# Behavioural Public Policy Blog

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## Could we use “cognitive vaccination” against “Anti-vaxx”?

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The dispute between propaganda anti-vaccine campaigners and those who support vaccination programs based on scientific evidence is a relentless battleground. Notably, in Italy the debate has recently flooded multiple outlets, from newspapers to social media, from parliament to main squares, heating up when a recently passed law made vaccination compulsory for pupils attending public schools, with parents not obliging risking a fine or the loss of parental authority.

The decision came after Italy, under close monitoring by the World Health Organization (WHO), had seen vaccination coverage rates decrease across preventable diseases by an average by 2%, and none of the vaccination programs reached the 95% coverage target set by the National Immunization Prevention Plan.

Why are so many parents in Italy (As well as in the USA, France, Japan and many other European and Western Pacific regions) deciding against following immunization programs recommended by public health authorities? Is the coercive solution devised by the Italian government the only viable response? Or is there a better behavioural public policy answer to encourage individuals to vaccinate, without falling in the trap of “law enforcement threats against individual freedom”?

Loss in confidence and vaccine hesitancy are complex and layered phenomena, but taking advantage of the toolbox of behavioural economics could provide better explanations and more appropriate solutions to this worrying trend, without being exposed to anti-vaxx policy counter-arguments (i.e. the freedom to choose how to maintain physical health, or exercising the liberty to dissent from perceived conflicts of interest involving governments and Big Pharma).

Conventional approaches to increase vaccine acceptance assume that, other than forcing, educating parents about the evidence-based benefits of vaccination solves the issue by simply changing their minds and beliefs.

Unfortunately, behavioural economics has time and time again proved that this is a simplistic model of how human beings make decisions and a poor framework to change hesitant attitudes. In fact in a previous blog post (https://bppblog.com/2017/06/01/new-research-confirms-ancient-talmudic-writings/) by Howard Lavine (add link), it was explained exactly how exposing people to the same body of evidence is unlikely to produce belief convergence among divergent opinions, but it rather leads to belief polarization. In other words, by simply exposing parents to information about vaccines might generate the opposite effect of what policy makers are aiming for: polarization rather than agreement.

In particular, behavioural economics sheds light on the mechanisms that influence people's decisions about vaccination. For example, within the "omission bias" parents might prefer not to vaccinate (omitting) and take a chance with the "natural illness", rather that "unnaturally vaccinate" (acting) and be the sure cause of a potential side-effect. This is directly linked with overestimating and over-weighting of small probabilities: some individuals have low thresholds of "acceptable risk", and these are even lower for deliberative actions.

These biases (together with others, such as the immediacy effect, availability heuristics, loss aversion, social preferences and trust) are fed by misinformation: a cognitive ticking bomb that needs defusing by effective and lasting de-biasing.

We claim that *Inoculation Theory* could help solve this policy problem. This approach has come into the spotlight again with a recent article published by Van Der Linden et al. (2017) on public attitudes about climate change. The idea behind this cognitive theory is a biological metaphor: like one's system can be inoculated with a weakened dose of a virus in order to protect the organism from future attacks by the very same disease; attitudes can be psychologically protected from alternative facts, fake news and generalized misinformation. Simplifying it to its core, *by being exposed to weak persuasive messages against an attitude, individuals should develop a sort of cognitive-immunization against future persuasive attacks.*

This technique could also be applied to vaccination hesitancy. Vaccination Hesitant Parents (VHPs) are mothers and fathers, who might refuse some vaccines, accept others, postpone some, ask for separate shots (rather than a combined one), or are dubious about the right thing to do when it comes to vaccinate their children. Generally speaking, VHPs follow expert advice with their first-born, but develop a sense of advocacy with the next one(s). These parents trust more their own (often web-based) "research" on immunization, rather then being blindly deferential: for them a good parent is one that questions expert recommendations. This type of "fence-sitters" are torn by the relation between the benefits and risks of vaccines, wondering if the former really outweigh the latter. They are easily persuadable, becoming immunization resistant rather than acceptors. The policy concern around VHPs is that indecision easily becomes demurral, as suggested by previous instances and studies (Salathè and Bonhoeffer (2008)). When hesitancy becomes refusal, then refusal results in unvaccinated clusters, and these critically turn into disease outbreaks.

Only two studies have been testing inoculation theory in the context of vaccination: McGuire et Papageorgis (1961) used a small sample of 130 students but with no statistically significant conclusion, and Wong et Harrison (2014) used a sample of 212 female university students to test the resistance of positive attitudes on HPV vaccination against messages attacking its safety and

efficacy. Although these studies have opened the way for further research in this area, investigations on inoculation theory for VHPs, against the attacks of anti-vaccinationist campaigns, are not yet available.

Our proposal aims at testing the validity of inoculation theory in a real – yet controlled – hospital clinic setting, as a tool to protect and de-bias Vaccine Hesitant Parents (VHPs) from the attacks of anti-vaccinationist arguments, generating resistance to persuasion.

After childbirth mothers and fathers are often overwhelmed by a number of challenges, including sleep deprivation, new schedules and doubts about childcare, which might leave them cognitively exposed also to anti-vaxx arguments. In order to protect them from influential misinformation attacks, we would "inoculate" them prior to exposure. In practice, during antenatal screening visits we will administer a questionnaire to parents in order to identify those who are potential VHPs. Next, "vaccination against anti-vaxxers" is simply a program to learn how to self-sufficiently counteract misinformation. To exemplify, parents would be first shown scientific evidence on vaccine safety, then warned that some groups use misleading tactics to try convince the public that vaccinations are not safe, and explain why and how such techniques work, reasoning on their falsehood.

Both early exposure to scientific evidence and a clear explanation of the techniques used in science denial and misinformation, generate resistance to anti-vaxx arguments. Compared to coercion, that triggers even more resistance and casts a shadow on the governments real intentions giving extra arguments to anti-vaxxers, inoculation theory maintains the freedom of choice, gently teaching techniques to de-bias one-self in all science-related areas of public policy interest (think of climate change or OGM food) and spreads across social networks, protecting also others and working just like herd immunity.

**Main References**


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