Social and behavioral consequences of mask policies during the COVID-19 pandemic

Cornelia Betsch, Lars Korn, Philipp Sprengholz, Lisa Felgendreffer, Sarah Eitze, Philipp Schmid, and Robert Böhm

*Media and Communication Science, University of Erfurt, 99089 Erfurt, Germany  
*Center for Empirical Research in Economics and Behavioral Sciences, University of Erfurt, 99089 Erfurt, Germany  
*Department of Psychology, University of Copenhagen, 1353 Copenhagen, Denmark  
*Department of Economics, University of Copenhagen, 1353 Copenhagen, Denmark  
*Copenhagen Center for Social Data Science (SODAS), University of Copenhagen, 1353 Copenhagen, Denmark

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Mandatory and voluntary mask policies may have yet unknown social and behavioral consequences related to the effectiveness of the measure, stigmatization, and perceived fairness. Serial cross-sectional data (April 14 to May 26, 2020) from nearly 7,000 German participants demonstrate that implementing a mandatory policy increased actual compliance despite moderate acceptance; mask wearing correlated positively with other protective behaviors. A preregistered experiment (n = 925) further indicates that a voluntary policy would likely lead to insufficient compliance, would be perceived as less fair, and could intensify stigmatization. A mandatory policy appears to be an effective, fair, and socially responsible solution to curb transmissions of airborne viruses.

COVID-19 | policy | face masks | pandemic

Since June 2020, World Health Organization has recommended that healthy people wear nonmedical masks to control the spread of COVID-19, for example, in settings where physical distancing cannot be achieved (1). Countries increasingly require masks in closed public spaces such as supermarkets. Evidence has accumulated that strategies targeting the susceptible population can effectively contribute to the containment of the outbreak (2). As even nonmedical masks reduce the spread of droplets and infectious aerosols (3, 4), mask wearing can protect others from contracting the virus (5) even though they do not prevent the mask-wearing person from infection. As high compliance is needed for effectiveness (4), policies that encourage or enforce mask wearing need to be in place. Yet, little is known about the behavioral consequences of voluntary vs. mandatory mask policies and of the social evaluation processes that take place under either policy (6). Therefore, we report data assessed to support the German government and other regulatory bodies to gain insights into public opinion and acceptance of measures and policies during the COVID-19 pandemic (7). The study obtained ethical clearance from the University of Erfurt’s Internal Review Board (#20200302/20200501), and all participants provided informed consent prior to the data collection.

Results

Fig. 1 shows data from a weekly cross-sectional survey with n = 6,973 German participants [approximately n = 1,000 per week; online sample, quota—representative for age × gender and federal state in Germany, April 14 to May 26, 2020; for details, see R markdown file (8)]: P < 0.05 is considered statistically significant. In detail, the results demonstrate that individuals with greater prosocial concerns (13) reported wearing masks in their everyday lives more frequently, r = 0.15, P < 0.001. In the hypothetical scenario, however, prosociality did not predict future mask wearing (odds ratio [OR] = 1.01, SE = 0.01 P = 0.343) under either policy (interaction policy by prosociality: OR = 1.03, SE = 0.02, P = 0.074). However, participants perceived others with face masks as more prosocial than those without, irrespective of mask policy (Fig. 2A; main effect others mask-wearing behavior: F(1, 921) = 98.66, P < 0.001, $\eta^2_p = 0.097$; interaction policy by others’ mask-wearing behavior: $F < 1$, not significant]. Relatedly, participants who reported wearing a mask frequently in their everyday life perceived greater warmth toward others who also wear a mask than toward others who do not (Fig. 2B; interaction participant’s mask-wearing behavior by others’ mask-wearing behavior: $\beta = 0.25, P < 0.001$). This indicates that people who adhere to the social contract of wearing a mask tend to socially “reward” each other but “punish” others who do not wear a mask, irrespective of the mask policy in place. As more people reported being unwilling to wear a mask...

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The authors declare no competing interest.

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To whom correspondence may be addressed. Email: cornelia.betsch@uni-erfurt.de.

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under a voluntary policy [77% compliance compared to 96% under a mandatory policy, \( \chi^2(1, n = 925) = 71.97, P < 0.001, \eta^2_p = 0.279 \)], more people may be subject to negative social evaluation under a voluntary policy (i.e., stigmatization could increase). In line with this, social labeling partially increased, as another person wearing a mask was more likely perceived as belonging to a risk group under a voluntary as opposed to a mandatory policy [Fig. 2C; interaction policy by others’ mask-wearing behavior: \( F(1, 921) = 8.88, P = 0.003, \eta^2_p = 0.010 \); however, they were not regarded as more likely to be infected with COVID-19 (Fig. 2D; \( F < 1 \), not significant)].

Finally, participants perceived a mandatory mask policy as fairer than a voluntary mask policy [paired \( t \) test; \( t(923) = 12.59, P < 0.001, d_c = 0.414 \)]; explorative analyses suggested that this was especially pronounced for participants belonging to a risk group [Fig. 2E; interaction risk group by mask policy: \( F(1, 922) = 13.55, P < 0.001, \eta^2_p = 0.014 \)]. Contrary to what was expected, the risk group’s perceived susceptibility did not increase compared to a priori susceptibility, given either policy [policy by risk group: \( F(1, 913) = 2.87, P = 0.091, \eta^2_p = 0.003 \); instead, both groups felt more susceptible when the other person did not wear a mask [exploratory main effect others’ mask-wearing behavior: \( F(1, 913) = 33.05, P < 0.001, \eta^2_p = 0.035 \)].
dependent variables were normalized to a range from 0 to 100. Points represent mean values, and error bars represent 95% CIs. The colored areas represent rotated kernel density distributions of individual responses. All dependent variables were normalized to a range from 0 to 100.

In conclusion, should countries or communities want people to wear masks (e.g., to curb local outbreaks or to reduce transmission in future waves of the pandemic), introducing a mandatory policy along with explicit communication of the benefits of mask wearing (risk reduction, mutual protection, positive social signaling) and the benefits of the mandatory policy (fairness, less stigmatization, higher effectiveness) appears advisable.

Materials and Methods
Materials, data, and analysis code (R markdown) are available at https://osf.io/dvbrn/.

Data Availability. Data and analysis code have been deposited in Open Science Framework [https://osf.io/dvbrn/]. All study data is included in the article.

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