Caste-ethnic disparity in vaccine use among children in Nepal

The United Nations' Millennium Development Goal 4 addresses child mortality as a major indicator of health and development, revealing much about a nation's health services and related social and economic factors. Currently, an estimated 8.1 million children die each year before age five, and approximately 99 % of these childhood deaths occur in low-income and middle-income countries (CDC 2011). Expanded vaccination coverage has been one of the most cost-effective ways to contain and lower the number of child deaths annually (WHO and UNICEF 2005). The cost for the basic six childhood vaccines is estimated to be less than one dollar (Gauri and Khaleghian 2002). With the realization of those benefits, the World Health Organization initiated its extended program on immunization (EPI) in 1974, which quickly gained acceptance in public health programs around the world.

Vaccines not only save lives, but also make ancillary long-term contributions to a nation's robustness. Improved health through vaccines contributes to economic growth in four ways: (1) they reduce production losses caused by worker illness; (2) they improve utilization of natural resources; (3) they increase the child enrollment numbers in schools; and (4) they liberate resources for other needs (household and national) that would otherwise be spent on treating illness (WDR 1993).

Nepal has made significant efforts to implement full vaccination coverage across its 75 districts, but the rate of children fully immunized hovers at a stubborn 87%. Curiously, these immunization rates vary across caste-ethnic groups. Because historical inequalities along caste/ethnic lines persist today in Nepal, we seek to explain this phenomenon by analyzing the difference in vaccination rates along these vectors. Accordingly, we set out guided by two questions: (1) is there a disparity in vaccine utilization based on caste or ethnicity, and (2) if yes, what factors contribute to that disparity?

We use the two rounds of the Nepal Living Standard Survey and construct a pooled cross sectional series of individual and household level characteristics. The NLSS is a nationally representative survey of the Nepalese civilian non-institutionalized population. It compiles data on many dimensions of household well-being including consumption, income, savings, employment, health, immunization, education, fertility, nutrition, housing, and migration.

The disparity in vaccine utilization rate between upper caste and indigenous is 8.047%, and between upper caste and Dalit 7.215% and both are significant. A majority of the disparity is explained by the differences in geographic factors such as urban versus rural location of households, the regional location of households (e.g., mountainous), and the distance to the nearest health facility. Household income also explains a significant portion of disparity in both cases. Parental education significantly contributes to the disparity between indigenous and upper

caste groups, but the size of contribution is very small. In case of the disparity between Dalit (low caste) and upper caste, the contribution of parental education is insignificant.

As access to immunization services explains the majority of the disparity between Dalits and upper caste and between indigenous and upper caste, Nepal can address this problem by reducing the differences in access, a problem that plagues many countries (Mahoney et al. 2007; Okeibunor et al. 2013). As poverty in Nepal is highly correlated with the quantity of the land holding and its productivity (Devkota et al. 2013), improvements in agricultural productivity could increase household income and help alleviate poverty and, in doing so, perhaps enhance the utilization of immunization services. Both of those policies would help to realize the objective of 100% immunization in the country.

Satis Devkota *and* ***Christopher Butler***
University of Minnesota, Morris, USA

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