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### Vaccine Mandates and the Tragedy of the Commons

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## Research Abstract Title

Vaccine Mandates and the Tragedy of the Commons

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**IRB Number:**

**Describe role of Submitting/Presenting Trainee in this project (limit 150 words):**

**The role of the trainee in this project was conceptual development, research, data collection, data and policy analysis, manuscript creation.**

**Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words**

**Background:**

After 501 cases of measles in 2019, Germany passed a law mandating the vaccine for all children entering school. At the same time, 61 children under 5 years of age died from Measles in Samoa. This led the government arrest of a vocal anti-vaccine figure who was said to be behind the reduction in vaccination rates. Samoa has begun door-to-door mandatory immunization.

Measles cases have been rising among developed nations due to reductions in vaccinations. Lower percentages of immunized people lead to outbreaks. In the 1970's England and Wales saw a large drop in their pertussis vaccination rates. This led to a national epidemic with 5,000 hospitalizations and 38 deaths. There is a correlation between increased incidence of outbreaks subsequent spikes in vaccine participation, raising a serious question around complacency and hesitancy. Vaccine exemptions lead to a loss of herd-immunity and outbreaks.

Many states in the US have moved to vaccine mandates for school entry but allow religious or principle-based exemptions. There is a fruitful debate underway among bioethicists around obligations to contribute to herd-immunity. We support this move but note two important barriers to herd-immunity: complacency and hesitancy. A systems theory archetype provides a useful way to explore the ethics and health consequences of losing herd-immunity thresholds.

**Objectives/Goal:**

Drawing on the current bioethical debate on vaccinations, we present the tragedy of the commons archetype to illustrate the ethics around complacency and hesitancy in losing herd-immunity thresholds. Our hypothesis is that the consequences of losing herd-immunity are known and unethical to allow.

**Methods/Design:**

Analyzing the current ethical arguments towards obligations to realize herd-immunity, we will apply the tragedy of the commons archetype to illustrate the ethical imperative for more coercive vaccine policies.

**Results:**

Herd-immunity is a social good. Any rational planner, considering the risks and benefits of immunization, would seek to immunize every child against common, life-threatening, contagious diseases for which there is a safe and effective immunization. The collective communitarian benefits outweigh each individual's risk, so all individuals benefit. Herd-immunity should be thought of like clean air, water or public land, something to which we each contribute and from which we all benefit.

**Conclusions:**

The solution for "tragedy of the commons" problems is communal political action – namely regulation– that maximizes social good and, by doing so, ensures that individuals will generally, as a part of the whole, be better off. "Nudging" strategies are insufficient. The focus should be shifted from individual liberty toward benefit to the community's common good – that provided by herd-immunity. We recommend three policy changes: 1) mandated immunizations for all contagious preventable disease that are susceptible to the tragedy of the commons archetype, 2) Only legitimate medical contraindications will be allowed, verified by a licensed medical or advanced practice nursing provider, and 3) State health departments monitor herd-immunity thresholds.