How Do Legislators Value Constituent's (Statistical) Lives?
COVID-19, Partisanship, and Value of a Statistical Life Analysis

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Draft. Comments welcome (mland014@ucr.edu).

Introduction

Life is sacred and most would be willing to pay a fortune to save their own lives and the lives of loved ones. Resources are however finite and there exists a tradeoff between a life saved and the resources exerted in doing so. Value of a statistical life (VSL) analysis is a technique where policy makers attempt to place a quantifiable value to life, or as close as possible, in order to find the optimal trade off between resources and statistical lives (Schelling 1968). This is done by observing how much agents are willing to pay to lower the risk of death or must be compensated for an increased risk of death. If a state legislator is willing to spend \$100 million in opening temporary hospitals that are expected to reduce COVID-19 fatalities by 20 it can be said that, as a lower bound, the state legislator values a statistical life at least $(100/20=)$ \$5 million.¹ This type of analysis may appear vulgar, but highlights that, given finite resources, there is a resource tradeoff for every life saved. As an important tool for policy makers, especially as they respond to COVID-19 (Harford 2020; Cornwall 2020; The Economist 2020), it is important to understand how VSL analysis is used by policy makers.

VSL analysis is no stranger to criticism. Indeed, VSL analysis originated because the United States Air Force complained that analysts implicitly placed no value on soldier's lives when analyzing the merits of various defense policies (Banzhaf 2014). VSL analysis by

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¹ While estimates vary, the Environmental Protection Agency (EPA) recommends a VSL valuation of approximately 9.5 million in 2020 dollars (Viscusi 2000).

government agencies has received criticism that it fails to account for differences in the statistical value of life across an individual's life cycle – the EPA values the life of a 30 year old and a 80 year old equally (Broughel 2020). In addition, there are concerns about the measurement of VSL (Ashenfelter 2006). For example, do subjects fully understand the risks involved with a given set of actions? If not, then is it appropriate to calculate VSL based on said behavior? See Ashenfelter (2006) and Viscusi (2012) for recent reviews of the VSL literature, including criticisms.

In this manuscript I show two additional limitations of VSL analysis and their implications for understanding policy maker's responses to the COVID-19 pandemic. Firstly, I find that state legislators' policy preferences are inelastic regarding the value of statistical life. That is to say that whether a statistical life is valued (at minimum) at \$100 thousand, \$1 million, or \$10 million dollars does not alter their COVID-19 policy preferences. It is possible that valuations greater than \$10 million alter policy preferences, but statistical lives are rarely valued so highly. If politicians' policy evaluations are for practical purposes inelastic, then VSL analysis fails to emphasize the resource trade off involved in reducing fatalities.

Secondly, policy maker's use of VSL analysis is influenced by their personal characteristics, chiefly their partisanship. This raises major concerns for policy making in response to the current COVID-19 pandemic, and government policy making general. One of the goals of VSL analysis was to provide a quantifiable measure to allow policy makers to optimize societal welfare (Banzhaf 2014). As Ashenfelter (2006) notes when discussing the problem: "When public decisions are being made [based on VSL analysis] we normally would like to base decisions on the preferences of the central agent, that is neither the agent who loves risk the most nor the agent who hates risk most, but someone in the centre [sic] of the distribution...". If policy maker's partisanship influences VSL analysis however, then public decisions are not

being made by a central agent but by a biased one who is either too risk averse or too risk taking. While VSL analysis may be useful in framing the tradeoffs involved in policy making, with this limitation it cannot be used to find an objectively optimal set of policies to deal with the COVID-19 pandemic. Depending on the nature of bias, VSL analysis will either recommend a set of policies that are too risk averse or too risk taking to combat the COVID-19 pandemic. If policies are too risk averse, more resources will be spent than needed. These are resources which could be used elsewhere – every dollar spent on COVID-19 is one less dollar for higher education or infrastructure improvements. Policies that are too risk taking could lead to unnecessarily high death counts.

I show these limitations of VSL analysis by using a survey experiment designed to elicit state legislator's value of statistical lives. I survey state legislators because COVID-19 policy responses in the United States has been decided primarily at the state and local level.² The relevant agents are therefore state and local government policy makers.

Partisanship in COVID-19 Policy Responses

As late as March, President Trump and other prominent Republican figures downplayed the seriousness of the COVID-19 pandemic. In the President's words, "...it's something that we have tremendous control over" (Brady 2020). Texan Lieutenant Governor Patrick went further by suggesting that senior citizens would be willing to take the risk of COVID-19 to avoid harming the United States economy (Sonmez 2020).

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² The preeminence of state and local governments in COVID-19 policymaking is because many of the relevant policies rely on policing powers which are, due to the United States' federal structure, reserved primarily to subnational governments.

Although it is still unclear why partisans have reacted to COVID-19 differently, emerging research finds that among the general public, Democrats and Republicans differ in their responses to the pandemic. In a survey of the general public, Gadarian, Goodman, and Pepinsky (2020) find that Democrats and Republican differ in attitudes towards the COVID-19 pandemic. Furthermore, using location data from smartphones, Allcott et al. (2020) find that Republicans are less likely to practice social distancing. Among the general public both attitudes and behavior are polarized.

My main contribution to the COVID-19 polarization literature is to show that partisan differences exists among subnational policy makers. Polarization has driven policy makers at the national level to support increasingly divergent policies (F. E. Lee 2009; Sinclair 2014). It is only relatively recently however that the literature has begun to show that subnational policy makers are also polarized in everything from immigration to gun control policy (Gerber and Hopkins 2011; Einstein and Glick 2018; Farris and Holman 2017; N. Lee, Landgrave, and Bansak 2020). Previously subnational politics was believed to be less polarized because of the United States' federal structure and sorting effects (Tiebout 1956; Peterson 1981).

Research Methods and Results

During April 2020, I fielded a short confidential survey with state legislators. In addition to COVID-19 preferences, state legislators were asked to self-report basic demographic characteristics (party ID, gender and race/ethnicity). The sample is primarily white (90.12 percent). Republican (vs Democrats) and Females (vs Males) both make up about 40 percent of the sample respectively. Recruitment was conducted online and incentivized by offering a charitable donation in exchange for participation (Butler and Pereira 2018). A total of 81

respondents participated in the survey experiment reported herein and 78 of those self-reported their party ID.³

Figure 1 – Survey Experiment Wording

Would you support policies that cost \$[150,000 / 1,500,000 / 15,000,000] million dollars to avoid 1.5 million covid-19 related deaths in the United States? [Yes/No]

Among the questions asked was a survey experiment intended to elicit state legislators' valuation of a statistical life, see **Figure 1**. The survey experiment randomly asked what cost state legislators would find acceptable to avoid COVID-19 related deaths; the three conditions respectively set the value of statistical life at $(150,000/1.5=)$ \$100 thousand, $(1,500,000/1.5=)$ \$1 million and $(15,000,000/1.5=)$ \$10 million. As the value of statistical life increases, price theory dictates that I should expect to find less state legislators willing to support policies intended to mitigate COVID-19 related deaths.

I test this by estimating a linear probability model (LPM) where the outcome is support (=1) for COVID-19 mitigation policies. The reference category is a valuation of 100 thousand dollars per statistical life. I do not find evidence that support for COVID-19 mitigation policies decreases as the valuation of a statistical life increases. State legislators' policy preferences are, at least within the observed range of valuations, inelastic to the value of statistical life.

Table 1 – Support for COVID-19 Mitigation Policies by Different VSL Valuations, LPM

VARIABLES	(1) Support
VSL - 1 Million	0.0495

³ While the sample size is small compared to studies with the general public, it is comparable to other studies using elites. See Holm, Nee, and Oppen (2019).

	(0.0941)
VSL - 10 Million	0.118
	(0.0950)
Constant	0.808***
	(0.0678)
Observations	81
R-squared	0.020
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

I next test if COVID-19 policy preferences differ across political party by conducting two-sided t-tests. I find that Democrats almost unanimously support (95.75 percent) policies intended to mitigate COVID-19 related deaths. While a large portion of Republicans (70.97 percent) of Republicans also support such policies, a significant differential exists across parties (24.78 percent, p-value= 0.002). For transparency purposes I report the party differential across the three different VSL experimental conditions in **Table 2**, but I discourage any attempt to draw inference about interactions given the small sample sizes.

Table 2 – Support for COVID-19 Mitigation Policies by Respondents Party ID, T-Test

	Value of Statistical Life Condition			
	All	100k	1 Million	10 Million
Democrat	95.745%	93.750%	94.118%	100.000%
<i>n</i> =	47	16	17	14
Republican	70.968%	60.000%	70.000%	81.818%
<i>n</i> =	31	10	10	11
Party Differential	24.777%	33.750%	24.118%	18.182%
<i>p-value</i> =	0.002	0.034	0.095	0.104

Note: Reported values from two-sided t-tests.

While the VSL valuations were experimentally manipulated, respondents' partisanship is not. I re-estimate the party differential as an LPM with the inclusion of gender (=1 if Female, =0 if Male) and race (=1 if white, =0 if non-white) as covariates in **Table 3**. Republican respondents

remain less likely to support COVID-19 mitigation policies by a significant margin (16.13 percent, p -value= 0.063).

Table 3 – Support for COVID-19 Mitigation Policies by Respondents Party ID, LPM

VARIABLES	(1) Support
Republican Respondent	-0.161* (0.0855)
Female Respondent	0.167* (0.0846)
White Respondent	-0.137 (0.122)
Constant	0.978*** (0.124)
Observations	78
R-squared	0.175

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Policy Implications and Conclusion

Government policy makers have an impossible task when they are asked to optimize between life and resources. This task is particularly important during health crisis such as the COVID-19 pandemic. Policy makers have attempted to solve the problem by using value of statistical life analysis to produce a seemingly objective valuation. As I have shown in this manuscript using a survey experiment with state legislators, VSL analysis has two significant limitations. Firstly, policy preferences are inelastic to VSL valuations. Whether a statistical life is valued at \$100 thousand or \$10 million does little to alter state legislators' policy preferences. This means that VSL does not even serve to emphasize resource trade off. Secondly, it either recommends a set of policies that are too risk averse or too risk taking. I find that compared to their Democratic counterparts, Republican state legislators are less willing to support costly

policies to combat the COVID-19 pandemic. As the COVID-19 pandemic continues, policy makers will have to find a new solution to the problem of valuing their constituents' lives.

For brevity the present manuscript has focused on highlighting partisan differences among policy makers in VSL analysis, but future research should seek to go beyond. As Allcott et al. (2020), Gadian, Goodman, and Pepinsky (2020), and other studies show, partisan differences in responses to COVID-19 also exist among the general public. Are policy maker's polarized policy preferences therefore due to pressure from their constituents? Or is it that the general public's polarized responses are due to cues from local elites? Future research is needed to answer these and related questions.

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