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DAJ ŽIVLJENJU PRILOŽNOST

GIVE LIFE A CHANCE

DONORSKA IN TRANSPLANTACIJSKA DEJAVNOST V SLOVENIJI

DONATION AND TRANSPLANTATION ACTIVITY IN SLOVENIA

2021

DAJ
Življenju priložnost

Donorska in transplantacijska dejavnost
v Sloveniji v letu 2021

slovenija transplant

GIVE
Life a chance

Donation and transplantation activity
in Slovenia in 2021

Daj življenju priložnost - Donorska in transplantacijska dejavnost v Sloveniji v letu 2021

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Give life a chance – Donation and transplantation activity in Slovenia in 2021

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Uvodne besede

V letni publikaciji *Daj življenju priložnost* predstavljamo statistične podatke in izbrane presežke v donorski in transplantacijski dejavnosti v letu 2021. Za nami je še eno leto, v katerem je dejavnost in uspešnost kreirala bolezen covid-19.

V primerjavi z letom 2020 smo sicer imeli manj aktivnih darovalcev in presaditev, a glede na kadrovsko podhranjenost, izčrpanost sodelavcev v donorski mreži in pomanjkanje prostora na oddelkih intenzivnega zdravljenja, smo z rezultatom lahko zadovoljni. V kriznih razmerah smo ponovno dokazali kakovosten pristop, predanost delu in dobro povezanost vseh strokovnjakov v nacionalni transplantacijski mreži. Ves čas nas je vodilo zavedanje, da epidemija ne sme zaustaviti dejavnosti, da pridobljeni organi ne smejo v uničenje in da je bolnikom na čakalnih seznamih treba zagotoviti kakovostno in varno zdravljenje s presaditvijo.

Zahvaljujemo se vsem sodelavcem v donorsko-transplantacijskem programu, zlasti pa vodstvu UKC Ljubljana, ki je v najbolj kritičnih trenutkih znalo potegniti prave poteze in storiti vse, da je v naši največji bolnišnici dejavnost potekala nemoteno. Iskreno se zahvaljujemo tudi vsem svojcem umrlih, ki so v čustveno zahtevnih situacijah ohranili humanost, čut za sočloveka in podali soglasje za darovanje. Prav visok delež soglasja je pripomogel k temu, da smo leto 2021 zaključili s podobnimi številkami kot lani. Veseli nas dejstvo, da je navkljub zdravstveni in družbeni krizi v ljudeh veliko dobrega, tudi zaupanje v darovanje organov se ni zmanjšalo.

Na koncu naj še omenim, da smo leto 2021 zaključili z iztekom mandata dolgoletne direktorice in gonilne sile razvoja zavoda od njegove ustanovitve, prim. Danice Avsec, dr. med. Zahvaljujem se ji za predano opravljeno delo in za trdne strokovne temelje, ki so dobro izhodišče za uresničitev vizije nadaljnjega razvoja zavoda in razširitev donorskega programa, ki ga načrtujemo v bližnji prihodnosti.

Andrej Gadžijev, dr. med.
Direktor in odgovorni zdravnik za donorsko dejavnost

Kazalo

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Slovarček temeljnih izrazov

BOLNIŠNIČNA KRVNA BANKA: enota, ki v bolnišnici shranjuje in razdeljuje kri ter krvne komponente in opravlja predtransfuzijsko testiranje ter bolnišnične transfuzijske dejavnosti. Za zbiranje krvi torej ni pooblaščena.

BOLNIŠNIČNI TRANSPLANTACIJSKI KOORDINATOR: zakon določa način imenovanja, naloge bolnišničnih koordinatorjev in pravilnik o koordinatorjih. Naloge bolnišničnih transplantacijskih koordinatorjev so: organizacija in koordinacija dela na vseh področjih transplantacijske dejavnosti v bolnišnici, od odkrivanja možnih mrtvih darovalcev do organizacije in koordinacije odvzemov v bolnišnici ter pospeševanje programa pridobivanja organov in tkiv za presaditev. Delo opravljajo zdravniki specialisti, ki so pridobili dodatna znanja o vseh področjih transplantacijske dejavnosti v bolnišnici oz. donorskem centru.

CENTRALNI TRANSPLANTACIJSKI KOORDINATOR: zdravnik z dodatnimi znanji, ki organizira in koordinira transplantacijsko dejavnost od zaznave možnega darovalca do odvzema. Centralni transplantacijski koordinatorji so v pripravljenosti 24 ur na dan vse dni na leto.

ČAKALNI SEZNAM (PREJEMNIKOV): zbirka podatkov zaporedno vpisanih pacientov, ki čakajo na presaditev z namenom zdravljenja. Indikacije za presaditev so za vsak organ/tkivo/celico specifične.

DAROVALEC: oseba, ki daruje del telesa za namen zdravljenja, ne glede na to, ali do darovanje pride za časa življenja ali po njeni/njegovi smrti.

DAROVANJE: darovanje dela telesa, namenjenega za zdravljenje s presaditvijo.

DEJANSKI UMRLI /MRTVI DAROVALEC: aktiven darovalec, od katerega je bil presajen vsaj en organ.

DODELJEVANJE: postopek, po katerem se izbere najustreznejšega prejemnika.

DONORSKA BOLNIŠNICA ALI CENTER: javnozdravstveni zavod ali enota tega zavoda, ki izvaja dejavnost pridobivanja delov telesa za namen zdravljenja s presaditvijo.

HUD NEŽELEN DOGODEK: kateri koli neželen ali nepredviden dogodek v zvezi s katero koli stopnjo postopka darovanja do presaditve, ki lahko povzroči prenos nalezljive bolezni, smrt, ogrozi življenje, povzroči invalidnost ali nezmožnost za delo, katerega posledica je hospitalizacija ali obolevnost, ali ki podaljša hospitalizacijo ali obolevnost.

HUDA NEŽELENA REAKCIJA: nenameren odziv, vključno s pojavom prenosljive bolezni, pri živem darovalcu ali prejemniku, ki bi lahko bil povezan s katero koli stopnjo postopka od darovanja do presaditve, ki je smrten, smrtno nevaren, ki povzroča invalidnost ali nezmožnost za delo, ali katerega posledica je hospitalizacija ali obolevnost ali ki podaljša hospitalizacijo ali obolevnost.

INTENZIVNO ZDRAVLJENJE/INTENZIVNA NEGA: zdravljenje, ki zahteva hitro odzivno diagnostiko, terapijo, nego in stalni nadzor življenjskih funkcij bolnika ponavadi v enoti za intenzivno zdravljenje.

MOŽEN UMRLI/MRTVI DAROVALEC: oseba, katere klinično stanje kaže na verjetnost, da izpolnjuje merila za možgansko smrt.

NACIONALNA IDENTIFIKACIJSKA ŠTEVILKA DAROVALCA OZIROMA PREJEMNIKA: identifikacijska oznaka, ki jo v skladu z nacionalnim sistemom identifikacije darovalcu ali prejemniku dodeli Slovenija-transplant in služi kot povezovalni znak, prek katerega se sledi darovalcu in prejemniku organa, zlasti pri izmenjavi podatkov med donorskimi centri, transplantacijskimi centri in drugimi državami članicami Evropske unije.

PRIMEREN UMRLI/MRTVI DAROVALEC: medicinsko ustrezna oseba, pri kateri je bila ugotovljena smrt na podlagi nevroloških meril, glede na relevantno zakonodajo.

SLEDLJIVOST: možnost, da se najde in identificira organ v vseh fazah preskrbe z organi ali uničenja, vključno z možnostjo, da se identificirata darovalec in donorski center, poiščejo prejemniki pri transplantacijskem centru ter identificirajo vsi pomembni neosebni podatki v zvezi s proizvodi in materiali v stiku z organom.

STOPNJA ODKLONITVE: odstotek odklonitev svojcev oz. oseb, ki so blizu umrlemu, za darovanje po smrti.

STOPNJA ZAVRNITEV: odstotek zavrnitev presadka pri prejemniku.

TRANSPLANTACIJSKA DEJAVNOST: zdravstvena dejavnost, ki vključuje postopke darovanja, pridobivanja, testiranja in razdeljevanja organov ter darovanja, pridobivanja, testiranja, predelave, konzerviranja, shranjevanja in razdeljevanja tkiv in celic za potrebe zdravljenja s presaditvijo.

TRANSPLANTACIJSKI CENTER: javnozdravstveni zavod ali enota tega zavoda, ki izvaja dejavnost zdravljenja s presaditvijo organov.

TRANSFUZIJSKI CENTER: organizacijska enota, ki je v bolnišnici odgovorna za zbiranje krvi, testiranje, predelavo zbrane krvi v krvne komponente in njihovo shranjevanje. Izvaja predtransfuzijsko testiranje in bolnišnične transfuzijske dejavnosti ter bolnišnice in druge porabnike oskrbuje s krvjo in krvnimi komponentami.

TRANSFUZIJSKI ZAVOD OZIROMA ZAVOD RS ZA TRANSFUZIJSKO MEDICINO V LJUBLJANI: na državni ravni odgovoren za strokovno raven preskrbe s krvjo in krvnimi pripravki ter povezovanje transfuzijske medicine z bolnišnično dejavnostjo. Zavod usklajuje vse dejavnosti v zvezi z izbiro krvodajalcev, zbiranjem, testiranjem, predelavo, hrambo in razdeljevanjem krvi ter krvnih pripravkov, klinično rabo krvi in nadzorom nad težkimi neželenimi dogodki oziroma reakcijami v zvezi s transfuzijo krvi. Zavod RS za transfuzijsko medicino na državni ravni usklajuje in povezuje mrežo bolnišničnih transfuzijskih oddelkov in bolnišničnih krvnih bank, vodi enoten informacijski sistem, strokovno izobraževanje in razvojno-raziskovalno dejavnost ter sodeluje z mednarodnimi organizacijami, zvezami in sorodnimi zavodi v drugih državah.

Zavod Slovenija-transplant

Javni zavod Republike Slovenije za presaditve organov in tkiv Slovenija-transplant je od leta 2002 osrednja nacionalna strokovna ustanova, ki povezuje, koordinira, pospešuje ter nadzira donorsko in transplantacijsko dejavnost v Sloveniji. V zavodu Slovenija-transplant je centralna koordinacijska pisarna nacionalne transplantacijske mreže, ki je bila ustanovljena leta 1998. Nacionalno mrežo sestavlja enajst donorskih bolnišnic po Sloveniji, Center za transplantacijsko dejavnost v UKC Ljubljana in Center za tipizacijo tkiv, ki deluje v sklopu Zavoda RS za transfuzijsko medicino. Nacionalna mreža omogoča delovanje donorskega in prejemniškega programa ter zagotavlja, da imajo dostop do zdravljenja s presaditvijo vsi, ki ga potrebujejo. Mreža deluje nepretrgoma, zato so strokovne ekipe v pripravljenosti 24 ur na dan, vse dni v letu.

Od leta 2000 je Slovenija vključena v neprofitno organizacijo za izmenjavo organov in tkiv Eurotransplant. Z izpolnjevanjem zahtevnih vstopnih pogojev se je prva iz regije priključila veliki skupini petih uspešnih držav na področju zdravljenja s presaditvijo, t. j. Nemčiji, Avstriji, Belgiji, Luksemburgu in Nizozemski. Od leta 2002 je Slovenija-transplant nosilec pogodbe z Eurotransplantom. Eurotransplant danes združuje 8 držav in prek 137 milijonov prebivalcev, sedež ima v Leidnu na Nizozemskem. Članstvo je pomembno za naše bolnike, saj so se s priključitvijo bistveno izboljšale možnosti preživetja in izidi zdravljenja s presaditvijo, predvsem v visoko urgentnih, življenjsko ogrožajočih stanjih, kot sta akutna odpoved delovanja srca in jeter, ter v drugih posebnih primerih (npr. otroci, hipersenzibilizirani bolniki). S sodelovanjem so se tudi občutno zmanjšali čakalni seznami, nacionalni transplantacijski programi so se razmahnili, izvajati smo začeli kombinirane presaditve. Predvsem pa smo lahko omogočili optimalnejšo tkivno skladnost med darovalcem in prejemnikom. Nekateri bolniki zaradi tkivne neskladnosti ustreznega organa v Sloveniji sploh ne bi dočakali. V letu 2020 smo obeležili pomembno 20. obletnico uspešnega sodelovanja z Eurotransplantom.

Zavod Slovenija-transplant se od ustanovitve naprej nenehno razvija v skladu s priporočenimi mednarodnimi smernicami. Stremimo k ustvarjanju izobražene in motivirane strokovne javnosti ter z več plastnim komuniciranjem vztrajno povečujemo zaupanje v transplantacijsko medicino med splošno

javnostjo. Preko članstev v mednarodnih strokovnih odborih in s sodelovanjem v evropskih projektih smo tesno vpeti v mednarodno okolje, tudi kot aktivni soustvarjalci strategij, razvoja in izobraževanja strokovnjakov v donorski in transplantacijski dejavnosti na mednarodnem področju. Ostajamo mednarodno prepoznan in zgleden primer za varen in učinkovit način organizacije in vodenja nacionalnega donorskega programa.

Pri urejanju in vodenju področja pridobivanja in uporabe delov človeškega telesa za namen zdravljenja v Slovenija-transplantu dosledno upoštevamo zakonodajo, evropske direktive in sprejete mednarodne konvencije. Prav tako skrbimo za ustrezno posodabljanje nacionalne zakonodaje in strokovnih protokolov. Ob uvajanju sprememb vključujemo predloge in odločitve zdravstvene stroke, kritične družbene premisleke ter načela medicinske etike in deontologije.

Ključne smernice delovanja zavoda so: samozadostnost – enakost in varnost za bolnike – optimalna učinkovitost – kakovost – sledljivost – profesionalnost – nekomercialnost – transparentnost – prostovoljno darovanje – preprečevanje zlorab.

Zavod deluje pod okriljem Ministrstva RS za zdravje. V letu 2021 je bilo v organizaciji devet redno zaposlenih, v donorskem programu pa je sodelovalo 96 pogodbenih sodelavcev. Decembra 2021 se je iztekel mandat vodenja prim. Danici Avsec, dr. med., dolgoletni direktorici in gonilni sili razvoja zavoda. Z ekipo je dosegla, da imamo v Sloveniji urejen donorski sistem, ki velja za primer dobre prakse v mednarodnem okolju, v številu umrlih darovalcev pa se uvrščamo med najuspešnejše države na svetu. Od 1. januarja 2022 je funkcijo direktorja prevzel Andrej Gadžijev, dr. med., specialist travmatolog, dolgoletni sodelavec Slovenija-transplanta in eden redkih strokovnjakov s področja donorske medicine pri nas. Prim. Avsec ostaja zaposlena v Slovenija-transplantu kot pooblaščena zdravnica in namestnica direktorja.

Presežki in zaznamki leta 2021

- Število potencialnih umrlih darovalcev in transplantacij organov je bilo v primerjavi z letom 2020 nižje. Glede na ekstremne delovne razmere in preobremenjenost osebja v enotah intenzivne medicine v obdobju korone, je rezultat dober. Število dejanskih umrlih darovalcev (39) je enako kot v letu 2020.

- Opravili smo 55 pogovorov s svojci umrlih glede darovanja organov. Zaupanje v sistem darovanja organov se ni zamajalo, 84 % svojcev je podalo soglasje za odvzem, kar je v zdravstveni in družbeni krizi izjemen rezultat.

- Slovenija se po številu presaditev src na milijon prebivalcev že vrsto let uvršča v sam svetovni vrh. Zadnji dve leti smo v svetovnem vrhu tudi v programu presaditev pljuč. Transplantacije izvajajo v Centru za transplantacijsko dejavnost v UKC Ljubljana.

- Izboljšali smo sistem darovanja tkiv v prostorih za umrle in s tem bistveno zmanjšali čakalni seznam za presaditve roženic, omogočili smo presaditve kože.

- V nacionalni register opredeljenih oseb glede posmrtnega darovanja se je vpisalo 225 več ljudi kot v letu 2020. Kar 80 % prebivalcev je izbralo elektronsko možnost za opredelitev.

- Odzivno in neposredno smo komunicirali z javnostmi, objavili več kot 40 poglobljenih časopisnih intervjujev in se več kot 260-krat pojavili v medijih.

- Na javnem natečaju **Najboljše prakse v zdravstvu v letu 2021** smo se uvrstili med 3 finaliste (najboljši s področja terciarne dejavnosti).

- Poleg Facebooka in Twitterja smo odprli komunikacijo na kanalu YouTube (@SloTransplant). Na platformi Facebook smo z organskim razširjanjem objav dosegli prek 120.000 uporabnikov.

- Razvili smo nacionalni transplantacijski informacijski sistem za zagotavljanje sledljivosti darovanih tkiv in celic.

- Kot partner v konzorciju pod okriljem ESOT smo uspeli na razpisu EU4Health in pridobili sredstva za 2,5 letni projekt BRAVEST (Building Resilience Against crisis: a systematic and global approach to adVancE organ Safety and supply in Transplantation).

- Z namenom spodbujanja raziskovanja in razvoja smo izpeljali I. javni nagradni natečaj Slovenija-transplanta za najboljše raziskovalno delo s področja donorske medicine oz. dejavnosti.

Zamenjava vodstva in primopredaja

Decembra 2021 se iztekel mandat vodenja prim. Danici Avsec, dr. med., dolgoletni direktorici in gonilni sili razvoja zavoda. Funkcijo direktorice je predala z naslednjimi besedami *»Ves čas smo z ustreznim razvojem skrbeli, da imamo v Sloveniji izjemno kakovosten, učinkovit in etično naravnan sistem darovanja organov in tkiv. Z aktivnostmi v evropskih projektih in v mednarodnih telesih je Slovenija-transplant prepoznan tudi širše, v mednarodni strokovni javnosti. Še posebej sem ponosna na dobro sodelovanje z vsemi mediji in drugimi strokami, ki sooblikujejo mnenje širše javnosti. Dosegli smo, da nam ljudje zaupajo, da večina svojcev poda soglasje za darovanje. V 22 letih smo veliko dela, truda in znanja vložili na vse ravni, ki so v pristojnosti zavoda, od razvoja zakonodaje, strokovnih protokolov, izobraževanja o donorski dejavnosti, komuniciranja do zagotavljanja etičnosti, varnosti in kakovosti«*. Prim. Avsec dodaja, da trenutni turbulentni časi zahtevajo veliko: *»Razvoj dejavnosti gre naprej, družba in medicina se spreminjata. Na voljo je boljša diagnostika, v tujini je že uveljavljeno darovanje po zastoju srca. Za napredek in uspešnost donorskega sistema je treba usklajevati številne vidike in organizacije. Veseli me, da bo moj naslednik z znanjem, izkušnjami in odgovornostjo, ki jo je že prikazal, nadaljeval z razvojno usmeritvijo zavoda in nadgradil sistem darovanja pri nas.«*

Prim. Danica Avsec je od začetka leta 2022 zaposlena kot namestnica direktorja Slovenija-transplanta in ostaja članica številnih strokovnih teles. Na direktorskem mestu jo je nadomestil Andrej Gadžijev, dr.med.

ZAMENJAVA VODSTVA IN PRIMOPREDAJA

FOTO: Slovenija-transplant

Ključne številke leta 2021

UMRLI DAROVALCI **41**

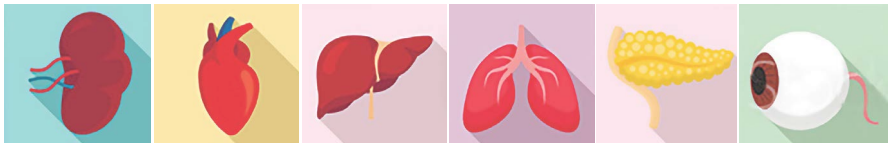
V LETU 2021 PO STAROSTNIH SKUPINAH

0<18 LET	18-59 LET	+60 LET
1	21	19

Povprečna starost je bila 54 let.

DAROVALCI SO PODARILI 125 ORGANOV

2021

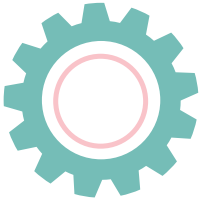


LEDVICE	SRCE	JETRA	PLJUČA	T. SLINAVKA	ROŽENICE
60	13	32	18	2	98

NACIONALNI REGISTER OPREDELJENIH OSEB GLEDE POSMRTNEGA DAROVANJA ORGANOV IN TKIV

Slovenija se uvršča med najuspešnejše države glede stopnje soglasja za darovanje.

977
(10 proti)
2021



Skupaj opredeljenih 11.584 ljudi
od tega 11.554 ZA in 30 PROTI.

V CENTRU ZA TRANSPLANTACIJSKO DEJAVNOST V UKC LJUBLJANA SO PRESADILI 105 ORGANOV

177 pacientov je bilo na čakalnem seznamu za presaditev
(stanje na dan 31.12.2021)

2021

PRIVOLITEV SVOJCEV ZA DAROVANJE ORGANOV IN TKIV

STOPNJA PRIVOLITVE: **84 %**

Transplantacijski koordinatorji so izvedli 55 POJASNILNIH POGOVOROV s svojci umrlih.

POVPREČNE ČAKALNE DOBE (v dnevih)

Čvrsti organi

NACIONALNI ČAKALNI SEZNAM ZA PRESADITVE ORGANOV

Čakalni seznam je seznam bolnikov, ki čakajo na del človeškega telesa za presaditev z namenom zdravljenja. Indikacije za presaditev so za vsak organ/tkivo/celico specifične. Vsi bolniki v Republiki Sloveniji imajo enake možnosti za uvrstitev na čakalni seznam prejemnikov in zagotovljen enak dostop do presaditve delov človeškega telesa. Konec leta 2021 je na presaditev organa čakalo 177 bolnikov. Skupno število čakajočih se je v primerjavi s preteklim letom ponovno nekoliko zmanjšalo, predvsem zaradi epidemiološke situacije s covid-19, ko so zdravniki obravnavali manj potencialnih kandidatov za uvrstitev na čakalni seznam. Povprečna čakalna doba je za vse organe v primerjavi z ostalimi državami relativno kratka. Slovenski bolniki čakajo na presaditev srca, jeter ali ledvice v povprečju manj kot leto dni. Za točnejše podatke o povprečnih čakalnih dobah za posamezen organ glej poglavje *Rezultati pri bolnikih, zdravljenih s presaditvijo*.

V letu 2021 je bilo v Sloveniji na čakalni seznam na novo uvrščenih 109 bolnikov, od tega 41 za ledvico (od tega eden v kombinaciji z jetri in eden v kombinaciji s srcem), 29 za srce (od tega 1 v kombinaciji z ledvico), 15 za pljuča in 23 za jetra (od tega eden v kombinaciji z ledvico).

Stanje na nacionalnem čakalnem seznamu na dan 31. 12. 2021 (vsi čakajoči)

Ledvica	Srce	Pljuča	Jetra*	Trebušna slinavka**
97	57	3	21	4
SKUPAJ				177 bolnikov

*Od tega 2 skupaj z ledvico **Od tega 3 skupaj z ledvico

Vir: http://statistics.eurotransplant.org/

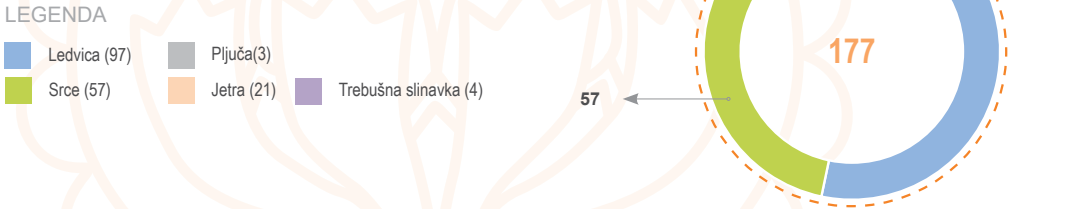
Nacionalni čakalni seznam v obdobju 2011–2021 (stanje na dan 31. 12. 2021, vsi čakajoči)

Leto	Ledvica	Srce	Pljuča*	Jetra	Trebušna slinavka	SKUPAJ
2011	120	46		17		**183**
2012	113	38		18	2	**169**
2013	114	39		19	1	**171**
2014	136	31		21	11	**188**
2015	110	52		29	11	**190**
2016	95	58		28	7	**181**
2017	112	56		35	8	**203**
2018	135	65		35	6	**234**
2019	138	55		35	5	**227**
2020	115	53	5	32	4	**204**
2021	97	57	3	21	4	**177**

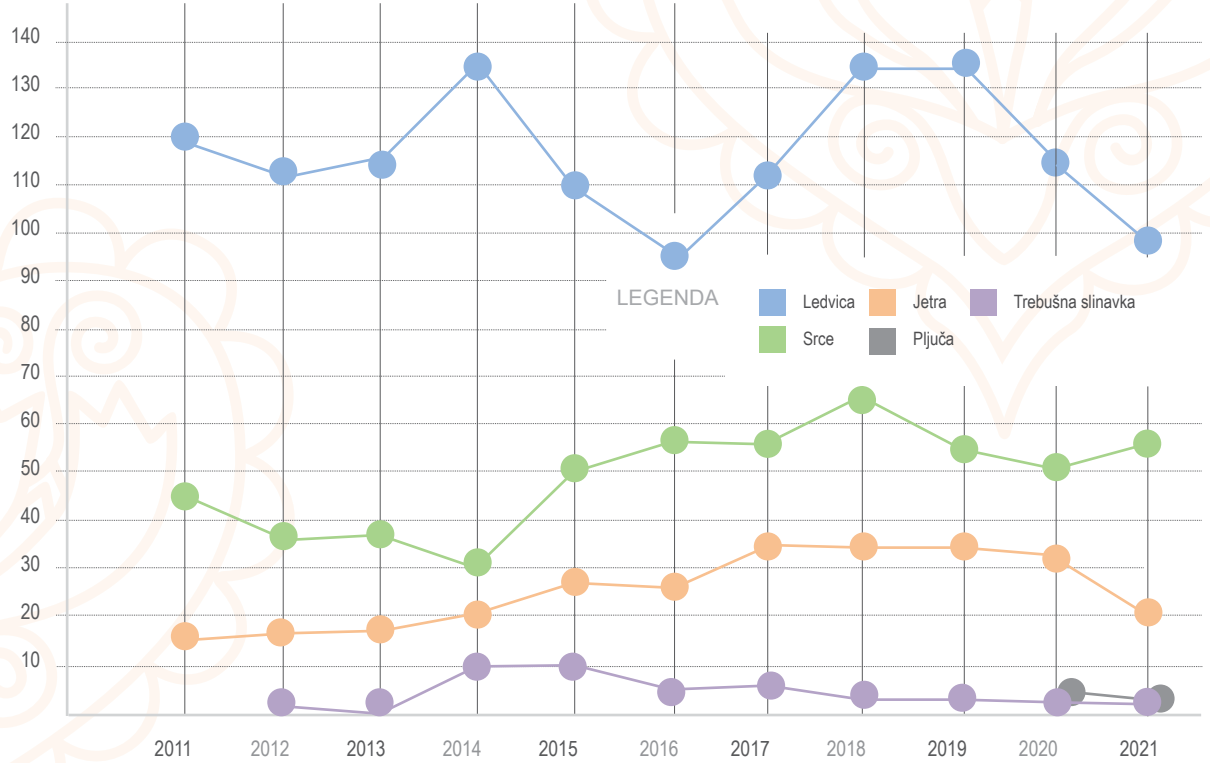
Vir: http://statistics.eurotransplant.org/

*Do septembra leta 2020 so bili slovenski pacienti, ki so čakali na presaditev pljuč, uvrščeni na avstrijski čakalni seznami.

Delež bolnikov na nacionalnem čakalnem seznamu po posameznem organu v letu 2021



Gibanje števila bolnikov na čakalni listi po organih in skupaj 2011–2021



Število bolnikov, umrlih med čakanjem na presaditev organa 2011-2021

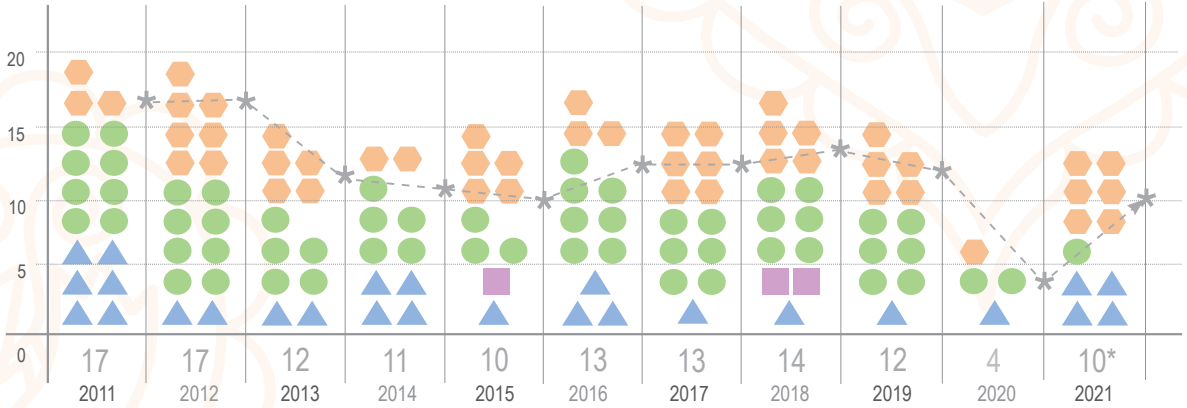
Podatki v spodnji tabeli prikazujejo število bolnikov, ki so bili uvrščeni na čakalni seznam za presaditev organa in so med čakanjem umrli. Vzrok smrti ni bil vedno povezan z odpovedjo organa, na katerega presaditev so čakali.

Leto	Ledvica	Ledvica skupaj s trebušno slinavko	Srce	Pljuča	Jetra	SKUPAJ
2011	6		8		3	**17**
2012	2		8		7	**17**
2013	2		5		5	**12**
2014	4		5		2	**11**
2015	1	1	3		5	**10**
2016	3		7		3	**13**
2017	1		6		6	**13**
2018	1	2	6		5	**14**
2019	1		6		5	**12**
2020	1		2		1	**4**
2021	4		1		6	**10***

*En umrli bolnik je čakal na kombinirano presaditev ledvice in jeter

Vir: http://statistics.eurotransplant.org/

**Gibanje števila bolnikov,
umrlih med čakanjem na presaditev organa 2011-2021**



*En umrli bolnik je čakal na kombinirano presaditev ledvice in jeter

Vir: http://statistics.eurotransplant.org/

LEGENDA

Ledvica
Jetra
Ledvica in trebušna slinavka
Srce
Gibanje števila bolnikov

ŠTEVILO UMRLIH DAROVALCEV

V letu 2021 smo v slovenskih donorskih bolnišnicah pridobili 41 aktivnih umrlih darovalcev, ki so bili medicinsko ustrezni in za katere smo pridobili privolitev svojcev. Uvodoma so prikazani podatki o številu aktivnih umrlih darovalcev v Sloveniji v primerjavi z državami sveta, za katere so bili v času priprave te publikacije že na voljo podatki za leto 2021. V nadaljevanju so prikazani podatki o številu dejanskih umrlih darovalcev, kar pomeni, da je bil od vsakega darovalca presajen vsaj en organ. V primerjavi z ostalimi državami članicami Eurotransplanta se Slovenija po številu dejanskih umrlih darovalcev na milijon prebivalcev v letu 2021 kot že nekaj let zapored uvršča na četrto mesto z rezultatom, ki je pomembno višji od povprečja v Eurotransplantu.

Število aktivnih umrlih darovalcev (MD) na milijon prebivalcev (NMP) v Sloveniji v letu 2021 v primerjavi z ostalimi državami sveta

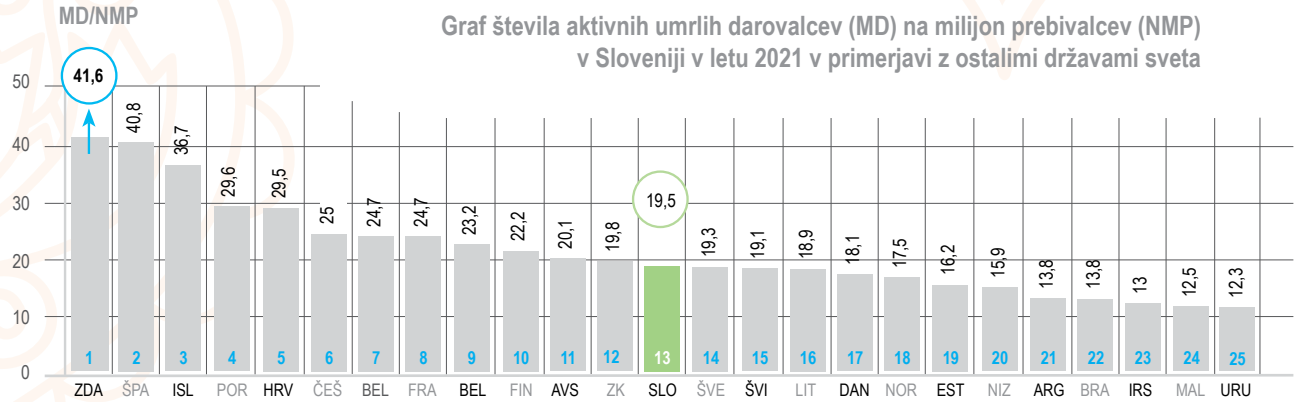
Država	Število MD/NMP 2021
1. ZDA	41,6
2. Španija	40,8
3. Islandija	36,7
4. Portugalska	29,6
5. Hrvaška	29,5
6. Češka Republika	25
7. Belgija	24,7
8. Francija	24,7
9. Belorusija	23,2

Država	Število MD/NMP 2021
10. Finska	22,2
11. Avstrija	20,1
12. Združeno kraljestvo	19,8
13. Slovenija	19,5
14. Švedska	19,3
15. Švica	19,1
16. Litva	18,9
17. Danska	18,1
18. Norveška	17,5

Država	Število MD/NMP 2021
19. Estonija	16,2
20. Nizozemska	15,9
21. Argentina	13,8
22. Brazilija	13,8
23. Irska	13
24. Malta	12,5
25. Urugvaj	12,3
26. Nemčija	11,1
27. Slovaška	10,9

Država	Število MD/NMP 2021
28. Madžarska	10,6
29. Izrael	10,5
30. Poljska	10,5
31. Latvija	8,9
32. Čile	7,7
33. Kuvajt	5,8
34. Grčija	5
35. Ciper	4,2
36. Združeni Arabski Emirati	3,9

Graf števila aktivnih umrlih darovalcev (MD) na milijon prebivalcev (NMP) v Sloveniji v letu 2021 v primerjavi z ostalimi državami sveta

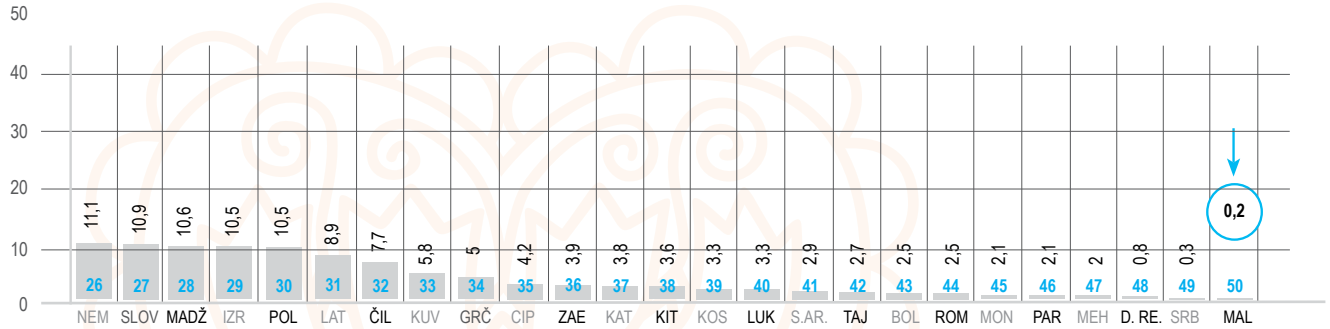


Država	Število MD/NMP 2021
37. Katar	3,8
38. Kitajska	3,6
39. Kostarika	3,3
40. Luksemburg	3,3
41. Saudijska Arabija	2,9
42. Tajska	2,7
43. Bolgarija	2,5
44. Romunija	2,5
45. Mongolija	2,1

Država	Število MD/NMP 2021
46. Paragvaj	2,1
47. Mehika	2
48. Dominikanska Republika	0,8
49. Srbija	0,3
50. Malezija	0,2

Vir: Newsletter Transplant, International Figures on Donation and Transplantation 2021. Preliminary report, april 2022.

MD/NMP



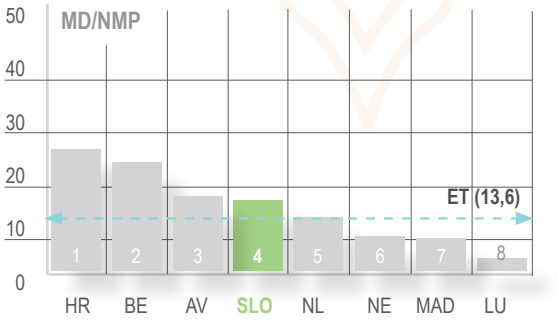
Absolutno število dejanskih umrlih darovalcev (MD) in število MD na milijon prebivalcev (NMP) v Sloveniji v letu 2021 in v primerjavi z Eurotransplantom.

Država	Slovenija (SLO)	Eurotransplant (ET)
Število MD	39	1.897
MD/NMP	18,5	13,6

Vir: http://statistics.eurotransplant.org/

Število dejanskih umrlih darovalcev na milijon prebivalcev (MD/NMP) ter primerjava z državami članicami Eurotransplanta v letu 2021

Država ET	Število MD/NMP 2021
1. Hrvaška (HR)	27,7
2. Belgija (BE)	24,2
3. Avstrija (AV)	18,8
4. Slovenija (SLO)	18,5
5. Nizozemska (NL)	15,5
6. Nemčija (NE)	10,8
7. Madžarska (MAD)	10,4
8. Luksemburg (LU)	3,2



Vir: http://statistics.eurotransplant.org/

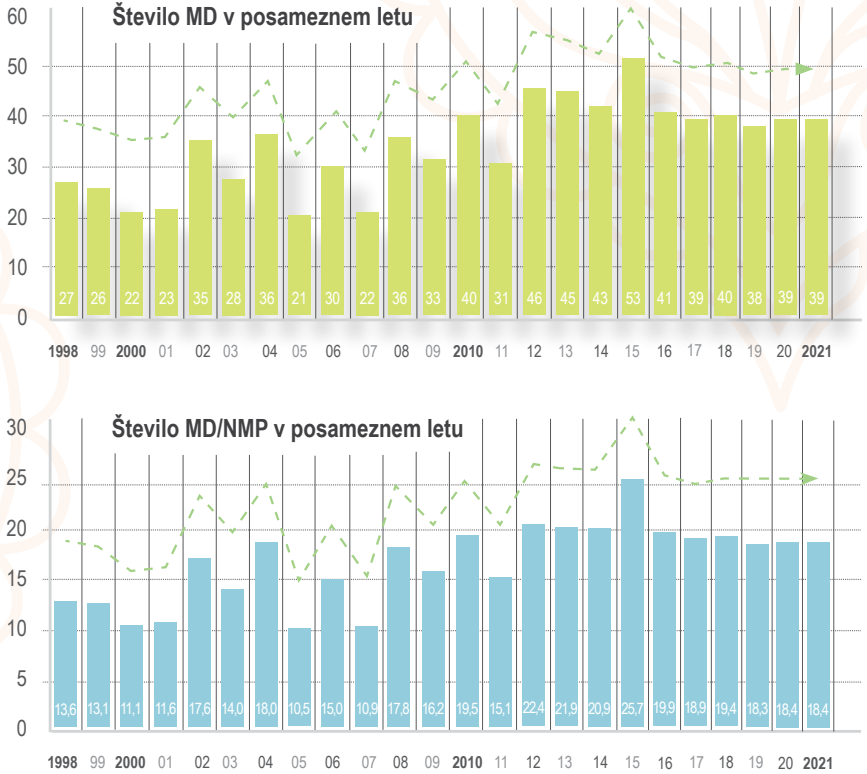
Število dejanskih umrlih darovalcev (MD) ter število umrlih darovalcev na milijon prebivalcev (MD/NMP) Sloveniji v letih od 1998 do 2021

Leto	Število MD	Število MD/NMP
1998	27	13,6
1999	26	13,1
2000	22	11,1
2001	23	11,6
2002	35	17,6
2003	28	14
2004	36	18
2005	21	10,5
2006	30	15
2007	22	10,9
2008	36	17,8
2009	33	16,2
2010	40	19,5

Leto	Število MD	Število MD/NMP
2011	31	15,1
2012	46	22,4
2013	45	21,9
2014	43	20,9
2015	53	25,7
2016	41	19,9
2017	39	18,9
2018	40	19,4
2019	38	18,3
2020	39	18,5
2021	39	18,5
SKUPAJ	**833**	**17,0**

Vir: http://statistics.eurotransplant.org/

Število dejanskih umrlih darovalcev (MD) in število dejanskih umrlih darovalcev na milijon prebivalcev (MD/NMP) v Sloveniji v letih od 1998 do 2021



Klasifikacija umrlih darovalcev organov

<table>
<tr><th colspan="3"><u>MOREBITEN</u> UMRLI DAROVALEC ORGANOV
Bolnik s hudo poškodbo možganov ALI bolnik z zaustavitvijo krvnega obtoka IN očitno medicinsko primeren za darovanje organov</th></tr>
<tr><th>Darovanje po smrti zaradi zaustavitve krvnega obtoka (DSK)</th><th>Lečeči zdravnik prepozna/opozori na možnega darovalca</th><th>Darovanje po možganski smrti (DMS)</th></tr>
<tr><td>MOŽEN DAROVALEC (DSK)

a. Oseba, pri kateri se je zaustavilo delovanje krvnega obtoka in dihanje, postopki oživljanja se ne uporabijo oz. se ne nadaljujejo. ALI
b. Oseba, pri kateri je mogoče predvideti, da se bo v določenem časovnem okviru zaustavilo delovanje krvnega obtoka in dihanje, kar bo omogočilo pridobitev organov.</td><td rowspan="4">Razlogi, zakaj možen darovalec ne postane dejanski darovalec

SISTEM DELA
- Zdravstveno osebje ni prepoznalo /opozorilo na možnega mrtvega darovalca ali primernega darovalca,
- Možganska smrt ni potrjena (npr. ne izpolnjuje meril) oz. postopek ugotavljanja MS ni zaključen (npr. ker ni na voljo ustreznih diagnostičnih naprav oz. osebja, ki bi opravilo potrditveni test),
- Smrt zaradi zaustavitve krvnega obtoka ni pravočasno potrjena,
- Logistične težave (npr. ekipa za odvzem organov ni na voljo),
- Ni ustreznega prejemnika (npr. pri otroku, krvna skupina, pozitivna serologija).

DAROVALEC/ORGAN
- Medicinsko neustrezen (npr. pozitivna serologija, tumor),
- Hemodinamska nestabilnost /nepredvidena zaustavitev srca,
- Anatomske, histološke in/ali funkcionalne nepravilnosti organov,
- Organi poškodovani med postopkom pridobivanja,
- Nezadostna perfuzija organov ali krvni strdek.

PRIVOLITEV
- Umrli je za časa življenja izrazil voljo, da ne želi biti darovalec,
- Zavrnitev svojcev umrlega,
- Zavrnitev mrliškega oglednika ali preiskovalnega sodnika zaradi forenzičnih razlogov.</td><td>MOŽEN DAROVALEC (DMS)

Oseba, katere klinično stanje kaže na verjetnost, da izpolnjuje merila za možgansko smrt.</td></tr>
<tr><td>PRIMEREN DAROVALEC (DSK)

Medicinsko ustrezna oseba, pri kateri je bila ugotovljena smrt na podlagi nepovratne prekinitve delovanja krvnega obtoka in dihanja, glede na relevantno zakonodajo, v časovnem okviru, ki omogoča pridobitev organov.</td><td>PRIMEREN DAROVALEC (DMS)

Medicinsko ustrezna oseba, pri kateri je bila ugotovljena smrt na podlagi nevroloških meril, glede na relevantno zakonodajo.</td></tr>
<tr><td>AKTIVEN DAROVALEC (DSK)

Primeren darovalec, za katerega imamo privolitev
a. Narejen je bil operacijski rez z namenom pridobitve organov za namen presaditve. ALI
b. Pridobljen je bil vsaj en organ za namen presaditve.</td><td>AKTIVEN DAROVALEC (DMS)

Primeren darovalec,
za katerega imamo privolitev
a. Narejen je bil operacijski rez z namenom pridobitve organov za namen presaditve. ALI
b. Pridobljen je bil vsaj en organ za namen presaditve.</td></tr>
<tr><td>DEJANSKI DAROVALEC (DSK)

Aktiven darovalec, od katerega je bil presajen vsaj en organ.</td><td>DEJANSKI DAROVALEC (DMS)

Aktiven darovalec, od katerega je bil presajen vsaj en organ.</td></tr>
<tr><td colspan="3">Upoštevati je potrebno »pravilo umrlega darovalca«. Bolnik lahko postane darovalec šele po smrti, pridobitev organov ne sme povzročiti smrti darovalca.</td></tr>
</table>

Povzeto po Madridski resoluciji o darovanju organov in transplantaciji

REGISTER OPREDELJENIH OSEB GLEDE DAROVANJA ORGANOV IN TKIV PO SMRTI

Vsak slovenski državljan ima v času življenja pravico in možnost, da se opredeli glede darovanja organov in tkiv. Od junija 2017 je poleg opredelitve za darovanje mogoča tudi opredelitev proti darovanju. Odločitev formalno potrdimo z vpisom v nacionalni register opredeljenih oseb, ki je bil vzpostavljen leta 2004. Izjavo o opredelitvi glede darovanja lahko podpišemo osebno na številnih pooblaščenih mestih v več krajih po Sloveniji (natančen seznam je objavljen na *www.slovenija-transplant.si*) ali elektronsko z digitalnim podpisom preko portala eUprava (*https://e-uprava.gov.si/*).

V letu 2021 se je v nacionalni register opredeljenih oseb glede posmrtnega darovanja zaradi epidemije covid-19 vpisalo nekaj manj oseb, kot v letih pred epidemijo, vseeno pa 225 več, kot v letu 2020. Zbrali smo 977 opredelitev (967 za, 10 proti). V nacionalnem registru opredeljenih oseb glede darovanja organov po smrti je bilo 31. 12. 2021 skupaj vpisanih 11.584 oseb (od tega 11.554 za in 30 proti). Elektronski način vpisa je od vzpostavitve v novembru 2018 uporabilo 2571 oseb. Letno se je na ta način opredelilo v povprečju 40 % opredeljenih, v letu 2021 pa je elektronsko možnost uporabilo 80 % opredeljenih.

Število vpisanih v registru opredeljenih oseb glede darovanja organov in tkiv po letih v obdobju od 2004 do 2021

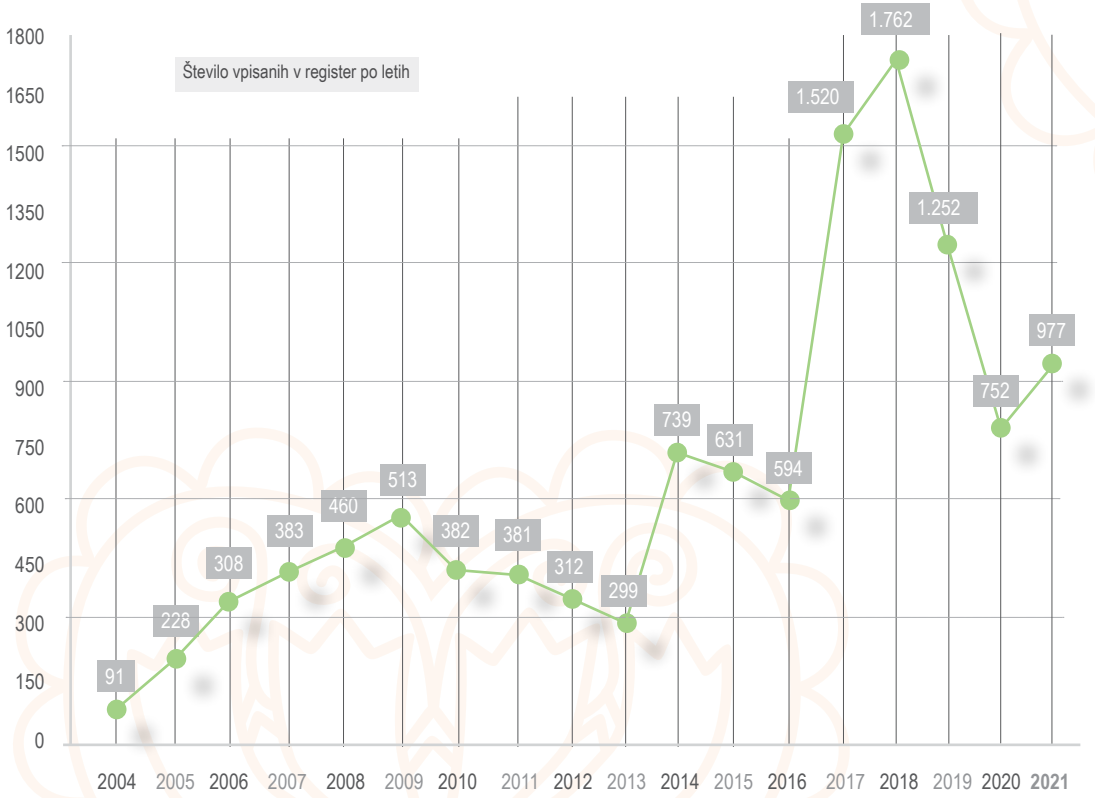
Vir: arhiv Slovenija-transplanta

Leto	Št. vpisanih
2004	91
2005	228
2006	308
2007	383
2008	460
2009	513
2010	382

Leto	Št. vpisanih
2011	381
2012	312
2013	299
2014	739
2015	631
2016	594
2017	1.520

Leto	Št. vpisanih
2018	1.762
2019	1.252
2020	752
2021	977
SKUPAJ	11.584

Število vpisanih v registru opredeljenih oseb glede darovanja organov in tkiv po letih v obdobju 2004–2021



STOPNJA PRIVOLITEV SVOJCEV ZA DAROVANJE

Pogovor s svojci oz. bližnjimi osebami možnega mrtvega darovalca glede darovanja se opravi v vseh primerih, ko je možno izpeljati postopke za darovanje organov za presaditev in odvzem od umrle osebe. Transplantacijski koordinator po potrditvi smrti ter vpisu časa smrti preveri v registru, ali je bil umrli opredeljen kot darovalec po smrti. Kljub znani opredelitvi je potrebno opraviti pogovor o darovanju s svojci umrlega. V pogovoru se poskuša izvedeti, kakšno je bilo stališče umrlega glede posmrtnega darovanja. V primeru privolitve je v nadaljevanju pogovora potrebno pridobiti dodatne zdravstvene podatke, ki so pomembni za darovanje.

Če volja umrlega ni znana, glede darovanja odločajo svojci. Vsi postopki so izvedeni z visoko stopnjo sočutja, razumevanja izjemno težkih čustvenih okoliščin ter v skladu z zakonodajnimi določbami in medicinsko doktrino. V letu 2021 je soglasje za odvzem organov po smrti bližnjega podalo kar 84 % svojcev, kar kaže na visoko stopnjo zaupanja v sistem darovanja organov.

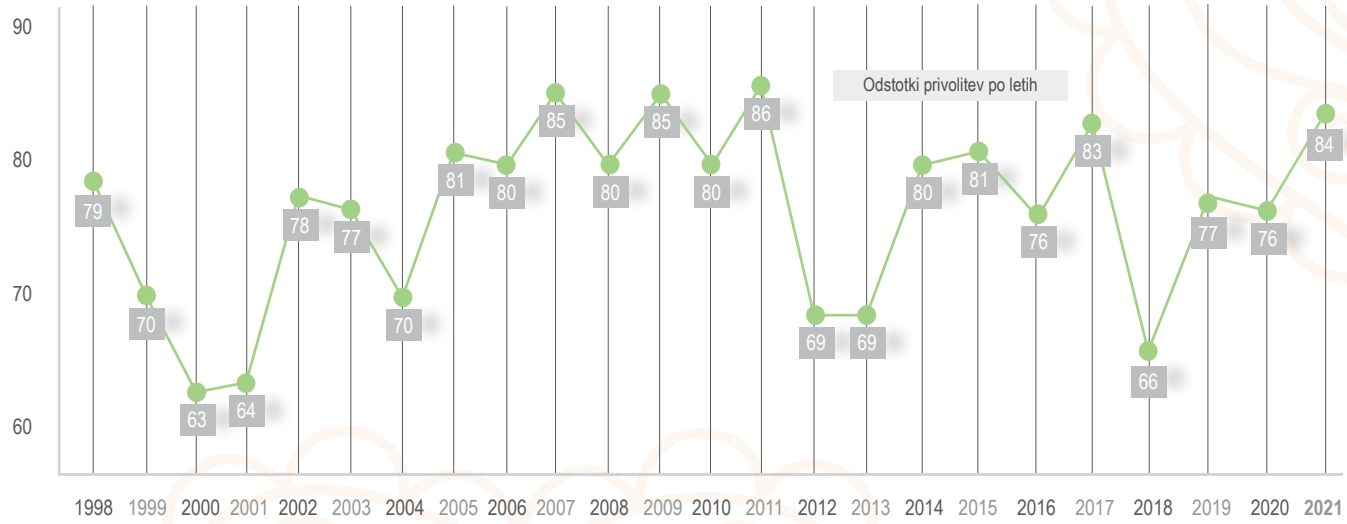
Slovenija-transplant svojcem umrlih darovalcev nudi možnost posvetovanja ob žalovanju s strokovno usposobljenimi in izkušenimi strokovnjaki.

Odstotki privolitev za darovanje v obdobju od 1998 do 2021

Vir: arhiv Slovenija-transplanta

Leto	%	Leto	%	Leto	%	Leto	%	Leto	%	Leto	%
1998	79	2002	78	2006	80	2010	80	2014	80	2018	66
1999	70	2003	77	2007	85	2011	86	2015	81	2019	77
2000	63	2004	70	2008	80	2012	69	2016	76	2020	76
2001	64	2005	81	2009	85	2013	69	2017	83	2021	84

Odstotki privolitev za darovanje v obdobju od 1998 do 2021



DELOVANJE DONORSKIH CENTROV

V slovenski donorski program je vključenih enajst donorskih bolnišnic oz. centrov: UKC Ljubljana in UKC Maribor ter splošne bolnišnice v Celju, Murski Soboti, Novi Gorici, Izoli, na Ptuju, v Novem mestu, Slovenj Gradcu, na Jesenicah in v Brežicah.

V donorskem centru izvajajo naslednje dejavnosti:

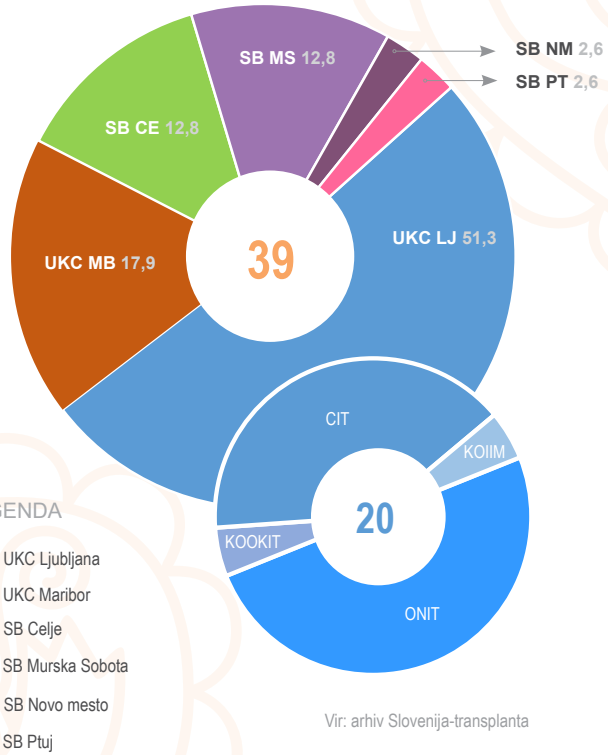
- odkrivajo možne mrtve darovalce,
- izvajajo diagnostiko možganske smrti,
- ugotavljajo primernost organov in tkiv za odvzem in presaditev,
- seznanjajo pokojnikove bližnje z možnostjo darovanja in pridobijo soglasje svojcev,
- ohranjajo delovanje organov mrtvih darovalcev – v intenzivni terapiji in med odvzemom organov,
- sodelujejo pri odvzemih organov in tkiv, ki jih izvajajo slovenske in tuje kirurške ekipe.

Največ darovalcev v Sloveniji pridobijo v UKC Ljubljana, kjer imajo največje število postelj v enotah intenzivne terapije in so v letu 2021 pridobili 20 dejanskih umrlih darovalcev. Donorski program učinkovito izvajajo tudi v UKC Maribor, kjer so pridobili 7 dejanskih umrlih darovalcev in v SB Celje in SB Murska Sobota s po 5 pridobljenimi dejanskimi umrlimi darovalci. Po enega darovalca so imeli v SB Novo mesto in v SB Ptuj.

Število in delež dejanskih umrlih darovalcev v posameznih donorskih centrih (DC) v letu 2021

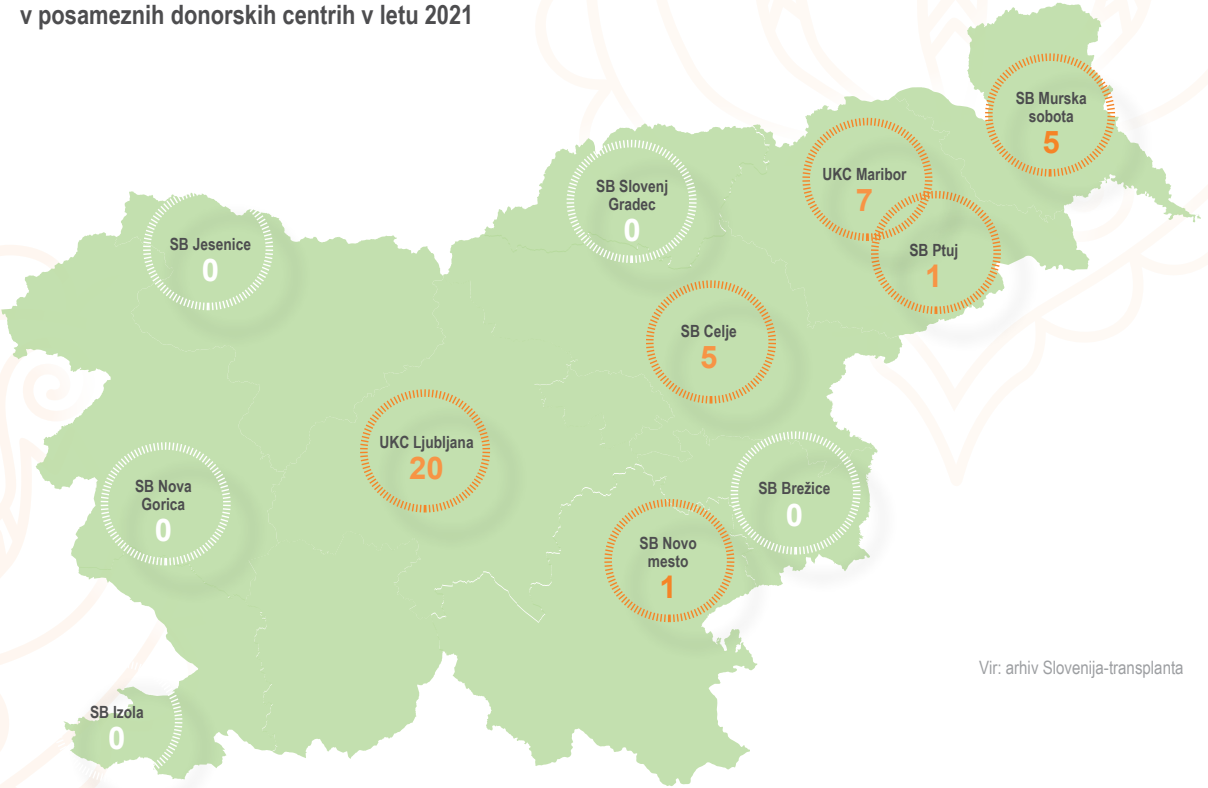
Donorski center	Število MD	Delež v %
UKC Ljubljana skupaj	20	51,3
Od tega ONIT*	10	
Od tega CIT**	8	
Od tega KOIIM***	1	
Od tega KOOKIT****	1	
UKC Maribor	7	17,9
SB Celje	5	12,8
SB Murska Sobota	5	12,8
SB Novo mesto	1	2,6
SB Ptuj	1	2,6
SKUPAJ	39	100

* ONIT – oddelek nevrološke intenzivne terapije,
** CIT – centralna intenzivna terapija,
*** KOIIM – klinični oddelek interne intenzivne medicine,
**** KOOKIT - klinični oddelek za otroško kirurgijo in intenzivno terapijo.



Vir: arhiv Slovenija-transplanta

Število dejanskih umrlih darovalcev v posameznih donorskih centrih v letu 2021



Vir: arhiv Slovenija-transplanta

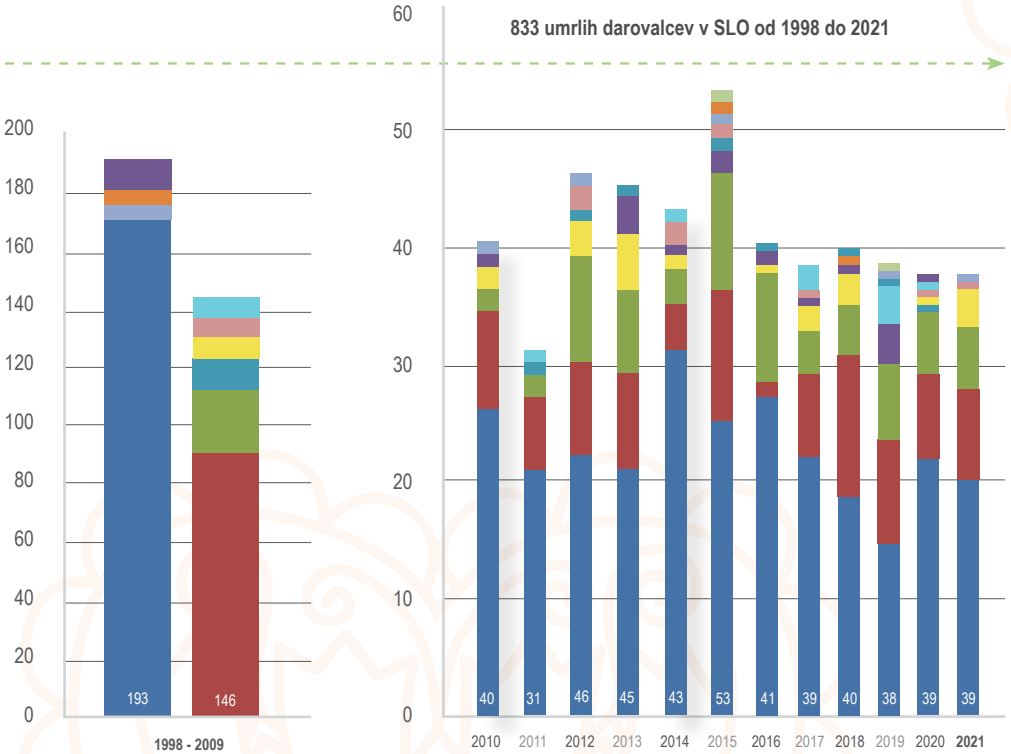
EKIPA SODELAVK IN SODELAVCEV
SLOVENIJA-TRANSPLANTA
Lovrenška jezera, 6. avgust 2021
FOTO: Slovenija-transplant

Število dejanskih umrlih darovalcev po donorskih centrih od 1998 do 2021

Vir: arhiv Slovenija-transplanta

Leto	UKC LJ	UKC MB	SB CE	SB MS	SB NG	SB Izola	SB Ptuj	SB JE	SB NM	SB SG	SB Brežice
1998-2009	176	95	22	7	10	9	7	6	3	4	
2010	26	8	2	2	1				1		
2011	21	6	2			1		1			
2012	22	8	9	3		1	2		1		
2013	21	8	7	5	3	1					
2014	31	4	3	1	1		2	1			
2015	25	11	10		2	1	1		1	1	1
2016	28	2	7	1	2	1					
2017	22	7	4	2	1		1	2			
2018	18	13	4	2	1	1				1	
2019	15	8	6		3	1		3	1		1
2020	22	7	5	1	1	1	1	1			
2021	20	7	5	5			1		1		
SKUPAJ	**447**	**184**	**86**	**29**	**25**	**17**	**15**	**14**	**8**	**6**	**2**

Število dejanskih umrlih darovalcev po donorskih centrih od 1998 do 2021



Potencial in realizacija v donorskih bolnišnicah za leto 2021

Potencial za darovanje za posamezno donorsko bolnišnico se izraža kot odstotek možgansko umrlih od vseh umrlih na oddelku za intenzivno zdravljenje (OIZ). Pove nam, pri koliko umrlih je bila do konca izpeljana diagnostika možganske smrti. Potencial je v neposredni povezavi z odkrivanjem primernih darovalcev na OIZ.

Realizacija v procesu darovanja nam pove, koliko primernih darovalcev (dokazana možganska smrt) je postalo aktivnih darovalcev. Izraža se kot odstotek aktivnih darovalcev od vseh dokazanih možgansko umrlih na OIZ.

Vir: arhiv Slovenija-transplanta

Donorska bolnišnica	Vse smrti v OIZ	MD	PD	*Potencial (%)	Dosegljivi (%)	AD	Realizacija (%)	**Dosegljiva (%)
UKC Ljubljana	423	43	32	7,6	13.7	21	66	65
UKC Maribor	221	17	9	4,1	13.7	7	78	65
SB Novo mesto	130	4	1	0,8	8.3	1	100	55
SB Celje	236	13	10	4,2	8,3	6	60	55
SB Nova Gorica	86	3	0	0	8.3	0	/	55
SB Ptuj	55	4	1	1,8	8.3	1	100	55
SB Murska Sobota	178	8	6	3,4	8.3	5	83	55
SB Izola	57	1	0	0	8.3	0	/	55
SB Slovenj gradec	81	5	1	1,2	8.3	0	/	55
SB Jesenice	37	0	0	0	8.3	0	/	55
SB Brežice	18	1	1	5,6	8.3	0	/	55

OIZ – oddelek za intenzivno zdravljenje, **MD** – možni darovalec, **PD** – primerni darovalec (dokazana možganska smrt), **AD** – aktivni darovalec (privolitev svojcev, odvzem organov), **Potencial** - % možgansko umrlih od vseh umrlih na OIZ = % PD/vse smrti na OIZ.
Realizacija - % aktivnih darovalcev od vsem možgansko umrlih = % AD/PD

*Potencial za donorsko bolnišnico je pričakovano višji za bolnišnice, ki imajo lastno nevrokirurško enoto in lahko dosežejo potencial tudi do 13,7 % (dosegljivi potencial). V letu 2021 je UKC Ljubljana precej zaostal za svojim potencialom, saj so bile številke skoraj 50 % nižje od dosegljivega potenciala. Velik odklon navzdol je posledica večjega števila pacientov, ki so umrli zaradi okužbe s Sars-CoV-2 ali z okužbo s Sars-CoV-2. Okužba s korona virusom je veljala kot absolutna medicinska kontraindikacija za darovanje, zato so bili umrli vnaprej izločeni kot možni darovalci. Nižji potencial je tudi posledica odhoda bolnišničnih koordinatorjev za transplantacije, ki sicer pravočasno prepoznavajo možne darovalce na svojih rednih deloviščih, na nova delovišča v posebnte kovidne enote intenzivne terapije. Tudi UKC Maribor je v letu 2021 močno zaostal za svojim potencialom. Vzroki so enaki kot pri UKC Ljubljana, poleg tega je bilo v bolnišnico sprejetih manj pacientov, pri katerih bi lahko nastopila klinična slika možganske smrti.

Za bolnišnice brez lastne nevrokirurške enote pa je dosegljivi potencial za darovanje do 8,3 %. Tej številki se je leta 2021 ponovno najbolj približala SB Celje, relativno blizu je bila še SB Murska Sobota. Po enega aktivnega darovalca sta imeli v letu 2021 SB Novo Mesto in SB Ptuj, v preostalih petih donorskih bolnišnicah pa ni bilo niti enega aktivnega darovalca, kar gre predvsem na račun izjemne preobremenjenosti, tako razpoložljivega kadra, kot prostora v donorskih bolnišnicah, s kovidnimi pacienti.

V letu 2021 je vseh 6 donorskih bolnišnic, v katerih so imeli vsaj enega aktivnega darovalca, preseglo dosegljivo realizacijo, kar gre na račun izjemno nizke stopnje odklonitve soglasja svojcev pri pogovoru o darovanju. Pri nizkih vrednostih potenciala zasledimo tudi odstopanja, kot npr. v SB Novo mesto in SB Ptuj, kjer so dosegli 100-odstotno realizacijo pri edinem primeru, pri čimer ni bilo medicinskih kontraindikacij za darovanje, prav tako pa so svojci v darovanje privolili. V takih primerih je večletna bilanca natančnejša in v skladu s pričakovanimi rezultati. Pri bolnišnicah, v katerih leta 2021 ni bilo dokazanih možganskih smrti in ni bilo aktivnih darovalcev, sta potencial in realizacija prav tako 0 % oziroma nemerljiva (/).

Seznam odgovornih oseb (t. i. bolnišničnih transplantacijskih koordinatorjev), ki skrbijo za razvoj, potek ter delovanje donorskega programa v posameznih donorskih centrih za leto 2021

Donorski center	Odgovorne osebe
UKC Ljubljana	prim. asist. mag. Rade Stanić, dr. med.
UKC Maribor	Tanja Kuprivec, dr. med.
SB Brežice	Nataša Pirc, dr. med.
SB Celje	Barbara Hudournik, dr. med.
SB Izola	Damjan Polh, dr. med.
SB Jesenice	Andraž Nastran, dr. med.
SB Murska Sobota	prim. Daniel Grabar, dr. med.
SB Nova gorica	Edyta Čerkini, dr. med.
SB Novo mesto	Matej Godnič, dr. med.
SB Ptuj	Mateja Prevolšek, dr. med.
SB Slovenj Gradec	Rok Popič, dr. med.

NA JAVNEM NATEČAJU NAJBOLJŠE PRAKSE V ZDRAVSTVU 2021
SMO PREJELI PRIZNANJE FINALISTI IZBORA 2021
(NAJBOLJŠI V KATEGORIJI TERCIARNA ZDRAVSTVENA DEJAVNOST)
Portorož, 18. junij 2021
FOTO: Slovenija-transplant

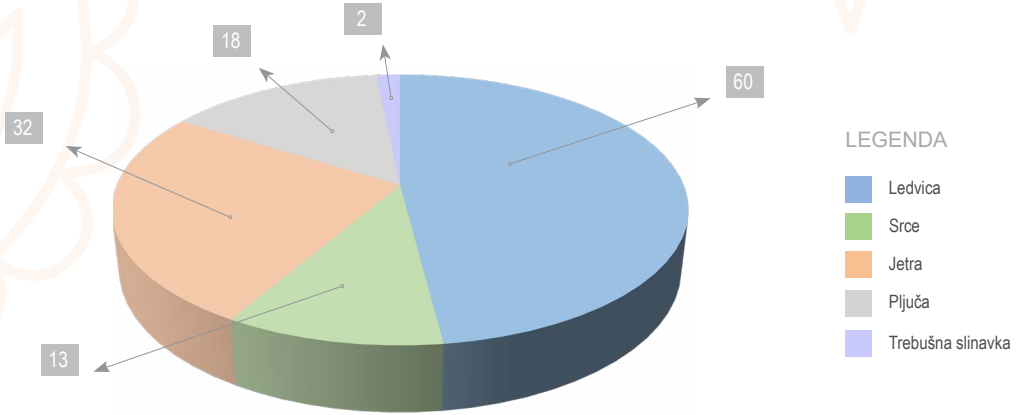
PRIDOBLJENI ČVRSTI ORGANI ZA NAMEN ZDRAVLJENJA

Število pridobljenih organov je odvisno od števila pridobljenih umrlih darovalcev, pa tudi od njihove starosti in medicinskih kontraindikacij. V letu 2021 je bilo število umrlih darovalcev nižje, posledično tudi število pridobljenih organov manjše, a je rezultat glede na krizne okoliščine na oddelkih za intenzivno zdravljenje dober. V nadaljevanju so prikazani podatki za leto 2021 in primerjava s preteklimi leti.

Število pridobljenih organov slovenskih umrlih darovalcev v letu 2021

Ledvica	Srce	Jetra	Pljuča (obe pljučni krili)	Trebušna slinavka	SKUPAJ
60	13	32	18	2	125

Vir: arhiv Slovenija-transplanta

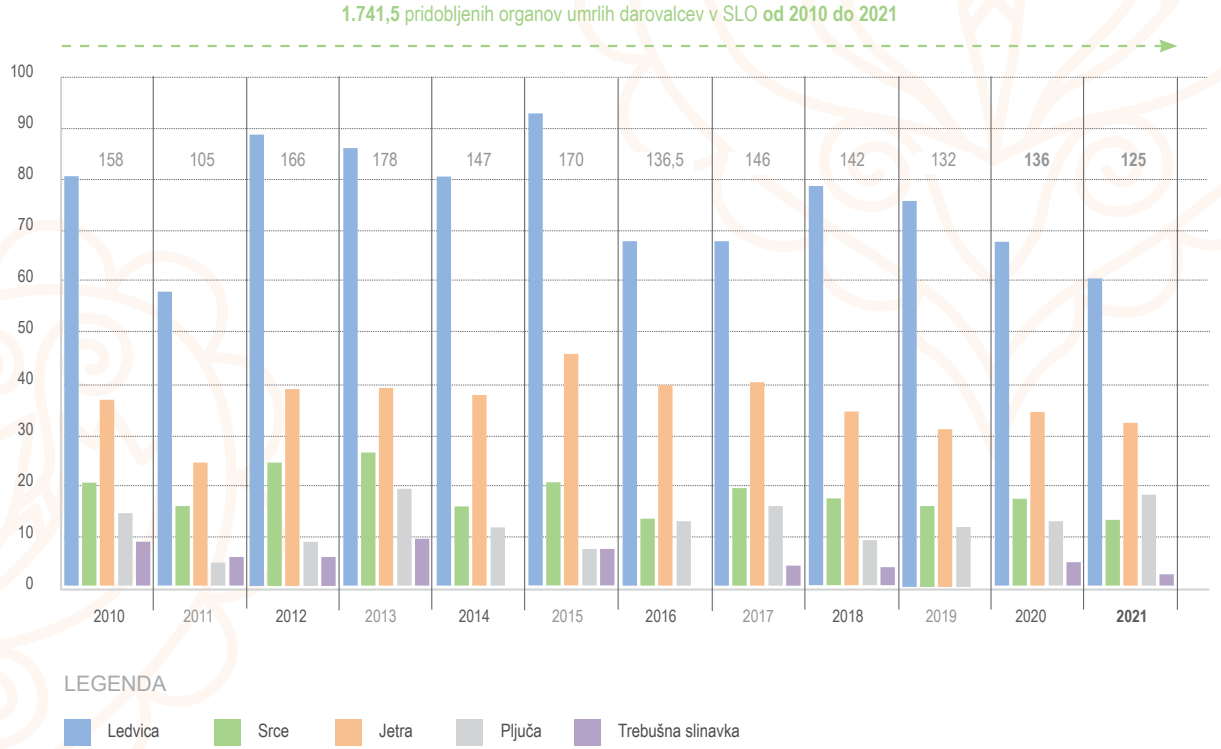


Pridobljeni organi slovenskih umrlih darovalcev od leta 2000 do 2021

Leto	Ledvica	Srce	Jetra	Pljuča (obe krili)	Trebušna slinavka	SKUPAJ
2000-2009	559	149	217	70,5	76	1.071,5
2010	80	20	37	13	8	158
2011	58	14	24	4	5	105
2012	89	25	39	8	5	166
2013	86	26	39	19	8	178
2014	80	16	38	11	2	147
2015	92	20	46	6	6	170
2016	68	13	39	13,5	2	135,5
2017	68	19	40	15	4	146
2018	79	17	34	9	3	142
2019	75	15	31	11	/	132
2020	68	17	34	13	4	136
2021	60	13	32	18	2	125
SKUPAJ	1.462	364	650	211	125	2.812

Vir: arhiv Slovenija-transplanta

Pridobljeni organi slovenskih umrlih darovalcev od 2010 do 2021



PRESAJENI ČVRSTI ORGANI

V Sloveniji imamo en transplantacijski center, to je Univerzitetni klinični center v Ljubljani, kjer se izvajajo programi za presaditve čvrstih organov. Sistem razporejanja organov zagotavlja enako dostopnost do terapije s presaditvijo organov vsem državljanom Slovenije.

Naloge transplantacijskega centra so:

- priprava prejemnikov za uvrstitev na čakalni seznam,
- presaditev organov,
- vodenje bolnikov po presaditvi.

Center za transplantacijsko dejavnost (CTD) UKC Ljubljana od leta 2014 vodi kardiovaskularni kirurg, dr. Ivan Kneževič, dr. med.

V letu 2021 je bilo opravljenih 105 presaditev organov, 104 so bili pridobljeni od umrlih darovalcev in en organ od živega darovalca. Največ je bilo presajenih ledvic. Po številu presajenih organov od umrlih darovalcev na milijon prebivalcev smo nekoliko nad povprečjem držav Eurotransplanta. Pomembno višje pa je število presaditev src na milijon prebivalcev, kjer smo zadnjih nekaj let v samem svetovnem vrhu. Slovenija se zadnji dve leti uvršča med najuspešnejše države sveta tudi v programu presaditve pljuč.

Pediatrične transplantacije delno opravljajo v UKC Ljubljana, za najmlajše otroke pa v bližnjih evropskih transplantacijskih centrih (ledvice v Gradcu, jetra v Bergamu). Za obravnavo in pripravo pred presaditvijo in zdravljenje ter sledenje bolnika po presaditvi organa poskrbijo na pristojnih oddelkih v UKC Ljubljana.

Presajeni čvrsti organi umrlih darovalcev v UKC Ljubljana v letu 2021 in primerjava z Eurotransplantom - absolutno število in število na milijon prebivalcev (NMP)

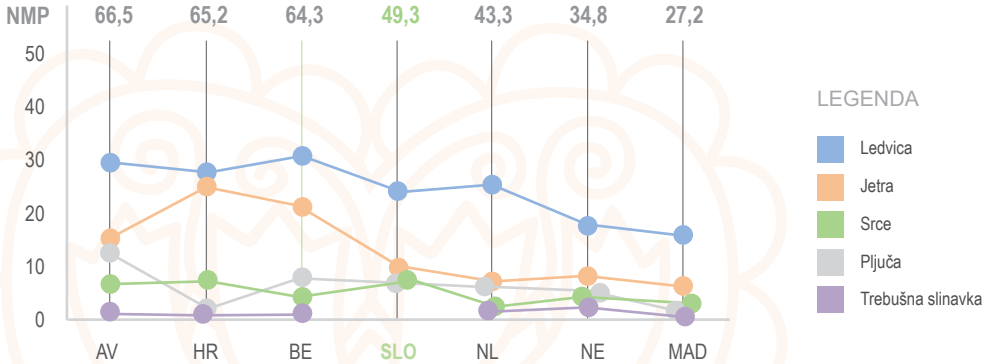
	Ledvica MD		Srce		Jetra		Pljuča		Trebušna slinavka		SKUPAJ	
	Št.	NMP	Št.	NMP	Št.	NMP	Št.	NMP	Št.	NMP	Št.	NMP
SLO	51	24,2	17	8,1	21	10	15	7,1	0	0	104	49,3
ET	2.957	21,3	571	4,2	1.514	11	1.231	4,6	111	0,9	6.398	40,8

Vir: arhiv Slovenija-transplanta in http://statistics.eurotransplant.org/

Število presajenih čvrstih organov umrlih darovalcev na milijon prebivalcev (NMP) v Sloveniji leta 2021 in primerjava z državami Eurotransplanta

Država ET	Ledvica	Jetra	Srce	Pljuča	Trebušna slinavka	Število presaditev/ NMP 2020
1. Avstrija (AV)	29,6	16,8	6,6	13,8	1,6	66,5
2. Hrvaška (HR)	29,5	25,8	8,4	2,2	1,5	65,2
3. Belgija (BE)	31,0	21,4	4,5	8,1	1,2	64,3
4. Slovenija (SLO)	24,2	10,0	8,1	7,1	/	49,3
5. Nizozemska (NL)	26,6	8,7	2,5	5,3	1,1	43,3
6. Nemčija (NE)	18,2	9,4	4,0	3,4	0,8	34,8
7. Madžarska (MAD)	16,4	6,1	3,5	1,4	0,4	27,2

Vir: arhiv Slovenija-transplanta in http://statistics.eurotransplant.org/



Število presajenih čvrstih organov umrlih darovalcev v Sloveniji oz. slovenskim prejemnikom od leta 1970 do 2021

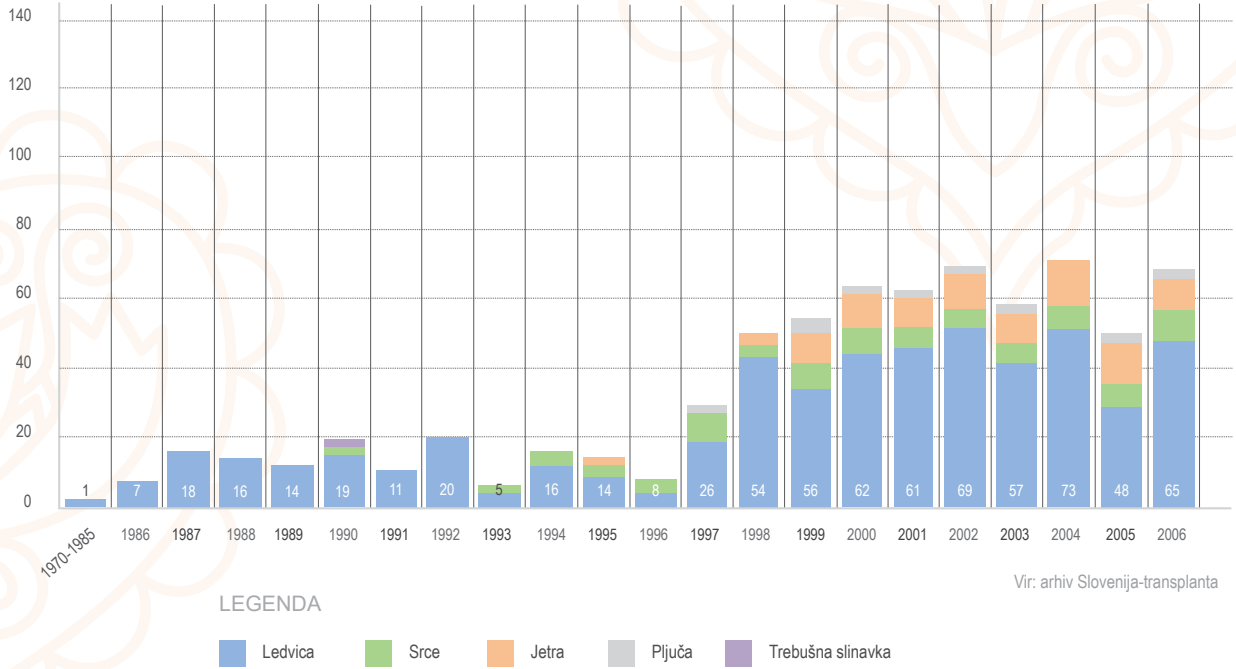
Leto	Ledvica	Srce	Jetra	Pljuča*	Trebušna slinavka	SKUPAJ
Od 1970 do 1985	1					1
1986	7					7
1987	18					18
1988	16					16
1989	14					14
1990	17	1			1	19
1991	11					11
1992	20					20
1993	4	1				5
1994	14	2				16
1995	10	3	1			14
1996	6	2				8
1997	19	6		1		26
1998	46	4	4			54
1999	37	7	9	3		56
2000	44	7	10	1		62
2001	47	4	9	1		61
2002	55	3	11			69
2003	43	3	9	2		57
2004	55	3	15			73

Vir: arhiv Slovenija-transplanta

Leto	Ledvica	Srce	Jetra	Pljuča*	Trebušna slinavka	SKUPAJ
2005	28	5	13	2		48
2006	48	8**	8	2		66
2007	30	11	10	1		52
2008	52	6	22	4		84
2009	43	18	18	2	2	83
2010	61	19	23	3	1	107
2011	46	14	20	7	1	88
2012	62	29***	27	2		120
2013	60	30	21	8	4	123
2014	55	33	31	3		122
2015	64	24	24	7	5	124
2016	44	31	27	10	5	117
2017	46	24	23	8		101
2018	54	23	27	7	3	114
2019	38	22	24	11	1	96
2020	46	24	25	16	2	113
2021	51	17	21	15		104
SKUPAJ	1.312	384	432	116	25	2.269

* Večina presaditev pljuč pri slovenskih prejemnikih je bila do vključno leta 2018 opravljena v AKH na Dunaju, z izjemo 2003 (1 presaditev v UKC LJ) in 2018 (2 presaditvi v UKC LJ). V letu 2019 je bilo v UKC Ljubljana opravljenih 10 presaditev pljuč in ena pediatrična presaditev v AKH Dunaj, v letu 2020 in 2021 so bile vse presaditve opravljene v UKC Ljubljana.
** Eno srce slovenskega darovalca je bilo presajeno slovenskemu bolniku v Gradcu.
*** Eno srce je bilo skupaj s pljuči presajeno slovenskemu bolniku na Dunaju.

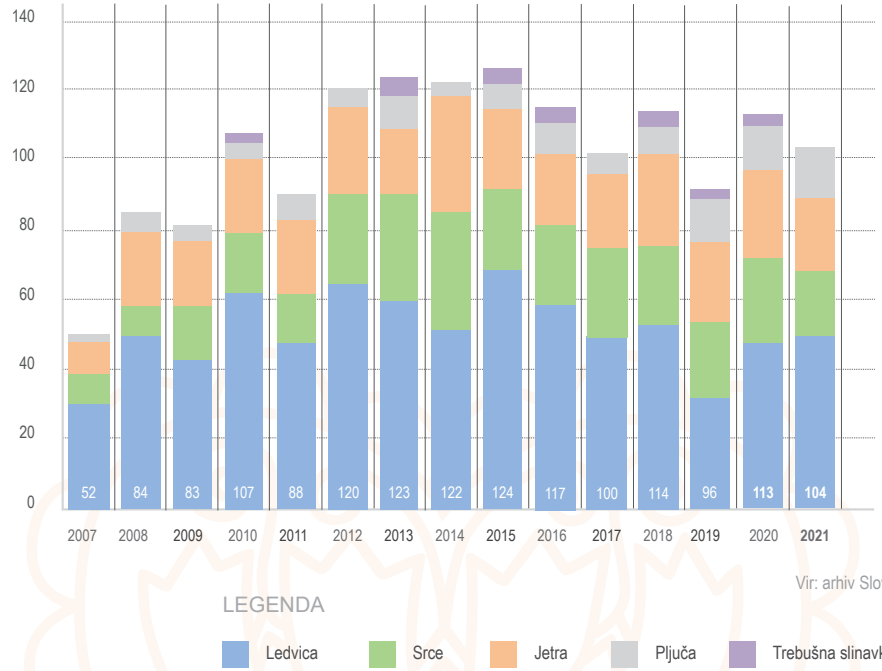
Število presajenih čvrstih organov umrlih darovalcev v Sloveniji oz. slovenskim prejemnikom od leta 1970 do 2006



Vir: arhiv Slovenija-transplanta

Število presajenih čvrstih organov umrlih darovalcev v Sloveniji oz. slovenskim prejemnikom od leta 2007 do 2021

2.269 presajenih čvrstih organov umrlih darovalcev v SLO **od 1970 do 2021**



Vir: arhiv Slovenija-transplanta

Število presajenih ledvic od živega darovalca

V Sloveniji je za časa življenja možno darovati le ledvico med sorodniki ali čustveno povezanimi osebami. Vsak primer presoja Etična komisija za presaditve, ob upoštevanju načela, da mora biti tveganje za zdravje darovalca sorazmerno v primerjavi s pričakovano koristjo za prejemnika. Ob začetku slovenskega transplantacijskega programa, od leta 1970 dalje, so sprva prevladovale presaditve ledvic od živih sorodnih darovalcev, od leta 1987 naprej pa je bila z razvojem nacionalnega donorskega programa večina organov za presaditev pridobljenih od umrlih darovalcev. Programa presaditev ledvice živega darovalca nekaj let niso izvajali, od leta 2016 dalje pa v UKC Ljubljana opravijo 1-2 presaditvi na leto. V letu 2021 je bila opravljena ena tovrstna presaditev.

Število presajenih ledvic od živega darovalca 1970 - 2021

Leto	Št.
1970-85	43
1986	23
1987	14
1988	13
1989	10
1990	2
1991	3

Leto	Št.
1992	5
1993	5
1994	0
1995	1
1996	2
1997	2
1998	1

Leto	Št.
1999	0
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0

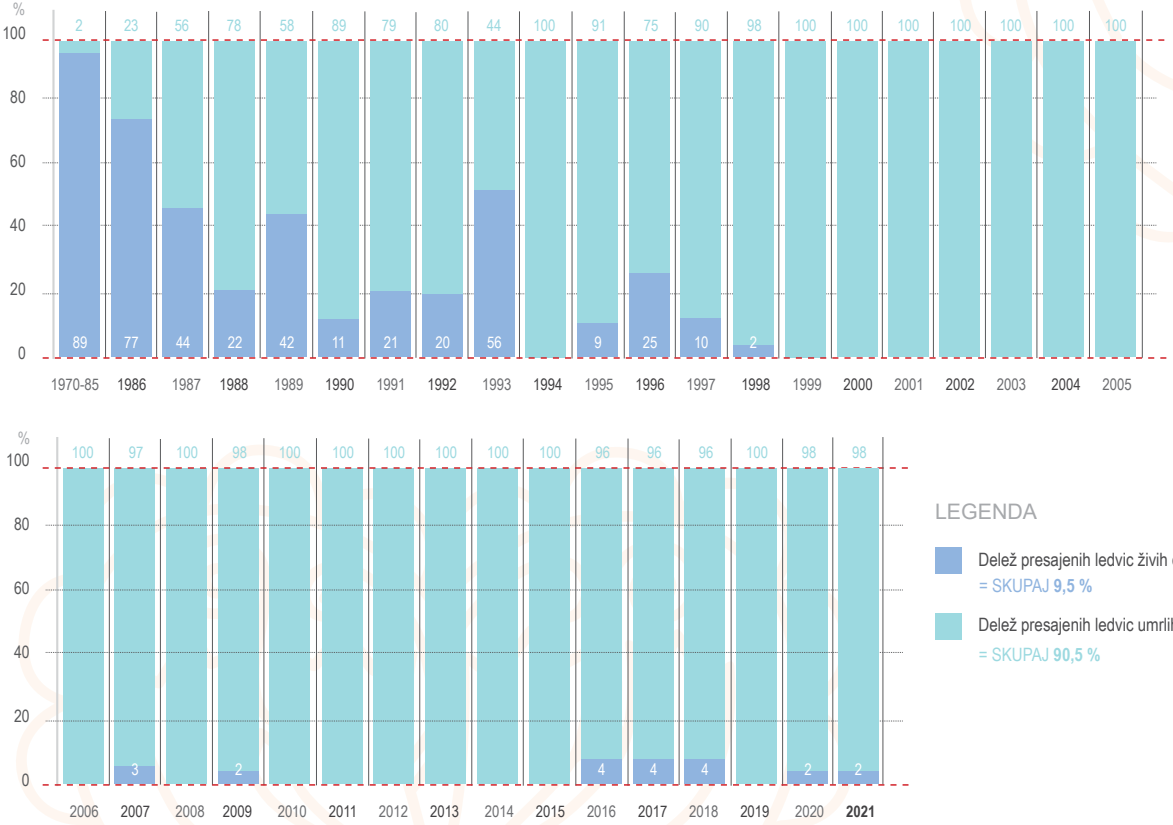
Leto	Št.
2006	0
2007	1
2008	0
2009	1
2010	0
2011	0
2012	0

Leto	Št.
2013	0
2014	0
2015	0
2016	2
2017	2
2018	2
2019	0

Leto	Št.
2020	1
2021	1

SKUPAJ	134

Deleži presajenih ledvic živih in umrlih darovalcev v % od 1970 do 2021



REZULTATI PRI BOLNIKIH, ZDRAVLJENIH S PRESADITVIJO

Program za presaditev srca

Od leta 1990 do konca 2021 je bilo v UKC Ljubljana opravljenih 384 presaditev srca, v letu 2021 smo presadili 17 src. V letu 2021 je bilo 16 bolnikov (94 %) transplantiranih urgentno, 1 bolnik (6 %) pa elektivno. UKC Ljubljana s svojim programom za presaditve srca sodi med največje centre za presaditev srca v območju Eurotransplanta in se po številu opravljenih presaditev lahko primerja z največjimi centri Nemčije, Belgije, Madžarske in Avstrije. Na področju Eurotransplanta je skupaj 42 centrov, ki opravljajo presaditve srca.

Večletno povprečje (2009-2021) čakalne dobe za elektivno presaditev srca znaša okoli 240 dni, za urgentno presaditev srca pa okoli 55 dni.

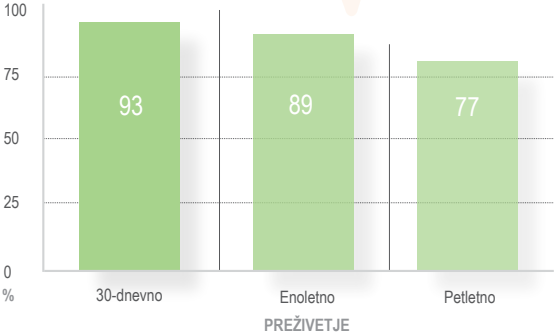
Najpogostejša vzroka za presaditev srca sta v letu 2021 bila ishemična bolezen srca (47 %) in dilatativna kardiomiopatija (35 %). Ostali vzroki pa so bili valvularna bolezen srca (6 %), hipertrofična kardiomiopatija (6 %) in kongenitalne hibe (6 %).

Rezultati preživetja bolnikov po presaditvi so primerljivi z rezultati iz mednarodnega referenčnega registra ISHLT (*The International Society for Heart & Lung Transplantation)*.

Preživetje odraslih bolnikov po presaditvi srca v % (za obdobje 1990–2021, n = 384)

30-dnevno preživetje	Enoletno preživetje	Petletno preživetje
93 %	89 %	77 %

Vir: Poročilo o delovanju programa za napredovalo srčno popuščanje in presaditev srca za leto 2021 (KO za kardiologijo, UKC Ljubljana)



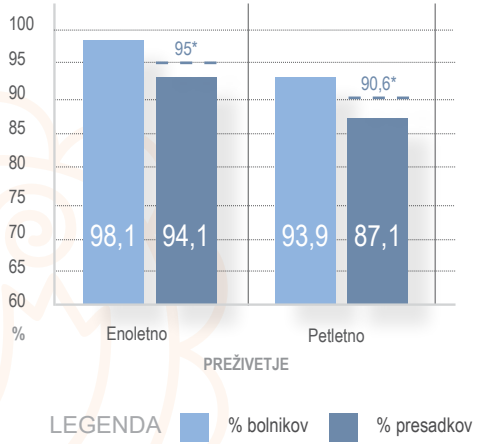
Program za presaditev ledvic

V Sloveniji je bilo v obdobju po priključitvi Eurotransplantu (1. 1. 2000-31. 12. 2021) presajenih 1.082 ledvic, od tega 1.072 ledvic podarjenih od umrlih in 10 ledvic od živih darovalcev. V letu 2021 je bilo presajenih skupaj 52 ledvic, od tega 51 od umrlega in 1 od živega darovalca. Nekaterim prejemnikom so ledvico presadili v kombinaciji z drugimi organi in sicer 24 pacientom skupaj s trebušno slinavko, štirim pacientom skupaj s srcem in dvema pacientoma skupaj z jetri. V prvem letu po presaditvi so v obdobju 1. 1. 2000-31. 12. 2021 pri 12,6 % vseh bolnikov s presajenim organom zaznali klinično, z biopsijo dokazano akutno zavrnitev presadka, v letu 2021 se je to zgodilo pri 5,7 % vseh pacientov.

Mediani čas od uvrstitve na čakalni seznam do presaditve je približno 350 dni za obdobje od 2010 do 2020. V letu 2021 je bil mediani čas od vključitve na čakalni seznam do presaditve 566 dni.

Preživetje bolnikov in presadkov po presaditvi ledvice v % (za obdobje 2000–2021, n = 1.082)

Enoletno preživetje	Petletno preživetje
Bolniki	
98,1 %	93,9 %
Presadki	
94,1 %	87,1 %
95 %*	90,6 %*



Vir: Kazalniki kakovosti Centra za transplantacijo ledvic (KO za nefrologijo, UKC Ljubljana)
* Zmanjšano za % bolnikov, ki so umrli z delujočim presadkom

Program za presaditev jeter

Leta 2021 je bilo v UKC Ljubljana opravljenih 21 presaditev pri 19 bolnikih (pri dvanajstih moških in sedmih ženskah). Pri dveh bolnicah so opravili nujno ponovno presaditev, en bolnik je po presaditvi umrl. Pri 18 bolnikih je bila presaditev redna, zaradi kronične jetrne bolezni, pri enem bolniku pa urgentna, zaradi akutne jetrne odpovedi. Glavni vzroki za presaditev jeter v letu 2021 so bili: ciroza jeter (31,6 %), jetrni rak (26,3 %), holestatska/kongenitalna jetrna bolezen (26,3 %), presnovna bolezen jeter (10,5 %) in akutna jetrna odpoved ob fulminantno potekajočem avtoimunskem hepatitisu (5,3 %).

V obdobju od 1995 do 31. 12. 2021 je bilo v UKC Ljubljana opravljenih skupaj 432 presaditev jeter pri 388 bolnikih. 62,5 % bolnikov je potrebovalo presaditev zaradi ciroze jeter, 10,3 % zaradi akutne odpovedi jeter, 9,6 % zaradi raka na jetrih, 9,3 % zaradi holestatske/kongenitalne jetrne bolezni, 2,4 % zaradi presnovnih bolezni jeter in 5,8 % zaradi ostalih, redkejših vzrokov (benigni jetrni tumorji, policistična bolezen jeter, Budd-Chiarijev sindrom …).

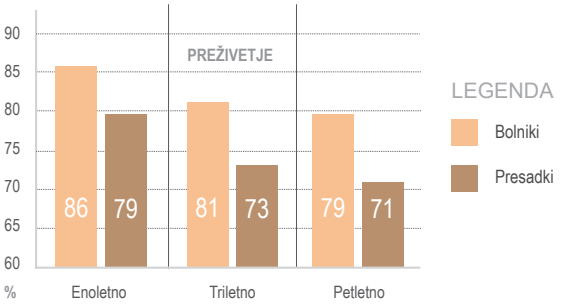
Povprečna čakalna doba za presaditev jeter v letu 2021 je bila 108 dni, mediana pa 55 dni. V primeru urgentne presaditve je ustrezen organ običajno na voljo v nekaj dneh.

Vir: Poročilo o delovanju programa za presaditev jeter za leto 2021 (KO za gastroenterologijo, UKC Ljubljana)

Preživetje bolnikov in presadkov po presaditvi jeter v % (za obdobje 1988–2021*)

	30-dnevno preživetje	Enoletno preživetje	Petletno preživetje
Bolniki	86 %	81 %	79 %
Presadki	79 %	73 %	71%

ELTR (European Liver Transplant Registry, SLLUBL: Specific Analyses, june 2019)
* Podatki za leto 2021 bodo na voljo šele v sredini leta 2022, zato objavljamo razpoložljive podatke za obdobje od 1988 do junija 2021.



Program za presaditev trebušne slinavke (sočasno z ledvico)

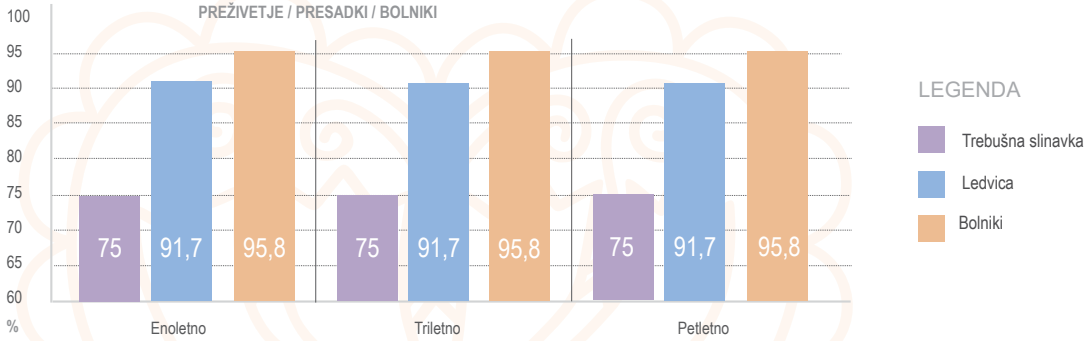
V obdobju od februarja 2009 do 31. 12. 2021 je bilo v Sloveniji opravljenih 24 sočasnih presaditev ledvice in trebušne slinavke. V letu 2021 ni bila opravljena nobena sočasna presaditev.

V celotnem obdobju od prve presaditve leta 2009 do 31. 12. 2021 je bilo 5 trebušnih slinavk odstranjenih v zgodnjem potransplantacijskem obdobju. En bolnik je umrl v zgodnjem potransplantacijskem obdobju zaradi okužbe. Konec leta 2021 je bilo v Sloveniji 15 bolnikov z delujočo presajeno trebušno slinavko in ledvico.

Preživetje bolnikov in presadkov po sočasni presaditvi trebušne slinavke in ledvice v % (za obdobje 2009–2021, n = 24 (bolniki) in n = 19 (presadki))

Enoletno preživetje		Triletno preživetje		Petletno preživetje	
Bolniki					
95,8 %		95,8 %		95,8 %	
Presadki					
T. slinavka	Ledvica	T. slinavka	Ledvica	T. slinavka	Ledvica
75 %	91,7 %	75 %	91,7 %	75 %	91,7 %

Vir: Poročilo – izr. prof. dr. Damjan Kovač, dr. med. (KO za nefrologijo, UKC Ljubljana)



Program za presaditev pljuč

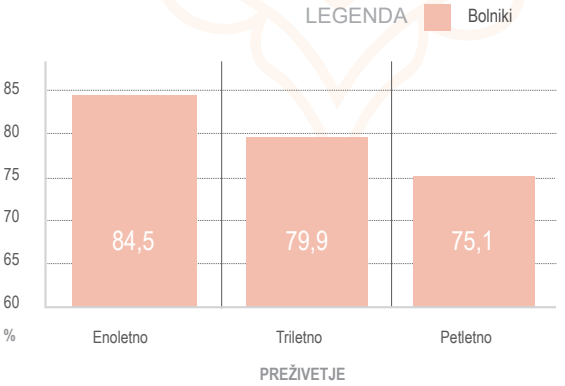
V obdobju 1997–2021 je bilo opravljenih 116 presaditev pljuč. 72 presaditev je bilo opravljenih v AKH Dunaj (do leta 2019), od tega ena ponovna presaditev in ena kombinirana presaditev srca in pljuč. V letu 2021 so v UKC Ljubljana opravili 15 presaditev pljuč, pri vseh pacientih je bila opravljena presaditev obeh pljučnih kril. Štiri presaditve so bile nujne, vse zaradi odpovedi pljuč zaradi posledic bolezni covid-19.

Najpogostejši vzroki za presaditev pljuč v UKC Ljubljana so bili: kronična obstruktivna pljučna bolezen (35 %), pljučne fibroze (21 %), cistična fibroza (12 %) in odpoved pljuč po covid-19. Mediana čakalna doba za nujno presaditev pljuč je bila 6 dni, za redno presaditev pa 179 dni.

Vir: Poročilo o delovanju programa za presaditev pljuč (doc. dr. Matevž Harlander, dr. med., predstojnik KO za pljučne bolezni in alergologijo, UKC Ljubljana)

Preživetje bolnikov po presaditvi pljuč v %
(za obdobje 1997–2021, n = 101)

Enoletno preživetje	Triletno preživetje	Petletno preživetje
Bolniki		
84,5 %	79,9 %	75,1 %



Tkiva in celice

PRESADITVE KRVOTVORNIH MATIČNIH CELIC

Presaditev krvotvornih matičnih celic (KMC) je najbolj razširjena oblika celičnega zdravljenja, saj se na ta način zdravi več kot 70 malignih in nemalignih bolezni, pri določenih hematoloških obolenjih pa je glavna terapevtska in tudi edina možnost za ozdravitev. Sodoben način zdravljenja s KMC v optimalnih pogojih dosega več kot 90-odstotno uspešnost (http://www.ztm.si). Za takšen uspeh pa je potrebno dobro imunsko (HLA) ujemanje darovalca in prejemnika. Zato je Slovenija vključena v svetovni register *Bone Marrow Donors Worldwide* (BMWR), v katerem so vpisani prostovoljni darovalci, ki so tipizirani. V primeru skladnosti se izvedejo postopki za odvzem in presaditev.

V nekaterih primerih je za zdravljenje možno uporabiti lastne KMC, kar imenujemo avtologno darovanje. Pogosteje gre za darovanje na osnovi ustrezne tkivne skladnosti med sorodniki. Po slovenski zakonodaji se lahko izvede tudi odvzem in presaditev med nesorodnimi osebami, pri čemer se upošteva princip anonimnosti. Darovanje drugega darovalca imenujemo tudi alogenično, pri čemer iščemo darovalca najprej v Sloveniji in nato v tujini.

Register Slovenija Donor

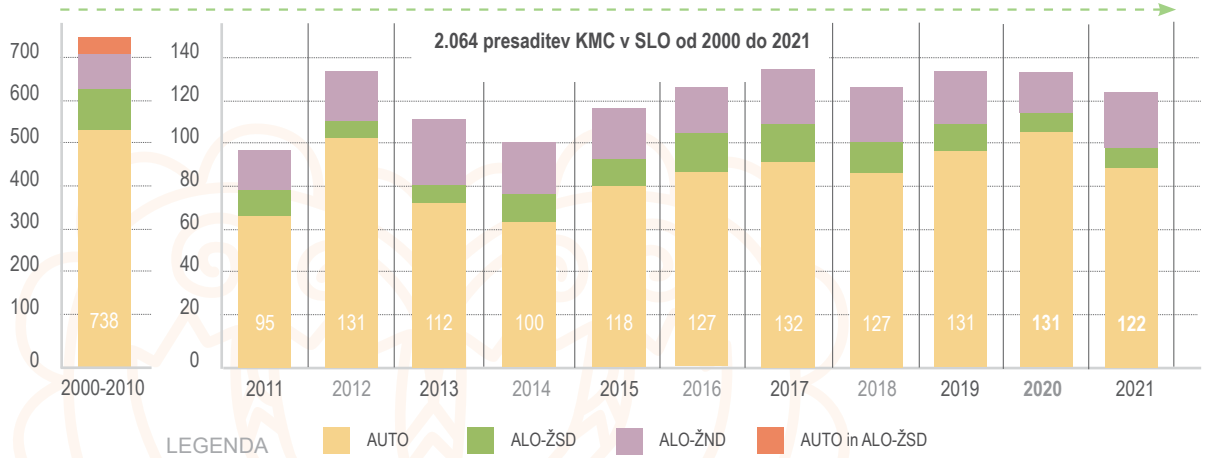
V Sloveniji je bil leta 1991 ustanovljen register nesorodnih darovalcev Slovenija Donor, ki je naslednje leto postal polnopravni član svetovnega registra *Bone Marrow Donors Worldwide (BMDW).*
Na dan 31. 12. 2021 je bilo v register Slovenija Donor vpisanih 22.816 oseb, od tega jih je bilo v svetovni register BMDW vpisanih 21.303.

Presaditve KMC v Sloveniji od leta 2000 do 2021

Tip presaditve	2000-2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AUTO	531	68	101	74	63	84	86	92	88	89	104	89
ALO-ŽSD	102	9	8	7	11	10	15	12	13	11	10	10
ALO-ŽND	84	18	22	31	26	24	26	28	26	31	17	23
AUTO in ALO-ŽSD	21											
SKUPAJ	738	95	131	112	100	118	127	132	127	131	131	122

AUTO – avtologne presaditve, **ALO** – alogenske presaditve, **ŽSD** – živi sorodni darovalec, **ŽND** – živi nesorodni darovalec

Vir: Letno poročilo ZTM – Slovenija donor, podatke mesečno zbiramo za arhiv Slovenija-transplanta.



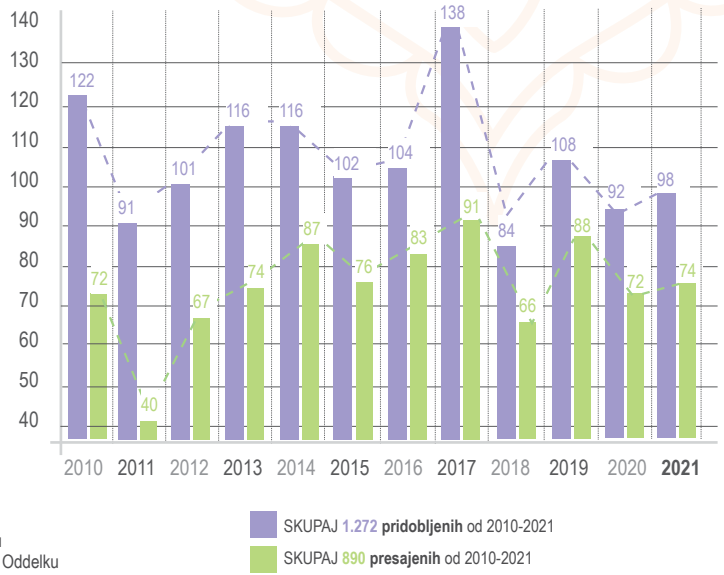
PROGRAM PRIDOBIVANJA IN PRESADITVE ROŽENIC

Zdravljenje s presaditvijo roženic je ena najpogostejših in tudi najuspešnejših presaditev tkiv pri nas in v svetu. Takšen način zdravljenja pogosto predstavlja edini način, s katerim izboljšamo vid zaradi predhodnega obolenja oz. poškodb.

Pridobljene in presajene roženice od leta 2010 do 2021

Vir: arhiv Slovenija-transplant

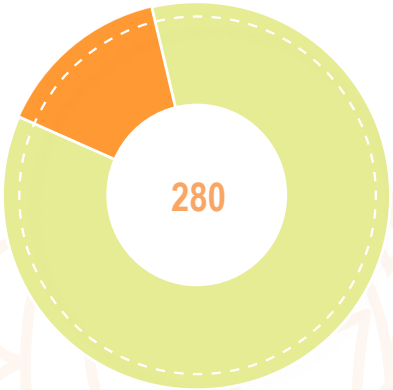
Leto	Št. pridobljenih roženic	*Št. presajenih roženic
2010	122	72
2011	91	40
2012	101	67
2013	116	74
2014	116	87
2015	102	76
2016	104	83
2017	138	91
2018	84	66
2019	108	88
2020	92	72
2021	98	74



* Podatki o presaditvah na Očesni kliniki UKC Ljubljana v obdobju 2010–2017, od leta 2018 dalje pa so vključene tudi presaditve na Oddelku za očesne bolezni UKC Maribor

V Sloveniji pridobivamo roženice od umrlih darovalcev po dokončni zaustavitvi srca ali po dokazani možganski smrti. Odvzem roženic je možen po predhodni privolitvi umrle osebe v času življenja oz. ob nenasprotovanju bližnjih. Poleg pridobljenega soglasja je potrebna še natančna ocena primernosti roženice za presaditev, ki jo sprejme prejemnikov odgovorni zdravnik. Presaditev roženice izvajajo v dveh transplantacijskih centrih: na Očesni kliniki v UKC Ljubljana ter na Oddelku za očesne bolezni v UKC Maribor.

Čakalni seznam bolnikov za presaditev roženice na Očesni kliniki v UKC Ljubljana (na dan 12. 1. 2022) in UKC Maribor (na dan 4. 1. 2022)



Diagnoza	Število bolnikov
Keratokonus	41
Ostale diagnoze	239
SKUPAJ	**280**

280 bolnikov (**277** UKC Ljubljana, **3** UKC Maribor) (100%)

LEGENDA

- Keratokonus: **41 bolnikov (15 %)**
- Ostale diagnoze: **239 bolnikov (85 %)** (poškodbe, degeneracija, retransplantacija, makule roženice, distrofija Fuchs, endotelna distrofija, cornea guttata, afaka in psevdofaka, keratopatija bullosa, vnetja, drugo)

Vir: UKC Ljubljana, Očesna klinika; UKC Maribor, Oddelek za očesne bolezni

OSTALA TKIVA IN CELICE

Sledljivost in transparentnost v programih presaditve oz. uporabe tkiv in celic za namen zdravljenja

Ustanove za tkiva in celice morajo imeti veljavno dovoljenje za delo, ki ga izda Javna agencija za zdravila in medicinske pripomočke (JAZMP). Zavod Slovenija-transplant je odgovoren za sledljivost in transparentnost, kar zagotavljamo z zbiranjem in pregledovanjem sprotnih poročil ustanov za tkiva in celice, ki nam na osnovi zakonskih zahtev in sklenjenih pogodb poročajo o darovanju, pridobivanju, procesiranju, shranjevanju, dodeljevanju, uporabi in uničenju tkiv in celic.

Po zaključku leta na osnovi letnih poročil posameznih ustanov za tkiva in celice v Slovenija-transplantu pripravimo zbirno letno poročilo. Prav tako smo pooblaščeni za pripravo letnega zaključnega poročila o hudih neželenih dogodkih in reakcijah ter ga posredujemo JAZMP, ki nato poroča Evropski komisiji.

Ustanove za tkiva in celice ter zagotavljanje kakovosti in varnosti

V Sloveniji je na nacionalni ravni v dejavnost preskrbe in uporabe tkiv in celic za zdravljenje vključenih 27 ustanov. Od tega je v program vključenih 15 bolnišnic in znotraj teh 40 kliničnih oddelkov. Glede na status je 18 ustanov za tkiva in celice javnih in 9 ustanov zasebnih. Zasebne ustanove imajo dovoljenje izključno za avtologno pridobivanje tkiv in celic.

Slovenija-transplant in JAZMP zagotavljata transparentno delovanje sistema ter sproti ugotavljata in obravnavata vse odklone, ki lahko vplivajo na kakovost in varnost tkiv in celic darovalcev, prejemnikov in osebja, ki je vključeno v posamezne procese.

Za pridobitev dovoljenja mora vsaka ustanova izpolnjevati stroge strokovne in zakonske pogoje. Vse ustanove imajo vzpostavljen sistem kakovosti, v katerem so opisani vsi postopki za zagotavljanje pogojev za kakovost tkiv in celic ter varnost prejemnikov. Vse ustanove redno nadzoruje JAZMP, v preverjanje podatkov pa je vključen tudi Slovenija-transplant.

Oploditev z biomedicinsko pomočjo in reproduktivne celice

V Sloveniji so registrirani 4 centri za dejavnost oploditve z biomedicinsko pomočjo parom, ki ne morejo zanositi po naravni poti: OBMP Ljubljana, OBMP Maribor, OBMP Postojna in ZC Dravlje. Obseg dejavnosti je razviden iz tabele o pridobljenih in uporabljenih tkivih in celicah. Omenjeno področje spada po številu izvedenih postopkov med najobsežnejše.

Pridobivanje in shranjevanje popkovnične krvi in popkovnice

V Sloveniji pridobivamo in shranjujemo za namen lastne uporabe tudi krvotvorne matične celice iz popkovnične krvi in popkovnice ter tudi drugih tkiv (npr. mlečni zobje). Dovoljenje za delo imajo ena javna tkivna banka – Zavod za transfuzijsko medicino (ZTM) in tri zasebne ustanove (Izvorna celica, Biobanka in FH-S). Javna banka popkovnične krvi pri ZTM je s 1. 12. 2014 zaključila s sprejemanjem vzorcev popkovnične krvi, saj je bilo zbranih in shranjenih zadostno število vzorcev, da lahko zadostijo potrebam v Sloveniji, vendar potekajo pogovori o nadaljevanju zbiranja in shranjevanja ne le za lastno uporabo, pač pa tudi za vsakogar, ki bi takšne celice potreboval. Govorimo o alogenem darovanju, ki bi bilo omogočeno z javnim financiranjem.

Vir: http://www.ztm.si/register-darovalcev/javna-banka-popkovnicne-krvi/

Število pridobljenih tkiv in celic v obdobju od 2009 do 2021

Leto	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Koža*	28	45	22	36	85	89	52	57	32	22	24	10	46
Kosti*	38	123	108	67	93	82	147	74	80	78	71	59	256
Mehkokostni presadki*	22	39	/	3	11	3	9	/	12	/	/	/	0
Hrustanec*	37	21	4	12	11	11	12	/	/	/	/	/	0
Reproduktivne celice (št. celic)	15.854	43.472	8.640	27.479	41.929	37.542	39.769	26.191	36.338	13.778	26.813	28.209	24.736

*Enota: število odvzetih vzorcev

Število uporabljenih tkiv in celic v obdobju od 2009 do 2021

Leto	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Koža*	36	10	14	34	67	23	31	28	/	20	3	/	47
Kosti*	23	47	57	97	59	62	92	82	72	71	81	101	123
Mehkokostni presadki*	12	/	2	2	3	4	3	5	2	3	5	4	2
Hrustanec*	15	/	3	7	4	9	5	1	/	/	1	/	3
Reproduktivne celice*	1.450	2.018	29.651	23.330	23.506	27.271	31.127	26.620	31.817	12.110	5.109	14.255	27.547

*Enota: število uporabljenih vzorcev

Vir: arhiv Slovenija-transplanta

Število enot pridobljene popkovnične krvi

Ustanova / Leto	2015	2016	2017	2018	2019	2020	2021
Izvorna celica	76	144	107	82	81	81	78
Biobanka	175	178	266	110	224	197	241
FH-S	8	45	101	169	192	206	245
Neocelica	238	0*	0*	0*	0*	0*	0*

*Ustanova prenehala z delovanjem

Število enot pridobljene popkovnice

Ustanova / Leto	2015	2016	2017	2018	2019	2020	2021
Izvorna celica	60	116	96	52	73	75	77
Biobanka	32	150	222	96	212	184	236
FH-S	8	42	96	114	196	213	247
Neocelica	198	0*	0*	0*	0*	0*	0*

*Ustanova prenehala z delovanjem

Vir: arhiv Slovenija-transplanta

NEŽELENI DOGODKI IN REAKCIJE

Slovenija-transplant je odgovoren za obravnavo neželenih dogodkov in reakcij ter odklonov na področju preskrbe s tkivi in celicami zaradi presaditve, t. i. histovigilanco. Namen zbiranja poročil o neželenih dogodkih in reakcijah ali tudi postavitev suma nanje, je zagotavljanje kakovosti izvajanja postopkov in s tem preprečevanja tveganja za zdravje pacientov, osebja, škode ali celo izgube tkiv in celic.

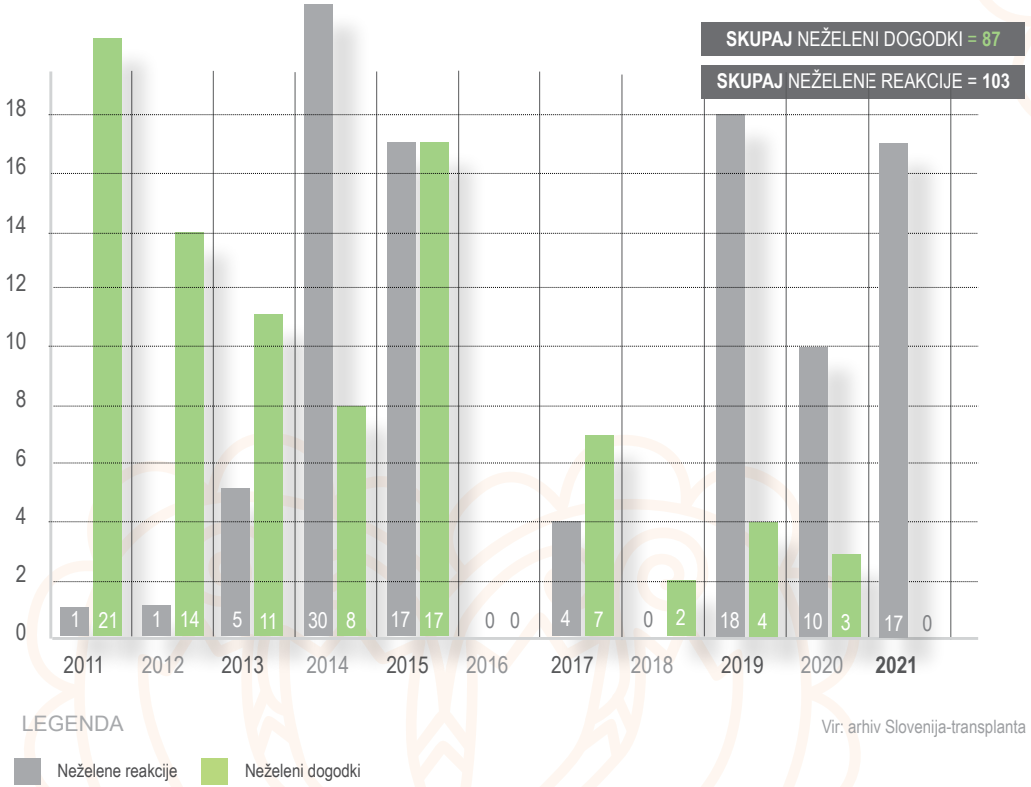
Poročanje poteka na predpisanih obrazcih, za posamezen primer je treba oddati začetno in končno poročilo. Oba obrazca sta prilogi Pravilnika o histovigilanci. Poročanje poteka v več fazah: zaznava odklona, natančna ocena in opis primera, sprejem ustreznih ukrepov za preprečitev škode na tkivih in celicah ter ljudeh, poročanje pristojnim inštitucijam in obveščanje vseh ustanov za tkiva in celice, ki so dobila tkiva in celice, pri katerih je prišlo do odklona.

Vsi podatki, ki se zbirajo v sistemu histovigilance, so anonimizirani, da se zagotovi zasebnost in na drugi strani upošteva t. i. kultura neobtoževanja, kar pomeni, da se spodbuja poročanje, iščejo se rešitve oz. izboljšave in ni obsojanja izvajalcev na osebni ravni.

V letu 2021 Slovenija-transplant ni prejel nobenega sprotnega poročila. Menimo, da obstajajo neželeni dogodki, o katerih pa izvajalci niso poročali v skladu z nacionalno zakonodajo. Zato bomo letu 2022 bomo organizirali za vse odgovorne osebe ustanov za tkiva in celice nacionalno izobraževanje.

V centru OBMP smo obravnavali tudi 17 primerov neželenih reakcij. V 8 primerih je šlo za sindrom ovarijske hiperstimulacije. V 6 primerih je prišlo do močnejše venozne krvavitve, a hospitalizacija ni bila potrebna. V dveh primerih je šlo za težave ob punkciji.

Število neželenih dogodkov in reakcij od 2011 do 2021



Vir: arhiv Slovenija-transplanta

OBJAVE IN PREDAVANJA NA KONFERENCAH

Pregledni in izvirni znanstveni članki

- Avsec D, Šimenc J. Twenty Years of Deceased Organ Donation in Slovenia: Steps Towards Progress in Quality, Safety, and Effectiveness. American Journal of Health Research, 2021, 9(3): 82-88. 9. Dostopno na: Twenty Years of Deceased Organ Donation in Slovenia: Steps Towards Progress in Quality, Safety, and Effectiveness: Science Publishing Group.
- Avsec D, Šimenc J. Better Donor Detection and Referral in the Intensive Care Units in the Context of End-of-Life Care, oddano v revijo Experimental and Clinical Transplantation, Supplementary issue (v pripravi za objavo).

Strokovni članki in publikacije

- Šimenc J. (spraševalka):»V centralni pisarni Eurotransplanta na dober dan najdemo 10 ujemanj med darovalcem in prejemnikom«. Intervju s dr. Petrom Brangerjem. Isis, Glasilo zdravniške zbornice Slovenije, 1/2021: 38-40. *Dostopno na http://online.pubhtml5.com/agha/ewpo/#p=38.*
- Avsec D, Uštar B. Daj življenju priložnost: Donorska in transplantacijske dejavnost v Sloveniji 2020. Zavod Slovenija-transplant: Ljubljana, 2021. *Dostopno na: Slovenija-transplant.*
- Šimenc J, Avsec D. Verstva in altruistično darovanje organov po smrti. Glasilo Transplant. Julij 2021.
- Šimenc J, Avsec D. Poročilo s kongresa Evropskega združenja za transplantacije organov. Glasilo Transplant. December 2021.
- Darovanje organov po smrti. Pogrebni priročnik za svojce preminulih, Mogenas, Ljubljana: 2021: p. 15. (pripravila Šimenc J.).

Sodelovanje na mednarodnih kongresih:

- Avsec D, Gadžijev A, Šimenc J. Uninterrupted and successful deceased donation programme in Slovenia during Covid-19 crisis in 2020. Transplant International, 34 (Suplement 1), August 2021. Abstracts of the 20th Biennial European Society for Organ Transplantation (ESOT) Congress, Milan, Italy, 29 August – 1 September 2021, p. 340

  Dostopno na www.esot.org.

Predavanja na konferencah (v kronološkem redu)

- Danica Avsec: Ethical and legislative aspects in transplant medicine, Webinar on transplant activities and donation programs for Caribean countries, vabljeno predavanje.
- Danica Avsec: Communication with the family, 4th Preparatory course for CETC 2021, organizacija Board of Transplant Coordinators pri UEMS Surgery v sodelovanju s Swisstransplant, vabljeno predavanje.
- Danica Avsec: Certification of European Transplant Coordinators and Preparatory Courses, 4th Preparatory course for CETC 2021, organizacija Board of Transplant Coordinators pri UEMS Surgery v sodelovanju s Swisstransplant, uvodno predavanje.
- Danica Avsec: Better Donor Detection and Referral in the Intensive Care Units in the Context of End-of-Life Care in Slovenia, MESOT 2021, vabljeno predavanje.
- Danica Avsec: How to establish a proactive donor detection program,
  Donation as part of End-of-life Care, video predavanje za didaktične namene.
  Dostopno na: www.esottransplantlive.org (samo za člane).

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Donor and transplantation activity in Slovenia in 2021

Introductory words

Our annual publication »*Give Life a Chance*« presents statistical data and key highlights of donation and transplantation activities in Slovenia in 2021. Due to persistent epidemics, last year donation and transplantation activities were influenced by the Covid 19 disease.

Compared to 2020, we had fewer active donors and solid organ transplants, but given the lack of human resources, the exhaustion of staff in the donation network and the lack of facilities in the intensive care units, the results are good.

I would like to thank all co-workers in the national donation and transplantation network, especially the management of the University Medical Centre Ljubljana, which responded appropriately in the most critical moments to ensure active programmes in our largest hospital. We would also like to take this opportunity to express our sincere gratitude to the relatives of the deceased. With consent to donation they demonstrated humanity and care for others during this particularly difficult time. The high consent rate contributed crucially to the fact that we ended 2021 with similar figures to last year. Despite the unfavorable social and health situation, there is a lot of good in people. Trust in the national organ donation system has not been diminished.

I would also like to take this opportunity to announce, in December 2021, the term of Danica Avsec, MD, expired. She has been a long-time director and driving force in the development of the Institute since its establishment in 2000. I would like to thank her for her dedicated work and for building a solid professional foundation, which is a good starting point for further development of the Institute and expansion of the donation programme we are planning for the near future.

Andrej Gadžijev, MD,

Director of the Slovenija-transplant Institute and responsible physician for donation activity

The Slovenija-transplant institute

Since 2002 the Institute of the Republic of Slovenia for the Transplantation of Organs and Tissues Slovenija-transplant has been the central national expert institution for connecting, co-ordinating, promoting and supervising donor and transplant activity in Slovenia. Established in 1998, Slovenija-transplant is the primary co-ordination office of the national transplantation network. The national network consists of 11 donor hospitals across Slovenia, the Transplantation Centre at the Ljubljana University Medical Centre, and the Tissue Typing Centre within the Blood Transfusion Centre of Slovenia. It operates the donor and recipient programme, while also ensuring that medical treatment with a transplant is possible for all who need it. The national network operates continuously and its expert teams are in a state of readiness 24 hours a day, every day of the year.

Since 2000 Slovenia has been a member of Eurotransplant, a non-profit organisation for organ and tissue exchange. After meeting the demanding entry criteria, it was the first country in the region to join the group of five successful countries in the area of transplant treatment, i.e. Germany, Austria, Belgium, Luxembourg and the Netherlands. In 2002, Slovenija-transplant signed a co-operation agreement with Eurotransplant. Today, Eurotransplant, with its registered seat in Leiden in the Netherlands, brings together 8 countries and over 137 million inhabitants. This membership is important for our patients because, upon joining Eurotransplant, the chances of their survival and transplant treatment outcomes have improved considerably, especially for life-threatening conditions like acute heart and liver failure and other special cases (e.g. children, hypersensitive patients). Thanks to our co-operation, the waiting lists have been shortened significantly, the national transplant programmes are fully operating and we have also introduced combined transplants. First and foremost, we have been able to ensure greater donor–recipient tissue compatibility. Tissue incompatibility can make finding an appropriate organ for certain patients impossible in Slovenia. In 2020 we celebrated the impressive 20th anniversary of our successful co-operation with Eurotransplant.

Since being established, the Institute has been constantly developing in line with international guidelines. We strive to create an educated and motivated professional public and, by way of multipronged communication, consistently increase the public's trust in transplantation medicine. Our membership in international professional committees and participation in European projects has given us an equal footing in the international arena, including as active co-creators of strategies, development and expert training in international donor and transplant activities. We continue to set an internationally recognised example of how a national donor programme should be organised and managed.

In its management and leadership of activities for procuring and using parts of the human body for medical treatment purposes, Slovenija-transplant consistently complies with the legislation, European directives and adopted international conventions. We also ensure that national legislation and expert protocols are promptly updated. Any changes we introduce are based on expert medical decisions and proposals, critical social considerations as well as the principles of medical ethics and deontology.

The key guidelines of our Institute's operations include: self-sufficiency | patient equality and safety | optimal effectiveness | quality | traceability | professionalism | non-commercialism | transparency | voluntary donation | prevention of abuse.

The Institute operates under the auspices of the Ministry of Health of the Republic of Slovenia. In 2021, the Institute employed 9 full-time staff and was working with 96 people under contract in the donor programme. In December 2021 the term of leading expired to Danica Avsec, MD. She has been a long-time director and driving force of the development of the institute since its establishment in 2000. With the team, she developed high quality, efficient and ethically oriented national donor system in Slovenia, considered as an example of good practice in the international environment. As of January 1, 2022, Andrej Gadžijev, MD, specialist traumatologist, long-term associate of Slovenia-transplant and one of the few experts in the field of donor medicine in our country has been appointed as a new director. Danica Avsec remains employed as responsible physician for donation activity and deputy director of Slovenija-transplant.

Outstanding achievements and highlights of 2021

- The number of potential deceased donors and organ transplants was slightly compared to 2020. But given the extreme working conditions and the overburdening of staff in intensive care units, the results are good.
- Transplant coordinators conducted 55 interviews with the relatives of the deceased. 84 % of relatives gave their consent for organ donation, which is a remarkable result in the health and social crisis. High consent rate indicates, confidence in the organ donation system has not been shaken.
- In recent years, Slovenia has been a world leader in the number of transplanted hearts PMP. For the last two years, the lung transplantation programme has been highly successful.
- We have improved the system of tissue donation and thus reduced the waiting list for corneal transplants and enabled skin transplants.
- Compared to 2020, 225 more people enrolled in the national register for organ donation declarations. As many as 80% of enrolment were made through the electronic system.
- We communicated transparently and directly with the public, published more than 40 indepth newspaper interviews and appeared in the media more than 260 times.

- Slovenija-transplant received an award at the public competition for the **Best practice in health care in 2021** (ranking among the three finalists).

- In addition to Facebook and Twitter, we have opened communication on the YouTube channel (@SloTransplant). Organically we reached over 120,000 users on the Facebook platform.

- We have developed a national transplant information system to ensure the traceability of donated tissues and cells.

- As a partner in a consortium under the umbrella of ESOT, we succeeded in the EU4Health tender and obtained funding for the 2.5-year project BRAVEST (Building Resilience Against crisis: a systematic and global approach to adVancE body Safety and supply in Transplantation).

- With the aim to promote research and development, we successfully conducted the first public competition for the best research work in the field of donor medicine.

Change of leadership

In December 2021 the term of leading expired to Danica Avsec, MD. She has been a long-time director and driving force of the development of the institute since its establishment in 2000. She handed over her position with the following words: *»I am especially proud of the respectable cooperation with the media and other professions that create public opinion on organ donation. We have gained admirable public trust in the national donation system, the majority of relatives gives consent to donation.«* Avsec further explains, the current turbulent times are challenging: *»Society and medicine are changing rapidly. In donation medicine new techniques and improved diagnostics are available, and donation after cardiac death is already established abroad. I am pleased that my successor will, with the knowledge, experience and responsibility he has already demonstrated, continue with the development orientation of the institute and upgrade the donation system in our country. «*

Since the beginning of 2022 Danica Avsec is employed as deputy director of Slovenija-transplant and remains a member of several expert bodies. Andrej Gadžijev, MD, is the new director of Slovenija-transplant.

CHANGE OF LEADERSHIP

FOTO: Slovenija-transplant

Key statistics for 2021

DECEASED DONORS 41

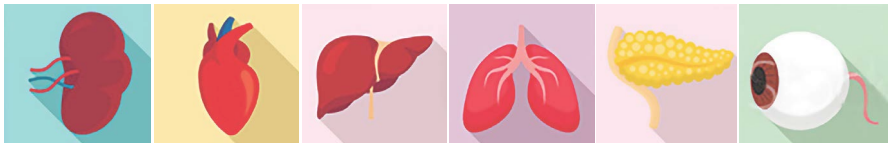
DECEASED DONORS IN 2021 BY AGE GROUPS

0<18 YEARS	18-59 YEARS	+60 YEARS
1	21	19

Average age was 54 years.

DECEASED DONORS DONATED 125 ORGANS

2021

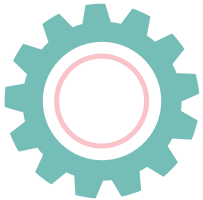


KIDNEY	HEART	LIVER	LUNG	PANCREAS	CORNEA
60	13	32	18	2	98

NATIONAL REGISTER OF DESIGNATED PERSONS ABOUT POST-MORTEM ORGAN AND TISSUE DONATION

Slovenia ranks among most successful countries in terms of the consent rate for donation.

977
(10 against)
2021



Registered 11.584 people
of which 11.554 FOR, and 30 against.

CONSENT FOR ORGAN AND TISSUE DONATION

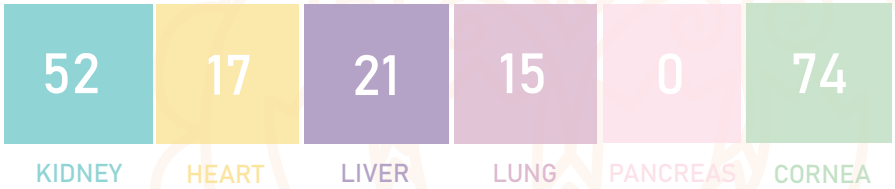
CONSENT RATE **84 %**

Transplant coordinators performed 55 family interviews with relatives of the deceased.

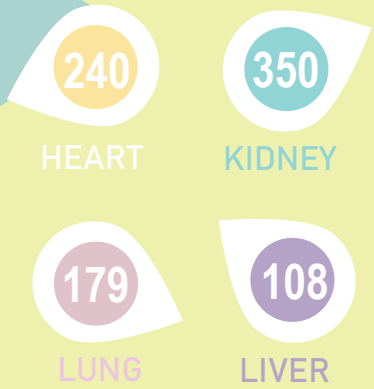
IN THE CENTRE FOR TRANSPLANTATION ACTIVITY IN UKC LJUBLJANA 105 ORGANS WERE TRANSPLANTED

177 patients are on the waiting list for transplantation
(status on 31.12.2021)

2021



AVERAGE WAITING TIME (IN DAYS)



Solid organs

NATIONAL WAITING LIST FOR ORGAN TRANSPLANTATION

The waiting list is a list of patients needing a part of a human body for medical transplantation purposes. The indications for transplantation are specific to each organ/tissue/cell. All patients in the Republic of Slovenia have the same possibility of being included on the list of recipients and have equal access to this treatment. By the end of 2021, 177 patients were waiting for an organ transplant. The number was lower compared to 2020 due to continuation of Covid-19 epidemic. The average waiting period for all organs is relatively short compared to other countries. On average, Slovenian patients wait for a heart, liver or kidney transplant for less than 1 year. For more information on average waiting periods for specific organs please see chapter *The results in transplanted patients*.

In 2021, 109 Slovenian patients have been included on the waiting list for the first time: 41 for a kidney (one in combination with a liver and one in combination with a heart), 29 for a heart (one in combination with a kidney), 15 for a lung and 23 for a liver (one in combination with a kidney) transplant.

Status of the national waiting list on 31.12.2021 (all patients)

Kidney	Heart	Lung	Liver*	Pancreas**
97	57	3	21	4
TOTAL				177 patients

* 2 in combination with a kidney ** 3 in combination with a kidney

Source: http://statistics.eurotransplant.org/

Status of the national waiting list in the 2011-2021 period (on 31.12. 2021, all patients)

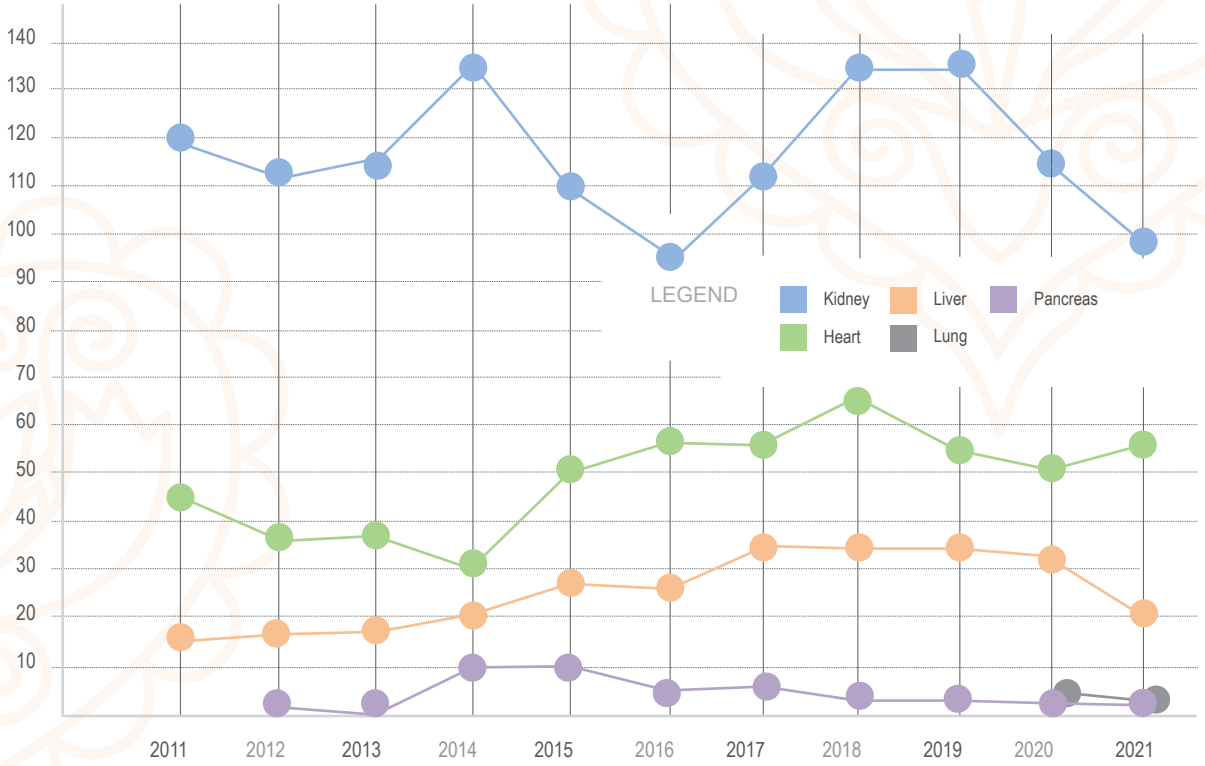
Year	Kidney	Heart	Lung*	Liver	Pancreas	TOTAL
2011	120	46		17		183
2012	113	38		18	2	169
2013	114	39		19	1	171
2014	136	31		21	11	188
2015	110	52		29	11	190
2016	95	58		28	7	181
2017	112	56		35	8	203
2018	135	65		35	6	234
2019	138	55		35	5	227
2020	115	53	5	32	4	204
2021	97	57	3	21	4	177

Source: http://statistics.eurotransplant.org//

* Before 2020, Slovene patients, waiting for a lung transplant, were included on Austrian waiting list

A share of patients on the national waiting list according to organ in 2021

Trends in patient numbers on the waiting list, by organ and the total for the 2011-2021 period



Waiting list mortality for the 2011-2021 period

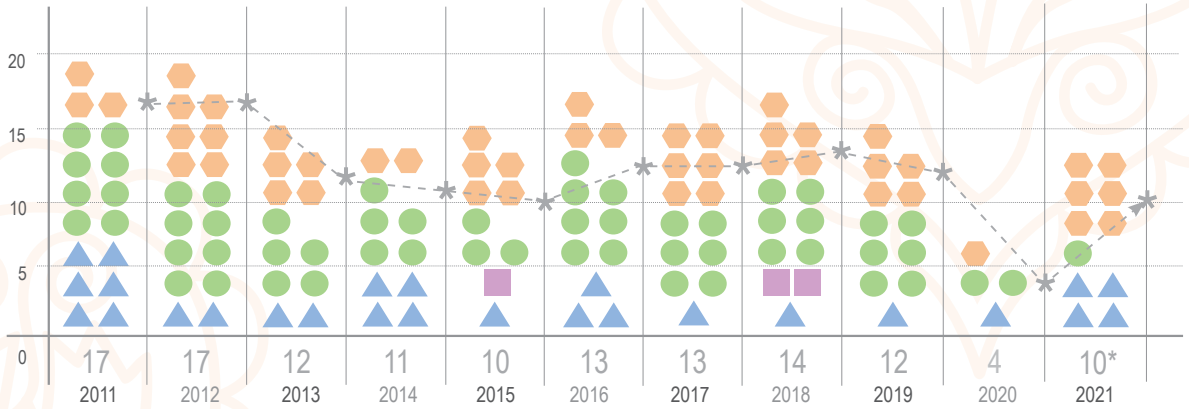
The following data show the number of patients who were included on the waiting list for an organ transplant and died during the waiting period. The cause of death was not always related to the failure of the organ for which they were waiting to be transplanted.

Year	Kidney	Kidney and pancreas	Heart	Lung	Liver	TOTAL
2011	6		8		3	17
2012	2		8		7	17
2013	2		5		5	12
2014	4		5		2	11
2015	1	1	3		5	10
2016	3		7		3	13
2017	1		6		6	13
2018	1	2	6		5	14
2019	1		6		5	12
2020	1		2		1	4
2021	4		1		6	10*

*One of the deceased patients waited for a combined kidney and liver transplant

Source: http://statistics.eurotransplant.org/

Trends in waiting list mortality for the 2011-2021 period



*One of the deceased patients waited for a combined kidney and liver transplant

Source: http://statistics.eurotransplant.org/

LEGEND

Kidney

Liver

Kidney and pancreas

Heart

Trends

NUMBER OF DECEASED DONORS

In 2021, Slovenian donor hospitals acquired 41 actual deceased donors who were medically suitable and for whom consent had been obtained from their relatives. Data at the beginning show the number of actual deceased donors in Slovenia compared to selected countries around the world. Below are details on the number of utilised deceased donors, which means that at least one organ was transplanted from each donor. Compared to other Eurotransplant member countries, in 2021 Slovenia was again ranked fourth in terms of the number of utilised deceased donors per million people with a result significately higher than the Eurotransplant average.

Number of actual deceased donors (DD) per million people (PMP) in Slovenia in 2021 and a comparison with other countries*

Country	No.of DD/PMP 2021
1. USA	41,6
2. Spain	40,8
3. Iceland	36,7
4. Portugal	29,6
5. Croatia	29,5
6. Czech Republic	25
7. Belgium	24,7
8. France	24,7
9. Belarus	23,2

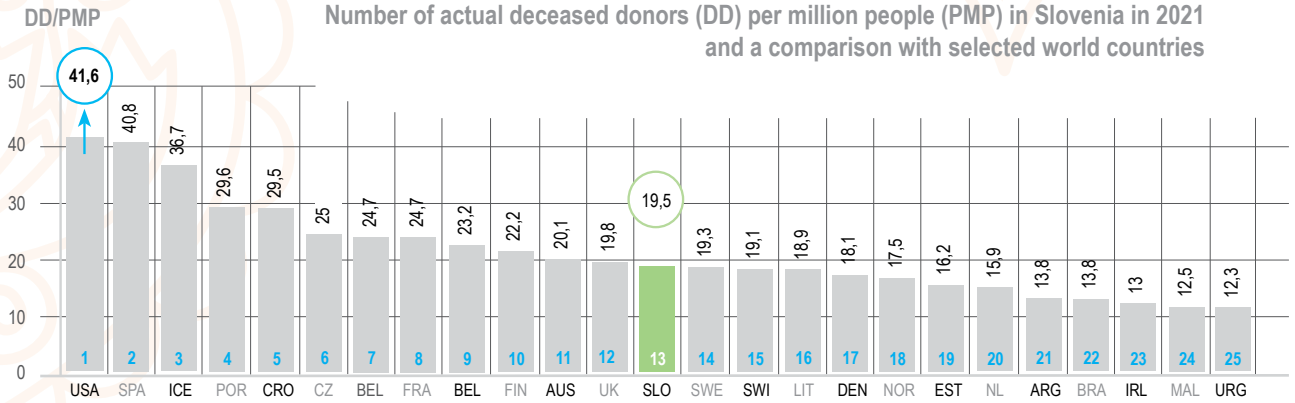
Country	No.of DD/PMP 2021
10. Finland	22,2
11. Austria	20,1
12. United kingdom	19,8
13. Slovenia	19,5
14. Sweden	19,3
15. Switzerland	19,1
16. Lithuania	18,9
17. Denmark	18,1
18. Norway	17,5

* we included all countries that submitted data for Newsletter Transplant Preliminary report issued in april 2022.

Country	No.of DD/PMP 2021
19. Estonia	16,2
20. Netherlands	15,9
21. Argentina	13,8
22. Brazil	13,8
23. Ireland	13
24. Malta	12,5
25. Uruguay	12,3
26. Germany	11,1
27. Slovakia	10,9

Country	No.of DD/PMP 2021
28. Hungary	10,6
29. Israel	10,5
30. Poland	10,5
31. Latvia	8,9
32. Chile	7,7
33. Kuwait	5,8
34. Greece	5
35. Cyprus	4,2
36. UAE	3,9

Number of actual deceased donors (DD) per million people (PMP) in Slovenia in 2021 and a comparison with selected world countries

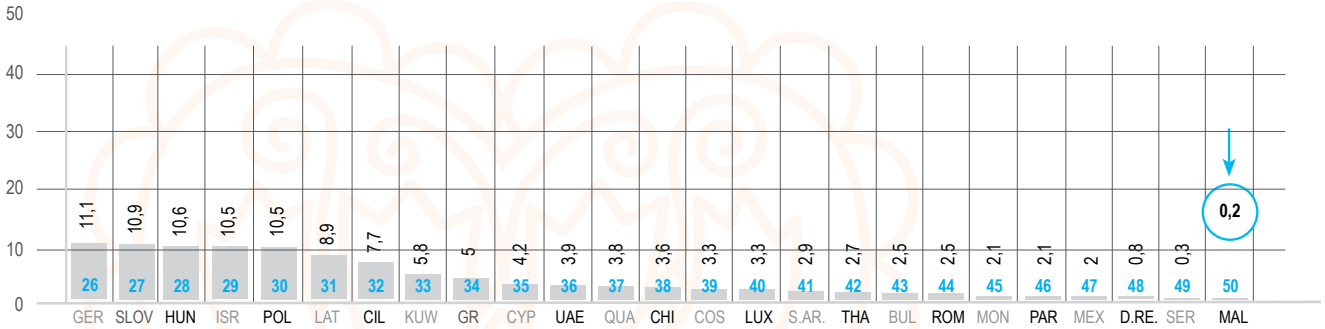


Country	No.of DD/PMP 2021
37. Quatar	3,8
38. China	3,6
39. Costa Rica	3,3
40. Luxembourg	3,3
41. Saudi Arabia	2,9
42. Thailand	2,7
43. Bulgaria	2,5
44. Romania	2,5
45. Mongolia	2,1

Country	No.of DD/PMP 2021
46. Parguai	2,1
47. Mexico	2
48. Dominican republic	0,8
49. Serbia	0,3
50. Malaysia	0,2

Source: Newsletter Transplant, International Figures on Donation and Transplantation 2021. Preliminary report, April 2022.

DD/PMP



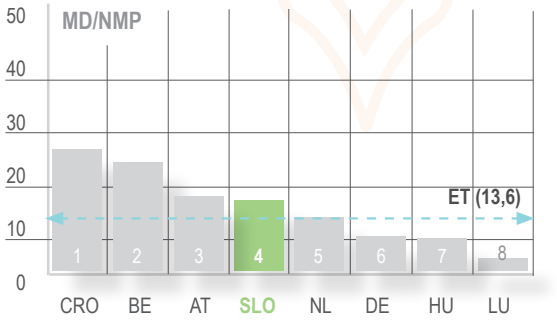
Number of utilised deceased donors (DD) per million people (PMP) in Slovenia in 2021 and a comparison with all Eurotransplant countries

Country	Slovenia	Eurotransplant
Number of DD	39	1.897
DD/PMP	18,5	13,6

Source: http://statistics.eurotransplant.org/

Number of utilised deceased donors per million people (DD/PMP) and a comparison with other Eurotransplant countries in 2021

ET Country	Number of DD/PMP in 2021
1.Croatia (CRO)	27,7
2. Belgium (BE)	24,2
3. Avstria (AT)	18,8
4. Slovenia (SLO)	18,5
5. Netherlands (NL)	15,5
6. Germany (DE)	10,8
7. Hungary (HU)	10,4
8. Luxembourg (LU)	3,2



Source: http://statistics.eurotransplant.org/

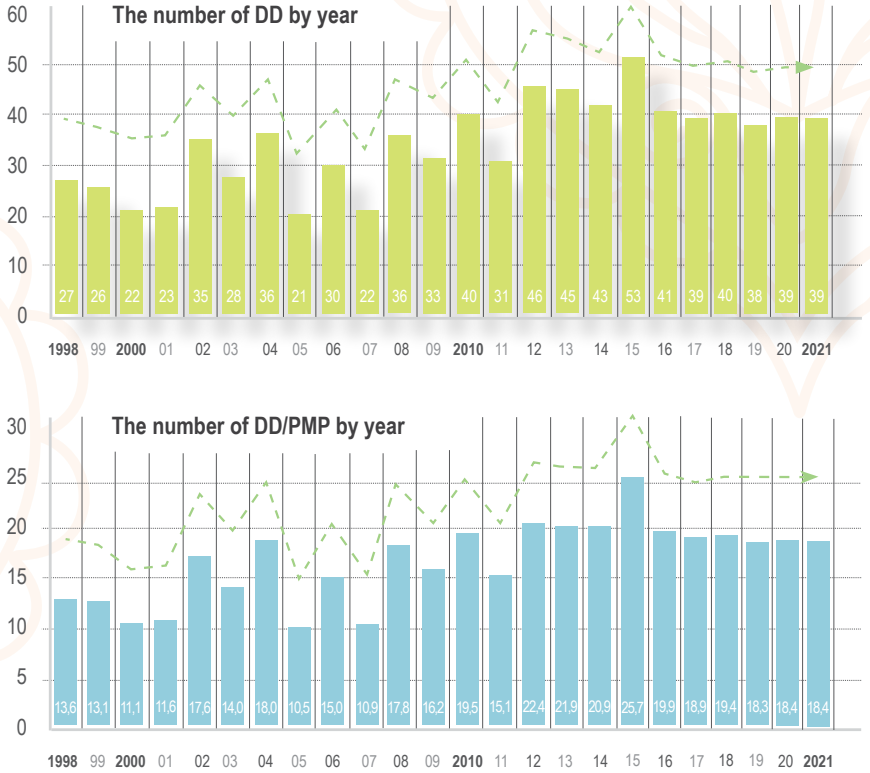
Number of utilised deceased donors (DD) and number of utilised deceased donors per million people (DD/PMP) in Slovenia in the 1998—2021 period

Year	Number MD	Number MD/NMP
1998	27	13,6
1999	26	13,1
2000	22	11,1
2001	23	11,6
2002	35	17,6
2003	28	14
2004	36	18
2005	21	10,5
2006	30	15
2007	22	10,9
2008	36	17,8
2009	33	16,2
2010	40	19,5

Year	Number MD	Number MD/NMP
2011	31	15,1
2012	46	22,4
2013	45	21,9
2014	43	20,9
2015	53	25,7
2016	41	19,9
2017	39	18,9
2018	40	19,4
2019	38	18,3
2020	39	18,5
2021	39	18,5
TOTAL	833	17,0

Source: http://statistics.eurotransplant.org/

Number of utilized deceased donors (DD) and number of utilized deceased donors per million people (DD/PMP) in Slovenia in the 1998–2021 period



The critical Pathway for Organ Donation

POSSIBLE DECEASED ORGAN DONOR
A patient with a devastating brain injury or lesion OR a patient with circulatory failure AND apparently medically suitable for organ donation

Donation after Circulatory Death (DCD)	Treating physician to Identify/refer a potential donor	Donation after BrainDeath (DBD)
POTENTIAL DCD DONOR **a.** A person whose circulatory and respiratory functions have ceased and resuscitative measures are not to be attempted or continued. OR **b.** A person in whom the cessation of circulatory and respiratory functions is anticipated to occur within a time frame that will enable organ recovery.	**Reasons why a potential donor does not become a utilized donor** **SYSTEM** - Failure to identify/refer a potential or eligible donor - Brain death diagnosis not confirmed (e.g. does not fulfil criteria) or completed (e.g. lack of tehnical resources or clinician to make diagnosis or perform confirmatory tests) - Circulatory death not declared within the appropriate time frame - Logistical problems (e.g. no recovery team) - Lack of appropriate recipient (e.g. child, blood type, serology positive) **DONOR/ORGAN** - Medical unsuitability (e.g. serology positive, neoplasia) - Haemodynamic instability/unanticipated cardiac arrest - Anatomical, histological and/or functional abnormalities of organs - Organs damaged during recovery - Inadequate perfusion of organs or thrombosis **PERMISSION** - Expressed intent of deceased not to be donor - Relative's refusal of permission for organ donation - Refusal by coroner or other judical officer to allow donation for forensic reasons	POTENTIAL DBD DONOR A person whose clinical condition is suspected to fulfill brain death criteria.
ELIGIBLE DCD DONOR A medicaly suitable person who has been declared dead based on the irreversible absence of circulatory and respiratory functions as stipulated by the law of the relevant jurisdiction within a time frame that enables organ recovery.		ELIGIBLE DBD DONOR A medicaly suitable person who has been declared dead based on neurologic criteria as stipulated by the law of the relevant jurisdiction.
ACTUAL DCD DONOR A consented eligible donor: **a.** In whom an operative incision was made with the intent of organ recovery for the purpose of transplantation. OR **b.** From whom at least one organ was recovered for the purpose of transplantation.		ACTUAL DBD DONOR A consented eligible donor: **a.**In whom an operative incision was made with the intent of organ recovery for the prupose of transplantation. OR **b.** From whom at least one organ was recovered for the purpose of transplantation.
UTILIZED DCD DONOR An actual donor from whom at least one organ was transplanted.		UTILIZED DBD DONOR An actual donor from whom at least one organ was transplanted.

The »dead donor rule« must be respected. That is, patients may only become donors after death, and the recovery of organs must not couse a donor´s death.

Source: The Madrid Resolution on Organ Donation and Transplantation

REGISTER FOR DONATION DECLARATIONS

Every Slovenian citizen has the right and possibility during their lifetime to decide to donate their organs and tissues. This decision is formally confirmed when it is entered in the national register of designated persons, set up back in 2004. The donor statement may be signed at many authorised donor registration points around Slovenia (a detailed list is published at www.slovenija-transplant.si) or electronically using a digital signature on the eAdministration (»eUprava«) portal (https://e-uprava.gov.si/). Since June 2017, a declaration against making organ donation is also possible.

Compared to previous years, fewer people have made a declaration in the national register of designated persons, newertheless the number was higher for 225 declarations compared to the year 2020. In 2021, we collected a total of 977 declarations (967 FOR and 10 AGAINST). As at 31.12.2021, 11.584 declarations were found on the register (11.554 FOR and 30 AGAINST). Since 2018, when electronic declaration was made possible, 2571 persons used this option. Yearly aproximately 40% of declarations are submitted ellectronicaly, rising to 80 % in 2021 due to covid-19 situation.

Number of declarations in the register, by year, in the 2004–2021 period

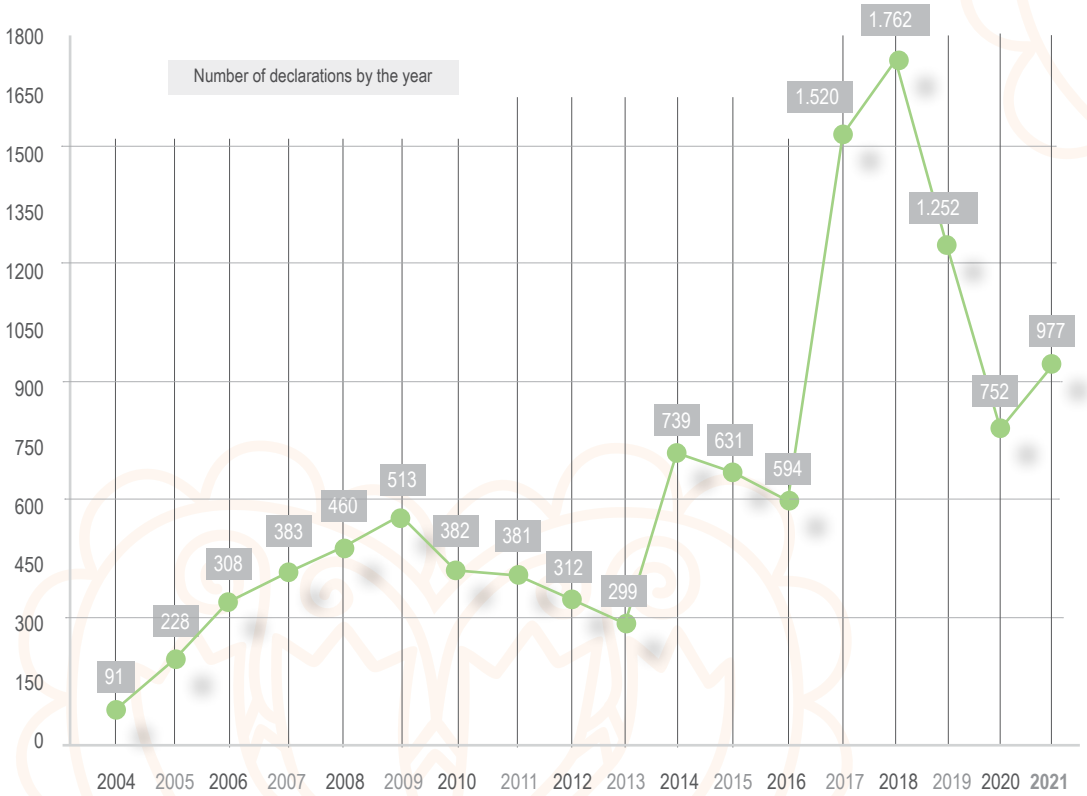
Source: archive of Slovenija-transplant

Year	No. of declarations
2004	91
2005	228
2006	308
2007	383
2008	460
2009	513
2010	382

Year	No. of declarations
2011	381
2012	312
2013	299
2014	739
2015	631
2016	594
2017	1.520

Year	No. of declarations
2018	1.762
2019	1.252
2020	752
2021	977
TOTAL	11.584

Number of declarations regarding donation in the register, by year, in the 2004–2021 period



PERCENTAGE OF CONSENT FOR DONATION

A conversation about donation with the close relatives of a potential deceased donor is conducted in every case when the donation of organs for transplantation is feasible. It is only after the death has been confirmed and the time of death registered that the transplantation co-ordinator checks the register to see whether the deceased was a designated after-death donor. Despite knowing about the designation, a conversation with the deceased person's close relatives about donation is carried out. During this conversation, transplant coordinators try to find out what the deceased person's position was regarding after-death organ donation.

If their intention is unknown, the close relatives make the decision. All procedures are carried out with a high level of sensitivity, understanding of the extremely difficult emotional circumstances and in line with the legislative provisions and the medical doctrine. In 2021 consent for donation was given by 84 % of relatives.

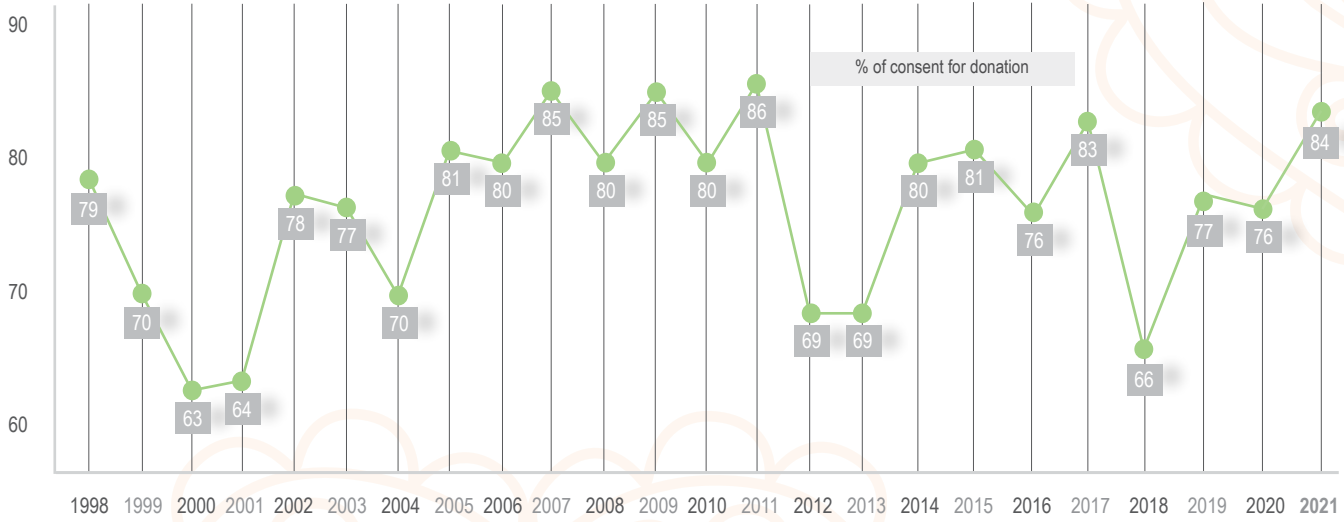
Slovenija-transplant offers the deceased donor's relatives an opportunity to be given grief counselling by a professionally trained and experienced experts.

Percentage of consent for donation in the 1998-2021 period

Source: archive of Slovenija-transplant

Year	%	Year	%	Year	%	Year	%	Year	%	Year	%
1998	79	2002	78	2006	80	2010	80	2014	80	2018	66
1999	70	2003	77	2007	85	2011	86	2015	81	2019	77
2000	63	2004	70	2008	80	2012	69	2016	76	2020	76
2001	64	2005	81	2009	85	2013	69	2017	83	2021	84

Percentage of consent for donation in the 1998–2021 period



OPERATIONS OF THE DONOR CENTRES

Eleven donor hospitals or centres are active in the Slovenian donor programme: the Ljubljana UMC and Maribor UMC and the general hospitals in Celje, Murska Sobota, Nova Gorica, Izola, Ptuj, Novo mesto, Slovenj Gradec, Jesenice and Brežice.

The following activities are performed in a donor centre:

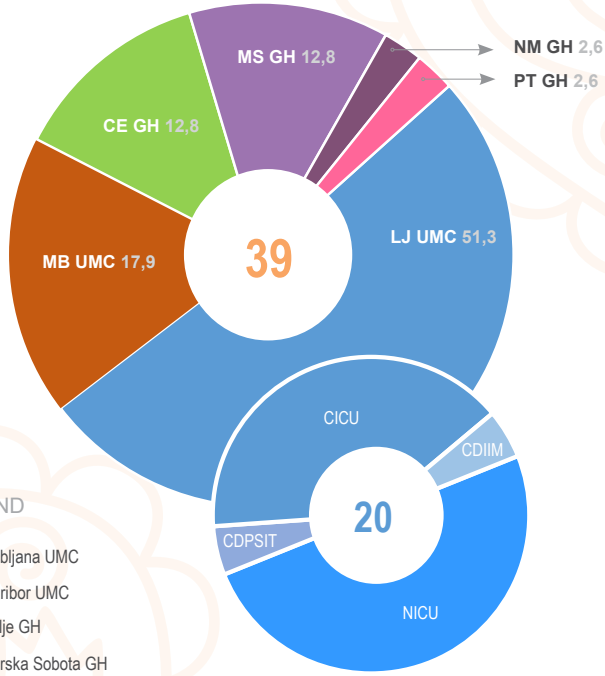
- identifycation of potential deceased donors;
- diagnostics of brain death;
- evaluation of the suitability of organs and tissues for removal and transplantation;
- communication with the relatives of the deceased about the possibility of organ donation;
- maintanance of the functioning of deceased donors' organs – in intensive care and during organ removal;
- participation in organ- and tissue-removal procedures performed by Slovenian and foreign teams of surgeons.

The highest number of donors is provided by the Ljubljana UMC, where the largest intensive care units are in place. In 2021, 20 utilised deceased donors were procured there. Good results were also achieved by the UMC Maribor where in 2021 they procured 7 utilised deceased donors and by Celje GH and Murska Sobota GH, both with 5 utilised donors. Novo mesto GH and Ptuj GH each procured one utilised deceased donor in 2021.

Number and share of utilised deceased donors in individual donor centres (DC) in 2021

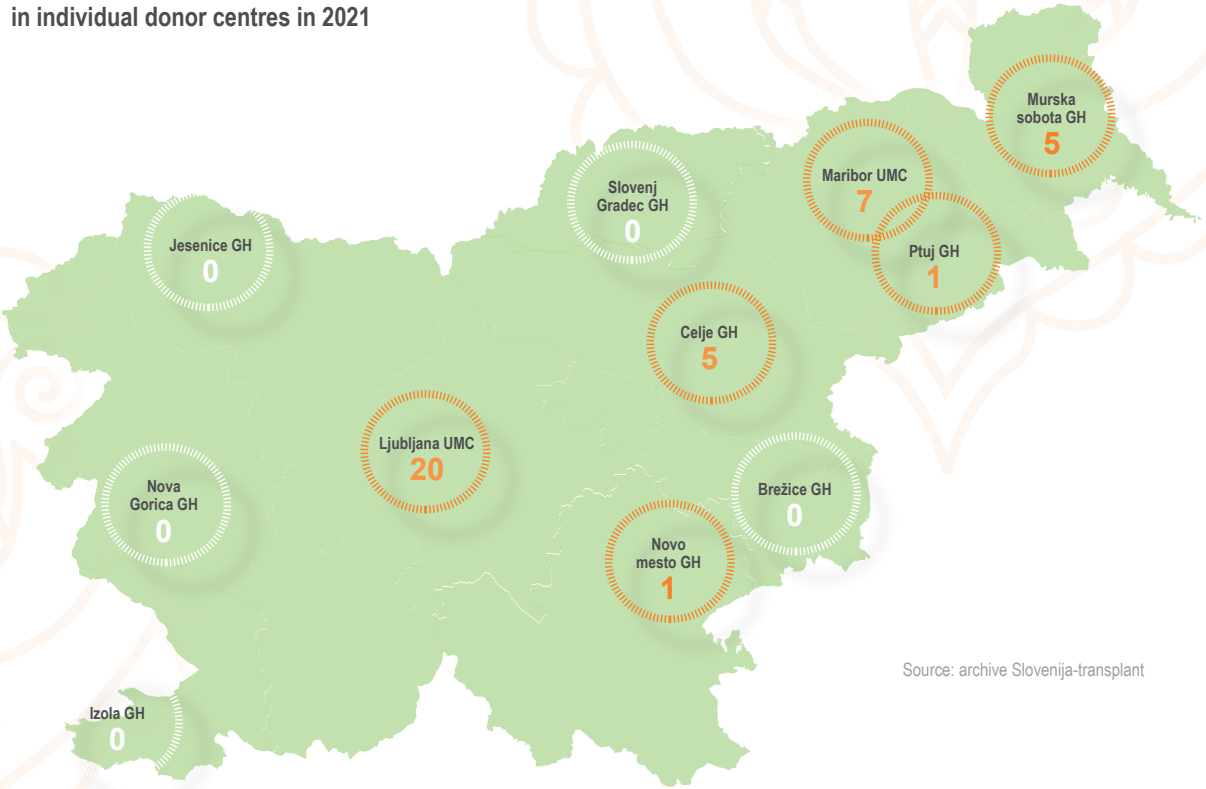
Donor centre	Number of DD	Share in %
Ljubljana UMC TOTAL	20	51,3
of which NICU*	10	
of which CICU**	8	
of which CDIIM***	1	
of which CDPSIT****	1	
Maribor UMC	7	17,9
Celje GH	5	12,8
Murska Sobota GH	5	12,8
Novo mesto GH	1	2,6
Ptuj GH	1	2,6
TOTAL	39	100

* NICU – Neurological Intensive Care Unit,
** CICU – Central Intensive Care Unit,
*** CDIIM – Clinical Department of Internal Intensive Medicine,
**** CDPSIT – Clinical Department of Paediatric Surgery and Intensive Therapy



Source:archive of Slovenija-transplant

Number of utilized deceased donors in individual donor centres in 2021



Source: archive Slovenija-transplant

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IN-PERSON & ONLINE

Uninterrupted and successful deceased program during Covid-19 crisis in Slovenia

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INTRODUCTION

Slovenia was no exception in struggles with overwhelming burdens in healthcare due to corona virus disease. The first wave lasted between March 12 and May 31, and the second from October 19 until the end of year, continuing deep into 2021.

Despite durable epidemic, donation and transplantation programs were running without interruptions, yet with appropriate safety adjustments. Yearly statistics show even better donation and transplantation results compared to 2019 (1,2).

The central organization of donation and transplantation activities on a national level proved to be of extreme value during crisis response.

AIM

In a retrospective review the authors present Slovenian results and example of successful adjustments to Covid-19 crisis.

From the beginning of the epidemic high awareness about the ethical responsibility of assuring the transplant treatment to patients on waiting lists and on prevention of discharge of procured organs was at the forefront (3).

Example might be transferable to other countries.

RESULTS

1. Slovenia is among ET countries that successfully managed DDP.
2. Positive PCR test was a contraindication for donation. Up to date, no donor derived Sars-CoV-2 infection was documented.
3. In cooperation with Transplant centre at University medical centre Ljubljana, ST has regularly motivated healthcare professionals and issued recommendations.
4. Professional standards were developed progressively, up to twice a week, along with governmental preventive measures, scientific findings with regards to donation medicine and SARS-CoV-2 infection and based on recommendations issues by European and professional authorities.
5. Each case of donation and transplantation was evaluated individually in line with daily situation, status in international transport, risk assessment, and availability of human resources and hospital facilities. Concerns and benefits of procedures were always shared with patients.

THE NUMBER OF DECEASED DONORS PMP IN 2020: 18.5.

Number of actual deceased donors was higher in 2020 compared to 2019.

Average DD's age was 59 years.

18 % (13) of procured solid organs were not used, which is less compared to 2019 (when 32% (29) of procured solid organs were not used).

Obligatory PCR tests for deceased donors were introduced in February 2020, even before an official announcement of epidemic in Slovenia.

More solid organs were transplanted compared to 2019. **The rate of transplanted solid organs PMP was 53,55.**

Due to complications after Covid-19 disease, a successful lung transplantation was performed to a 34-old patient.

CONSENT RATE FOR DONATION

With 76% consent rate to donation remained high (78% in 2019).
Still, epidemic impacted consent for donation. Out of 17 family refusals, at least 4 were related to Covid-19.

NEGATIVE IMPACT OF EPIDEMIC ON DONOR REALISATION

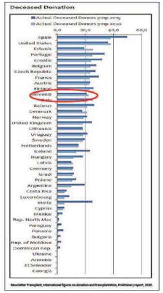
ICU units and donor professionals in some donor centers (especially UMC Maribor, the second largest hospital in Slovenia) were severely affected by Covid-19 patients. As the ICU were transformed into Covid-19 units, situation caused lower donor detection realization.

WAITING LIST FOR A TRANSPLANTATION

Average waiting time for a transplant treatment remained relatively low.

By the end of 2020, 204 new patients were put on waiting list (23 less compared to 2019).

4 patients died while waiting for an organ.



Cohesive professional community succeeded in rapidly readjusting donation activities to altered conditions on national and international level (Eurotransplant region) (6). Covid-19 epidemic had no significant impact on the absolute numbers of deceased donors in Slovenia.

METHOD

Slovenija-transplant Institute (ST) is a public body and a chief national competent authority, linking all institutions and hospitals in the national transplant network and managing cooperation with Eurotransplant (4,5).

Since March 2020, ST has been systematically gathering data in relation to Covid-19. Aim was to evaluate and to prevent negative impact of virus Sars-CoV-2 on a national deceased donation program (DDP).

The following parameters were monitored:
- the number of infected deceased donors (DD),
- the number of family refusals due to Covid-19,
- the number of unused procured/offered organs due to epidemiological status,
- the potential and realization of deceased donors in donor hospitals during epidemic.

Continuous monitoring enabled successful coping with crisis situation and brisk responses to the dynamic of epidemiological scenarios.

CONCLUSIONS

- With specific safety measures, dedicated healthcare professionals, and support of leading actors in healthcare system and transplant centre, the **donation and transplantation programs remained active through the whole epidemic (elective procedures were postponed though).**
- This resulted in **more organs procured, organ offers** from Eurotransplant countries and **transplantations performed** compared to 2019.
- Donation and transplantation results were **publicly and professionally highlighted as success story of Slovenian healthcare system** in the crisis 2020.
- **Slovenia is an example of good practice** showing how medically complex and organizational demanding donation and transplant programs can operate efficiently, safely, and ethically through durable healthcare crisis situation, like Covid-19.

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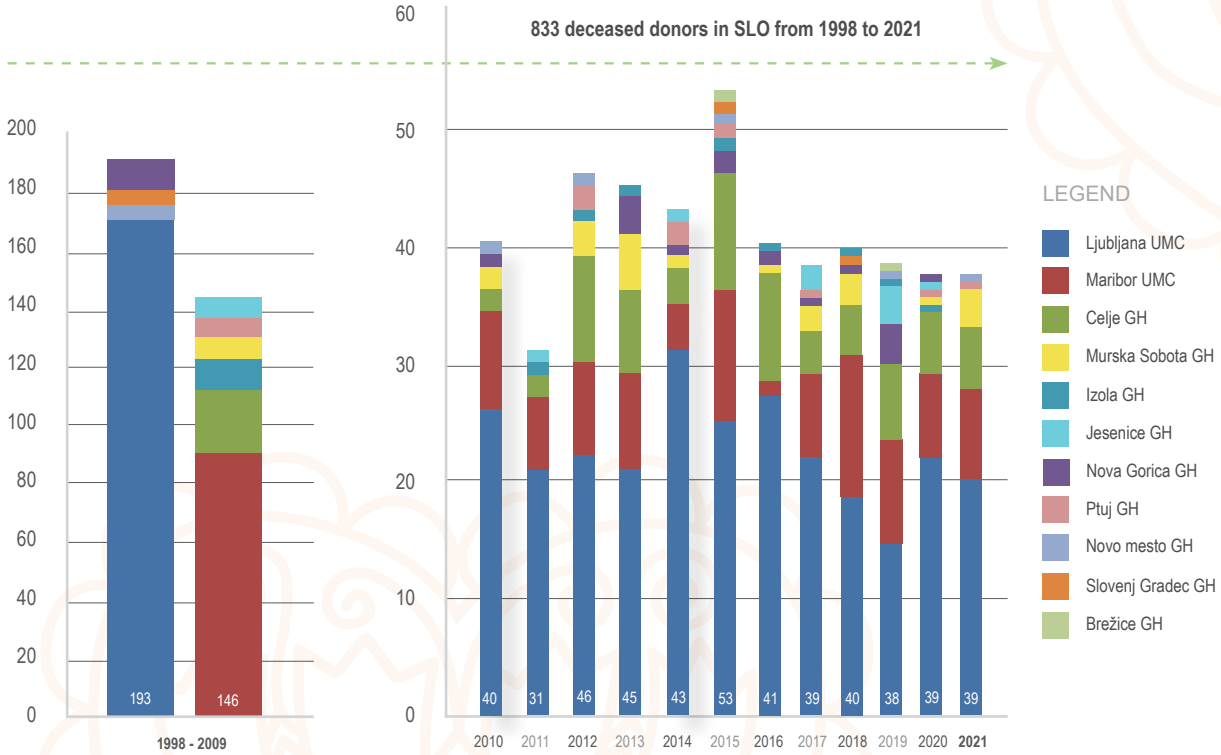
Number of utilised deceased donors in donor centres in the 1998–2021 period

Year	LJ UMC	MB UMC	CE GH	MS GH	NG GH	Izola GH	Ptuj GH	Jesenice GH	NM GH	SG GH	Brežice GH
1998-2009	176	95	22	7	10	9	7	6	3	4	
2010	26	8	2	2	1				1		
2011	21	6	2			1		1			
2012	22	8	9	3		1	2		1		
2013	21	8	7	5	3	1					
2014	31	4	3	1	1		2	1			
2015	25	11	10		2	1	1		1	1	1
2016	28	2	7	1	2	1					
2017	22	7	4	2	1		1	2			
2018	18	13	4	2	1	1				1	
2019	15	8	6		3	1		3	1		1
2020	22	7	5	1	1	1	1	1			
2021	20	7	5	5			1		1		
TOTAL	**447**	**184**	**86**	**29**	**25**	**17**	**15**	**14**	**8**	**6**	**2**

Source: archive Slovenija-transplant

Number of utilized deceased donors in donor centres in the 1998–2021 period



Potential and realisation in donor hospitals

The donation potential of an individual donor hospital is expressed as the percentage share of brain-dead donors of the total number of deceased persons in the intensive care unit (ICU). It indicates the number of deaths where the diagnostic of brain death was completed. The potential is directly associated with the identification of eligible donors in ICUs.

Realisation in the donation process indicates the number of eligible donors (proven brain death) who became actual donors. It is expressed as the share of actual donors of the total number of deaths due to brain death in the ICUs.

Source: archive Slovenija-transplant

Donor hospital	All deaths in the ICU	PD	ED	*Potential (%)	Available (%)	AD	Realisation (%)	**Available (%)
Ljubljana UMC	423	43	32	7,6	13.7	21	66	65
Maribor UMC	221	17	9	4,1	13.7	7	78	65
Novo mesto GH	130	4	1	0,8	8.3	1	100	55
Celje GH	236	13	10	4,2	8,3	6	60	55
Nova Gorica GH	86	3	0	0	8.3	0	/	55
Ptuj GH	55	4	1	1,8	8.3	1	100	55
Murska Sobota GH	178	8	6	3,4	8.3	5	83	55
Izola GH	57	1	0	0	8.3	0	/	55
Slovenj Gradec GH	81	5	1	1,2	8.3	0	/	55
Jesenice GH	37	0	0	0	8.3	0	/	55
Brežice GH	18	1	1	5,6	8.3	0	/	55

ICU – intensive care unit, **PD** – potential donor, **ED** – eligible donor (proven brain death), **AD** – actual donor (relatives' consent, organ removal)
Potential – % of brain-dead patients in total number of deceased persons in the ICU = % ED/total deaths in the ICU
Realisation – % of actual donors in total number of brain-dead patients = % AD/ED

*As expected, a donor hospital's potential is higher among hospitals which operate their own neurosurgical unit and can even reach up to 13.7 % (available potential). The Ljubljana UMC lagged behind its potential in 2021 with numbers almost 50 % below its potential. This deviation can be attributed to the higher number of patients who died because of Sars-CoV-2 infection or with Sars-CoV-2 infection. Infection with the aforementioned corona virus is an absolute medical contraindication for organ donation, so many of those who died were excluded as possible donors. The lower numbers are also due to the fact that hospital transplant coordinators, who identify potential donors in a timely manner at their regular jobs, were transferred to the new positions in the Covid intensive care units. Maribor UMC also lagged behind its potential in 2021 for similar reasons. Also, fewer patients with potential for clinical presentation of brain death were admitted.

In hospitals without their own neurosurgical unit, the available donation potential reaches up to 8,3 %. This figure was again closely approached by the Celje GH, while Murska Sobota GH was relatively close. Novo mesto GH and Ptuj GH each had one actual deceased donor in 2021, but the remaining 5 donor hospitals had no actual deceased donors, mostly due to exhaustion of health care workers and extreme working conditions in intensive care units.

**Realisation mainly depends on the percentage share of absolute medical contraindications and refused donation by relatives in the period under scrutiny. Available realisation considers up to 20 % of absolute medical contraindications and up to 10 % of refused donation by relatives, while also distinguishing between donor hospitals with a neurosurgical unit and those without one (10 % difference); other obstacles in the donor process in total account for up to 5 %. Thus, the available realisation for hospitals with a neurosurgical unit was calculated at 65 % and for those without such a unit 55 %. In 2021, the available realisation was exceeded by all six donor hospitals with at least one actual donor, reflecting extremely low family refusal rate. Some deviations were found in low values of the potential, e.g. in Novo mesto GH and Ptuj GH, where 100 % realisation was achieved in one case – there were no medical contraindications for donation and the relatives gave their consent. In such cases a two-year balance is more accurate and in line with expected results. In hospitals where there were no proven brain deaths in 2021 and no actual donors, the potential and the realisation were both 0 % or non-measurable (/).

List of authorised persons (i.e. hospital transplantation coordinators) in charge of the development, implementation and functioning of the donation programme in individual donor centres in 2021

Donor centre	Transplantation coordinators
Ljubljana UMC	Chief Phys. Rade Stanić, MD, MSc
Maribor UMC	Tanja Kuprivec, MD
Brežice GH	Nataša Pirc, MD
Celje GH	Barbara Hudournik, MD
Izola GH	Damjan Polh, MD
Jesenice GH	Andraž Nastran, MD
Murska Sobota GH	Chief Phys. Daniel Grabar, MD
Nova gorica GH	Edyta Čerkini, MD
Novo mesto GH	Matej Godnič, MD
Ptuj GH	Mateja Prevolšek, MD
Slovenj Gradec GH	Rok Popič, MD

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Twenty Years of Deceased Organ Donation in Slovenia: Steps Towards Progress in Quality, Safety, and Effectiveness

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*Corresponding author

Abstract: The paper describes 20 years of the thriving evolution of the organ donation system in Slovenia. Even before the turn of the century, Slovenia was a pioneering country in South-East Europe in terms of the organizational, legislative, medical, and ethical development of donor and transplantation medicine. Real progress came in the year 2000 when the national donation and transplant competent organization the Slovenija-transplant (ST) institute was established, modern national legislation was introduced, and the country met the demanding entrance requirements to join Eurotransplant (ET), an international foundation for organ and tissue exchanges. Joining the ET led to improvements in numbers of organs procured from deceased donors, allowed better transplant treatment options for Slovenian patients (especially urgent, hyper sensibilized, etc.), reduced patient waiting lists, while the larger 'pool' of patients meant that a suitable match could be found for procured organs. Over the 20 years of deceased donation development, priorities have included assuring the quality, safety, and traceability of human organs, tissues, and cells within an efficient, transparent and ethical transplant system. Great attention has always been placed on frequent, open, transparent, and high-quality communication with the public. Entailing a retrospective study, the article presents analysis of key figures and quality indicators of the Slovenian deceased donation program for the period 2000–2019. Slovenia has stood out for its rate of consent for deceased donation (the 20-year average exceeds 75%), been a world leader in the number of heart transplants per million population (at around 11 heart transplants pmp), and has a consistent deceased donor rate (around 20–22 deceased donors pmp). In the challenging pandemic year of 2020, Slovenia once more demonstrated its quality and professionalism. It was one of the countries that best adapted to the crisis. With regular videoconferences on a daily/weekly basis that included professionals and the frequent alteration of safety protocols, the national deceased and transplantation programs were able to remain active and without drops in numbers. The quality of organs and safety for patients was not under threat. Statistics for 2020 show that even more deceased donors and transplantations were performed than in 2019. The article provides an example of good practice of adaptation of the world renowned "Spanish donation model" to suit a specific national context. The findings are useful and transferable to clinical settings in other smaller countries that still need to establish national organ and tissue donation programs. Unfortunately, in many countries around the world (even in Europe), transplant treatment is neither available nor accessible to many patients in need.

Keywords: Deceased Organ Donation, Organizational System, National Competent Authority, Quality

PUBLICATION OF ORIGINAL SCIENTIFIC ARTICLE
Avsec, Šimenc 2021

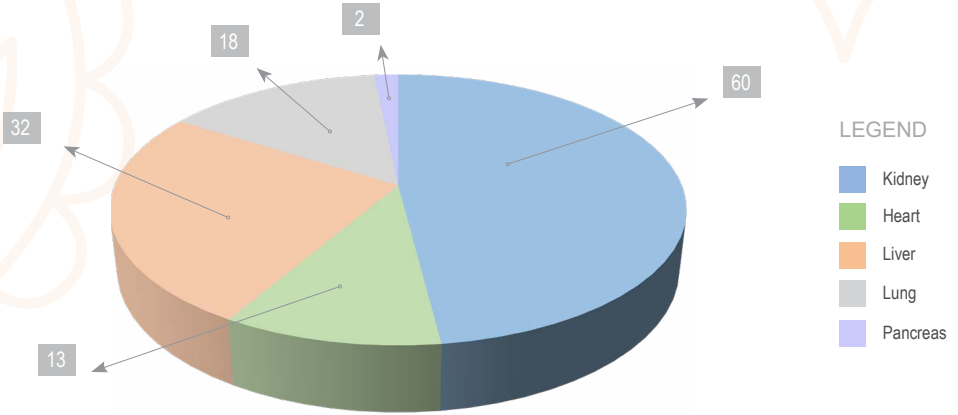
PROCURED SOLID ORGANS FOR THE PURPOSE OF MEDICAL TREATMENT

The number of procured organs depends on the number of procured deceased donors, along with the age and any medical contraindications. Due to covid-19 epidemic the number of potential deceased donors and procured organs was slightly lower in 2021 than the year before. But given the extreme working conditions in intensive care units, the results are good. Data for 2021 and a comparison with previous years are given below.

Number of procured organs of Slovenian deceased donors in 2021

Kidney	Heart	Liver	Lung (both lobes)	Pancreas	TOTAL
60	13	32	18	2	125

Source: archive of Slovenija-transplant

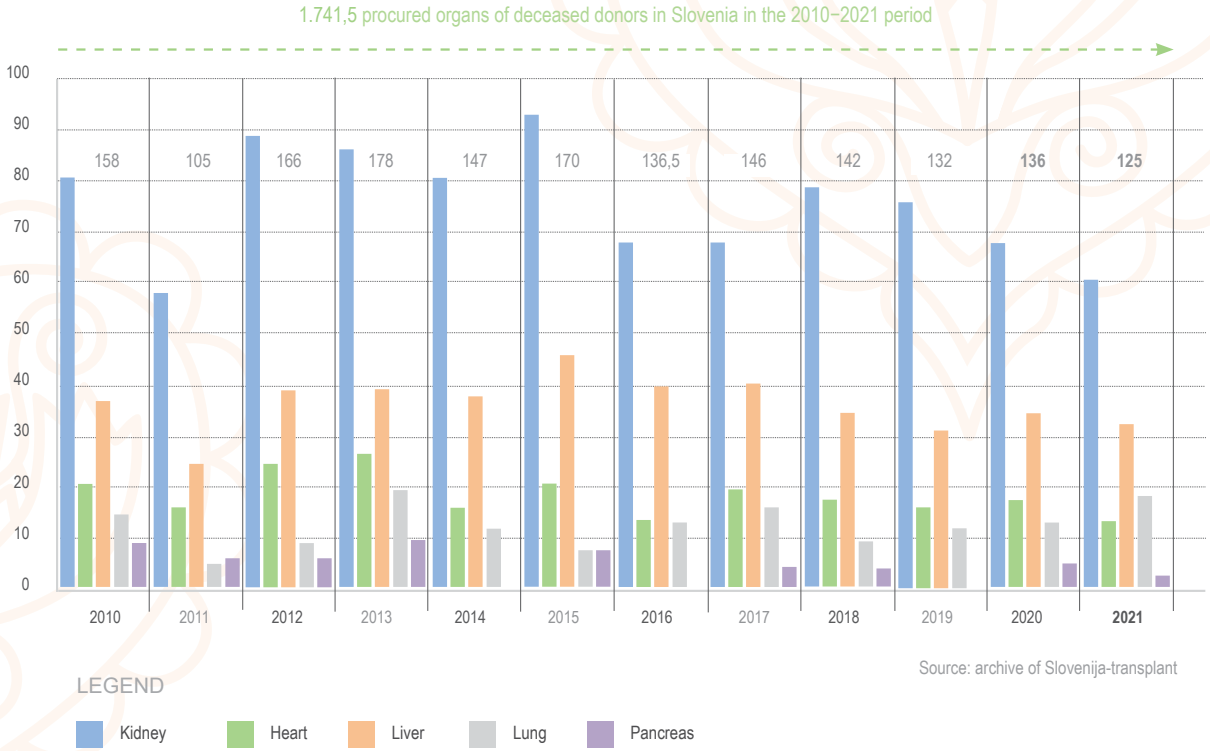


Procured organs of deceased donors in Slovenia in the 2000–2021 period

Year	Kidney	Heart	Liver	Lung (both lobes)	Pancreas	TOTAL
2000-2009	559	149	217	70,5	76	1.071,5
2010	80	20	37	13	8	158
2011	58	14	24	4	5	105
2012	89	25	39	8	5	166
2013	86	26	39	19	8	178
2014	80	16	38	11	2	147
2015	92	20	46	6	6	170
2016	68	13	39	13,5	2	135,5
2017	68	19	40	15	4	146
2018	79	17	34	9	3	142
2019	75	15	31	11	/	132
2020	68	17	34	13	4	136
2021	60	13	32	18	2	125
TOTAL	1.462	364	650	211	125	2.812

Source: archive of Slovenija-transplant

Procured organs of deceased donors in Slovenia in the 2010–2021 period



Source: archive of Slovenija-transplant

TRANSPLANTED SOLID ORGANS

There is one transplantation centre in Slovenia – the Ljubljana University Medical Center – at which programmes for organ transplantation are carried out. The organ distribution system ensures equal access to medical treatment with organ transplantation for all Slovenian citizens. The tasks of the transplantation centre include:

- preparing recipients for inclusion on the waiting list;
- organ transplantation; and
- guiding patients after transplantation.

Since 2014, the transplantation centre has been managed by the cardiovascular surgeon Dr. Ivan Kneževič, MD.

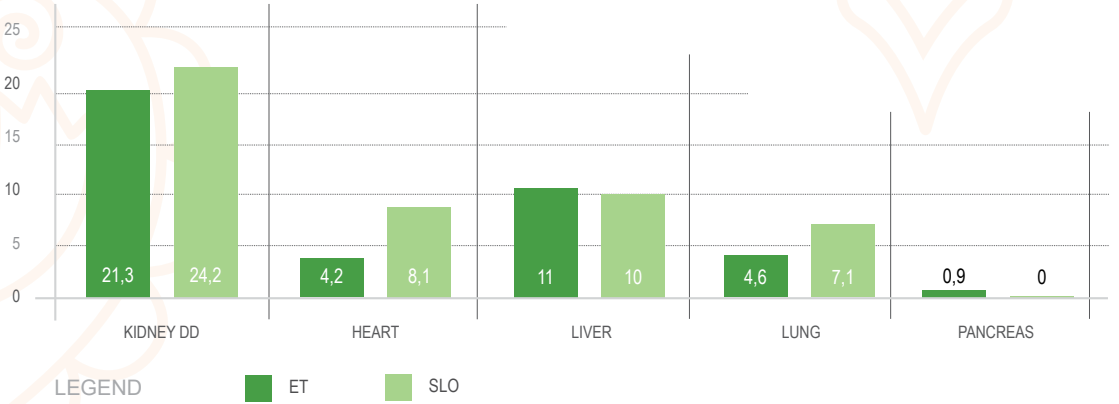
In 2021, 105 organs were transplanted, 104 from deceased donors and one from living donor. The most transplanted organ is the kidneys and we slightly exceed the average of Eurotransplant countries in terms of the number of all transplants from deceased donors per million people. Considerably higher is the number of transplanted hearts per million people, where in the past few years we have been among world's most successfull countries. In the last two years, Slovenia has been one of the most successful countries in the world also in terms of lung transplant program.

Paediatric transplantations are partly performed in the Ljubljana UMC and for younger children in nearby European transplantation centres (kidneys in Graz, liver in Bergamo). The relevant departments in the Ljubljana UMC are in charge of treatment and preparation before organ transplantation as well as medical treatment and monitoring of the patient after transplantation.

Transplanted solid organs from deceased donors in the Ljubljana UMC in 2021 and a comparison with Eurotransplant – absolute number and per million people (PMP)

	Kidney DD		Heart		Liver		Lung		Pancreas		TOTAL	
	No.	PMP	No.	PMP	No.	PMP	No.	PMP	No.	PMP	No.	PMP
SLO	51	24,2	17	8,1	21	10	15	7,1	0	0	104	49,3
ET	2.957	21,3	571	4,2	1.514	11	1.231	4,6	111	0,9	6.398	40,8

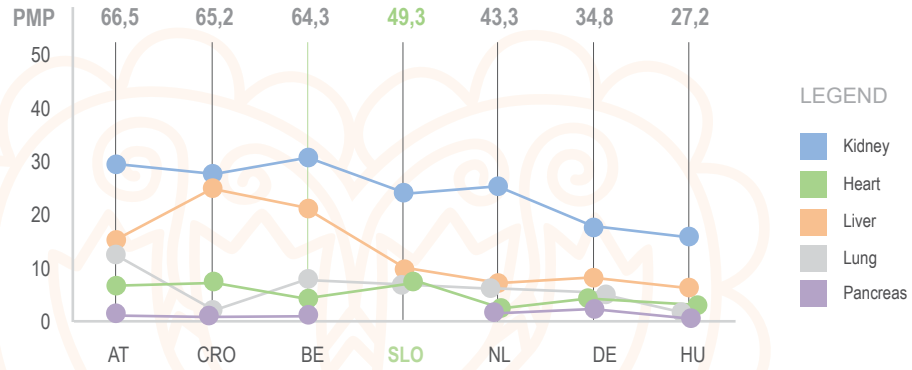
Source: archiv Slovenija-transplant and http://statistics.eurotransplant.org/



Number of transplanted solid organs from deceased donors per million people (PMP) in Slovenia in 2021 and a comparison with the Eurotransplant countries

ET country	Kidney	Liver	Heart	Lung	Pancreas	Number of transplantations/ PMP in 2021
1. Avstria (AT)	29,6	16,8	6,6	13,8	1,6	66,5
2. Croatia (CRO)	29,5	25,8	8,4	2,2	1,5	65,2
3. Belgium (BE)	31,0	21,4	4,5	8,1	1,2	64,3
4. Slovenia (SLO)	24,2	10,0	8,1	7,1	/	49,3
5. Netherlands (NL)	26,6	8,7	2,5	5,3	1,1	43,3
6. Germany (DE)	18,2	9,4	4,0	3,4	0,8	34,8
7. Hungary (HU)	16,4	6,1	3,5	1,4	0,4	27,2

Source: http://statistics.eurotransplant.org/



Number of transplanted solid organs from deceased donors in Slovenia in the 1970–2021 period

Year	Kidney	Heart	Liver	Lung*	Pancreas	TOTAL
1970 - 1985	1					1
1986	7					7
1987	18					18
1988	16					16
1989	14					14
1990	17	1			1	19
1991	11					11
1992	20					20
1993	4	1				5
1994	14	2				16
1995	10	3	1			14
1996	6	2				8
1997	19	6		1		26
1998	46	4	4			54
1999	37	7	9	3		56
2000	44	7	10	1		62
2001	47	4	9	1		61
2002	55	3	11			69
2003	43	3	9	2		57
2004	55	3	15			73

Source: archive of Slovenija-transplant

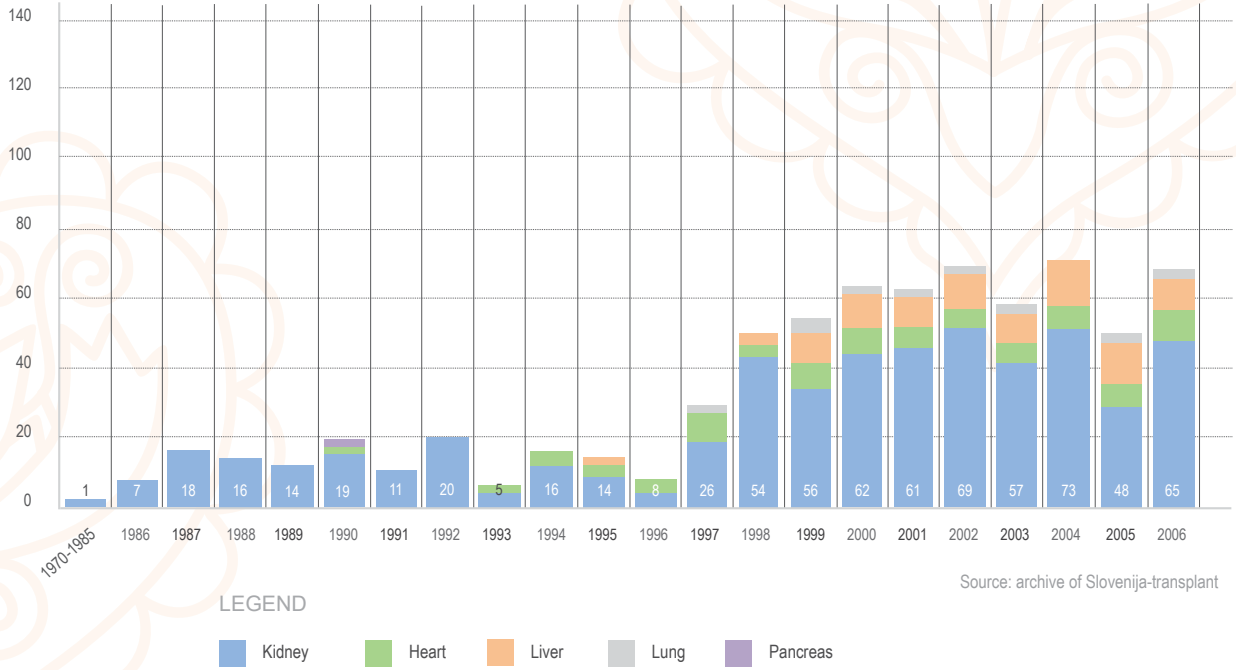
Year	Kidney	Heart	Liver	Lung*	Pancreas	TOTAL
2005	28	5	13	2		48
2006	48	8**	8	2		66
2007	30	11	10	1		52
2008	52	6	22	4		84
2009	43	18	18	2	2	83
2010	61	19	23	3	1	107
2011	46	14	20	7	1	88
2012	62	29***	27	2		120
2013	60	30	21	8	4	123
2014	55	33	31	3		122
2015	64	24	24	7	5	124
2016	44	31	27	10	5	117
2017	46	24	23	8		101
2018	54	23	27	7	3	114
2019	38	22	24	11	1	96
2020	46	24	25	16	2	113
2021	51	17	21	15		104
SKUPAJ	**1.312**	**384**	**432**	**116**	**25**	**2.269**

* All lung transplants for Slovenian patients were performed in AKH Vienna with the exception of 2003 (1 transplant performed in Ljubljana UMC) and 2018 (2 transplants performed in Ljubljana UMC). In 2019, ten transplantations of both lung lobes were performed in the Ljubljana UMC and one paediatric lung transplantation in the University Hospital in Vienna (AKH). Since 2020 all lung transplants are performed in UMC Ljubljana.

** One heart from a Slovenian donor was transplanted to a Slovenian patient in Graz

*** One heart was transplanted, together with lungs, to a Slovenian patient in Vienna

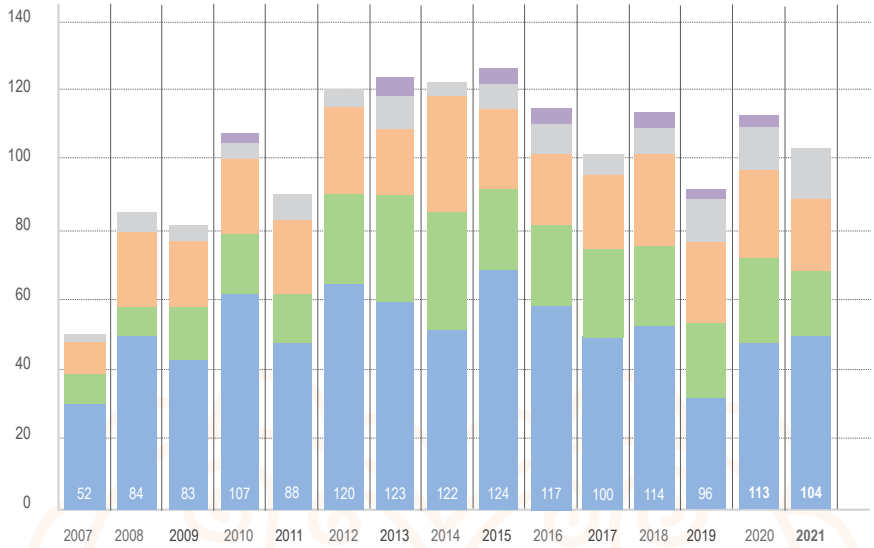
Number of transplanted solid organs of deceased donors in Slovenia in the 1970–2006 period



Source: archive of Slovenija-transplant

Number of transplanted solid organs of deceased donors in Slovenia in the 2007–2021 period

2.269 transplanted solid organs of deceased donors in SLO in the 1970–2021 period



Source: archive of Slovenija-transplant

Number of kidneys transplanted from living donors in Slovenija

A living kidney donation in Slovenia is only possible for genetically or emotionally related recipients. Each case of living donation is always reviewed and approved by the Transplant Ethics Committee. The risk to the donor's health must not be disproportionate to the expected benefit to the recipient. At the beginning of the transplantation programme in Slovenia, since 1970, living kidney donation was predominant. From 1986 on, with the establishment of the national donor programme, most organs were retrieved from deceased donors. After a few years break the living kidney donation programme was revived in 2016 with 1-2 living kidney transplants performed yearly in UMC Ljubljana. One such transplant was performed in 2021.

Number of kidneys from living donors transplanted in Slovenia in the 1970-2021 period

Year	Nr.
1970-85	43
1986	23
1987	14
1988	13
1989	10
1990	2
1991	3

Year	Nr.
1992	5
1993	5
1994	0
1995	1
1996	2
1997	2
1998	1

Year	Nr.
1999	0
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0

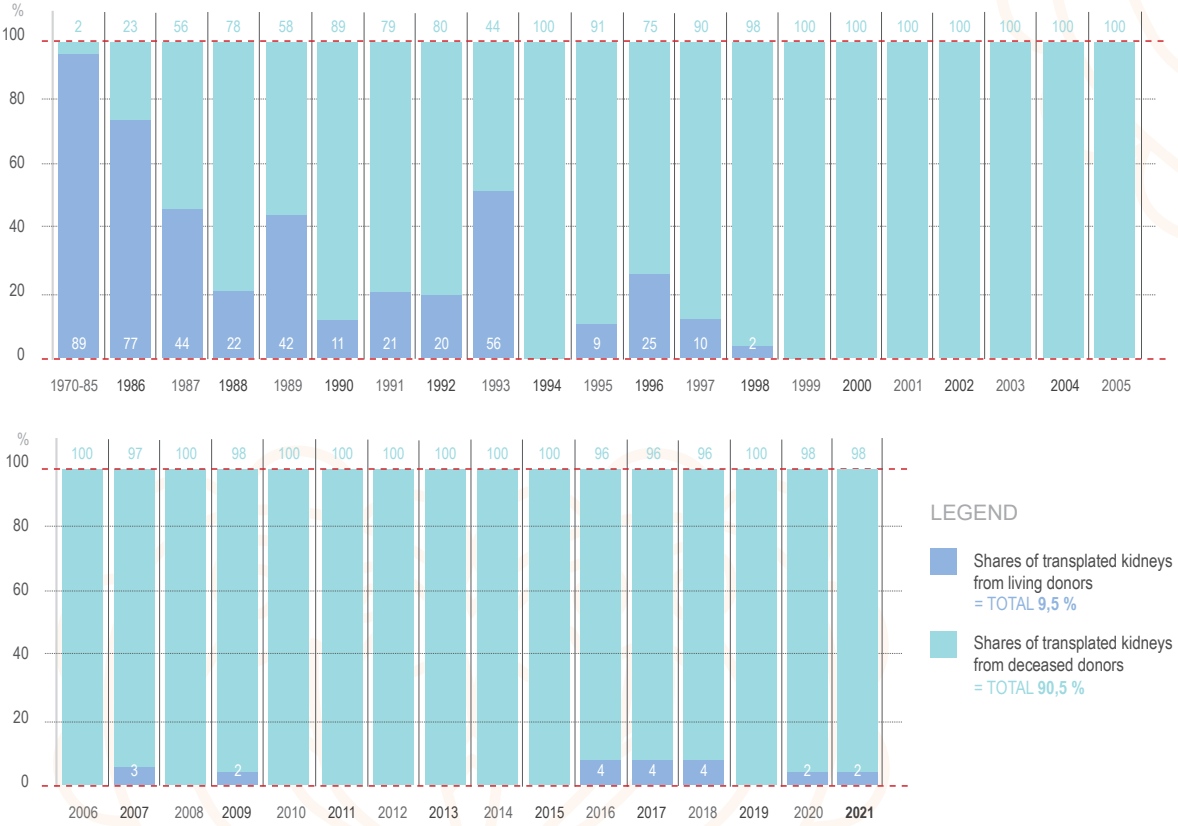
Year	Nr.
2006	0
2007	1
2008	0
2009	1
2010	0
2011	0
2012	0

Year	Nr.
2013	0
2014	0
2015	0
2016	2
2017	2
2018	2
2019	0

Year	Nr.
2020	1
2021	1

TOTAL	134

Shares of transplanted kidneys from living and deceased donors in the 1970 – 2021 period



THE RESULTS IN TRANSPLANTED PATIENTS

Heart transplant programme

From 1990 to the end of 2021, the Ljubljana UMC performed 384 heart transplants, 17 out of those in 2021. Sixteen (94 %) patients had an urgent and 1 (6 %) an elective transplant. The Ljubljana UMC is ranked among largest heart transplant centres in the Eurotransplant area and may be compared by number of transplants with the biggest centres in Germany, Belgium, Hungary and Austria. There is a total of 42 heart transplant centres in the Eurotransplant area.

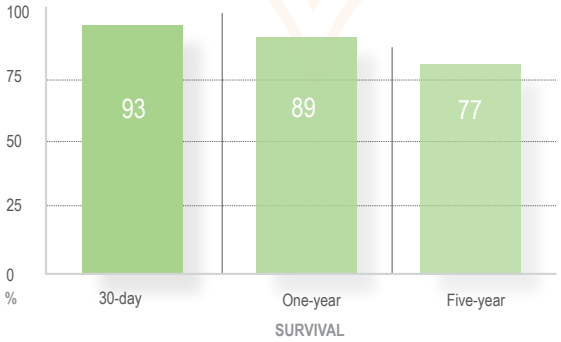
The multi-year average (2009–2021) waiting period for an elective heart transplant was approximately 240 days and for an urgent heart transplant about 55 days.

Of all patients with a heart transplant in 2021, 47 % needed the procedure due to ischemic heart disease and 35 % due to dilated cardiomyopathy. Additional reasons for the transplant include valvular heart disease (6 %), hypertrophic cardiomyopathy (6 %) and congenital heart defects (6 %).

The patient survival rates are comparable with those from the international reference register kept by the International Society for Heart and Lung Transplantation (ISHLT).

Survival of adult heart transplant recipients in % (1990–2021, n = 384)

30-day survival	One-year survival	Five-year survival
93 %	89 %	77 %



Source: Report on implementation of the programme for advanced heart failure and heart transplantation for 2021 (Cardiology Department, Ljubljana University Medical Centre)

Kidney transplant programme

In the period in which Slovenija-transplant has been a member of Eurotransplant (1 January 2000–31 December 2021), 1.082 kidneys of living (10) and deceased donors (1.072) have been transplanted. Some recipients had a kidney transplanted in combination with other organs of which 24 with pancreas, four with heart and two with liver.

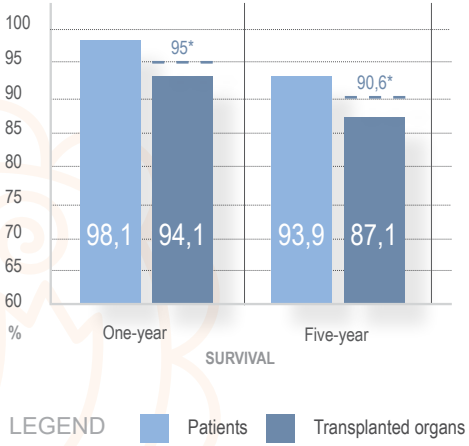
In the first post-transplantation year the clinical, biopsy-proven acute rejection of the transplant was reported in 12.6 % of all patients (1 January 2000–31 December 2021), and in 5,7 % of all patients in year 2021.

In the 2010–2020 period, the median waiting time until transplantation was 350 days. In 2021 the median waiting time until transplantation was 566 days.

Source: Quality indicators of the Kidney Transplantation Centre (Department of Nephrology,
*Censored for patient death with functioning kidney graft

Survival of kidney transplant recipients and transplanted organs in % (2000–2021, n = 1.082)

One-year survival	Five-year survival
Patients	
98,1 %	93,9 %
Transplanted organs	
94,1 %	87,1 %
95 %*	90,6 %*



Liver transplant programme

In 2021, 21 liver transplants were performed in 19 patients (12 men and 7 women) at UMC Ljubljana. Two patients had urgent re-transplantation and one patient died after transplantation. Eighteen patients had elective liver transplantation and one had urgent liver transplantation. The most common indications for liver transplantation in 2021 were cirrhosis of the liver (31.6 %), liver cancer (26.3 %), cholestatic/congenital disease (26.3 %), metabolic liver disease (10.5 %), and acute liver failure due to fulminant autoimmune hepatitis (5.3 %).

Between 1995 and Dec. 31, 2021, University Medical Centre Ljubljana performed 432 liver transplants in 388 patients. Of all patients with liver transplantation, 62.5 % needed the procedure due to cirrhosis of the liver, 10.3 % due to acute liver failure, 9.6 % due to liver cancer, 9.3 % due to cholestatic/congenital disease, and 2.4 % due to metabolic liver disease. Other reasons for transplantation (5.8 %) include benign liver tumours, polycystic liver disease, and Budd-Chiari syndrome.

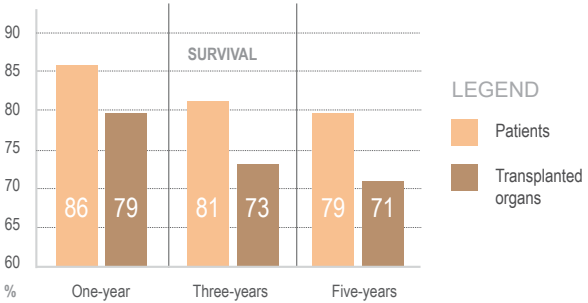
Source: Report on implementation of the programme for liver transplantation for 2021 (Clinical Department of Gastroenterology, University Medical Centre Ljubljana)

The average waiting time for liver transplantation in 2021 was 108 days, with a median of 55 days. In high urgency cases, a suitable organ was usually available within a few days.

Survival of liver transplant recipients and transplanted organs in % (1988–2021*)

	One-year survival	Three-year survival	Five-year survival
Patients	86 %	81 %	79 %
Transplanted organs	79 %	73 %	71 %

Source: ELTR (European Liver Transplant Registry, SLLUBL: Specific Analyses June 2021)
* Data for 2021 will be available in mid 2022; published data are from 1988 to June 2021



Pancreas transplant programme (in combination with kidney)

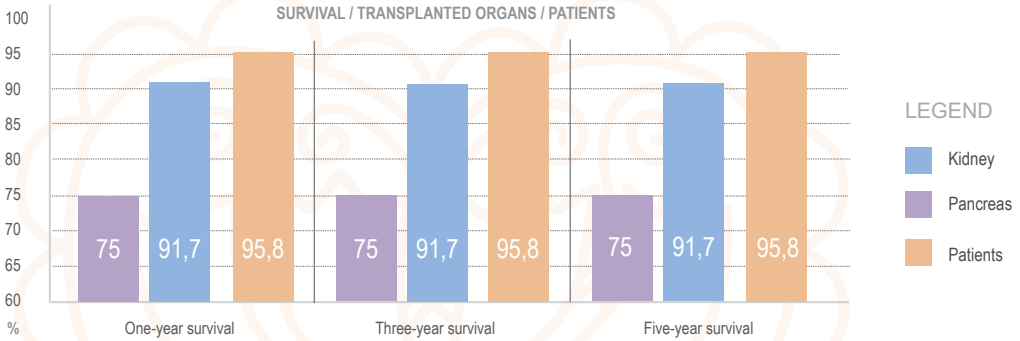
In the period from February 2009 to 31 December 2021, 24 pancreas transplants were carried out, all concurrently with kidney. No pancreas and kidney transplantation were performed in 2021.

In the period from February 2009 to 31 December 2021 five pancreases were removed in the early post-transplant period. One recipient died in the early post-transplant period due to infection. On 31 December 2021 there were 15 patients with functioning pancreas and kidney.

Survival of combined pancreas-kidney transplant recipients and transplanted organs in % (2009–2021, n=24 (patients) in n=19 (transplanted organs))

One-year survival		Three-year survival		Five-year survival	
Patients					
95,8 %		95,8 %		95,8 %	
Transplanted organs					
Pancreas	Kidney	Pancreas	Kidney	Pancreas	Kidney
75 %	91,7 %	75 %	91,7 %	75 %	91,7 %

Source: Associate Professor Dr. Damjan Kovač, (Department of Nephrology, UMC Ljubljana)



Lung transplant programme

In the period from 1997 to 2021, 116 lung transplants were performed in Slovenian patients. 72 transplants were performed at AKH Vienna (until 2019), including one re-transplantation and one combined lung -heart transplantation. In 2021, 15 lung transplants were performed at UMC Ljubljana, all of them were of both lung lobes. Four transplants were urgent, all due to complications after covid 19 disease.

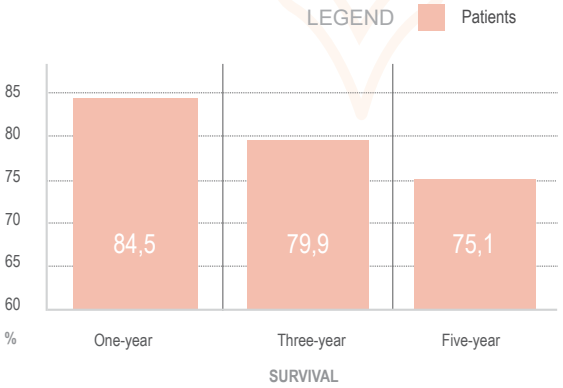
The most common indications for lung transplantation at UMC Ljubljana were chronic obstructive pulmonary disease (35 %), pulmonary fibrosis (21 %), cystic fibrosis (21 %), and lung failure after covid-19.

The median waiting time for urgent lung transplantation in 2021 was 6 days, and for elective lung transplantation was 179 days.

Survival of lung transplant recipients in % (1997–2021)

One-year survival	Three-year survival	Five-year survival
Patients		
84,5 %	79,9 %	75,1 %

Source: doc. dr. Matevž Harlander, MD
(Department of Pulmology and Alergology, University Medical Centre Ljubljana)



Tissues and cells

TRANSPLANTATION OF HAEMATOPOIETIC STEM CELLS

The transplantation of haematopoietic stem cells (HSCs) is the dominant type of cell treatment since over 70 malignant and non-malignant diseases can be treated in this way, whereas for specific haematological diseases this is the main and only therapeutic possibility for a patient's recovery. The modern method of medical treatment using HSCs is more than 90% successful in optimal conditions (http://www.ztm.si). For such success, good donor-recipient immunological (HLA) matching is required. Therefore, Slovenia has been included in the World Registry (BMWR), where voluntary donors are registered and typed, and where collection and transplantation procedures are performed if a match is found.

In some cases it is possible to use a patient's own HSCs, this is called an autologous donation. More often a donation is based on match between relatives. According to Slovenian legislation, collection and transplantation can also be performed between unrelated persons, respecting the principle of anonymity. Donation by another donor is called allogeneic and a donor is sought both in Slovenia and abroad.

The Slovenija Donor register

In Slovenia a register of non-related donors, Slovenia Donor, was established in 1991 and the following year it became a full member of the world register Bone Marrow Donors Worldwide (BMDW).

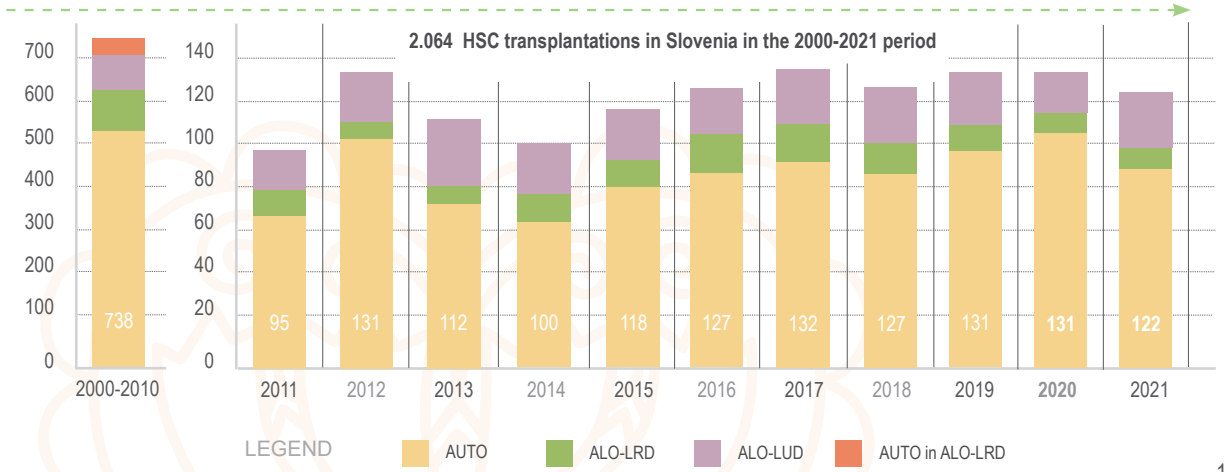
On 31.12.2021, the Slovenia Donor register featured 22.816 people, of whom 21.303 were entered in the BMDW register.

HSC transplantations in Slovenia in the 2000–2021 period

Transplantion type	2000-2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
AUTO	531	68	101	74	63	84	86	92	88	89	104	89
ALO-LRD	102	9	8	7	11	10	15	12	13	11	10	10
ALO-LUD	84	18	22	31	26	24	26	28	26	31	17	23
AUTO and ALO-LRD	21											
TOTAL	738	95	131	112	100	118	127	132	127	131	131	122

AUTO – autologous transplantations, **ALO** – allogeneic transplantations, **LRD** – living related donor, **LUD** – living unrelated donor

Source: Yearly report of ZTM – Slovenija donor, data collected monthly for Slovenija-transplant archives



CORNEA PROCUREMENT AND TRANSPLANTATION PROGRAMME

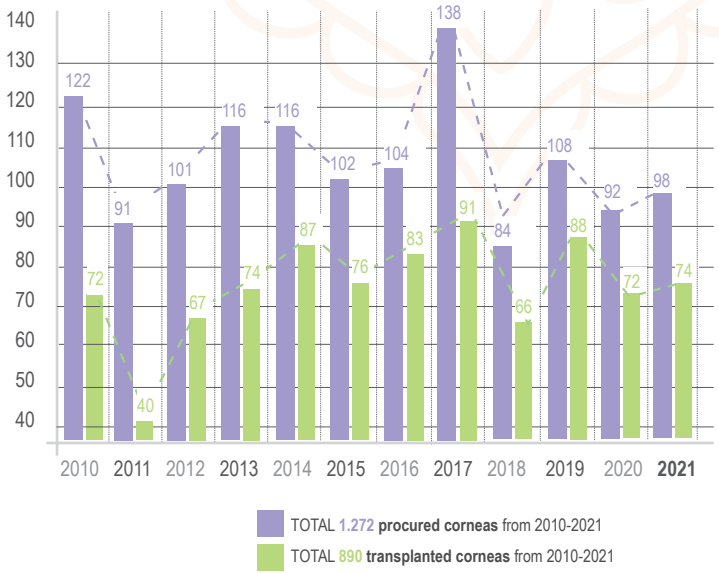
Cornea transplantation is one of the most frequent and most successful tissue transplantations in Slovenia and in the world. This medical treatment is often the only method that can improve sight after a disease or injury. In Slovenia, corneas are procured from deceased donors after a

Procured and transplanted corneas in the 2010–2021 period

Year	No. of procured corneas	*No. of transplanted corneas
2010	122	72
2011	91	40
2012	101	67
2013	116	74
2014	116	87
2015	102	76
2016	104	83
2017	138	91
2018	84	66
2019	108	88
2020	92	72
2021	98	74

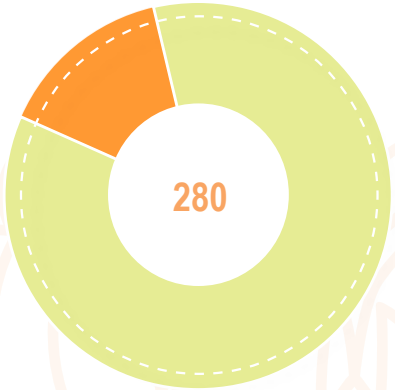
* 2010–2017 – cornea transplants performed in Ljubljana UMC only; from 2018 on, cornea transplants performed in Ljubljana UMC and Maribor UMC

Source: archive of Slovenija-transplant



cardiovascular death or a brain death. The removal of corneas is possible following consent given by the deceased person before their death or if their close relatives do not object. In addition to the consent obtained, a detailed assessment of the suitability of the cornea for transplantation by the responsible physician of the recipient is required. Corneas are transplanted in two transplantation centres: the Department of Ophthalmology in the Ljubljana UMC and the Department of Ophthalmology in the Maribor UMC.

Waiting list of patients seeking a cornea transplant at the Department of Ophthalmology in the Ljubljana UMC (on 12 January 2022) and Maribor UMC (on 4 January 2022)



Diagnosis	Number of patients
Keratoconus	41
Other diagnoses	239
TOTAL	280

Total: **280** patients (**277** Ljubljana UMC, **3** Maribor UMC) (100%)

LEGEND

Diagnosis of keratoconus: **41 patients (15 %)**

Other diagnoses: **239 patients (85 %)**
(injuries, degeneration, retransplantation, corneal macula, Fuchs dystrophy, endothelial dystrophy, cornea guttata, aphakia and pseudophakia, bullous keratopathy, infections, other)

Source: Ljubljana UMC, Department of Ophthalmology, UMC Maribor Department of Ophthalmology

OTHER TISSUES AND CELLS

Traceability and transparency in transplant programmes or tissue and cell use programmes for treatment purposes

Tissue and cell institutions must hold a valid permit, issued by the Agency for Medicinal Products and Medical Devices of the Republic of Slovenia (hereinafter: JAZMP). Slovenija-transplant ensures traceability and transparency by promptly collecting and reviewing reports written by the institutions for tissues and cells which present the donation, procurement, processing, storing, allocation, use and disposal of tissues and cells.

At the end of the year, Slovenija-transplant compiles an aggregate annual report based on annual reports issued by individual tissue and cell institutions. We are also authorised for compiling an annual final report on serious adverse events and reactions and submit it to the JAZMP, which then reports thereon to the European Commission.

Tissue and cell institutions along with quality and safety assurance

In Slovenia, 26 institutions are involved in the activity of procuring and using tissues and cells at the national level. Fifteen hospitals are included in the programme and, within these, 40 clinical departments. In terms of their status, 18 tissue and cell institutions are public and 8 privately owned. Private institutions hold a permit exclusively for the autologous procurement of tissues and cells.

Slovenija-transplant and the JAZMP ensure that the system functions transparently and promptly identify and discuss any deviations that could affect the quality and safety of the tissues and cells of donors, recipients as well as the staff involved in the processes.

To obtain a permit, every institution must comply with strict expert and legal terms and provisions. All institutions have set up a quality assurance system where all the procedures for ensuring conditions for tissue and cell quality and recipient safety are defined. They are regularly supervised by the JAZMP, whereas Slovenija-transplant also performs verification of the reported data.

Artificial insemination with biomedical assistance and reproductive cells

Four centres are registered in Slovenia for the activity of artificial insemination with biomedical assistance for couples, namely the Ljubljana AIBA Centre, the Maribor AIBA Centre, the Postojna AIBA Centre and the Dravlje Health Centre.
The scope of their activities is evident from the table showing the procured and used tissues and cells. This is the most comprehensive area in terms of the number of procedures conducted.

Procuring and storing umbilical cord blood and the umbilical cord

In Slovenia we also procure haematopoietic stem cells from umbilical cord blood and the umbilical cord as well as other tissues (e.g. milk teeth). One public tissue bank, i.e. the Blood Transfusion Centre of Slovenia (hereinafter: BTCS), and three privately-owned institutions (Izvorna celica, Biobanka and FH-S) hold a permit for this activity. The public umbilical cord blood bank within the BTCS has stopped accepting samples of umbilical cord blood because a sufficient number of samples had been collected and stored to cater to the needs of Slovenia. However, discussions are underway to continue collecting and storing not only for autologous use, but also for anyone who would need such cells. We are talking about an allogeneic donation that would be made possible by public funds.

Number of procured tissues and cells in the 2009–2021 period

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Skin*	28	45	22	36	85	89	52	57	32	22	24	10	46
Bones*	38	123	108	67	93	82	147	74	80	78	71	59	256
Soft bone grafts*	22	39	/	3	11	3	9	/	12	/	/	/	0
Cartilage*	37	21	4	12	11	11	12	/	/	/	/	/	0
Reproductive cells (no. of cells)	15.854	43.472	8.640	27.479	41.929	37.542	39.769	26.191	36.338	13.778	26.813	28.209	24.736

* Unit: number of samples taken

Number of tissues and cells used in the 2009–2021 period

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Skin*	36	10	14	34	67	23	31	28	/	20	3	/	47
Bones*	23	47	57	97	59	62	92	82	72	71	81	101	123
Soft bone grafts*	12	/	2	2	3	4	3	5	2	3	5	4	2
Cartilage*	15	/	3	7	4	9	5	1	/	/	1	/	3
Reproductive cells	1.450	2.018	29.651	23.330	23.506	27.271	31.127	26.620	31.817	12.110	5.109	14.255	27.547

* Unit: number of samples used

Source: Archive of Slovenija-transplant

Number of procured umbilical cord blood units

Institution / Year	2015	2016	2017	2018	2019	2020	2021
Izvorna celica	76	144	107	82	81	81	78
Biobanka	175	178	266	110	224	197	241
FH-S	8	45	101	169	192	206	245
Neocelica	238	0*	0*	0*	0*	0*	0*

* this institution stopped operating

Number of procured umbilical cord units

Institution / Year	2015	2016	2017	2018	2019	2020	2021
Izvorna celica	60	116	96	52	73	75	77
Biobanka	32	150	222	96	212	184	236
FH-S	8	42	96	114	196	213	247
Neocelica	198	0*	0*	0*	0*	0*	0*

* this institution stopped operating

Source: Archive of Slovenija-transplant

Adverse events and reactions

Slovenija-transplant is responsible for monitoring adverse events and reactions as well as deviations in the area of the procurement of tissues and cells for transplantation and/or tissue vigilance. The aim of collecting reports on adverse events and reactions or even raising doubts about them is to assure the quality of procedures and thus prevent the damage or even loss of tissues and cells.

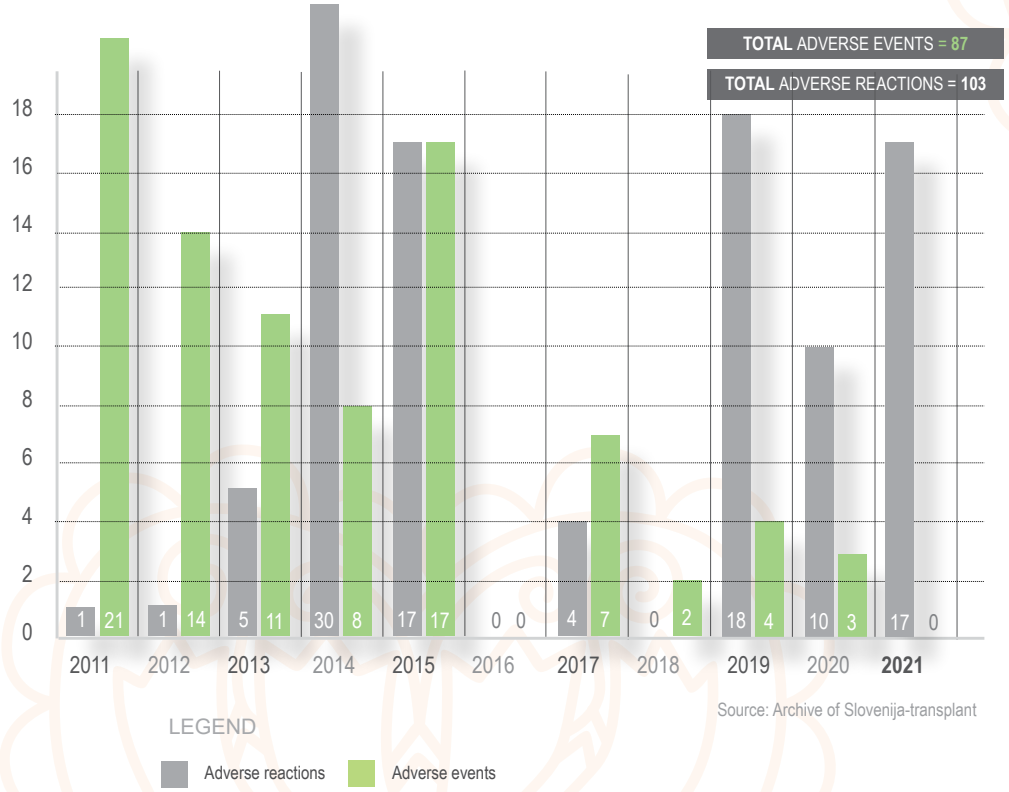
Reporting takes place using prescribed forms, whereby initial and final reports must be submitted for each case. Both forms are attached to the Rules on Tissue Vigilance. Reporting entails several phases: identification of deviation, detailed assessment and description of the case, adoption of appropriate measures for preventing damage to tissues and cells as well as people, reporting the case to relevant institutions and notification of all tissue and cell institutions which were provided with tissues and cells in which deviations were identified.

All data collected in the tissue vigilance system are anonymised so as to ensure privacy and, on the other hand, comply with the so-called culture of non-judgement, which means encouraging reporting along with searching for solutions and improvements, while not judging implementers on a personal level.

Slovenija-transplant received no reports on adverse events in 2021. We believe that adverse events do occur but have not been reported according to Slovene legislation. In 2022 we are organising a national training on tissue vigilance and adverse event reporting for all responsible persons of tissue and cell institutions.

An AIBA centre also dealt with 17 cases of adverse reactions. Eight cases involved ovarian hyperstimulation syndrome. In 6 cases, strong venous bleeding occurred, but hospitalisation was not required. In two cases trouble at ovarian puncture procedure occured.

Number of adverse events and reactions in the 2009–2021 period



Source: Archive of Slovenija-transplant

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Scientific articles

- Avsec D, Šimenc J. Twenty Years of Deceased Organ Donation in Slovenia: Steps Towards Progress in Quality, Safety, and Effectiveness. American Journal of Health Research, 2021, 9(3): 82-88. 9. Available: Twenty Years of Deceased Organ Donation in Slovenia: Steps Towards Progress in Quality, Safety, and Effectiveness: Science Publishing Group.
- Avsec D, Šimenc J. Better Donor Detection and Referral in the Intensive Care Units in the Context of End-of-Life Care, submitted to Experimental and Clinical Transplantation, Supplementary issue (in preparation for publication).

Professional articles and publications

- Šimenc J. (interviewer):» In the central office of Eurotransplant on a good day we find 10 matches between the donor and the recipient / V centralni pisarni Eurotransplanta na dober dan najdemo 10 ujemanj med darovalcem in prejemnikom«. Intervju s dr. Petrom Brangerjem. Isis, 1/2021: 38-40. Available at: http://online.pubhtml5.com/agha/ewpo/#p=38.
- Avsec D, Uštar B. (eds). Give life a chance: donation and transplantation activity in Slovenia in 2020. Ljubljana: Institute for transplantation of organs and tissue of the republic of Slovenia, Ljubljana: 2021. Available at: https://www.slovenija-transplant.si/admin/uploads/upload/DajZivljenjuPriloznost2020.pdf
- Šimenc J, Avsec D. Religion and Altruistic Deceased Organ Donation / Verstva in altruistično darovanje organov po smrti. Glasilo Transplant. July 2021.
- Šimenc J, Avsec D. Report from ESOT congress/ Poročilo s kongresa Evropskega združenja za transplantacije organov. Glasilo Transplant. December 2021.

- Deceased organ donation: Funeral guide for relatives of the deceased / Darovanje organov po smrti. Pogrebni priročnik za svojce preminulih, Mogenas, Ljubljana: 2021: p. 15. (prepared by Šimenc J.).

Participation in International Congress

- Avsec D, Gadžijev A, Šimenc J. Uninterrupted and successful deceased donation programme in Slovenia during Covid-19 crisis in 2020. Transplant International, 34 (Suplement 1), August 2021. Abstracts of the 20th Biennial European Society for Organ Transplantation (ESOT) Congress, Milan, Italy, 29 August – 1 September 2021, p. 340. Available at: www.esot.org .

Oral presentations and lectures (in chronological order)

- Danica Avsec: Ethical and legislative aspects in transplant medicine, Webinar on transplant activities and donation programs for Caribean countries, invited lecture.
- Danica Avsec: Communication with the family, 4th Preparatory course for CETC 2021, Board of Transplant Coordinators at UEMS Surgery in cooperation with Swisstransplant, invited lecture.
- Danica Avsec: Certification of European Transplant Coordinators and Preparatory Courses, 4th Preparatory course for CETC 2021, Board of Transplant Coordinators at UEMS Surgery in cooperation with Swisstransplant, introductory lecture.
- Danica Avsec: Better Donor Detection and Referral in the Intensive Care Units in the Context of End-of-Life Care in Slovenia, MESOT 2021, invited lecture.
- Danica Avsec: How to establish a proactive donor detection program, Donation as part of End-of-life Care, Educational video lecture, Available at: www.esottransplantlive.org (members access only), invited lecture.

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- Council of Europe Convention against Trafficking in Human Organs (CM, 9. 7. 2014).
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