The Impact of Electricity Outages on Health Outcomes of Children in Kyrgyzstan

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Overview

As electricity prices in developing countries are relatively low to recover the costs of provision, proper investment in infrastructure for generation and distribution of electricity is usually absent. These results in frequent outages or rolling blackouts by the electricity suppliers aimed to manage the difference in supply and demand. Such outages commonly occur in some developing countries and can have a significant impact on certain households (Ali, 2016).

The frequent electricity outages may create sizeable problems for the households in terms of storing food, and cooling their households as the work of refrigerators and AC's is constantly interrupted, especially in countries like Kyrgyzstan where extremely hot summers are rather a rule than exception. This in turn may affect the health status of the households negatively, especially among very young (aged 0-5) parts of population.

In winter if reliable electricity supply is absent households often use coal or wood to heat their homes. Most of the residents in these regions who do not have access to the centralized infrastructure burn coal in self-made coal stoves to heat their homes. These self-made stoves are usually of a poor quality resulting in indoor air pollution, which in turn is a catalyst of various respiratory diseases (Akhmetov, 2014).

Methods

The paper will utilize household level data from Kyrgyzstan. We track the same 3,000 households and 8,000 individuals in all major Kyrgyz regions.
We analyze the effect of electricity outages on health outcomes of children aged from 0 to 5 using two distinct anthropometric outcomes, weight for age, and height for age. Anthropometric outcomes of children are calculated with accordance to World health organization (WHO) in form of deviations (z-score) from the given reference groups. We use the following econometric model for each of the three anthropometric outcomes of interest:

$$Health_{it} = \beta_2 \ln(outages_{it}) + \theta_2\, Income_{it} + Z_{it}\varphi_2{}' + H_{it}\delta_2{}' + \gamma_2{}'_i + \gamma_2{}'_r + \gamma_2{}'_t + u_{irt}$$

where i and t stand for household and time subscripts. On the left hand side we have two anthropometric outcomes used as proxies for child health (weight for age, and height for age). The terms γ_i and γ_t are household, and year fixed effects, γ_r stands for region fixed effects.
Besides our main variable of interest, the frequency of the electricity outages reported by the households, our model also controls for region specific time varying variables Z_{it} and household specific time varying variables (H_{it}) like household size, the number of rooms in dwelling, access to gas, piped water, and phone connection, and demographic controls, such as years of schooling, age and age squared (as a proxy for skill and experience of the household members), among others.

Results

We find a negative and statistically significant association between height for age z-score of children, and reported frequency of electricity outages. We also observe generally negative relationship between outages and weight for age z-score. However, this relationship is statistically insignificant.

Conclusions

Our results indicated that frequent electricity cut-offs affecting height of the children from 0 to 5 year age negatively and has significant and independent (of income) impact on household well-being.

References

Akhmetov, A.,(2014). Health Effects of Coal: A Long-Run Relationship Assessment of Coal Production and Respiratory Health in Kazakhstan. Energy and Environment Research, 4(3), pp.138-146.

Ali, A. (2016). The Impact of Electricity Outages on Households. Doctoral Theses University of Toronto.