

Extended abstract:

Long-term economic consequences of vaccines in Matlab, Bangladesh

Abdur Razzaque¹, Damian Walker², David Canning³,
Peter Kim Streatfield¹, Mohammad Yunus¹,
Julia Driessen², Motafa Kamal¹, Enamul Haque¹

1ICDDR,B; 2Johns Hopkins University; 3Harvard University

Background

Until recently, the value of vaccine research usually looked at avoided costs that resulted from immunization: a) medical costs associated child's sickness, and b) indirect costs associated with parental work, etc.

Studies of health affect on wellbeing are limited. Some studies found that there is an effect of health on income while others looked at the effect of child health on adult health and linked between adult height and income. In the Philippines, childhood immunization has increased cognitive ability.

There are several mechanisms through which the economic benefits of vaccination can accrue. First, the direct effect on child health those persists into adult health and then affects productivity. Second, children's physical growth and cognitive development suffers from ill health. If these development problems are not overcome by later catch-up- it leads to low cognitive development that can affect children's schooling and low productivity in adulthood.

The study will look into long-term economic benefits of childhood vaccination on education and accumulation of household assets.

Data and Methodology

The study is conducted in Matlab where the ICDDR,B has been maintaining a Demographic Surveillance System since 1966 over 200,000 people. The site has an intervention and a comparison area, and since 1977 the intervention area received enhanced family planning and maternal and child health services. Measles vaccination was introduced into half of the intervention area in 1982 and expanded to the other half area in 1985. Children in the area were also receiving BCG, OPV, DPT and measles vaccination from 1986.

The fundamental problem in the estimation proposed is that vaccination is not random. For measles vaccination, we will first instrument the vaccination with being in the recommended age range and leaving in the measles vaccination area after initiation in 1982 or living in the whole area after the program was expanded in 1985. We are also controlling for possible confounding factors, in particular area dummies and time dummies. To differentiate the effects of BCG, OPV, DPT and measles vaccines, propensity score matching was conducted. This will match each child who was vaccinated with one of these vaccines with another who has similar characteristics in terms of family background characteristics but who was not vaccinated. Assuming that, conditional on observed variable, vaccination is random we can determine the size of the effect by looking at mean outcomes for the treated group versus our constructed 'control' group.

Results

In the intervention area there about 27,000 births between 1980 and 1988 and were followed for deaths and out-migration until 2005. Education and household assets data were collected during the census of 1996 and 2005. We found that those individuals who received three doses each of OPV and DPT, as well as the BCG and measles vaccines had significant impact on education in 1996 and 2005, as well as asset accumulation in 1996.

Policy implications

The study will aid policy makers and those involve in decision-making about the allocation of scare resources by indicating the extent to which particular vaccines promote economic wellbeing. In the long run, this research may be useful in promoting vaccination as a vehicle for income growth and poverty reduction, and not simply as part of social welfare spending. The information generated could also be valuable in the marketing and pricing of vaccines and drugs.