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A prosocial legacy of COVID-19 among healthcare professionals?*

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Abstract

We study the extent to which exposure to COVID-19 has affected the prosociality of healthcare professionals. Drawing on evidence from an incentivized experiment and a companion survey of healthcare professionals ($N = 194$) at a large Italian hospital, we find that exposure to COVID-19 predicts their altruistic motivation. Healthcare professionals who either worked in COVID-19 wards or had a close relative or friend severely affected by the virus exhibited a higher propensity to prioritize patient welfare over personal gain. Controlling for demographic characteristics and personality traits, our estimates indicate a 5 percentage point increase in prosociality among exposed individuals. Conversely, personally contracting COVID-19 is related to a 6 percentage point decline in prosociality. Our results highlight that experiences of need shape prosocial preferences in hospital settings.

Keywords: COVID-19, provider altruism, healthcare professionals, medical decision-making, prosocial behavior, experiment

JEL codes: C91, D64, D81, I12

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1 Introduction

The COVID-19 pandemic has had profound economic, social, and political consequences, fundamentally transforming how societies prepare for and respond to public health emergencies. Beyond institutional and policy-level changes, the COVID-19 pandemic has reshaped individual behaviors, influencing both patients' attitudes toward healthcare and the decision-making and moral engagement of healthcare providers. Healthcare professionals (HCPs), in particular, confronted an unprecedented public health emergency that imposed extraordinary physical, emotional, and psychological demands on them.[1] At the same time, starting with Arrow (1963), the healthcare profession is thought to be characterized by prosocial and altruistic motivations, driving individuals to act in the interest of the well-being of others, even under extreme conditions.

Understanding if and how such altruistic behavior evolved under the strain of the COVID-19 emergency is essential for designing effective health policies and maintaining a resilient and ethically grounded healthcare workforce. A natural setting in which one may examine this question is Northern Italy. In particular, Northern Italy was one of the first European areas severely affected by COVID-19; the healthcare system was under extreme pressure, and Italian HCPs were exposed to high mortality rates and prolonged ethical strain. Studies conducted in Italian hospitals revealed elevated levels of anxiety, compassion fatigue, and moral distress among healthcare personnel (Barello et al., 2020). However, to date, there has been limited research on how exposure to the COVID-19 pandemic has affected HCPs' prosociality.

This paper studies how different forms of exposure to COVID-19 predict the prosocial behaviors of medical doctors and nurses with respect to their patients in Italy three years after the outbreak of the pandemic. In an experimental framework, we test how different forms of exposure—namely, having worked in a COVID-19 ward, having had a friend or close relative who experienced severe symptoms, or having personally contracted the disease during the first wave of the pandemic in spring 2020—exert lasting effects on HCPs' choices between therapies that lead to different payoffs for patients and physicians. Using rich data from a sample of 194 doctors and nurses employed at a large Italian hospital in Turin, we study whether these shocks are associated with any differences in the propensity to choose therapies that maximize patients' well-being rather than physicians' monetary benefits.

Our results provide evidence of a long-lasting effect of COVID-19 exposure on the behaviors of healthcare providers. First, we show that doctors and nurses who worked in COVID-19 wards exhibit a higher propensity to prioritize patients' benefits over their own gains. Our estimates suggest a sizable effect of roughly 5 percentage points. This estimate remains robust after controlling for demographic characteristics and several personality traits (e.g., patience, risk aversion, and inequality aversion) including overall prosociality, proxied by regular blood donation and charitable giving. This positive impact is more pronounced among HCPs more likely to have volunteered in COVID-19 wards, suggesting that prosocial attitudes were particularly strengthened among those who were already more inclined toward altruism. Consistent with these results, we find an even larger increase in altruism among doctors and nurses who were exposed to COVID-19 through a close friend or relative with a severe infection, rather than through

[1] The intense workload, high infection risk, and moral dilemmas associated with triage and patient care during the pandemic exacerbated stress and burnout among HCPs (Shanafelt et al., 2020; Greenberg et al., 2020).

professional contact with patients. On the other hand, being personally infected with COVID-19 is associated with a large reduction in physicians' altruistic behavior, especially in case of a serious contagion requiring hospitalization.

Our empirical evidence is consistent with *identity theory*, which posits that social and professional identities may shape preferences and behaviors beyond individual traits, fostering effort and cooperation (e.g., Akerlof and Kranton, 2000, 2005; Chen and Li, 2009; Charness and Chen, 2020). The outbreak of the COVID-19 crisis reinforced the salience of physicians' professional mission (i.e., identity), thereby heightening the symbolic value and purpose of their work. During the COVID-19 pandemic, the medical profession was widely recognized as embodying collective resilience and civic duty, which in turn might have strengthened HCPs' professional identity as a key source of intrinsic motivation and moral satisfaction (Pellegrini et al., 2022). We document that the enhanced sense of purpose was not merely transient: the positive effect of having worked in a COVID-19 ward persists well beyond the initial phase of public celebration, when HCPs were portrayed as "heroes". That is, HCPs' direct involvement in high-intensity care environments may reinforce patient-oriented altruistic motivations through mechanisms of professional identification and internalized social value (e.g., Oswald and Powdthavee, 2008; Deaton, 2012).

In contrast, the negative association between personal COVID-19 infection and altruistic behavior among HCPs may be interpreted within the framework of behavioral and psychological theories that link adverse shocks to self-protective behavioral shifts. Experiencing illness firsthand often redirects cognitive and emotional resources toward personal recovery, security, and self-preservation, thereby temporarily diminishing other-regarding preferences (Loewenstein, 2000; Fiske and Taylor, 2007). That is, the personal burden of disease may crowd out prosocial tendencies by prioritizing self-care over altruistic engagement, particularly when individuals face lasting psychological or physiological consequences of infection. This is consistent with existing work on inequality preferences (e.g., Asaria et al., 2023) and, more generally, suggests that personal health shocks depress HCPs' prosocial motivations.

Our paper provides three main contributions to the literature. First, it contributes to the literature on the stability of preferences and attitudes over time, examining whether and to what extent individual traits and behaviors are persistently affected by the occurrence of large-scale shocks. Several works have asked whether these preferences are altered by large shocks and highly disruptive events, such as the COVID-19 pandemic, which may induce long-term changes in perceptions and behaviors. In particular, our paper contributes to the smaller literature on the effects of COVID-19 on HCPs. Poole et al. (2025) show that Danish physicians' preferences and attitudes have remained relatively stable after the outbreak of COVID-19. This result is consistent with other experimental studies suggesting that this shock led at most to a transitory increase in altruism, risk aversion and interpersonal trust, especially among young individuals (Shachat et al., 2021a,b; Abel and Brown, 2022; Gambetta and Morisi, 2022).

Second, we add to the broad existing literature on HCPs' altruism toward their patients and the determinants of such attitudes (Li et al., 2017; Li, 2018; Li et al., 2022; Attema et al., 2023; for a recent survey, see Galizzi et al., 2023). Existing evidence shows that medical treatments are often induced by providers' financial incentives rather than by patients' needs (Currie et al., 2011, 2014). Furthermore, Casalino et al. (2024) document that physicians' altruism leads to better health outcomes for patients

and a more efficient allocation of resources. Conversely, profit motivation is associated with worse quality of care, higher costs, and provision of potentially harmful overtreatment (Gertler and Kwan, 2024). Less altruistic medical doctors are also more likely to respond to high payments from pharmaceutical industries, prescribing more expensive branded drugs (Huang et al., 2025).

Finally, the paper contributes to the literature on the effect of personal health shocks on HCPs' prosocial behaviors. So far, there is evidence of a negative effect of COVID-19 on the prosocial behavior of young adolescents with low socioeconomic status (Terrier et al., 2021) and who experienced a strong mental health burden (Lohmann et al., 2023), thereby widening gaps in students' attitudes. Moreover, Angrisani et al. (2024) document that personality traits were largely negatively impacted for workers in highly exposed professions (e.g., traders). More specifically, we speak to the large body of research that investigates the impact of COVID-19 on individual attitudes, which yields mixed results (see Umer, 2023 for a review). Several studies show that medical students volunteering in COVID-19 wards exhibit better communication skills, a greater propensity for teamwork, and increased altruism (Ali et al., 2021), often reinforcing traits that are intergenerationally transmitted (Guo et al., 2024). On the other hand, Cartwright et al. (2023) document that HCPs more exposed to the physical and psychological burden of the pandemic became significantly less likely to encourage relatives and friends to pursue a medical career, an effect that is primarily explained by decreased altruism and higher risk aversion. This paper shows how these different, and apparently divergent, effects on altruism arise through distinct channels of exposure to COVID-19. We differentiate between exposure through professional contact with patients in COVID-19 wards, through close friends or relatives who experienced severe illness, and through personal infection. While many studies have investigated the impact of health shocks on preferences and behaviors, little attention has been devoted so far to their effects on HCPs, despite the important implications for patient care and health system efficiency.

Taken together, our study contributes to the above literature by documenting how large unexpected shocks may persistently shape behaviors and attitudes among exposed groups, especially in terms of prosociality (e.g., Beatton and Torgler, 2018; Fumagalli et al., 2023). On the one hand, we highlight the importance of HCPs' traits in shaping patients' outcomes, suggesting that screening and hiring procedures should consider both technical competencies and prosocial attitudes. In line with *identity theory*, reinforcing HCPs' professional and social identity may enhance their altruism, thereby improving the quality of care provided. On the other hand, the negative impact of personal COVID-19 infections indicates that support mechanisms addressing the needs of HCPs (e.g., medical assistance, safety protocols, organizational measures meant to reduce stress and burnout; see Reiff et al., 2022) may help effectively sustain altruism and, in turn, improve patient outcomes.

The paper proceeds as follows. Section 2 provides background on our setting. In Section 3, we lay out our study design and describe our sample. Section 4 provides a descriptive analysis and outlines our econometric approach. Section 5 shows our estimation results and Section 6 discusses underlying mechanisms and concludes.

2 Background and Study Setting

2.1 COVID-19 and healthcare in Italy

Following the outbreak of COVID-19 in China in late 2019, Italy was among the first European countries to be severely affected by the spread of the disease, especially in its northern regions. After the first COVID-19 cases were reported in Lombardy in February 2020, Italy experienced an extremely rapid surge in the number of COVID-related hospitalizations and fatalities. This placed the Italian healthcare system under strain, with hospitals facing serious shortages of beds and equipment, particularly in intensive care units (ICUs) in northern regions (Armocida et al., 2020; Boccia et al., 2020; Angelici et al., 2023).

When the Italian government imposed a nationwide lockdown in March 2020 to limit the contagion and reduce pressure on the healthcare system, hospital facilities were already facing a shortage of available beds. Thus, the regional authorities in charge of the supply of healthcare services promoted a rapid expansion of capacity. While Italy had approximately 5,200 intensive care beds (about 8.8 beds per 100,000 inhabitants) at the beginning of 2020, this figure exceeded 8,500 within a few months, although with large regional disparities and persistent shortages in highly affected areas (Gitto et al., 2021).

Several hospitals in areas exposed to a higher incidence of COVID-19 converted existing wards into temporary intensive care units or constructed new modular wards in adjacent areas. There was also a massive reallocation of medical and protective equipment toward regions and hospitals exposed to a higher incidence of severe COVID-19 cases in Northern Italy. Several additional hospital workers were either reassigned to COVID-19 wards or newly recruited, even among medical students, retired doctors and nurses, and volunteers. To strengthen the healthcare system and support these measures aimed at expanding ICU capacity, the Italian government allocated more than 3.5 billion euros in additional emergency funds (OECD - European Observatory on Health Systems and Policies, 2021).[2]

Despite substantial efforts, the rapid spread of the virus—especially in northern Italian regions—led to the saturation of intensive care units. Due to the scarcity of beds and equipment during the first wave of the pandemic, physicians were required to make hard decisions, selecting the patients who had to be prioritized in the access to life-saving treatments. As a result of the excess demand for healthcare driven by the pandemic, HCPs faced a substantially increased workload, often working several consecutive extended shifts. Medical doctors and nurses employed in COVID-19 wards were therefore experiencing a serious physical and emotional toll, not only due to the difficult health decisions to be made, but also because of the support to be provided to patients who could not receive visits due to the severe restrictions. Moreover, the limited availability of personal protective equipment exposed HCPs to a high risk of contagion. Thus, to avoid infecting their close relatives at home, doctors and nurses often lived in isolation from their families for prolonged periods of time, with further negative effects on their levels of distress, anxiety, and burnout.

Furthermore, the outbreak of COVID-19 disrupted routine healthcare services, leading to delays and cancellations of outpatient visits, diagnostic procedures, and routine non-urgent surgeries. These

[2] Note that these additional resources, initially introduced as emergency funds during the pandemic, were subsequently incorporated on a permanent basis into the Italian *National Health Fund*.

disruptions had serious implications not only for the timely diagnosis and treatment of new conditions but also for the continuity of care for chronic illnesses. As a result, several patients experienced a deterioration in their health status, with long-term consequences on healthcare system backlogs that extended beyond the acute phase of the pandemic (Gualano et al., 2021; Franzoni et al., 2025).

2.2 Our study setting

To examine the association between exposure to COVID-19 and HCPs' attitudes, this study focuses on a major northern Italian hospital located in Turin, the regional capital of Piedmont, where several COVID-19 wards were opened during the first wave of the pandemic in spring 2020 (Bo et al., 2020). Piedmont was, in fact, one of the regions most severely affected during this first wave. For example, in April 2020, it recorded the highest incidence of confirmed cases in Italy, reaching 3.6 cases per 1,000 inhabitants (Italian Department of Civil Protection, 2025).

The hospital where we collected data is one of the largest public healthcare facilities operating within the Regional Healthcare System in Piedmont. It is equipped with specialized departments that deliver both primary care and advanced medical services. The four main departments are Surgical, Medical, Diagnostics and Services, and Emergency and Acute Care. Each department encompasses multiple units, ensuring a comprehensive and diversified range of healthcare provisions.[3]

This hospital has approximately 480 beds, 90% of which are inpatient beds, while the remaining beds are designated for outpatient day care.[4] Overall, the hospital employs approximately 1,480 staff members, encompassing a wide range of professional roles that reflected its diversified organizational structure. These employees can be classified as HCPs or support staff in social-care roles, with the former representing over 80% of the total workforce. Nurses and medical doctors account for approximately 52% and 27% of HCPs, respectively. The remaining 20% is almost evenly split between technicians (e.g., radiology and laboratory staff) and other specialized profiles (e.g., midwives, physiotherapists, and psychologists).

After the outbreak of the COVID-19 pandemic in March 2020, the hospital underwent a substantial reorganization. Starting March 1, following a specific mandate from the regional healthcare authority, the hospital temporarily suspended all scheduled elective inpatient admissions and all outpatient specialist treatments. Until the end of May, the general surgery unit remained closed, with all eight operating rooms converted into COVID-19 wards.[5] During the second quarter of 2020, the intensive care treatments provided by the hospital were almost exclusively dedicated to COVID-19 patients. Considering the full capacity of the hospital, the general directorate estimated that, during the first wave of the pan-

[3] The Surgical Department includes units such as general surgery, cardiac surgery, vascular surgery, thoracic (pulmonary) surgery, oncological surgery, anesthesiology, obstetrics and gynecology, ophthalmology, and urology. The Medical Department covers cardiology, internal medicine, oncology, neurology, nephrology, pulmonology, pediatrics, and endocrinology, among others. The Diagnostics and Services Department comprises laboratory medicine, radiology, pathology, pharmacy, and nuclear medicine. Finally, the Emergency and Acute Care Department is responsible for managing urgent admissions and providing critical interventions for acute medical conditions.

[4] Note that, since our experiment was conducted in 2023, this was the most up-to-date information available at the time, reflecting the situation as of December 31, 2022.

[5] After a gradual reopening of the surgical unit beginning in June 2020, all activities were again suspended on November 1, due to the onset of the second wave of COVID-19 infections.

demic, between 50% and 60% of all available beds (i.e., approximately 240 to 290 beds) were allocated to COVID-19 patients. Among the remaining beds, capacity was reduced by more than one-third – generally by decreasing the number of beds per room from three to two – to ensure the minimum required distancing measures aimed at preventing the spread of the virus.

To cope with the emergency and manage the increasing number of COVID-19 infections, the departments of the hospital rapidly reallocated human resources, revising at the same time their clinical protocols. Moreover, to address the limited availability of personnel, the regional health authorities of Piedmont launched a recruitment campaign that covered all its major hospitals. In March 2020, two public calls were opened to hire both fixed-term nursing staff and social healthcare workers, requiring full availability for 24-hour shifts. A further special procedure was launched to urgently recruit medical doctors, including graduates still completing their specialization. The recruitment focused on key specialties relevant to the pandemic response, such as epidemiology, respiratory diseases, anesthesiology and intensive care, virology, and microbiology. The hospital further introduced a dedicated psychological support service for its employees, aimed at addressing the heightened stress, uncertainty, and emotional strain experienced during the health emergency.

3 Study design

3.1 Ethics and recruitment

This study is based on a survey and experiment administered to the HCPs of a major public hospital. The structure of the questionnaire and the data collection process were planned with the hospital's General Management, ensuring that no patients were involved and that no clinical experimentation was conducted.[6] This experimental research project is registered at the Center for Open Science (OSF) under the title "COVID-19, prosocial preferences, and inequality aversion" (OSF Registration).

All hospital employees involved in both direct and indirect healthcare assistance were deemed eligible and thus invited to take part in our study. They were invited through an official communication sent by the hospital's General Director on December 6, 2023. The invitation explained that the survey was jointly designed by researchers affiliated with the London School of Economics, the Università Cattolica del Sacro Cuore of Rome, and the University of Cologne, explicitly mentioning that its objective was to investigate prosocial preferences and risk attitudes after the outbreak of the COVID-19 pandemic.

Participation was voluntary and respondents were assured of the anonymity and confidentiality of their answers. Participants received a link to access the survey via *Qualtrics* and, as a first task, they were prompted to create an anonymous identification code. They were also informed that the estimated completion time for the survey was approximately 10 minutes.

[6] Prior to implementation in the hospital, the study protocol received ethical approval from both the Ethics Committee of the hospital itself and the London School of Economics and Political Science Research Ethics Committee (Protocol Ref. 72257).

3.2 Survey and experimental design

Our analysis of the correlation between exposure to COVID-19 and altruism is based on an incentivized experiment and survey administered between mid-December 2023 and February 2024 to HCPs.

To measure HCPs' altruism, we use a short version of Attema et al.'s (2023) experimental paradigm. In this medically framed setup, subjects are asked to make a series of six binary choices, each involving a trade-off between own profits and patient benefits. Five decision situations involve no Pareto-dominated choice, while one does. Both physician profits and patient benefits are expressed in monetary terms. Table 1 summarizes the combinations of payoffs in each task.

Table 1: Choice scenarios in the experiment

Choice scenario	1	2	3	4	5	6
Therapy A	(3;15)	(3;15)	(9;9)	(6;12)	(3;15)	(3;3)
Therapy B	(15;3)	(9;9)	(15;3)	(15;3)	(12;6)	(15;3)

Notes. This table reports the combinations of payoffs for each choice scenario of the experiment. The order in which the scenarios appeared on subjects' screens was randomized. In each pair, the first payoff refers to the monetary profit for the physician, while the second payoff reflects the gain for the patient.

While all subjects make decisions as physicians for stylized patients, their choices have real-world consequences. They are informed that, at the end of the experiment, one of the six tasks is randomly selected to determine each individual's payoff. In particular, physicians' earnings are converted into equivalent probabilities to win an Apple iPad (10.9", 64GB).[7] Patients' benefits are instead translated into donations to *Telethon*, a well-known non-profit foundation advancing medical research in rare genetic diseases[8] Upon the conclusion of our study, the Apple iPad was effectively awarded to the participant who maximized monetary profits in the randomly selected task of the experiment, and a donation of 1,000 Euro—corresponding to the payoffs generated for patients during the experiment—was made to *Telethon*. This incentive mechanism follows the structure of previous experiments on provider behavior (e.g., Hennig-Schmidt et al., 2011; Hennig-Schmidt and Wiesen, 2014; Kesternich et al., 2015). Appendix A reports the exact experimental instructions.

To identify a HCP's exposure to COVID-19, respondents were asked to indicate (i) whether they were employed in a COVID-19 ward during the first wave of the pandemic in 2020, and, for those who did work in such wards, whether their assignment was based on specific medical expertise; (ii) whether they had a friend or close relative who experienced COVID-19 with different severity, ranging from mild symptoms to hospitalization and ICU admission; and (iii) whether they experienced a COVID-19 infection themselves, again distinguishing between different degrees of severity.

[7] For instance, based on the monetary value of the iPad (about 425 EUR), for each participant the winning probability associated with a payoff of 15 in the experiment corresponds to about 4%.

[8] For more details on Telethon foundation, see `https://www.fondazionetelethon.it`.

Our survey also measured attitudes toward inequality, following the approach proposed by Costa-Font and Cowell (2025). First, respondents had to state whether, on a scale from 1 (strongly disagree) to 10 (strongly agree), they believed that reducing income inequality should be a government priority. Second, they had to report the extent to which they agreed with the statement that the reduction of income inequality should be prioritized over the overall increase of income. This question was rated between 1 (maximum support for economic growth) and 10 (maximum support for income equality). Analogously, respondents had to state their preference for reducing health inequalities rather than improving overall life expectancy, again on a 1–10 scale, with higher values indicating stronger support for equity in health outcomes.

To further assess their prosocial attitudes, subjects were asked whether they were regular blood donors or made regular donations to non-profit organizations. Additionally, our survey investigates patience, with participants rating on a scale from 1 to 10 their willingness to sacrifice some present welfare to obtain greater benefits in the future, and risk aversion, with participants rating on a scale from 1 to 10 their propensity for taking risks. Our dataset also includes information on personal characteristics such as gender, age, region of origin, acquired qualifications, and family background (i.e., whether parents or grandparents were active in the same profession). Table A.1 in Appendix A lists all survey questions, along with the corresponding answer options (see also Falk et al., 2018).

3.3 Sample description

The 194 HCPs in our sample are on average 48 years old, 60% of them are females, and 40% are nurses rather than doctors. Table 2 compares these characteristics with those of the healthcare staff in the hospital under analysis, and more generally with employees in Italian hospital facilities (Italian Ministry of Health, 2022). Columns (2) and (3) show that, although smaller in overall employment size, the hospital staff closely resembles that of other Italian hospital trusts, particularly in terms of gender composition and share of nurses. As far as our sample is concerned (Column 1), although the average age is relatively similar between samples, nurses tend to be somewhat under-represented. This also explains a lower share of female respondents in our sample. Sections 5 and 6 discuss how this under-representation does not threaten our main conclusions, inducing, if anything, an attenuation bias in our estimates.

Table 3 shows descriptive statistics for our sample of respondents, who account for more than 19% of HCPs employed by the hospital and invited to take part in the experiment. It summarizes our key variables regarding the demographic and job characteristics of the individuals included in our sample, their attitudes and preferences, as well as their exposure to COVID-19.

In addition to the demographic variables described above, 26% of participants are originally from regions other than Piedmont and 14% of them have at least one parent who also worked in the healthcare sector. With regard to health status, 30% of respondents report being in very good condition.

Focusing on attitudes and preferences, 10% of respondents in our sample are regular blood donors, while 38% of them are regular donors to non-profit charitable organizations. Overall, these individuals exhibit a high degree of aversion to inequality, with an average score of 8.22 on a scale ranging from 1 to 10. However, when evaluating their preferences for prioritizing income or health equality over the

Table 2: Comparison between our sample and universe of healthcare employees in Italian hospitals

	(1) Our sample of respondents	(2) Our hospital in Turin	(3) Average Italian public hospital
Female	60%	71%	70.9%
Age	47.86	46.31	48.16
Nurse	40%	60%	61.2%
N	194	1,029	1,952

Notes. This table compares the demographic characteristics of our sample with those of the HCPs employed at the hospital in Turin under analysis and, more generally, at Italian hospital facilities (Italian Ministry of Health, 2022). The last row displays the number of observations included in our sample (Column 1), the number of HCPs employed at the hospital in Turin under analysis (Column 2), and the average number of HCPs in Italian public hospital authorities (Column 3). Technical and administrative staff is excluded from the total number of employees.

improvement of general income or health levels in the population, participants express a more moderate view, with two average scores of, respectively, 4.83 and 4.38. We observe an intermediate degree of risk propensity in our sample of doctors and nurses, with an average score of 4.94 on our 10-point Likert scale, while their level of patience—defined as the willingness to give up something to benefit from it in the future—is much higher, with a mean of 7.47.

According to our measures of exposure to the COVID-19 shock, two-thirds (66%) of respondents in our sample report having worked in a COVID-19 ward during the first wave of the pandemic in spring 2020, with 26% assigned there specifically due to their medical expertise. About one-third (29%) of participants in the survey have a close friend or relative who suffered a severe COVID-19 infection. Finally, 31% of respondents contracted COVID-19 themselves. In what follows, we investigate how these exposures to the shock may have shaped altruistic preferences some years after the first wave of the pandemic.

4 Descriptive analysis and empirical approach

4.1 Descriptive statistics

Figure 1 displays the association between different exposures to COVID-19 and HCPs' altruism toward patients. Focusing on the five tasks of the experiment in which respondents face a trade-off between therapies that maximize either physicians' monetary payoffs or patients' benefits, the figure displays cumulative distribution functions of altruistic choices, comparing respondents based on their type of COVID-19 exposure.

The distributions shown in Figures 1a and 1b indicate that individuals who worked in a COVID-19 ward or had a close friend or relative experiencing a severe infection exhibit a higher number of altruistic

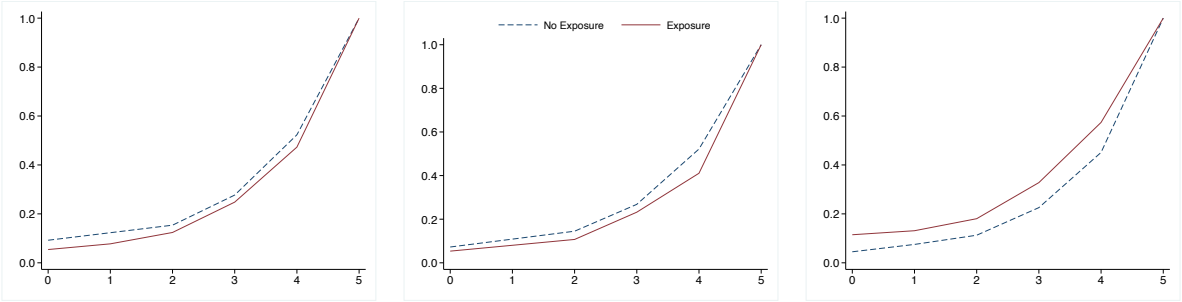
Table 3: Summary statistics

	Mean	SD	Min	Max	*N*
A. Demographic and job characteristics					
Female	0.60	0.49	0	1	194
Age	47.86	10.32	25	66	194
From other region or abroad	0.26	0.44	0	1	194
Parents with same job	0.14	0.35	0	1	194
Doctor	0.60	0.49	0	1	194
Nurse	0.40	0.49	0	1	194
Very good self-reported health	0.30	0.46	0	1	194
B. Attitudes and preferences					
Regular blood donor	0.10	0.30	0	1	194
Regular charity donations	0.38	0.49	0	1	194
Inequality aversion	8.22	2.10	1	10	194
Income equality over total income	4.83	2.49	1	10	194
Health equality over health level	4.38	2.75	1	10	190
Risk propensity	4.94	2.22	0	10	194
Patience	7.47	1.59	2	10	194
C. Exposure to COVID-19					
COVID-19 ward	0.66	0.47	0	1	194
COVID-19 ward due to medical expertise	0.26	0.44	0	1	194
Friend with severe COVID-19	0.29	0.45	0	1	194
COVID-19 infection	0.31	0.47	0	1	194

Notes. This table presents descriptive statistics for the main variables concerning respondents' demographic characteristics (Panel A), attitudes and preferences (Panel B), and exposure to COVID-19 (Panel C).

decisions. In both cases, the cumulative distribution functions of exposed HCPs lie below those of their unexposed counterparts, suggesting first-order stochastic dominance. In contrast, physicians who were themselves infected with COVID-19 exhibit the opposite pattern, with a cumulative distribution function lying above that of the non-exposed group, indicating fewer altruistic choices (panel 1c).

Table 4 reports descriptive statistics on the number of altruistic choices made by the respondents over the first five tasks of the experiment. In each panel of Table 4, we compare the number of altruistic choices for HCPs who did or did not experience the three different types of exposure to COVID-19. Working in a COVID-19 ward or having a close friend or relative who suffered from a severe COVID-19 infection are both associated with a higher propensity to make altruistic choices. In contrast, Panel C indicates that the opposite effect materializes for infected subjects. Figure B.1 in Appendix B provides further support by comparing the share of respondents choosing the profit-maximizing option over the altruistic one in each task of the experiment.



(a) Worked in COVID-19 ward (b) Friend with COVID-19 (c) Own COVID-19 infection

Figure 1: Cumulative distribution of the number of altruistic choices by COVID-19 exposure

Notes. This figure compares the cumulative distribution functions of the number of altruistic choices made by HCPs exposed to COVID-19. Panel 1a focuses on differences between HCPs who did ($N = 129$) or did not ($N = 65$) work in a COVID-19 ward during the first wave of the pandemic in spring 2020. Panel 1b compares the choices of HCPs who did ($N = 56$) or did not ($N = 138$) have a friend or close relative experiencing a severe COVID-19 infection. Panel 1c contrasts HCPs who did ($N = 61$) or did not ($N = 133$) experience themselves a COVID-19 infection.

Table 4: Number of altruistic choices by COVID-19 exposure

Exposure	Mean	SD	N
A. Working in COVID-19 ward			
Yes	4.02	1.39	129
No	3.83	1.58	65
B. Friend or relative with severe COVID-19			
Yes	4.14	1.34	56
No	3.88	1.49	138
C. COVID-19 infection			
Yes	3.67	1.64	61
No	4.09	1.34	133

Notes. This table presents descriptive statistics comparing the number of altruistic choices made by doctors and nurses depending on the type of exposure to COVID-19.

4.2 Empirical approach

To investigate the association after a few years between different types of COVID-19 exposure and HCPs' altruism, we estimate a linear probability model predicting the likelihood of choosing the therapy that maximizes the patient's payoff across our set of hypothetical clinical scenarios. Our baseline model specification is as follows:

$$Y_{is} = \alpha + \beta \cdot \textsc{Exposure}_i + \gamma \mathbf{X}_i + \rho \mathbf{A}_i + \delta_s + \varepsilon_{is} \tag{1}$$

where Y_{is} is a binary indicator equal to 1 if respondent i chooses the therapy that maximizes the patient's payoff in scenario s and 0 otherwise.[9]

The variable EXPOSURE_i is a dummy equal to one if respondent i was exposed to COVID-19 during the first wave of the pandemic in spring 2020, based on one of the following alternative definitions: (*i*) the respondent worked in a COVID-19 ward; (*ii*) the respondent had a friend or close relative who experienced a severe COVID-19 infection; or (*iii*) the respondent herself was infected with COVID-19.

The vector of individual-level controls $\mathbf{X}_i$ includes dummy variables for gender, for age groups (25–39, 40–49, 50–59, 60+), for being born outside Piedmont, for having completed education in another region, for parental employment in the healthcare sector, and for health status. Vector $\mathbf{A}_i$ includes a set of variables that account for individual attitudes and preferences. Specifically, we include dummy variables for being a regular donor to charitable organizations, a regular blood donor, having high risk propensity, high patience, and high aversion to income inequality. For each form of exposure to COVID-19, we also control for the other two potential simultaneous types of exposure. The model always includes scenario fixed effects (δ_s), which account for differences in the structure of payoffs in each trade-off s. ε_{is} is the error term. We use White robust standard errors in all specifications.

5 Results

Main estimates

Table 5 displays how different types of exposure to COVID-19 predict HCPs' altruism toward patients. Panel A shows that having worked in a COVID-19 ward during the first wave of the pandemic is associated with a higher level of altruism in the choice of therapies, corresponding to an increase of more than 5 percentage points. Similarly, Panel B documents that respondents with a friend or relative who experienced a severe COVID-19 infection exhibit an even larger effect on altruism, exceeding 6 percentage points. Conversely, Panel C reports that being infected with COVID-19 has a sizable negative relationship—up to 6.5 percentage points—with physicians' altruism. This negative association becomes even larger when restricting attention to severe COVID-19 infections requiring hospitalization (Appendix Table C.1).[10]

The estimated effects of the different types of exposure to the COVID-19 shock remain robust when controlling for personality traits (Column 2) and, in particular, for whether individuals are donors to charitable organizations or regular blood donors, both of which are positively associated with physicians' probability of maximizing patients' payoffs. Moreover, Column (3) shows that the coefficients for each type of exposure remain unchanged when the other two potential simultaneous exposures are included in the specification.

[9] In case the choice is between two therapies that yield the same payoff for the patient, the choice scenario (here: 6) is dropped from the analysis.

[10] Note that HCPs exposed to a COVID-19 infection with severe symptoms account for a relatively small share of our sample (slightly over 8%).

Robustness checks

Appendix Tables C.2, C.3, and C.4 show how the main coefficients of interest evolve as control variables are progressively added to the model. These specifications further document that higher risk propensity is associated with a sizable reduction in altruism, whereas greater patience has the opposite effect.[11]

As a further robustness check, Appendix Table C.6 reports the marginal effects from a logit model estimating how the probability of maximizing patients' payoffs is affected by having worked in a COVID-19 ward (Panel A), having a close friend or relative who experienced a severe COVID-19 infection (Panel B), or having personally contracted the disease (Panel C). The estimated coefficients are largely aligned to those obtained from our baseline linear probability model (Table C.2).

Finally, Appendix Table C.7 shows the correlation between altruism and exposure to COVID-19, focusing on respondents who experienced only one type of exposure.[12] In both cases, the positive estimates corroborate the results presented in Table 5. Actually, the magnitude of these coefficients appears even larger, although this might reflect the relatively small sample size resulting from the applied restrictions.

Mechanisms and heterogeneity

To investigate the mechanisms behind the positive effect of exposure to a COVID-19 ward on HCPs' altruism, Appendix Table C.8 distinguishes HCPs on the basis of their medical expertise. More specifically, we identify those who entered without specific expertise, and thus are more likely to have volunteered.[13] For the former group, recruited due to medical expertise, although the coefficients tend to lose statistical significance as a result of reduced statistical power, the magnitude of the positive effect of having worked in a COVID-19 ward remains in line with the estimates displayed in Panel A of Table 5. For volunteers, the statistically significant positive effect becomes even larger, suggesting that working in COVID-19 wards particularly strengthened the prosocial attitudes of doctors and nurses who already exhibited an altruistic tendency. The fact that this effect remains robust after controlling for regular blood donation and charitable giving indicates that exposure to COVID-19 wards indeed had a further significant impact.

Figure 2 shows the heterogeneous estimates of the effect of exposure to COVID-19 wards on doctors' and nurses' altruism toward patients, reporting the main coefficient of model (1) for several subsamples of respondents. According to this analysis, the observed overall positive effect is largely driven by females, older respondents aged 50+, and nurses. Although estimates become more imprecise, the positive effect on altruism appears larger also among blood donors. Finally, Appendix Figure B.2 focuses on the effect of exposure through a close friend who experienced severe COVID-19 symptoms or through a personal infection. In the former case, the estimated coefficient is positive for almost all respondent groups (except

[11] Appendix Table C.5 shows that patience and aversion to income inequality are *per se* negatively associated with exposure to COVID-19 wards.

[12] Note that in our sample it is not possible to estimate the effect of having personally experienced a COVID-19 infection without also having been exposed to either a COVID-19 ward or a severely infected friend, due to the near absence of observations meeting this condition.

[13] This interpretation is consistent with employment rates. Doctors and nurses who worked in COVID-19 wards due to their specific expertise report an average employment rate in these wards of 75% (with 77% of them reporting an employment rate above 50%). In contrast, doctors and nurses whose activity in COVID-19 wards was not motivated by their specific expertise report an average employment rate in these wards of 46% (with 57% of them reporting an employment rate below 50%).

Table 5: Healthcare professionals' probability of maximizing patients' payoffs

	(1)	(2)	(3)
A. Work in COVID-19 ward			
COVID-19 ward	0.048*	0.052*	0.055*
	(0.028)	(0.029)	(0.029)
Regular charity donations	0.051**	0.051**	0.051**
	(0.025)	(0.026)	(0.025)
Regular blood donor	0.110***	0.121***	0.114***
	(0.034)	(0.036)	(0.037)
B. Friend or relative with severe COVID-19			
Friend with severe COVID-19	0.057**	0.056**	0.060**
	(0.028)	(0.028)	(0.027)
Regular charity donations	0.056**	0.059**	0.051**
	(0.025)	(0.026)	(0.025)
Regular blood donor	0.107***	0.117***	0.114***
	(0.035)	(0.037)	(0.037)
C. COVID-19 infection			
COVID-19 infection	-0.058**	-0.051*	-0.065**
	(0.029)	(0.028)	(0.028)
Regular charity donations	0.048*	0.051**	0.051**
	(0.025)	(0.025)	(0.025)
Regular blood donor	0.099***	0.109***	0.114***
	(0.034)	(0.036)	(0.037)
Scenario Fixed Effects	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes
Individual preferences	No	Yes	Yes
Other COVID-19 Exposures	No	No	Yes
N	970	970	970

Notes. This table reports the estimates from a linear probability model for the association between different types of exposure to COVID-19 and HCPs' likelihood of choosing a therapy that maximizes patients' payoffs. Panel A examines the effect of having worked in a COVID-19 ward during the first wave of the pandemic in spring 2020. Panel B examines the effect of having had a friend or close relative who experienced a severe COVID-19 infection. Panel C examines the effect of having been personally infected with COVID-19. All specifications include fixed effects for each trade-off and a set of demographic controls listed in Table 3 (Section A). Column (2) adds dummy variables for high risk propensity, high patience, and high aversion to income inequality (see Table 3, Section B). Column (3) controls for other potential exposures to COVID-19 (Table 3, Section C). Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. *,**,*** represent the 10%, 5%, 1% significance levels.

those aged 40–49 and regular blood donors) and is particularly large for younger individuals under 40. In the latter case, the effect is significantly negative for most groups of respondents, whereas it becomes negligible for males, relatively younger subjects (aged 25–49), and blood donors.

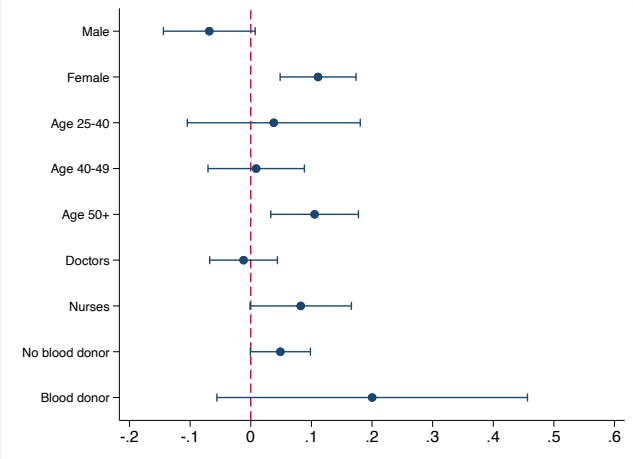


Figure 2: Heterogeneous effects of doctors' and nurses' exposure to COVID-19 wards

Notes. This figure shows the estimates from a linear probability model for the association between exposure to COVID-19 wards and HCPs' likelihood of choosing a therapy that maximizes patients' payoffs, with confidence intervals at the 10% significance level. The figure reports the estimate of β from equation (1) separately for different subsamples. All specifications include fixed effects for the trade-offs under analysis, the demographic controls listed in Table 3 (Section A), the dummy variables for high risk propensity, high patience, and high aversion to income inequality (Table 3, Section B), as well as the controls for other potential exposures to COVID-19 (Table 3, Section C).

6 Conclusions

This paper documents novel empirical evidence on how large-scale societal shocks—such as the outbreak of the COVID-19 pandemic—can shape HCPs' prosocial preferences, moral attitudes, and behavioral choices in a lasting manner. While much of the existing literature has focused on the short-term psychological and economic effects of the pandemic, this study explores its lasting impact on prosocial motivation among HCPs, a group uniquely positioned at the intersection of personal risk and social responsibility.

We have drawn on original survey data collected from a major public hospital in Turin, Northern Italy, one of the epicenters of the first wave of the pandemic. The survey was complemented by an incentivized behavioral experiment designed to elicit physicians' and nurses' altruism toward patients. Specifically, the experimental task measures participants' willingness to choose treatment options that maximize patients' health outcomes at the expense of their own monetary gains, thereby providing a behavioral indicator of patient-oriented altruism. We study whether different forms of exposure to COVID-19—such as working in dedicated COVID-19 wards, having close relatives or friends severely affected by the virus, or experiencing personal infection—are systematically associated with long-term differences in prosocial behavior. By linking real-world exposure to experimentally measured altruistic choices, we shed light on how crises of unprecedented magnitude can reshape the moral and motivational foundations of professional conduct in healthcare settings.

First, we show that working in a COVID-19 ward during the first wave of the pandemic in March 2020 is associated with a significantly higher propensity among HCPs to choose options that maximize patients' well-being, even after controlling for individual personality traits and attitudinal differences. This finding suggests that direct professional exposure to the health emergency strengthened intrinsic motivations and reinforced prosocial orientations within the medical workforce. In particular, our evidence indicates that HCPs who were already more altruistically inclined exhibited an even greater increase in

patient-regarding behavior when assigned to COVID-19 wards. This pattern is consistent with psychological and behavioral theories positing that crises and shared adversity can amplify cooperative norms and moral commitments within professional groups (Bauer et al., 2020; Han et al., 2022). Such results highlight the resilience of intrinsic motivations in healthcare and their potential to be strengthened by contextual experiences of collective effort and moral duty. In line with these results, we find an even larger positive effect on altruism following an exposure through a close friend or relative who experienced a severe COVID-19 infection. Conversely, being personally infected with COVID-19 is associated with an opposite negative effect on HCPs' prosociality, potentially reflecting the psychological burden associated with contagion and severe illness. Overall, these results document how large shocks may strengthen professional identities and foster cooperation but also generate psychological costs that undermine individual prosociality.

On one side, our evidence on increased altruism after working in COVID-19 wards may be rationalized within the framework of identity theory as the unexpected health crisis likely fostered greater effort, cooperation, and prosociality by making HCPs' professional mission and social role particularly salient. On the other side, the negative impact of personal infection is consistent with theoretical models suggesting that large adverse shocks lead individuals to prioritize their own needs and gains.

A careful interpretation of our results should, however, acknowledge some *limitations* and *caveats*. First, our experiment was conducted in a single hospital in Turin, which may raise concerns about the external validity of our findings, also depending on the heterogeneous exposure to COVID-19 of different regions. Reassuringly, although smaller in overall employment size, the characteristics of its healthcare staff are closely aligned with those observed on average in the other Italian hospital facilities (Table 2). Moreover, while some categories of workers (e.g., women and nurses) tend to be under-represented in our sample, this is unlikely to threaten the reliability of the estimates, since these groups are those associated with stronger effects. This implies that, if anything, our estimates should be interpreted as lower bounds for the actual effects of exposure to COVID-19. Second, we are interpreting the therapy choices made in our incentivized experimental setting as a reliable proxy of physicians' altruism and prosociality. However, this is a relatively strong assumption, as doctors' and nurses' behaviors inevitably depend on their characteristics and interactions in a much more complex real-world environment.

Although this is primarily a study in *positive* economics, as it investigates how an unexpected large-scale shock may persistently shape individual preferences, our findings also carry some health policy implications. In particular, our results shed light on the relationship between HCPs' attitudes and patients' outcomes, suggesting that preferences should be taken into account in screening and hiring procedures alongside technical competencies. The adverse impact of personal COVID-19 infection on altruism indicates that hospital workers—and, more generally, all individuals exposed to potential health shocks—should be the focus of measures designed to reduce risks, stress, and burnout. Indeed, such efforts would also ensure better outcomes for patients. In this perspective, future research should explore how institutional support can reinforce HCPs' prosocial behavior, assessing the long-term impact of such attitudinal shifts on the quality of patient care.

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Appendix A Description of the experiment

This Appendix reports the instructions that all participants received before the beginning of the experiment, both translated into English and in their original version in Italian.

Translation into English

- You are taking part in a survey on decision-making behavior in the research field of experimental economics. All of you, as well as other participants, will be asked to take a series of decisions during this experiment. The amount of your winnings will depend on your choices. Please read carefully the following description of the experiment.
- During this experiment, you will make six decisions.
- For the entire duration of the experiment, you will decide which therapy to administer to patients.
- For each patient, you will be allowed to choose between two alternative therapy options, *Therapy A* or *Therapy B*. Your choice will determine both your earnings in euros and the benefits for the patient, also measured in euros.
- **We inform you that your decisions will have real-world consequences.**
- Once you have completed the experiment and the questionnaire, you will be asked whether you would like to take part in a lottery with a 10.9" Apple iPad Wi-Fi 64GB as the final prize.
- Please note that your chances of winning the iPad increase with the amount you earn across the different tasks in the experiment. After the experiment ends, one of the six tasks will be randomly selected to determine your monetary earnings (in euros), which will automatically translate into a number of lottery tickets for the iPad draw. The higher your earnings, the more tickets you will receive.
- No patient will take part in the experiment (and none of the participants will take the role of patient). However, patient benefits in euros, as determined by your decisions in the randomly selected task (as described above), will be donated to help real patients. All patients' winnings will be entirely donated to *Fondazione Telethon*.

Original Version - *Italian*

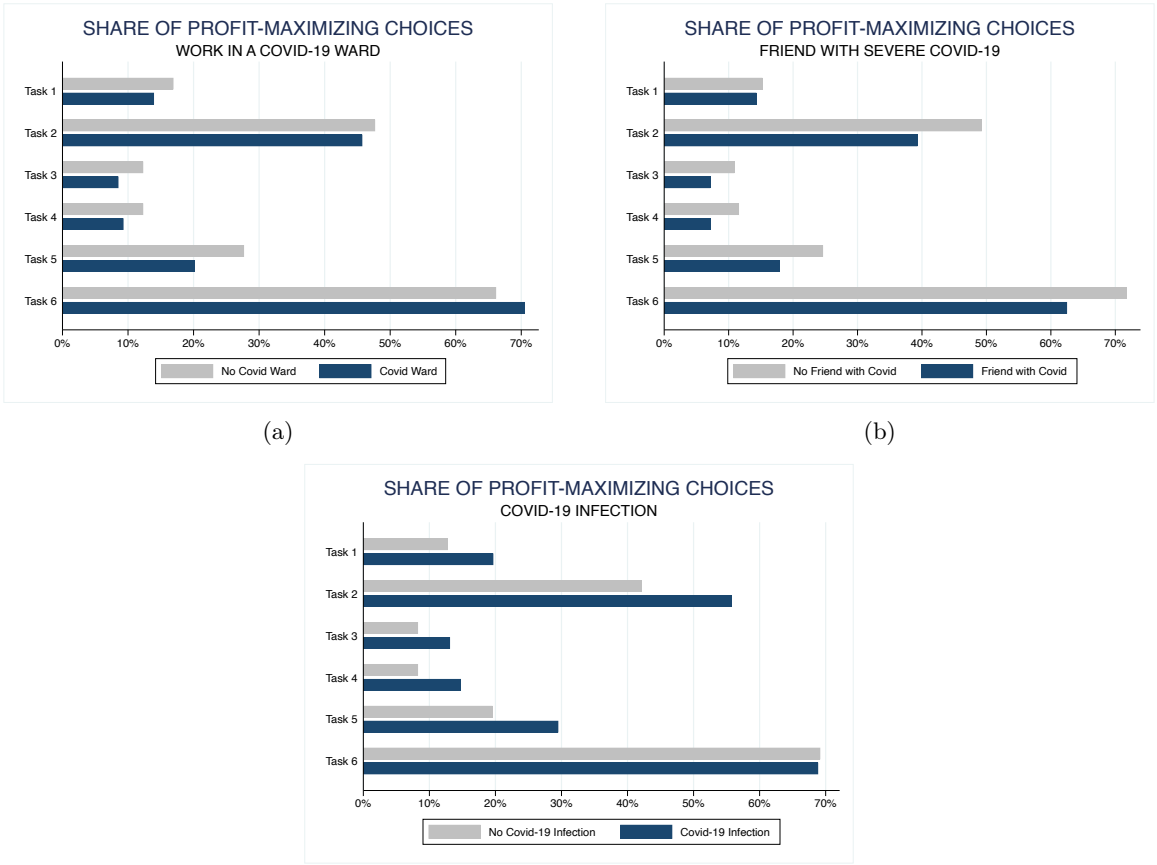
- *State partecipando ad una indagine sul comportamento nel prendere decisioni nel- l'ambito della ricerca economico-sperimentale. A voi tutti e ad altri partecipanti verrà chiesto di prendere alcune decisioni durante l'esperimento. L'ammontare delle vostre vincite dipenderà dalle vostre decisioni. Siete pregati di leggere attentamente la descrizione dell'esperimento.*
- *Durante l'esperimento, prenderete 6 decisioni.*
- *Per tutta la durata dell'esperimento deciderete quale terapia somministrare ai pazienti.*

- *Per ciascun paziente potrete scegliere tra due opzioni di terapia, Terapia A o Terapia B. Sarà la vostra decisione a determinare la vostra vincita in euro nonché i benefici per il paziente, anche questi valutati in euro.*
- ***Desideriamo avvisarvi che le vostre scelte avranno conseguenze reali.***
- *Una volta terminato sia l'esperimento che il questionario vi verrà chiesto se volete prendere parte ad una lotteria il cui premio finale sarà un iPad 10.9" Wi-Fi 64GB.*
- *Considerate che le vostre possibilità di vincere l'iPad aumentano con le vincite accumulate durante le fasi dell'esperimento. Una volta che questo viene completato si selezionerà a caso uno dei 6 turni per determinare la vostra vincita in euro, che si tradurrà automaticamente in un numero maggiore di biglietti per vincere l'iPad alla lotteria più alta è la vincita.*
- *Nessun paziente sarà presente durante l'esperimento (e nessuno dei partecipanti assumerà il ruolo di paziente). Tuttavia, i benefici del paziente, in euro, determinati dalle vostre decisioni durante il turno selezionato a caso (come descritto sopra) aiuteranno pazienti reali. In particolare, le vincite dei pazienti saranno devolute integralmente alla Fondazione Telethon.*

Table A.1: Structure of the survey

Question	Answer scale
General attitudes toward inequality Do you agree or disagree with this statement? "Reducing differences between those on high incomes and those on low incomes should be a priority of the Italian Government." (Costa-Font and Cowell, 2025)	Select a value between: - 1 (= strongly disagree) - 10 (= strongly agree)
Trade-offs in income Would you say that reducing income inequality (i.e., differences in incomes) in Italy is more or less important than improving total national income? (Costa-Font and Cowell, 2025)	Rate your view between: - 1 = Reducing inequality is more important - 10 = Improving total income is more important
Trade-offs in health Would you say that reducing health inequality (i.e., differences in life expectancies across social groups) in Italy is more or less important than improving average life expectancy? (Costa-Font and Cowell, 2025)	Rate your view between: - 1 = Reducing inequality is more important - 10 = Improving average health is more important
Altruism – Blood donation Are you a blood donor?	Select one answer: - Yes, on a regular basis - Yes, sometimes - No
Altruism – Donations Are you donating money to charities or non-profit organizations?	Select one answer: - Yes, regularly - Yes, sometimes - No
Patience Are you a person who is generally willing to give up something today in order to benefit from that in the future, or are you not willing to do so in comparison to others? (Falk et al., 2018)	Rate your answer on a scale between: - 0 (= not at all willing to delay gratification) - 10 (= very willing to give up something)
Risk aversion Are you a person who is generally willing to take risks, or do you try to avoid taking risks? (Falk et al., 2018)	Rate your answer on a scale between: - 0 (= not at all willing to take risks) - 10 (= very willing to take risks)
COVID-19 exposure - Infection Did you personally experience COVID-19 during the first wave back in 2020?	Select one answer: - No - Yes, but with minor health problems - Yes, with severe health problems, but I was not hospitalized - Yes, with severe health problems which required hospitalization - Yes, with severe health problems which required hospitalization in ICU
COVID-19 exposure - Relatives or friends Did any of your relatives or friends experience COVID-19 back in 2020?	Select one answer: - No - Yes, but with minor health problems - Yes, with severe health problems, but without being hospitalized - Yes, with severe health problems which required hospitalization - Yes, with severe health problems which required hospitalization in ICU
COVID-19 exposure - Professional experience Have you worked in a COVID-19 ward in the first wave of the pandemic? Was your experience in the COVID-19 ward related to your professional role in the hospital or not?	Select one answer: - No - Yes Select one answer: - No - Yes

Appendix B Additional Figures

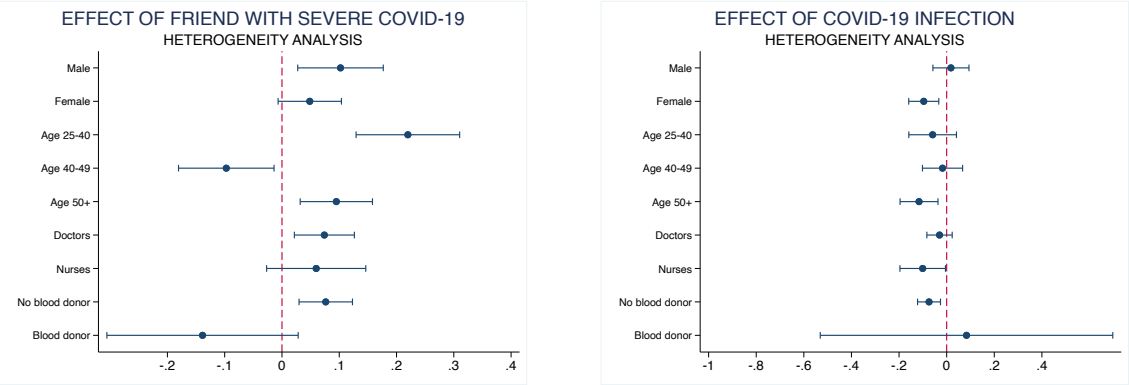


(a) (b)

(c)

Figure B.1: Doctors' and nurses' therapy choices

Notes. This figure shows the shares of doctors and nurses who maximize the utility of the patients rather than their own monetary benefits in each phase of the experiment. Panel B.1a focuses on differences between HCPs who did or did not work in a COVID-19 ward during the first wave of the pandemic in spring 2020. Panel B.1b compares the choices of HCPs who did or did not have a friend or close relative experiencing a severe COVID-19 infection. Panel B.1c contrasts HCPs who did or did not experience themselves a COVID-19 infection. In each of the six tasks of the experiment under analysis, respondents were asked to choose between the following couples of therapies, where the first payoff is earned by the physician and the second is obtained by the patient: (3;15) vs. (15;3) in task 1; (3;15) vs. (9;9) in task 2; (9;9) vs. (15;3) in task 3; (6;12) vs. (15;3) in task 4; (3;15) vs. (12;6) in task 5; (3;3) vs. (15;3) in task 6.



(a) (b)

Figure B.2: Heterogeneous effects of doctors' and nurses' exposure to COVID-19

Notes. This figure shows the estimates from a linear probability model for the association between different types of exposure to COVID-19 and HCPs' likelihood of choosing a therapy that maximizes patients' payoffs, with confidence intervals at the 10% significance level. In each panel, the coefficient β from equation (1) is estimated separately for different subsamples. All specifications include fixed effects for the trade-offs under analysis, the demographic controls listed in Table 3 (Section A), the dummy variables for high risk propensity, high patience, and high aversion to income inequality (Table 3, Section B), as well as the controls for other potential exposures to COVID-19 (Table 3, Section C).

Appendix C Additional Tables

Table C.1: Doctors' and nurses' probability of maximizing patients' payoffs - Effect of severe COVID-19 infection

	(1)	(2)	(3)
Severe COVID-19 infection	-0.090*	-0.086*	-0.114**
	(0.053)	(0.052)	(0.052)
Regular charity donations	0.049*	0.052**	0.053**
	(0.025)	(0.025)	(0.025)
Regular blood donor	0.104***	0.114***	0.120***
	(0.034)	(0.036)	(0.036)
Scenario Fixed Effects	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes
Individual preferences	No	Yes	Yes
Other COVID-19 Exposures	No	No	Yes
N	970	970	970

Notes. This table reports the estimates from a linear probability model for the association between experiencing a severe COVID-19 infection (with serious symptoms requiring hospitalization) and HCPs' likelihood of choosing a therapy that maximizes patients' payoffs. All specifications include fixed effects for the trade-offs under analysis and a set of demographic controls listed in Table 3 (Section A). Column (2) adds dummy variables for high risk propensity, high patience, and high aversion to income inequality (see Table 3, Section B). Column (3) controls for other potential exposures to COVID-19 (Table 3, Section C). Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.2: Doctors' and nurses' probability of maximizing patients' payoffs - Effect of having worked in a COVID-19 ward

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COVID-19 ward	0.045	0.048*	0.047*	0.051*	0.052*	0.059**	0.055*
	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)	(0.029)	(0.029)
Very good self-reported health	-0.007	-0.018	-0.007	-0.014	-0.015	-0.017	-0.007
	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)	(0.028)	(0.029)
Regular charity donations		0.051**	0.058**	0.052**	0.051**	0.047*	0.051**
		(0.025)	(0.025)	(0.025)	(0.026)	(0.025)	(0.025)
Regular blood donor		0.110***	0.116***	0.121***	0.121***	0.114***	0.114***
		(0.034)	(0.035)	(0.036)	(0.036)	(0.036)	(0.037)
High risk propensity			-0.069***	-0.066***	-0.066**	-0.063**	-0.066**
			(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
High patience				0.051**	0.050*	0.046*	0.040
				(0.026)	(0.026)	(0.026)	(0.026)
High income ineq. aversion					0.008	0.013	0.007
					(0.026)	(0.026)	(0.025)
COVID-19 infection						-0.058**	-0.065**
						(0.028)	(0.028)
Friend with severe COVID-19							0.060**
							(0.027)
Scenario Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	970	970	970	970	970	970	970

Notes. This table reports the estimates from a linear probability model for the association between having worked in a COVID-19 ward during the first wave of the pandemic in 2020 and HCPs' likelihood of maximizing patients' payoffs. Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. All specifications include fixed effects for the five trade-offs under analysis, as well as the following demographic controls: a dummy variable for females, a set of dummies for age groups (25–39; 40–49; 50–59; 60+), a dummy variable for being non-native (i.e., born outside Piedmont), a dummy variable for having completed education in other regions or abroad, and a dummy variable for parental occupation in the healthcare sector. All columns also include a dummy variable for self-reported very good health. Column (2) adds a dummy variable for regular donors to non-profit organizations and a dummy variable for regular blood donors. Column (3) adds a dummy variable for high risk propensity (i.e., a score of at least 6 out of 10). Column (4) adds a dummy variable for high patience (i.e., a score of at least 8 out of 10). Column (5) adds a dummy variable for high aversion to income inequality (i.e., a score of at least 6 out of 10 in the preference for income equality over income growth). Column (6) adds a dummy variable for individuals who were infected with COVID-19. Column (7) adds a dummy variable for individuals with a close friend or relative who experienced COVID-19 with severe symptoms. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.3: Doctors' and nurses' probability of maximizing patients' payoffs - Effect of friend or close relative with severe COVID-19

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Friend with severe COVID-19	0.052*	0.057**	0.060**	0.056**	0.056**	0.064**	0.060**
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.027)	(0.027)
Very good self-reported health	0.008	-0.003	0.009	0.003	0.004	0.004	-0.007
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)
Regular charity donations		0.056**	0.063**	0.058**	0.059**	0.055**	0.051**
		(0.025)	(0.025)	(0.025)	(0.026)	(0.025)	(0.025)
Regular blood donor		0.107***	0.113***	0.117***	0.117***	0.110***	0.114***
		(0.035)	(0.036)	(0.036)	(0.037)	(0.037)	(0.037)
High risk propensity			-0.072***	-0.070***	-0.070***	-0.068***	-0.066**
			(0.026)	(0.026)	(0.026)	(0.025)	(0.026)
High patience				0.042	0.042	0.037	0.040
				(0.026)	(0.026)	(0.026)	(0.026)
High income ineq. aversion					-0.004	-0.001	0.007
					(0.026)	(0.025)	(0.025)
COVID-19 infection						-0.059**	-0.065**
						(0.028)	(0.028)
COVID-19 ward							0.055*
							(0.029)
Scenario Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	Yes	Yes	Yes	Yes	Yes
N	970	970	970	970	970	970	970

Notes. This table reports the estimates from a linear probability model for the association between having a close friend or relative who experienced a severe COVID-19 infection and HCPs' likelihood of maximizing patients' payoffs. Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. All specifications include fixed effects for the six trade-offs, as well as the following control variables: a dummy variable for females, a set of dummies for age groups (25–39; 40–49; 50–59; 60+), a dummy variable for being non-native (i.e., born outside Piedmont), a dummy variable for having completed education in other regions or abroad, and a dummy variable for parental occupation in the healthcare sector. All columns also include a dummy variable for self-reported very good health. Column (2) adds a dummy variable for regular donors to non-profit organizations and a dummy variable for regular blood donors. Column (3) adds a dummy variable for high risk propensity (i.e., a score of at least 6 out of 10). Column (4) adds a dummy variable for high patience (i.e., a score of at least 8 out of 10). Column (5) adds a dummy variable for high aversion to income inequality (i.e., a score of at least 6 out of 10 in the preference for income equality over income growth). Column (6) adds a dummy variable for individuals who were infected with COVID-19. Column (7) adds a dummy variable for individuals who worked in a COVID-19 ward during the first wave of the pandemic in spring 2020. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.4: Doctors' and nurses' probability of maximizing patients' payoffs - Effect of severe COVID-19 infection

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COVID-19 infection	-0.068**	-0.058**	-0.054*	-0.050*	-0.051*	-0.058**	-0.065**
	(0.029)	(0.029)	(0.029)	(0.029)	(0.028)	(0.028)	(0.028)
Very good self-reported health	-0.000	-0.010	0.001	-0.005	-0.005	-0.017	-0.007
	(0.027)	(0.027)	(0.028)	(0.028)	(0.027)	(0.028)	(0.029)
Regular charity donations		0.048*	0.056**	0.051**	0.051**	0.047*	0.051**
		(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Regular blood donor		0.099***	0.105***	0.110***	0.109***	0.114***	0.114***
		(0.034)	(0.035)	(0.036)	(0.036)	(0.036)	(0.037)
High risk propensity			-0.067***	-0.065**	-0.064**	-0.063**	-0.066**
			(0.026)	(0.026)	(0.025)	(0.026)	(0.026)
High patience				0.044*	0.043*	0.046*	0.040
				(0.025)	(0.026)	(0.026)	(0.026)
High income ineq. aversion					0.005	0.013	0.007
					(0.026)	(0.026)	(0.025)
COVID-19 ward						0.059**	0.055*
						(0.029)	(0.029)
Friend with severe COVID-19							0.060**
							(0.027)
Scenario Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	970	970	970	970	970	970	970

Notes. This table reports the estimates from a linear probability model for the association between having experienced a COVID-19 infection and HCPs' likelihood of maximizing patients' payoffs. Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. All specifications include fixed effects for the five trade-offs under analysis, as well as the following control variables: a dummy variable for females, a set of dummies for age groups (25–39; 40–49; 50–59; 60+), a dummy variable for being non-native (i.e., born outside Piedmont), a dummy variable for having completed education in other regions or abroad, and a dummy variable for parental occupation in the healthcare sector. All columns also include a dummy variable for self-reported very good health. Column (2) adds a dummy variable for regular donors to non-profit organizations and a dummy variable for regular blood donors. Column (3) adds a dummy variable for high risk propensity (i.e., a score of at least 6 out of 10). Column (4) adds a dummy variable for high patience (i.e., a score of at least 8 out of 10). Column (5) adds a dummy variable for high aversion to income inequality (i.e., a score of at least 6 out of 10 in the preference for income equality over income growth). Column (6) adds a dummy variable for individuals who worked in a COVID-19 ward during the first wave of the pandemic in spring 2020. Column (7) adds a dummy variable for individuals with a friend or relative who experienced a severe COVID-19 infection. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.5: Doctors' and nurses' preferences and attitudes

	(1) Inequality Aversion	(2) Income Ineq. Aversion	(3) Health Ineq. Aversion	(4) Patience for Future	(5) Risk propensity
COVID-19 ward	0.285	-0.984**	-0.544	-0.687***	0.365
	(0.339)	(0.406)	(0.463)	(0.255)	(0.342)
COVID-19 infection	-0.111	0.451	0.443	-0.282	-0.096
	(0.359)	(0.392)	(0.481)	(0.258)	(0.352)
Friend with severe COVID-19	0.321	0.140	0.593	0.238	0.522
	(0.297)	(0.362)	(0.470)	(0.255)	(0.322)
Demographic controls	✓	✓	✓	✓	✓
Self-reported health status	✓	✓	✓	✓	✓
Blood donor - Charity	✓	✓	✓	✓	✓
N	194	194	190	194	194
Average - Control	8.05	5.35	4.70	7.95	4.62

Notes. This table reports the estimates from a linear probability model for the association between different types of exposure to COVID-19 and HCPs' preferences and attitudes. The dependent variable is, respectively, (i) the score on a scale 1–10 assigned to the importance of reducing inequality as a government priority (Column 1); (ii) the score on a scale 1–10 assigned to the relative importance of reducing income inequality over increasing total income (Column 2); (iii) the score on a scale 1–10 assigned to the relative importance of reducing health inequality over increasing overall life expectancy (Column 3); (iv) the score on a scale 1–10 assigned to individual willingness to sacrifice present benefits for future well-being (Column 4); and (v) the score on a scale 1–10 assigned to individual propensity to take risks (Column 5). All specifications include demographic controls (i.e., gender; a set of dummies for age groups 25–39, 40–49, 50–59 and 60+; a dummy variable for being non-native workers (i.e., born outside Piedmont), a dummy variable for having completed education in other regions or abroad, and a dummy variable for parental occupation in the healthcare sector), as well as a dummy for very good self-reported health status, a dummy for regular blood donors, and a dummy for regular donors to non-profit organizations. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.6: Doctors' and nurses' probability of maximizing patients' payoffs - Marginal effects from logit model

	(1)	(2)	(3)
Panel A: Work in COVID-19 ward			
COVID-19 ward	0.047*	0.052*	0.055**
	(0.027)	(0.027)	(0.027)
Regular charity donations	0.052*	0.054**	0.052**
	(0.026)	(0.027)	(0.027)
Regular blood donor	0.127**	0.134***	0.130***
	(0.050)	(0.049)	(0.049)
Panel B: Friend or relative with severe COVID-19			
Friend with severe COVID-19	0.058**	0.059**	0.062**
	(0.028)	(0.029)	(0.029)
Regular charity donations	0.057**	0.062**	0.052**
	(0.026)	(0.027)	(0.027)
Regular blood donor	0.125**	0.134***	0.130***
	(0.050)	(0.049)	(0.049)
Panel C: COVID-19 infection			
COVID-19 infection	-0.055**	-0.048*	-0.061**
	(0.026)	(0.026)	(0.026)
Regular charity donations	0.050*	0.054**	0.052**
	(0.026)	(0.027)	(0.027)
Regular blood donor	0.118**	0.124**	0.130***
	(0.050)	(0.050)	(0.049)
Scenario Fixed Effects	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes
Individual preferences	No	Yes	Yes
Other COVID-19 Exposures	No	No	Yes
N	970	970	970

Notes. This table reports the marginal effects from a logit model for the association between different types of exposure to COVID-19 and HCPs' likelihood of maximizing patients' payoffs. Panel A examines the effect of having worked in a COVID-19 ward during the first wave of the pandemic in spring 2020. Panel B examines the effect of having had a friend or close relative who experienced a severe COVID-19 infection. Panel C examines the effect of having been personally infected with COVID-19. All specifications include fixed effects for the trade-offs under analysis and a set of demographic controls listed in Table 3 (Section A). Column (2) adds dummy variables for high risk propensity, high patience, and high aversion to income inequality (see Table 3, Section B). Column (3) controls for other potential exposures to COVID-19 (Table 3, Section C). Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.7: Doctors' and nurses' probability of maximizing patients' payoffs

	(1)	(2)
Panel A: Only exposure to COVID-19 ward		
COVID-19 ward	0.090**	0.090**
	(0.039)	(0.039)
Regular charity donations	0.018	0.022
	(0.036)	(0.036)
Regular blood donor	0.133***	0.144***
	(0.046)	(0.049)
N	500	500
Panel B: Only exposure to friend or relative with severe COVID-19		
Friend with severe COVID-19	0.136**	0.113*
	(0.068)	(0.067)
Regular charity donations	0.100*	0.107*
	(0.058)	(0.059)
Regular blood donor	0.100	0.079
	(0.062)	(0.069)
N	255	255
Scenario Fixed Effects	Yes	Yes
Demographic controls	Yes	Yes
Individual preferences	No	Yes

Notes. This table reports the estimates from a linear probability model for the association between different types of exposure to COVID-19 and HCPs' likelihood of maximizing patients' payoffs. Panel A examines the effect of having worked in a COVID-19 ward during the first wave of the pandemic in spring 2020, but without having had any friend or close relative who experienced a severe COVID-19 infection and without having been personally infected as well. Panel B examines the effect of having had a friend or close relative who experienced a severe COVID-19 infection, but without having worked in a COVID-19 ward and without having been personally infected as well. All specifications include fixed effects for the trade-offs under analysis and a set of demographic controls listed in Table 3 (Section A). Column (2) adds dummy variables for high risk propensity, high patience, and high aversion to income inequality (see Table 3, Section B). Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. *,**,*** represent the 10%, 5%, 1% significance levels.

Table C.8: Doctors' and nurses' probability of maximizing patients' payoffs - Control for potential self-selection in COVID-19 wards

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COVID-19 ward - Expertise	0.035	0.040	0.043	0.048	0.049	0.060*	0.052
	(0.031)	(0.031)	(0.031)	(0.031)	(0.032)	(0.032)	(0.033)
COVID-19 ward - No expertise	0.063*	0.061*	0.053	0.056*	0.057*	0.059*	0.060*
	(0.032)	(0.032)	(0.033)	(0.033)	(0.034)	(0.033)	(0.033)
Very good self-reported health	-0.009	-0.019	-0.007	-0.014	-0.016	-0.017	-0.008
	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)	(0.028)	(0.029)
Regular charity donations		0.048*	0.056**	0.051*	0.050*	0.047*	0.050*
		(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Regular blood donor		0.111***	0.116***	0.122***	0.121***	0.114***	0.114***
		(0.034)	(0.035)	(0.036)	(0.036)	(0.036)	(0.037)
High risk propensity			-0.068***	-0.066**	-0.065**	-0.063**	-0.065**
			(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
High patience				0.051**	0.050*	0.046*	0.040
				(0.026)	(0.026)	(0.026)	(0.026)
High income ineq. aversion					0.008	0.013	0.006
					(0.026)	(0.026)	(0.025)
COVID-19 infection						-0.058**	-0.064**
						(0.029)	(0.029)
Friend with severe COVID-19							0.061**
							(0.028)
N	970	970	970	970	970	970	970
Scenario Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes. This table reports the estimates from a linear probability model for the association between having worked in a COVID-19 ward during the first wave of the pandemic in 2020 and HCPs' likelihood of maximizing patients' payoffs. To account for potential self-selection into COVID-19 wards, we distinguish between doctors and nurses who worked there because of their medical expertise and those who were not employed there due to their specific expertise. Among the six tradeoffs faced by each respondent, the sixth task is excluded because the choice is between two therapies that give the same payoff to the patient. All specifications include fixed effects for the five trade-offs under analysis, as well as the following demographic controls: a dummy variable for females, a set of dummies for age groups (25–39; 40–49; 50–59; 60+), a dummy variable for being non-native (i.e., born outside Piedmont), a dummy variable for having completed education in other regions or abroad, and a dummy variable for parental occupation in the healthcare sector. All columns also include a dummy variable for self-reported very good health. Column (2) adds a dummy variable for regular donors to non-profit organizations and a dummy variable for regular blood donors. Column (3) adds a dummy variable for high risk propensity (i.e., a score of at least 6 out of 10). Column (4) adds a dummy variable for high patience (i.e., a score of at least 8 out of 10). Column (5) adds a dummy variable for high aversion to income inequality (i.e., a score of at least 6 out of 10 in the preference for income equality over income growth). Column (6) adds a dummy variable for individuals who were infected with COVID-19. Column (7) adds a dummy variable for individuals with a close friend or relative who experienced COVID-19 with serious symptoms. *,**,*** represent the 10%, 5%, 1% significance levels.

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