

Behavior Matters!

Impacts of Sanitation and Hygiene on Health in Nepal

Jeffrey Vescovi, Melissa Martinez, Andres Quijada | Prepared for Dr. Alok Bohara as part of the Sustainable Development Action Lab | Nepal Study Center, University of New Mexico. (Fall 2018)

Introduction

Water sanitation and hygienic behaviors are fundamental to human development and well-being. According to the World Health Organization, 2015, 633 million people lacked improved drinking water sources and 2.4 billion lacked improved sanitation facilities. Many schools and low income households lack adequate and safe wash services. Our project is based on Improving water sanitation, hygiene habits such as (washing hand and wash utensils) to show the correlation with reducing illnesses such as diarrhea, jaundice, worms, and many more.

Literature Review

One of the most important indicators of a thriving population is the health of its people. Historically, health has received much attention from researchers and several studies exist which corroborate the research findings presented here. It is evident from this and other studies that factors which have the highest impact on health improvement are behavioral. According to such research, two of the most overarching challenges we must overcome in developing countries are to implement tools and education models which create sustainable behavior changes in adults and to persuade government officials to strengthen infrastructures which encourage and support healthier customs and praxis for all its people (Wright 1997). The World Bank offers helpful guidance and recommendations that can and should be taken into consideration by policy advocates.

Furthermore, it is important to point out that while many people in developing countries like Nepal do have a fair understanding of general health knowledge, this is not enough to forge lasting behavioral reform. In a study by Pattanayak and Pfaff (2009), evidence shows that the quality of environment and facilities used for hygienic care is conducive in establishing better health practices.

Lastly, in a study by Karn *et al.* (2012), the researchers recommend increasing education as a catalyst to improved hygiene practice. Though the analysis in the immediate research did not look specifically at the effects of education on health, it is acceptable to note that any method which increases positive behavior including education is beneficial.

Research Question

How is total sickness affected by hand washing, washing utensils, and water treatment, and how important are these behaviors in the context of age, income, and knowledge of general health?

Hypothesis

The effects of different types of illness are reduced by improving health practices such as washing hands and utensils, and water treatment, when age, income, and general health knowledge are controlled.

Method/Models

- Method: OLS Regression
- Models:
 - Model 1: $TotNoSick = \beta_0 + \beta_1 Hand\ Wash + \beta_2 Wash\ Utensil + \beta_3 Type\ Treatment + u_t$
 - Model 2: $TotNoSick = \beta_0 + \beta_1 Hand\ Wash + \beta_2 Wash\ Utensil + \beta_3 Type\ Treatment + \beta_4 General\ Health\ Knowledge + u_t$
 - Model 3: $TotNoSick = \beta_0 + \beta_1 Hand\ Wash + \beta_2 Wash\ Utensil + \beta_3 Type\ Treatment + \beta_4 General\ Health\ Knowledge + \beta_5 Age + \beta_6 Income\ Quintile + u_t$

Variables

- Dependent Variable:
 - TotNoSick: Total number of individuals who suffer from Diarrhea, Jaundice, Cholera, Typhoid, and Worms.
- Independent Variables:
 - HandWash: How often individuals wash their hands after using the toilet.
 - WashUtensil: How often individuals wash their dishes and utensils.
 - TypeTreatment: How water is treated. Binary variable where 1 is a good method such as boiling, Euroguard, or chlorine, and 0 is no response, or a bad method such as filtering through a cloth, or letting water stand and settle.
- Control Variables:
 - General_health_knowledge: Composite index that scores individuals from 0 to 9 based on their knowledge of general health principles.
 - Age
 - IncomeQuintile: Divides sample population into five groups based on the amount of assets owned.

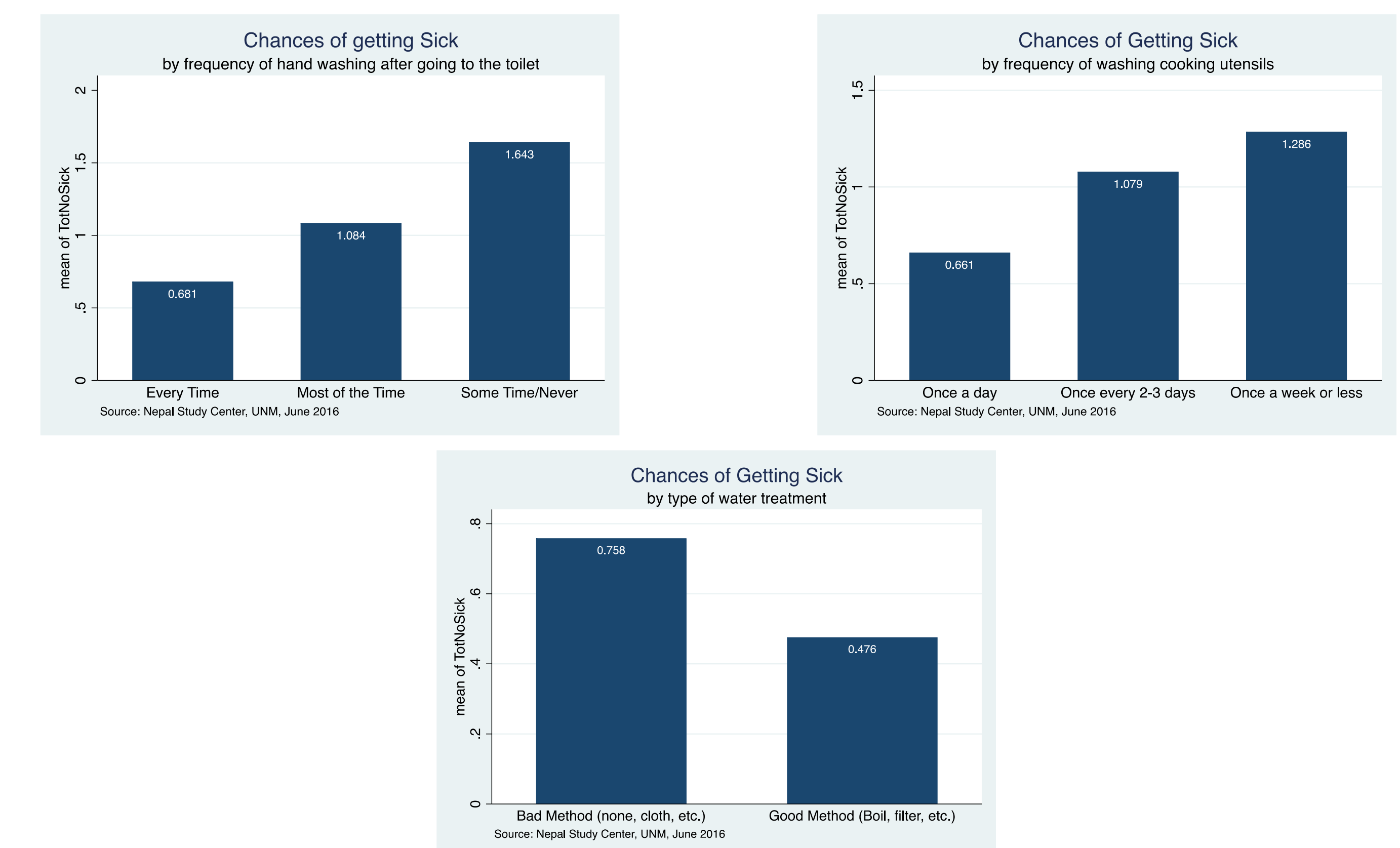
Regression Table

VARIABLES	Factors Causing Sickness		
	(1) Multivariate Model 1	(2) Multivariate Model 2	(3) Multivariate Model 3
WashUtensil	0.216*** (0.071)	0.217*** (0.072)	0.221*** (0.072)
HandWash	0.400*** (0.083)	0.396*** (0.084)	0.385*** (0.084)
TypeTreatment	-0.232*** (0.083)	-0.231*** (0.083)	-0.218*** (0.083)
general_health_knowledge		-0.020 (0.061)	0.005 (0.063)
IncomeQuintile			-0.040 (0.028)
Age			-0.002 (0.003)
Constant	-2.048*** (0.500)	-1.979*** (0.543)	-1.795*** (0.558)
Observations	745	745	745
R-Squared2	0.0743	0.0744	0.0775
Adjusted-R2	0.0705	0.0694	0.0700
F-Sat	19.82	14.87	10.34
n	745	745	745

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results

Our Regression Analysis shows us that our hypothesis is correct. Our independent variables are statistically significant at the one percent level. This indicates that all three of our independent variables have an impact on the total number of sick individuals that is statistically different from zero. When we control for general health knowledge in model two, our adjusted R^2 takes a slight dip while the coefficient of our independent variables remains the same. This indicates that general health knowledge has almost no impact on these behaviors. When Income Quintile and Age are added in model three, we obtain almost the same results as model two. Therefore, Income Quintile and Age also have very little to no impact on sanitation and health related behaviors.



Conclusion

Our results illustrate that *behavior* rather than general health knowledge, income, or age is the main driver of health and good hygiene habits. Across all incomes, age groups, and levels of knowledge, there is bad sanitation and hygiene. Therefore, the best approach to this issue is to educate the population on good hygiene and sanitation habits, and to make this a priority in their community.

References

- Karn, R. R., B. B., & N. J. (2012). A Study on Personal Hygiene and Sanitary Practices in a Rural Village of Mornag District of Nepal. *Journal of Nobel Medical College*, 1(2), 39-44. Retrieved September 25, 2018, from <https://www.nepjol.info/index.php/JoNMC/article/view/7298/5914>.
- Pattanayak, S. K., & Pfaff, A. (2009). Behavior, Environment, and Health in Developing Countries: Evaluation and Valuation. *Annual Review of Resource Economics*, 1(1), 183-217.
- Wright, A. M. (1997). *Toward a Strategic Sanitation Approach: Improving the Sustainability of Urban Sanitation in Developing Countries*(pp. 1-38, Rep.). Washington, DC: International Bank for Reconstruction and Development/The World Bank.