

Social Signaling and Childhood Immunization: A Field Experiment in Sierra Leone

Based on BFI Working Paper No. 2024-125, "[Social Signaling and Childhood Immunization: A Field Experiment in Sierra Leone](#)," by Anne Karing, University of Chicago

This study tests whether social signaling can positively influence parents' vaccination decisions in Sierra Leone. Giving children color-coded bracelets that indicate their vaccination status increases parents' belief in the visibility of their actions and their knowledge of other children's vaccine status. The bracelets have no effect on vaccination decisions when their color corresponds to an easier-to-complete vaccine with low perceived benefits, and large, positive effects when their signal is linked to a costlier-to-achieve vaccine with high perceived benefits.

Social signaling is a powerful tool for encouraging good behavior. When peoples' actions are disclosed to their peers, they are more likely to conserve energy, donate to charity, and even turn out to vote. In this paper, the author studies whether social signaling can encourage parents to vaccinate their children. In a setting where resources for enforcing positive behaviors are limited—in this case, Sierra Leone—social image concerns can be a promising lever for cost-effective policy.

To test this question, the author runs an experiment in partnership with the Ministry of Health in Sierra Leone. She introduces a new signal—in the form of color-coded bracelets—to indicate whether parents vaccinated their child in a timely manner. The author randomly assigns each of 120 public clinics in her sample to one of four groups, listed in Figure 1.

Figure 1 • Experimental Groups

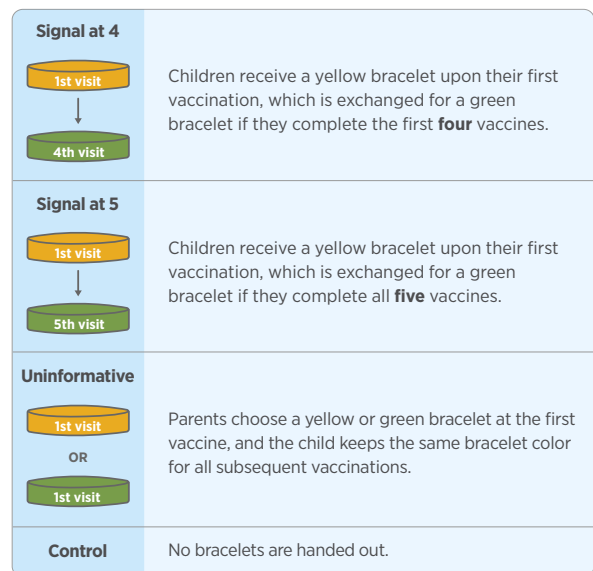
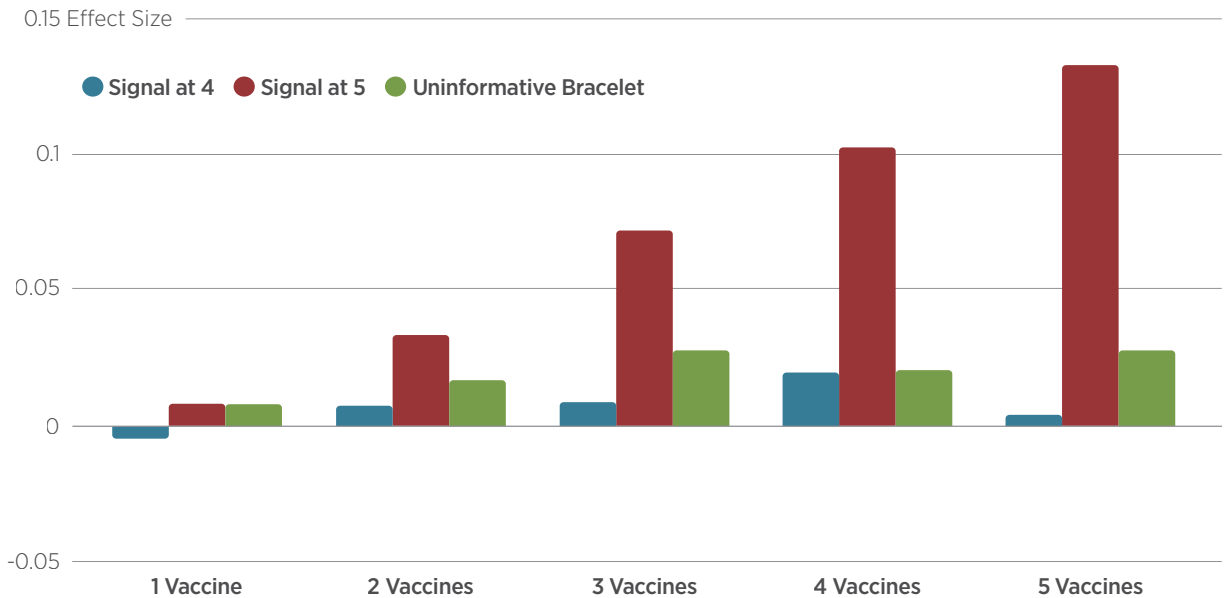


Figure 2 • The Effects of Signals on Timely and Complete Vaccination, Separated by Treatment



Note: This graph presents treatment responses for each signal.

The uninformative treatment allows the author to separate the signaling role from consumption, salience and reminder benefits of a bracelet. The two signaling groups allow the author to test how placing the signal at different points along the vaccine schedule affects parents' vaccination behavior. Parents are required to take their child for five vaccines during their first year of life. Completing all vaccines on time—an action achieved by only 58% of parents—sends a strong positive signal of being a “caring” parent, potentially offering significant motivation. However, if completing the vaccines is perceived as too difficult, it may not motivate parents. Conversely, completing the first four vaccines in a timely manner—an action achieved by 75% of parents—is easier; thus, failing to do so sends a strong negative signal of being “negligent”, which in turn can be highly motivating.

The author compares the share of children in the *Control and Uninformative groups* who receive their fourth and fifth vaccinations on time with the shares in the *Signal at 4* and *Signal at 5* groups. She also surveys parents about their beliefs concerning children's vaccinations. She finds the following:

- Signal bracelets increase parents' belief in the visibility of their actions. While parents in the control group believe that, at most, 48% of other parents have knowledge about their own child's vaccinations, parents in the *Signal at 4* group believe that 61% of other parents

are aware of whether their child received their fourth vaccine on time and parents in the *Signal at 5* group believe that 64.5% of other parents know about their child's fifth vaccine.

- Bracelets also increase parents' knowledge of other children's vaccination status. A child having a green bracelet increases the likelihood of other parents correctly knowing the number of vaccines the child has received by 18% for children in the *Signal at 4* group, and 37% for children in the *Signal at 5* group, compared to the *Uninformative* group.
- While the *Signal at 4* treatment has no effect on the share of children who receive their fourth or fifth vaccines in a timely manner, *Signal at 5* has a large effect on the share of children receiving both their fourth and fifth vaccines on time. The percentage of children receiving five timely vaccines rises by 13.3 percentage points compared to the control group, and the percentage receiving four rises by 10.3 percentage points. *Signal at 5* also increased timely completion of vaccines two and three, showing parents change their behavior up to nine months in advance of receiving the social reward.
- Survey data demonstrate higher bracelet retention among children in *Signal at 5* compared to *Signal at 4*, suggesting that parents place a higher value on signaling the

timely completion of five vaccines. This may be because a signal is perceived as a more informative about parents' type if it conveys a hard to achieve action. Since parents did not learn as much from the yellow bracelet as they did from the green bracelet, obtaining the latter was not a strong enough signal in the *Signal at 4* group. Alternatively, parents assign greater importance to the fifth vaccine than the fourth, thus thinking more highly of parents who obtained the signal in *Signal at 5* than *Signal at 4*. There is no evidence indicating that the bracelets changed vaccine preferences.

- Overall, the author's intervention increased the share of children who receive their five required vaccines by one year of age by 9.4 percentage points at a marginal cost of \$24.7 per fully immunized child. This places the program on par with the most cost-effective immunization interventions.

The upshot is that social image concerns can be leveraged in low-resource settings to increase the rate at which parents vaccinate their children. Importantly, the author's results also reveal that these effects can vary significantly with the costs and benefits of actions. For a signal to be effective at influencing behavior, it needs to convey an action that is costly and perceived as important. Negative signals are more likely to be disregarded due to their ambiguity about whether a person chose not to act or did not have the opportunity, whereas positive signals clearly convey that an action was taken. As a result, signals might largely work through social *rewards* rather than *punishments*.

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