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# Antibiotic Resistance as a Tragedy of Commons

**Sedef Oluklulu**[1]

**Abstract:** The infections caused by microbic organism and bacteria can be cured since discovery of antibiotics in the late 1930's. Antibiyotic treatment not only reduced the risk of fetal diseases but also the transmissin of microbic agents between humans and animals. The risky processes like orthopeadic surgery, chemotherapy, organ transplant wolud be much more fatal without antibiotics. Antibiotics that are used as nutritional supplement for farm animals increases production by accelerating the weight gain and growth of animals. On the other side widespread use of antibiotics caused the formation of genetically modified bacteria resistant to antibiotics. When the frequency of doctors prescribing antibiotics increases, the risk of resistance to antibiotic increase. Even if the disease is not clearly diagnosed, prescribing broad-spectrum antibiotics can also increases the risk of antibiotic resistance. In the public finance theory, quasi-public goods, where exclusion is not possible, but where the additional individual reduces the benefit of other individuals, are defined as common goods. It is not possible to exclude anyone from the resistance in the formation of antibiotic resistance however every individual that are use antibiotics for unnecessary reasons increases the risk of antibiotic resistance. This is considered as the tragedy of the commons in the theory of finance. The rational individual would like to maximize their interest by using antibiotics like healing from a simple cold without getting rest at home. However individuals'short-run interest maximizing behavior would damage the common interest in the long-term by causing bacteria to gain resistance and losing their therapeutic properties. The situation is similar in the case of the common pasture of several villages, villagers acquire more farm animals by considering their short-term interests and the Nash equilibrium in the prisoner's dilemma.

**Keywords:** Theory of public finance, tragedy of commons, antibiotic resistance, common pool resource, prisoner's dilemma

[1]Anadolu University, Department of Public Finance, Eskişehir, Türkiye, sedefcelik@anadolu.edu.tr