

Probabilistic Expectations about HIV in Rural Malawi

Adeline Delavande

Universidade Nova de Lisboa, RAND

Corporation and CEPR

Hans-Peter Kohler

University of Pennsylvania

Short abstract

In high HIV-prevalence contexts, individual choices about sexual partnerships and risk reduction strategies depends critically on respondents' subjective expectations about the prevalence of HIV and their subjective probabilities of own HIV infection, survival, future condom use with different partners, etc. Despite the central role of expectations, few studies are based on well-defined subjective expectations. In this paper, we present unique data on AIDS-related probabilistic expectations that we have collected in rural Malawi. More precisely, we (i) evaluate the success of the elicitation methodology we developed; (ii) describe respondents' subjective probabilities of survival, analyze how it varies by characteristics, and assess their accuracy by comparing them to life tables; (iii) evaluate the extent to which respondents think contracting HIV/AIDS affects life expectancy by analyzing beliefs about the survival of hypothetical individuals who are either healthy or infected with HIV/AIDS; (iv) analyze the association between beliefs and risk taking behavior.

Long abstract

This paper presents unique data on AIDS-related probabilistic expectations collected in rural Malawi. Subjective expectations play a crucial role in health decisions. For example, the decision to smoke or engage in risky sex depends importantly on individual subjective beliefs about the health consequences of those actions. In high HIV-prevalence contexts, individual choices about sexual partnerships, risk reduction strategies, the formation and dissolution of unions depends critically on respondents' subjective expectations about the prevalence of HIV in the local population and their subjective probabilities of own HIV infection, survival, future condom use with different partners, availability of antiretroviral treatments for AIDS, etc. Several studies have thus argued that correct expectations about AIDS risks are a prerequisite of behavioral change (Aggleton et al. 1994; Cerwonka et al. 2000; Estrin 1999; Smith 2003; UNAIDS 1999; Weinstein and Nicolich 1993). Despite this alleged central role of expectations, few studies have used well-defined subjective expectations, and researchers interested in predicting behavior based on expectations often make non-verifiable assumptions (for instance, regarding the interpretation of verbal scales measuring degrees of subjective likelihood such as very likely vs. not very likely).

In the last 15 years, economists have successfully begun to elicit probabilistic expectations from respondents through survey questions (see Manski 2004 for an overview; specific analyses include Delavande 2005; Dominitz and Manski 1996, 1997; Fischhoff et al. 2000; Hurd and McGarry 1995). This research has shown that respondents, at least in developed countries, are willing and able to answer questions, such as “What do you think is the *percent chance* that you will lose your job during the next 12 months?”, that elicit their expectations in probabilistic form. As a result, the elicitation of probabilistic expectations has been included in many large-scale surveys such as the Health and Retirement Study (HRS) and the National Longitudinal Survey of Youth (NLSY97). Several studies have also combined probabilistic expectations with econometric decision models to conduct inference on behavior, including for instance retirement decisions, engagement in crime and contraception choice (Delavande 2005; Hurd et al. 2002; Lochner 2003; Van der Klaauw and Wolpin 2002). Some recent work suggests that similar enterprise might be successful in developing countries (Ottanasio, 2006; McKenzie et al, 2006).

Given the promise of knowledge about AIDS-related subjective expectations for understanding the decision process about the adoption of risk-reduction strategies, we have developed innovative techniques for the elicitation of probabilistic expectations in Malawi and elicited beliefs from a wide range of outcomes. The present paper focuses on expectations about survival. The expectations data was collected as part of the 4th wave of the Malawi Diffusion and Ideational Change (MDICP) Project, a longitudinal survey of ever-married women and their spouses in rural Malawi. The first round of the MDICP was carried out in the summer of 1998, and interviewed 1541 ever-married women of childbearing age and 1065 husbands of the currently married women in three Malawi districts: Balaka in South, Mchinji in the Center and Rumphi in the North. The last wave took place in the summer 2006.

The Elicitation Strategy

In developed countries, the methodology employed to elicit probabilistic expectations has mostly relied on questions asking about the “percent chance” that a specified event occurs in the future. These quantitative expectations have the advantage of providing well-defined absolute numerical scales for responses. In the context of developing countries with low literacy and numeracy, however, the notion of “percent chance” cannot feasibly be implemented in surveys.

In MDICP, we have used an interactive format asking respondents to allocated 10 beans on a plate to express the likelihood that an event will be realized. The following introduction was read to the respondents:

“I will ask you several questions about the chance or likelihood that certain events are going to happen. There are 10 beans in the cup. I would like you to choose some beans out of these 10 beans and put them in the plate to express what you think the likelihood or chance is of a specific event happening. One bean represents one chance out of 10. If you do not put any beans in the plate, it means you are sure that the event will NOT happen. As you add beans, it means that you think the likelihood that the event happens increases. For example, if you put one or two beans, it means you think the event is not likely to happen but it is still possible. If you pick 5 beans, it means that it is just as likely it happens as it does not happen (fifty-fifty). If you pick 6 bins, it means the event is slightly more likely to happen than not to happen. If you put 10 beans in the plate, it means you are sure the event will happen. There is not right or wrong answer, I just want to know what you think.”

Final data from the 4th wave of the MDICP will be available in December 2006. Preliminary data from a pilot run on 30 respondents which are very encouraging.

- Focal answers

A frequent problem reported concerning expectations questions is the tendency for respondents to provide focal answers (typically, 0, 50 and 100%) (Lillard and Willis, 2002). In the pilot, we find that the proportion of focal answers is very similar to other surveys from developed countries. Table 1 presents the distribution of beliefs for one of the training questions: the probability that a baby born in the respondent's community this month will die within one year.

Table 1: Distribution of beliefs about infant mortality

	Freq.	Percent	Cum.
0	6	20.00	20.00
1	3	10.00	30.00
2	2	6.67	36.67
3	2	6.67	43.33
4	2	6.67	50.00
5	5	16.67	66.67
6	1	3.33	70.00
7	3	10.00	80.00
8	3	10.00	90.00
10	3	10.00	100.00
Total	30	100.00	

- Answers consistent with probability theory

After the introductory questions, respondents were asked about two included events: the likelihood of going to the market within two days and within two weeks. These questions can be used to evaluate whether the answers are internally consistent with probabilities. In the pilot, all respondents provided a likelihood of going to the market within 2 days smaller or equal than going to the market within 2 weeks. This suggests that they have a good understanding of the concept of likelihood.

Subjective probabilities of survival

We have asked respondents their beliefs about their one-year, 5-year and 10-year survival. We will evaluate how these probabilities vary by sex, age, HIV status and risk perceptions, likelihood of becoming infected within a year, and assess their accuracy by comparing them to life tables and estimates of survivorship for persons who are HIV positive.

We have also asked respondents about the one-year, 5-year and 10-year survival of the following hypothetical individuals:

- A woman your age who is healthy and does not have HIV
- A woman your age who is infected with HIV
- A woman your age who is sick with AIDS
- A woman your age who is sick with AIDS and is treated with ARV

These questions will be used to evaluate the extent to which respondents think engaging in risky behaviors or contracting HIV/AIDS affects life expectancy, and how much heterogeneity they exhibit in that regard.

The link between subjective probabilities of survival and risk taking behavior

The ultimate goal of collecting the expectations data is to improve inference on how people make decision. We will then evaluate the association between the perceived cost of contracting HIV, namely the difference in elicited survival between the healthy and infected hypothetical individual, and risk taking behavior such as condom use and number of sexual partners.