

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Thuret et al, One threat, different answers: the impact of COVID-19 pandemic on cornea donation and donor selection across Europe

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List of contributors and of contributing eye banks.**List of participants (by alphabetic order)**

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List of participating eye banks (by alphabetic order of countries)

Austria: Vienna Eye Bank; Hornhautbank Salzburg; Red Cross Blood Transfusion Service of Upper Austria (Linz). **Belgium:** Ocular Tissue Bank, Amnion Tissue Bank (Antwerp); Tissue Bank UZ Ghent. **Bulgaria:** International Eye Bank Sofia. **Croatia:** Croatian Tissue and Cell Bank (Zagreb). **Czech Republic:** Oční tkáňová banka Praha Vinohrady, z.u./ Eye Bank Prague; National Cell and Tissue Center Inc. (Brno). **Denmark:** The Danish Cornea Bank (Aarhus). **Finland:** Regea Cell and Tissue Center-Tampere University. **France:** Banque de tissus et cellules des Hospices Civils de Lyon; Tissue Bank Univ Hospital Rouen; Banque de tissus EFS Bourgogne/Franche-Comté (Besançon); Banque Multi-Tissus Univ Hospital Nantes; Banque de Tissus-EFS Bretagne (Brest); Tissue Bank CHU Nancy; Banque de cornées - EFS Auvergne-Rhône-Alpes (Saint-Etienne) ; Tissue Bank Univ Hospital (Toulouse). For the 8 other French eye banks, results were obtained thanks to the Agence de la Biomédecine, Saint-Denis, France. **Germany:** Mitteldeutsche Hornhautbank (MCH) (Halle); Hornhautbank München gGmbH (Munich); Hornhautbank Münster; Lions Hornhautbank der Universitätsaugenklinik Würzburg; Bayerische Gewebebank; LMU Klinikum (Munich); Hornhautbank Essen, university hospital Essen; Knappschafts-Gewebebank Sulzbach / DGFG; Klaus Faber Zentrum für Hornhauterkrankungen inklusive Lions Hornhautbank (Komburg/Saar); Lions Hornhautbank Heidelberg; Lions Cornea Bank Baden-Württemberg (Freiburg); Cornea Bank Aachen, RWTH University Hospital; Cornea Bank Braunschweig / DGFG; Gewebebank Hannover / DGFG; Cornea Bank Cologne; Lions Hornhautbank NRW (Düsseldorf); Cornea bank University hospital of Cologne; Gewebebank Mecklenburg-

Vorpommern gGmbH (Rostock). **Italy:** Eye Bank of Monza; Fondazione Banca degli Occhi del Veneto Onlus (FBOV); Banca delle cornee della regione Piemonte. **Norway:** Norwegian Eye Bank (Oslo). **Poland:** Lublin Eye Bank. **Portugal:** Coimbra Eye Bank - Banco de Olhos; Slovenia: Ljubljana Eye Bank. **Spain:** Barcelona Tissue Bank; A Coruña University Hospital-Tissue establishment; Banc de Teixits de les Illes Balears (Palma). **Sweden:** Tissue Establishment Eye Bank Umea; The Eye bank (Möln dal); Lund Tissue Bank; The Cornea Bank Örebro. **Switzerland:** Eye Bank Bern, Department of Ophthalmology, Inselspital, Bern University Hospital; Eye bank of Lausanne. **The Netherlands:** ETB-Bislife, Cornea Department (Bewerwijk); Amnitrans Eyebank Rotterdam. **United Kingdom:** Moorfields Lions Eye Bank (MLEB), Moorfields Eye Hospital (London); NHS Blood and Transplant Eye Bank (Bristol and Liverpool).

List of contra-indications for corneal donation advocated by the European Eye bank Association in their Minimum Medical Standards (revised 01/02/2020). Contra-indications of infectious origin are highlighted in blue. Individual countries may impose more stringent standards.

- Cause of death unknown, unless autopsy provides information on the cause of death after procurement and none of the general criteria for exclusion set out in the present section applies;
- History of a disease of unknown aetiology;
- Donors with malignant diseases can be evaluated and considered for cornea donation (not for donation of vascularized ocular tissues), except for those with retinoblastoma, haematological neoplasm (such as leukaemia, lymphoma, myeloma), and malignant tumours of the anterior segment of the eye (i.e. primary tumours such as conjunctival intraepithelial neoplasia, squamous cell carcinoma or malignant melanoma as well as metastasis in the anterior ocular segment from other primary malignant tumours). In the case of donors with malignant diseases and a potential risk of metastasis formation in the anterior ocular segment, a thorough slit-lamp examination of the globe or the corneo-scleral disc focused on possible metastasis must be undertaken in the eye bank;
- Risk of transmission of diseases caused by prions. This risk applies, for example, to:
 - a) people diagnosed with Creutzfeldt–Jakob disease, or variant Creutzfeldt–Jakob disease, or having a family history of non-iatrogenic Creutzfeldt–Jakob disease;
 - b) people with a history of rapid progressive dementia or degenerative neurological disease, including those of unknown origin, such as Alzheimer's Disease, multiple sclerosis, amyotrophic lateral sclerosis;
 - c) recipients of hormones derived from the human pituitary gland (such as growth hormones) and recipients of grafts of cornea, sclera and dura mater, and persons that have undergone undocumented neurosurgery (where dura mater may have been used).
- Systemic infection which is not controlled at the time of donation, including bacterial diseases, systemic viral (such as rabies), fungal or parasitic infections, or significant local infection in the tissues and cells to be donated. Donors with bacterial septicaemia (except for encephalitis and meningitis) may be evaluated and considered for eye donation but only where the corneas are to be stored by organ culture to allow detection of any bacterial contamination of the tissue;

- History, clinical or laboratory evidence of HIV or AIDS, acute or chronic hepatitis B (except in the case of persons with a proven immune status), hepatitis C and HTLV I/II, transmission risk or evidence of risk factors for these infections;
- History of chronic, systemic autoimmune and/or inflammatory disease that could have a detrimental effect on the quality of the tissue to be retrieved;
- Evidence of any other risk factors for transmissible diseases on the basis of a risk assessment, taking into consideration donor social history (e.g. intravenous drug abuse, sexual promiscuity), travel and exposure history and local infectious disease prevalence; in this context according to the Standards to the surveillance and epidemic intelligence actions of the European Centre of Disease Control it is important to investigate travel in high-risk regions when checking social anamnesis with regards to new or emerging communicable diseases such as the Ebola virus, Zika-virus, new Corona virus (referred to as 2019-nCoV or Corona-Wuhan) etc. To look for a specific disease index for a country the UK Blood Services Geographical Disease Risk Index for example lists the current disease risks for specific countries (www.transfusionguidelines.org).
- Presence on the donor's body of physical signs implying a risk of transmissible disease(s), such as bruises, lacerations, scars, piercing, needle tracks not compatible with recent clinical history, fresh tattoos that may hide parenteral drug use, and signs of transmissible diseases such as Kaposi sarcoma, swollen lymph nodes, skin rashes, Jaundice of unknown aetiology, should be interpreted in the context of donor medical and social history;
- Ingestion of, or exposure to, a substance (such as cyanide, lead, mercury, gold) that may affect the quality of the ocular tissue, or may be transmitted to recipients in a dose that could endanger their health;
- Recent history of vaccination with a live attenuated virus where a risk of transmission is considered to exist;
- Transplantation with xenografts;
- Additional exclusion criteria for deceased child donors;

Any children born from mothers with HIV infection or that meet any of the exclusion criteria described above must be excluded as donors until the risk of transmission of infection can be definitely ruled out:

a) Children aged less than 18 months born from mothers with HIV, hepatitis B, hepatitis C or HTLV infection, or at risk of such infection, and who have been breastfed by their mothers

during the previous 12 months, cannot be considered as donors regardless of the results of the analytical tests;

b) Children of mothers with HIV, hepatitis B, hepatitis C or HTLV infection, or at risk of such infection, and who have not been breastfed by their mothers during the previous 12 months and for whom analytical tests, physical examinations, and reviews of medical records do not provide evidence of HIV, hepatitis B, hepatitis C or HTLV infection, can be accepted as donors;

- Eye diseases and ocular surgery: congenital or acquired disorders of the eye (e.g. [herpetic keratitis](#)), or previous ocular surgery, that would prejudice graft outcome (e.g. corneas with previous refractive surgery, or stromal scars, may be acceptable for posterior lamellar keratoplasty).

European Eye Bank Association questionnaire send to European eye banks.Q1: Eye bank name Q2: Town/city Q3: Country Q4: Name of the person completing the questionnaire +/- position in the eye bank

Q5: Table

	Number of donor corneas procured	Number of donor corneas distributed (assigned/delivered)
February 2018		
March 2018		
April 2018		
May 2018		
February 2019		
March 2019		
April 2019		
May 2019		
February 2020		
March 2020		
April 2020		
May 2020		

Q6: It would be extremely useful if you could provide us with a copy of the official recommendation in force for donor selection since the start of COVID-19 in your country (or region if applicable) [preferred file formats: .doc or .docx, .pdf, .jpeg, .gif]

Q7: On what date was this new recommendation implemented?

Q8: If you have had a period of total corneal retrieval stoppage, on what date were you able to start again?

DD/MM

Q9: During March, April and May 2020, did you experience any operational problems relating to:

(a) the confinement of eye bank staff at home?

YES/NO

(b) health problems of your staff directly related to COVID-19?

YES/NO

(c) a right of withdrawal exercised by your staff for fear of a risk of infection related to their work in the eye bank?

YES/NO

If you answered 'yes' to any of the parts of Q9, please provide details:

Q10: in the event of a publication,

- would you like the name of your cornea bank to appear in a list of contributors? YES/NO

- would you like your name to appear in a list of contributors?

YES/NO

Table S1. List of institutes and/or national agencies that produced the donor screening algorithms during the COVID-19 period (by alphabetic order of countries). No official data for countries missing from this table.

Country	Institutes/national agencies
Austria	European Center for Disease Prevention and Control (ECDC)
Belgium	Agence fédérale des médicaments et des produits de santé (AFMPS) Conseil supérieur de la santé
Croatia	University Hospital Centre Zagreb, Clinical Department of Transfusion Medicine and Transplantation Biology, University Hospital Centre Zagreb - Clinical Department of Transfusion Medicine and Transplantation Biology - Croatian Tissue and Cell Bank
Denmark	Danish Patient Safety Authority
Europe	European Center for Disease Prevention and Control (ECDC)
Finland	European Center for Disease Prevention and Control (ECDC)
France	Agence de la biomédecine (ABM)
Germany	Federal Institute for Vaccines and Biomedicines. Paul-Ehrlich-Institute (PEI). Agency of the German Federal Ministry of Health
Italy	Ministero della Salute, Istituto superiore di Sanita. Centro Nazionale Trapianti (CNT).
Norway	National Transplant Centre
Poland	Helsedirektoratet
Portugal	Poltransplant
Spain	Direcao-Geral da Saude (DGS). Instituto Portuguese do Sangue e da transplantação (IPST)
Sweden	Ministerio de Sanidad. Organización Nacional de Trasplantes
Switzerland	Socialstyrelsen
The Netherlands	Swiss Transplant. Swiss National Foundation for organ donation and transplant
United Kingdom	Nederlandse Transplantatie Stichting (NTS)
	NHS-Blood and Transplant Tissue and Eye Services (NHSBT-TES)

Table S2. Number of eye banks surveyed per European countries

	Present survey	Registered with EEBA*	According to EU Tissue Establishment Compendium
Austria	3	5	5
Belgium	2	4	4
Bulgaria	1	2	6
Croatia	1	1	1
Czech Republic	2	3	4
Denmark	1	1	1
Finland	1	1	2
France	16	9	16
Germany	17	20	36
Italy	3	7	14
Norway	1	2	3
Poland	1	2	6
Portugal	1	2	6
Slovenija	1	1	3
Spain	3	4	31 (8 with significant activity)
Sweden	3	5	5
Switzerland	2	4	
The Netherlands	2	2	2
United Kingdom	3	2	3
Total	64	77	148

*Only 77 the 110 European eye banks in the EEBA mailing list are active members of the learned society.

Table S3. Data from EU/EEA & UK from ECDC as of June 3rd 2020
(<https://www.ecdc.europa.eu/en/cases-2019-ncov-eueea>. Data for Switzerland was calculated from the ECDC download file (COVID-19-geographic-distribution-worldwide-2020-06-17.xlsx). Data sorted based on "Reported deaths of/with COVID-19 per 100,000 population".

EU/EEA and the UK	Sum of Cases	Sum of Deaths	Reported cases per 100 000 population	Reported deaths per 100 000 population
Belgium	58615	9505	513.2	83.2
Spain	239932	27940	513.5	59.8
UK	277985	39369	418.1	59.2
Italy	233515	33530	386.4	55.5
Sweden	38589	4468	378.9	43.9
France	151325	28940	225.9	43.2
Netherlands	46647	5967	270.7	34.6
Switzerland	30791	1656	361.5	19.4
Portugal	32895	1436	319.9	14
Germany	182370	8551	219.9	10.3
Denmark	11734	580	202.4	10
Austria	16674	669	188.5	7.6
Finland	6887	320	124.8	5.8
Slovenia	1475	108	71.3	5.2
Norway	8446	237	158.9	4.5
Czech Rep	9364	323	88.1	3
Poland	24395	1092	64.2	2.9
Croatia	2246	103	54.9	2.5
Bulgaria	2538	144	36.1	2.1
Total	1376423	164938		

Table S4. Grading of the stringency of donor selection algorithms. Points attributed to each of the five columns are detailed in Table 2. The same color code was applied in the corresponding Figure 4. Countries are ordered based on the stringency of the donor selection algorithms from low (green) to high (red).

	proven COVID 19 history	suspected COVID	Asymptomatic at risk	Pre- mortem PCR	PCR	TOTAL
Switzerland***	1	1	1	0	0	3
Portugal	1	1	1	0	1	4
Bulgaria**	1	1	1	0	1	4
Denmark-April	3	1	1	0	0	5
ECDC-April*	3	1	1	0	0	5
Germany	2	1	2	0	1	6
UK	2	2	2	0	1	7
Poland	4	1	1	0	1	7
Sweden	2	2	2	1	0	7
Norway	2	2	2	0	1	7
Italy	2	4	3	0	0	9
Finland*	2	4	2	0	1	9
Austria*	2	4	2	0	1	9
ECDC-March	2	4	2	0	1	9
France	3	3	3	1	0	10
Spain	3	3	3	1	0	10
Belgium	3	3	3	0	1	10
Croatia	3	3	3	1	0	10
The Netherlands	3	4	3	1	1	12
Denmark-March	3	4	4	0	1	12

* Based on ECDC March recommendations

** No official recommendation was obtained

*** Only country without mention of delay before death, for the first three items.