

## Extended Abstract

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<b>Paper/Poster Title</b>	<b>Ostrom Meets the Pandemic: Lessons from Asian Rice Farming Traditions</b>
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<b>Abstract</b>	<b>200 words max</b>
<p>A robust public health system during a pandemic is a common good. We argue that the ongoing coronavirus pandemic is a tragedy of the commons. During the early phases of the pandemic, Asia outperformed the US and Europe in managing it. The traditions and practices of rice farming in Asian countries are key to understanding the regional differences. Farming rice, unlike wheat, requires finding cooperative solutions to common goods problems such as irrigation. The history of rice cultivation in Asia implies that those societies have long had institutions that deal well with the commons through credible commitment, mutual monitoring, and sanctions. The descendants of Asian rice farmers commit themselves to a set of rules and are vigilant in monitoring their neighbors in common goods situations because they fear social rejection if they do not. Exploiting Asian immigration history in the US and the pandemic as a natural experiment, and using a patient-level CDC dataset, we show that Asian rice farming descendants are less likely to contract and/or die from the coronavirus even in the US. Then, using a Facebook survey, Google mobility data, and the US Census household pulse survey, we find that they were better able to resolve commons problems associated with the pandemic by getting vaccinated, wearing masks, and practicing social distancing.</p>	
<b>Keywords</b>	Asian Immigration, CDC, Common Goods, Culture, Elinor Ostrom, Institutions, Mask Wearing, Pandemic, Rice Farming, Social Distancing, Social Rejection
<b>JEL Code</b>	D70, N32, Q10, Z13 see: <a href="http://www.aeaweb.org/jel/guide/jel.php?class=Q">www.aeaweb.org/jel/guide/jel.php?class=Q</a> )
<b>Introduction</b>	<b>100 – 250 words</b>
<p>In this paper, from an economist's standpoint, we investigate the fundamental determinants of differences in human behavior between the East and the West. To do so, we go back in history to Neolithic revolution approximately 10,000 years ago. Because the agricultural sector had dominated economic production prior to the industrial revolution, this historical approach might provide us with some clues to the origin of differences in human behavior between the East and the West (Harari, 2014). Agro-ecological constraints have shaped the geographical distribution of staple crops between the two regions such that rice has been a staple crop in Asia, whereas wheat has been a staple crop in Europe. To be specific, while Asian countries are in general ideal environments for rice cultivation, European countries are neither very warm nor humid climates for rice farming. We argue that institutions developed in Asian rice farming areas are key to understanding differences in human behavior between the East and the West. Fundamentally, farming rice necessarily requires solutions to <i>common</i></p>	

*goods problems*.<sup>1</sup> Talhelm et al. (2014) pointed out that irrigation and massive labor requirements are two unique features in Asian rice farming, which distinguishes itself from rainfed wheat farming in Europe. We thus hypothesize that present-day Asian rice farming descendants are more likely to be committed to government mandates and more likely to be vigilant toward their neighbors' behaviors in commons situations because they are afraid of being rejected socially. A natural question arises at this point: how do we test our hypothesis empirically? The ongoing coronavirus pandemic provides us with a natural experiment. We first argue that public health in normal times is a public good; *public health in pandemics*, however, is a common good.

### Methodology

100 – 250 words

Here, we overcome these issues by focusing on the Asian immigration history in the US over the past six decades as a natural experiment. Unlike the US immigration history of Europeans and African Americans, which started from at least the 16th centuries, mass immigration from Asia started less than 60 years after the Immigration and Nationality Act of 1965 that eliminated the national origins quota system. Hence, Asian immigrants are more likely to possess cultural traits that are similar to those in rice farming Asian countries. We first test whether Asian rice farming descendants outperformed in managing public health amid the pandemic to avoid a tragedy of the commons. To be specific, using the patient-level CDC data, we test whether Asians in the US are less likely to be infected by and to die from the Covid viruses.

Then, we test whether Asian rice farming legacies are attributable to resolving the commons problems in the pandemic. That is, we test whether provision (e.g., free-riding in vaccinations) and appropriation (e.g., individual freedom in social distancing and in mask wearing) problems were better managed among Asian rice farming descendants in the pandemic. To do so, we use three high-quality datasets, (i) Delphi's COVID-19 Trends and Impact Survey (CTIS) data from *Facebook*, (ii) US Census Household Pulse Survey (HPS) data, and (iii) COVID-19 Community Mobility Reports database from *Google*, to measure behavioral responses, as well as beliefs and norms on them, across Asian rice farming descendants and others, which capture credible commitment and mutual monitoring regarding appropriation and provision problems in the commons situations (e.g., vaccination, mask wearing, and social distancing) in the US.

### Results

100 – 250 words

Equipped with the high-quality datasets, we find that Asian farming descendants are more likely to commit themselves to a set of government mandates and vigilant toward their neighbors' behaviors in commons situations because they fear from social rejection. To be specific, first, we find that Asian rice farming descendants are more likely to commit providing their own resources in the form of vaccination to achieve herd immunity in the common goods situation, thereby better resolving the *provision* problem. Second, we find that rice farming descendants are more likely to wear masks and implement social distancing, which curbed the spread of Covid, thereby better resolving the *appropriation* problem. Take together, Asian rice farming legacies, not collectivism, have operated as a strong social control mechanism in Asian rice farming areas, which persist today and play major roles in managing commons. We found that Asians are 29 percent less likely to die of Covid and 45 percent less likely to have Covid, confirming that Asian rice farming descendants better managed public health amid the pandemic, i.e., the commons. If the US had operated under the institutional mechanism that

resolve the commons, 183,013 American lives would have been saved and that 17,154,891 American people would not have been caught Covid as of Aug 30, 2021.

## Discussion and Conclusion

100 – 250 words

Our work is most closely related to the analysis of economic governance, especially the commons. Unlike the previous studies in economics literature on this topic, we focus on public health in pandemics and define it as a common good. Notwithstanding that there have been some earlier studies in the public health literature that attempts to link public health and commons (Siegall et al., 2009; Cully, 2014; Ram-Tiktin, 2018), to our best knowledge, no studies have yet delineated the fundamental economic characteristics of public health in pandemic. Adopting the concept of a rival good in economics, we contribute to the literature by clearly differentiating public health in pandemic (i.e., a common good) from public health in normal times (i.e., a public good). Furthermore, applying the common goods framework to the current COVID-19 situation, combined with the multiple microdatasets, we show that Asian rice farming legacies are attributable to better resolving the commons issues in the pandemic. Thus, our empirical findings contribute one additional piece of evidence to the empirical literature on common goods problems.<sup>9</sup>

Second, we complement a literature on investigating agrarian origins of individualism and collectivism.<sup>10</sup> Olsson and Paik (2016) find that regions which adopted agriculture early are characterized by collectivist values. Ang (2019) find that agricultural legacies of a more labor intensive environment is associated with modern-day collectivistic traits. Buggle (2020) and Buggle and Durante (2021) suggest that the coordination of labor required by irrigation systems is associated with collectivist cultures. Fiszbein et al. (2022) find that agricultural labor intensity is positively associated with collectivism. Talhelm et al. (2014) argue that a history of farming rice makes cultures more interdependent. While the previous studies advanced our understanding of origins of individualism and collectivism, it is still unclear through what mechanisms rational agents that solve an optimization problem behave differently. In this paper, building on the rice theory of Talhelm et al. (2014), we interpret the issues arising from farming rice as common goods problems. Then, looking through a economist's eyes on the rice farming since the Neolithic Revolution, one can still regard people as self-interested individuals, not collectivistic individuals, but at the same time, one may explain why people behave differently between the East and the West. To be specific, relying on Ostrom (1990), we provide a novel mechanism such that: (i) institutions have existed to deal with commons problems in rice farming via credit commitment, mutual monitoring, and sanctions; and (ii) those institutions have shaped economic agents' behaviors over time.