

SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

Action number: CA15210 (European Network for Collaboration on Kidney Exchange Programmes)

STSM title: Quality of transplants in kidney exchange programmes

STSM start and end date: 15/09/2019 to 21/09/2019

Grantee name: Péter Biró

PURPOSE OF THE STSM/

Péter Biró (senior researcher at the Hungarian Academy of Sciences) visited Antonio Nicolo (Professor of economics at University of Padova) to continue the joint research started in January 2019 with the visit of Antonio Nicolo to Budapest. The main topics of research is the role of transplants' quality in kidney exchange programs.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS

We continued the research on the quality of transplants in kidney exchange programmes (KEPs). National KEPs are operating in at least ten European countries under various policy restrictions and objectives. The number of transplants in the solution is the primary consideration everywhere. The quality of the transplants is also considered in some of the programmes by giving scores on the HLA-match in between the potential donors and patients, and considering their age-differences, but the effect of these scores seem to be negligible. The natural measure for the quality of the transplant is the expected graft survival time. According to the medical literature on living kidney donation this is primarily influenced by the age of the donor, the age-difference and the HLA-matching between the donor and the patient. Together with Lucrezia Furian (leading transplant surgeon at the Padova transplant centre) we discussed the possibilities of conducting simulations of their living donation data (possibly combined with the Italian KEP data) to investigate the potential gains of conducting exchanges instead of the direct transplants (with around 1/3 ABOi transplants in the last years).

We prepared a plan for conducting simulations on real and generated data, where the main question is how the quality of transplants can be improved when involving more compatible or ABO incompatible pairs in the KEP. We discussed the most important factors used in the literature and also the potential solutions concepts that we could compare in the simulations.

Regarding the theoretical side of the study, we discussed and identified different incentive properties of the matching mechanism used in this agent-based framework, that may well depend on the objectives of the optimisation.

FUTURE COLLABORATIONS (if applicable)

We will conduct the planned simulations on generated instances and on the data of the Padova centre, when this will be available. We will also continue the study of incentive properties of different matching mechanism in kidney exchange programmes from the perspective of patient-donor pairs.