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Close kin influence COVID-19 precautionary behaviors and vaccine acceptance of older individuals

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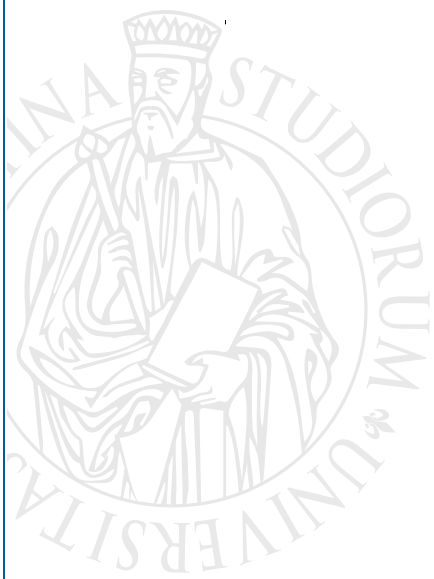

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Close kin influence COVID-19 precautionary behaviors and vaccine acceptance of older individuals

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Abstract

The family plays a central role in shaping health behaviors of its members through social control and support mechanisms. We investigate whether and to what extent close kin (i.e., partner and children) have mattered for older people in taking on precautionary behaviors (e.g., physical distancing) and vaccination during the COVID-19 pandemic in Europe. Drawing on data from SHARE (Survey of Health, Ageing and Retirement in Europe), we combine its Corona Surveys (June-August 2020 and June-August 2021) with pre-COVID information (October 2019-March2020). We find that having close kin (especially a partner) is associated with a higher probability of both adopting precautionary behaviors and accepting a COVID-19 vaccine. Results are robust to controlling for other potential drivers of precautionary behaviors and vaccine acceptance, as well as to accounting for co-residence with kin. Our findings suggest that policy makers and practitioners may differently address kinless individuals when promoting public policy measures.

Keywords: COVID-19; Coronavirus; Parenthood; Partnership; Precautionary behaviors; SARS-CoV-2; COVID-19 vaccine acceptance.

Introduction

In the early phases of the COVID-19 pandemic, individual precautionary behaviors were the only weapon to protect people from infection and reduce the spread of the virus in the community. Due to herd immunity remaining a distant target (Aschwanden 2021) and given that COVID-19 vaccines neither permanently nor completely protect against infection (Hall et al 2021; Naaber et al 2021; Swan et al 2021), precautionary health behaviors have remained crucial also after the launch of COVID-19 vaccination campaigns. Thus, governments across the globe have imposed or recommended behaviors such as physical distancing, mask-wearing, and frequent hand-washing. Although these have been presented as general guidelines for everyone, individuals at greater risk of developing a more severe case of COVID-19 when infected by the Coronavirus, such as older individuals, have been particularly encouraged to adopt precautionary health behaviors during the pandemic in order to limit admissions to Intensive Care Units and deaths from COVID-19-related conditions (Carr 2020; Davies et al 2020; Hradsky & Komarek 2021; Mallapaty 2020; Richardson et al 2020; Zhou et al 2020). Monitoring and understanding compliance with COVID-19-preventive behaviors have become a prime target for research since the beginning of the pandemic (Bíró et al 2021; Delerue et al 2022; Galasso et al 2020; Haischer et al 2020; Hutchins et al 2020; Pasion et al 2020; Plohl & Musli, 2020; Spitzer et al 2022).

More recently, the fight against the pandemic entered a new stage with the approval by health authorities of effective COVID-19 vaccines. Although it is widely recognized that effective and equitable distribution of COVID-19 vaccines is a key policy priority (Moodley 2022; Rydland et al 2022), ensuring their acceptance by the population is just as important. Thus, several studies have aimed at understanding the determinants of vaccine acceptance (i.e., actual vaccine intake and intention to be vaccinated) (Bergmann, et al 2021; Bhagianadh et al 2022; Detoc et al 2020; Dror et al 2020; Galanis et al 2021; Lazarus et al 2021; Lindholt et al 2021; Sallam 2021; Solís Arces et al 2021; Wang et al 2020).

Despite the acknowledged importance of precautionary health behaviors and vaccines to limit the spread of the virus, compliance with guidelines and vaccine acceptance are anything but universal. Even among older adults, that are at the highest risk of COVID-19

complications, studies have shown that a large share of individuals does not follow the recommended precautionary behaviors (Bíró et al 2021; Hutchins et al 2020) and/or is unvaccinated and not willing to be vaccinated (Bhagianadh et al 2022; Detoc et al 2020; Wang et al 2020; Sallam 2021). Socio-demographic characteristics of individuals such as gender, education, as well as health conditions have been shown to be associated with the adoption of precautionary health behaviors (Bíró et al 2021; Delerue et al 2022; Galasso et al 2020; Haischer et al 2020; Hutchins et al 2020; Pasion et al 2020; Plohl & Musli, 2020; Spitzer et al 2022) and vaccine acceptance (Bergmann, et al 2021; Bhagianadh et al 2022; Detoc et al 2020; Dror et al 2020; Galanis et al 2021; Lazarus et al 2021; Lindholt et al 2021; Sallam 2021; Solís Arces et al 2021; Wang et al 2020), with highly educated individuals and those in poorer health conditions more likely to follow guidelines and get vaccinated, while a gender "paradox" emerged (Galasso et al 2021): women are more likely to adopt precautionary behaviors but less likely to accept COVID-19 vaccines. Other studies have considered the role of anti-intellectualisms (Merkley et al 2021), science skepticism (Brzezinski et al 2021), information trust (Tan et al 2022) and misinformation (Loomba et al 2021). We extend the existing work by analyzing the role of having close kin and more specifically whether having a partner and/or children influence precautionary health behaviors and vaccine acceptance.

Indeed, social ties are known to influence health behaviors throughout the lifecourse (Berkman et al 2000; Resnick et al 1997; Umberson et al 2010). In particular, studies have shown that partner and children tend to represent the most important social ties for older adults in terms of emotional closeness and intensity of support (Umberson et al 2010; Dykstra 2007; Connidis & Barnett 2018; Rook & Schuster 1996). Accordingly, numerous studies have focused on the role of having close kin (i.e., having a partner and/or having children) on health behaviors (see the reviews by Carr & Utz 2020; Hank & Steinbach 2018; Umberson & Thomeer 2020). Theoretically, the social-behavioral explanations of the importance of the family for health behaviors focus on the instrumental and emotional support that family members provide to each other complying with social norms of family obligations (Antonucci et al 2007; Carr & Springer 2010). Family members complement the role of the

health care system by providing material support, information, and motivation to prevent diseases and help adhering to medical treatments or recommendations (DiMatteo 2004).

The power of close kin to improve health is also explained by the social control function of family members, which exert pressures and control to inhibit unhealthy behaviors and to promote positive habits and lifestyles (Umberson et al 2010; Umberson 1987, 1992). Social control affects health behaviors directly (through sanctions for deviant behaviors, regulation, and physical interventions) and indirectly (through internalization of norms of healthful behavior and facilitation of positive health behaviors) (Umberson 1987). Partnership and parenthood enhance a sense of obligation and greater self-regulation that discourages harmful behaviors and boosts healthy ones (Fuller 2010; Umberson 1987).

Although under certain circumstances (e.g., family conflicts, multiple roles overload) kin may have a negative effect on health behaviors (DiMatteo 2004; Nomaguchi & Bianchi 2004), most studies have found positive effects (Hank and Steinbach; Umberson et al 2010). Moreover, the effect of partnership tends to be more consistently beneficial for health and health behaviors as compared to that of children (Ross et al. 1990; Umberson & Montez 2010; Umberson 1987). The influence of family members on health behaviors is particularly strong when they live together (Umberson 1987) and later in life (Thomas et al 2017).

In the context of the COVID-19 pandemic, the social control function of partners and children might have been particularly relevant to vehiculate information about the importance of adopting precautionary behaviors (e.g., wearing masks) and of vaccination. Similarly, instrumental support might have also been relevant as children might have helped their older parents with (online and in-person) shopping in order to limit their physical contacts. Thus, we should expect individuals with a partner and children to be more likely to adopt precautionary behaviors and (to be willing) to get vaccinated compared to their counterparts who lack these kin ties. Based on findings from the literature on family and health behaviors mentioned above, the effect should also be stronger for partnership than parenthood status.

We test the role of close kin in precautionary health behaviors and COVID-19 vaccine acceptance using large-scale representative data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a survey on individuals aged 50 or more implemented in several European countries (Börsch-Supan et al 2013). We combine data from the two SHARE Corona Surveys, administered in June-August 2020 and June-August 2021, with information from the latest pre-COVID wave (regular wave 8; October 2019-March 2020). Our findings suggest that partnership and parenthood are positively associated with the likelihood of adopting precautionary health behaviors and to accept COVID-19 vaccine. The effect of having a partner is found to be usually stronger than that of having children. Our results urge policy makers and practitioners in the health sector to pay special attention to kinless individuals when designing interventions and recommendations related to precautionary health behaviors and vaccination. This research provides important insights to be better prepared for the next phases of the COVID-19 pandemic and in case of future pandemics.

Methods

Data

The present study used data from the Survey of Health, Ageing and Retirement in Europe (SHARE) (Börsch-Supan et al 2013). SHARE is a longitudinal survey on non-institutionalized individuals aged 50+ and their partners in 27 European countries and Israel. It is conducted biannually since 2004 and 9 waves of data have been collected till date. We use data from wave 8, which started in October 2019 but was suspended in all countries in March 2020 due to the COVID-19 outbreak. Regular data collection is based on computer-assisted personal interviewing (CAPI), which provides pre-COVID information (Börsch-Supan 2022a). A special dataset, SHARE Corona Survey 1 (Börsch-Supan 2022b), was added to wave 8. This survey has been administered with CATI (computer assisted telephone interviewing) between June and August 2020 to collect information on individuals' behaviors and conditions during the pandemic (SHARE Corona Survey 1; SCS1). We excluded observations from Portugal (because Portugal started the fieldwork of the regular wave 8 only a few weeks before the start of the first lockdown due to the pandemic), thus restricting the analyses to individuals from the 27 countries included in both regular and SCS1 data. We

also use data from wave 9, i.e. SHARE Corona Survey 2 (SCS2) (Börsch-Supan 2022c) collected between June and August 2021. Our outcome variables (precautionary behaviors and vaccine acceptance) come from the two SHARE Corona Surveys; independent variables, instead, are measured from the pre-COVID wave 8 of SHARE because these variables not available in the Corona Surveys. We dropped individuals older than 85 because they constituted a small share of the sample (about 4%) with almost no variation for certain outcomes. Results were however not affected by this selection. After discarding relatively few observations with missing values on the independent variables, our analytic samples comprise between 27,432 and 33,097 individuals depending on the outcome (the sample sizes differ because some outcomes do not apply to all respondents – those who declared who never left their home since the beginning of the pandemic – and because of missing values).

Measures

Using data from SCS1 we built nine outcome variables corresponding to nine different precautionary health behaviors. The questionnaire of the SCS1 is available at: http://www.share-project.org/data-documentation/questionnaires/corona-questionnaire-1.html. All outcome variables are binary and coded so that 1 represents a precautionary behavior. More specifically the variables are constructed as follows (note that all of them refer to activities done or not since the outbreak of the pandemic). *Washing hands* equals one for respondents who report washing hands more than usual. *Sanitizing hands* equals one for respondents who report using special hand sanitizer or disinfection fluids more frequently than usual. *Covering coughs and sneezes* equals one for respondents who report paying special attention to covering cough and sneeze. *Wearing masks* equals one for respondents who report always wearing a face mask when in a public space. *Keeping distance* equals one for respondents who report always keeping distance from others in public. *Less shopping* equals one for respondents who report to have left their home for shopping less often or not at all since the outbreak of the pandemic. *Less walks* equals one for respondents who report to have left their home for going out for a walk less often or not at all since the outbreak of the pandemic. *Less meetings* equals one for respondents who report to have left their home for meeting with more than 5 people from outside their household less often or not at all since the outbreak of the pandemic. *Less visits* equals one for respondents who report to have left

their home for visiting other family members less often or not at all since the outbreak of the pandemic.

The SCS2 used a different questionnaire (available at: http://www.share-project.org/data-documentation/questionnaires/corona-questionnaire-2.html). Thus, as mentioned above, because the resulting variables are not comparable with those in SCS1, we did not consider them in the main analyses but only among additional analyses. Several changes have been introduced in the questionnaire. Questions about some of the precautionary behaviors investigated in the survey 1 were not kept in the second one (*Washing hands*; *Sanitizing hands; Wearing masks; Less walks; Less visits*); the others were modified. More specifically, while in survey 1 the questions asked the respondent to compare their behaviors during the pandemic to what they were used to do before it, in survey 2 some of the questions were about the absolute frequency of each behavior in the three months preceding the survey. This was the case for two behaviors also included in survey 1 and for which we built the following variables. *Infrequent shopping* equals one for respondents who report going out for shopping less often than once a week during the three months preceding the survey. *Infrequent meetings* equals one for respondents who report to have left their home for meeting with more than 5 people from outside their household less often than once a week during the three months preceding the survey. For one behavior it was kept the focus on change in frequency but in comparison to the first wave of the pandemic (instead of since its start as in survey 1): *More covering of cough/sneeze* equals one for respondents who report paying special attention to covering cough and sneeze more frequently. The item that remained more similar in survey 2 as compared to the first one refers to physical distance. *Keeping distance* equals one for respondents who report to always pay special attention to keep distance from others in public during the three months preceding the survey. Finally, in survey 2 some items were added. We considered the following. *Infrequent restaurants* equals one for respondents who report going out to a restaurant less often than once a week during the three months preceding the survey.

SCS2 collected information on vaccination status and intent to get vaccinated in two consecutive steps. Respondents were first asked whether they had been vaccinated against

COVID-19 at least once. Then, those who had not yet been vaccinated, are asked about their intention to do so and distinguishing whether they already had scheduled an appointment for vaccination, wanted to get vaccinated, did not want to get vaccinated, or were still undecided. We combined the information from these two questions and built a three-level categorical outcome variable: *vaccinated / willing to get the vaccine* (including vaccinated individuals and those who intend to get the vaccine); *undecided*; *not willing to get the vaccine*.

The explanatory variable combined information on partnership and parenthood status: *has a partner and children* (respondents who are in a partnership and have at least one child); *has a partner, no children* (childless respondents with a partner); *no partner, has children* (unpartnered respondents with at least one child); *no partner, no children* (respondents with no close kin – reference category). In the main analyses we do not distinguish according to living arrangements, i.e. we only account for having kin independently of whether respondents co-reside with their partners or children. In a robustness check we built a similar variable but considering having kin only in case of co-residence; i.e. we dropped respondents who did not co-reside with their partner or at least one child. The resulting variable had the following categories: *has cores. partner and children* (respondents who co-reside with their partner and who co-reside with at least one child); *has cores. partner, no children* (childless respondents with a co-resident partner); *no partner, has co-res. children* (unpartnered respondents with at least one co-resident child); *no partner, no children* (respondents with no close kin – reference category).

Control variables included the following. *Age* (in 5-year categories: *50-54* – reference category; *55-59*; *60-64*; *65-69*; *70-74*; *75-79*; *80-85*); *Female* (gender of respondent; *male* – reference category); *Education* (*low* – reference category; *medium*; *high*); *Working status* (*retired* – reference category; *working*; *other*); *Household income*; *Self-rated health* (= 1 for respondents who rate their health as *fair* or *poor*; = 0 if health is rated as *good, very good* or *excellent*); *Diagnosed illness* (= 1 for respondents who self-reports of at least one doctor-diagnosed conditions (hypertension, diabetes, cancer, lung disease, heart disease, stroke and arthritis); = 0 otherwise); *Gali* (global activity limitations; = 1 for respondents whose activities are limited or severely limited because of health problems; = 0 otherwise);

Respondent or close relatives tested positive (= 1 if the respondent or a close relative (partner, children, parents) has been tested for the Coronavirus and the result was positive; = 0 otherwise); *Country* of residence (reference category: *Austria*); *Week of interview*. As for education, the three groups are defined based on the International Standard Classification of Education (ISCED; http://www.uis.unesco.org/): low (ISCED 0-1, no or primary education, and ISCED 2, lower secondary education), medium (ISCED 3-4, higher secondary education), and high (ISCED 5-6, tertiary education). The independent variables have been measured using information from the regular SHARE wave 8 either because they are time-invariant characteristics of because of unavailability of the information in the two SHARE Corona Surveys.

Analyses

Each of the precautionary health behavior described above represented a different binary outcome that we modeled using logistic regression. Thus, for the SCS1 we estimated nine logistic regression models, one for each outcome. Similarly, we estimated five logistic regression models for each of the precautionary health behavior considered in the additional analyses based on SCS2. As for the vaccine acceptance outcome variable, we have estimated a multinomial logistic regression model. Although an ordering of the three categories of the outcome can be established (in terms of vaccine acceptance), a multinomial model allowed a higher degree of flexibility compared to an ordered logistic regression (i.e., it was possible to estimate separate effects of the independent variables for each category of the outcome).

To ease interpretation of results, the main findings are reported in the main text graphically as Average Marginal Effects (AMEs) for the explanatory variable with 95% confidence intervals. Due to the categorical nature of our outcomes and explanatory variables, the AMEs are to be interpreted as the discrete effect of the independent variable (compared to the reference category – *no partner, no children*), i.e. as the difference between the predicted probabilities (in percentage points) across the groups being compared (e.g., *has a partner and children* vs *no partner, no children*). Full tables of regression estimates (estimated

coefficients; log-odds) are reported in the Supplementary Materials. All control variables listed above have been included in all regression models.

Among the additional analyses we have implemented, we considered heterogeneity analyses to rule out that the main findings only applied to certain demographic (gender and age) or country groups. More specifically, we have re-estimated the models that generated the main results by adding interactions between the explanatory variable and, in turn, gender, age (two groups: 50-64; 65+) and country groups. Countries have been grouped geographically: Norther-Central Europe (Denmark, Finland, France, Germany, Luxembourg, Netherlands, Sweden, Switzerland) and Southern-Eastern Europe (Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Israel, Italy, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Spain). Although simple, this classification allows to capture considerable variation in family norms and similar grouping have been used in previous study about the role of families on health and mortality (Zueras et al 2020). Results are presented graphically. More specifically, as for the main analyses we have estimated the AMEs for the three categories of the explanatory variable corresponding to availability of close kin. However, this time we estimated separate AMEs for the two groups defined by gender, age or country. In the few cases of a statistically significant difference (at the 5% level) between the AMEs this is indicated by an "*x*" used as a marker (the "*x*" is used for the highest AME among the two compared). Full tables of regression estimates (estimated coefficients; log-odds) are reported in the Supplementary Materials. All control variables listed above have been included in all regression models.

Results

Having close kin and precautionary behaviors

We first present the results based on the SHARE Corona Survey 1 (SCS1) which collected information on nine precautionary behaviors in June-August 2020. To ease interpretation of results, we present them graphically in Figure 1 in terms of Average Marginal Effects (AMEs) with 95% confidence intervals obtained from fully-adjusted logistic regression models (see Methods for the socio-demographic and health variables we controlled for). The

full table of regression estimates (log-odds) is reported in the Supplementary Materials (Table S.1).

Results in Figure 1 show that, overall, respondents who have close kin (partner or children) are more likely to adopt the suggested precautionary health behaviors against the spread of the virus compared to kinless older adults. As an example, compared to older people who do not have a partner, partnered older adults (independently of whether they have children or not) are about 6 percentage points more likely to use hand sanitizer or disinfection fluids more frequently than before the outbreak of the pandemic. The positive effect of kin is particularly evident for partnership: for most outcomes, having a *partner and no children* is more often associated with a higher probability of adopting precautionary behaviors than having *children and no partner*. In addition, the AMEs for those who have a *partner and children* are usually very similar and not statistically different to the AMEs for those who have a *partner and no children*. The only precautionary behavior where the combined effect of partnership and parenthood is both significantly and substantially higher than the effect of partnership alone is for reporting less shopping: partnered parents are about 5 percentage points more likely to report having left home for shopping less often or not at all since the outbreak of the pandemic than partnered respondents without children.

Having close kin and vaccine acceptance

Next, we present results about vaccine acceptance based on SHARE Corona Survey 2 (SCS2; June-August 2021), the only SHARE survey where this information is available. Figure 2 presents estimated AMEs (with 95% confidence intervals) obtained from a fully-adjusted multinomial logistic regression (full regression estimates are available in Table S.2 of the Supplementary Materials). Figure 2 shows that the probability of being already vaccinated or planning to do so is about 5 percentage points higher for respondents who have a partner (independently of whether they have children or not). Correspondingly, older adults in a partnership are less likely of both being undecided about vaccination and of not intending to get vaccinated. Parenthood, instead, does not seem to play a role in vaccine acceptance. In fact, the AMEs of having *children and no partner* are very close to zero, and not statistically

significant. In addition, the effect of partnership is neither substantially nor statistically modified by its combination with parenthood.

Heterogeneity analyses

Figures 3-8 present results obtained when interactions with gender, age groups, and country groups were considered to rule out the specificity of results for certain demographic or country groups (full regression estimates are available in Tables S.3-S.8 of the Supplementary Materials). Overall, results are very similar across gender (Figures 3 and 4), age groups (Figures 5 and 6) and country groups (Figures 7 and 8), with statistically significant differences only observed in a bunch of cases, therefore confirming the importance of partnership for precautionary behaviors and COVID-19 vaccine acceptance.

Accounting for co-residence with kin

The stronger effect on precautionary behaviors and vaccine acceptance found for partnership as compared to parenthood might be driven by typical living arrangements with different kin at older ages. In our sample, the vast majority (96.2%) of partnered older adults live with their partner. Instead, only 16.3% of older parents co-reside with at least one of their children. Thus, partners might be more likely to provide support and to exert control as compared to children simply because of the higher amount of time (and resources) shared. However, even analyses that account for living arrangements show that (co-residing) partners more clearly influence precautionary behaviors and vaccine acceptance compared to (co-residing) children (see Figure S.1 for precautionary behaviors and Figure S.2 for vaccine acceptance in the Supplementary Materials).

Additional analyses

As explained in the Methods section, information on precautionary behaviors has been collected very differently in the second SHARE Corona Survey as compared to the first one. Nonetheless, analyses based on items in SCS2 Corona Surveys yielded similar results to those based on items in SCS1: having close kin, and especially a partner, is associated with a higher probability of adopting precautionary behaviors (see Figures S.3 and S.4 in the Supplementary Material).

Finally, in additional preliminary analyses (available upon request) we also distinguished parents by their number of children but did not find this to matter. Also, given the slightly different sample size available for each outcome, we run the regression models selecting only observations available for all outcomes but results were barely affected.

Discussion

Precautionary behaviors have demonstrated efficacy at containing the spread of COVID-19 (Kwon et al 2021; Islam et al 2020; Mitze et al 2020). Similarly, COVID-19 vaccines have been found to reduce the risk of infection, hospitalization and death (Chung; Nordström; Vasileiou). Thus, to slow the spread of the Coronavirus and limit its negative health consequences it is crucial to understand the factors associated with individuals' adoption of precautionary behaviors and acceptance of COVID-19 vaccines. Our study focuses on the role of kin ties among older people, which the general (pre-COVID) literature on health behaviors found to be crucial (Carr & Utz 2020; Hank & Steinbach 2018; Umberson & Thomeer 2020; DiMatteo 2004; Umberson et al 2010; Umberson 1987, 1992; Nomaguchi & Bianchi, 2004; Ross et al 1990; Thomas et al 2017).

Our results show that having kin is overall positively associated with older individuals' likelihood of adopting precautionary behaviors and of being vaccinated or willing to get a COVID-19 vaccine. In particular, we find individuals in a partnership to be more likely to accept vaccine and to adopt (almost all) precautionary behaviors considered in this analysis. Results are robust to controlling for several other drivers of precautionary behaviors and vaccine acceptance (such as health and education), as well as to accounting for co-residence with kin. In addition, results are not specific for age, gender, or country groups. Most statistically significant associations are also substantially important. For example, we find an adjusted difference in the probability of adoption of certain precautionary behavior (washing hand, using hand sanitizer, covering coughs and sneezes, reduced shopping) and of accepting COVID-19 vaccines of about 5 percentage points between partnered and unpartnered older adults, which is similar to the effect found in previous research for gender, health perception

and chronic conditions (Bíró et al. 2021; Galasso et al. 2020; Galasso et al. 2021; Lindholt et al. 2021; Spitzer et al. 2022).

Although our data do not include direct measures of social control, the positive effect of kin on older people's adoption of precautionary behaviors and vaccine acceptance in the context of the COVID-19 pandemic is in line with predictions from the pre-COVID literature which finds ample evidence of positive effects of family social control on health behaviors, such as avoidance of alcohol and cigarette consumption (Lewis & Butterfield 2007; Tucker 2002; Umberson et al 2010; Umberson et al 2018). Thus, it can be speculated that during a pandemic partners and children have an important role in encouraging and controlling the respect of public health measures and recommendations to reduce the risk of contagion and its negative health effects. Evidence in our study is also consistent with social support mechanisms identified in pre-COVID studies, showing that motivational and practical help from kin may positively influence health behaviors (Han et al 2019; Thomas et al 2019; Umberson et al 2010). In the context of a pandemic, partners and children may offer assistance, and provide useful information to understand the importance of precautionary behaviors and vaccination. Practical help may also be useful. In fact, among the health behaviors we analyzed, we find that having children is especially important for a specific outcome, i.e., limiting in-person shopping, which reduces the risk of meeting many strangers in a crowded indoor space, thus reducing the risk of infection (Pantano et al 2021; Shumsky et al 2021; Ying et al 2021).

The generally stronger role that we find for partners compared to children in influencing precautionary behaviors and vaccine acceptance also fits with the predominant evidence in the general literature on family and health behaviors that tend to report larger associations with health behaviors of being in a partnership than having children (Ross et al 1990; Umberson & Montez 2010; Umberson 1987). This is in part explained by the stronger and more effective social control received by partners (Tucker 2002; Umberson et al 2010), and by their greater provision of emotional and practical support (Dykstra 2007; Ross et al 1990; Walen & Lachman 2000). In addition, partners have been found to bilaterally influence each

other's behaviors, thus reinforcing the social support and control function of being in a partnership (Lewis et al 2004).

Our study has some limitations. Our data could not account for the quality of relationships with partner and children for those individuals who have these ties. Previous research found that in case of conflicting relationships, family ties may also lead to health-compromising behaviors as coping mechanisms to deal with stress (Ng & Jeffery 2003). Also, the effectiveness of social control may vary with the type of control utilized (Lewis & Butterfield 2005). Future research could examine more in detail possible heterogeneity in the role of kin ties in the context of the COVID-19 pandemic. It is also worth noting that data on precautionary behaviors and vaccine acceptance come from surveys on survived individuals up to the interview dates. This might introduce a selection bias. Finally, results might be affected by differential response rates by family status during the pandemic. However, data quality controls showed that response rates remained satisfactory (Bergmann & Börsch-Supan 2022).

Despite limitations, our findings help illuminating the complex role of kin ties in the spread of the COVID-19 pandemic and its health outcomes. On the one hand, it has been argued that family relationships (measured, for example, in terms of co-residence, frequent face-to-face contacts, etc.) may increase the chances to get in contact with an infected person, thus constituting a risk to contract the virus. While it has been shown that conditional on having a (co-resident) family member infected the risk of getting the Coronavirus substantially increases (Li et al 2020; Yan et al 2021), the evidence on the (unconditional) risk of Coronavirus infection due to family ties *per se* is still scarce and, with few exceptions, is based on macro-level data. Even the macro-level analyses show mixed results, with some studies reporting a positive association between measures of family ties (e.g., co-residence or frequency face-to-face contacts) and COVID-19 health outcomes (e.g., case-fatality rate or deaths) (Bayer & Kuhn 2020; Fenoll & Grossbard 2020), while other studies found opposite results, especially when sub-national data have been considered (Arpino et al 2020ab; Basellini & Camarda 2022; Belloc et al 2020; Liotta et al 2020). A recent study (Uccheddu and Rizzi 2022) based on part of the same individual-level data we used (SCS1)

found that living with children was associated with a lower risk of Coronavirus for older women. Although it was not the focus on their study, the authors also found a similar effect for living with a partner for both men and women. These results are consistent with our findings of a positive association of close kin ties with precautionary behaviors and vaccine acceptance.

As Ross and colleagues (1990) wrote well before the onset of the COVID-19 pandemic, "a family is more than just a collection of people who might expose each other to infections and pollutants." Thus, on the one hand, as all types of in-person contact, family contact can constitute a risk factor for SARS-CoV-2 infection. On the other hand, our study shows that partners, and to a lesser extent, children can positively influence precautionary behaviors and vaccination. The overall effect of kin on risk of contagion and death is not easy to predict and it may vary with several factors, including extra-family (horizontal) relationships (Sage et al.) working status (Brandén et al 2020) and age (Andrade et al 2022) of family members. Our findings point to a potential positive role of kin in helping public health institutions to fight the pandemic and suggest that when analyzing the role of social relationships on COVID-19 outcomes rather than social network size *per se* one should account for (precautionary) behaviors and all types of contact (not limited to a specific type of ties, e.g. family) a person has. Understanding under which conditions social relationships may play a positive role in the context of a pandemic is of paramount importance and our study offers a new perspective and empirical evidence on this matter. Our findings that kin can have a positive influence on precautionary behaviors and vaccine acceptance suggest that policy makers and practitioners should focus especially on kinless individuals, especially those who are unpartnered, when designing measures to encourage the respect of anti-COVID public health measures.

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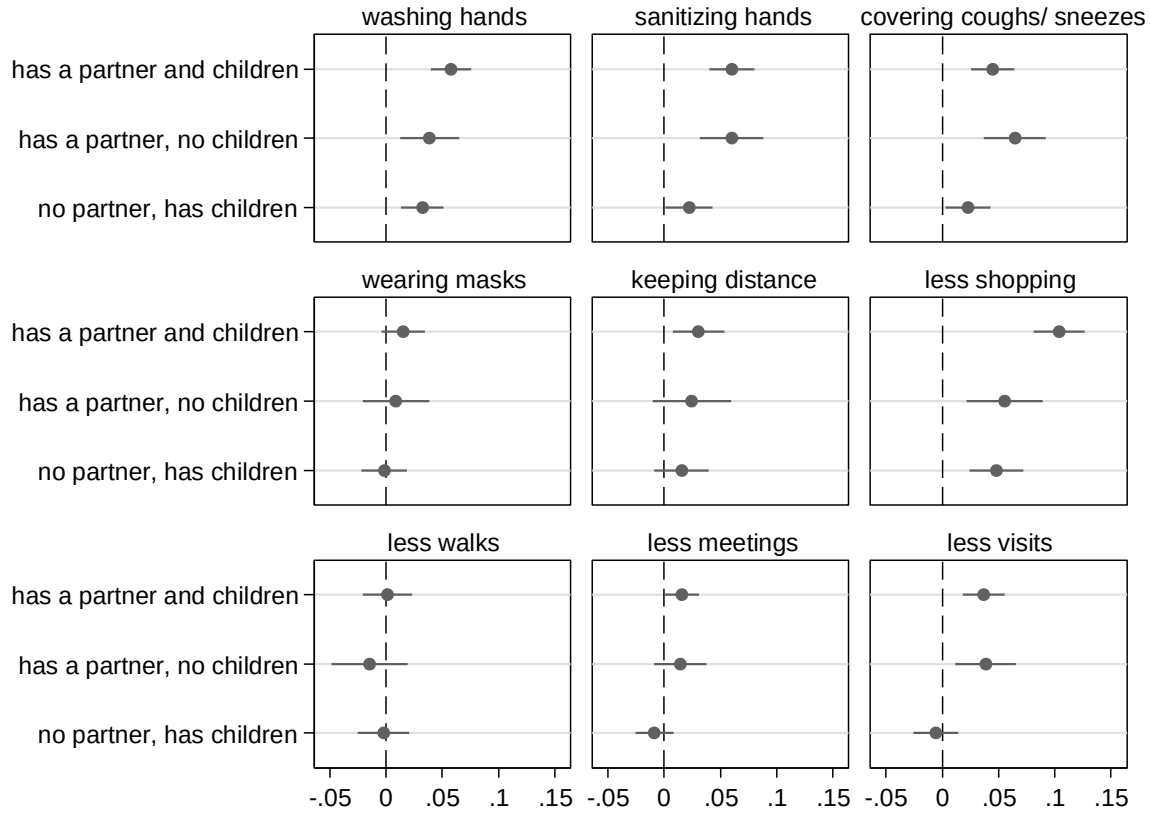
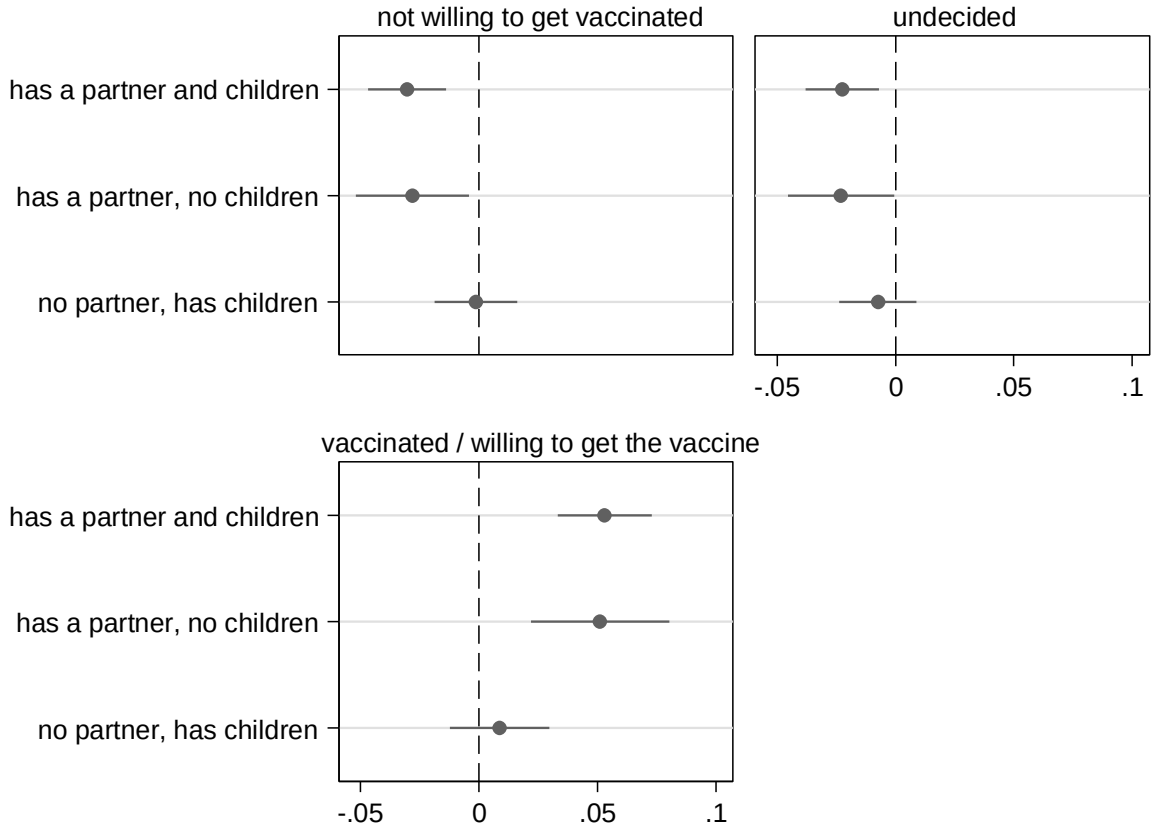
Figures to be included in the manuscript

Fig. 1 – Availability of close kin (partner and children) and COVID-19 precautionary behaviors



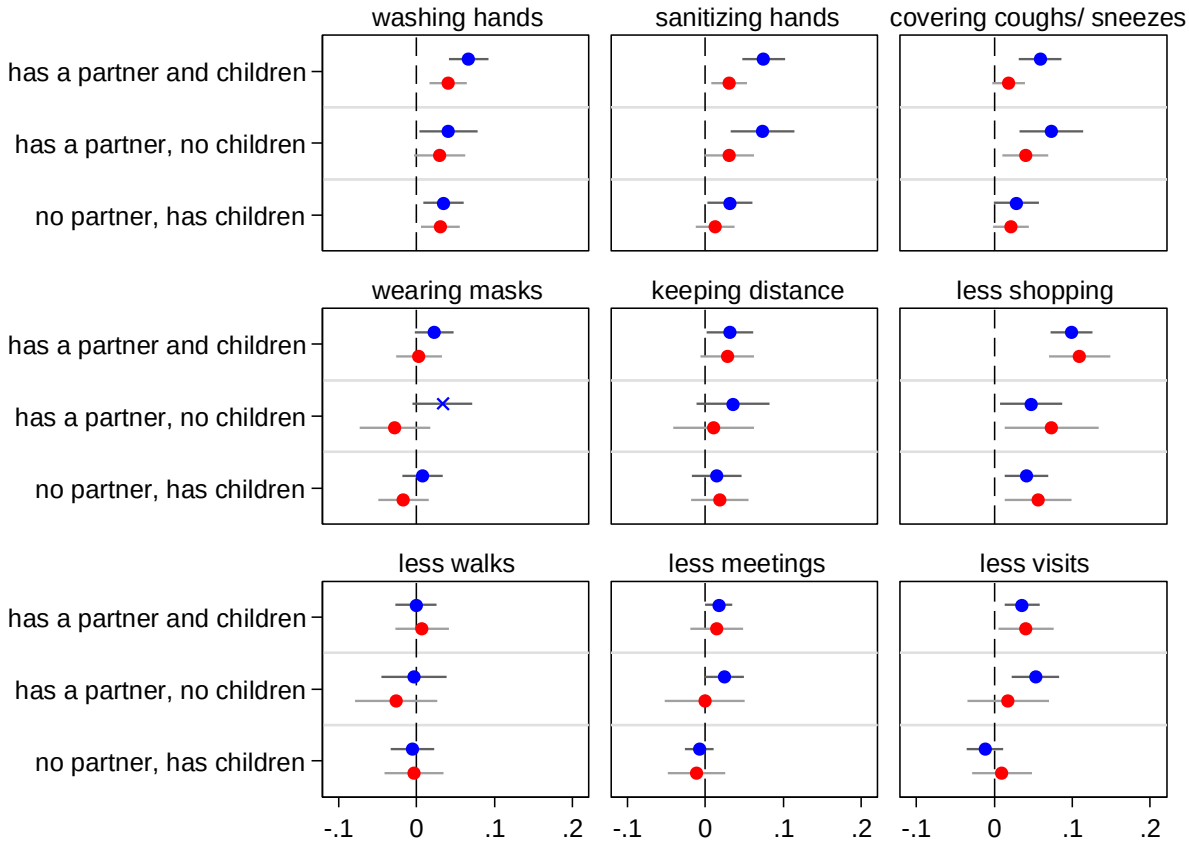
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from nine separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). All control variables are included in the models. Full estimates are available in Table S.1 in the Supplementary Materials. Data are from SHARE Corona Survey 1 (June-August 2020).

Fig. 2 – Availability of close kin (partner and children) and COVID-19 vaccine acceptance



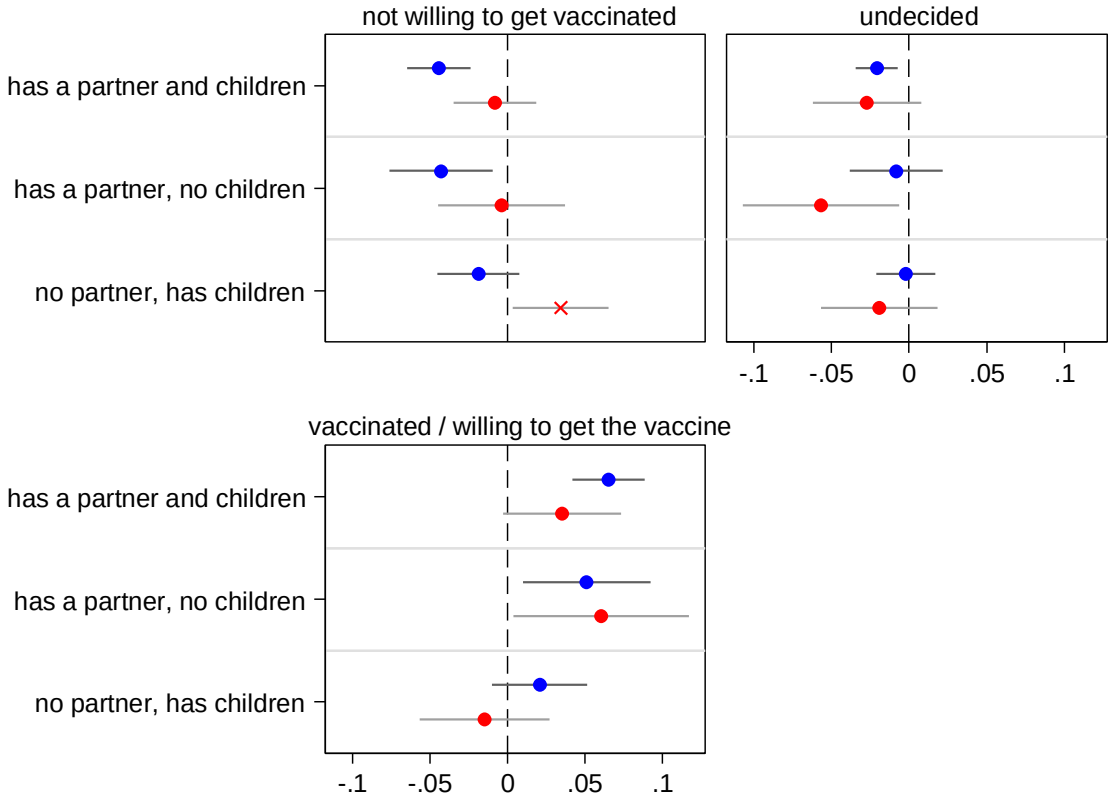
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each AME compares the predicted probability of a certain outcome category (e.g., being vaccinated or willing to get the vaccine) for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). All control variables are included in the models. Full estimates are available in Table S.2 in the Supplementary Materials. Data are from SHARE Corona Survey 2 (June-August 2021).

Fig. 3 – Availability of close kin (partner and children) and COVID-19 precautionary behaviors by age group (65+ in blue; 50-64 in red)



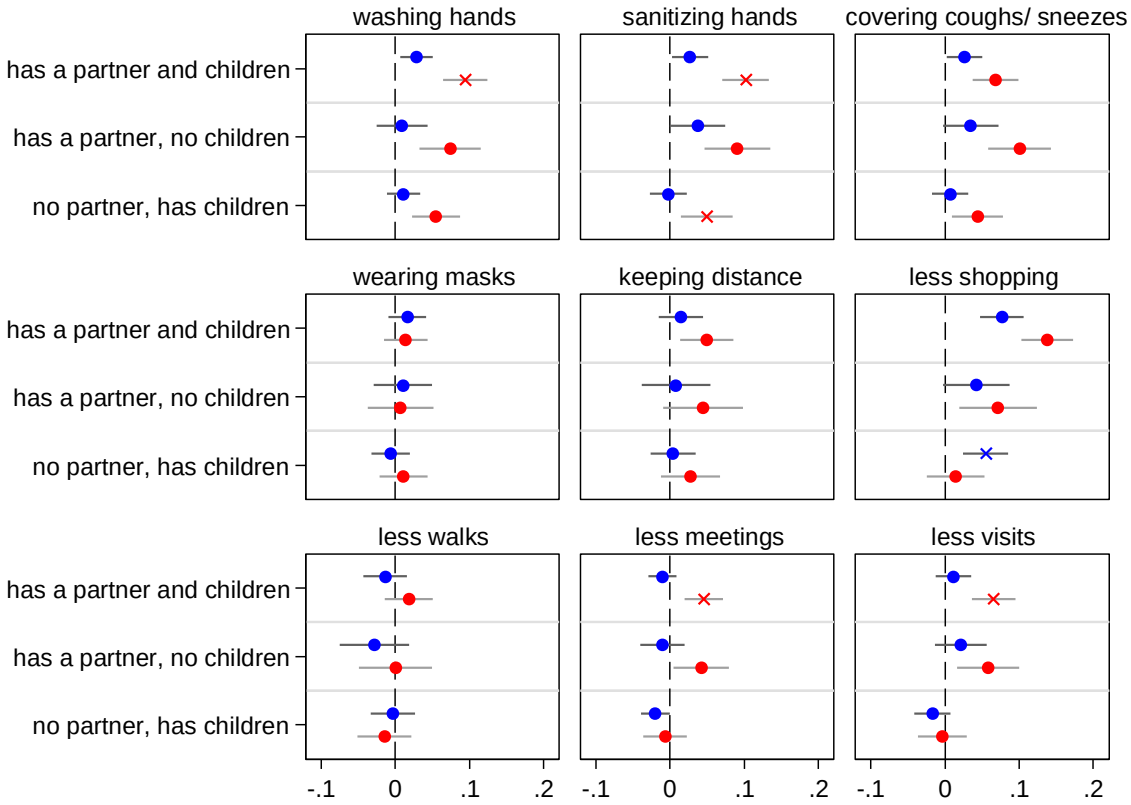
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from nine separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each model includes an interaction between the explanatory variable and a dummy variable for age that distinguishes two groups. Thus, separate AMEs by age are obtained (65+ in blue; 50-64 in red). Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). Statistically significant differences ($p<0.05$) between the AMEs of the two considered age groups are indicated by an "x" in correspondence of the bigger AME. All control variables are included in the models. Full estimates are available in Table S.3 in the Supplementary Materials. Data are from SHARE Corona Survey 1 (June-August 2020).

Fig. 4 – Availability of close kin (partner and children) and COVID-19 vaccine acceptance by age group (65+ in blue; 50-64 in red)



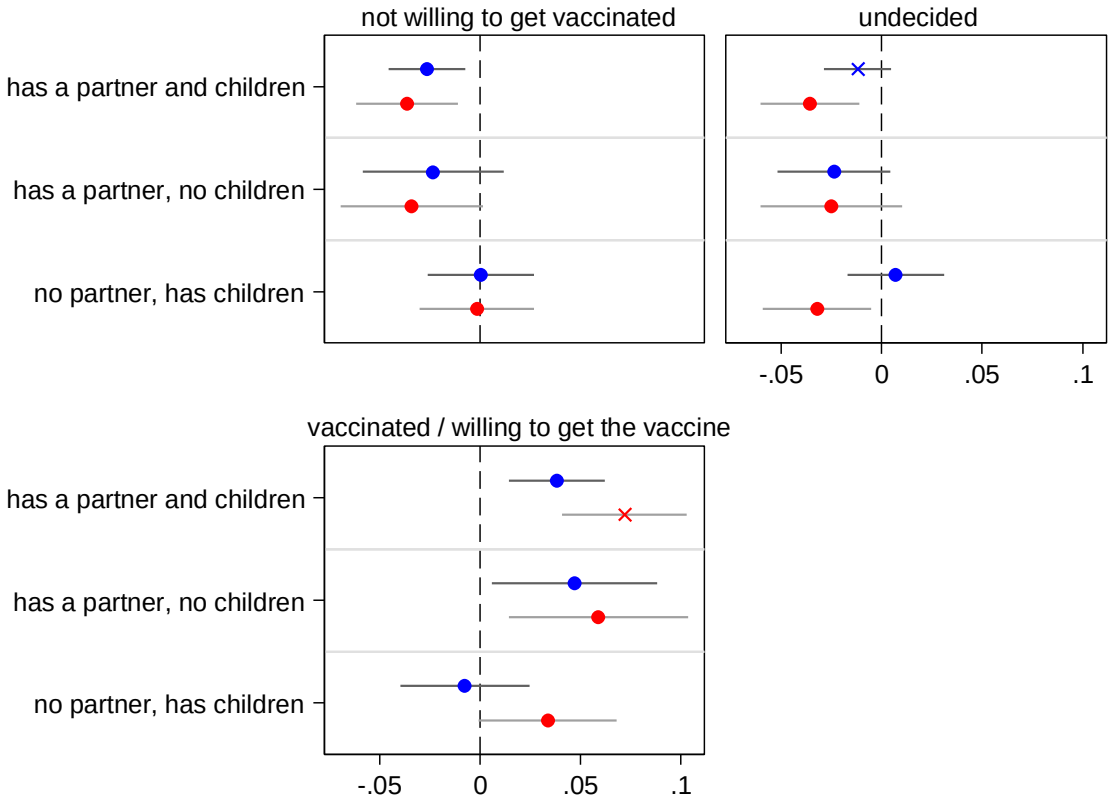
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each model includes an interaction between the explanatory variable and a dummy variable for age that distinguishes two groups. Thus, separate AMEs by age are obtained (65+ in blue; 50-64 in red). Each AME compares the predicted probability of a certain outcome category (e.g., being vaccinated or willing to get the vaccine) for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). Statistically significant differences ($p<0.05$) between the AMEs of the two considered age groups are indicated by an "x" in correspondence of the bigger AME. All control variables are included in the models. Full estimates are available in Table S.4 in the Supplementary Materials. Data are from SHARE Corona Survey 2 (June-August 2021).

Fig. 5 – Availability of close kin (partner and children) and COVID-19 precautionary behaviors by gender (women in blue; men in red)



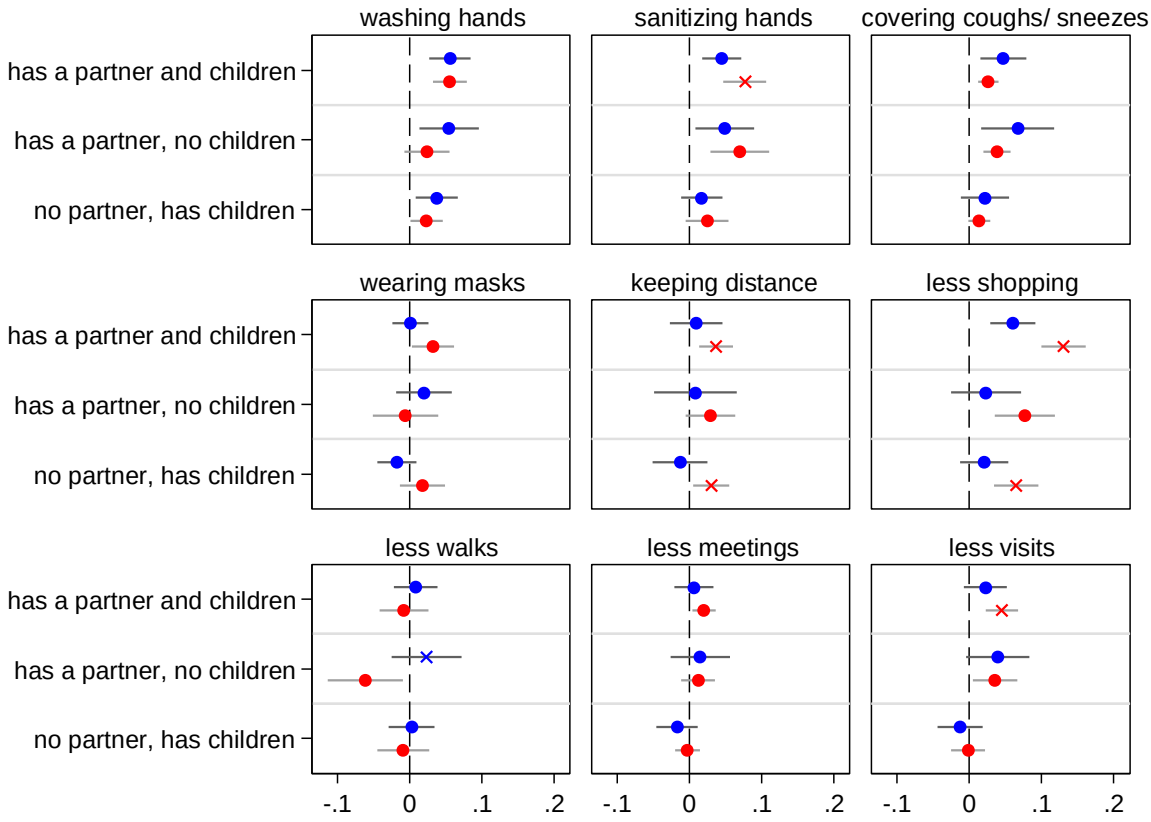
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from nine separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each model includes an interaction between the explanatory variable and a dummy variable for gender. Thus, separate AMEs by gender are obtained (women in blue; men in red). Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). Statistically significant differences ($p<0.05$) between the AMEs of the two genders are indicated by an "x" in correspondence of the bigger AME. All control variables are included in the models. Full estimates are available in Table S.5 in the Supplementary Materials. Data are from SHARE Corona Survey 1 (June-August 2020).

Fig. 6 – Availability of close kin (partner and children) and COVID-19 vaccine acceptance by gender (women in blue; men in red)



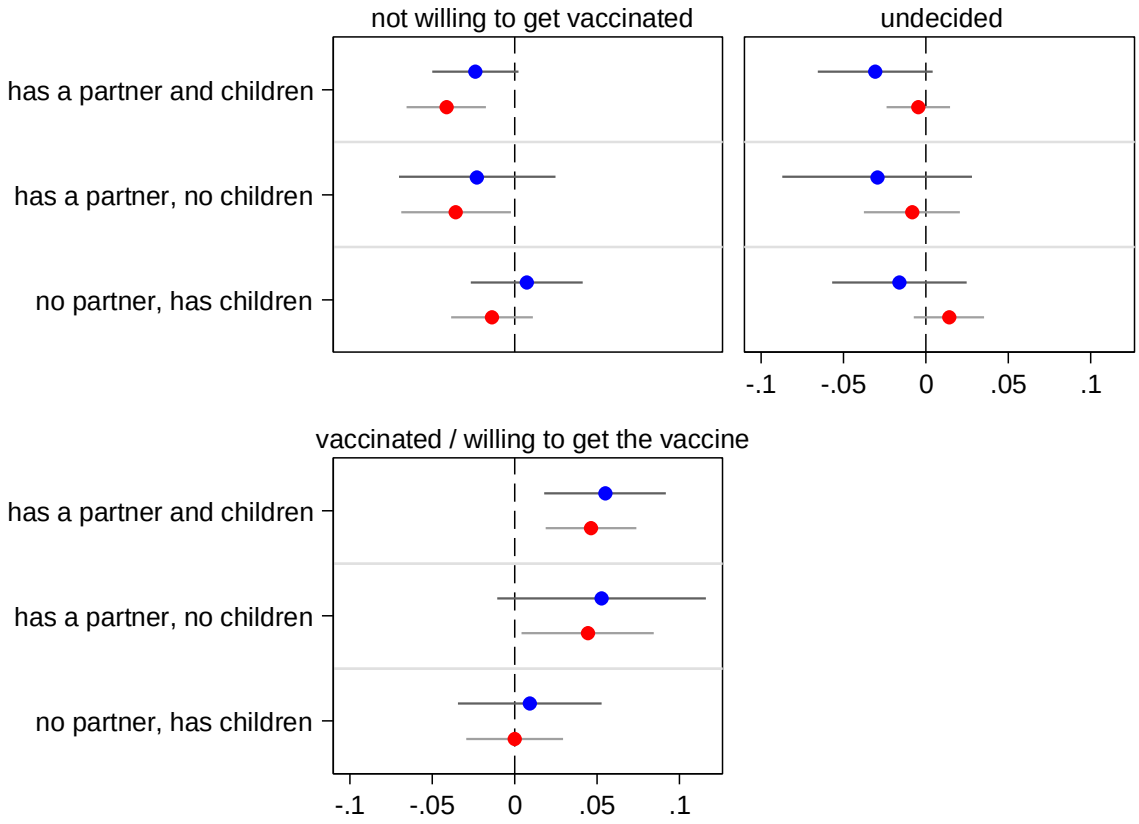
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each model includes an interaction between the explanatory variable and a dummy variable for gender. Thus, separate AMEs by gender are obtained (women in blue; men in red). Each AME compares the predicted probability of a certain outcome category (e.g., being vaccinated or willing to get the vaccine) for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). Statistically significant differences ($p<0.05$) between the AMEs of the two genders are indicated by an "x" in correspondence of the bigger AME. All control variables are included in the models. Full estimates are available in Table S.6 in the Supplementary Materials. Data are from SHARE Corona Survey 2 (June-August 2021).

Fig. 7 – Availability of close kin (partner and children) and COVID-19 precautionary behaviors by country groups (South-East Europe in blue; North-West Europe in red)



Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from nine separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each model includes an interaction between the explanatory variable and a dummy variable for country that distinguishes two groups (South-East Europe in blue; North-West Europe in red). Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). Statistically significant differences ($p<0.05$) between the AMEs of the two considered country groups are indicated by an "x" in correspondence of the bigger AME. All control variables are included in the models. Full estimates are available in Table S.7 in the Supplementary Materials. Data are from SHARE Corona Survey 1 (June-August 2020).

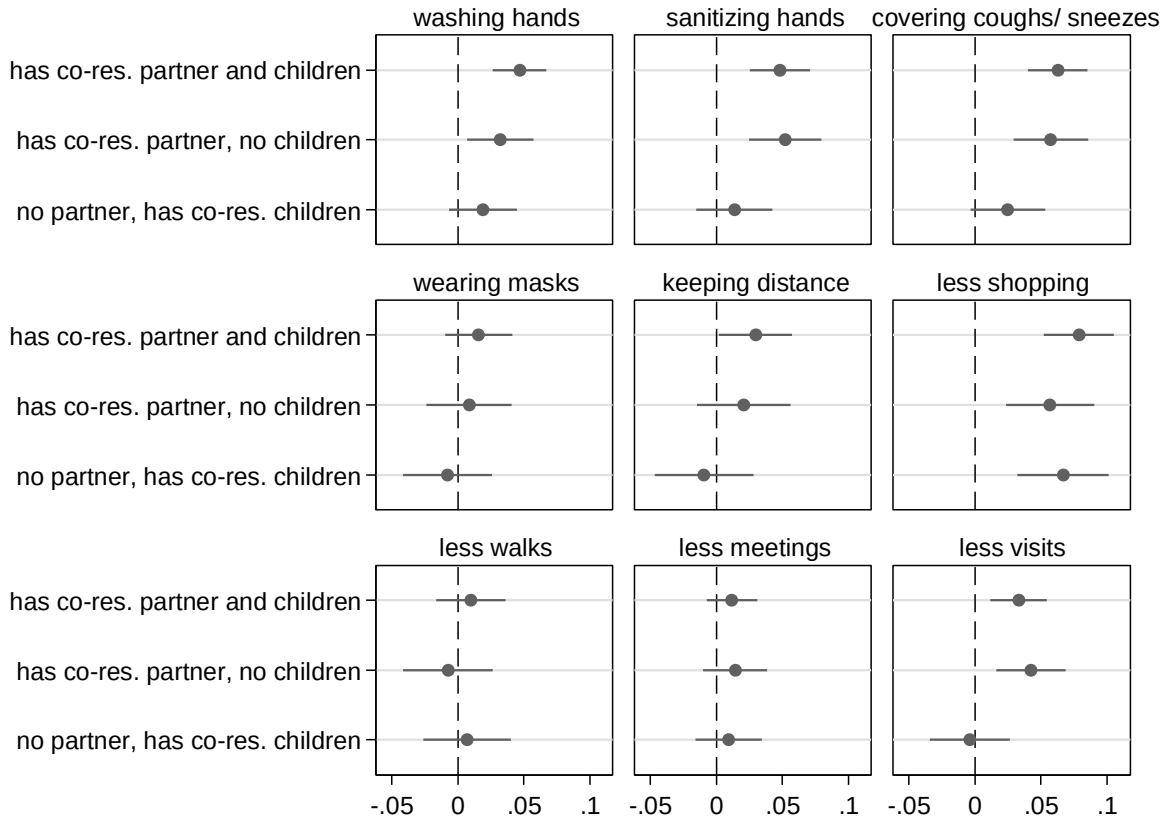
Fig. 8 – Availability of close kin (partner and children) and COVID-19 vaccine acceptance by country groups (South-East Europe in blue; North-West Europe in red)



Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each model includes an interaction between the explanatory variable and a dummy variable for country that distinguishes two groups (South-East Europe in blue; North-West Europe in red). Each AME compares the predicted probability of a certain outcome category (e.g., being vaccinated or willing to get the vaccine) for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). Statistically significant differences ($p<0.05$) between the AMEs of the two considered country groups are indicated by an "x" in correspondence of the bigger AME. All control variables are included in the models. Full estimates are available in Table S.8 in the Supplementary Materials. Data are from SHARE Corona Survey 2 (June-August 2021).

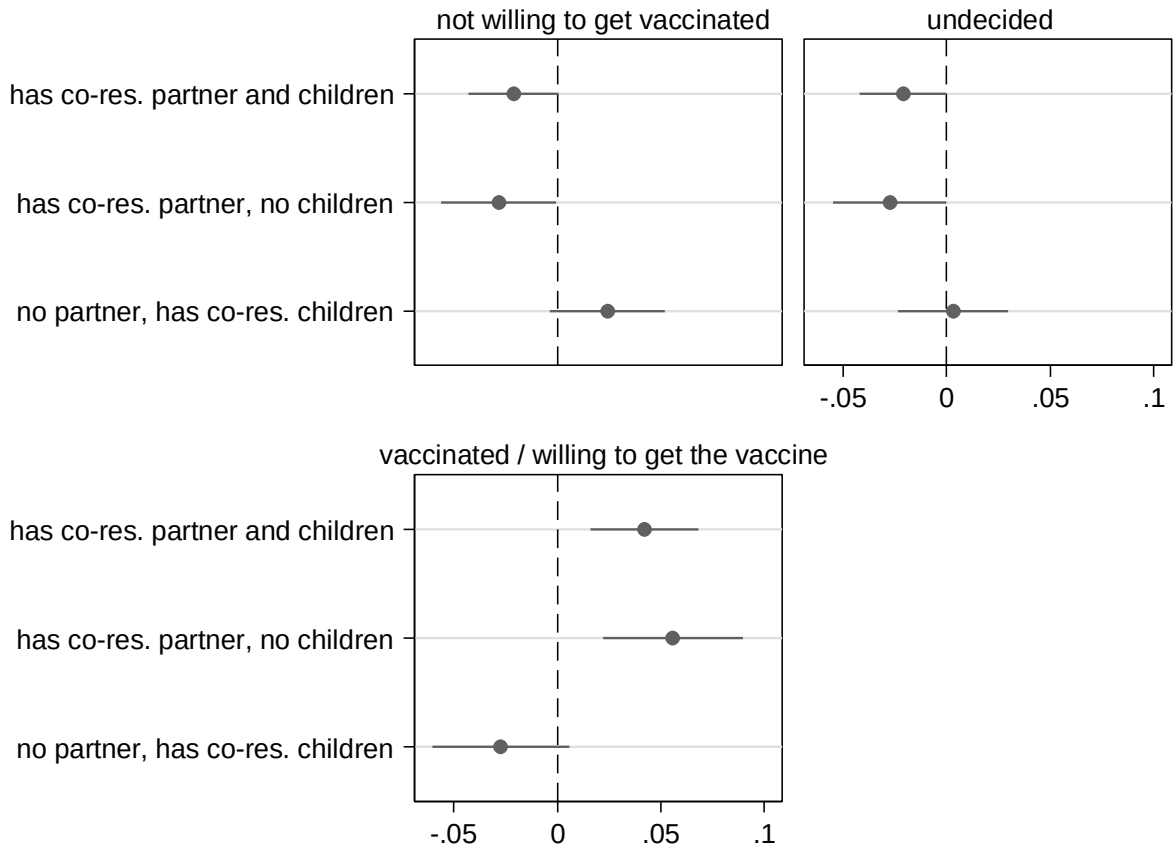
Supplementary Materials: Additional Figures and Tables

Figure S.1 – Coresidence with close kin (partner and children) and COVID-19 precautionary behaviors



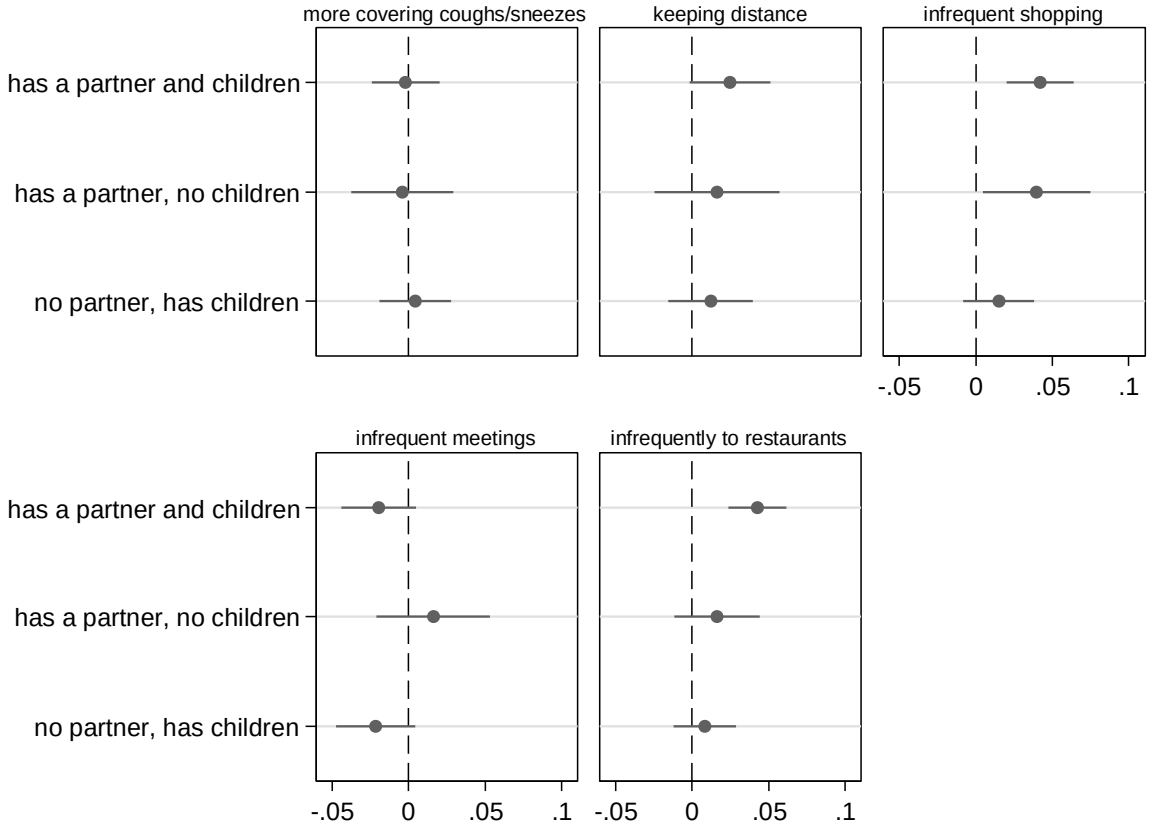
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from nine separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (coresidence with kin) is presented in the form of AMEs. Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available and coreside with them (e.g., those who coreside with both a partner and at least one child) with that for the reference group (kinless, i.e. older adults who lack both partner and children). All control variables are included in the models. Data are from SHARE Corona Survey 1 (June-August 2020).

Fig. S.2 – Coresidence with close kin (partner and children) and COVID-19 vaccine acceptance



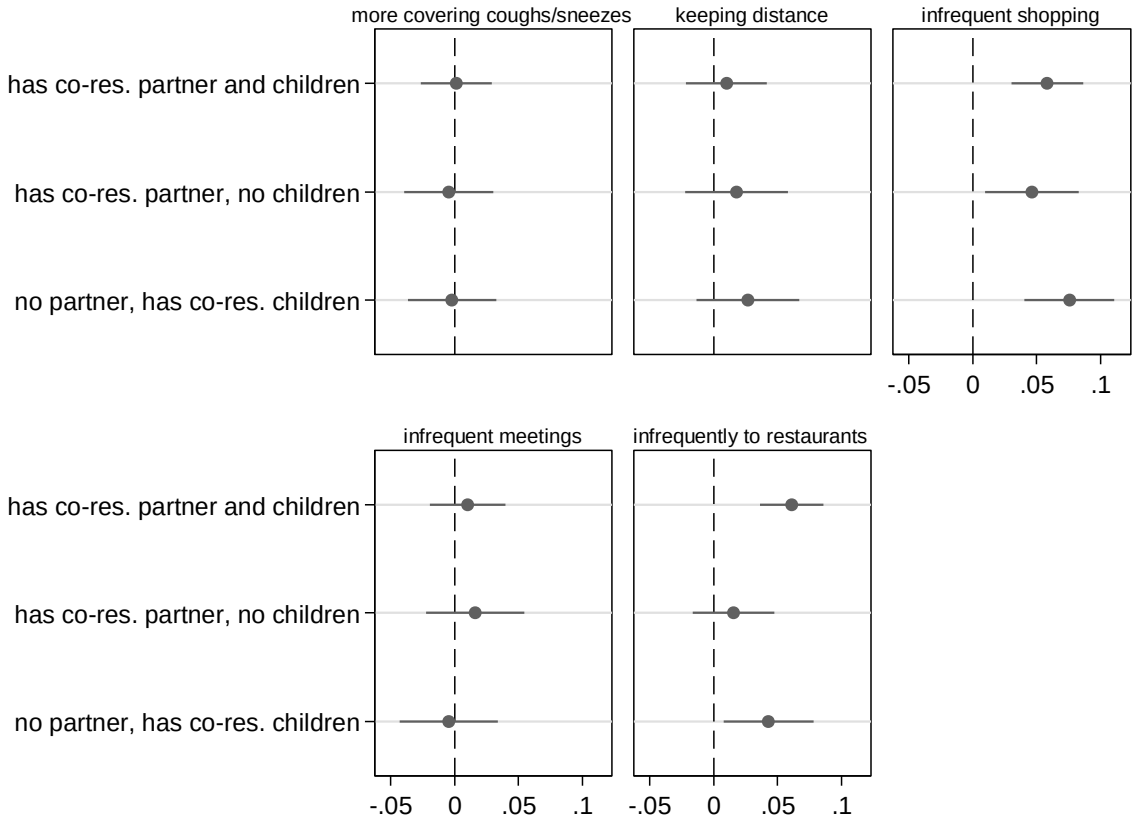
Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance. In particular, the effect of the explanatory variable (coresidence with kin) is presented in the form of AMEs. Each AME compares the predicted probability of a certain outcome category (e.g., being vaccinated or willing to get the vaccine) for each one of the three groups of older adults who have kin available and coreside with them (e.g., those who coreside with both a partner and at least one child) with that for the reference group (kinless, i.e. older adults who lack both partner and children). All control variables are included in the models. Data are from SHARE Corona Survey 2 (June-August 2021).

Fig. S.3 – Availability of close kin (partner and children) and COVID-19 precautionary behaviors in June-August 2021 (SHARE Corona Survey 2)



Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from five separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (having kin) is presented in the form of AMEs. Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available (e.g., those who have both a partner and children) with that for the reference group (kinless, i.e. older adults who lack both partner and children). All control variables are included in the models. Data are from SHARE Corona Survey 2 (June-August 2021).

Figure S.4 – Coresidence with close kin (partner and children) and COVID-19 precautionary behaviors in June-August 2021 (SHARE Corona Survey 2)



Notes: The graph shows results (Average Marginal Effects (AMEs) with 95% confidence intervals) from nine separate logistic regression models for each of the considered precautionary behaviors. In particular, the effect of the explanatory variable (coresidence with kin) is presented in the form of AMEs. Each AME compares the predicted probability of adopting a precautionary behavior for each one of the three groups of older adults who have kin available and coreside with them (e.g., those who coreside with both a partner and at least one child) with that for the reference group (kinless, i.e. older adults who lack both partner and children). All control variables are included in the models. Data are from SHARE Corona Survey 2 (June-August 2021).

Table S.1 – Logistic regression models for nine COVID-19 precautionary behaviors, full results

Independent variables	Outcome variables (COVID-19 precautionary behaviors)								
	washing hands	sanitizing hands	covering coughs and sneezes	wearing masks	keeping distance	less shopping	less walks	less meetings	less visits
Having close kin (Ref.: no partner, no children)									
has a partner and children	0.54***	0.43***	0.34***	0.12	0.18**	0.56***	0.01	0.18*	0.31***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.09)	(0.07)
has a partner, no children	0.34**	0.43***	0.52***	0.07	0.14	0.29**	-0.08	0.16	0.32**
	(0.12)	(0.11)	(0.12)	(0.11)	(0.10)	(0.09)	(0.09)	(0.14)	(0.12)
no partner, has children	0.28***	0.15*	0.17*	-0.01	0.09	0.25***	-0.01	-0.09	-0.05
	(0.08)	(0.07)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)	(0.09)	(0.08)
Age (Ref.: 50-54)									
age 55-59	0.23*	0.45***	0.47***	-0.03	0.00	-0.18*	-0.45***	-0.09	-0.26**
	(0.11)	(0.09)	(0.10)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.09)
age 60-64	0.32***	0.45***	0.51***	0.08	0.05	-0.16*	-0.40***	-0.02	-0.16
	(0.10)	(0.09)	(0.09)	(0.10)	(0.08)	(0.07)	(0.07)	(0.10)	(0.09)
age 65-69	0.38***	0.34***	0.36***	0.10	0.14	-0.08	-0.35***	0.02	-0.01
	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.08)	(0.07)	(0.10)	(0.09)
age 70-74	0.36***	0.27**	0.25**	0.18	0.24**	0.12	-0.14	0.24*	0.23*
	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.09)
age 75-79	0.22*	0.01	0.08	0.14	0.20*	0.15	0.03	0.43***	0.30**
	(0.10)	(0.09)	(0.09)	(0.10)	(0.09)	(0.08)	(0.08)	(0.11)	(0.10)
age 80-85	0.09	-0.16	-0.08	0.17	0.16	0.39***	0.27***	0.44***	0.39***
	(0.10)	(0.09)	(0.09)	(0.11)	(0.09)	(0.08)	(0.08)	(0.12)	(0.10)
Female	0.28***	0.22***	0.27***	0.53***	0.40***	0.64***	0.32***	0.43***	0.33***
	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Education (Ref.: low)									
medium	0.12	0.25***	0.19***	0.20**	0.11	0.00	-0.06	0.10	-0.01
	(0.07)	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)
high	0.17**	0.43***	0.23***	0.24***	0.18***	-0.07	-0.25***	0.08	-0.13*
	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.07)	(0.06)
Working status (Ref.: Retired)									
working	0.21**	0.38***	0.24***	-0.04	-0.10*	-0.30***	-0.15***	-0.73***	-0.15**
	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.04)	(0.04)	(0.06)	(0.05)
other	-0.07	-0.09	-0.06	-0.03	-0.02	-0.02	0.18***	-0.07	-0.02
	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.07)	(0.06)
Household income	0.02*	-0.00	0.01	-0.00	0.00	0.02*	-0.01*	0.02	0.02*
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Self-rated health	-0.07**	-0.10***	-0.03	-0.02	-0.02	0.14***	0.30***	0.05*	0.15***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diagnosed illness	-0.04	0.18***	0.10*	0.22***	0.11**	0.06	0.03	0.05	0.01
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Gali	-0.08	-0.07	-0.09*	-0.02	0.01	0.28***	0.22***	0.24***	0.13**
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Respondent or close	0.13	0.08	0.23**	-0.01	0.02	0.12*	-0.13*	0.03	0.04
relatives tested positive	(0.08)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)	(0.06)	(0.08)	(0.07)
Country (Ref.: Austria)									
Germany	-0.64**	-0.64***	-0.91***	0.32	-0.45**	-0.85***	-0.71***	-0.19	-0.64***
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.14)	(0.19)	(0.16)
Sweden	-0.24	-0.07	-1.34***	-5.57***	-0.78***	-0.20	-1.54***	-0.82***	-0.27
	(0.21)	(0.16)	(0.22)	(0.34)	(0.15)	(0.14)	(0.15)	(0.18)	(0.17)
Netherlands	0.03	-0.38*	-1.22***	-6.05***	-0.70***	-0.62***	-1.15***	0.04	-0.19
	(0.25)	(0.18)	(0.24)	(0.60)	(0.17)	(0.15)	(0.17)	(0.23)	(0.19)
Spain	0.67**	1.06***	-0.98***	1.26***	0.47*	0.77***	1.97***	0.92***	1.02***
	(0.25)	(0.19)	(0.23)	(0.21)	(0.19)	(0.17)	(0.16)	(0.26)	(0.22)
Italy	0.15	0.53**	-1.21***	1.80***	0.54**	0.84***	2.78***	1.03***	0.92***
	(0.22)	(0.17)	(0.22)	(0.21)	(0.18)	(0.15)	(0.16)	(0.22)	(0.19)
France	-0.72***	0.25	-1.10***	-0.21	-0.76***	-0.20	0.66***	-0.15	-0.20
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Denmark	-0.20	1.63***	-0.56*	-5.51***	-0.11	-0.94***	-1.50***	-0.66***	-0.50**
	(0.22)	(0.21)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Greece	-0.08	0.14	-0.87***	-1.23***	-1.57***	-0.02	1.46***	0.06	-0.13
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.13)	(0.18)	(0.16)
Switzerland	-0.17	0.48**	-1.02***	-2.85***	-0.52**	0.28	-0.39**	0.55*	0.19
	(0.22)	(0.17)	(0.23)	(0.18)	(0.16)	(0.15)	(0.14)	(0.22)	(0.18)
Belgium	-0.20	-0.01	-1.29***	-1.30***	-0.22	0.02	0.01	0.76***	0.46*
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.22)	(0.18)
Israel	-0.28	-0.73***	-1.54***	0.63**	-0.99***	-0.06	0.98***	-0.44*	0.20
	(0.23)	(0.17)	(0.23)	(0.21)	(0.18)	(0.16)	(0.16)	(0.21)	(0.20)
Czech Republic	-0.83***	0.04	-1.45***	1.80***	-0.64***	-0.59***	0.45***	-0.47**	-0.66***
	(0.20)	(0.16)	(0.22)	(0.19)	(0.15)	(0.14)	(0.13)	(0.18)	(0.16)
Poland	-0.01	0.12	-0.82***	1.17***	-0.71***	-0.21	0.60***	-0.33	-0.05
	(0.21)	(0.16)	(0.22)	(0.19)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Luxembourg	-0.76***	0.33	-0.95***	1.76***	0.41*	0.72***	0.13	1.46***	0.62**
	(0.22)	(0.19)	(0.24)	(0.24)	(0.20)	(0.17)	(0.15)	(0.32)	(0.21)
Hungary	-0.37	-0.13	0.24	-0.13	-0.82***	0.36*	1.54***	-0.67**	0.62**
	(0.24)	(0.19)	(0.31)	(0.20)	(0.19)	(0.17)	(0.17)	(0.22)	(0.23)

Slovenia	-0.39	1.00***	-1.88***	0.78***	-0.28	1.17***	-0.20	0.75***	0.89***
	(0.20)	(0.17)	(0.21)	(0.18)	(0.16)	(0.15)	(0.13)	(0.21)	(0.18)
Estonia	-0.17	0.41*	-1.98***	-2.29***	-0.60***	0.08	-0.10	-0.80***	0.22
	(0.21)	(0.16)	(0.21)	(0.17)	(0.16)	(0.14)	(0.13)	(0.18)	(0.17)
Croatia	-0.19	0.32	-0.78***	-1.40***	-1.01***	0.22	1.25***	0.32	0.47*
	(0.22)	(0.17)	(0.23)	(0.18)	(0.17)	(0.15)	(0.15)	(0.22)	(0.19)
Lithuania	0.18	0.47**	-1.20***	1.25***	-0.27	0.62***	0.74***	0.02	0.53**
	(0.23)	(0.18)	(0.23)	(0.20)	(0.17)	(0.16)	(0.14)	(0.21)	(0.19)
Bulgaria	-0.06	-0.60***	-1.25***	0.42*	-0.22	-0.71***	1.15***	-1.11***	-0.78***
	(0.23)	(0.17)	(0.23)	(0.19)	(0.18)	(0.15)	(0.15)	(0.19)	(0.17)
Cyprus	0.10	1.59***	-2.52***	-0.63**	-0.75***	0.86***	2.10***	0.39	0.57*
	(0.27)	(0.28)	(0.23)	(0.20)	(0.20)	(0.21)	(0.19)	(0.28)	(0.25)
Finland	-0.02	0.71***	-0.79***	-5.11***	-1.37***	-0.31*	-1.19***	-0.46*	-0.38*
	(0.22)	(0.18)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Latvia	-0.25	-0.24	-1.41***	-3.54***	-1.68***	-0.17	0.10	-0.44*	0.21
	(0.23)	(0.18)	(0.23)	(0.23)	(0.17)	(0.16)	(0.15)	(0.21)	(0.20)
Malta	0.66*	0.88***	-0.89***	-0.21	0.46*	0.97***	1.86***	0.68**	0.99***
	(0.27)	(0.20)	(0.24)	(0.20)	(0.23)	(0.18)	(0.16)	(0.25)	(0.23)
Romania	0.05	-0.11	-1.00***	0.93***	0.03	0.61***	2.95***	0.31	0.65***
	(0.22)	(0.17)	(0.23)	(0.19)	(0.18)	(0.15)	(0.18)	(0.22)	(0.19)
Slovakia	-0.57**	-0.18	-2.26***	0.24	-1.38***	-0.74***	0.55***	-1.11***	-0.63***
	(0.22)	(0.18)	(0.22)	(0.19)	(0.16)	(0.15)	(0.15)	(0.19)	(0.17)
Constant	1.50***	0.49*	2.10***	0.16	1.23***	-0.31	-1.02***	1.78***	0.92***
	(0.25)	(0.20)	(0.25)	(0.23)	(0.20)	(0.18)	(0.18)	(0.25)	(0.22)
N	33097	33101	32926	27986	27968	32829	32606	32488	32504

Note: Estimated coefficients (effects on log-odds) from separate logistic regression models for each outcome. Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 1 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space. Data are from SHARE Corona Survey 1 (June-August 2020).

Table S.2 – Multinomial logistic regression model for COVID-19 vaccine acceptance, full results

Independent variables	Outcome categories (Ref.: vaccinated/willing to get the vaccine)	
	not willing to get vaccinated	undecided
Having close kin (Ref.: no partner, no children)		
has a partner and children	-0.48***	-0.44***
	(0.10)	(0.11)
has a partner, no children	-0.44**	-0.44*
	(0.17)	(0.18)
no partner, has children	-0.04	-0.11
	(0.10)	(0.11)
Age (Ref.: 50-54)		
age 55-59	-0.18	0.07
	(0.12)	(0.12)
age 60-64	-0.20	-0.18
	(0.11)	(0.12)
age 65-69	-0.31**	-0.29*
	(0.12)	(0.12)
age 70-74	-0.49***	-0.61***
	(0.12)	(0.13)
age 75-79	-0.56***	-0.90***
	(0.13)	(0.14)
age 80-85	-0.46***	-1.08***
	(0.13)	(0.15)
Female	-0.04	-0.08
	(0.05)	(0.05)
Education (Ref.: low)		
medium	-0.11	-0.01
	(0.09)	(0.10)
high	-0.39***	-0.28**
	(0.08)	(0.09)
Working status (Ref.: Retired)		
working	0.21**	0.06
	(0.08)	(0.08)
other	0.56***	0.32***
	(0.07)	(0.08)
Household income	-0.07***	-0.15***
	(0.02)	(0.03)
Self-rated health	0.12***	0.08*
	(0.03)	(0.03)
Diagnosed illness	-0.17**	-0.22***
	(0.06)	(0.06)
Gali	0.15*	0.08
	(0.06)	(0.07)
Respondent or close relatives tested positive	-0.28***	-0.10
	(0.05)	(0.05)
Country (Ref.: Austria)		
Germany	-0.46*	-0.92***
	(0.18)	(0.27)

Sweden	-1.72***	-1.62***
	(0.38)	(0.48)
Netherlands	-1.29***	-1.71**
	(0.37)	(0.61)
Spain	-2.04***	-3.83***
	(0.33)	(1.02)
Italy	-1.15***	-0.76**
	(0.20)	(0.24)
France	-0.26	-0.08
	(0.19)	(0.24)
Denmark	-1.80***	-2.95***
	(0.32)	(0.73)
Greece	-0.34*	0.49*
	(0.17)	(0.20)
Switzerland	0.74***	1.13***
	(0.18)	(0.23)
Belgium	-1.15***	-1.55***
	(0.23)	(0.35)
Israel	-1.36***	-1.30**
	(0.34)	(0.49)
Czech Republic	-0.04	0.17
	(0.18)	(0.22)
Poland	0.36*	0.70***
	(0.17)	(0.21)
Luxembourg	-0.50	-1.20**
	(0.26)	(0.45)
Hungary	0.20	-0.74
	(0.23)	(0.39)
Slovenia	0.58***	1.19***
	(0.17)	(0.20)
Estonia	0.21	0.76***
	(0.16)	(0.20)
Croatia	0.39*	1.16***
	(0.18)	(0.21)
Lithuania	0.86***	0.98***
	(0.18)	(0.23)
Bulgaria	2.71***	3.21***
	(0.19)	(0.23)
Cyprus	-0.48	0.49
	(0.31)	(0.30)
Finland	-1.43***	-0.94**
	(0.28)	(0.32)
Latvia	1.48***	1.90***
	(0.18)	(0.22)
Malta	-1.91***	-2.92***
	(0.37)	(0.73)
Romania	2.24***	2.24***
	(0.17)	(0.21)
Slovakia	0.74***	0.91***
	(0.18)	(0.22)
Constant	-1.67***	-2.06***
	(0.24)	(0.29)

N	27432

Estimated coefficients (effects on log-odds) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance (reference = vaccinated/willing to get the vaccine). Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 2 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space. Data are from SHARE Corona Survey 2 (June-August 2021).

Table S.3 – Logistic regression models for nine COVID-19 precautionary behaviors that include an interaction between the explanatory variable (having kin) and age groups, full results

Independent variables	Outcome variables (COVID-19 precautionary behaviors)								
	washing hands	sanitizing hands	covering coughs and sneezes	wearing masks	keeping distance	less shopping	less walks	less meetings	less visits
Having close kin (Ref.: no partner, no children)									
has a partner and children	0.52***	0.37**	0.23	0.03	0.17	0.51***	0.04	0.11	0.26*
	(0.13)	(0.12)	(0.13)	(0.12)	(0.10)	(0.09)	(0.10)	(0.12)	(0.11)
has a partner, no children	0.35	0.36	0.58*	-0.21	0.06	0.34*	-0.15	-0.01	0.11
	(0.21)	(0.20)	(0.23)	(0.18)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
no partner, has children	0.37**	0.14	0.28*	-0.13	0.11	0.26**	-0.02	-0.08	0.06
	(0.14)	(0.13)	(0.14)	(0.13)	(0.11)	(0.10)	(0.11)	(0.13)	(0.12)
65 or older (ref.: younger than 65)	-0.62**	-1.12***	-1.16***	-0.41	-0.18	0.97***	0.97***	0.90**	0.65**
	(0.24)	(0.22)	(0.22)	(0.23)	(0.20)	(0.19)	(0.19)	(0.28)	(0.23)
Interactions between "65 or older" and:									
has a partner and children	0.03	0.09	0.14	0.14	0.00	0.09	-0.04	0.14	0.08
	(0.15)	(0.14)	(0.15)	(0.15)	(0.13)	(0.12)	(0.13)	(0.17)	(0.15)
has a partner, no children	-0.04	0.08	-0.10	0.47*	0.14	-0.07	0.13	0.37	0.44
	(0.25)	(0.24)	(0.27)	(0.23)	(0.21)	(0.18)	(0.19)	(0.28)	(0.24)
no partner, has children	-0.10	0.04	-0.11	0.19	-0.03	-0.03	-0.01	-0.02	-0.16
	(0.17)	(0.16)	(0.16)	(0.16)	(0.14)	(0.13)	(0.13)	(0.18)	(0.16)
Age (ref.: 50-54)									
age 55-59	-0.11	-0.11	-0.11	-0.12	-0.06	0.15	-0.08	0.15	-0.05
	(0.15)	(0.14)	(0.14)	(0.12)	(0.10)	(0.09)	(0.10)	(0.11)	(0.11)
age 60-64	-0.04	-0.15	-0.11	-0.02	-0.02	0.20*	-0.00	0.24*	0.06
	(0.15)	(0.14)	(0.14)	(0.12)	(0.10)	(0.09)	(0.10)	(0.11)	(0.11)
age 65-69	0.63***	0.76***	0.80***	0.25	0.24	-0.71***	-0.86***	-0.69***	-0.45**
	(0.12)	(0.10)	(0.10)	(0.15)	(0.13)	(0.13)	(0.11)	(0.20)	(0.15)
age 70-74	0.60***	0.68***	0.68***	0.33*	0.34**	-0.50***	-0.65***	-0.45*	-0.19
	(0.12)	(0.10)	(0.10)	(0.15)	(0.13)	(0.13)	(0.11)	(0.20)	(0.16)
age 75-79	0.46***	0.42***	0.50***	0.29	0.31*	-0.45***	-0.48***	-0.25	-0.12
	(0.12)	(0.10)	(0.10)	(0.15)	(0.13)	(0.13)	(0.11)	(0.21)	(0.16)
age 80-85	0.32**	0.24*	0.34**	0.31*	0.26*	-0.21	-0.23	-0.23	-0.01
	(0.12)	(0.10)	(0.11)	(0.15)	(0.13)	(0.13)	(0.12)	(0.21)	(0.16)
Female	0.28***	0.21***	0.27***	0.53***	0.40***	0.66***	0.32***	0.45***	0.34***
	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Education (Ref.: low)									
medium	0.11	0.23***	0.18**	0.19**	0.10	0.02	-0.05	0.12	-0.00

	(0.07)	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)
high	0.15**	0.40***	0.21***	0.24***	0.18***	-0.05	-0.23***	0.11	-0.11
	(0.06)	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.04)	(0.07)	(0.06)
Working status (Ref.: Retired)									
working	0.15*	0.28***	0.14*	-0.05	-0.11*	-0.22***	-0.08	-0.66***	-0.10
	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
other	-0.11	-0.14**	-0.12*	-0.04	-0.03	0.03	0.22***	-0.02	0.01
	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.08)	(0.06)
Household income	0.02*	-0.00	0.01	-0.00	0.00	0.02*	-0.01*	0.02	0.02*
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Self-rated health	-0.07**	-0.09***	-0.03	-0.02	-0.02	0.14***	0.30***	0.05	0.15***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diagnosed illness	-0.04	0.18***	0.10*	0.22***	0.11**	0.06	0.03	0.05	0.01
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Gali	-0.08	-0.06	-0.09*	-0.02	0.01	0.27***	0.21***	0.23***	0.13**
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Respondent or close	0.13	0.07	0.22**	-0.01	0.02	0.13*	-0.13*	0.04	0.05
relatives tested positive	(0.08)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)	(0.06)	(0.08)	(0.07)
Country (Ref.: Austria)									
Germany	-0.64**	-0.64***	-0.91***	0.32	-0.45**	-0.85***	-0.71***	-0.19	-0.64***
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.14)	(0.19)	(0.16)
Sweden	-0.23	-0.06	-1.34***	-5.57***	-0.77***	-0.21	-1.54***	-0.83***	-0.27
	(0.21)	(0.16)	(0.22)	(0.34)	(0.15)	(0.14)	(0.15)	(0.18)	(0.17)
Netherlands	0.04	-0.37*	-1.21***	-6.05***	-0.70***	-0.63***	-1.16***	0.02	-0.20
	(0.25)	(0.18)	(0.24)	(0.60)	(0.17)	(0.15)	(0.17)	(0.23)	(0.19)
Spain	0.68**	1.08***	-0.96***	1.27***	0.47*	0.76***	1.96***	0.90***	1.01***
	(0.25)	(0.19)	(0.23)	(0.21)	(0.19)	(0.17)	(0.16)	(0.26)	(0.22)
Italy	0.15	0.53**	-1.21***	1.80***	0.54**	0.84***	2.79***	1.04***	0.92***
	(0.22)	(0.17)	(0.22)	(0.21)	(0.18)	(0.15)	(0.16)	(0.22)	(0.19)
France	-0.72***	0.24	-1.10***	-0.21	-0.76***	-0.19	0.67***	-0.14	-0.20
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Denmark	-0.20	1.64***	-0.56*	-5.51***	-0.11	-0.95***	-1.51***	-0.66***	-0.50**
	(0.22)	(0.21)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Greece	-0.08	0.15	-0.86***	-1.23***	-1.57***	-0.02	1.46***	0.06	-0.12
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.13)	(0.19)	(0.16)
Switzerland	-0.16	0.49**	-1.01***	-2.86***	-0.52**	0.27	-0.40**	0.54*	0.18
	(0.22)	(0.17)	(0.23)	(0.18)	(0.16)	(0.15)	(0.14)	(0.22)	(0.18)
Belgium	-0.20	-0.02	-1.30***	-1.30***	-0.22	0.02	0.01	0.77***	0.46**
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.22)	(0.18)

Israel	-0.27	-0.70***	-1.51***	0.64**	-0.98***	-0.09	0.95***	-0.47*	0.19
	(0.23)	(0.17)	(0.23)	(0.21)	(0.18)	(0.16)	(0.16)	(0.21)	(0.20)
Czech Republic	-0.83***	0.03	-1.45***	1.80***	-0.64***	-0.59***	0.45***	-0.47*	-0.65***
	(0.20)	(0.16)	(0.22)	(0.19)	(0.15)	(0.14)	(0.13)	(0.18)	(0.16)
Poland	-0.02	0.09	-0.84***	1.16***	-0.71***	-0.18	0.62***	-0.30	-0.02
	(0.21)	(0.16)	(0.22)	(0.19)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Luxembourg	-0.76***	0.31	-0.96***	1.76***	0.40*	0.74***	0.14	1.48***	0.64**
	(0.22)	(0.19)	(0.24)	(0.24)	(0.20)	(0.17)	(0.15)	(0.32)	(0.21)
Hungary	-0.37	-0.13	0.24	-0.13	-0.82***	0.36*	1.55***	-0.66**	0.63**
	(0.24)	(0.19)	(0.31)	(0.20)	(0.19)	(0.17)	(0.17)	(0.22)	(0.23)
Slovenia	-0.39	1.00***	-1.88***	0.78***	-0.28	1.18***	-0.20	0.75***	0.89***
	(0.20)	(0.17)	(0.21)	(0.18)	(0.16)	(0.15)	(0.13)	(0.21)	(0.18)
Estonia	-0.17	0.41*	-1.97***	-2.29***	-0.60***	0.07	-0.10	-0.80***	0.21
	(0.21)	(0.16)	(0.21)	(0.17)	(0.16)	(0.14)	(0.13)	(0.18)	(0.17)
Croatia	-0.20	0.30	-0.79***	-1.40***	-1.01***	0.24	1.27***	0.33	0.49**
	(0.22)	(0.17)	(0.23)	(0.18)	(0.17)	(0.15)	(0.15)	(0.22)	(0.19)
Lithuania	0.17	0.46*	-1.21***	1.25***	-0.27	0.63***	0.76***	0.04	0.54**
	(0.23)	(0.18)	(0.23)	(0.20)	(0.17)	(0.16)	(0.14)	(0.21)	(0.19)
Bulgaria	-0.06	-0.61***	-1.25***	0.41*	-0.22	-0.70***	1.16***	-1.10***	-0.76***
	(0.23)	(0.17)	(0.23)	(0.19)	(0.18)	(0.15)	(0.15)	(0.19)	(0.17)
Cyprus	0.09	1.58***	-2.53***	-0.63**	-0.75***	0.86***	2.10***	0.38	0.56*
	(0.27)	(0.28)	(0.23)	(0.20)	(0.20)	(0.21)	(0.19)	(0.28)	(0.25)
Finland	-0.04	0.68***	-0.83***	-5.12***	-1.37***	-0.29*	-1.17***	-0.44*	-0.37*
	(0.22)	(0.18)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Latvia	-0.27	-0.27	-1.43***	-3.54***	-1.68***	-0.15	0.12	-0.42*	0.23
	(0.23)	(0.18)	(0.23)	(0.23)	(0.17)	(0.16)	(0.15)	(0.21)	(0.20)
Malta	0.66*	0.88***	-0.89***	-0.21	0.46*	0.98***	1.87***	0.69**	1.00***
	(0.27)	(0.20)	(0.24)	(0.20)	(0.23)	(0.18)	(0.16)	(0.25)	(0.23)
Romania	0.03	-0.15	-1.03***	0.92***	0.02	0.64***	2.98***	0.35	0.68***
	(0.22)	(0.17)	(0.23)	(0.19)	(0.18)	(0.16)	(0.18)	(0.22)	(0.19)
Slovakia	-0.60**	-0.24	-2.32***	0.24	-1.39***	-0.69***	0.60***	-1.06***	-0.59***
	(0.22)	(0.18)	(0.22)	(0.19)	(0.16)	(0.15)	(0.15)	(0.19)	(0.17)
Constant	1.89***	1.19***	2.82***	0.36	1.31***	-0.70***	-1.48***	1.50***	0.67**
	(0.29)	(0.25)	(0.29)	(0.26)	(0.22)	(0.20)	(0.20)	(0.27)	(0.24)
N	33097	33101	32926	27986	27968	32829	32606	32488	32504

Note: Estimated coefficients (effects on log-odds) from separate logistic regression models for each outcome. Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 3 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space.

Table S.4 – Multinomial logistic regression model for COVID-19 vaccine acceptance that includes an interaction between the explanatory variable (having kin) and age groups, full results

Independent variables	Outcome categories (Ref.: vaccinated/willing to get the vaccine)	
	not willing to get vaccinated	undecided
Having close kin (Ref.: no partner, no children)		
has a partner and children	-0.18	-0.29
	(0.16)	(0.16)
has a partner, no children	-0.20	-0.62*
	(0.26)	(0.27)
no partner, has children	0.33	-0.10
	(0.17)	(0.17)
65 or older (ref.: younger than 65)	-0.08	-1.06**
	(0.30)	(0.33)
Interactions between "65 or older" and:		
has a partner and children	-0.49*	-0.26
	(0.21)	(0.22)
has a partner, no children	-0.41	0.35
	(0.34)	(0.37)
no partner, has children	-0.56**	0.01
	(0.21)	(0.23)
Age (ref.: 50-54)		
age 55-59	-0.38**	-0.28*
	(0.14)	(0.14)
age 60-64	-0.42**	-0.57***
	(0.14)	(0.14)
age 65-69	0.02	0.50*
	(0.18)	(0.23)
age 70-74	-0.17	0.17
	(0.18)	(0.23)
age 75-79	-0.24	-0.14
	(0.19)	(0.23)
age 80-85	-0.15	-0.34
	(0.19)	(0.24)
Female	-0.05	-0.11*
	(0.05)	(0.05)
Education (Ref.: low)		
medium	-0.12	-0.05
	(0.09)	(0.10)
high	-0.41***	-0.33***
	(0.08)	(0.09)
Working status (Ref.: Retired)		
working	0.16*	-0.04
	(0.08)	(0.08)
other	0.53***	0.25**
	(0.08)	(0.08)
Household income	-0.07***	-0.15***
	(0.02)	(0.03)
Self-rated health	0.13***	0.09**

	(0.03)	(0.03)
Diagnosed illness	-0.17**	-0.21***
	(0.06)	(0.06)
Gali	0.16*	0.09
	(0.06)	(0.07)
Respondent or close	-0.28***	-0.10
relatives tested positive	(0.05)	(0.05)
Country (Ref.: Austria)		
Germany	-0.45*	-0.92***
	(0.18)	(0.27)
Sweden	-1.72***	-1.61***
	(0.38)	(0.48)
Netherlands	-1.29***	-1.68**
	(0.37)	(0.61)
Spain	-2.02***	-3.79***
	(0.33)	(1.02)
Italy	-1.15***	-0.76**
	(0.20)	(0.24)
France	-0.27	-0.08
	(0.19)	(0.24)
Denmark	-1.80***	-2.94***
	(0.32)	(0.73)
Greece	-0.34*	0.50*
	(0.17)	(0.20)
Switzerland	0.75***	1.14***
	(0.18)	(0.23)
Belgium	-1.15***	-1.55***
	(0.23)	(0.36)
Israel	-1.34***	-1.25*
	(0.34)	(0.49)
Czech Republic	-0.04	0.17
	(0.18)	(0.22)
Poland	0.35*	0.67**
	(0.17)	(0.21)
Luxembourg	-0.51*	-1.23**
	(0.26)	(0.45)
Hungary	0.19	-0.75
	(0.23)	(0.39)
Slovenia	0.58***	1.19***
	(0.17)	(0.20)
Estonia	0.21	0.77***
	(0.16)	(0.20)
Croatia	0.39*	1.14***
	(0.18)	(0.21)
Lithuania	0.85***	0.97***
	(0.18)	(0.23)
Bulgaria	2.71***	3.20***
	(0.19)	(0.23)
Cyprus	-0.47	0.51
	(0.31)	(0.30)
Finland	-1.44***	-0.96**
	(0.28)	(0.32)

Latvia	1.47***	1.87***
	(0.18)	(0.22)
Malta	-1.91***	-2.93***
	(0.37)	(0.73)
Romania	2.23***	2.20***
	(0.17)	(0.21)
Slovakia	0.72***	0.86***
	(0.18)	(0.22)
Constant	-1.70***	-1.70***
	(0.29)	(0.32)
N	27432	

Estimated coefficients (effects on log-odds) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance (reference = vaccinated/willing to get the vaccine). Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 4 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space. Data are from SHARE Corona Survey 2 (June-August 2021).

Table S.5 – Logistic regression models for nine COVID-19 precautionary behaviors that include an interaction between the explanatory variable (having kin) and gender, full results

Independent variables	Outcome variables (COVID-19 precautionary behaviors)								
	washing hands	sanitizing hands	covering coughs and sneezes	wearing masks	keeping distance	less shopping	less walks	less meetings	less visits
Having close kin (Ref.: no partner, no children)									
has a partner and children	0.75***	0.66***	0.46***	0.10	0.26**	0.67***	0.10	0.42***	0.48***
	(0.10)	(0.09)	(0.10)	(0.11)	(0.09)	(0.08)	(0.09)	(0.11)	(0.10)
has a partner, no children	0.56***	0.57***	0.73***	0.05	0.23	0.33**	0.00	0.39*	0.42**
	(0.16)	(0.15)	(0.17)	(0.16)	(0.14)	(0.13)	(0.14)	(0.18)	(0.16)
no partner, has children	0.39***	0.29**	0.28**	0.08	0.14	0.07	-0.08	-0.05	-0.02
	(0.11)	(0.10)	(0.11)	(0.12)	(0.10)	(0.09)	(0.10)	(0.12)	(0.11)
Female (Ref.: male)	0.65***	0.59***	0.49***	0.54***	0.54***	0.73***	0.43***	0.88***	0.61***
	(0.14)	(0.13)	(0.13)	(0.14)	(0.13)	(0.11)	(0.12)	(0.17)	(0.14)
Interactions between "female" and:									
has a partner and children	-0.44**	-0.44***	-0.23	0.03	-0.17	-0.22	-0.17	-0.57**	-0.37*
	(0.15)	(0.13)	(0.14)	(0.15)	(0.13)	(0.12)	(0.12)	(0.18)	(0.15)
has a partner, no children	-0.47	-0.27	-0.43	0.03	-0.18	-0.10	-0.15	-0.53	-0.21
	(0.24)	(0.22)	(0.24)	(0.23)	(0.21)	(0.18)	(0.19)	(0.28)	(0.24)
no partner, has children	-0.28	-0.31*	-0.23	-0.13	-0.11	0.25*	0.06	-0.21	-0.13
	(0.16)	(0.14)	(0.15)	(0.16)	(0.14)	(0.12)	(0.13)	(0.19)	(0.16)
Age (Ref.: 50-54)									
age 55-59	0.24*	0.46***	0.47***	-0.02	0.01	-0.18*	-0.45***	-0.09	-0.26**
	(0.11)	(0.09)	(0.10)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.09)
age 60-64	0.33***	0.45***	0.51***	0.09	0.05	-0.16*	-0.40***	-0.02	-0.16
	(0.10)	(0.09)	(0.09)	(0.10)	(0.08)	(0.07)	(0.07)	(0.10)	(0.09)
age 65-69	0.38***	0.34***	0.36***	0.11	0.13	-0.09	-0.35***	0.01	-0.02
	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.08)	(0.07)	(0.10)	(0.09)
age 70-74	0.36***	0.27**	0.25**	0.19	0.23**	0.10	-0.15*	0.23*	0.23*
	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.09)
age 75-79	0.21*	0.01	0.08	0.15	0.20*	0.13	0.02	0.41***	0.28**
	(0.10)	(0.09)	(0.09)	(0.10)	(0.09)	(0.08)	(0.08)	(0.11)	(0.10)
age 80-85	0.08	-0.17	-0.08	0.18	0.15	0.36***	0.26**	0.41***	0.38***
	(0.10)	(0.09)	(0.09)	(0.11)	(0.09)	(0.08)	(0.08)	(0.12)	(0.10)
Education (Ref.: low)									
medium	0.12	0.25***	0.19***	0.20**	0.11	0.00	-0.06	0.10	-0.01
	(0.07)	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)
high	0.16**	0.42***	0.23***	0.24***	0.18***	-0.07	-0.25***	0.08	-0.13*

	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.07)	(0.06)
Working status (Ref.: Retired)									
working	0.21**	0.38***	0.24***	-0.04	-0.10*	-0.30***	-0.15***	-0.74***	-0.16**
	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.04)	(0.04)	(0.06)	(0.05)
other	-0.06	-0.07	-0.05	-0.04	-0.02	-0.01	0.19***	-0.05	-0.01
	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.07)	(0.06)
Household income	0.02*	-0.00	0.01	-0.00	0.00	0.02**	-0.01*	0.02	0.02*
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Self-rated health	-0.07**	-0.10***	-0.03	-0.02	-0.02	0.14***	0.30***	0.05*	0.15***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diagnosed illness	-0.04	0.18***	0.10*	0.22***	0.11**	0.06	0.03	0.04	0.01
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Gali	-0.08	-0.07	-0.09*	-0.02	0.01	0.28***	0.22***	0.24***	0.13**
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Respondent or close	0.13	0.08	0.23**	-0.01	0.02	0.12*	-0.13*	0.03	0.04
relatives tested positive	(0.08)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)	(0.06)	(0.08)	(0.07)
Country (Ref.: Austria)									
Germany	-0.62**	-0.63***	-0.90***	0.31	-0.44**	-0.84***	-0.70***	-0.17	-0.63***
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.14)	(0.19)	(0.16)
Sweden	-0.22	-0.06	-1.34***	-5.58***	-0.77***	-0.18	-1.52***	-0.80***	-0.25
	(0.21)	(0.16)	(0.22)	(0.34)	(0.15)	(0.14)	(0.15)	(0.18)	(0.17)
Netherlands	0.04	-0.37*	-1.22***	-6.06***	-0.70***	-0.60***	-1.14***	0.05	-0.18
	(0.25)	(0.18)	(0.24)	(0.60)	(0.17)	(0.15)	(0.17)	(0.23)	(0.19)
Spain	0.67**	1.07***	-0.98***	1.26***	0.47*	0.77***	1.97***	0.92***	1.02***
	(0.25)	(0.19)	(0.23)	(0.21)	(0.19)	(0.17)	(0.16)	(0.26)	(0.22)
Italy	0.16	0.53**	-1.20***	1.80***	0.54**	0.84***	2.79***	1.04***	0.92***
	(0.22)	(0.17)	(0.22)	(0.21)	(0.18)	(0.15)	(0.16)	(0.22)	(0.19)
France	-0.71***	0.26	-1.09***	-0.22	-0.76***	-0.19	0.67***	-0.13	-0.19
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Denmark	-0.19	1.65***	-0.56*	-5.52***	-0.11	-0.93***	-1.49***	-0.63***	-0.48**
	(0.22)	(0.21)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Greece	-0.08	0.14	-0.87***	-1.23***	-1.57***	-0.01	1.46***	0.06	-0.13
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.13)	(0.19)	(0.16)
Switzerland	-0.16	0.49**	-1.02***	-2.86***	-0.51**	0.30*	-0.38**	0.57**	0.20
	(0.22)	(0.17)	(0.23)	(0.18)	(0.16)	(0.15)	(0.14)	(0.22)	(0.18)
Belgium	-0.19	-0.00	-1.29***	-1.31***	-0.21	0.03	0.02	0.78***	0.47**
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.22)	(0.18)
Israel	-0.28	-0.73***	-1.54***	0.63**	-0.99***	-0.05	0.98***	-0.43*	0.21
	(0.23)	(0.17)	(0.23)	(0.21)	(0.18)	(0.16)	(0.16)	(0.21)	(0.20)

Czech Republic	-0.82***	0.05	-1.44***	1.79***	-0.64***	-0.58***	0.45***	-0.46*	-0.65***
	(0.20)	(0.16)	(0.22)	(0.19)	(0.15)	(0.14)	(0.13)	(0.18)	(0.16)
Poland	0.00	0.13	-0.82***	1.16***	-0.70***	-0.20	0.61***	-0.31	-0.04
	(0.21)	(0.16)	(0.22)	(0.19)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Luxembourg	-0.75***	0.33	-0.95***	1.76***	0.41*	0.72***	0.13	1.46***	0.63**
	(0.22)	(0.19)	(0.24)	(0.24)	(0.20)	(0.17)	(0.15)	(0.32)	(0.21)
Hungary	-0.37	-0.12	0.24	-0.13	-0.82***	0.36*	1.54***	-0.66**	0.62**
	(0.24)	(0.19)	(0.31)	(0.20)	(0.19)	(0.17)	(0.17)	(0.22)	(0.23)
Slovenia	-0.38	1.01***	-1.87***	0.77***	-0.27	1.19***	-0.20	0.76***	0.90***
	(0.20)	(0.17)	(0.21)	(0.18)	(0.16)	(0.15)	(0.13)	(0.21)	(0.18)
Estonia	-0.17	0.41*	-1.98***	-2.29***	-0.60***	0.08	-0.10	-0.79***	0.22
	(0.21)	(0.16)	(0.21)	(0.17)	(0.16)	(0.14)	(0.13)	(0.18)	(0.17)
Croatia	-0.18	0.33	-0.78***	-1.40***	-1.00***	0.23	1.26***	0.33	0.48*
	(0.22)	(0.17)	(0.23)	(0.18)	(0.17)	(0.15)	(0.15)	(0.22)	(0.19)
Lithuania	0.18	0.47**	-1.20***	1.25***	-0.27	0.62***	0.75***	0.03	0.53**
	(0.23)	(0.18)	(0.23)	(0.20)	(0.17)	(0.16)	(0.14)	(0.21)	(0.19)
Bulgaria	-0.06	-0.59***	-1.24***	0.42*	-0.22	-0.70***	1.15***	-1.10***	-0.77***
	(0.23)	(0.17)	(0.23)	(0.19)	(0.18)	(0.15)	(0.15)	(0.19)	(0.17)
Cyprus	0.10	1.59***	-2.52***	-0.63**	-0.75***	0.87***	2.10***	0.39	0.57*
	(0.27)	(0.28)	(0.23)	(0.20)	(0.20)	(0.21)	(0.19)	(0.28)	(0.25)
Finland	-0.01	0.72***	-0.79***	-5.12***	-1.36***	-0.30*	-1.18***	-0.45*	-0.37*
	(0.22)	(0.18)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Latvia	-0.25	-0.24	-1.40***	-3.54***	-1.68***	-0.17	0.10	-0.44*	0.21
	(0.23)	(0.18)	(0.23)	(0.23)	(0.17)	(0.16)	(0.15)	(0.21)	(0.20)
Malta	0.66*	0.88***	-0.89***	-0.21	0.46*	0.98***	1.86***	0.68**	0.99***
	(0.27)	(0.20)	(0.24)	(0.20)	(0.23)	(0.18)	(0.16)	(0.25)	(0.23)
Romania	0.06	-0.11	-1.00***	0.93***	0.03	0.61***	2.95***	0.32	0.66***
	(0.22)	(0.17)	(0.23)	(0.19)	(0.18)	(0.16)	(0.18)	(0.22)	(0.19)
Slovakia	-0.56*	-0.17	-2.26***	0.24	-1.38***	-0.73***	0.56***	-1.09***	-0.62***
	(0.22)	(0.18)	(0.22)	(0.19)	(0.16)	(0.15)	(0.15)	(0.19)	(0.17)
Constant	1.33***	0.30	1.98***	0.15	1.16***	-0.36	-1.08***	1.59***	0.79***
	(0.26)	(0.21)	(0.26)	(0.24)	(0.21)	(0.19)	(0.19)	(0.25)	(0.23)
N	33097	33101	32926	27986	27968	32829	32606	32488	32504

Note: Estimated coefficients (effects on log-odds) from separate logistic regression models for each outcome. Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 5 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space.

Table S.6 – Multinomial logistic regression model for COVID-19 vaccine acceptance that includes an interaction between the explanatory variable (having kin) and gender, full results

Independent variables	Outcome categories (Ref.: vaccinated/willing to get the vaccine)	
	not willing to get vaccinated	undecided
Having close kin (Ref.: no partner, no children)		
has a partner and children	-0.58***	-0.61***
	(0.15)	(0.15)
has a partner, no children	-0.51*	-0.43
	(0.24)	(0.24)
no partner, has children	-0.11	-0.45*
	(0.16)	(0.18)
Female (Ref.: male)	-0.19	-0.43*
	(0.19)	(0.21)
Interactions between "female" and:		
has a partner and children	0.18	0.33
	(0.20)	(0.22)
has a partner, no children	0.13	-0.06
	(0.33)	(0.37)
no partner, has children	0.13	0.56*
	(0.21)	(0.24)
Age (Ref.: 50-54)		
age 55-59	-0.18	0.07
	(0.12)	(0.12)
age 60-64	-0.20	-0.19
	(0.11)	(0.12)
age 65-69	-0.30**	-0.30*
	(0.12)	(0.12)
age 70-74	-0.48***	-0.61***
	(0.12)	(0.13)
age 75-79	-0.55***	-0.90***
	(0.13)	(0.14)
age 80-85	-0.46***	-1.08***
	(0.13)	(0.15)
Education (Ref.: low)		
medium	-0.11	-0.01
	(0.09)	(0.10)
high	-0.39***	-0.27**
	(0.08)	(0.09)
Working status (Ref.: Retired)		
working	0.21**	0.06
	(0.08)	(0.08)
other	0.55***	0.32***
	(0.07)	(0.08)
Household income	-0.07***	-0.15***
	(0.02)	(0.03)
Self-rated health	0.12***	0.08*
	(0.03)	(0.03)
Diagnosed illness	-0.17**	-0.22***

	(0.06)	(0.06)
Gali	0.15*	0.08
	(0.06)	(0.07)
Respondent or close	-0.28***	-0.10
relatives tested positive	(0.05)	(0.05)
Country (Ref.: Austria)		
Germany	-0.47*	-0.92***
	(0.18)	(0.27)
Sweden	-1.72***	-1.61***
	(0.38)	(0.48)
Netherlands	-1.29***	-1.70**
	(0.37)	(0.61)
Spain	-2.04***	-3.83***
	(0.33)	(1.02)
Italy	-1.15***	-0.75**
	(0.20)	(0.24)
France	-0.26	-0.07
	(0.19)	(0.24)
Denmark	-1.81***	-2.96***
	(0.32)	(0.73)
Greece	-0.34*	0.49*
	(0.17)	(0.20)
Switzerland	0.74***	1.14***
	(0.18)	(0.23)
Belgium	-1.15***	-1.55***
	(0.23)	(0.36)
Israel	-1.36***	-1.30**
	(0.34)	(0.49)
Czech Republic	-0.04	0.17
	(0.18)	(0.22)
Poland	0.36*	0.70***
	(0.17)	(0.21)
Luxembourg	-0.50	-1.20**
	(0.26)	(0.45)
Hungary	0.19	-0.74
	(0.23)	(0.39)
Slovenia	0.58***	1.19***
	(0.17)	(0.20)
Estonia	0.20	0.77***
	(0.16)	(0.20)
Croatia	0.39*	1.16***
	(0.18)	(0.21)
Lithuania	0.86***	0.99***
	(0.18)	(0.23)
Bulgaria	2.71***	3.21***
	(0.19)	(0.23)
Cyprus	-0.48	0.50
	(0.31)	(0.30)
Finland	-1.43***	-0.93**
	(0.28)	(0.32)
Latvia	1.48***	1.90***
	(0.18)	(0.22)

Malta	-1.91***	-2.92***
	(0.37)	(0.73)
Romania	2.25***	2.24***
	(0.17)	(0.21)
Slovakia	0.74***	0.90***
	(0.18)	(0.22)
Constant	-1.58***	-1.89***
	(0.26)	(0.30)
N	27432	

Estimated coefficients (effects on log-odds) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance (reference = vaccinated/willing to get the vaccine). Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 6 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space. Data are from SHARE Corona Survey 2 (June-August 2021).

Table S.7 – Logistic regression models for nine COVID-19 precautionary behaviors that include an interaction between the explanatory variable (having kin) and country groups, full results

Independent variables	Outcome variables (COVID-19 precautionary behaviors)								
	washing hands	sanitizing hands	covering coughs and sneezes	wearing masks	keeping distance	less shopping	less walks	less meetings	less visits
Having close kin (Ref.: no partner, no children)									
has a partner and children	0.67***	0.59***	0.46***	0.24*	0.30***	0.83***	-0.04	0.35**	0.46***
	(0.11)	(0.10)	(0.11)	(0.11)	(0.09)	(0.08)	(0.09)	(0.13)	(0.10)
has a partner, no children	0.25	0.53***	0.74***	-0.04	0.24	0.46***	-0.33*	0.20	0.36*
	(0.17)	(0.16)	(0.20)	(0.16)	(0.14)	(0.13)	(0.14)	(0.20)	(0.16)
no partner, has children	0.24*	0.17	0.22	0.13	0.25*	0.38***	-0.04	-0.04	-0.01
	(0.11)	(0.10)	(0.11)	(0.11)	(0.10)	(0.09)	(0.09)	(0.13)	(0.11)
South-East (Ref.: North-West)	-0.47	-0.01	-2.11***	0.45	-1.13***	-0.33	0.47*	-0.90***	-0.43
	(0.26)	(0.21)	(0.26)	(0.23)	(0.20)	(0.18)	(0.18)	(0.25)	(0.22)
Interactions between "South-East" and:									
has a partner and children	-0.22	-0.27*	-0.20	-0.23	-0.26*	-0.51***	0.08	-0.29	-0.30*
	(0.15)	(0.13)	(0.14)	(0.15)	(0.13)	(0.12)	(0.12)	(0.17)	(0.15)
has a partner, no children	0.19	-0.18	-0.35	0.20	-0.20	-0.34	0.45*	-0.07	-0.06
	(0.24)	(0.22)	(0.25)	(0.23)	(0.21)	(0.18)	(0.19)	(0.27)	(0.24)
no partner, has children	0.04	-0.05	-0.10	-0.26	-0.31*	-0.27*	0.06	-0.10	-0.08
	(0.15)	(0.14)	(0.15)	(0.16)	(0.14)	(0.12)	(0.13)	(0.18)	(0.15)
Age (Ref.: 50-54)									
age 55-59	0.23*	0.45***	0.47***	-0.03	0.00	-0.19*	-0.45***	-0.09	-0.26**
	(0.11)	(0.09)	(0.10)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.09)
age 60-64	0.32**	0.44***	0.51***	0.08	0.05	-0.16*	-0.40***	-0.02	-0.17
	(0.10)	(0.09)	(0.09)	(0.10)	(0.08)	(0.07)	(0.07)	(0.10)	(0.09)
age 65-69	0.38***	0.33***	0.36***	0.11	0.14	-0.09	-0.34***	0.01	-0.02
	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.08)	(0.07)	(0.10)	(0.09)
age 70-74	0.35***	0.27**	0.25**	0.19	0.24**	0.11	-0.14	0.24*	0.23*
	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.09)
age 75-79	0.21*	0.01	0.07	0.14	0.20*	0.15	0.03	0.43***	0.29**
	(0.10)	(0.09)	(0.09)	(0.10)	(0.09)	(0.08)	(0.08)	(0.11)	(0.10)
age 80-85	0.08	-0.17	-0.08	0.17	0.16	0.38***	0.28***	0.43***	0.38***
	(0.10)	(0.09)	(0.09)	(0.11)	(0.09)	(0.08)	(0.08)	(0.12)	(0.10)
Female	0.28***	0.21***	0.27***	0.54***	0.40***	0.64***	0.32***	0.43***	0.32***
	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Education (Ref.: low)									
medium	0.13	0.25***	0.19***	0.19**	0.10	-0.00	-0.06	0.10	-0.01

	(0.07)	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)
high	0.17**	0.43***	0.23***	0.24***	0.18***	-0.07	-0.25***	0.09	-0.13*
	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.07)	(0.06)
Working status (Ref.: Retired)									
working	0.21**	0.38***	0.25***	-0.03	-0.10*	-0.29***	-0.15***	-0.73***	-0.15**
	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.04)	(0.04)	(0.06)	(0.05)
other	-0.08	-0.09	-0.06	-0.03	-0.02	-0.02	0.18***	-0.07	-0.02
	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.07)	(0.06)
Household income	0.02	-0.00	0.01	-0.00	0.00	0.01*	-0.01*	0.02	0.02
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Self-rated health	-0.07**	-0.10***	-0.03	-0.02	-0.02	0.14***	0.30***	0.05*	0.15***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diagnosed illness	-0.04	0.18***	0.10*	0.22***	0.11**	0.06	0.03	0.04	0.01
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Gali	-0.08	-0.07	-0.09*	-0.02	0.01	0.28***	0.22***	0.24***	0.13**
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)
Respondent or close	0.13	0.07	0.22**	-0.01	0.02	0.12*	-0.13*	0.03	0.04
relatives tested positive	(0.08)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)	(0.06)	(0.08)	(0.07)
Country (Ref.: Austria)									
Germany	-0.65**	-0.66***	-0.91***	0.33	-0.44**	-0.87***	-0.70***	-0.20	-0.65***
	(0.20)	(0.16)	(0.22)	(0.17)	(0.15)	(0.14)	(0.14)	(0.19)	(0.16)
Sweden	-0.25	-0.08	-1.35***	-5.58***	-0.78***	-0.21	-1.54***	-0.83***	-0.27
	(0.21)	(0.16)	(0.22)	(0.34)	(0.15)	(0.14)	(0.15)	(0.18)	(0.17)
Netherlands	0.03	-0.39*	-1.23***	-6.05***	-0.70***	-0.62***	-1.15***	0.04	-0.19
	(0.25)	(0.18)	(0.24)	(0.60)	(0.17)	(0.15)	(0.17)	(0.23)	(0.19)
Spain	1.24***	1.25***	1.28***	1.02***	1.84***	1.50***	1.42***	2.03***	1.65***
	(0.19)	(0.15)	(0.13)	(0.16)	(0.15)	(0.13)	(0.13)	(0.22)	(0.19)
Italy	0.73***	0.72***	1.06***	1.56***	1.92***	1.58***	2.23***	2.15***	1.55***
	(0.14)	(0.12)	(0.11)	(0.15)	(0.13)	(0.11)	(0.12)	(0.16)	(0.14)
France	-0.73***	0.24	-1.10***	-0.22	-0.76***	-0.20	0.66***	-0.15	-0.20
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.19)	(0.17)
Denmark	-0.21	1.63***	-0.57*	-5.52***	-0.11	-0.96***	-1.50***	-0.66***	-0.50**
	(0.22)	(0.21)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Greece	0.49***	0.33**	1.39***	-1.47***	-0.19*	0.72***	0.91***	1.17***	0.50***
	(0.13)	(0.11)	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.11)	(0.10)
Switzerland	-0.16	0.48**	-1.02***	-2.85***	-0.51**	0.30*	-0.39**	0.56**	0.20
	(0.22)	(0.17)	(0.23)	(0.18)	(0.16)	(0.15)	(0.14)	(0.22)	(0.18)
Belgium	-0.20	-0.01	-1.29***	-1.30***	-0.21	0.03	0.01	0.77***	0.46**
	(0.21)	(0.17)	(0.22)	(0.17)	(0.16)	(0.14)	(0.14)	(0.22)	(0.18)

Israel	0.30	-0.54***	0.72***	0.40*	0.40**	0.69***	0.43***	0.68***	0.84***
	(0.17)	(0.13)	(0.13)	(0.15)	(0.13)	(0.12)	(0.12)	(0.16)	(0.16)
Czech Republic	-0.26*	0.22*	0.81***	1.57***	0.75***	0.14	-0.10	0.63***	-0.03
	(0.12)	(0.11)	(0.10)	(0.14)	(0.10)	(0.09)	(0.09)	(0.11)	(0.10)
Poland	0.57***	0.30**	1.44***	0.93***	0.68***	0.53***	0.05	0.78***	0.59***
	(0.14)	(0.11)	(0.11)	(0.12)	(0.10)	(0.09)	(0.09)	(0.11)	(0.11)
Luxembourg	-0.77***	0.31	-0.96***	1.77***	0.41*	0.71***	0.14	1.46***	0.62**
	(0.22)	(0.19)	(0.24)	(0.24)	(0.20)	(0.17)	(0.15)	(0.32)	(0.21)
Hungary	0.19	0.05	2.50***	-0.36*	0.57***	1.09***	0.99***	0.44**	1.24***
	(0.17)	(0.15)	(0.25)	(0.15)	(0.15)	(0.14)	(0.13)	(0.16)	(0.19)
Slovenia	0.18	1.18***	0.38***	0.54***	1.11***	1.91***	-0.75***	1.86***	1.52***
	(0.13)	(0.12)	(0.09)	(0.11)	(0.10)	(0.11)	(0.09)	(0.15)	(0.12)
Estonia	0.38**	0.58***	0.28**	-2.52***	0.78***	0.80***	-0.65***	0.30**	0.83***
	(0.12)	(0.11)	(0.09)	(0.11)	(0.10)	(0.09)	(0.09)	(0.10)	(0.11)
Croatia	0.39**	0.51***	1.48***	-1.64***	0.38***	0.96***	0.70***	1.43***	1.10***
	(0.15)	(0.13)	(0.13)	(0.12)	(0.11)	(0.11)	(0.10)	(0.16)	(0.14)
Lithuania	0.74***	0.64***	1.06***	1.02***	1.12***	1.34***	0.20*	1.12***	1.15***
	(0.16)	(0.13)	(0.12)	(0.15)	(0.12)	(0.11)	(0.10)	(0.14)	(0.14)
Bulgaria	0.51**	-0.41**	1.01***	0.19	1.17***	0.03	0.60***	-0.00	-0.15
	(0.17)	(0.13)	(0.14)	(0.15)	(0.14)	(0.11)	(0.12)	(0.13)	(0.12)
Cyprus	0.68**	1.77***	-0.26	-0.86***	0.64***	1.61***	1.55***	1.50***	1.21***
	(0.22)	(0.26)	(0.14)	(0.17)	(0.17)	(0.18)	(0.17)	(0.25)	(0.22)
Finland	-0.03	0.70***	-0.80***	-5.11***	-1.36***	-0.32*	-1.19***	-0.47*	-0.39*
	(0.22)	(0.18)	(0.23)	(0.30)	(0.16)	(0.14)	(0.15)	(0.19)	(0.17)
Latvia	0.31	-0.07	0.85***	-3.77***	-0.29*	0.55***	-0.45***	0.66***	0.83***
	(0.16)	(0.13)	(0.13)	(0.18)	(0.12)	(0.12)	(0.11)	(0.15)	(0.15)
Malta	1.23***	1.07***	1.38***	-0.46**	1.84***	1.72***	1.30***	1.79***	1.63***
	(0.21)	(0.17)	(0.15)	(0.15)	(0.19)	(0.14)	(0.13)	(0.21)	(0.20)
Romania	0.63***	0.07	1.26***	0.69***	1.42***	1.34***	2.40***	1.42***	1.29***
	(0.15)	(0.12)	(0.12)	(0.14)	(0.13)	(0.11)	(0.15)	(0.15)	(0.14)
Constant	1.46***	0.41	2.01***	0.04	1.10***	-0.51**	-0.98***	1.67***	0.83***
	(0.26)	(0.21)	(0.26)	(0.24)	(0.21)	(0.19)	(0.19)	(0.26)	(0.23)
N	33097	33101	32926	27986	27968	32829	32606	32488	32504

Note: Estimated coefficients (effects on log-odds) from separate logistic regression models for each outcome. Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 7 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space.

Table S.8 – Multinomial logistic regression model for COVID-19 vaccine acceptance that includes an interaction between the explanatory variable (having kin) and country groups, full results

Independent variables	Outcome categories (Ref.: vaccinated/willing to get the vaccine)	
	not willing to get vaccinated	undecided
Having close kin (Ref.: no partner, no children)		
has a partner and children	-0.73***	-0.25
	(0.17)	(0.26)
has a partner, no children	-0.62*	-0.35
	(0.29)	(0.46)
no partner, has children	-0.16	0.29
	(0.17)	(0.27)
South-East (Ref.: North-West)	0.48	1.21***
	(0.26)	(0.34)
Interactions between "South-East" and:		
has a partner and children	0.37	-0.22
	(0.21)	(0.29)
has a partner, no children	0.27	-0.10
	(0.36)	(0.50)
no partner, has children	0.20	-0.48
	(0.21)	(0.30)
Age (Ref.: 50-54)		
age 55-59	-0.18	0.07
	(0.12)	(0.12)
age 60-64	-0.20	-0.18
	(0.11)	(0.12)
age 65-69	-0.30**	-0.29*
	(0.12)	(0.12)
age 70-74	-0.48***	-0.60***
	(0.12)	(0.13)
age 75-79	-0.56***	-0.90***
	(0.13)	(0.14)
age 80-85	-0.46***	-1.08***
	(0.13)	(0.15)
Female	-0.04	-0.08
	(0.05)	(0.05)
Education (Ref.: low)		
medium	-0.11	-0.01
	(0.09)	(0.10)
high	-0.39***	-0.29**
	(0.08)	(0.09)
Working status (Ref.: Retired)		
working	0.21**	0.06
	(0.08)	(0.08)
other	0.56***	0.32***
	(0.07)	(0.08)
Household income	-0.06***	-0.15***

	(0.02)	(0.03)
Self-rated health	0.12***	0.08*
	(0.03)	(0.03)
Diagnosed illness	-0.17**	-0.22***
	(0.06)	(0.06)
Gali	0.15*	0.08
	(0.06)	(0.07)
Respondent or close relatives tested positive	-0.28***	-0.10
	(0.05)	(0.05)
Country (Ref.: Austria)		
Germany	-0.45*	-0.89***
	(0.18)	(0.27)
Sweden	-1.71***	-1.62***
	(0.38)	(0.48)
Netherlands	-1.29***	-1.69**
	(0.37)	(0.61)
Spain	-2.78***	-4.74***
	(0.32)	(1.01)
Italy	-1.89***	-1.67***
	(0.18)	(0.20)
France	-0.26	-0.08
	(0.19)	(0.24)
Denmark	-1.79***	-2.96***
	(0.32)	(0.73)
Greece	-1.08***	-0.42**
	(0.15)	(0.15)
Switzerland	0.74***	1.14***
	(0.18)	(0.23)
Belgium	-1.16***	-1.54***
	(0.23)	(0.36)
Israel	-2.11***	-2.21***
	(0.33)	(0.47)
Czech Republic	-0.78***	-0.73***
	(0.15)	(0.17)
Poland	-0.38**	-0.21
	(0.14)	(0.15)
Luxembourg	-0.48	-1.18**
	(0.26)	(0.45)
Hungary	-0.54**	-1.64***
	(0.21)	(0.36)
Slovenia	-0.16	0.29*
	(0.13)	(0.14)
Estonia	-0.53***	-0.14
	(0.13)	(0.14)
Croatia	-0.35*	0.25
	(0.16)	(0.15)
Lithuania	0.12	0.08
	(0.14)	(0.16)
Bulgaria	1.97***	2.30***
	(0.16)	(0.17)
Cyprus	-1.22***	-0.41

	(0.30)	(0.27)
Finland	-1.42***	-0.93**
	(0.28)	(0.32)
Latvia	0.74***	1.00***
	(0.15)	(0.16)
Malta	-2.66***	-3.83***
	(0.36)	(0.72)
Romania	1.50***	1.33***
	(0.13)	(0.15)
Constant	-1.50***	-2.33***
	(0.27)	(0.36)
N	27432	

Estimated coefficients (effects on log-odds) from a multinomial logistic regression model for the three-level categorical outcome vaccine acceptance (reference = vaccinated/willing to get the vaccine). Standard errors in parentheses. *** p<0.001; *** p<0.01; *** p<0.05. Estimates correspond to the AMEs represented in Fig. 8 in the main manuscript. A set of dummy variables for the week of interview are also included but coefficients are not shown to save space. Data are from SHARE Corona Survey 2 (June-August 2021).