

**ESSAYS ON THE ENVIRONMENTAL IMPACT ON CHILD HEALTH: THE
CASE OF SRI LANKA**

Rambandage Dhanushka Ravilal Perera

National Graduate Institute for Policy Studies

Summary

This dissertation investigates the impact of environmental shocks on child health, focusing on natural and artificial actions in the environment. The first chapter examines the heterogeneous impact of rainfall shocks experienced in utero on the health outcomes of newborn babies in Sri Lanka. The Demographic and Health Surveys (DHS) conducted in 2006 and 2016, and rainfall data from approximately 140 rainfall stations from 1970-2016 are combined to estimate regional level fixed-effect model. The results indicate that; (1) the increase of rainfall from the historical rain during the first trimester increases the birth weight of children, and this impact is concentrated among poor children in rural and plantation (estate) sectors. (2) Rainfall shocks in the third-trimester decrease the birth weight of children in the urban sector, particularly among boys.

The second chapter examines the effect of air pollution on children's respiratory health (age under 0-6 years) living in seven highly populated districts (Colombo, Gampaha, Kaluthara, Galle, Rathnapura, Kurunegala, and Kandy) in Sri Lanka. We utilized household data from the Demographic and Health Survey (DHS) in 2016 and air pollution data; a monthly average of 24 hours SO₂ (Sulfur Dioxide) emission records from 67 stations which were monitored by the NBRO (National Building Research Organization). This study has considered the WHO recommended air pollution interim targets (2005); most studies have relatively less focused. We used GIS techniques to

interpolate pollution data and estimated the effects of ambient SO₂ pollution using the regional level fixed-effects model. Our main results show that (1) among the poor children living 10km radius of air pollution measurement stations, ambient SO₂ pollution is associated with a higher likelihood of respiratory disorders. (2) This relationship is concentrated only among poor households, measured by the DHS wealth index. The findings of this dissertation suggested the importance of targeting the pregnant mothers living in rural and plantation sectors and the mothers in the third trimester of pregnancy in the urban sector when implementing the nutrient supplement and diseases prevention programs in Sri Lanka. Also, this study highlights the reviewing of existing policies on air pollution, limiting the SO₂ emissions to meet the WHO standards. Overall, this study highlights the importance of targeting disadvantaged groups such as households living in rural/estate sectors and poor households in an urban setting.