**Using an Agent-based Modeling Approach to Organ Trafficking Market Formations**

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**Abstract**

There has been an overall increase in the organ trafficking markets globally. The emergence and existence of these markets depends on interactions between organ sellers, buyers, transplant service/care providers, and financial institutions. This paper develops an analytical framework named OrganSIM, an Agent based Model (ABM) that simulates emergence of organ trade networks. OrganSIM could be used to explore how illegal organ trafficking markets come into existence and expand, and what factors lead various people to be a part of the underground market. The primary objective of the research is to create a simulation model that could be used for testing various policy ideas under consideration in the US, including donor compensation. OrganSIM is used to simulate realistic social networks that are specific to organ trafficking agents, namely: buyers, sellers, brokers and surgeons, each of them playing distinct roles. The ABM is used to simulate the evolution of the social network and to identify the most effective approaches to mitigate the network expansion of the underground market. The approaches would be able to identify viable solutions among policy alternatives such as legal regulated compensation of organs, government regulated distribution system, and so on. The study is one of the first attempts to model a system where various illegal markets form, grow, and disappear because of interactions between various agents at multiple levels. The agent based model would consist of agents, their attributes, and behavior and transition rules, which all interact through space and time. An assessment of the network of organ trafficking together with the knowledge of the main transaction routes would be a useful tool for identifying effective policies to mitigate illicit organ trafficking.

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