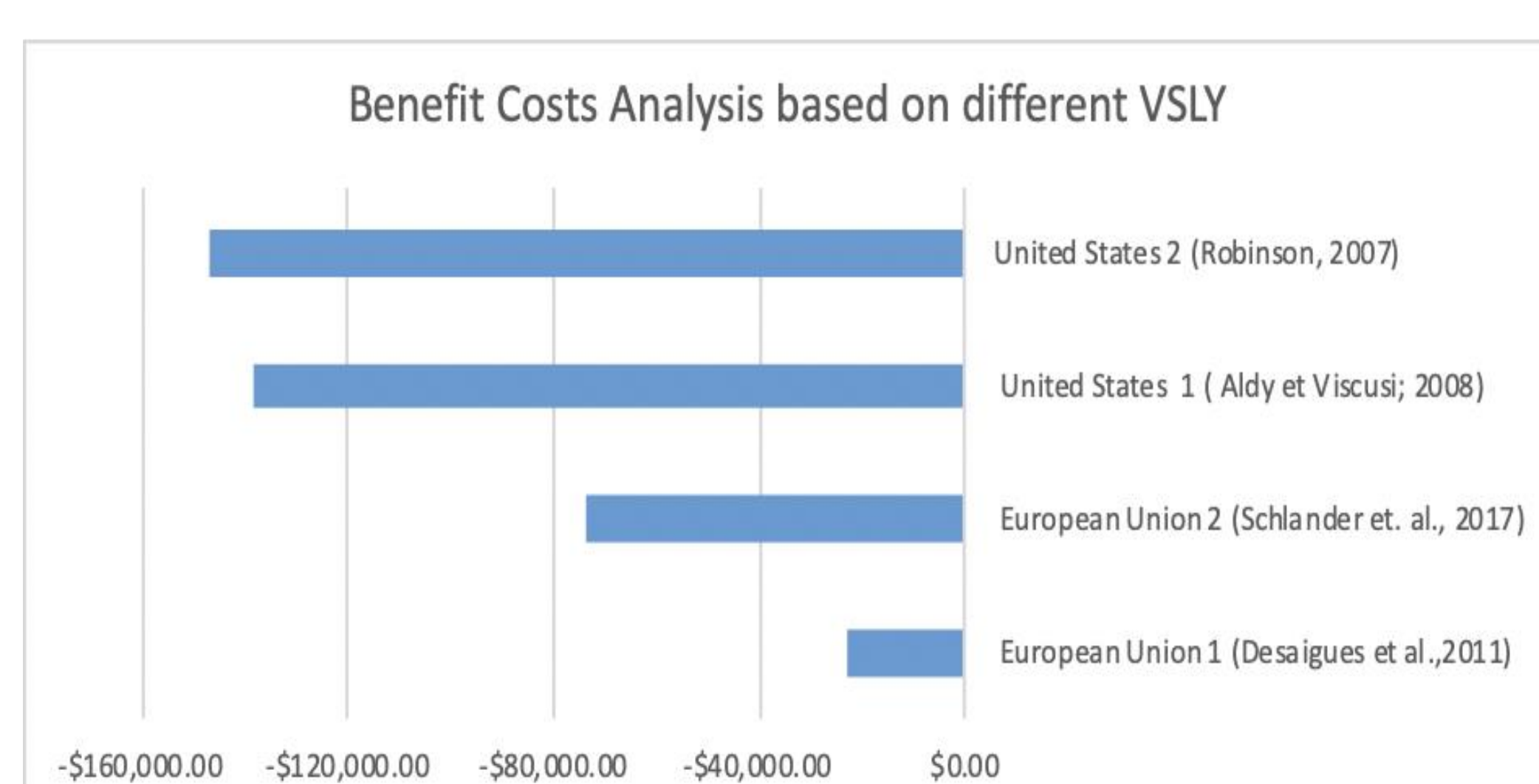
We developed a Markov model with seven states, including five BMI categories (<30; 30-34; 35-39; 40-49; 50-59 kg/m²), one surgical adverse event state, and a death state, to estimate the incremental cost-effectiveness ratio (ICER), and net monetary benefit (NMB) of ESG relative to LSG, using a U.S. healthcare perspective, with a lifetime horizon and one-month cycle length. Transition probabilities, costs and utility-weight estimates were derived from the scientific literature and the Health Care Utilization Project (HCUP) database.⁴⁻⁶ The model was populated with a cohort of 1,000 individuals (BMI 35-39). Probabilistic sensitivity analyses (PSAs) were conducted with different starting BMI categories to account for parameter uncertainty.

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graph TD; BMI30["BMI: 30-34.9"] --> BMI35["BMI: 35-39.9"]; BMI35 --> BMI40["BMI: 40-49.9"]; BMI40 --> BMI50["BMI: 50-59.9"]; BMI50 --> BMIlt30["BMI: < 30"]; BMIlt30 --> BMI30; BMI30 --> Death((Death)); BMI35 --> Death; BMI40 --> Death; BMI50 --> Death; BMIlt30 --> Death; AE((Adverse Event  
(1 cycle only))) --> BMI35; AE --> BMI40; AE --> Death; BMI30 --> BMI30; BMI35 --> BMI35; BMI40 --> BMI40; BMIlt30 --> BMIlt30; BMI50 --> BMI50; Death --> Death;
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In the base case analysis and at the average willingness to pay (WTP) threshold of \$100,000/QALY gained, LSG strongly dominated ESG (ICER of -\$11,816/QALY gained) due to the higher cost and lower effectiveness of ESG in reducing weight, compared to LSG. This translated into a NMB of -\$38,410. In PSAs, the base case ICER remained robust to parameter uncertainties, with 81.5% of the 1,000 simulated values remaining strongly dominated. The cost-effectiveness profile of ESG relative to LSG did not vary with changes in starting BMI category.



	Cost	QALY	LY
ESG	\$106,594.06	17.96759	38.16246
Comparator	\$102,535.05	18.3111	38.42983
Incremental	\$4,059.01	-0.34351	-0.26736
ICER	-\$11,816.34		
WTP	\$100,000		
NMB	-\$38,409.81		
Results of base case 40 year old female with BMI 35 – 39.9. Dollars are 2018 USD discounted at 3% annually.			



References:

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