



HEDG

HEALTH, ECONOMETRICS AND DATA GROUP

THE UNIVERSITY *of York*

WP 21/05

COVID Angels Fighting Daily Demons?
Mental Health of Healthcare Workers and Religion

Emilia Barili; Paola Bertoli;

Veronica Grembi and Veronica Rattini

March 2021

<http://www.york.ac.uk/economics/postgrad/herc/hedg/wps/>

COVID Angels Fighting Daily Demons? Mental Health of Healthcare Workers and Religion[†]

Emilia Barili Paola Bertoli Veronica Grembi Veronica Rattini
University of Genoa University of Verona University of Milan University of Milan

This Draft: March 2021

Abstract

Relying on a unique survey of more than 15,000 respondents in Italy conducted immediately after the first wave of the COVID-19 pandemic, we show that randomly priming religiosity in healthcare workers decreases their self-assessed level of mental distress. The effect is stronger for nurses (-11.2%) than for physicians (-7.6%). Similar results are also confirmed at the level of self-assessed concerns over different aspects of workers' lives and personal networks, potential sources of distress. Consistent with the idea that religion serves as a coping mechanism, the effect is stronger for more impacted categories (females and hospital workers) and for respondents facing more stressful situations, such as being reassigned due to the COVID-19 emergency or working in a COVID-19-related specialty (*e.g.*, emergency care), among others. Self-classifying as religious explains the larger impact of religious priming on physicians but not on nurses. We argue that the spiritual identity of nurses was more connected by a unique media campaign that identified them as *COVID angels*. Hence, ad hoc messages in times of distress might reinforce the positive effect of coping mechanisms.

JEL Classification: I10, N34, Z12

Keywords: Healthcare Workers, Mental Health, COVID-19, Coping Mechanisms, Religiosity

[†]We are grateful for the support of the physicians and nurses associations that promoted the diffusion of our survey and all the physicians, nurses, biologists, psychologists, obstetricians, and technicians who took time to fill it out. The survey was approved by the Ethics Committee of the University of Verona (Prot. N. 0221872 - 22/06/2020), while the University of Pavia certified compliance with privacy requirements (Prot. N. 61080 - 15/06/2020). All participants gave their informed consent at the beginning of the survey.

1 Introduction

An increasing number of studies shows the negative impact of the COVID-19 pandemic on mental health regardless of the different institutional contexts and responses to the emergency, as is apparent from evidence from the US (*e.g.*, [Giuntella et al. \(2021\)](#), [Adams-Prassl et al. \(2020\)](#)) and the UK (*e.g.*, [Oreffice and Quintana-Domeque \(2020\)](#), [Proto and Quintana-Domeque \(2021\)](#)), to name a few. These results are expected to better describe the experience of some population groups, among which healthcare workers stand out. In terms of both intensity and duration, their exposure to emotional and psychological distress during the pandemic has no recent precedents in many Western countries. For instance, Spanish healthcare workers dealing with infected patients and located in areas with a higher incidence of infection reported higher levels of stress ([García-Fernández et al., 2020](#)). In the US, high levels of mental distress were observed among healthcare workers treating COVID-19 patients, with nurses being particularly affected ([Shechter et al., 2020](#)). Similarly, Polish healthcare workers with a COVID-19-related specialty (*i.e.*, emergency room, infectious diseases, or intensive care) showed a higher risk of suffering from anxiety, depression, and sleep disorders than healthcare workers working in other specialties ([Wańkiewicz et al., 2020](#)). All in all, consistent with evidence on past disease outbreaks (*e.g.*, severe acute respiratory syndrome—SARS) ([Gershon et al., 2016](#); [Lee et al., 2018](#); [Lu et al., 2006](#); [Patel et al., 2018](#); [Phua et al., 2005](#); [Senga et al., 2016](#); [Shah et al., 2020](#)) and with the effects detected in the overall population, by the end of the first wave (summer 2020) of the COVID-19 pandemic, healthcare personnel had experienced a dramatic deterioration of their mental health, showing clear signs of post traumatic stress disorder (PTSD) and burnout ([Cabarkapa et al., 2020](#); [Giusti et al., 2020](#); [Muller et al., 2020](#); [Pappa et al., 2020](#); [Prete et al., 2020](#); [Vindegaard and Benros, 2020](#)).

While many countries are struggling with the consequences of a second wave (fall/winter 2020-2021), understanding the role of potential mechanisms (*e.g.*, sports, social support, sharing experiences, meditation) to help cope with the stress triggered by the situation has important consequences for both the health of specific categories of workers and the general well-being of the population ([Bohlken et al., 2020](#); [Cai et al., 2020](#); [Chew et al., 2020](#); [Dong et al., 2020](#); [Labrague and De Los Santos, 2020](#); [Maraqa et al., 2020](#); [Shechter et al., 2020](#); [Xiao et al., 2020](#)). This paper assesses the effectiveness of a specific coping mechanism that can be used to deal with traumatic events: religion. The propensity of people to use religion to cope with negative events is known as religious coping ([Pargament, 2001](#)).[†] Although we are not the first to investigate the

[†]The idea is that people seeking to reduce distress generated by certain events find support in spirituality ([Folkman and Lazarus, 1984](#)). This tendency is in turn explained by existential insecurity theory: religious beliefs and practices equip people with rules and habits that are helpful for coping with problems ([Immerzeel and Van Tubergen, 2013](#)). As pointed out in [Molteni et al. \(2020\)](#), religious allegories and parables provide psychological support ([Stolz, 2009](#); [Zapata, 2018](#)) and decrease ambiguity ([Brandt and Henry, 2012](#)). In addition to these effects, religion can also provide social support through its community dimension ([Ellison and George, 1994](#); [Lim and Putnam, 2010](#)), reassurance against death anxiety and promotion of the immortality of the soul ([Solomon et al., 1991](#); [Vail et al., 2010](#)). Previous research has widely documented a rise in religiosity as a consequence of natural disasters or economic insecurity ([Belloc et al., 2016](#); [Bulbulia, 2004](#); [Chen, 2010](#); [Sibley and Bulbulia, 2012](#); [Sinding Bentzen, 2019](#); [Zapata, 2018](#)).

role of religion as a coping mechanism against mental distress (*e.g.*, [Koenig \(1998\)](#)), previous studies have failed to estimate a precise magnitude of the role played by religious coping, limiting their discussion to descriptive analyses.

Isolating the effects of religiosity on health presents notable empirical challenges: religious people are generally wealthier, enjoy higher levels of education, and are in more stable marriages ([Gruber, 2005](#)). All these characteristics are expected to positively affect individual (objective or self-assessed) physical and mental health. To overcome these empirical challenges, we ran an experiment through an online survey that was administered to healthcare workers in Italy between June 15th and August 31st, 2020, while the pressure of the first wave of the pandemic was fading away. The experiment directly manipulates the salience of individual religiosity through implicit priming, as in [Benjamin et al. \(2016\)](#). Hence, our original survey included two versions of the same 50-item questionnaire, one with a religious priming treatment (*i.e.*, unscrambling statements including “sacred” words) and one with standard neutral questions. Participants were randomly assigned to one of these two versions. Overall, we collected more than 15,000 questionnaires, with approximately 5,000 respondents among physicians and more than 9,000 among nurses. Based on the answers to the frequency of feelings of distress (*e.g.*, feeling frequently or constantly depressed or anxious), we construct our main outcome of interest, *Mental distress*, which captures severe mental distress statuses. In addition, we generate an index for the level of *Concerns*, which groups the potential causes of poor self-assessed mental health (*e.g.*, being concerned for your relatives’ health or being concerned about the level of stress in the workplace). Since both measures refer to the period from the end of February to June 15th, 2020, our estimated effects refer to coping with past traumatic events, in the spirit of the literature on dealing with PTSD.

We show that priming religiosity decreases self-assessed mental distress by -9.5% in the full sample, with physicians and nurses reporting a -7.6% and a -11.2% decrease, respectively. Among the components of *Mental distress*, the main effect on physicians is feeling depressed and having sleeping problems. In contrast, the effect on nurses arises from all dimensions of mental distress, including fearing that something bad is about to happen and feeling anxious. The results are stronger in the subsample of respondents working in Northern regions, the area most affected by the virus during the first wave. These findings are robust to controlling for the main socioeconomic characteristics of the respondent, the characteristics of her work status (*e.g.*, working in the public or private sector, working in shifts), her own experience with the virus (*e.g.*, testing positive or working with COVID-19 patients), and the experience of her colleagues (*e.g.*, becoming infected or dying from COVID-19). The results are also robust to the use of regional fixed effects. This is relevant since the Italian healthcare system is organized at the regional level (20 regions), and the intensity of the first wave of the pandemic was remarkably different across regions, with Southern regions only marginally affected. The effects on *Mental distress* are also confirmed through an analysis of the impact on *Concerns*, especially on concerns related to *Stress at the workplace*, *Personal health*, and *Relatives health*.

Based on the assumption that the treatment effects should be stronger when the traumatic

experience has a potentially deeper impact, we address the role of religion as a coping mechanism in two ways. First, we run the baseline analysis on subcategories of workers who were, on average, under more distress as far as mental health is concerned (*i.e.*, women) and who were more exposed to the first wave (*i.e.*, hospital workers). As pointed out by [Astbury \(2001\)](#), gender is indeed a structural determinant of mental health, with women being more affected by poor mental health conditions, especially when ordinary conditions are considered (*e.g.*, depression, anxiety). This means that women are more likely to report higher mental distress, and as a consequence, the activation of a coping mechanism should have a larger impact on that group. This assumption is confirmed by our results: our religious priming generates a reduction in reporting extremely poor mental status of -9.9% in the subgroup of women. Likewise, healthcare workers operating in hospitals were extremely exposed to infected patients and the consequences of a lack of organization. Consistently, the estimated effect on these workers implies a reduction of -11.2% in reporting poor mental status.

As a second step, we analyze the differential response based on the type of situation experienced during the first wave, identifying those situations most correlated with high levels of stress. Following [Barili et al. \(2020\)](#), the definition of these situations differs between nurses and physicians, with physicians suffering more from the lack of medical personnel and nurses suffering more from colleagues testing positive or dying from the virus. The results show that the effect of the treatment is stronger in situations regarded as more stressful and, as such, more likely to produce bad consequences for mental health. When we analyze the heterogeneous effects of the stressful situations across categories of workers, we still observe a profession-specific response to the treatment, except for in a very few specific situations (*e.g.*, being reassigned to a ward different from their original one, which has a similar effect for both physicians and nurses when they are hospital workers).

Finally, we check whether our priming implicitly activates a strictly defined inner religious identity. This is an important step to clarify how the coping mechanism can be activated with different types of individuals (*e.g.*, [Akerlof and Kranton \(2000\)](#)). We consider both a more subjective proxy (*i.e.*, self-classification as a religious person) and a less subjective proxy (*i.e.*, prevalence of religious weddings in the province of birth) to identify respondents with different degrees of religious/spiritual identity. We test the results on several subsamples (*i.e.*, the full sample, females, all hospital workers and hospital workers by profession), observing that when the difference between more and less religious respondents is significant, more religious respondents report a stronger effect of the priming (*i.e.*, they present significantly lower levels of mental distress when treated). However, this result, consistent with the literature, holds uniquely in the subsample of physicians, not explaining, in a robust way, variations in the subsample of nurses. We argue that strict classifications of types should not be the only measure used to proxy for the spirituality of individuals who, in the case of Italian nurses, were endorsed by a unique media campaign. The campaign, which was quite intense during the first wave of the pandemic, identified nurses as the primary focus of public attention on healthcare workers' extraordinary effort, naming and portraying them as *COVID Angels*. With qualitative evidence,

we argue that our treatment activated a *COVID Angels* identity dimension, indirectly made salient by religious priming, which provides support for the stronger effects found among nurses. This result is important since it stresses the role in reinforcing coping mechanisms that overall social support and appraisal might play in times of extreme distress.

Our results contribute to the literature on COVID-19 and the mental health of healthcare workers and to the discussion of religion as a coping mechanism during the COVID-19 pandemic. Recently, [Bentzen \(2020\)](#) has shown that Google searches on religious topics increased by 50% during the first wave at a global scale. In addition, descriptive evidence suggests that individuals who were more heavily exposed to COVID-19 during the outbreak or who were religious relied more on religious coping during the first wave ([Molteni et al., 2020](#)).² However, we improve on the existing evidence by priming religiosity to test the channels and magnitudes of its effects on the perception of distressing situations experienced in the recent past.

The paper is organized as follows. Section 2 describes the main features of the Italian healthcare system, the spread of the COVID-19 pandemic in the country and the institutional/governmental response to it. Section 3 provides a description of our survey and of the related religious priming while defining our outcomes of interest. Section 4 illustrates our dataset, and Section 5 presents our econometric specification and the baseline results. Section 6 examines when and for whom religion played a stronger role as a coping mechanism, while Section 7 further investigates the relationship between religious priming and individual spirituality. Section 8 concludes.

2 Institutional Background

2.1 The Healthcare System

In Italy, healthcare services are managed at the local level, with 20 regions in charge of providing services to their residents. Although bound to national standards set by the central government, regions enjoy wide discretion in regulating and organizing healthcare delivery within their borders ([Ferré et al., 2014](#)). This has resulted in the creation of public hospital networks based on different combinations of hospitals managed by local health authorities (LHAs), independent hospitals (*e.g.*, teaching hospitals) and private accredited institutions ([Anessi-Pessina et al., 2004](#)). The gatekeepers are general practitioners (GPs) for the overall population and pediatricians for people younger than 16. Healthcare workers in public hospitals, GPs, and pediatricians are directly employed by an LHA, and all public hospital workers can only work in one facility under the so-called exclusivity clause. Healthcare workers also work in nursing homes for elderly or disabled people, in agencies specialized in emergency

²One-quarter of the U.S. adult population reports having a stronger faith as a consequence of the pandemic ([Gecewicz, 2020](#)), while in Italy, there was an increase in praying during the first wave. The data for Italy come from the preview of the survey by ([Garelli, 2020](#)), available at <http://www.settimananews.it/chiesa/virus-religiosita-degli-italiani/>.

care, and in local clinics (*e.g.*, in charge of implementing vaccination campaigns, conducting screenings, or offering counseling visits). In addition to physicians and nurses, healthcare personnel include other professional figures, such as dentists, laboratory technicians, obstetricians, and rehabilitation staff. Even though there are regional heterogeneities, ownership of the healthcare facilities is predominantly public, and public hospitals account, on average, for 86% of the overall available beds (83% in Lombardy, which is one of the regions with the largest private-sector presence) (Istat, 2015).

2.2 The First Wave of COVID-19: The Spread of the Virus

The first wave of the pandemic in Italy officially started with the national government’s declaration of the state of emergency on January 31st. However, the acquisition of both invasive and noninvasive instruments and ventilation devices and the allocation of protective masks to healthcare personnel only took place approximately a month after the declaration of the state of the emergency; at the time of this declaration, many still considered COVID-19 a nonharmful virus.³ By the end of February 2020, the number of reported positive cases increased dramatically, and the Italian National Health Service classified Lombardy and Veneto (two Northern Italian regions) as *COVID-19 red zones*. This classification implied the adoption of strict quarantine measures, restrictions on movements of persons, and the temporary closure of schools, shops, and industrial activities (Sebastiani et al., 2020). By the beginning of March, several other areas in the North of the country were labeled red zones, and starting from March 9th until mid-May, dramatic restrictions on economic activities and mobility of persons were introduced in the entire country.

As a whole, Italy was heavily damaged by the first wave of the COVID-19 pandemic. From the end of February 2020 to mid-June 2020, the total number of assessed cases was 237,290, leading to the deaths of 34,371 people.⁴ As is apparent from Figure 1, the Northern part of the country was the most affected, with remarkable regional variations in the incidence of COVID-19 mortality, as shown in Figure 2.⁵ A more comprehensive view of the hardship of the first wave comes from the comparison of the total mortality during the months of the first wave with the average mortality registered in the same months during the period 2015-2019. As shown in Figure 3, the mortality in January-February 2020 was smaller than that in previous years, while starting from March 2020, there are variations of more than 100% against the levels in the 2015-2019 period.

³Some politicians, such as the mayors of the cities of Milan and Bergamo (both located in Lombardy) and representatives of political parties or businesses associations encouraged the public to adopt a “business as usual” approach.

⁴These figures are taken from the Ministry of Health website:
<http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1>.

⁵In exploring the geography-specific intensity of the COVID-19 outbreak, we consider alternative measures of death rates produced by Istat and Iss (2020): the COVID-19 mortality rate adjusted for demographic differences between provinces (Figure 2 (a)); the share of COVID-19 deaths over the total number of deaths registered in the relevant period and location (Figure 2 (b)); the percentage variation in the number of deaths registered in 2020 in comparison with the average value registered in the period 2015-2019 (Figure 3 presents the monthly values of this index).

2.3 The First Wave of COVID-19: The Response to the Virus

While the principles and criteria to contain and mitigate the epidemic through case detection, contact tracing, isolation, physical distancing, and mobility restrictions, as well as equipment expansion and staff redeployment, were nationally formalized, each region organized the implementation in its own way and at its own pace (Binkin et al., 2020). As a consequence, regional responses to the first wave of the COVID-19 pandemic differed considerably in terms of investments and timing. For example, clear differences lay in the use of swab testing and in contact-tracing procedures.⁶ Many regions (*e.g.*, Lombardy) followed the national protocol and tested the symptomatic cases only, while other regions (*e.g.*, Veneto) opted for a large-scale procedure.

Since nearly 20% of the hospitalized cases needed two weeks or more of intensive care (ISS, 2020) and 88% required assisted ventilation (Grasselli et al., 2020), enormous efforts were made to increase the number of beds in intensive care units (ICUs), through, for instance, the conversion of hospital wards into ICUs and the creation of temporary hospitals for the intensive care of COVID-19 patients. As shown in Figure 4, at the peak of the first wave of the pandemic, the saturation rate of the ICU beds in the country was approximately 75%, with that of Lombardy and Piedmont being close to 150% (Fanelli et al., 2020).⁷ These transformations meant that a substantial part of the healthcare staff needed to be reassigned from old tasks to new duties overnight and not always with clear guidelines.

During the first wave, healthcare workers faced an unprecedented emergency situation. The numbers of positive cases rapidly depleted local resources, especially in the Northern regions, making it necessary to reassign some of the medical personnel as contact tracers (Barili et al., 2020). The government had to ask retired staff to return to work and to allocate extra funding for the recruitment of 20,000 workers. The work of healthcare professionals was also threatened by shortages of protective supplies (*e.g.*, gloves, medical masks, goggles, and gowns), further increasing their risk of infection, and by continuous changes in the health protocols. Moreover, their higher risk of contagion was overlooked for most of the first wave of the pandemic.⁸ In contrast to the general public, healthcare workers were also excluded from the preventive quarantine measures prescribed after being in contact with a COVID-19-positive patient, and they could stop working only in cases of respiratory symptoms or if they tested positive Barili

⁶With respect to contact tracing, the national protocol required to notify the related LHA of all the new cases; in the LHAs, explicitly trained nurses and health staff carried out the so-called epidemiological interview. In addition, LHAs had to follow up, isolate and put under surveillance all the recent and close contacts of the interviewed cases.

⁷Contextually, to control for the entry of highly infectious patients into hospitals and reduce the risk of intrahospital contagion, regional and local authorities also activated special emergency numbers and made agreements with the Red Cross and with nongovernmental organizations to recruit additional staff and emergency devices. They allowed only urgent cases to directly access hospitals; they organized pretriage pathways outside hospitals (De Filippo et al., 2020) and created the Special Unit for the Continuity of Care (USCA) to handle the home care of less severe cases. Additionally, resident physicians in other disciplines and generic licensed physicians were called upon to replace or support GPs who had fallen ill or had been quarantined (Barili et al., 2020).

⁸For most of the first wave, the hazard associated with both asymptomatic and presymptomatic cases was not yet generally recognized. At the end of the first wave, up to 10% of Italy's confirmed COVID-19 cases were healthcare workers, and between March 11th and May 8th, 178 physicians died of COVID-19 (FNOMCeO, 2020).

et al. (2020).

For all the above reasons, the resilience, extraordinary effort and commitment shown by Italian healthcare workers soon came into the spotlight. Many pictures of nurses with bloodied and bruised faces from their heavy duties or from falling asleep at their desks circulated online (Figure 18), and social media feeds filled with encouraging, heartfelt and grateful messages. During the hardest times of the stay-at-home orders, when healthcare workers were among the very few categories allowed to be outside, newspapers, TV news, and talk shows constantly referred to healthcare personnel as *heroes* and *angels*. Public figures, such as Pope Francis, thanked all the Italian healthcare workers for their heroic service.⁹ One image showing a nurse with angel’s wings cradling the Italian peninsula in her arms, a *COVID angel*, became symbolic of healthcare workers’ dedication during the first wave (Figure 5). The same image was painted over the walls of one of the most heavily affected hospitals in Lombardy as a sign of gratitude toward the extraordinary work done by these workers.¹⁰ This unexpected public reaction mainly underscores the sense of community and gratitude, possibly giving meaning to the hardships of this exhausting work.

3 Survey

3.1 Participants and General Procedure

To understand the impact of religious identity on healthcare workers’ self-assessed mental health, we ran an online survey between June 15th and August 31st, 2020. Given the end of the main mobility restrictions imposed on June 3rd, this time window can be considered the post-first wave period in Italy. Before launching the survey, we collected the email addresses of potential participants from different sources: the provincial boards of physicians and nurses repositories (108 provinces), hospital websites, and representative associations, some of which advertised and promoted our survey (see Appendix A, Figure A1 and Table A1). Our final contact list included approximately 265,000 email addresses. Each contact received an initial invitation by email followed by 2 reminders (1 and 2 weeks after the first invitation). In each email, we explained that the survey was about the working conditions of healthcare personnel in Italy and that participation was possible using any electronic device (*i.e.*, PC, tablet or smartphone) with an internet connection. Potential participants were also informed that the expected completion time was approximately 15 minutes.

The survey included two versions of the same questionnaire. One version of the survey incorporated religious priming (see Section 3.2), whereas the other version had neutral priming.

⁹<https://www.vaticannews.va/en/pope/news/2020-06/pope-francis-audience-doctors-health-care-priests-covid-pandemic1.html>.

¹⁰Positive initiatives directed in particular at nurses (such as the #WEWITHNURSES campaign) have continued even during the second wave. For instance, the company Barilla changed the packaging of one of its products (*i.e.*, its Abbracci [“Hugs”] cookies) to promote a charity campaign to sustain nurses affected by COVID-19 and their families (Figure A2).

Participants were randomly assigned to one of these two versions through a random redirect tool compatible with the Google Forms platform, which was used to design the survey.¹¹ Overall, we included 50 short questions, whose English translations are available in Appendix B.

During the first week of the survey – between June 15th and June 22nd – we ran a pilot with about a 2% share (*i.e.*, 5,000 contacts, randomly selected) of the full sample to check whether the invitation email and the length and structure of the survey were sufficiently comprehensible and effective for collecting valid responses. No particular concerns arose during the pilot; therefore, starting from June 22nd, the survey was emailed to the full sample.¹² Figure 6 illustrates the timeline of the survey, and Figure 7 illustrates the trend in the completed questionnaires.

The geographical distribution of the survey responses is shown in Figure 8 (a) for the full sample, which includes 5,077 physicians distributed as in Subfigure (b), and 9,069 nurses distributed as in Subfigure (c). Our main focus was on Northern regions, since they were the most affected by the virus. In Figure 9, we report the number of respondents per profession (*i.e.*, physicians vs. nurses) out of the total number of professionals working in both the private and public sectors (as in [Istat \(2015\)](#)). Overall, the coverage rate in Northern regions was approximately 6.6% for physicians and 4.5% for nurses.¹³

In addition to nurses and physicians, other health workers – safety inspectors, controllers, administrative personnel, biologists, and researchers – were also invited to participate in the survey. This was done to capture the impact of COVID-19 on these professionals, who were often reassigned as contact tracers during the first wave of the pandemic, and to more accurately account for the regional disparities in the availability of healthcare personnel.

3.2 Religious Priming

The efficacy of a priming treatment can be explained in light of self-categorization theory in psychology ([James, 2007](#); [Turner, 2010](#)), formalized in economics by [Akerlof and Kranton \(2000\)](#): every individual has multiple social identities based on her religion, gender, occupation, etc., and at a particular moment, individual behavior could be influenced more by the norms of the salient identity than by the nonsalient ones. Therefore, by using priming to make one identity more salient, it is possible to activate identity-salient norms, shedding new light not only on

¹¹The choice of the Google Forms platform was made to ensure a user-friendly interface to reduce the impact of formatting on response times and the probability of respondents making mistakes and thereby avoid jeopardizing participant engagement and response validity.

¹²In the empirical analysis, we pooled the data from the pilot with the full-sample observations since no substantial changes were made to the survey after the pilot.

¹³The coverage for physicians ranges between a minimum of 2.7% in Friuli-Venezia-Giulia and a maximum of 11.6% in Veneto, while that for nurses ranges between 0.5% in Valle d’Aosta and 7.2% in Trentino-Alto Adige. Considering the entire country, the response rate is 5.7%, meaning an average coverage of approximately 0.2% and 0.9% for physicians and nurses, respectively. This difference in survey responses across Italian macro areas is quite common; see, for example, [Simione and Gnagnarella \(2020\)](#), [Mazzoleni et al. \(2019\)](#), or [Albano et al. \(2020\)](#). Overall, it is not possible to compare our response rate and coverage with those of previous studies, as our survey potentially targeted all Italian healthcare workers rather than workers in specific hospitals or geographical areas within a country.

their effects on behavior but also on which norms are associated with the primed identity.

Following the approach implemented in [Shariff and Norenzayan \(2007\)](#); [Srull and Wyer \(1979\)](#) and empirically validated in [Benjamin et al. \(2016\)](#), who show that priming significantly increases the salience of participants’ religious identity, we create two versions of the same questionnaire. The first version makes salient the participants’ religious identity through implicit religious priming (the religious priming group), while the second version primes no particular identity with neutral priming (the control group). The priming mechanism consists of a sentence-unscrambling task where subjects have to unscramble 10 five-word sentences by dropping an extra word from each sentence and creating a four-word phrase that makes grammatical sense. To make the priming subtle enough, five of the scrambled sentences contained religiosity-related words (*i.e.*, *spirit*, *divine*, *God*, *sacred*, and *prophet*), while the remaining sentences contained only neutral words. The neutral priming treatment instead used only neutral words in all sentences. This task made participants’ religious identity salient using religious words since their semantic relatedness sparked participants’ mental associations with religiosity. To check for any experimenter demand effect of the priming, at the end of the survey, we also asked participants to speculate on the objectives of the study, and no one reported anything related to their religious identity.

After being exposed to the treatment, respondents were asked questions related to, among others, their mental health status and their main concerns during the COVID-19 pandemic. Comparing the answers provided in the two versions allows us to estimate the marginal effect of religious identity on workers’ self-assessed mental health as defined in Section 3. We also asked participants in both the treatment and the control groups to declare their religious beliefs.¹⁴

3.3 Outcomes Definition

We proxy self-assessed mental health using several measures. The first and most relevant outcome is *Mental distress*, which is a discrete variable ranging from 0 (*i.e.*, no severe mental distress) to 4 (*i.e.*, severe mental distress). This index is the linear sum of the 4 dummies *Depression*, *Anxiety*, *Fear*, and *Sleeping problems*, which are considered the main dimensions of poor mental health. For each of these dimensions, the corresponding dummy tells us if the respondent experienced that specific feeling (*e.g.*, feeling depressed) *very often* or *always* between the beginning of the COVID-19 first wave and June 15th, 2020. In Tables A2 and A3, Appendix A, we provide a more detailed description of each outcome.

Similarly, to measure the overall level of concerns, we rely on a second index, *Concerns*, which is a discrete variable ranging from 0 (*i.e.*, no severe concerns) to 7 (*i.e.*, severe concerns), summing 7 dummies: *Stress in the workplace*, *Personal health*, *Relatives health*, *Couple problems*, *Nobody to talk*, *Financial problems*, and *Family problems*. For each type

¹⁴To measure subjects’ religious beliefs, we included a direct question similar to the one from the World Values Survey (WVS): “In daily life, which of the following statements describes you better: (a) I am a practicing religious person, (b) I am a religious non-practicing person, (c) I don’t know if I am religious or not, or (d) I am not a religious person”.

of concern, a related dummy captures whether that specific situation was a cause of very frequent or constant concern for the respondent from the beginning of the pandemic to June 15th.

These individual types of concern are related to both the working conditions and the daily life of workers and potentially represent the main causes of mental distress. Hence, it is not surprising that our two composite indexes (*i.e.*, *Mental distress* and *Concerns*) are positively and strongly correlated (correlation equal to 0.6). For this reason, our primary interest lies in the study of *Mental distress*, while we use *Concerns* to provide further evidence of the dimensions of the psychological burden suffered by healthcare workers.

As a robustness check, we provide an alternative definition of the main outcomes of interest based on a principal component analysis (PCA). The alternatively defined indexes are highly correlated with the baseline measures (*i.e.*, a correlation of 0.835 for *Mental distress-Mental distress PCA* and of 0.888 for *Concerns-Concerns PCA*) and confirms our findings (see Table A7).

4 Data Analysis

Balance tests are presented in Table 1 for the full sample, while Tables 2 and 3 show similar tests for the samples of physicians and nurses. In addition to the usual questions on gender, nationality, age, marital status, and the presence of children in the household, we insert extra questions to capture other significant determinants of mental well-being, such as housing dimensions and whether the respondent lives alone (Amerio et al., 2020; Husky et al., 2020; Liu et al., 2020). The square footage of the accommodation provides valuable information in at least two ways. On the one hand, it is an indirect measure of wealth that is not necessarily captured by workers' income (which we control for): an individual earning a low salary could still belong to a wealthy family. On the other hand, it is a good proxy for feasible social distancing among cohabitants, which might affect the level of concern and distress within the household. Living alone may also capture different aspects of the pandemic experience: if a worker lives alone, she might be more (psychologically) overwhelmed, but at the same time, she could be less concerned about the well-being of others, since there is no risk of infecting cohabitants. We also collect information on the presence of other healthcare workers in the family of origin. This may be an additional source of concern since workers' relatives, if they are health professionals, are exposed to a higher risk of infection; however, sharing the same profession and challenges might aid workers in coping with distress through this extra source of support.

Table 1 shows that on average, 70% of our respondents work in a hospital, 3% in a teaching hospital, 15% in the private sector, and 59% self-classify as religious (practicing or not practicing). A comparison of Tables 2 and 3 shows that nurses are more likely to be younger and female than physicians. Consistently, nurses are also less likely than physicians to have

children, to be married or cohabiting, and to live in a large accommodation. At the same time, they are more likely to have changed their workplace in the past to work in a hospital (especially in a nonteaching hospital) and in the private sector. Physicians are less likely to be subject to work shifts, but they did more overtime work during the first wave of the COVID-19 pandemic. Overall, no significant differences emerge on any of the observable socioeconomic characteristics between the treatment and the control groups.

Figure 10 reports the distribution of *Mental distress* and *Concerns* across the three categories of professionals in our survey: physicians, nurses, and *Other* (i.e., obstetricians, psychologists, and lab technicians, among others). Overall, nurses report higher levels of both mental distress and concerns than the other two categories. Figures 11 and 12 report the distribution of *Mental distress* and *Concerns* across treatment groups and by profession (i.e., physicians vs. nurses). We find a significant difference in both outcomes between the treatment and the control groups. Healthcare workers who receive religious priming report lower levels of self-assessed distress and concerns than the control group. This difference comes mainly from nurses, while the effect is smaller for physicians. In Figure 13, we instead plot how the treatment effect varies with workers' geographical area, finding no significant difference. For both mental distress and levels of concern, we find stronger effects, to some extent, in the Northern and Central parts of the country. Notice also that the average level of concern is slightly higher in the Southern part of country, although the 95% confidence intervals overlap.¹⁵

Finally, considering gender and type of workplace, the main effect of religious priming appears to be driven by females and hospital workers (Figure 14), while working in a COVID-19-related specialty (i.e., ICU, anesthesiology, emergency care, cardiology, pulmonary diseases, infectious diseases) drives the main effect on mental distress only, as shown in Figure 15.

5 The Effects of Religious Priming

We estimate the effect of priming religiosity, mainly focusing on *Mental distress*, using the model in Equation 1 – where *Outcomes* captures the different outcomes as described in Tables A2 and A3 for each healthcare worker i working in region r – and the controls listed in Table 4. In addition, we also control for the COVID-19 death rate, which is based on administrative data for the working province p (108 provinces overall) of the worker, as described in Section 2.2.

¹⁵In Figure A3, we also consider the distribution of *Panic attacks*, a dummy equal to one if the respondent declares she has experienced at least one panic attack and zero otherwise. Although it is apparent that nurses are more likely than physicians to have experienced a panic attack, there are no substantial differences due to priming. This result is important since panic attacks constitute an objective medical condition, and as such, they are not expected to be impacted by ex post exposure to a coping mechanism.

$$\begin{aligned}
Outcomes_{ir} = & \delta Priming_i + \lambda CovidDeath_{ip} + SES'_i \sigma + Providers'_i \gamma + \\
& COVID\ Colleagues'_i \beta + COVID\ Own'_i \pi + \tau_r + \epsilon_{ir}
\end{aligned}
\tag{1}$$

The model accounts for both the worker’s own exposure to COVID-19 (*COVID19 Own*) and colleagues’ experience with the virus (*COVID19 Colleagues*). *COVID19 Colleagues* measures whether the respondent had some colleagues who were infected or died from the virus, while *COVID19 Own* looks at her personal experience by assessing whether the respondent was exposed to or tested positive for the virus, worked overtime, was reassigned to a different ward/function, or had to directly take care of COVID-19 patients. *Providers_i* groups details about the employer, such as, among others, the type of healthcare provider (public vs. private, teaching hospitals, etc.), its quality as perceived by the respondent, the opinion of the respondent on system responsiveness to the emergency, and the lack of personnel as perceived by the respondent in her province of work. Finally, we add region of work fixed effects τ_r to deal with all time-invariant geographical differences, such as population characteristics, macroeconomic factors, cultural attitudes, and organization of the healthcare system.

Figure 16 plots the estimated δ on the full sample and by profession. Making the worker’s religious identity salient significantly decreases the incidence of mental distress, which drops by -9.5% (-0.08 estimated δ out of 0.84, the mean value of mental distress). When we distinguish between physicians and nurses, the treatment effect on physicians is slightly smaller than that on nurses: the magnitude of the effect on physicians is approximately -7.6% (-0.051/0.67), while the effect on nurses is -11.2% (-0.109/0.97). Table 5 considers the different components of mental distress for the entire sample and only for the Northern regions. The effect of religious priming is stronger on the level of self-assessed depression and sleeping problems. At the average value of *Depression*, the treatment triggers a reduction of -17.8% (*i.e.*, -0.023/0.129) overall, of -15.6% among physicians, and of -19.7% among nurses. The magnitude increases when we consider the Northern regions only, where the figures become -19%, -18%, and -20.8%, respectively. The impact on *Sleeping problems* varies between -8.6% (full sample) and -10.2% (nurses) in the full sample and between -10.4% (full sample) and -13.4% (nurses) in the sample of Northern regions. The reduction in the levels of *Fear* and *Anxiety* observed in the full sample is mainly driven by nurses. This result is in line with the fact that nurses are more likely to be exposed to the disease and to work with COVID-19 patients, which might increase the risk of feeling anxious or the fear that something bad is about to occur (Buselli et al., 2020; Giusti et al., 2020; Magnavita et al., 2020; Riello et al., 2020).

As expected given the strong correlation between *Mental distress* and *Concerns*, religious priming also negatively affects the overall level of concern, which decreases by -5.5% (-0.101/1.85) in the full sample (Figure 16). However, the effect is statistically significant only among nurses and is equal to -6.6% (0.144/2.19). Among the 7 variables defining *Concerns*, we focus on the

three dimensions that record the highest averages: concerns about personal health, relatives' health and the level of stress in the workplace.¹⁶ As shown in Table 6, the greatest effect (a -9.4% reduction) is observed with respect to respondents' personal health. Concerns about relatives' health and on the level of stress in the workplace decrease by -3.7% and -2.5%, respectively, after religious priming. Note also that the overall results are mainly driven by nurses (especially by those working in the Northern regions).¹⁷

6 On Whom and When the Effect Counts the Most

Our baseline results are consistent with evidence from other fields, such as neuropsychology and psychiatry, where it has been shown that religion could be an effective means of coping with stress, since it decreases the activation of distress responses in the human brain (Inzlicht and Tullett, 2010; Inzlicht et al., 2011). From a psychological point of view, the idea is that religious beliefs generally provide alternative interpretations of certain events, giving them specific meanings. As stressed by Koenig and Larson (2001), these meanings, in turn, provide a sense of purpose or an interpretation that enhances hope and motivation among religious people. This mechanism could be particularly beneficial for mental health when stress is severe or out of control and originates outside the individual (Frankl, 1959; Strawbridge et al., 1998). Consistent with this approach, we further investigate the idea of religion as a coping mechanism by focusing on our primary outcome of interest (*i.e.*, *Mental distress*) and considering, on the one hand, the subgroups of workers who are more likely to be psychologically overwhelmed by the emergency and, on the other hand, those situations that are correlated with the highest levels of workers' mental distress (Barili et al. (2020)). The general intuition is that if religiosity is a way to cope with stress or, at least in our setting, with self-reported measures of mental distress, then the effect should be stronger for the people on whom and in circumstances when the stressor factors are higher.¹⁸

Hence, we conduct our subgroup analysis on the subsamples of women and of hospital workers. In general, women are more likely to suffer from depression and anxiety than men, while hospital workers were more exposed to the distress of dealing with the emergency. When we estimate Equation 1 on these subsamples, our expectations are confirmed by the coefficients plotted in Figure 17. Priming religiosity triggers a -9.9% (-0.094/0.95) decrease in mental distress among females and a -11.2% decrease among hospital workers (-0.099/0.88). Consistent results are also observed for concerns, for which the effects are stronger among females (-6.5%) and hospital workers (-6.3%) than on the average population (Figure 17). The analysis of the single

¹⁶Overall, 50.5% of respondents declare that they have been extremely (*i.e.*, very often or always) concerned about their relatives' health during the first wave, while 44% have been extremely concerned about the level of stress in their workplace and 23% about their personal health.

¹⁷The results for the remaining components of *Concerns* are presented in Table A5 in Appendix A.

¹⁸As a robustness test, we check whether our main results could be explained by the fact that treated respondents also decide to take greater advantage of leaves (e.g., sick leave, vacations). The results are available in Table A6 and show a basic null effect of the treatment on the likelihood of using leave from work, which could explain a lower incidence of severe mental distress.

component of mental distress, shown in Table 7 for both females and hospital workers, confirms that all components are significantly affected by the treatment, and the main driver seems to be concern about the respondent’s own work, which decreases by 2.8 percentage points for females and by 2.5 percentage points for hospital workers.

When we move on to the identification of the most stressful situations correlated with higher levels of distress, we focus on 7 cases: reporting a lack of personnel at the province of work level, being reassigned after the COVID-19 outbreak, having at least one colleague who was infected with or died of COVID-19, being personally exposed to the virus or testing positive, and working in a COVID-19-related specialty before the outbreak. Using these dummies, for which we control in the baseline specification, we estimate Equation 2, in which we add the interaction term $Priming_i * D_{i*}$.

$$Outcomes_{ir} = \delta Priming_i + \omega Priming_i * D_i^* + \lambda CovidDeath_{ip} + SES_i' \sigma + Providers_i' \gamma + COVID\ Colleague_{i'} \beta + COVID\ Own_{i'} \pi + \tau_r + \epsilon_{ir} \quad (2)$$

where D_i is the dummy for each dimension. This means that δ represents the effect of the treatment on those not experiencing the additional stress factor and $\delta+\omega$ on those experiencing it, while ω indicates whether the difference between the two groups is statistically significant. For instance, δ captures the effect of not being reassigned due to the COVID-19 emergency, $\delta+\omega$ is the effect on those reassigned, and ω is the difference between the two groups.

As shown in Table 8, our treatment has a stronger effect when the situation was more stressful to start with (*i.e.*, the estimated ω is mostly negative and statistically significant). For instance, we estimate a stronger effect on those reassigned than on those not reassigned, on those working in a COVID-19 specialty, and on those who tested positive for COVID-19. However, the large majority of these channels notably do not explain the experience of physicians but do explain the perception of not having enough healthcare workers in the province where the respondent works. By contrast, being reassigned, having infected colleagues, testing positive for COVID-19, and working in a COVID-19 specialty drive the effects on nurses. Table 9 replicates the same analysis on the subsamples of females and hospital workers. All the channels except for being personally affected by COVID-19 (*i.e.*, being exposed or testing positive) exert the expected effects among females. Overall, the effect on physicians is driven by those perceiving a lack of personnel. In the sample of hospital workers, the experience of being reassigned plays the largest role for both physicians and nurses, consistent with the fact that workers in hospitals were more likely to be reassigned due to the transformation of wards into COVID-19 wards. Finally, we also test for a heterogeneous response based on administrative data on the distribution of ICU beds in 2018, plotting the coefficients in Figure A4.¹⁹ The intuition behind this check is that

¹⁹We consider the most updated information available at the time of the analysis (2018). Data on the total number of ICU beds available and their occupancy by COVID-19 patients during the first wave are currently not available. The national agency AGENAS started reporting this information from September 2020 on.

the effect of religious priming should be stronger where the number of ICU beds was lower to start with. Even if the estimated effect goes in that direction, the difference between the two samples (i.e., having more vs. fewer ICU beds) is not always statistically significant, probably because we are not able to obtain access to the real distribution of ICU beds in spring 2020.

We find no evidence of different responses to priming based on the severity of the outbreak immediately before the participation date (Figure A5), and the results are not affected by the day of participation in the survey (Figure A6).²⁰

7 Effective Religious Priming: A Channel

As shown in previous studies, responsiveness to religious cues is related to individual religious beliefs and cultural values (Norenzayan et al., 2013) and to the self-relevancy of priming (Wheeler et al., 2007). Hence, we address the relationship between priming religiosity and classification of the individual as a religious person. Priming should make elements of religiosity and spirituality already present in the respondent more salient. However, it could also be that the spiritual/religious identity of the individual is not exclusively captured by involvement in strictly defined religious activities. For instance, the literature underlines how not only participating in religious services but also attending guided meditation classes have beneficial effects on mental health, lowering anxiety and depression levels through the reinforcement of spiritual identity (Stanley et al. (2011)). Hence, we expect priming to have a greater effect on respondents self-classifying as religious, respondents with a stronger spiritual/religious identity or respondents generally feeling themselves to be somehow related to religiosity/spirituality concepts.

We verify this hypothesis by performing a heterogeneity analysis based on self-classification as a religious person (both practicing and not practicing)²¹ and on the prevalence of religious weddings in the province of birth of the respondent.²² The first measure indicates the respondent’s subjective perception of her religious identity, while the second measure underlines the cultural context of her province of origin. We interact the measures with the treatment to estimate any difference in response based on the spiritual/religious identity of the individual as in Equation 2. The results are presented in Table 10 for the full sample, by

²⁰The severity of the outbreak is computed as the average growth in the number of COVID-19 cases in the province of work of the respondent during the week before the participation date. Additionally, the results presented in Figure A6 show that priming is not affected by the inclusion of a control for the day of participation in the survey.

²¹Self-classification as a religious person is a subjective measure and could be biased by personal experiences occurring immediately before the survey or by differences in the value assigned to each option. Indeed, different individuals may label their behavior differently according to the standard that they have in mind (*e.g.*, an individual who grows up in a very religious context but is not actually practicing that often may classify himself as nonreligious, but he may still maintain his religious identity).

²²The religious weddings indicator is the percentage of religious weddings out of the total number of weddings held in the province of birth of the healthcare worker in 2018 (last available year). The data are collected by the Italian Institute of Statistics (ISTAT). We define a dummy based on the median value of the distribution to identify *more religious* and *less religious* provinces.

profession, and for the subgroups of females and hospital workers. When significant, the estimated difference between more and less spiritual/religious types confirms that more spiritual/religious respondents are more responsive to priming, reporting lower levels of mental distress. This is true in particular for physicians, while the distinction is not significant for nurses.

Nurses tend to categorize themselves as religious less frequently than physicians. Given the nature of the treatment, this would predict a lower effect of religiosity among nurses, but this is not the case according to our baseline results. We argue that the effect on nurses is nevertheless consistent with social identity theory due to the media campaign that focused on nurses and exalted them as *COVID angels*. The strongly significant and negative effect estimated for all subgroups of nurses can be reconciled with the effect of priming by this intense exposure, which may have induced in them a feeling of fulfillment beyond their individual religious identity as commonly defined but that was still made salient by the priming. This result is very relevant when we think about the potential of ad hoc public campaigns to reinforce the effect of coping mechanisms, especially in times of high distress for specific categories of workers.

8 Conclusions

Epidemic outbreaks like the COVID-19 pandemic, which are negative and highly unpredictable events, generate severe emotional distress. Healthcare workers, who are on the front lines in the treatment of patients and the confinement of the infection, are more at risk of feeling fear, anxiety, and exhaustion and of suffering from stress (Prete et al., 2020).

Based on an experimental setting proposed through an online survey directed at Italian healthcare workers, we verify that religion is an effective coping strategy to reduce the levels of reported mental stress and the main concerns that most likely induce distress. Although physicians and nurses tend to use different coping mechanisms in emergency situations (Wong et al., 2005), we show that religious coping remains an effective strategy in both groups (Maraqa et al., 2020; Salman et al., 2020; Shechter et al., 2020).²³

From a policy perspective, recent studies have highlighted the importance of supporting healthcare workers not only in terms of provision of adequate protective equipment and working environments but also from a psychological point of view. In particular, the report WHO (2020) proposes a list of practical tools that can be used to support mental health. Among these tools, the use of effective coping strategies is considered one of the most important tools that each individual can adopt to preserve her mental well-being. Given the positive results observed for religious coping, the spiritual sensibilities of each individual should always be respected, including through the definition of adequate spaces in the workplace dedicated to prayers and meditation. We additionally observe that community acknowledgment of the relevant role played

²³Doctors mostly use action planning strategies, while nurses resort more to disengagement and distraction activities (Wong et al., 2005).

by healthcare workers in saving lives and protecting patients may have strong beneficial effects on their individual mental status. Honoring care and healthcare workers is indeed a second tool suggested by WHO (2020) to lower the psychological distress of health workers.

Compliance with Ethical Standards

Conflicts of interest: The authors declare that they have no conflicts of interest.

References

- Adams-Prassl, A., T. Boneva, M. Golin, and C. Rauh (2020). The impact of the coronavirus lockdown on mental health: evidence from the us. *HCEO Working Paper* (2020-30).
- Akerlof, G. A. and R. E. Kranton (2000). Economics and identity. *The quarterly journal of economics* 115(3), 715–753.
- Albano, D., A. Bruno, F. Bruno, M. Calandri, D. Caruso, A. Clemente, P. Coppolino, D. Cozzi, R. De Robertis, F. Gentili, et al. (2020). Impact of coronavirus disease 2019 (covid-19) emergency on italian radiologists: a national survey. *European radiology* 30(12), 6635–6644.
- Amerio, A., A. Brambilla, A. Morganti, A. Aguglia, D. Bianchi, F. Santi, L. Costantini, A. Odone, A. Costanza, C. Signorelli, et al. (2020). Covid-19 lockdown: Housing built environment’s effects on mental health. *International journal of environmental research and public health* 17(16), 5973.
- Anessi-Pessina, E., E. Cant, and C. Joninii (2004). Phasing out market mechanisms in the italian national health service. *Public Money and Management* 24(5), 309–316.
- Astbury, J. (2001). Gender disparities in mental health. In *Mental health. Ministerial Round Tables 2001, 54th World Health Assemble*, pp. 73–92.
- Barili, E., P. Bertoli, V. Grembi, and V. Rattini (2020). On the drivers of the well-being and satisfaction of healthcare workers during the covid-19 pandemic. *Mimeo*.
- Belloc, M., F. Drago, and R. Galbiati (2016). Earthquakes, religion, and transition to self-government in italian cities. *The Quarterly Journal of Economics* 131(4), 1875–1926.
- Benjamin, D. J., J. J. Choi, and G. Fisher (2016). Religious identity and economic behavior. *Review of Economics and Statistics* 98(4), 617–637.
- Bentzen, J. (2020). In crisis, we pray: Religiosity and the covid-19 pandemic. *CEPR Discussion Paper No. DP14824*.
- Binkin, N., S. Salmaso, F. Michieletto, and F. Russo (2020). Protecting our health care workers while protecting our communities during the covid-19 pandemic: a comparison of approaches and early outcomes in two italian regions, italy, 2020. *medRxiv*.
- Bohlken, J., F. Schömig, M. R. Lemke, M. Pumberger, and S. G. Riedel-Heller (2020). Covid-19 pandemic: Stress experience of healthcare workers—a short current review. *Psychiatrische Praxis* 47(4), 190–197.

- Brandt, M. J. and P. Henry (2012). Psychological defensiveness as a mechanism explaining the relationship between low socioeconomic status and religiosity. *International Journal for the Psychology of Religion* 22(4), 321–332.
- Bulbulia, J. (2004). The cognitive and evolutionary psychology of religion. *Biology and philosophy* 19(5), 655–686.
- Buselli, R., M. Corsi, S. Baldanzi, M. Chiumiento, E. Del Lupo, V. Dell’Oste, C. A. Bertelloni, G. Massimetti, L. Dell’Osso, A. Cristaudo, et al. (2020). Professional quality of life and mental health outcomes among health care workers exposed to sars-cov-2 (covid-19). *International journal of environmental research and public health* 17(17), 6180.
- Cabarkapa, S., S. E. Nadjidai, J. Murgier, and C. H. Ng (2020). The psychological impact of covid-19 and other viral epidemics on frontline healthcare workers and ways to address it: A rapid systematic review. *Brain, behavior, & immunity-health*, 100144.
- Cai, H., B. Tu, J. Ma, L. Chen, L. Fu, Y. Jiang, and Q. Zhuang (2020). Psychological impact and coping strategies of frontline medical staff in hunan between january and march 2020 during the outbreak of coronavirus disease 2019 (covid-19) in hubei, china. *Medical science monitor: international medical journal of experimental and clinical research* 26, e924171–1.
- Chen, D. L. (2010). Club goods and group identity: Evidence from islamic resurgence during the indonesian financial crisis. *Journal of political Economy* 118(2), 300–354.
- Chew, Q. H., F. L.-A. Chia, W. K. Ng, W. C. I. Lee, P. L. L. Tan, C. S. Wong, S. H. Pua, V. G. Shelat, E.-J. D. Seah, C. W. T. Huey, et al. (2020). Perceived stress, stigma, traumatic stress levels and coping responses amongst residents in training across multiple specialties during covid-19 pandemic—a longitudinal study. *International Journal of Environmental Research and Public Health* 17(18), 6572.
- De Filippo, O., F. D’Ascenzo, F. Angelini, P. P. Bocchino, F. Conrotto, A. Saglietto, G. G. Secco, G. Campo, G. Gallone, R. Verardi, et al. (2020). Reduced rate of hospital admissions for aacs during covid-19 outbreak in northern italy. *New England Journal of Medicine*.
- Dong, Z.-Q., J. Ma, Y.-N. Hao, X.-L. Shen, F. Liu, Y. Gao, and L. Zhang (2020). The social psychological impact of the covid-19 pandemic on medical staff in china: A cross-sectional study. *European Psychiatry* 63(1).
- Ellison, C. G. and L. K. George (1994). Religious involvement, social ties, and social support in a southeastern community. *Journal for the scientific study of religion*, 46–61.
- Fanelli, S., G. Lanza, A. Francesconi, and A. Zangrandi (2020). Facing the pandemic: The italian experience from health management experts’ perspective. *The American Review of Public Administration* 50(6-7), 753–761.
- Ferré, F., A. G. de Belvis, L. Valerio, S. Longhi, A. Lazzari, G. Fattore, W. Ricciardi, and A. Maresso (2014). Italy: Health system review. *Health Systems in Transition* 16(4), 1–168.
- FNOMCeO (2020). List of doctors who died during the covid-19 epidemic.
- Folkman, S. and R. S. Lazarus (1984). *Stress, appraisal, and coping*. New York: Springer Publishing Company.

- Frankl, V. (1959). Man's search for meaning. *New York: Simon and Schuster*.
- García-Fernández, L., V. Romero-Ferreiro, López-Roldán, S. P. D., Padilla, I. Calero-Sierra, M. Monzó-García, J. Pérez-Martín, and R. Rodríguez-Jimenez (2020). Mental health impact of covid-19 pandemic on spanish healthcare workers. *Psychological Medicine*, 1–3.
- Garelli, F. (2020). Virus e religiosità degli italiani. *Mimeo*.
- Gecewicz, C. (2020). Few americans say their house of worship is open, but a quarter say their faith has grown amid pandemic. *Pew Research Center*.
- Gershon, R., L. A. Dernehl, E. Nwankwo, Q. Zhi, and K. Qureshi (2016). Experiences and psychosocial impact of west africa ebola deployment on us health care volunteers. *PLoS currents* 8.
- Giuntella, O., K. Hyde, S. Saccardo, and S. Sadoff (2021). Lifestyle and mental health disruptions during covid-19. *Proceedings of the National Academy of Sciences* 118(9).
- Giusti, E. M., E. Pedrolì, G. E. D'Aniello, C. S. Badiale, G. Pietrabissa, C. Manna, M. S. Badiale, G. Riva, G. Castelnovo, and E. Molinari (2020). The psychological impact of the covid-19 outbreak on health professionals: a cross-sectional study. *Frontiers in Psychology* 11.
- Grasselli, G., A. Zangrillo, A. Zanella, M. Antonelli, L. Cabrini, A. Castelli, D. Cereda, A. Coluccello, G. Foti, R. Fumagalli, et al. (2020). Baseline characteristics and outcomes of 1591 patients infected with sars-cov-2 admitted to icus of the lombardy region, italy. *Jama* 323(16), 1574–1581.
- Gruber, J. H. (2005). Religious Market Structure, Religious Participation, and Outcomes: Is Religion Good for You? *Advances in Economic Analysis & Policy* 5(1).
- Husky, M. M., V. Kovess-Masfety, and J. D. Swendsen (2020). Stress and anxiety among university students in france during covid-19 mandatory confinement. *Comprehensive Psychiatry* 102, 152191.
- Immerzeel, T. and F. Van Tubergen (2013). Religion as reassurance? testing the insecurity theory in 26 european countries. *European sociological review* 29(2), 359–372.
- Inzlicht, M. and A. M. Tullett (2010). Reflecting on god: Religious primes can reduce neurophysiological response to errors. *Psychological Science* 21(8), 1184–1190.
- Inzlicht, M., A. M. Tullett, and M. Good (2011). The need to believe: a neuroscience account of religion as a motivated process. *Religion, brain & behavior* 1(3), 192–212.
- ISS (2020). Epidemia covid-19, aggiornamento nazionale: 23 aprile 2020.
- Istat (2015). HEALTH FOR ALL Database.
- Istat and Iss (2020). Impatto dell'epidemia covid19 sulla mortalità totale della popolazione residente. periodo gennaio-maggio 2020. *Rapporto ISS ISTAT July*.
- James, W. (2007). *The principles of psychology*, Volume 1. Cosimo, Inc.
- Koenig, H. G. (1998). Religious attitudes and practices of hospitalized medically ill older adults. *International Journal of Geriatric Psychiatry* 13(4), 213–224.
- Koenig, H. G. and D. B. Larson (2001). Religion and mental health: Evidence for an association. *International Review of Psychiatry* 13(2), 67–78.

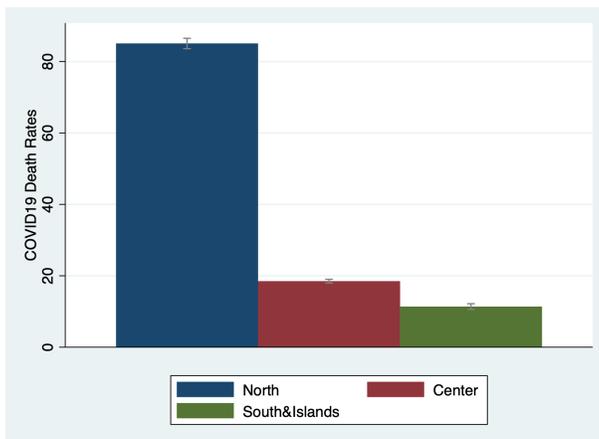
- Labrague, L. J. and J. A. A. De Los Santos (2020). Covid-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and social support. *Journal of nursing management* 28(7), 1653–1661.
- Lee, S. M., W. S. Kang, A.-R. Cho, T. Kim, and J. K. Park (2018). Psychological impact of the 2015 mers outbreak on hospital workers and quarantined hemodialysis patients. *Comprehensive psychiatry* 87, 123–127.
- Lim, C. and R. D. Putnam (2010). Religion, social networks, and life satisfaction. *American sociological review* 75(6), 914–933.
- Liu, Y., H. Chen, N. Zhang, X. Wang, Q. Fan, Y. Zhang, L. Huang, B. Hu, and M. Li (2020). Anxiety and depression symptoms of medical staff under covid-19 epidemic in china. *Journal of Affective Disorders* 278, 144–148.
- Lu, Y.-C., B.-C. Shu, Y.-Y. Chang, et al. (2006). The mental health of hospital workers dealing with severe acute respiratory syndrome. *Psychotherapy and psychosomatics* 75(6), 370–375.
- Magnavita, N., G. Tripepi, and R. R. Di Prinzio (2020). Symptoms in health care workers during the covid-19 epidemic. a cross-sectional survey. *International journal of environmental research and public health* 17(14), 5218.
- Maraqa, B., Z. Nazzal, and T. Zink (2020). Palestinian health care workers’ stress and stressors during covid-19 pandemic: A cross-sectional study. *Journal of Primary Care & Community Health* 11, 2150132720955026.
- Mazzoleni, G., M. Barbareschi, M. Basciu, D. Fassinato, P. Viani, F. Vittadello, M. Truini, G. De Rosa, and S. Mezzopera (2019). National survey of anatomical pathology centres in italy: the questionnaire. *Pathologica-Journal of the Italian Society of Anatomic Pathology and Diagnostic Cytopathology* 111(1), 4–12.
- Molteni, F., R. Ladini, F. Biolcati, A. M. Chiesi, G. M. Dotti Sani, S. Guglielmi, M. Maraffi, A. Pedrazzani, P. Segatti, and C. Vezzoni (2020). Searching for comfort in religion: insecurity and religious behaviour during the covid-19 pandemic in italy. *European Societies*, 1–17.
- Muller, R. A. E., R. S. Ø. Stensland, R. S. van de Velde, et al. (2020). The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: a rapid systematic review. *Psychiatry Research*, 113441.
- Norenzayan, A., J. Henrich, and E. Slingerland (2013). A synthesis. *Cultural evolution: Society, technology, language, and religion* 12, 365.
- Oreffice, S. and C. Quintana-Domeque (2020). Gender inequality in covid-19 times: Evidence from uk prolific participants. *IZA Discussion Paper*.
- Pappa, S., V. Ntella, T. Giannakas, V. G. Giannakoulis, E. Papoutsis, and P. Katsaounou (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the covid-19 pandemic: A systematic review and meta-analysis. *Brain, behavior, and immunity*.
- Pargament, K. I. (2001). *The psychology of religion and coping: Theory, research, practice*. Guilford press.

- Patel, R. S., R. Bachu, A. Adikey, M. Malik, and M. Shah (2018). Factors related to physician burnout and its consequences: a review. *Behavioral Sciences* 8(11), 98.
- Phua, D., H. Tang, and K. Tham (2005). Coping responses of emergency physicians and nurses to the 2003 severe acute respiratory syndrome outbreak. *Academic emergency medicine* 12(4), 322–328.
- Preti, E., V. Di Mattei, G. Perego, F. Ferrari, M. Mazzetti, P. Taranto, R. Di Pierro, F. Madeddu, and R. Calati (2020). The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Current psychiatry reports* 22(8), 1–22.
- Proto, E. and C. Quintana-Domeque (2021). Covid-19 and mental health deterioration by ethnicity and gender in the uk. *PloS one* 16(1), e0244419.
- Riello, M., M. Purgato, C. Bove, D. MacTaggart, and E. Rusconi (2020). Prevalence of post-traumatic symptomatology and anxiety among residential nursing and care home workers following the first covid-19 outbreak in northern italy. *Royal Society Open Science* 7(9), 200880.
- Salman, M., M. H. Raza, Z. U. Mustafa, T. M. Khan, N. Asif, H. Tahir, N. Shehzadi, and K. Hussain (2020). The psychological effects of covid-19 on frontline healthcare workers and how they are coping: a web-based, cross-sectional study from pakistan. *medRxiv*.
- Sebastiani, G., M. Massa, and E. Riboli (2020). Covid-19 epidemic in italy: evolution, projections and impact of government measures. *European journal of epidemiology* 35(4), 341.
- Senga, M., K. Pringle, A. Ramsay, D. M. Brett-Major, R. A. Fowler, I. French, M. Vandi, J. Sellu, C. Pratt, J. Saidu, N. Shindo, and D. G. Bausch (2016). Factors underlying ebola virus infection among health workers, kenema, sierra leone, 2014–2015. *Clinical Infectious Diseases* 63(4), 454–459.
- Shah, K., D. Kamrai, H. Mekala, B. Mann, K. Desai, and R. S. Patel (2020). Focus on mental health during the coronavirus (covid-19) pandemic: applying learnings from the past outbreaks. *Cureus* 12(3).
- Shariff, A. F. and A. Norenzayan (2007). God is watching you: Priming god concepts increases prosocial behavior in an anonymous economic game. *Psychological science* 18(9), 803–809.
- Shechter, A., F. Diaz, N. Moise, D. E. Anstey, S. Ye, S. Agarwal, J. L. Birk, D. Brodie, D. E. Cannone, B. Chang, et al. (2020). Psychological distress, coping behaviors, and preferences for support among new york healthcare workers during the covid-19 pandemic. *General hospital psychiatry* 66, 1–8.
- Sibley, C. G. and J. Bulbulia (2012). Faith after an earthquake: A longitudinal study of religion and perceived health before and after the 2011 christchurch new zealand earthquake. *PloS one* 7(12), e49648.
- Simione, L. and C. Gnagnarella (2020). Differences between health workers and general population in risk perception, behaviors, and psychological distress related to covid-19 spread in italy. *Frontiers in psychology* 11, 2166.
- Sinding Bentzen, J. (2019). Acts of god? religiosity and natural disasters across subnational world districts. *The Economic Journal* 129(622), 2295–2321.
- Solomon, S., J. Greenberg, and T. Pyszczynski (1991). A terror management theory of social behavior: The psychological functions of self-esteem and cultural worldviews. In *Advances in experimental social psychology*, Volume 24, pp. 93–159. Elsevier.

- Srull, T. K. and R. S. Wyer (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social psychology* 37(10), 1660.
- Stanley, M. A., A. L. Bush, M. E. Camp, J. P. Jameson, L. L. Phillips, C. R. Barber, D. Zeno, J. W. Lomax, and J. A. Cully (2011). Older adults' preferences for religion/spirituality in treatment for anxiety and depression. *Aging and Mental Health* 15(3), 334–343.
- Stolz, J. (2009). Explaining religiosity: towards a unified theoretical model 1. *The British journal of sociology* 60(2), 345–376.
- Strawbridge, W. J., S. J. Shema, R. D. Cohen, R. E. Roberts, and G. A. Kaplan (1998). Religiosity buffers effects of some stressors on depression but exacerbates others. *Journals of Gerontology: Social Sciences* 53B(3), 18–126.
- Turner, J. C. (2010). Social categorization and the self-concept: A social cognitive theory of group behavior. *Key readings in social psychology. Rediscovering social identity*.
- Vail, K. E., Z. K. Rothschild, D. R. Weise, S. Solomon, T. Pyszczynski, and J. Greenberg (2010). A terror management analysis of the psychological functions of religion. *Personality and Social Psychology Review* 14(1), 84–94.
- Vindegaard, N. and M. E. Benros (2020). Covid-19 pandemic and mental health consequences: systematic review of the current evidence. *Brain, Behavior, and Immunity*.
- Wańkiewicz, P., A. Szylińska, and I. Rotter (2020). Assessment of mental health factors among health professionals depending on their contact with covid-19 patients. *International Journal of Environmental Research and Public Health* 17(16), 5849.
- Wheeler, S. C., K. G. DeMarree, and R. E. Petty (2007). Understanding the role of the self in prime-to-behavior effects: The active-self account. *Personality and social psychology review* 11(3), 234–261.
- WHO (2020). Mental health and psychological considerations during the COVID-19 outbreak. *WHO Report 1*.
- Wong, T. W., J. K. Yau, C. L. Chan, R. S. Kwong, S. M. Ho, C. C. Lau, F. L. Lau, and C. H. Lit (2005). The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *European Journal of Emergency Medicine* 12(1), 13–18.
- Xiao, H., Y. Zhang, D. Kong, S. Li, and N. Yang (2020). The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (covid-19) in january and february 2020 in china. *Medical science monitor: international medical journal of experimental and clinical research* 26, e923549–1.
- Zapata, O. (2018). Turning to god in tough times? human versus material losses from climate disasters in canada. *Economics of disasters and climate change* 2(3), 259–281.

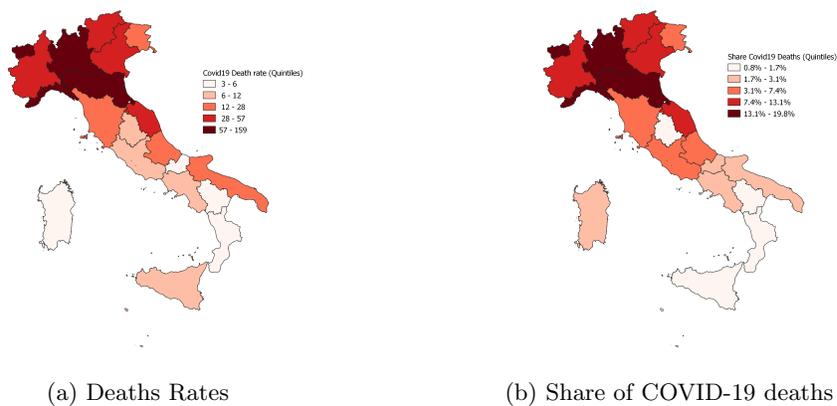
Tables and Figures

Figure 1: COVID-19 Death Rate by Macro Area (Jan-May 2020)



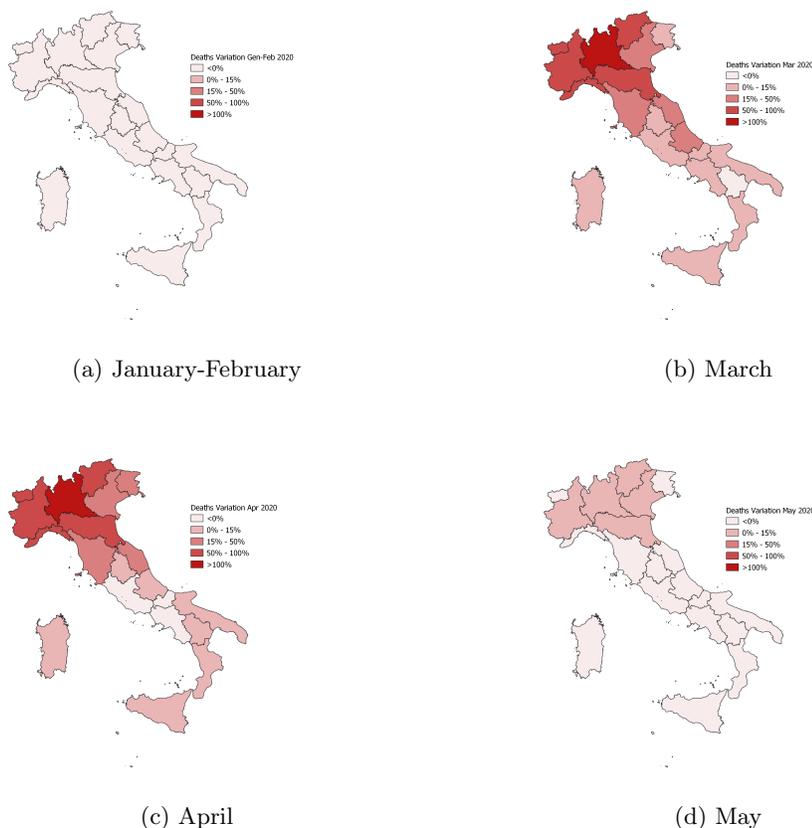
Notes: Average COVID-19 death rate by macro area. The *COVID-19 death rate* is a measure computed by the National Institute of Statistics (ISTAT) together with the Istituto Superiore di Sanità (ISS) on administrative data (Istat and Iss (2020)). The index *death rate*, which refers to the period January-May 2020, represents the mortality rate of COVID-19 standardized according to the demographic characteristics of the resident population in each province (values expressed per 100,000 inhabitants).

Figure 2: COVID-19 Death Rate and COVID-19 Deaths by Region



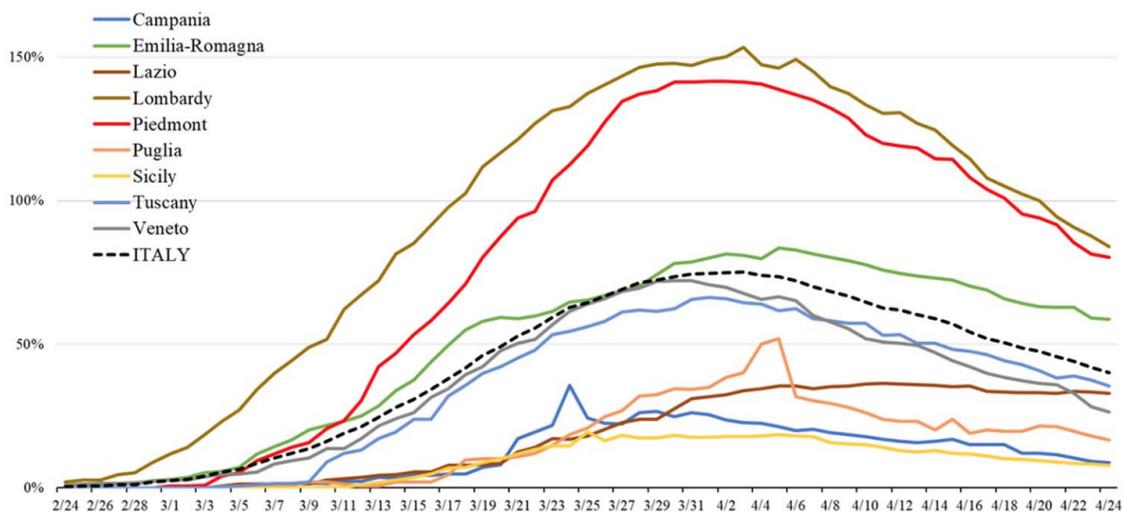
Notes: Average COVID-19 death rate and share of COVID-19 deaths by region are measures computed by the National Institute of Statistics (ISTAT) together with the Istituto Superiore di Sanità (ISS) on administrative data (Istat and Iss (2020)). The index *death rate*, which refers to the period January-May 2020, represents the mortality rate of COVID-19 standardized according to the demographic characteristics of the resident population in each province (values expressed per 100,000 inhabitants). The *share of COVID-19 deaths* reports the share of deaths of patients who tested positive for the virus over the total number of deaths in the region and relevant period.

Figure 3: Variations in Death Rates by period-region (2020)



Notes: Variations in *death rates* are measures computed by the National Institute of Statistics (ISTAT) together with the Istituto Superiore di Sanità (ISS) on administrative data (Istat and Iss (2020)). They describe the percentage variation in death rates observed in the relevant month in 2020 in comparison with the corresponding average rate reported in the period 2015-2019.

Figure 4: ICU Occupancy during the First Wave of COVID-19



Notes: The figure, taken from Fanelli et al. (2020), presents the share of regional ICU beds used to treat COVID-19 patients.

Figure 5: COVID Angels



(a) COVID Angels

(b) Wall of one hospital in Lombardy

Notes: Figure 5 presents a health worker with angel's wings cradling the Italian peninsula in her arms (creator: Franco Rivoli). This image became a symbol of healthcare workers' dedication during the first wave of the epidemic in Italy. The same image was painted over the walls of one of the most heavily affected hospitals in Lombardy (Hospital Papa Giovanni XXIII, Bergamo) as a sign of gratitude toward the extraordinary work done by these workers.

Figure 6: Timeline of the Survey

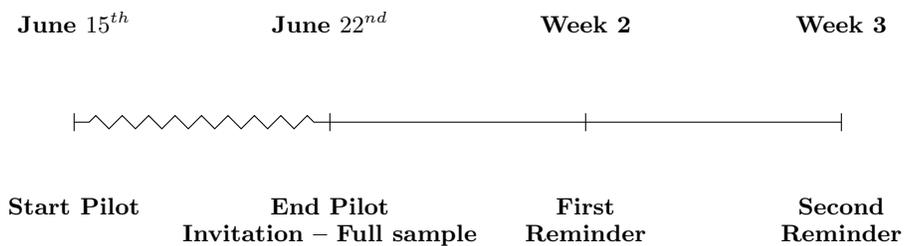
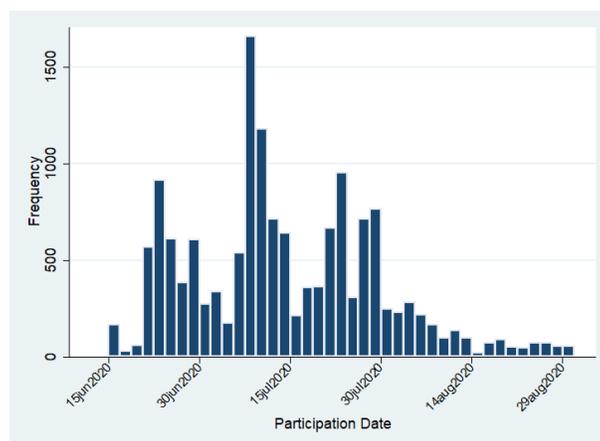
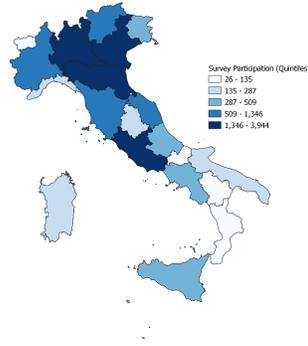


Figure 7: Timeline of Survey Responses

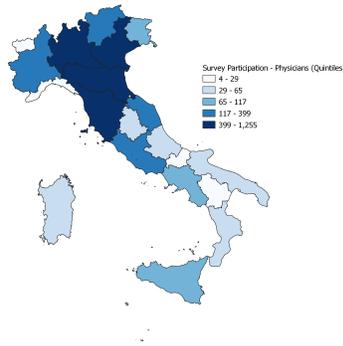


Notes: Each bar is the absolute number of responses to the survey by participation day. *Participation Date* is the day when the survey was completed.

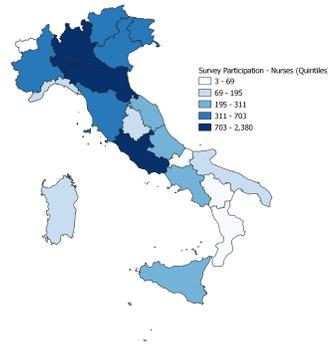
Figure 8: Response Rates by Region



(a) Overall



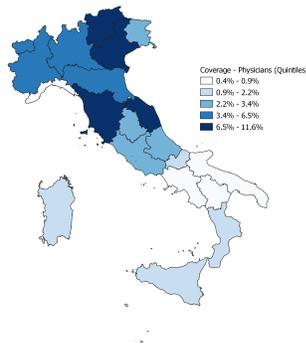
(b) Physicians



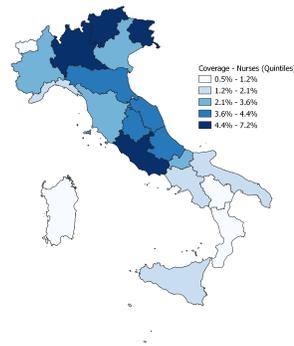
(c) Nurses

Notes: The response rate is computed as the number of responses received from each region (20) and professional category out of the total number of individuals contacted in that region per category. In line with previous studies (*e.g.*, [Simione and Gnagnarella \(2020\)](#), [Mazzoleni et al. \(2019\)](#), [Albano et al. \(2020\)](#)), Northern regions report higher response rates.

Figure 9: Regional Coverage by Professional Category



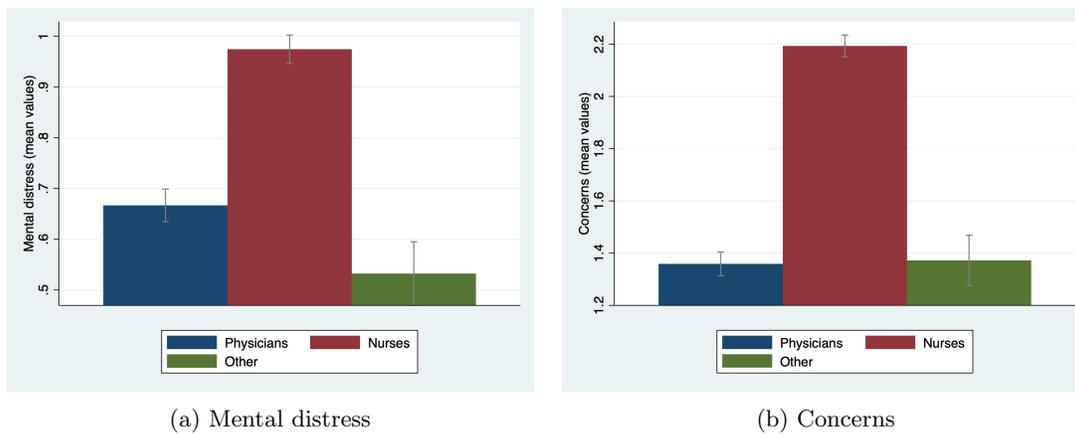
(a) Physicians



(b) Nurses

Notes: Regional coverage is computed as the absolute number of responses received from each region (20) and professional category out of the total number of professionals registered with official boards in that region per category.

Figure 10: Mental Distress and Concerns among Professions



Notes: *Mental distress* is a measure of severe mental distress and takes values between 0 and 4, with 4 representing the highest level of distress. *Concerns* is a measure of severe levels of concern and takes values between 0 and 7, with 7 representing the highest level of concern.

Table 1: **Balance Tests: Full Sample**

	No Priming	Priming p-value	Difference
Children	0.57 (0.50)	0.56 (0.50)	0.37
Age	43.54 (12.75)	43.57 (12.49)	0.88
Female	0.64 (0.48)	0.65 (0.48)	0.56
Italian	0.98 (0.13)	0.99 (0.12)	0.38
Married	0.49 (0.50)	0.49 (0.50)	1.00
Home sq. meter > 100	0.51 (0.50)	0.50 (0.50)	0.25
Good health status	0.95 (0.23)	0.94 (0.23)	0.36
Living alone	0.14 (0.35)	0.15 (0.36)	0.11
Same workplace	0.27 (0.44)	0.26 (0.44)	0.15
Healthcare worker in family	0.34 (0.47)	0.34 (0.47)	0.81
Working in hospital	0.70 (0.46)	0.70 (0.46)	0.26
Teaching hospital	0.03 (0.16)	0.03 (0.16)	0.30
Private	0.15 (0.35)	0.15 (0.35)	0.87
Contract with work shifts	0.78 (0.41)	0.78 (0.42)	0.53
COVID-19 overtime	0.68 (0.47)	0.69 (0.46)	0.18
Religious person	0.59 (0.49)	0.59 (0.49)	0.78

Notes: For an explanation of the variables, see Table A4.

Table 2: **Balance Tests: Physicians**

	No Priming	Priming p-value	Difference
Children	0.68 (0.47)	0.66 (0.47)	0.13
Age	49.34 (12.29)	49.26 (11.93)	0.81
Female	0.50 (0.50)	0.50 (0.50)	0.66
Italian	0.99 (0.08)	0.99 (0.07)	0.60
Married	0.62 (0.49)	0.62 (0.49)	0.82
Home sqr. meter > 100	0.68 (0.47)	0.67 (0.47)	0.21
Good health status	0.96 (0.19)	0.95 (0.21)	0.21
Living alone	0.13 (0.34)	0.15 (0.35)	0.11
Same workplace	0.29 (0.45)	0.27 (0.44)	0.09
Healthcare worker in family	0.33 (0.47)	0.33 (0.47)	0.61
Working in hospital	0.65 (0.48)	0.67 (0.47)	0.10
Teaching hospital	0.06 (0.23)	0.07 (0.25)	0.22
Private	0.10 (0.30)	0.11 (0.31)	0.18
Wage	0.59 (0.49)	0.57 (0.49)	0.12
Contract with work shifts	0.69 (0.46)	0.70 (0.46)	0.75
COVID-19 overtime	0.79 (0.41)	0.79 (0.41)	0.96
Religious person	0.57 (0.50)	0.58 (0.49)	0.44

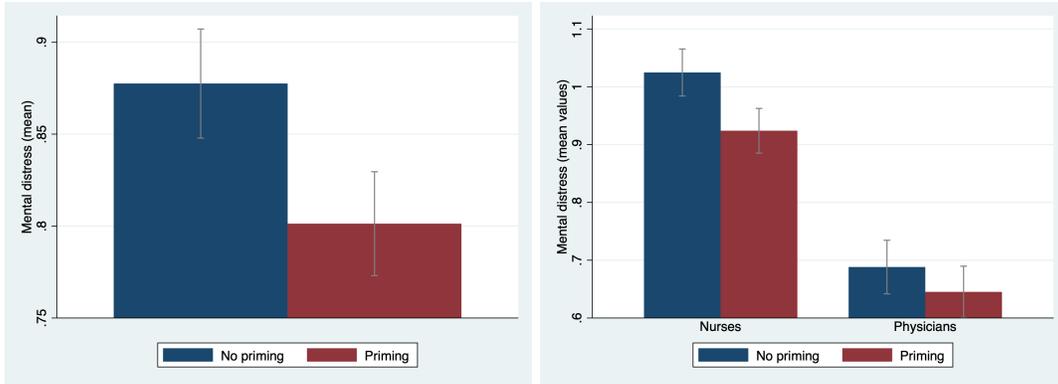
Notes: For an explanation of the variables, see Table A4.

Table 3: **Balance Tests: Nurses**

	No Priming	Priming p-value	Difference
Children	0.50 (0.50)	0.50 (0.50)	0.94
Age	40.30 (11.81)	40.38 (11.63)	0.74
Female	0.72 (0.45)	0.73 (0.44)	0.24
Italian	0.98 (0.15)	0.98 (0.14)	0.47
Married	0.42 (0.49)	0.41 (0.49)	0.85
Home sqr. meter > 100	0.41 (0.49)	0.40 (0.49)	0.54
Good health status	0.94 (0.24)	0.93 (0.25)	0.75
Living alone	0.15 (0.36)	0.15 (0.36)	0.42
Same workplace	0.26 (0.44)	0.26 (0.44)	0.59
Healthcare worker in family	0.35 (0.48)	0.35 (0.48)	0.94
Working in hospital	0.72 (0.45)	0.72 (0.45)	0.86
Teaching hospital	0.01 (0.08)	0.01 (0.08)	0.83
Private	0.17 (0.38)	0.17 (0.38)	0.54
Wage	0.03 (0.16)	0.03 (0.17)	0.30
Contract with work shifts	0.83 (0.38)	0.82 (0.38)	0.26
COVID-19 overtime	0.62 (0.49)	0.64 (0.48)	0.12
Religious person	0.59 (0.49)	0.59 (0.49)	0.78

Notes: For an explanation of the variables, see Table A4.

Figure 11: Descriptives: Mental Distress by Priming

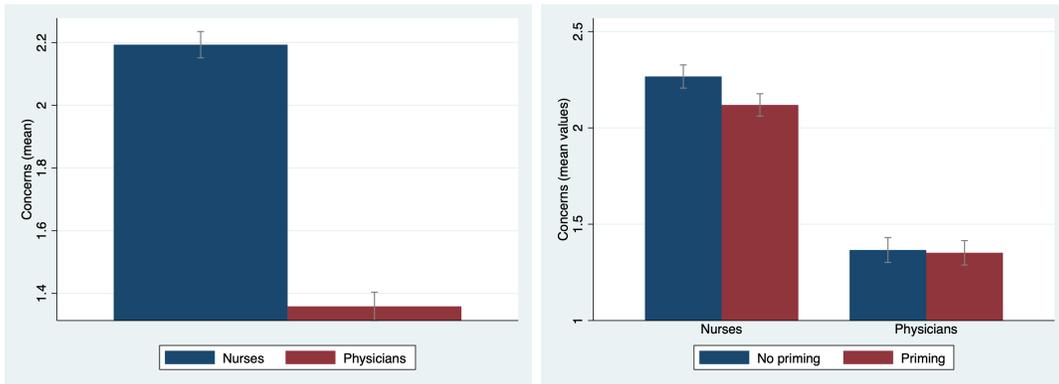


(a) Overall

(b) By profession

Notes: *Mental distress* is a measure of severe mental distress and takes values between 0 and 4, with 4 representing the highest level of distress.

Figure 12: Descriptives: Concerns by Priming

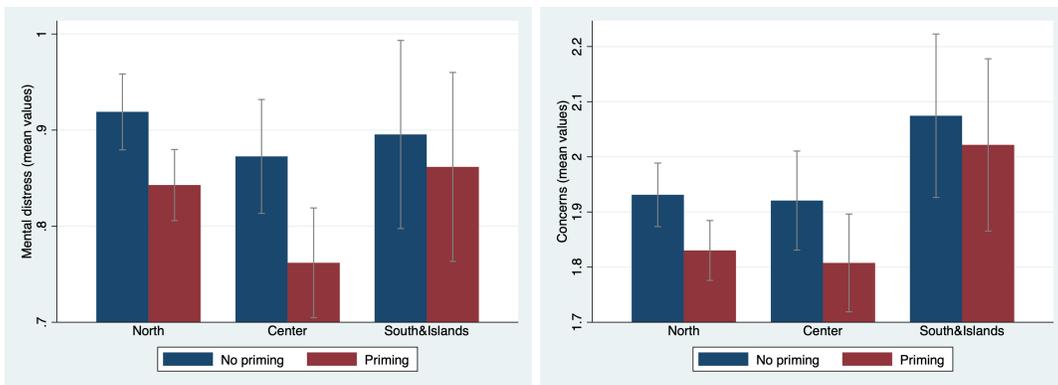


(a) Overall

(b) By profession

Notes: *Concerns* is a measure of severe levels of concern and takes values between 0 and 7, with 7 representing the highest level of concern.

Figure 13: Descriptives by Area

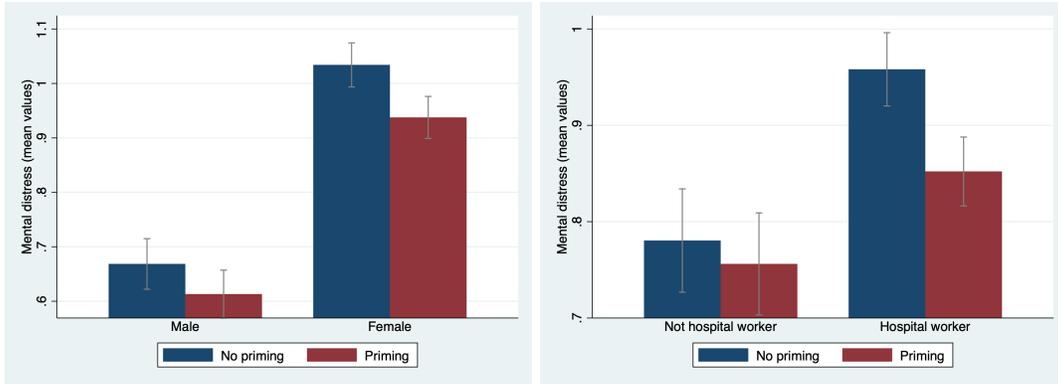


(a) Mental distress

(b) Concerns

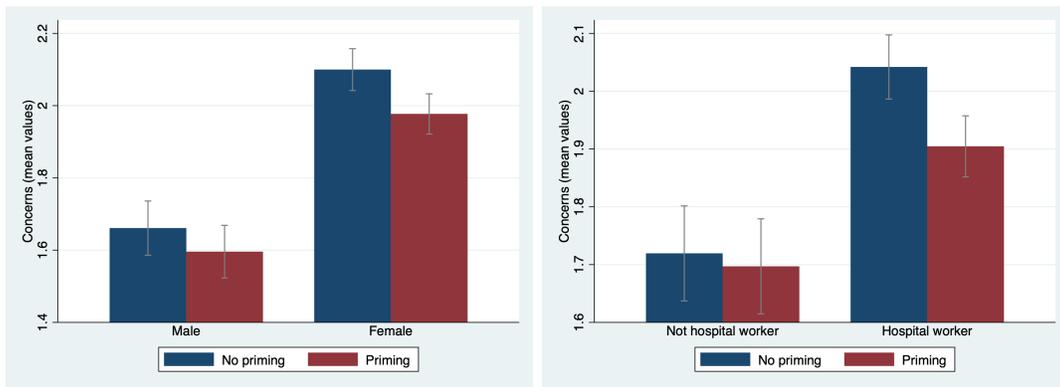
Notes: *Mental distress* is a measure of severe mental distress and takes values between 0 and 4, with 4 representing the highest level of distress. *Concerns* is a measure of severe levels of concern and takes values between 0 and 7, with 7 representing the highest level of concern. The areas represent the working area of the respondent.

Figure 14: Descriptives by Gender and Workplace



(a) Mental distress by gender

(b) Mental distress by workplace

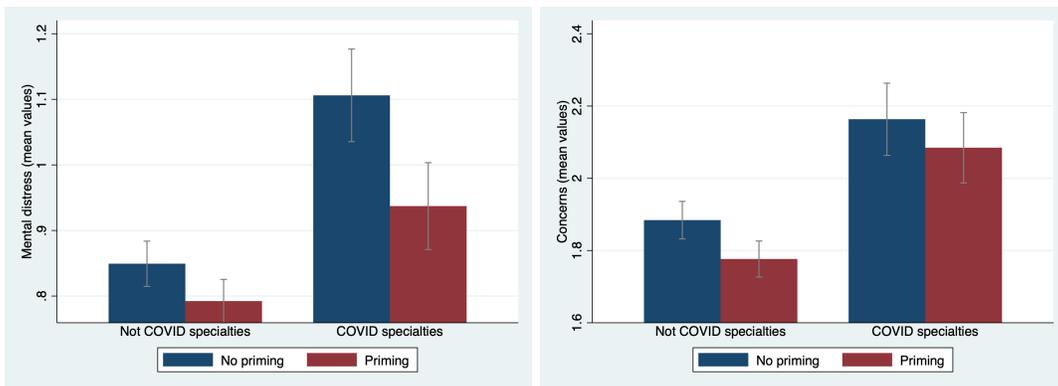


(c) Concerns by gender

(d) Concerns by workplace

Notes: *Mental distress* is a measure of severe mental distress and takes values between 0 and 4, with 4 representing the highest level of distress. *Concerns* is a measure of severe levels of concern and takes values between 0 and 7, with 7 representing the highest level of concern.

Figure 15: Descriptives by COVID-19 Specialty



(a) Mental distress

(b) Concerns

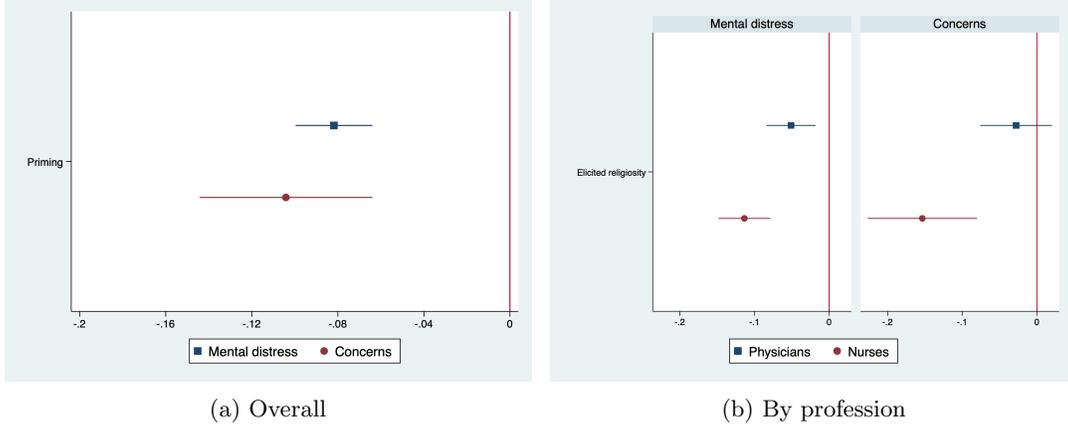
Notes: *Mental distress* is a measure of severe mental distress and takes values between 0 and 4, with 4 representing the highest level of distress. *Concerns* is a measure of severe levels of concern and takes values between 0 and 7, with 7 representing the highest level of concern. *COVID – 19 specialty* includes ICU, emergency care, anesthesiology, cardiology, pulmonary disease, and infectious disease specialties.

Table 4: **Controls**

Socioeconomic	Environment perceptions	Network experience	Own experience
Children	Good-quality facility	Infected colleagues	COVID-19 overtime
Age	Lack of personnel	Dead colleagues	Exposed to COVID-19
Female	Prompt response		COVID-19 positive
Italian	Effective response		Taking care of COVID-19 patients
Married			Reassigned due to COVID-19 crisis
Home sq. meter > 100			
Good health status			
Living alone			
Same workplace			
Healthcare worker in family			
Working in hospital			
Teaching hospital			
Private			
Contract with work shifts			
Wage			
Provincial rate of growth of mortality			

Notes: When we refer to the COVID-19 crisis, we mean the first wave that took place in Italy from the end of February 2020 to the beginning of June 2020. *Provincial rate of growth of mortality* represents the mortality rate of COVID-19 standardized according to the demographic characteristics of the resident population in each province (values expressed per 100,000 inhabitants).

Figure 16: Results



Notes: The plotted coefficients refer to the estimated value of religious priming as in Equation 1. Controls are those listed in Table 4. Standard errors are clustered at the working region level. Confidence intervals at 95%.

Table 5: Priming on Mental Distress: Single Causes and Geographical Areas

	All Regions				Only Northern Regions			
	Depression	Fear	Anxiety	Sleeping problems	Depression	Fear	Anxiety	Sleeping problems
PANEL A: All								
Priming	-0.023*** (0.004)	-0.017*** (0.005)	-0.019*** (0.006)	-0.021*** (0.004)	-0.025*** (0.005)	-0.018** (0.006)	-0.008 (0.005)	-0.026*** (0.004)
Obs	14,746	14,746	14,746	14,746	9,523	9,523	9,523	9,523
Mean	0.129	0.225	0.267	0.243	0.13	0.228	0.272	0.249
PANEL B: Physicians								
Priming	-0.015** (0.006)	-0.013 (0.009)	-0.004 (0.009)	-0.020** (0.008)	-0.018* (0.008)	-0.004 (0.008)	0.004 (0.01)	-0.021** (0.008)
Obs	4,829	4,829	4,829	4,829	3,156	3,156	3,156	3,156
Mean	0.096	0.167	0.216	0.188	0.098	0.166	0.22	0.191
PANEL C: Nurses								
Priming	-0.029*** (0.006)	-0.020*** (0.007)	-0.031*** (0.007)	-0.028*** (0.007)	-0.031*** (0.008)	-0.029*** (0.005)	-0.018** (0.006)	-0.038*** (0.008)
Obs	8,828	8,828	8,828	8,828	5,581	5,581	5,581	5,581
Mean	0.147	0.257	0.295	0.274	0.149	0.264	0.303	0.283
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓	✓	✓	✓	✓

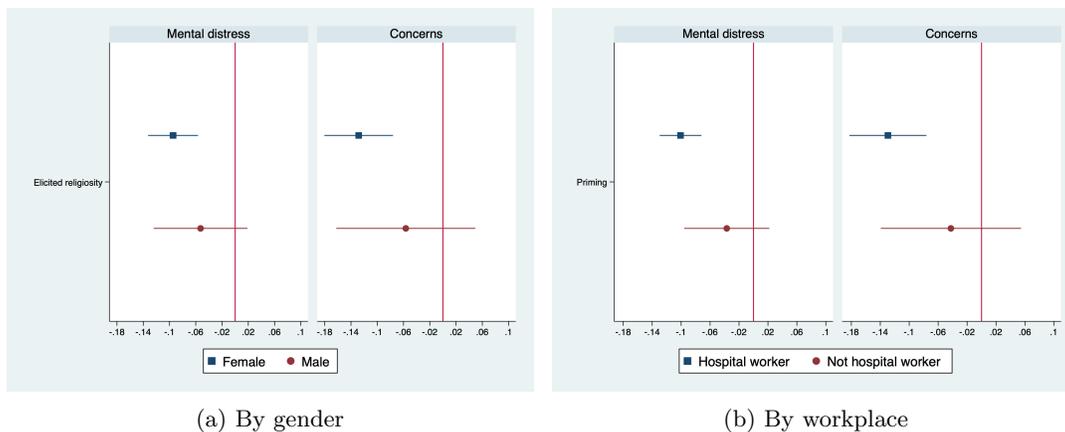
Notes: Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Priming on Concerns: Main Individual Causes and Geographical Areas

	All Regions			Only Northern Regions		
	Stress in the workplace	Personal health	Relatives health	Stress in the workplace	Personal health	Relatives health
PANEL A: All						
Priming	-0.011* (0.006)	-0.022*** (0.007)	-0.019** (0.008)	-0.014** (0.006)	-0.018* (0.008)	-0.019 (0.012)
Obs	14,746	14,746	14,746	9,523	9,523	9,523
Mean	0.441	0.235	0.505	0.447	0.236	0.507
PANEL B: Physicians						
Priming	-0.016 (0.012)	-0.007 (0.006)	0.000 (0.016)	-0.010 (0.017)	0.000 (0.004)	0.000 (0.025)
Obs	4,829	4,829	4,829	3,156	3,156	3,156
Mean	0.352	0.16	0.412	0.357	0.168	0.421
PANEL C: Nurses						
Priming	-0.011* (0.006)	-0.029*** (0.009)	-0.028*** (0.009)	-0.022*** (0.005)	-0.026* (0.013)	-0.030** (0.009)
Obs	8,828	8,828	8,828	5,581	5,581	5,581
Mean	0.508	0.284	0.57	0.52	0.284	0.571
Controls	✓	✓	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓	✓	✓

Notes: Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Figure 17: Results for Subgroups



Notes: The plotted coefficients refer to the estimated value of religious priming as in Equation 1. Controls are those listed in Table 4. Standard errors are clustered at the working region level. Confidence intervals at 95%.

Figure 18: Media Campaign



Notes: Figure 18 (a) was published on the official website of the Ministry of Health (http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministro&id=4348). It refers to the recruitment of nurses for the most affected hospitals. Figure 18 (b) reports a picture first published on Twitter that became a symbol of the dedication of nurses. It presents a nurse from the hospital of Cremona, Lombardy, who fell asleep at the end of a shift.

Table 7: **Priming on Mental Distress: Individual Causes for Females and Hospital Workers**

PANEL A: Females				
PANEL A.1: Main Causes of Mental Distress				
	Depression	Fear	Anxiety	Sleeping problems
Priming	-0.030*** (0.004)	-0.019*** (0.005)	-0.023** (0.010)	-0.022** (0.008)
Obs	9,635	9,635	9,635	9,635
Mean	0.14	0.25	0.29	0.27
PANEL A.2: Main Causes of Concern				
	Stress in the workplace	Own health	Relatives' health	
Priming	-0.020** (0.007)	-0.028*** (0.009)	-0.023*** (0.006)	
Obs	9,635	9,635	9,635	
Mean	0.47	0.26	0.55	
PANEL B: Hospital Workers				
PANEL B.1: Main Causes of Mental Distress				
	Depression	Fear	Anxiety	Sleeping problems
Priming	-0.026*** (0.003)	-0.020** (0.007)	-0.026*** (0.008)	-0.027*** (0.004)
Obs	10,306	10,306	10,306	10,306
Mean	0.13	0.23	0.27	0.25
PANEL B.2: Main Causes of Concern				
	Stress in the workplace	Own health	Relatives' health	
Priming	-0.015** (0.006)	-0.025*** (0.007)	-0.024** (0.010)	
Obs	10,306	10,306	10,306	
Mean	0.47	0.24	0.53	
Controls	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓

Notes: Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Priming on Mental Distress: Potential Drivers

	Lack of personnel	Reassigned	Infected colleagues	Deaths from colleagues	Exposed to COVID-19	Positive for COVID-19	Working in a COVID-19 specialty
PANEL A: All							
Priming	No -0.046* (0.025)	No -0.040** (0.014)	No -0.019 (0.033)	No -0.071*** (0.014)	No -0.084*** (0.011)	No -0.073*** (0.012)	No -0.056*** (0.012)
Priming p interaction	Yes -0.092*** 0.000	Yes -0.231*** 0.000	Yes -0.104*** 0.000	Yes -0.207** 0.024	Yes -0.038 0.532	Yes -0.149*** 0.000	Yes -0.176*** 0.000
Difference	-0.046 (0.031)	-0.191*** (0.046)	-0.085** (0.037)	-0.136 (0.094)	0.046 (0.061)	-0.076** (0.035)	-0.120** (0.044)
PANEL B: Physicians							
Priming	No 0.064 (0.043)	No -0.035 (0.022)	No -0.028 (0.073)	No -0.039 (0.026)	No -0.060*** (0.018)	No -0.045** (0.016)	No -0.048** (0.021)
Priming p interaction	Yes -0.093*** 0.004	Yes -0.130** 0.015	Yes -0.058*** 0.006	Yes -0.150 0.358	Yes 0.045 0.661	Yes -0.131* 0.082	Yes -0.076 0.416
Difference	-0.157** (0.067)	-0.095 (0.064)	-0.030 (0.086)	-0.111 (0.180)	0.105 (0.110)	-0.086 (0.073)	-0.028 (0.104)
PANEL C: Nurses							
Priming	No -0.118** (0.050)	No -0.051* (0.027)	No -0.013 (0.034)	No -0.099*** (0.018)	No -0.107*** (0.017)	No -0.103*** (0.019)	No -0.070*** (0.015)
Priming p interaction	Yes -0.105*** 0.000	Yes -0.286*** 0.000	Yes -0.145*** 0.000	Yes -0.282*** 0.009	Yes -0.120 0.196	Yes -0.147*** 0.001	Yes -0.223*** 0.000
Difference	0.013 (0.050)	-0.235*** (0.076)	-0.132*** (0.041)	-0.182 (0.106)	-0.012 (0.092)	-0.044 (0.044)	-0.153*** (0.045)
Controls	✓	✓	✓	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓	✓	✓	✓

Notes: COVID-19-related specialties include ICU, emergency care, anesthesiology, cardiology, pulmonary disease, and infectious disease specialties. Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Heterogeneities for Females and Hospital Workers

	Lack of personnel	Reassigned	Infected colleagues	Deaths from colleagues	Exposed to COVID-19	Positive for COVID-19	Working in a COVID-19 specialty
PANEL A: All Females							
Priming	No -0.006 (0.034)	No -0.050** (0.019)	No 0.002 (0.037)	No -0.086*** (0.018)	No -0.094*** (0.017)	No -0.089*** (0.021)	No -0.070*** (0.021)
Priming p interaction	Yes -0.125*** 0.000	Yes -0.259*** 0.001	Yes -0.133*** 0.000	Yes -0.230*** 0.004	Yes -0.099 0.280	Yes -0.141*** 0.007	Yes -0.197*** 0.001
Difference	-0.120*** (0.039)	-0.209*** (0.072)	-0.135*** (0.045)	-0.144** (0.067)	-0.004 (0.091)	-0.051 (0.058)	-0.127* (0.062)
PANEL B: Female Physicians							
Priming	No 0.127 (0.080)	No -0.081* (0.045)	No -0.021 (0.098)	No -0.073 (0.064)	No -0.109** (0.051)	No -0.082 (0.056)	No -0.083 (0.054)
Priming p interaction	Yes -0.167*** 0.009	Yes -0.126 0.251	Yes -0.111* 0.067	Yes -0.246* 0.084	Yes 0.127 0.252	Yes -0.181 0.234	Yes -0.128 0.438
Difference	-0.294*** (0.094)	-0.045 (0.085)	-0.089 (0.108)	-0.173 (0.180)	0.237** (0.099)	-0.099 (0.168)	-0.044 (0.173)
PANEL C: Female Nurses							
Priming	No -0.083** (0.033)	No -0.082 (0.070)	No -0.041 (0.024)	No 0.006 (0.037)	No -0.109*** (0.019)	No -0.100*** (0.023)	No -0.110*** (0.023)
Priming p interaction	Yes -0.212*** 0.001	Yes -0.122*** 0.000	Yes -0.327*** 0.000	Yes -0.157*** 0.000	Yes -0.175 0.161	Yes -0.223** 0.045	Yes -0.130** 0.038
Difference	-0.129 (0.078)	-0.040 (0.080)	-0.286*** (0.092)	-0.163*** (0.053)	-0.066 (0.119)	-0.123 (0.115)	-0.020 (0.067)
PANEL D: All Hospital Workers							
Priming	No -0.048 (0.038)	No -0.050** (0.022)	No -0.027 (0.051)	No -0.093*** (0.019)	No -0.117*** (0.015)	No -0.089*** (0.020)	No -0.068** (0.025)
Priming p interaction	Yes -0.117*** 0.000	Yes -0.246*** 0.000	Yes -0.122*** 0.000	Yes -0.203* 0.065	Yes 0.072 0.449	Yes -0.193*** 0.000	Yes -0.186*** 0.001
Difference	-0.070* (0.038)	-0.197*** (0.061)	-0.096 (0.059)	-0.110 (0.111)	0.189* (0.094)	-0.104* (0.053)	-0.118* (0.063)
PANEL E: Physicians Working in Hospitals							
Priming	No 0.125** (0.056)	No -0.050 (0.034)	No 0.022 (0.088)	No -0.061* (0.031)	No -0.097*** (0.025)	No -0.066** (0.027)	No -0.071 (0.042)
Priming p interaction	Yes -0.141*** 0.000	Yes -0.166*** 0.002	Yes -0.101*** 0.002	Yes -0.227 0.244	Yes 0.175 0.283	Yes -0.158 0.223	Yes -0.082 0.372
Difference	-0.266*** (0.071)	-0.116* (0.064)	-0.123 (0.095)	-0.166 (0.202)	0.272 (0.162)	-0.092 (0.132)	-0.011 (0.122)
PANEL F: Nurses Working in Hospitals							
Priming	No -0.141*** (0.048)	No -0.052* (0.030)	No -0.053 (0.044)	No -0.117*** (0.019)	No -0.136*** (0.019)	No -0.113*** (0.020)	No -0.080*** (0.027)
Priming p interaction	Yes -0.117*** 0.000	Yes -0.299*** 0.001	Yes -0.144*** 0.000	Yes -0.229*** 0.010	Yes -0.006 0.952	Yes -0.200*** 0.000	Yes -0.220*** 0.001
Difference	0.024 (0.050)	-0.247** (0.094)	-0.091 (0.058)	-0.111 (0.088)	0.130 (0.105)	-0.087 (0.056)	-0.139* (0.074)
Controls	✓	✓	✓	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓	✓	✓	✓

Notes: Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Capturing the Role of Religiosity

	Entire Sample	Females Religious Person	Hospital Workers	Entire Sample	Females Religious Weddings	Hospital Workers
PANEL A: All						
Priming	No -0.089*** (0.029)	No -0.096** (0.042)	No -0.097*** (0.032)	Less -0.044* (0.023)	Less -0.052 (0.038)	Less -0.014 (0.028)
Priming p interaction	Yes -0.074*** 0.000	Yes -0.094** 0.012	Yes -0.102*** 0.000	More -0.104*** 0.001	More -0.128*** 0.000	More -0.153*** 0.000
Difference	0.015 (0.038)	0.002 (0.068)	-0.005 (0.037)	-0.060 (0.047)	-0.077 (0.057)	-0.139** (0.053)
PANEL B: Physicians						
Priming	No 0.008 (0.032)	No 0.046 (0.072)	No 0.001 (0.059)	Less 0.030 (0.030)	Less 0.030 (0.076)	Less 0.049 (0.049)
Priming p interaction	Yes -0.095*** 0.002	Yes -0.179** 0.013	Yes -0.126*** 0.002	More -0.120*** 0.006	More -0.195*** 0.003	More -0.174*** 0.004
Difference	-0.103* (0.049)	-0.225** (0.090)	-0.127 (0.080)	-0.150** (0.059)	-0.225** (0.086)	-0.223** (0.090)
PANEL C: Nurses						
Priming	No -0.162*** (0.051)	No -0.166** (0.072)	No -0.152*** (0.045)	Less -0.102*** (0.019)	Less -0.100* (0.048)	Less -0.071 (0.041)
Priming p interaction	Yes -0.071*** 0.003	Yes -0.077** 0.050	Yes -0.103*** 0.001	More -0.155*** 0.001	More -0.228* 0.058	More -0.151*** 0.001
Difference	0.091 (0.065)	0.089 (0.102)	0.049 (0.063)	-0.053 (0.045)	-0.128 (0.121)	-0.080 (0.071)

Notes: Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. *Religious Weddings* is the percentage of religious wedding out of the total number of weddings celebrated in the province of birth of the healthcare worker in 2018 (last available year). We define a dummy based on the median value of the distribution to identify *more religious* and *less religious* provinces.

Appendix A

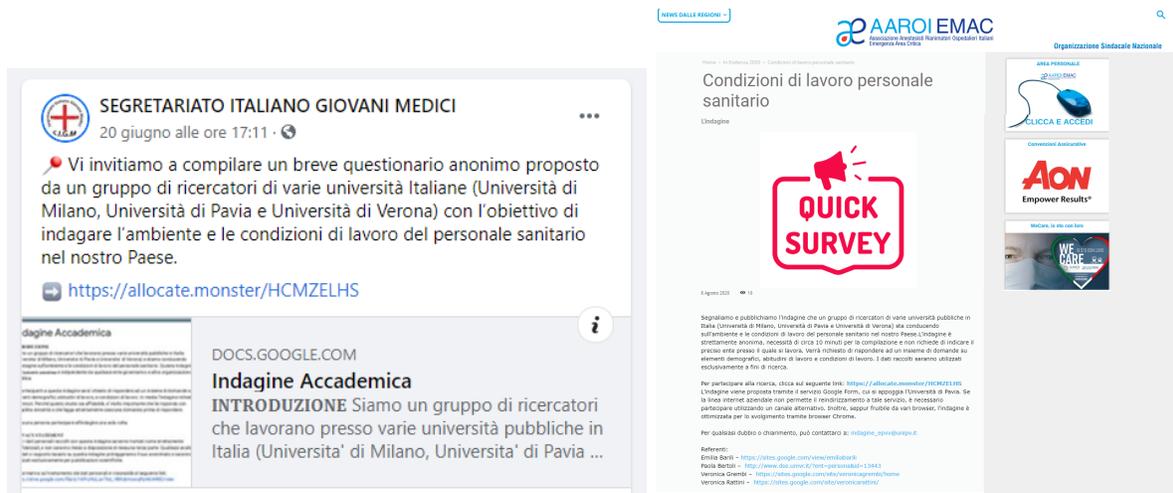
This Appendix provides additional tables and figures, which are also discussed in the paper.

Table A1: Associations participating in the survey

Description	Professionals
Segretariato Italiano Giovani Medici	Physicians
Associazione Anestesiisti Rianimatori Ospedalieri Italiani - Emergenza Area Critica	Physicians
Organizzazione Sindacale interdisciplinare e apartitica dei Medici Ospedalieri Dipendenti dal S.S.N.	Physicians
Associazione Italiana Nursing Sociale	Nurses
Associazione Infermieri di Famiglia e di Comunità	Nurses

Notes: List of associations of healthcare professionals participating in the survey. They provide a valuable contribution sharing the survey through their members.

Figure A1: Some adhesions



Notes: Examples of survey media coverage from associations participating in the study.

Table A2: **Outcomes Definition - Mental Distress**

Outcomes	Definition
Mental distress	Continuous from 0 to 4, with 4 the highest value. It is the sum of 4 dummies: Depression, Fear something bad is about to happen, Anxiety, and Sleeping problems
Depression	Dummy=1 if during the COVID-19 first wave you felt depressed or hopeless: always or very often and 0 otherwise
Fear	Dummy=1 if during the COVID-19 first wave you had been scared that something bad was about to happen: always or very often and 0 otherwise
Anxiety	Dummy=1 if during the COVID-19 first wave you felt nervous, anxious or edgy: always or very often and 0 otherwise
Sleeping problems	Dummy=1 if during the COVID-19 first wave you had sleeping problems or problems to get asleep: always or very often and 0 otherwise

Notes: When we refer to the COVID-19 first wave, we refer to the first wave which took place in Italy from the end of February 2020 to mid-June 2020.

Table A3: **Outcomes Definition - Concerns**

Outcomes	Definition
Concerns	Continuous from 0 to 7, with 7 the highest value. It is the sum of 7 dummies: Nobody, Family problems, Financial problems, Couple problems, Relatives' health, Personal health, Stress at the workplace
Nobody	Dummy=1 if during the the COVID-19 first wave you were concerned because you did not have anybody to talk to: always or very often and 0 otherwise
Family problems	Dummy=1 if during the COVID-19 first wave you were concerned for family of origin problems: always or very often and 0 otherwise
Financial problems	Dummy=1 if during the COVID-19 first wave you were concerned for financial problems: always or very often and 0 otherwise
Partner problems	Dummy=1 if during the COVID-19 first wave you were concerned for problems with your partner: always or very often and 0 otherwise
Relatives health	Dummy=1 if during the COVID-19 first wave you were concerned for the health of your relatives: always or very often and 0 otherwise
Personal health	Dummy=1 if during the COVID-19 first wave you were concerned for your personal health: always or very often and 0 otherwise
Stress at the workplace	Dummy=1 if during the COVID-19 first wave you were concerned for the level of stress at your workplace: always or very often and 0 otherwise

Notes: When we refer to the COVID-19 first wave, we refer to the first wave which took place in Italy from the end of February 2020 to mid-June 2020.

Table A4: **Variables Definition**

Variable	Definition
Children	Dummy=1 if presence of children and 0 otherwise
Age	Age as a continuous dummy
Female	Dummy=1 if female and 0 otherwise
Italian	Dummy=1 if Italian and 0 otherwise
Married	Dummy=1 if married and 0 otherwise
Home sq. meter > 100	Dummy=1 if the home size is more than 100 squared meters and 0 otherwise
Good health status	Dummy=1 if health status is self-classified as good or very good and 0 otherwise
Living alone	Dummy=1 if live alone and 0 otherwise
Same workplace	Dummy=1 if always worked in the same workplace and 0 otherwise
Healthcare worker in family	Dummy=1 if in family of origin there are healthcare workers (<i>i.e.</i> , nurses or physicians) and 0 otherwise
Working in hospital	Dummy=1 if work in a hospital and 0 otherwise
Teaching hospital	Dummy=1 if work in a teaching hospital and 0 otherwise
Private	Dummy=1 if work for the private sector and 0 otherwise
Contract with work-shifts	Dummy=1 if have a contract which requires work-shifts and 0 otherwise
Wage	Dummy=1 if the declared wage is above 1,500 (2,500) for nurses (physicians) and 0 otherwise
Provincial COVID19 mortality rate	Provincial COVID19 standardized mortality rate per 100,000 inhabitants
Good quality facility	Dummy=1 if high self-reported quality of the workplace and 0 otherwise
Lack of personnel	Dummy=1 if perception of severe lack of personnel and 0 otherwise
Prompt response	Dummy=1 if perception prompt response from the institution and 0 otherwise
Effective response	Dummy=1 if perception effective response from the institution and 0 otherwise
Infected colleagues	Dummy=1 if colleagues infected from COVID19 and 0 otherwise
Dead colleagues	Dummy=1 if colleagues dead from COVID19 and 0 otherwise
COVID19 overtime	Dummy=1 if did overtime due to COVID19 crisis and 0 otherwise
Exposed to COVID19	Dummy=1 if exposed to COVID19 individuals and 0 otherwise
Positive to COVID19	Dummy=1 if tested positive to COVID19 and 0 otherwise
Taking care of COVID19 patients	Dummy=1 if take care of COVID19 patients and 0 otherwise
Reassigned due to COVID19 crisis	Dummy=1 if reassigned to a different ward due to the COVID19 and 0 otherwise

Notes: When we refer to the COVID19 pandemic, we refer to the first wave which took place in Italy from the end of February 2020 to mid-June 2020. *Wage* in the full sample is a dummy equal to 1 if the wage is above 2,000 euros and 0 otherwise.

Table A5: Priming on concerns: remaining single causes and Geographical areas (extra)

	All regions				Only Northern Regions			
	Partner relationship	Nobody to talk	Financial troubles	Family troubles	Partner relationship	Nobody to talk	Financial troubles	Family troubles
PANEL A: All								
Priming	-0.021*** (0.006)	-0.008 (0.008)	-0.001 (0.007)	-0.019*** (0.006)	-0.026** (0.009)	-0.020* (0.008)	0.001 (0.008)	-0.017** (0.006)
Obs.	14,746	14,746	14,746	14,746	9,523	9,523	9,523	9,523
Mean	0.186	0.147	0.154	0.186	0.182	0.145	0.139	0.178
PANEL B: Physicians								
Priming	0.002 (0.005)	-0.018 (0.011)	0.012 (0.009)	0.000 (0.005)	0.000 (0.007)	-0.021 (0.017)	0.016* (0.007)	0.008* (0.004)
Obs.	4,829	4,829	4,829	4,829	3,156	3,156	3,156	3,156
Mean	0.131	0.102	0.079	0.123	0.133	0.099	0.078	0.121
PANEL C: Nurses								
Priming	-0.037*** (0.007)	-0.003 (0.011)	-0.005 (0.009)	-0.032*** (0.009)	-0.044*** (0.009)	-0.018 (0.011)	-0.008 (0.014)	-0.034*** (0.009)
Obs.	8,828	8,828	8,828	8,828	5,581	5,581	5,581	5,581
Mean	0.228	0.179	0.193	0.231	0.222	0.178	0.173	0.222
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓	✓	✓	✓	✓

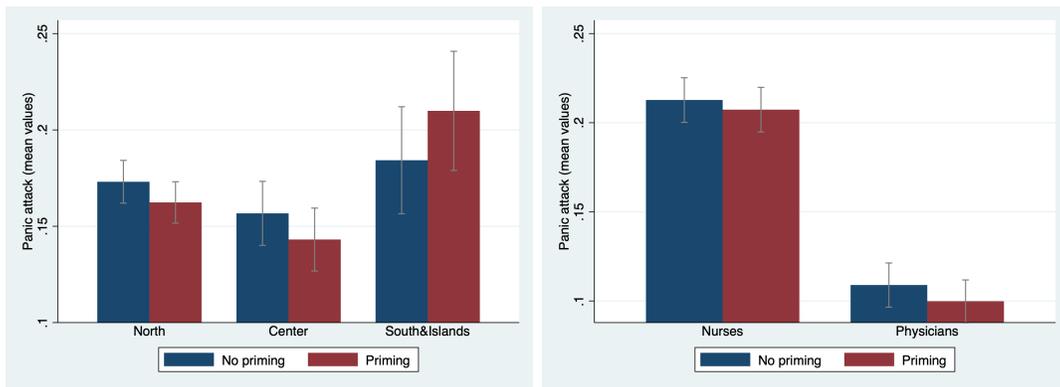
Notes: Controls are listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A2: Packaging dedicated to nurses



Notes: During the second wave, the Barilla company produces a new packaging for the cookies called “Abbracci” -i.e., hugs (Figure A2). The intention is to promote a charity campaign to collect funds to help nurses sick of COVID-19 and their families. The message reported on the back reinforces the concept of gratitude and community directed to nurses that was typical of the first wave. More details on the webpage dedicated: <https://www.mulinobianco.it/noicongliinfermieri>.

Figure A3: Other outcomes: Panic attack



(a) By geographical areas

(b) By professions

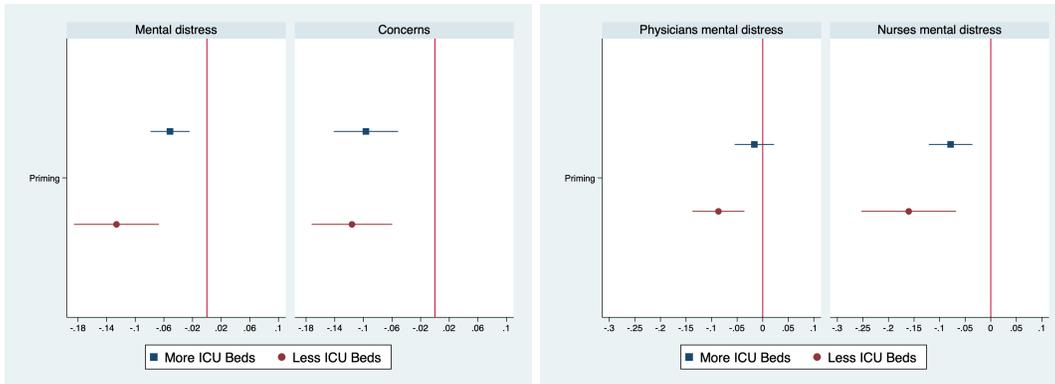
Notes: *Panic attack* is a dummy equal 1 when the respondent declares to have had at least a panic attack during the COVID-19 first wave.

Table A6: **Priming on leave permits**

	All regions	Only North	Females	Hospital workers
PANEL A: All				
Priming	0 (0.011)	0.005 (0.007)	0.005 (0.007)	-0.004 (0.013)
Obs	14,746	9,523	9,523	10,306
Mean	0.348	0.366	0.366	0.38
PANEL B: Physicians				
Priming	-0.011 (0.015)	-0.01 (0.022)	-0.02 (0.022)	-0.014 (0.014)
Obs	4,829	3,156	2,446	3,285
Mean	0.334	0.357	0.369	0.408
PANEL C: Nurses				
Priming	0.007 (0.016)	0.012 (0.008)	0.017 (0.012)	-0.003 (0.018)
Obs	8,828	5,581	6,422	6,462
Mean	0.343	0.357	0.349	0.355
Controls	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓

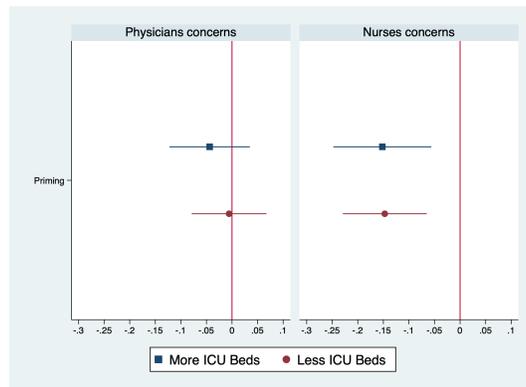
Notes: Leave permits are permits for sick leave, vacations, medical conditions of some of the respondent relative (no COVID related). Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A4: Heterogeneous effects based on the availability of ICU beds



(a) Mental distress & Concerns

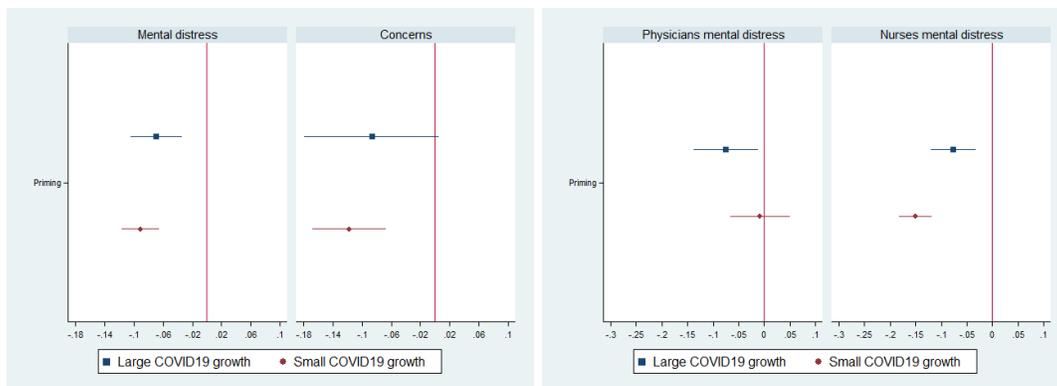
(b) Mental distress by profession



(c) Concerns by profession

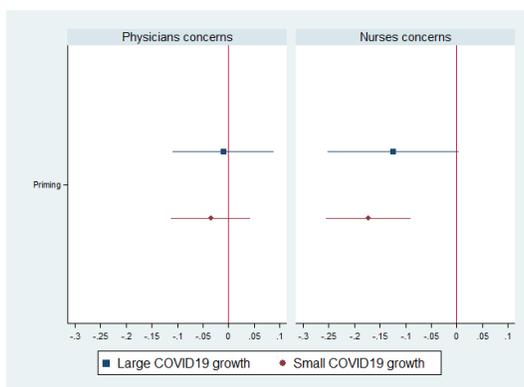
Notes: Using data from the Ministry of Health, we construct a measure of ICU beds per resident population per province in 2018 (the latest available year), and we define *More ICU beds* as those provinces with above the median of the distribution of ICU beds. The Estimations from Equation 1. Confidence intervals at 95%.

Figure A5: **Heterogeneous effects based on the COVID-19 outbreak**



(a) Mental distress & Concerns

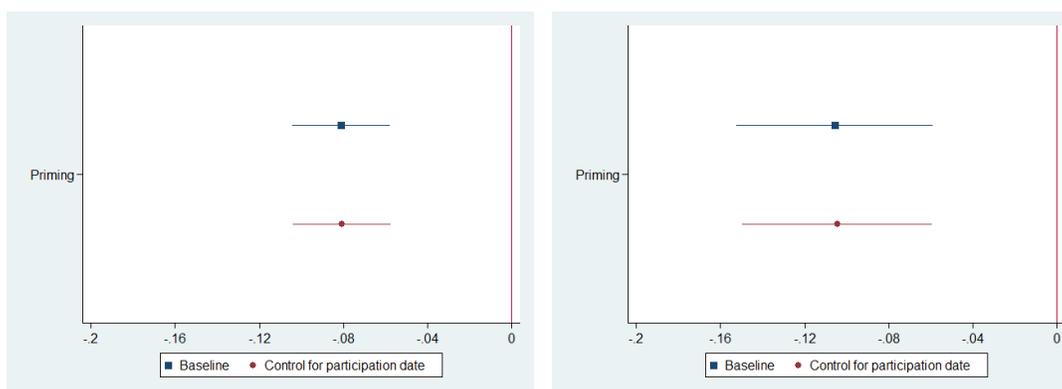
(b) Mental distress by profession



(c) Concerns by profession

Notes: Using data from the Ministry of Health, we construct a measure of COVID-19 outbreak in the week before the participation in the survey, and we define *Large COVID-19 outbreak* as those provinces with above the median of the distribution of growth in COVID-19 outbreak in the week before the participation. The Estimations from Equation 1. Confidence intervals at 95%.

Figure A6: **Results: control for participation date**



(a) Mental Distress

(b) Concerns

Notes: *Baseline* refers to the estimated value of religious priming as in Equation 1. *Control for participation date* refers to the estimated value of religious priming as in Equation 1 when an additional control for the day of participation is included. For both regressions, baseline controls are those listed in Table 4. Standard errors are clustered at the working region level. Confidence intervals at 95%.

Table A7: Alternative definition of outcomes (PCA)

	All regions		Only Northern Regions	
	Mental Distress	Concerns	Mental Distress	Concerns
PANEL A: All				
Priming	-0.106*** (0.021)	-0.107*** (0.032)	-0.116*** (0.023)	-0.100* (0.043)
Obs	13,516	14,746	8,739	9,523
Mean	2.858	4.034	2.897	4.003
PANEL B: Physicians				
Priming	-0.075*** (0.021)	-0.050 (0.036)	-0.084** (0.025)	-0.010 (0.016)
Obs	4,600	4,829	3,014	3,156
Mean	2.570	3.492	2.615	3.512
PANEL C: Nurses				
Priming	-0.141*** (0.028)	-0.143*** (0.037)	-0.164*** (0.021)	-0.168* (0.056)
Obs	7,914	8,828	4,996	5,581
Mean	3.094	4.409	3.153	4.371
Controls	✓	✓	✓	✓
Working region FE	✓	✓	✓	✓

Notes: Dependent variables defined by means of a PCA analysis on the 5 causes of mental distress (Mental distress PCA) and 7 causes of concern (Concerns PCA). Controls are those listed in Table 4. Standard errors are clustered at the working region level. *** p<0.01, ** p<0.05, * p<0.1.

Appendix B: The Survey

INTRODUCTION: We are a group of researchers working at various public universities in Italy (the University of Milan, University of Pavia, and the University of Verona) and we are conducting a survey on the working conditions of the healthcare personnel. This investigation is strictly anonymous and independent from any organization or unit.

You will be asked to answer a set of questions on your demographic characteristics, work habits, and working conditions. On average, the survey will take 13 minutes.

All personal data collected with this survey will be treated as strictly confidential, and will not be made available to any third party. Any data analysis or report based on this survey will protect your anonymity and will be used only for scientific publications.

INSTRUCTIONS: The display may not be compatible with some versions of Mozilla Firefox, the recommended browser is Goggle Chrome. If the survey is carried out by telephone, it is recommended to use the horizontal screen mode of your device. Use the *Next* button to proceed.

The answers will be saved at the end of the questionnaire, using the *Submit* button.

QUESTIONNAIRE

1. Gender
2. Age
3. Province of birth
4. Province of residence
5. In general, how would you say your general health condition is:
 - . Excellent
 - . Very good
 - . Good
 - . Not very good
 - . Bad
6. Do you suffer from any particular health condition or chronic pathology?
7. Do you have an Italian nationality?
8. For how many years have you lived in Italy?
9. Marital status
10. Do you live alone?
11. How many children do you have?
12. Approximately your home is:
 - . less than 50 squared meters
 - . between 50 and 100 squared meters
 - . between 100 and 150 squared meters
 - . over 150 squared meters
 - . I don't know
13. Are there in your family of origin (parents, grandparents, uncles) any:
 - . Doctors/Dentists
 - . Nurses
 - . Other healthcare professionals
 - . None of the above
14. Year of the diploma/degree for the professional qualification

15. Place of the diploma/degree for the professional qualification
16. Did you ever carry out a continuous period of study/research/work abroad during your training?
 - . Yes, less than 3 months
 - . Yes, between 3 and 6 months
 - . Yes, between 6 months and 1 year
 - . Yes, more than a year
 - . Never
17. Profession
18. How many specializations do you have?
19. Please indicate your primary specialization
20. Your current working condition is:
 - . Full-time employment indefinite-time contract
 - . Full-time definite-term contract
 - . Employed part-time indefinite-time contract
 - . Part-time employment definite-time contract
 - . Trainee / PhD student / Resident Doctor
 - . SSN Affiliated
 - . Self-employed professional
 - . Freelancer at a public/private facility
 - . Looking for a first job
 - . Looking for a job
 - . Retired
 - . Other:
21. [For Physicians only]: Which of the following options best describes your occupation:
 - . Continuity of care
 - . Territorial Medicine
 - . Family Doctor
 - . General Practitioner (affiliated)
 - . Doctor in Nursing Home
 - . Doctor in RSA
 - . Doctor in the pharmaceutical industry
 - . Doctor in the Public Administration
 - . Doctor in the Armed Forces
 - . Hospital Doctor, in a private facility
 - . Hospital Doctor, in a private affiliated structure
 - . Hospital Doctor, in a public facility
 - . Specialist (affiliated)
 - . Private practice specialist
 - . Dentist
 - . Pediatrician
 - . Researcher University
 - . Other:
22. [All the rest] Which of the following options best describes your occupation:
 - . Home Worker
 - . Clinic Worker
 - . Worker in hospital - private
 - . Worker in hospital - affiliated private

- . Worker in hospital - public
 - . Worker in Nursing Home
 - . Worker in Elderly home
 - . Worker in the pharmaceutical industry
 - . Worker in the Armed Forces
 - . Primary Care Service
 - . Researcher University
 - . Other:
23. Province of work
24. How many years have you been working in the facility where you are currently working?
25. Approximately how many places of work have you changed since you started working?
26. How many hours of work does your contract specify per week?
27. Does your contract specify any work shift?
28. On average, how many hours do you work per week (including clinical and non-clinical activities)?
28. Since the start of the COVID-19 emergency, on average, how many hours have you worked per week (including clinical and non-clinical activities)?
29. In what department/ward are you currently working?
30. What is the net salary you received last month? Exclude any other monthly payments (thirteenth, fourteenth, etc.) and extra-payments that you do not receive every month (annual productivity bonuses, overdue payments, allowances for missions, unusual overtime, etc.)
31. Within your structure/ward which function do you have:
- . Head of the unit
 - . Coordinator
 - . Ward Doctor
 - . Ward worker (including nurse, physiotherapist ...)
 - . Resident
 - . Consultant
 - . Director (general, administrative, health, etc.)
 - . Does not apply (GP, family doctor...)
 - . Other:
32. How much do you trust the managerial skills of the health director?
33. How much do you trust the medical expertise of the health director?
34. How much do you trust the health guidelines/protocols provided by:
- . The region where you work
 - . The Ministry of Health
35. In the Italian public health system, how do you think matter:
- . Merit / competence
 - . Politics
36. In general, would you say that the facility where you work is of quality:
- . Excellent
 - . Very good
 - . Good
 - . Not very good.
 - . Bad
 - . Not applicable (*e.g.*, GP, pediatrician)
37. How much do you agree with the following statements?
- . If I could start over, I would not be in this profession

- . If I could start over, I would choose a different field of specialization
 - . My specialization no longer has the appeal it had at the beginning
 - . In general, the area in which I specialized has met my expectations
38. How satisfied are you:
- . with the profession?
 - . with your current job?
 - . with your current income?
 - . with the balance between private and working life?
 - . with the general working environment and the relationships with the colleagues?
 - . with the general working environment and the relationships with the administrative staff?
 - . with the number of hours worked?
 - . with the career prospects?
39. How exposed do you feel to the following risk factors?
- . Time pressure or excessive workload
 - . Physical threats or violence
 - . Bullying or harassment
 - . Poor communication or collaboration within the organization
 - . Difficult-to-treat patients, trainees, and students
 - . Lack of autonomy or control over time or processes
 - . Workplace insecurity
 - . Professional responsibility
40. In your opinion, is there a lack of medical personnel that could endanger residents' access to care in the province where you work?
41. From the beginning of the COVID-19 emergency until 15/06, how often did you experience the following conditions:
- . Feeling depressed or hopeless
 - . Feeling nervous, anxious, or on edge
 - . Having troubles in sleeping or falling asleep
 - . Being afraid that something bad might happen
42. From the beginning of the COVID-19 emergency until 15/06, have you ever been worried about:
- . Your health
 - . The health of your relatives and friends
 - . The relationship with your partner (if in a couple)
 - . The relationship with your family of origin
 - . The stress at your workplace
 - . Financial problems
 - . Not having anyone to talk to
43. From the beginning of the COVID-19 emergency until 15/06, did you have any panic attack (sudden feeling of fear or panic?):
44. From the beginning of the COVID-19 emergency until 15/06, were you:
- . Hired for the emergency
 - . Fired / Laid off
 - . Assigned to a ward/hospital other than your habitual ward/hospital
 - . Directly involved in the treatment of COVID-19 patients
 - . In contact with COVID-19 positive patients
 - . Directly involved in the care of post-COVID-19 patients (no longer positive)
 - . In solitary confinement because of the suspicion of a COVID-19 infection

- . In quarantine because infected (positive swab) by COVID-19
 - . In quarantine because symptomatic of COVID-19
 - . Hospitalized for COVID-19
 - . Hospitalized for other reasons from COVID-19 but related to your professional activity
45. Have some of your colleagues been infected and/or hospitalized, or lost their lives due to COVID-19?
- . No
 - . Yes, infected in quarantine
 - . Yes, infected and hospitalized
 - . Yes, infected and deceased
46. From the beginning of the COVID-19 emergency until 15/06, have you taken some days off (sickness, holidays, law 104, parental leave)?
- . No
 - . Yes, 1-5 days
 - . Yes, 6-15 days
 - . Yes, 15-30 days
 - . Yes, more than 30 days
47. How do you evaluate the COVID-19 protocols adopted by your facility (province if you do not belong to any facility) in terms of [very positive, somehow positive, average, not very positive, not positive at all] :
- . Timing
 - . Effectiveness
48. In your daily life, which of the following statements describes you better:
- . I am practicing religious
 - . I am non-practicing religious
 - . I can't tell if I'm religious or not.
 - . I'm not a religious person
49. [Optional question] In your opinion, what was the purpose of this survey?
50. [Optional question] Do you belong to one of the following groups?
- . Trade union association
 - . Scientific association
 - . Association concerning your professional specialization
 - . I do not belong to any group related to my profession
 - . Other

A Sentence-Unscrambling Task Instructions

Now we ask you to participate in a simple activity. Starting from a group of 5 words, you have to form a sentence of 4 words, excluding, therefore, one of the initial 5 words. For example: high winds the flies plane → the plane flies high. Answers containing no characters or punctuation will not be accepted. Any word order will be accepted, therefore there is no right or wrong answers. Please complete each scramble within 60 seconds.

Sentences - Religious priming

1. felt she eradicate spirit the
2. dessert divine was fork the
3. appreciated presence was imagine her
4. more paper it once do
5. send I over it mailed
6. evil thanks give God to
7. yesterday it finished track he
8. sacred was book refer the
9. reveal the future simple prophets
10. prepared somewhat I was retired

Sentences - Neutral priming

1. fall was worried she always
2. shoes give replace old the
3. retrace good have holiday a
4. more paper it once do
5. send I over it mailed
6. saw hammer he the train
7. yesterday it finished track he
8. sky the seamless blue is
9. predictable he shoes his tied
10. prepared somewhat I was retired

Appendix C: Mass Media Campaign

In this Appendix, we collected qualitative evidence on the mass media campaign which identifies healthcare personnel to *COVID Angels*. There are mainly titles from newspapers articles spanning from February to June 2020. The title of the article is translated in the title of the figure.

Figure C1: “Coronavirus, the angels of the red zone”

CORRIERE DELLA SERA / POLITICA



PROTAGONISTI

Coronavirus, gli angeli della zona rossa

Dottori e «cittadini semplici» che hanno deciso di dare un aiuto a chi opera in prima linea.
Per altruismo, solidarietà o spirito di servizio

di Elisabetta Rosaspina

Notes: Article published on *Corriere della Sera* on February 28, 2020.

Figure C2: “Hospitals, nurses, pharmacies: the angels of the virus”



IN EDICOLA / STORIA DI COPERTINA

Ospedali, infermieri, farmacie: gli angeli del virus

Il Fatto Quotidiano

PRIMO PIANO EDITORIALE COMMENTI POLITICA ECONOMIA CRONACA ITALIA MONDO CULTURA SPORT

Gli specialisti del Sacco e del Policlinico di Milano: “L’organizzazione sanitaria è già ai limiti del collasso. Il coronavirus impatta molto sulle strutture”

di Sarah Buono, Davide Milosa e Marco Pasciuti | 9 MARZO 2020

Notes: Article published on *Il Fatto Quotidiano* on March 09, 2020.

Figure C3: “The angels of the ambulances leave “On mission to the North””

The screenshot shows the top portion of a news article on the La Repubblica website. At the top left, there are links for 'la Repubblica', 'Mobile', 'Facebook', and 'Twitter'. The main header features the 'la Repubblica' logo and the word 'Archivio'. Below this is a horizontal navigation bar with buttons for 'Home', 'Pubblico', 'Economia&Finanza', 'Sport', 'Spettacoli', 'Cultura', and 'Motori'. The breadcrumb trail reads: 'Sei in: Archivio > la Repubblica.it > 2020 > 03 > 25 > Partono gli angeli delle...'. The article title is 'Partono gli angeli delle ambulanze "In missione al Nord"'. The author is 'di Laura Barbuscia' and it is noted as 'I a pagina 5'. At the bottom of the snippet, the date '25 marzo 2020' and a 'sez.' link are visible.

Notes: Article published on *La Repubblica* on March 25, 2020.

Figure C4: “The angels of the ambulances, from Rome to the front line”

This screenshot shows a different article on the La Repubblica website. The top navigation includes 'la Repubblica', 'Mobile', 'Facebook', 'Twitter', and additional links for 'RTE', 'LE INCHIESTE', 'L'Espresso', and 'Network'. The main header has the 'la Repubblica' logo and 'Archivio'. The navigation bar includes 'Home', 'Pubblico', 'Economia&Finanza', 'Sport', 'Spettacoli', 'Cultura', 'Motori', 'Viaggi', 'Moda', 'Casa', 'Salute', 'Meteo', 'Lavoro', and 'Annunci'. The breadcrumb trail is: 'Sei in: Archivio > la Repubblica.it > 2020 > 03 > 25 > Gli angeli delle ambulanze...'. The article title is 'Gli angeli delle ambulanze, da Roma al fronte'. A short excerpt follows: 'di Laura Barbuscia « Non chiamatemi eroe. Sono un essere umano, in trincea, che per vincere la guerra contro il virus aiuto i colleghi stremati negli ospedali del Nord ». Stefano La Penna, 50enne di Ostia, da 20 anni autista soccorritore delle ambulanze 118 di Roma, ha scelto la strada della solidarietà: « Preferisco riempire il cuore più che il portafogli — dice — e mettermi a disposizione pur di aiutare chi ha più bisogno ».' To the right of the article text is a sidebar with the heading 'TOPIC CORRELATI' and three categories: 'PERSONE', 'ENTI E SOCIETÀ', and 'LUOGHI'.

Notes: Article published on *La Repubblica* on March 25, 2020.

Figure C5: “Coronavirus, “Heroes Angels”: 10 thousands thanks in 24 hours to Areu for doctors and rescuers”

[MENU](#)

[SPECIALI](#)
[ABBONATI](#)
[LEGGI IL GIORNALE](#)
[ACCEDI](#)

IL GIORNO

[CRONACA](#)
[SPORT](#)
[ECONOMIA](#)
[EDIZIONI](#)

[COLORI REGIONI](#)
[ZONE COVID](#)
[GOVERNO DRAGHI](#)
[MISSIONE SU MARTE](#)
[MONDIAI](#)

HOME > CRONACA > **CORONAVIRUS, "ANGELI EROI":...** Publicato il 27 marzo 2020

Coronavirus, "Angeli eroi": 10mila grazie in 24 ore ad Areu per medici e soccorritori

L'intero archivio verrà conservato: "Resterà a memoria di un periodo di straordinario impegno"

Articolo / Coronavirus, Areu attiva un mail per dire 'grazie' a medici e infermieri

[Condividi](#)
[Tweet](#)
[Invia tramite email](#)

Medici e paramedici in ambulanza con protezioni coronavirus

POTREBBE INTERESSARTI ANCHE

Colori regioni: oggi il verdetto. Iss: Rt sopra l'1. Chi va verso l'arancione

Toro

Notes: Areu is the agency for the emergency of the Lombardy region. Article published on *Il Giorno* on March 27, 2020.

Figure C6: “The angels of intensive care, I was reborn thanks to their smiles”

[L'ECO DI BERGAMO](#)

[Cerca](#)

[CRONACA](#)
[ECONOMIA](#)
[CULTURA E SPETTACOLI](#)
[SPORT](#)
[EVENTI](#)
[VIDEO](#)
Seleziona un territorio

HOME / BERGAMO CITTÀ / «GLI ANGELI DELLA TERAPIA INTENSIVA SONO RINATO GRAZIE AI LORO SORRISI»

Edizione Digitale | Abbonamenti | Necrologie | Corner | Skille | Eppen
BonusCasa
Accedi Registrati

Domenica 19 Aprile 2020 (0)

[Facebook](#)
[Twitter](#)
[Mi piace](#)
[Condividi](#)

«Gli Angeli della terapia intensiva sono rinato grazie ai loro sorrisi»

Notes: Article published on *L'Eco di Bergamo* on April 19, 2020. The province of Bergamo has been among the most affected in the country by the first wave of the pandemic.

Figure C7: “Gloves, gowns, socks. The white angels of the dark”



Notes: Article published on *La Nazione* on April 22, 2020.

Figure C8: “Behind the “diving suit”, the great heart of the Angels in the wards”



Notes: Article published on *Il Giorno* on May 08, 2020.

Figure C9: “International nurses day: this is how Bergamo celebrates the angels of the covid emergency”



Notes: Article published on *Corriere della Sera* on May 12, 2020.

Figure C10: “The voice of the sick: thanks to the angels of COVID”



Notes: Article published on *Il Giorno* on May 27, 2020.

Figure C11: “Healthcare workers rebel “We are underpaid angels””



Notes: Article published on *La Repubblica* on June 09, 2020.

Figure C12: “The protest of the nurses, sit-in of the angels without rewards”



Notes: Article published on *Il Resto del Carlino* on June 09, 2020.

Figure C13: “The angels of the pandemic who were and remain precarious”



Notes: Article published on *La Repubblica* on June 30, 2020.