

1 **How the COVID-19 pandemic affects transgender health care in upper-middle-income and**
2 **high-income countries – A worldwide, cross-sectional survey**

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4 **Short title: COVID-19 and transgender health care**

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6 Andreas Koehler¹, Joz Motmans², Leo Mulió Alvarez³, David Azul⁴, Karen Badalyan⁵, Koray
7 Basar⁶, Cecilia Dhejne⁷, Dragana Duišin⁸, Bartosz Grabski⁹, Aurore Dufrasne¹⁰, Natasa Jokic-
8 Begic¹¹, Antonio Prunas¹², Christina Richards¹³, Kirill Sabir¹⁴, Jaimie Vaele¹⁵, Timo Ole
9 Nieder^{1*}

10

11 ¹ University Medical Center Hamburg-Eppendorf, Institute for Sex Research, Sexual
12 Medicine, and Forensic Psychiatry, Martinistrasse 52, 20246 Hamburg, Germany

13

14 ² Transgender Infopunt, Ghent University Hospital, Ghent, Belgium

15

16 ³ Transgender Europe, Berlin, Germany

17

18 ⁴ La Trobe University, La Trobe Rural Health School, Department of Community and Allied
19 Health, Discipline of Speech Pathology, Melbourne, Australia

20

21 ⁵ Eurasian Key Populations Coalition, Warszawa, Poland

22

23 ⁶ Hacettepe University, Department of Psychiatry, Ankara, Turkey

24

25 ⁷ Karolinska University Hospital, Andrology, Sexual Medicine, Transgender Medicine,
26 Stockholm, Sweden

27

28 ⁸ Clinical Centre of Serbia, Department of Psychiatry, Belgrade, Serbia

29

30 ⁹ Jagiellonian University Medical College, Sexology Lab, Department of Psychiatry, Krakow,
31 Poland

32

33 ¹⁰ Genres Pluriels, Brussels, Belgium

34

35 ¹¹ University of Zagreb, Clinical and Health Psychology Unit, Department of Psychology,
36 Faculty of Humanities and Social Sciences, Zagreb, Croatia

37

38 ¹² University of Milan, Department of Psychology, Milan, Italy

39

40 ¹³ Tavistock and Portman NHS Foundation Trust & Regents University London, School of
41 Psychotherapy and Psychology, London, United Kingdom

42

43 ¹⁴ FtM Phoenix Group, Moscow, Russia

44

45 ¹⁵ University of Waikato, Faculty Arts & Social Sciences, New Zealand

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47 * t.nieder@uke.de

48 **Abstract**

49 **Background**

50 Since the beginning of the COVID-19 pandemic, access to medical care was restricted for
51 nearly all non-acute medical conditions. Due to their status as a vulnerable social group and
52 the inherent need for transition-related treatments (e.g., hormone treatment), transgender
53 people are assumed to be affected particularly severely by the restrictions caused by the
54 COVID-19 pandemic. This study aims to assess the impact of the COVID-19 pandemic on the
55 health and health care of transgender people.

56 **Methods and findings**

57 As an ad hoc collaboration between researchers, clinicians, and 23 community organizations,
58 we developed a web-based survey. The survey was translated into 26 languages, and
59 participants were recruited via various social media and LGBTIQ-community sources.
60 Recruitment started in May 2020. We assessed demographical data, physical and mental
61 health problems (e.g., chronic physical conditions), risk factors (e.g., smoking), COVID-19
62 data (symptoms, contact history, knowledge and concerns about COVID-19), and the
63 influence of the COVID-19 pandemic on access to transgender health care and health-related
64 supplies. To identify factors associated with the experience of restrictions to transgender
65 health care, we conducted multivariate logistic regression analysis.
66 5267 transgender people from 63 higher-middle income and high-income countries
67 participated in the study. Over 50% of the participants had risk factors for a severe course of
68 a COVID-19 infection and were at a high risk of avoiding testing or treatment of a COVID-19
69 infection due to the fear of mistreatment or discrimination. Access to transgender health
70 care services was restricted due to the COVID-19 pandemic for 50% of the participants. Male
71 sex assigned at birth and a lower monthly income were significant predictors for the

72 experience of restrictions to health care. 35.0% of the participants reported at least one
73 mental health conditions. Every third participant had suicidal thoughts, and 3.2% have
74 attempted suicide since the beginning of the COVID-19 pandemic. A limitation of the study is
75 that we did not analyze data from low-income countries and access to the internet was
76 necessary to participate.

77 **Conclusions**

78 Transgender people are assumed to suffer under the severity of the pandemic even more
79 than the general population due to the intersections between their status as a vulnerable
80 social group, their high amount of medical risk factors, and their need for ongoing medical
81 treatment. The COVID-19 pandemic can potentiate these vulnerabilities, add new challenges
82 for transgender individuals, and, therefore, can lead to devastating consequences, like
83 severe physical or mental health issues, self-harming behaviour, and suicidality.

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99 **Introduction**

100 Transgender people experience their gender as incongruent with the sex assigned at birth.
101 They might identify as a binary gender (female, male) or outside of the gender binary.
102 People who are non-binary might experience their gender as moving between male and
103 female (e.g., genderfluid) or as situated beyond the gender binary (e.g., genderqueer). Some
104 reject the concept of sex and gender at all, either on a personal, or a general level (e.g.,
105 agender). Transgender health care primarily focusses on medical measures to support the
106 person's transition to live their gender both physically and socially. This may include
107 hormone therapy, gender-affirming surgery, and a variety of additional interventions (e.g.,
108 voice and communication therapy, hair removal)[1]. For treatment-seeking transgender
109 people these interventions positively affect mental health and quality of life, and are thus
110 considered state-of-the-art treatments [2-5]. However, not all transgender people want to
111 undergo any of these types of care, or might have access to it [6, 7].
112 Up to now, transgender people have been considered to be a vulnerable social group, many
113 of whom have experienced discrimination and marginalization by society, and health care
114 systems in particular [4, 8]. Access to transgender health care is often restricted due to legal
115 requirements, financial barriers, and 'gatekeeping' health care providers in countries all over
116 the world [9, 10]. These elements can lead to a negative impact on transgender individual's
117 health and quality of life [4].
118 During to the COVID-19 pandemic access to medical care was, and in some areas globally still
119 is, restricted for nearly all non-acute medical conditions. State health care, as well as private
120 practice, were mainly focusing on COVID-19. Since transgender individuals often need access
121 to medical treatments such as hormone therapy [1], these restrictions are likely to have
122 increased psychological distress. Due to both their status as a vulnerable social group and

123 their need for transition-related treatments [4, 8], this impact may be particularly severe for
124 transgender people [11].

125 Even though some authors have already addressed the impact of the COVID-19 pandemic on
126 transgender people, there remains a dearth of evidence. Perez-Brumer and Silva-Santisteban
127 [12] discussed the disparities transgender people face in Peru due to binary-based policies as
128 a response to the COVID-19 pandemic (only women or men are allowed to leave their homes
129 on certain weekdays) and how this increasing discrimination impacts physical and mental
130 health. Van der Miesen and colleagues [13] summarized the intersections between health
131 care, human rights, and socioeconomic stress for transgender individuals during the COVID-
132 19 pandemic. They state the need for a joint strategy of policy makers, transgender
133 advocates, health care providers, and governments. Wang and colleagues [11] refer to the
134 barriers of care for transgender people in times of COVID-19 in light of evidence from their
135 clinic in Beijing, China. The restricted access to hormone treatment was associated with high
136 levels of depression and anxiety due to the challenge of continuing presenting and socially
137 living as their sex assigned at birth. All the authors state the need for collaborative strategies
138 between relevant stakeholders (e.g., governments, health care providers, advocacy groups)
139 to actively consider the difficulties faced by the transgender population during the COVID-19
140 pandemic and the need for high-quality evidence to base strategies upon [11-13].

141 Therefore, as the first of its kind, the current study systematically investigates the impact of
142 the COVID-19 pandemic on the health and health care of transgender individuals. As an ad
143 hoc collaboration between researchers, community members and clinicians from several
144 countries, it aims to generate empirical evidence on the situation of transgender individuals
145 in times of COVID-19 and, therefore, help to develop and implement measures addressing
146 the obstacles that affect transgender individuals during the pandemic.

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148 **Methods**

149 **Study design**

150 The TransCareCovid-19 survey (www.transcarecovid-19.com), is a web-based survey
151 designed to investigate the effects of the COVID-19 pandemic on health care for transgender
152 individuals. This cross-sectional study was developed by XX, YY, and ZZ in cooperation with
153 local health care providers and community members. Several members of the research
154 group are transgender. Additional consultation was sought in the construction of the survey
155 by peer and professional organisations.

156 The survey was first developed in German and, in cooperation with 23 community
157 organisations (for details see www.transcarecovid-19.com), translated into 27 languages
158 (Arabic, Azerbaijani, Armenian, Bulgarian, Chinese, Croatian, Dutch, English, Farsi, French,
159 Georgian, German, Hungarian, Italian, Kazakh, Kyrgyz, Macedonian, Polish, Portuguese,
160 Romanian, Russian, Serbian, Spanish, Swedish, Tajik, Turkish, Ukrainian).

161 The study followed strict ethical guidelines and received ethical approval from both the Local
162 Psychological Ethics Committee at the University Medical Center MM-NN (No.: LPEK-0130,
163 date: 01/04/2020), as well as from PP University Hospital (BC-07607, date: 15/04/2020). All
164 respondents provided informed consent.

165 **Participants**

166 To recognize the heterogeneity of the transgender population, the survey was open to
167 anyone who identifies, experiences, and/or describes themselves, as transgender and were
168 at least 16 years of age. Participants were recruited via postings on LGBTIQ-related social
169 media channels, mailing lists of support groups and LGBTIQ-related associations, and
170 through snowball sampling.

171 **Data collection**

172 The data collection started in May 2020 and is still ongoing. The participant recruitment was
173 supported by several scientific and community organisation (for details see
174 www.transcarecovid-19.com). The present sample is based on the data collected until
175 August 9, 2020. We choose this date as the COVID-19 pandemic was slowing down in most
176 countries all over the world and our data allowed us to give a comprehensive overview on
177 how the first wave of COVID-19 affected transgender people. This paper consists of analyses
178 of data from high-income and upper middle-income economies according to the World Bank
179 country classification[14] only, as participant recruitment for lower middle-income and low-
180 income economies started later.

181 **Variables**

182 The TransCareCovid-19 survey collects demographical data regarding age, education,
183 occupational status, country of residence, place of residence, residence status, living
184 situation, financial income, relationship, minority status (person of colour, religious minority,
185 sexual minority, gender minority, minority due to disability status, another minority), sex
186 assigned at birth, and gender. The participants' country of residence was classified by the
187 current World Bank country classification by income level [14]. Upper middle-income
188 economies are defined as having a gross national income (GNI) per capita of \$4,046 –
189 \$12,535. A country with a GNI per capita of greater than \$12,535 is considered a high-
190 income economy. Physical health problems were assessed using items based on established
191 studies[15, 16] and free-text responses. COVID-19 symptoms, contact history, satisfaction
192 with information, knowledge, and concerns about COVID-19, were assessed following Wang
193 and colleagues using 4-point Likert scales (1-highest value, 4-lowest value) [17]. We added
194 additional items related to transgender-specific discrimination and avoidance of health care

195 based on former studies [16]. Finally, data regarding transition-related health care such as
196 medical procedures which the respondent has undergone, and the influence of the COVID-
197 19 pandemic on access to transgender health care and health-related supplies (e.g., chest
198 binders), were assessed based on an established protocol [18]. Depending on the procedures
199 which the respondent had undergone, participants were specifically asked about the
200 influence of the COVID-19 pandemic on single treatments. For example, only participants
201 who already used hormones were asked if access to their medication was restricted. Fears
202 about future restrictions on treatment were investigated if participants had already sought
203 or planned the treatment.

204 Due to the method of participant recruitment, access to a web-enabled device, social media
205 activity, and technical affinity need to be considered as potential biases. By encouraging
206 participants to promote the survey with their peers we tried to address the issue of lacking
207 social media activity. Unfortunately, we were not able to provide a paper-pencil version of
208 the survey due to the wide range of the study and a lack of financial and human resources.

209 **Statistical analysis**

210 Continuous data are presented as mean (SD). Categorical data are presented as n (%).
211 Missing data were deleted pairwise. To identify factors associated with the experience of
212 restrictions to transgender health care, we conducted a multivariate logistic regression
213 analysis. Experiencing restrictions in at least one domain (hormone treatment, hair removal
214 treatment, surgery, surgical aftercare) was included as depended variable (yes, no). We
215 entered the covariates in two blocks. Block 1 included age, education (no formal education,
216 primary, secondary, tertiary education), relationship (yes, no), minority status (person of
217 colour, religious minority, sexual minority, gender minority), disability (yes, no), sex assigned
218 at birth (female, male), and gender (binary, non-binary). This block was labelled

219 Demographic Characteristics. Block 2 included the following aspects of the social
220 environment: Countries' GNI per capita (upper middle-income economy, high- income
221 economy), residence status (yes, no), population of place of residence (urban, rural), ability
222 to make ends meet with monthly income (very easily, easily, fairly easily, with some
223 difficulty, with difficulty, with great difficulty), and health insurance (yes, no). This block was
224 labelled Social Environment. Cox and Snell's R² and Nagelkerke's R² are reported as
225 coefficients of determination. To check for violations of assumptions for logistic regression
226 such as independence of errors, incomplete information from the predictors, diagnostics
227 were conducted on all relevant variables. Collinearity diagnostics did not reveal significant
228 multicollinearity concerns for any of the variables in the model. A p value of <.05 was
229 considered to be statistically significant. SPSS 24.0 was used for all statistical analyses.

230

231 **Results**

232 Between May 1, 2020, and August 9, 2020, 7905 potential participants accessed the survey.
233 597 participants did not give informed consent and thus were not able to access the survey.
234 Another 593 participants gave informed consent but did not answer any further questions.
235 From the remaining 6715 participants, 1223 individuals were excluded from the analyses
236 because they did not respond to at least 50% of the survey. For the present analysis, 225
237 participants from low-income and lower middle-income economies were not included. The
238 final dataset consisted of 5267 participants.
239 On average, the present sample is of early middle age (30.70 years \pm 12.06), highly educated
240 (60.7% tertiary education), mostly single (48.7%), and living in an urban environment
241 (79.9%). 57.3% were assigned female at birth. 74.0% identified as binary [trans] man or
242 [trans] woman, whereas 21.5% identified as a non-binary gender.

243 Basic and transgender-related demographics are presented in Table 1. Table 2 and Fig 1
 244 show the current country of residence of the participants.[14] Most participants lived in
 245 European countries. Fig 2 gives an overview of the physical health problems of the
 246 participants. 2768 (52.6%) reported a least one acute or chronic condition. 525 (10.0%)
 247 reported that these conditions resulted in severe limitations in daily activities, 1674 (31.8%)
 248 reported limitations to some extent. 509 (9.7%) had no limitations due to their chronic
 249 condition. 1009 (19.2%) of the participants were smokers. 327 (6.2%) used to smoke but had
 250 recently stopped. 3035 (73.6%) had at least once in their life seriously considered suicide,
 251 1827 (35.1%) had had suicidal thoughts since the beginning of the COVID-19 pandemic. 1797
 252 (34.5%) had had at least once suicide attempt, 168 (3.2%) have attempted suicide since the
 253 beginning of the COVID-19 pandemic.

254

255 **Table 1** Demographics and social situation

	N (%)
Total N°	5267 (100.00%)
Age	
Years (Mean [SD])	30.70 (12.06)
Range	15.00 - 81.00
Education	
No formal education	42 (0.8%)
Primary education	354 (6.7%)
Secondary education	1019 (19.3%)
Tertiary education: vocational education and training	608 (11.5%)
Tertiary education: college/university	2589 (49.2%)
Other	302 (5.7%)
I cannot or do not wish to answer the question	87 (1.7%)
Missing	266 (5.1%)
Relationship	
Single	2563 (48.7%)
Married, living together	424 (8.1%)
Married, but living separately	83 (1.6%)
Registered relationship, living together	82 (1.6%)
Registered relationship, but living separately	37 (0.7%)
Non-registered relationship, living together	669 (12.7%)

Non-registered relationship, but living separately	675 (12.8%)
In more than one relationship	199 (3.8%)
Widowed	14 (0.3%)
Other	198 (3.6%)
I cannot or do not wish to answer the question	60 (1.1%)
Missing	266 (5.1%)
Occupational status ^a	
Student	1780 (33.8%)
Vocational training	226 (4.3%)
Unskilled worker	163 (3.1%)
Employee	1635 (31.0%)
Civil servant	185 (3.5%)
Self-employed	447 (8.5%)
Informal employment	119 (2.3%)
Unemployed	812 (15.4%)
Retired	112 (2.1%)
Unable to work	422 (8.0%)
Other	400 (7.6%)
I cannot or do not wish to answer the question	52 (1.0%)
Minority status ^a	
Person of color	528 (10.5%)
Religious minority	908 (17.3%)
Sexual minority	4414 (83.8%)
Gender minority	4842 (91.9%)
Minority due to disability status	1438 (27.3%)
Another minority	1013 (19.3%)
Gender	
(Trans) man	2141 (40.6%)
(Trans) woman	1761 (33.4%)
Cross-dresser	46 (0.9%)
Non-binary/genderqueer /agender/ polygender/genderfluid	1131 (21.5%)
I don't know, I don't have a preference	144 (2.7%)
Missing	44 (0.8%)
Living according to gender	
Never	370 (7.0%)
Occasionally	998 (18.9%)
Almost always	1249 (23.7%)
Always	2619 (49.7%)
Missing	31 (0.6%)
Sex assigned at birth	
Female	3018 (57.3%)
Male	2194 (41.7%)

	Missing	55 (1.0%)
Place of residence		
	City or the suburbs or outskirts of a city, or town	4210 (79.9%)
	A country village, farm, or home in the countryside	1043 (19.8%)
	Missing	14 (0.3%)
Change of living situation due to COVID-19		
	Missing	10 (0.2%)
Other people living in household		
	Missing	0 (0.0%)
Garden, balcony, other outdoor space		
	Missing	20 (0.4%)
Distress due to current living situation		
	Missing	13 (0.2%)
Making ends meet with the available monthly income		
	Very easily	746 (14.2%)
	Easily	990 (18.8%)
	Fairly easily	1380 (26.2%)
	With some difficulty	1042 (19.8%)
	With difficulty	507 (9.6%)
	With great difficulty	390 (7.4%)
	I don't want to say	78 (1.5%)
	I don't know	121 (2.3%)
	Missing	13 (0.2%)

256 ^a Multiple answers were possible

257

258 **Table 2** Countries

Upper middle-income countries	762 (14.5%)
Argentina	6 (0.1%)
Armenia	34 (0.6%)
Azerbaijan	19 (0.3%)
Belarus	3 (0.1%)
Bosnia and Herzegovina	3 (0.1%)
Botswana	3 (0.1%)
Brazil	36 (0.7%)
Bulgaria	14 (0.3%)
China	150 (2.7%)
Georgia	27 (0.5%)
Indonesia	2 (0.1%)
Iran	1 (0.1%)

Iraq	1 (0.1%)
Kazakhstan	30 (0.5%)
Lebanon	6 (0.1%)
Malaysia	2 (0.1%)
Mexico	2 (0.1%)
Montenegro	16 (0.3%)
Namibia	4 (0.1%)
North Macedonia	17 (0.3%)
Russia	61 (1.1%)
Serbia	69 (1.3%)
South Africa	75 (1.4%)
Turkey	181 (3.3%)
High-income countries	4505 (85.5%)
Australia	109 (2.0%)
Austria	94 (1.7%)
Barbados	1 (0.1%)
Belgium	229 (4.2%)
Canada	128 (2.3%)
Chile	1 (0.1%)
Croatia	30 (0.5%)
Czech Republic	33 (0.6%)
Denmark	17 (0.3%)
Finland	62 (1.1%)
France	66 (1.2%)
Germany	1311 (23.9%)
Greece	6 (0.1%)
Hungary	74 (1.3%)
Iceland	2 (0.1%)
Ireland	8 (0.1%)
Israel	4 (0.1%)
Italy	48 (0.9%)
Japan	3 (0.1%)
Latvia	1 (0.1%)
Liechtenstein	1 (0.1%)
Luxembourg	2 (0.1%)
Malta	7 (0.1%)
Netherlands	175 (3.2%)
New Zealand	37 (0.7%)
Norway	33 (0.6%)
Poland	296 (5.4%)
Portugal	14 (0.3%)
Republic of Korea	1 (0.1%)
Romania	1 (0.1%)
Seychelles	2 (0.1%)
Slovakia	3 (0.1%)
Slovenia	6 (0.1%)
Spain	136 (2.5%)

Sweden	328 (6.0%)
Switzerland	303 (5.5%)
United Kingdom	563 (10.3%)
United States	366 (6.7%)
Taiwan	1 (0.1%)
Missing	38 (0.7%)

259

260 **Fig 1** Participants current country of residence

261

262 **Fig 2** Acute and chronic conditions associated with a risk of a severe course of a COVID-19
263 infection

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265 Table 3 gives an overview on COVID-19-related topics. Participants were quite satisfied with
266 the information they received on the COVID-19 pandemic (M: 2.13 ± 0.8) and had high
267 confidence in medical personnel to diagnose COVID-19 (M: 2.01 ± 0.8). Participants assumed
268 it as not very likely to be diagnosed with COVID-19 (M: 2.90 ± 0.9) and as highly likely to
269 survive a COVID-19 infection (M: 1.63 ± 0.8). They were concerned that members of their
270 families or close friends will contract COVID-19 (M: 2.09 ± 0.9).

271

272 **Table 3** COVID-19 health care, avoidance, and knowledge

COVID-19 health care	
Tested for COVID-19 within the last 14 days	130 (2.5%)
In quarantine within the last 14 days	1481 (28.1%)
Diagnosed with COVID-19	20 (0.4%)
Recovered from COVID-19	14 (0.3%)
Direct contact with a person diagnosed with COVID-19	109 (2.1%)
Indirect contact with a person diagnosed with COVID-19	245 (4.7%)
Contact with a person suspected to have COVID-19	818 (15.5%)
COVID-19 health care avoidance	
Avoided COVID-19 testing because of fear of mistreatment	295 (5.6%)
Avoided COVID-19 testing because of fear of discrimination	356 (6.8%)
Will avoid COVID-19 testing because of fear of mistreatment	761 (14.4%)
Will avoid COVID-19 testing because of fear of discrimination	888 (16.9%)
COVID-19 knowledge	

Transmission via droplet infection	5040 (95.7%)
Increasing number of infections worldwide	5091 (96.7%)
Increasing number of deaths worldwide	5067 (96.2%)
Increasing number of survivals worldwide	4592 (87.2%)

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274

275 Table 4 summarises the influence of the COVID-19 pandemic on transgender health care. Of
 276 the 4699 participants that had undergone transition-related treatment or planned to do so,
 277 2875 (61.2%) feared access restrictions to transgender health care in the future due to the
 278 COVID-19 pandemic. Of the 3463 participants that had already undergone transition-related
 279 treatment, 1706 (49.3%) experienced restrictions in access to transgender health care
 280 services. A multivariate logistic regression analysis revealed that the sex assigned at birth
 281 and the adequacy of the monthly income predicted the experience of restrictions to
 282 transgender health care significantly. Participants assigned male at birth (OR: 2.239) and
 283 individuals with a lower income (OR: 1.102) were at greater risk of experiencing restrictions
 284 to transgender health care procedures (Table 5).

285

286 **Table 4** Restrictions regarding transgender health care due to the COVID-19 pandemic

	N (% ^a)
Accessed at least one transgender health care procedure	3463 (65.7%)
Experienced restrictions in access to transgender health care	1706 (49.3%)
Accessed or planned at least one transgender-related treatment procedure	4699 (89.2%)
Fear restrictions to transgender health care in the future	2875 (61.2%)
Access to hormones currently restricted	676 (21.8%)
I cannot get a prescription	162 (24.0%)
I cannot get an appointment with my hormone prescriber	249 (36.8%)
A scheduled appointment was canceled without replacement	110 (16.3%)
An appointment has been postponed	81 (12.0%)
I am afraid to go to a medical provider or a hospital	189 (28.0%)
My hormones cannot be supplied or can only be supplied at a lower dosage than has been prescribed to me	177 (26.2%)
Other	224 (33.1%)

Fear that access to hormones will be affected in the future	2316 (44.0%)
Access to hair removal treatment currently restricted	665 (63.4%)
Fear that access to hair removal treatment will be affected in the future	776 (44.1%)
Surgery cancelled or postponed	
Yes	454 (15.6%)
Not yet, but I expect it will	568 (19.5%)
Problems with aftercare for recent surgery	344 (56.4%)
I cannot get an appointment for aftercare	45 (13.1%)
A scheduled appointment was canceled without replacement	70 (20.3%)
An appointment has been postponed	84 (24.4%)
Complications (e.g., secondary bleeding) have not been treated	22 (6.4%)
I am afraid to go to a doctor or a hospital	41 (11.9%)
Other	82 (23.8%)
Fear that surgical aftercare will be affected in the future	316 (21.9%)
Access restricted to	
medical material necessary after surgery (e.g., vaginal dilators)	160 (3.0%)
other material (e.g., binders, packing material)	651 (12.4%)
non-medical supplies (e.g., wigs, make-up)	860 (16.3%)
Access to counselling services (e.g., peer counselling) limited	2285 (43.4%)
Alternative options for accessing counselling services	1271 (47.9%)
Undergoing mental health care (e.g., for depression)	2055 (39.0%)
Access to mental health care limited	1271 (61.9%)
Fear that access to mental health care will be affected in the future	1035 (50.4%)
Member of a support group	1543 (28.5%)
Access to support groups limited	1067 (69.2%)

287 ^a Percentages refer to the number of participants who assessed a certain transgender health
 288 service, not to the total sample

289

290 **Table 5** Multiple regression analysis regarding the experience of restrictions to transgender
 291 health care

	b ± SE	CI	p	OR (95% CI)
Demographics				
Age	0.000 ± 0.003	-0.007 - 0.006	0.899	1.000 (0.993, 1.006)
Education	-0.013 ± 0.067	-0.148 - 0.119	0.850	0.987 (0.869, 1.121)

Relationship	0.033 ± 0.079	-0.123 - 0.201	0.677	1.033 (0.886, 1.205)
POC	0.158 ± 0.145	-0.129 - 0.436	0.269	1.171 (0.885, 1.550)
Religious minority	-0.083 ± 0.118	-0.320 - 0.144	0.466	0.920 (0.742, 1.142)
Sexual minority	0.000 ± 0.116	-0.220 - 0.236	0.997	1.215 (0.891, 1.657)
Gender minority	0.194 ± 0.157	-0.104 - 0.490	0.217	1.081 (0.891, 1.657)
Disability	0.077 ± 0.095	-0.097 - 0.276	0.388	0.380 (0.903, 1.657)
Sex assigned at birth	0.967 ± 0.082	0.809 - 1.136	0.001	2.239 (2.239, 3.092)
Non-binary gender	-0.034 ± 0.119	-0.262 - 0.213	0.767	0.966 (0.769, 1.214)
Social Environment				
Countries GNI per capita	-0.167 ± 0.115	-0.392 - 0.056	0.153	0.846 (0.677, 1.057)
Residence status	-0.312 ± 0.254	-0.845 - 0.182	0.212	0.732 (0.449, 1.191)
Population place of residence	0.106 ± 0.102	-0.092 - 0.320	0.292	1.111 (0.913, 1.354)
Monthly income	0.097 ± 0.028	0.045 - 0.150	0.003	1.102 (1.043, 1.164)
Health insurance	0.093 ± 0.175	-0.255 - 0.422	0.600	1.098 (0.792, 1.521)
Constant	0.754 ± 0.554	-0.283 - 1.840	0.172	0.808

292 R^2 0.063 (Cox & Snell), 0.084 (Nagelkerke). Model χ^2 (15) = 186.693, p=0.000

293

294 Discussion

295 As the first of its kind, the current study provides empirical insights into how the COVID-19
 296 pandemic affects the health care of transgender people in higher middle-income and high-
 297 income countries. Over 50% of our participants had risk factors for a severe course of a
 298 COVID-19 infection and were at a high risk of avoiding testing or treatment of a potential
 299 COVID-19 infection due to fear of mistreatment and/or discrimination. Transgender health
 300 care was highly affected by the COVID-19 pandemic, with almost half of participants
 301 experiencing some sort of restricted access to health care. Restricted access to transgender
 302 health care applied rather universally to all transgender individuals, with a male sex assigned
 303 at birth and a lower monthly income as the only significant predictors.

304 We found, that over 50% of transgender individuals have risk factors for a severe course of a
 305 COVID-19 infection (i.e., pre-existing medical conditions, being a smoker).[19-22] Compared
 306 with that, 23.5% of the working population in the EU and one-third of the European general
 307 population over 15 suffer from chronic conditions [23]. Similar numbers were found for
 308 other OECD countries [24]. Only in the US is the prevalence of chronic conditions between
 309 the transgender and the general population approximately equal, with 6 out of 10 adults

310 having a chronic condition [25]. Additionally, our participants were likely to avoid COVID-19
311 testing or care because of fears of discrimination or mistreatment. This was true even
312 though they were aware of the potential severity of COVID-19. This avoidance of care could
313 even worsen their risk for serious consequences of COVID-19.

314 We found that access to all transgender health care interventions was restricted due to the
315 COVID-19 pandemic. This could be especially important for those who access ongoing
316 treatments such as hormone therapy [3]. Hormone therapy is considered one of the most
317 important treatment options for many transgender individuals and is highly associated with
318 better mental health and quality of life [26]. An interruption of a hormone therapy is not
319 associated with physical risks when gonadectomy was not performed. However, mental
320 health risks must be considered. Stopping hormone treatment is often associated with a
321 return of some features related to the sex assigned at birth (e.g., the return of
322 menstruation). Moreover, mood swings and symptoms of depression and anxiety can occur
323 [2, 3, 27]. There is a risk of psychological distress for the twenty percent of our sample
324 whose hormones have been, or still are, restricted due to the pandemic. This association has
325 also been reported by Wang and colleagues in their clinic in Beijing, China [11]. The same
326 may well be true for hair removal treatments. While hair removal might not have the same
327 value as hormone treatment, it is often performed as a supportive measure as hormone
328 treatment alone could be insufficient to eliminate hair growth [27]. As a population,
329 transgender individuals are already experiencing poor mental health, decreased quality of
330 life, and are at high risk of discrimination and harassment [4, 8]; consequently, the
331 restrictions in access to health care may affect transgender people to a greater extent than
332 the general population. This higher vulnerability might also intersect with other minority
333 statuses, such as being a person of colour.

334 All these transgender-specific issues caused by the COVID-19 pandemic need to be
335 addressed by both structural changes as well as counselling services (e.g., peer counselling)
336 and mental health care professionals. However, due to the COVID-19 pandemic, access to
337 these measures is limited, too. For 43.4% of the participants who assessed counselling
338 services, the access to those was restricted. 61.9% of those who undergo mental health care
339 (e.g., for a pre-existing affective disorder) experienced access restrictions. Only half of the
340 participants had alternative options for accessing counselling services (e.g., online
341 consultations). Additionally, even access to low-threshold services, like support groups, was
342 limited for two thirds of their members. In light of the available data, the COVID-19
343 pandemic and its associated restrictions, combined with the systemic inequalities
344 transgender people face in almost every country in the world, appears to have had a
345 significant impact on the (mental) health of transgender people. Tragically, our study found
346 that more than one third of our sample had had suicidal thoughts and 3.2% had attempted
347 suicide since the beginning of the pandemic. And even though no causal conclusions can be
348 drawn based on our cross-sectional study, it seems reasonable to assume that many of these
349 suicidal attempts are linked to the situation caused by the COVID-19 pandemic. Indeed, at
350 the least this association ought to be a warning sign that transgender people might be
351 disproportionately affected by COVID-19.

352 Some treatment options for transgender people such as genital surgeries [1] have been
353 highly restricted due to the COVID-19 pandemic, too. At the time of the data analysis,
354 approximately 15.6% of surgeries were already cancelled and another 19.5% of the
355 participants expected their surgery to be cancelled. Additionally, aftercare for recent surgery
356 was also restricted. As genital surgery is considered an important treatment option to
357 increase quality of life and reduce psychological distress in transgender people [2, 28], a

358 postponement of these procedures can negatively impact a person's well-being. Especially
359 regarding surgical aftercare, restrictions could lead to serious health concerns like wound
360 infections or disorders of wound healing [2]. Moreover, due to insecurities caused by the
361 postponement of surgery, mental health problems could occur which should be addressed
362 by counselling services or mental health professionals when possible. However, as the access
363 to these services is restricted too, problems associated with postponed surgeries might not
364 be addressed sufficiently and could intersect with already existing distress such as
365 restrictions to accessing hormone treatment.

366 All potential distress caused by restrictions to transgender health care might be further
367 affected by social and socio-economic circumstances, as already reported by Perez-Brumer
368 and Silva-Santisteban [12]. We found that one third of our participants had difficulties
369 making ends meet with their available monthly income and another third experienced
370 distress due to their current living situation. However, using regression analysis, we only
371 found a male sex assigned at birth and a lower monthly income to be significant predictors
372 for the experience of restrictions to transgender health care. The significant association to a
373 male sex assigned at birth could be due to a greater stigma towards transgender people
374 assigned male at birth [29]. The association between the monthly income and a higher risk
375 of restrictions to transgender health care with an OR of 1.102 could be considered weak.
376 Therefore, it seems that the COVID-19 pandemic hits the transgender population in higher-
377 middle-income and high-income countries in its entirety and that there aren't any major
378 protective social factors.

379 The strength of our study is that it includes a high number of participants from several
380 countries all over the world. This is important as, with a number of 6.8 to 355 per 100,000,
381 transgender people are only a small group within the general population [30]. The results

382 are therefore likely to be applicable to other upper middle-income and high-income
383 countries with similar health systems. Moreover, the study was developed and conducted by
384 transgender researchers in close cooperation with community organisations. Therefore, we
385 intentionally took power differences between researchers and study subjects into account
386 and tried to ensure tangible outcomes for the community.

387 We consider the type of data collection a potential limitation of our study due to access to
388 the internet being a necessity. This could have excluded participants with low income or
389 without experience with digital technology. However, our sample was comparable to
390 previous studies, in terms of gender or education, for example [7, 18]. As there is still a
391 dynamic COVID-19 situation, with increasing and decreasing numbers of infections and
392 changing national measures to address these, this research also did not explore international
393 comparisons. In countries where COVID-19 has been more effectively suppressed the
394 impacts of COVID-19 could, therefore, be lower. Moreover, we only analysed data from
395 higher middle-income and high-income countries, which is why the results cannot be
396 generalized to countries with lower GNI per capita. However, as participant recruitment in
397 lower middle-income countries and low-income countries appeared to be difficult (but is still
398 ongoing) the clear need for evidence of how COVID-19 affects transgender people led us to
399 focus on the present data. We currently strive to provide data from lower middle-income
400 countries and low-income countries as soon as possible.

401 In sum, it appears that the COVID-19 pandemic has an extraordinary impact on the
402 transgender population in higher middle-income and high-income countries, and that
403 transgender people might suffer under the severity of the pandemic even more than the
404 general population. This is due to the intersections between their status as a vulnerable
405 social group, their high amount of medical risk factors, and their need for ongoing medical

406 treatment. The COVID-19 pandemic can potentiate these vulnerabilities, add new challenges
407 for transgender people, and can therefore lead to devastating consequences such as severe
408 physical or mental health issues, self-harming behaviour, and even suicidality.

409

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421

422 **Contributors**

423 XX, YY, and ZZ conceived the study. All authors reviewed the study concerning country-specific
424 issues. All authors contributed to participant recruitment and data collection. XX, YY, and ZZ
425 managed the data and did the statistical analysis. All authors collaborated in interpretation of
426 the results and drafting and revision of the manuscript.

427

428 **Declaration of Interests**

429 All authors declare no competing interests.

430 **Data sharing**

431 We will consider sharing de-identified, individual participant-level data that underlie the results
432 reported in this Article on receipt of a request detailing the study hypothesis and statistical
433 analysis plan. All requests should be sent to the corresponding author. The corresponding author
434 and lead investigators of this study will discuss all requests and make decisions about whether
435 data sharing is appropriate based on the scientific rigour of the proposal. All applicants will be
436 asked to sign a data access agreement.

437

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517

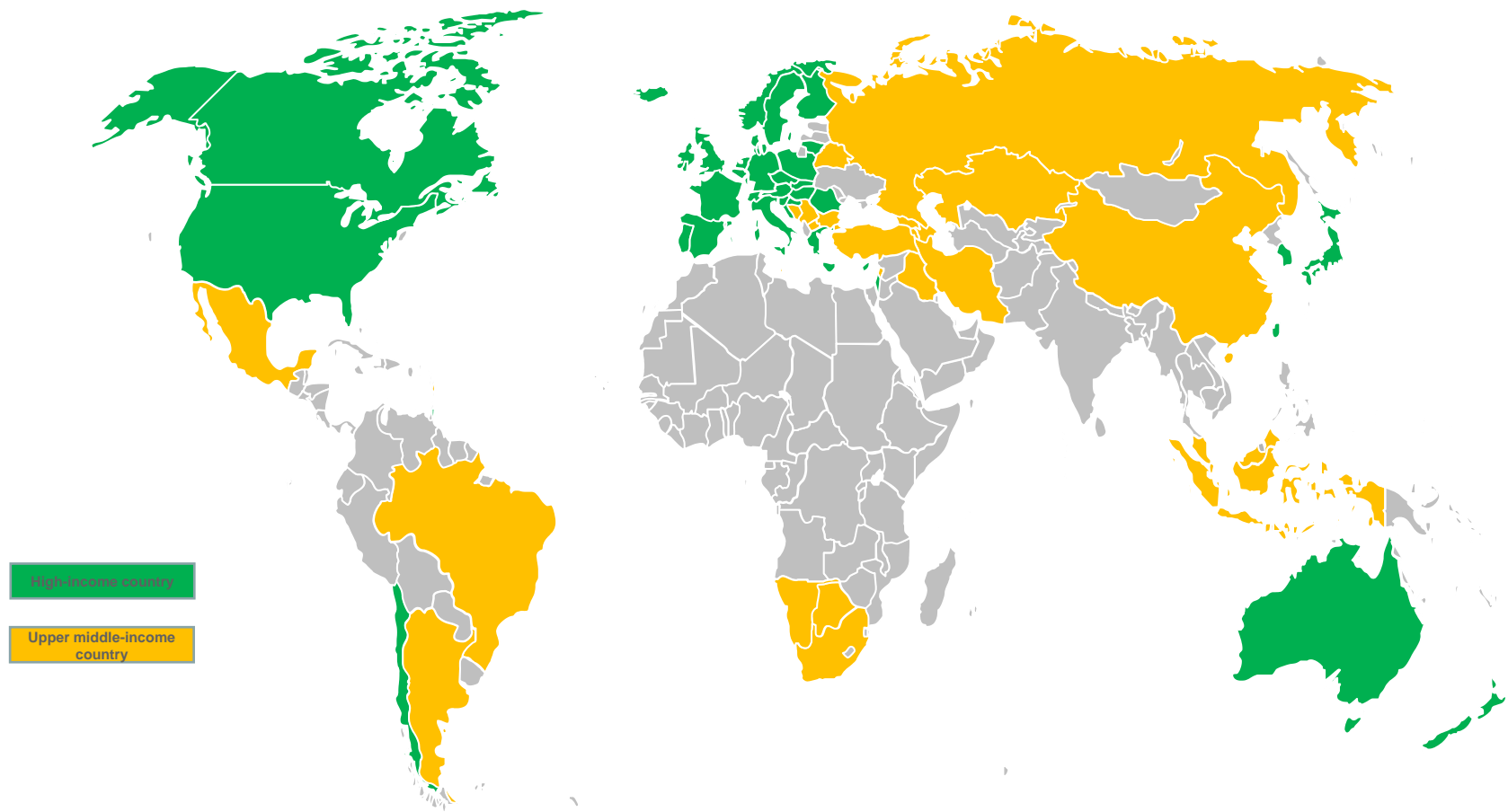


Fig 1 Participants current country of residence

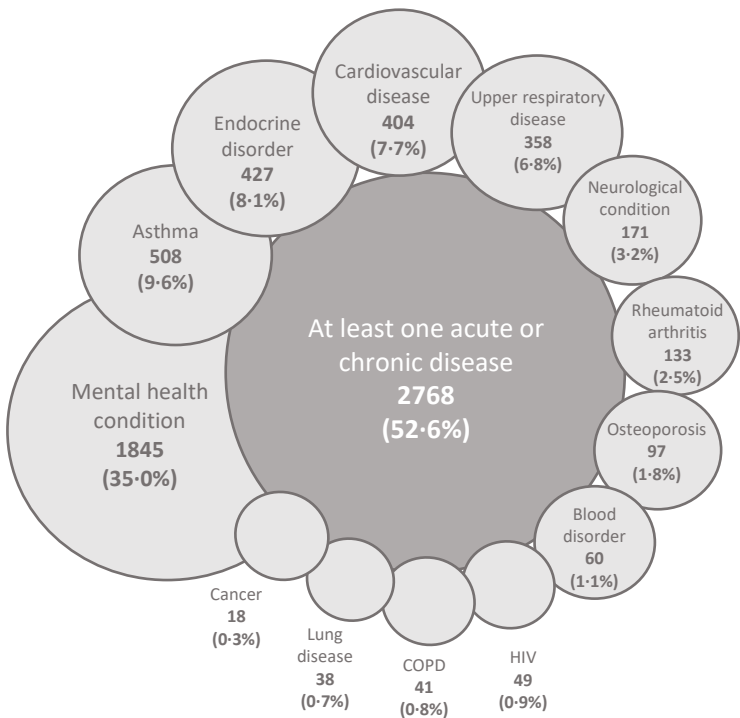


Fig 2 Acute and chronic conditions associated with a risk of a severe course of a COVID-19 infection