14.11 Lecture 2: Public Health Messages

How to Convince Others to Adopt Healthy Behaviors?

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In this lecture, we are going to examine various ways which have been proposed to try to get people to adopt behaviors or take actions that are good for their health.
Let's start by trying to think of what types of behavior this could be.

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Before thinking about various approaches to convince people, we need to understand why we do need to motivate people to adopt these behaviors in the first place. If this is good for them, why don't they just do it? Why is there any need for public action? In other words: why could there be a wedge between people's current actions and the optimal action from a society's perspective?
There are 3 main classes of reasons for such a gap to emerge:

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Depending on the main source of the gap, what would you be prepared to do (as a policy maker) to align people's incentives to the social good?

• If the main source of the gap is the presence of an externality:

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• If the main source of the gap is the lack of information:

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• If the main source of the gap is a rationale for "paternalism," it will depend on what the source of the failure of people is to optimize properly

-high discount rate in the present relative to the future:

-inertia/procrastination

Possible options?

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Seeing how people react to different types of attempts to affect their behaviors also helps us understand exactly how we function.

A few questions:

-Could you/would you want to use money to convince people to do something, even if the main source of the problem is a lack of information?

-Could you use information to solve an externality problem?

-Can you try to trick people into doing something if they have made a rational decision not to do it.

In most cases, you can select to encourage different types of activities:

-risk avoidance vs. risk reduction: i.e. should you tell girls in Africa not to have sex with older men, or not to have sex at all?

-prevention vs. cure: i.e. should you tell kids in Africa to wear shoes in order to avoid catching worms, or should you encourage the treatment?

What are the tradeoffs in these two cases?

The papers that we are going to see today will help us answer some of these questions. Along the way, we will also learn about the threats to the validity of experiments, and what can be done about these threats.

1 The Impact of Subsidies

First things first, we will start with old fashioned policies: reduce prices or increase rewards! Two particularly adequate contexts: Deworming and Immunization.

1.1 Free Deworming Treatment

Intestinal worms affect a quarter of a billion people worldwide. They make children listless and tired. They also lead to stunting and increase school absenteeism.

1.1.1 First Step: Demonstrating the value of the treatment and the presence of externalities

Methodological aside: Externalities

There are many randomized experiments on worms, which do not find much effect. Generally, the randomization is done within a school, at the individual level. What could be the reason the studies find no effect?

The problem is the externalities created by the contagion effect.

Assumption for the validity of randomized evaluation.

$E[y^0|T=1] - E[y^0|T=0] = 0$

Why is this assumption violated when there are externalities?

What is the solution to avoiding this problem?

Miguel and Kremer (2004) randomize at the *school* level. They examine whether externalities are present in two ways:

-Look at untreated children within schools

-Look at neighboring schools

Look at the table. Do you find evidence of externalities?

Two lessons:

1. Not taking the externalities into account would reduce the estimated impact of the treatment.

2. The externalities imply that the social value of the treatment is much larger than the private value, and there is therefore a case for subsidizing the treatment if...

3. What is the good indicator to tell us whether this condition holds?

Other possible example of spillover effects?

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1.1.2 Second Step: What is the impact of subsidizing the treatment?

Experiment: The treatment was free for the first year. After one year, the schools that had initially received the treatment were separated into two groups:
-one group continued to receive free treatment
-in one group, parents were asked to provide "cost sharing" participation: 30ksh (0.40 dollars) for just one drug and 100 ksh (1.40 dollars) for two drugs in schools that needed two. The price is still heavily subsidized (it covers about one-fifth of the cost of delivering the drug through the program).
Results: see tables 1 and 2.
-fraction of children who get the treatment in both groups:

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This is a large effect.... How can we explain it?

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Methodological aside: Compliance

Now our second methodological point. Suppose I want to estimate the effect of deworming a child. But, even when treatment is free, not every child receives the treatment (the COMPLIANCE for the treatment is low).

-Can I compare those who received the treatment in treatment schools to those who did not? Why or why not?

-Can I compare those who received the treatment in treatment schools to children in the comparison group? Why or why not?

-The randomization only allows us to compare those assigned *to the treatment to those who are not. But is that the effect of deworming? Why or Why not?*

-We call this comparison the Intention to Treat *estimate. Going from the intention to treat estimate to the effect of the treatment itself is sometimes possible, but we will see this only later.*

-For now, the lesson to remember is that you always need to compare ALL the children who were initially assigned to the treatment to ALL the children who were initially assigned to comparison, no matter where they ended up.

-Think of other situations in which shuffling of treatment and control would arise, and how will you handle them?

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1.2 Subsidies for immunization

The deworming example shows that people are very strongly discouraged by any positive price. But even when the activity is free, many people still do not undertake it. Maybe they should be *encouraged* to undertake activities that have high social returns. Vaccination is a pretty obvious candidate. And indeed, in many developed countries it is not only free but also compulsory... (to enroll in school, etc....).

The frontier of the research in this domain: Banerjee, Duflo, Glennerster (2007!)

Setting: Udaipur district, Rajasthan. *VERY* low immunization rate (4% of the children under 2 are "on target").

Possible reasons:

-Cost (supply). Vaccination is free, but there is a big absenteeism problem in health centers. Going to the health center to find it closed is discouraging.

-Information.

-Lack of interest (procrastination over small immediate costs even with large benefits in the long run?).

Two interventions, conducted in 120 villages.

1. Experiment 1: 60 villages randomly selected to get an immunization camp; organized by Seva Mandir (a local NGO) on a fixed day of the month every month. A Seva Mandir worker is reminding people of the day of the camp, and telling them about the benefits of immunization.

2. Experiment 2: in 30 of these villages, the mother receives a kilogram of dal (lentil) for each immunization. This is a small incentive.

Mid-term results among 0-2 year olds

-"on target" in control villages: 4%.

-"on target" in Treatment 1 villages: 20%.

-"on target" in Treatment 2 villages: 40%.

Is the effect of dal large or small?

1.3 Subsidies for getting an HIV-AIDS test

Before interpreting these results, here are some more which go in the same direction.

HIV-AIDS testing is viewed as an effective way to prevent HIV-AIDS. Voluntary Counselling and Testing is free in most countries, and promoted intensively, but the number of people who get tested remains small. What could be the reasons for this?

Thornton (2005) tests whether small changes in the costs and rewards of getting tested can have an impact on the likelihood of doing it.

The experiment is attached to a household survey conducted in Malawi. As part of the survey, everybody was offered to be tested for HIV-AIDS, and people were offered the option to come and get their results after a few weeks.

• Experimental Design

Basic condition: A temporary center is set up in the village a few weeks after the test, and individuals can come to get their results and receive a VCT session. A VCT session lasts 30 minutes, regardless of HIV status.

Incentives: after they agree to take the test, people draw a token from a bucket, with an amount of money they will get if they collect their results. Those who draw a token of zero do not get a voucher. For the others, the nurse writes them a voucher. The voucher amount goes from 1 to 3 dollars (average weekly income is about 9 dollars).
Distance: VCT center was randomly placed within the village, generating random variation in the distance between a person's home and the center (average distance: 2 kilometers).
RESULTS:
See the graphs and tables: What are the main conclusions?
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What theme emerges from all 3 papers (deworming; immunization; HIV-AIDS)?

How can it be related to the issues of information or benign paternalism that we discussed earlier?

2 The Impact of Information

2.1 Two discouraging examples

2.1.1 HIV-AIDS Status and Prevention

A few months after people got their results, the researchers went back, asked some questions about sex behavior, offered 30 cents to participants for their time, and offered the option to buy condoms at a discounted price.
Obvious question to ask:

Methodological aside: Attrition
This part of the study faces one specific problem: not everybody could be traced at the second interview. 82% of those tested could be found. Obviously no questions can be asked of the others! When people disappear from the sample, this is called attrition.
Suppose that the data disappeared randomly (a dog ate some byte). Would that be an issue?

But in fact, if people do not come, there are other reasons. What can they be?

Are there reasons why those who have received an incentive would be more or less likely to attrit?

How could this affect our results on the decision to purchase a condom?

What to do about attrition? Generally, try to avoid it. It is possible to compute bounds *of what the estimate can be by assigning "fake" data to all those who attrited: you can say they all decided to purchase a condom.*

When should you be worried about attrition?

What can you do to check whether attrition is an issue in this case?

Results

$y = \alpha + \beta R + \gamma HIV * R + \delta HIV + X\lambda + \epsilon$

How do I interpret this regression?

δ is?

γ is?

See results in the tables: Comments?

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While the effects are significant, they are not *very* large. Testing does not appear to be the "single most influential driver for behavior change": in fact, when you compare the cost-effectiveness of testing vs. other policies to prevent HIV-AIDS (e.g. circumcision, condom subsidies, etc.), this may not be the most effective policy.

2.1.2 Steps to prevent worms

Remember the worm experiment.... In the same schools where they distributed the medicine, the NGO they are working with also trained the teachers to talk about prevention of worms with the children: teachers were brought in for a 1-day training session and taught how to explain to children how to prevent worm infection (wash your hands, don't swim in the lake, wear shoes). Table 3 in the handout shows what effect this had.... What do you see?

2.2 What information to present?

Have we learned from these two examples that information is never useful? What are other reasons for information not working in the deworming example?

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A first question to ask is therefore: what is the best information to convey, which is related to the choice type of behavior that you are trying to promote (or avert)?

e.g. are you trying to promote total risk avoidance or risk reduction? (in economics, we call that the extensive vs. intensive margin). We discussed the tradeoff earlier. Public health campaigns often choose to emphasize risk avoidance, but it may or may not be the right policy to pursue. The relative importance of the two margins is unclear.

Our next paper (Dupas, 2005) tries to address precisely this question: to fight HIV-AIDS in Kenya among adolescents, the government approach is the "ABCD" strategy (abstinence, be faithful, use condoms, or you die...): promote abstinence till marriage, and then be faithful to your partner. Condoms are not really recommended or promoted, though they are not condemned either. The message is "everyone can have HIV."

An alternative to this message is to communicate the information that not everyone is as likely to have HIV: see HIV prevalence by age and gender group in Kenya. Informing boys and girls that older men are MUCH MORE likely to be infected with HIV-AIDS than younger men may lead younger girls to avoid having sexual relationships with older men.

It is relatively frequent for girls to have sexual relationships with older men (44% say that their partner is 5 years older or more).

Two interventions are tested together:

1. Intervention 1 : teachers receive training reinforcement to teach the standard approach (risk avoidance message)

2. Intervention 2 : NGO workers go to the school and conduct a short session where boys and girls are shown a video about the "sugar daddy phenomenon" and are told the infection rates by gender and age group.

Methodological aside: Testing multiple interventions

What is the right way to set up the design to test the impact of multiple interventions and compare them?

Suppose you decided to go to one set of schools and test one intervention. Then you go to another set of schools and test another intervention. You find that intervention 1 has a significant impact, whereas intervention 2 does not. Can you convincingly conclude that intervention 1 works better than intervention 2? Why or why not?

When we specifically want to compare two interventions, we use stratification*: the treatment status for intervention 2 is randomly assigned,* conditional *on the treatment status for intervention 1. If the sample is large enough, you might even be able to compute standard errors.*

See the graph for the design of this experiment (2-by-2 design).

Main outcome of interest in this study: did students change their behavior and adopt strategies that made them, on balance, less likely to stay HIV-free? What are possible measures of effectiveness? What is the value and what are the drawbacks of each of these measures?

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The paper uses pregnancy rates: easy to measure and indicative of the same behavior that may lead to being HIV infected. Moreover, the pregnancy rate among teenagers is an interesting outcome in and of itself.

Results on pregnancy:

1. No impact of the regular program.
2. Strong impact of the targeted information program.
3. Effect on age of partner.
4. Overall, there is a reduction in the likelihood of having a child with an older man, and no change in the chance of having a child with a younger man.

Information on risk reduction led to an important change in behavior. This is the piece of information they did *not* have, and that suggested to them a course of action that they could follow in a sustained manner.

2.3 How to present information?

Another important question is the form in which the information should be presented. You can often present the same information in two ways. E.g. "Avoid having unprotected sex with older men and you will stay HIV free." Or "Avoid having unprotected sex with older men or you will die." The first message is framed as a gain, the second as a loss. Which is more effective? Under what circumstances?

Rothman and Salovey (1997) discuss some of this evidence in a review paper in the reading list (you can go to the website of the Health, Emotion and Behavior Laboratory at Yale for a description of many more experiments).

http://research.yale.edu /heblab/

The experiments conducted by this group concern the framing of health messages to adopt cancer and HIV prevention and detection behavior. In a typical experiment, participants who are not adhering to current guidelines for a health behavior, say, mammography screening, are assigned randomly to view either gain-framed (emphasizing benefits of obtaining mammography) or loss-framed (emphasizing costs of not obtaining mammography) persuasive videos that are factually equivalent and equally engaging. Attitudes and beliefs are measured before and immediately following the intervention.

Theoretical frame for understanding the differential effect of "gain-framed" and "loss-framed" messages: prospect theory (Kahneman and Tverski).

Suppose there are 2 possible programs to combat an epidemic that is expected to affect 600 individuals.

-If program A is adopted, 200 people will be saved. If program B is adopted, there is a 1/3 probability that all 600 people will be saved, and 2/3 probability that nobody will be saved

What do you prefer? Most people prefer A.

Now consider the following choice:

-If program C is adopted, 400 people will die. If program D is adopted, there is a 1/3 probability that nobody will die and 2/3 probability that everybody will die.

What do you prefer? Most people prefer D.

Why might that be? Kahneman and Tverski posit that the utility function in the domain of losses is *convex*. The marginal disutility associated with one more loss is lower if there are

already lots of losses.

What does this imply?

-In the domain of gains, people are risk averse.

-However, in the domain or losses, they are risk seeking.

1. If you want to encourage a prevention behavior, gain-framed messages may be more effective than loss-framed behavior.

2. If you want to encourage a detection behavior which may be perceived as "risky" (because you might find out that you have the disease), then a loss-framed may be more effective than a gain-framed behavior.

3. Within a given experiment, those who are more certain of the outcome of a test may be more perceptive to gain-framed messages, and those who are more uncertain may be more perceptive to loss-framed messages.

4. If you could present the same behavior as prevention or detection, a loss-framed message may be more effective in promoting it in the case of prevention, and a gain-framed may be more effective in the case of detection.

An example of that is a mouth-rinse liquid promotion, presented either as prevention or detection. See Rothman, Martino, et al. (1999), where they observed exactly that.

Example 1: HIV-AIDS testing again (among low-income minorities in the U.S.) (Apanovitch, McCarthy and Salovey, 2003).

Since HIV is an illness linked to past behavior, some individuals can perceive an HIV test as a very safe activity, which will reinforce their confidence in being HIV-free. These individuals should be more responsive to a gain-framed message. For some individuals, there is a clear possibility that they will discover that they are HIV-positive. These individuals should be more responsive to a loss-framed message.

The experiment contrasted the effect of a gain-framed and a loss-framed video on low-income minority women.

Experimental design: 531 low-income women, including some who had to be removed from the experiment, leaving 480 women (most of them minority). Participants were recruited in a housing project and community health centers.

Women watched 1 of 4 videos:

-Attain/desirable (gain)

-Not attain/desirable (loss)

-Attain/undesirable (loss)

-Not attain/undesirable (gain)

Then an interview was conducted, and the participants had to rank the video, and also to say whether they were likely to test positive if they conducted a test for HIV.

6 months later, they were called again, and they were asked whether they got tested during the intervening period.

The researchers then compared the chance of getting tested after 6 months depending on the frame of the video.

Methodological aside: Is this design exactly right?

Note that the researchers asked people about their certainty of being framed AFTER the video, not before. They then compared the results across two samples: those who said they might test positive and those who said they would test negative.

Is there a possibility that the video affects the perceived chance of testing positive?

If there is any such risk, is the comparison valid?

NO, because the two samples are now created endogeneously by the experiment. In other words, you have a problem of sample selection.

E.g. suppose that those who think they will test positive for HIV do not get tested; those who are totally sure that they are negative are happy to be tested (regardless of whether they watch the video). Those who have been convinced by the video that they are negative do not change their behavior.

Now suppose that those who watched the loss frame are much more likely to think that they would test positive. Only the die hard optimists would think that they would test negative after watching the loss-framed video.

So in the sample of people who think they would test positive–there are some people who watched the gain frame, and many people who watched the loss frame–none of them want to be tested, so there is no effect of watching the loss frame in this sample.

In the sample of people who think they would test negative after watching the video–there are a bunch of people who watched the gain frame, and a few people who watched the loss frame–the

few people who watch the loss frame are these die hard optimists, so they will be happy to be tested. The sample of the other ones is more mixed. So you may find that in this sample, those who have watched the loss frame are more *likely to be tested.*

It has nothing to do with the interaction effect the authors want to find.

Many more experiments can be found on the health behavior lab's web site. Considering the results from all of our experiments as a group, loss-framed messages seem better at promoting early detection behaviors like mammography, but gain-framed messages more effectively promote prevention behaviors like using sunscreen.