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**Can food safety shortfalls disrupt nutritional gains from increased animal-source food consumption?
Evidence from Eid al-Adha.**

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Motivation and Significance

The international health community has recently increased the focus on raising the consumption of animal-source foods in developing countries. The agricultural sector has been an important focus of these efforts due to the interdependence of food production, nutrition and health outcomes. For animal source foods, in particular, interventions aimed at increasing animal production and animal product availability, especially in rural markets, provide a clear opportunity to increase intake and access to such foods for potentially food insecure populations.

Increased consumption of animal source foods may increase the risk of disease due to foodborne pathogens when not properly handled and prepared. Such pathogens can result in not only acute illness, but also negative nutritional outcomes. While much of the literature has highlighted the high nutritional potential of such foods, little attention has been paid to infrastructure deficiencies for handling and processing animal-sourced foods, particularly meat. Such shortfalls in food safety have the potential to counteract some health gains, especially if renewed international efforts to increase animal consumption are not combined with improved processing capacity.

Background

The holiday of Eid-al Adha is celebrated by Muslims worldwide. In commemoration of the ram slaughtered in Abraham's son's stead, it is traditional for observers to consume meat, usually sheep or goats. Furthermore, a large portion of the meat consumed on this holiday is slaughtered and handled in informal facilities and private residences.

Study Design

Eid al-Adha provides an important natural experiment to study the impact of short term increases in home-produced meat consumption on acute illness, particularly episodes of diarrhea, among children. We use DHS surveys from 9 countries in Africa and Asia. These countries were selected because they contain data on both Muslim and non-Muslim households interviewed both within 14 days of Eid al Adha and with no holiday exposure. Using non-Muslims as a comparison group, we estimate the impact of meat consumption during this holiday on diarrheal illness among children. Because Eid al Adha follows a lunar calendar, we can disentangle diarrhea resulting from shocks to meat consumption and preparation due to the holiday from seasonal factors that also contribute to illness.

Empirical Question

What is the impact of Eid al-Adha on the incidence of diarrhea among children?



Sample Size by Religion

	Non-Muslim	Muslim
Guinea	6,340	52,581
India	113,860	20,205
Mali	3,709	44,711
Mozambique	52,753	14,895
Niger	484	44,209
Nigeria	54,825	86,078
Uganda	47,313	7,229
Tanzania	34,146	20,494
Burkina Faso	34,341	49,465

Model

Difference in difference (DD) specification :

$$Y_{im} = \beta_0 + \beta_1 Eid_{im} + \beta_2 Muslim_{im} + \beta_3 Muslim * Eid_{im} + X' \alpha + \mu_m + e_{im}$$

Results

Impact of Eid al Adha on Diarrhea Rates of Children under Five

	Diarrhea within 14 days		
Muslim X Eid within 14 days (DD)	.035 [.048]	.035 [.020]	.035 [.035]
Eid within 14 Days	-.005 [.597]	-.005 [.581]	-.005 [.659]
Muslim	.030 [.079]	.030 [.044]	.030 [.099]
N	666,247	666,247	666,247
Country Random Effects	No	Yes	No
Standard Error Calculation	Cluster Robust Variance	Cluster Robust Variance	Wild Bootstrap Clustering

Dependent variable in all regressions is dummy variable for whether child had diarrhea within 14 days of interview. **p-values in brackets** below coefficient estimates. All regressions control for month of interview, child's age, age of mother, and urban/rural status. Standard errors clustered at the country level in all regressions.

- Eid al Adha increases incidence of diarrhea in Muslim children relative to non-Muslim children
 - Magnitude of effect in full pooled sample a 21% increase in diarrhea rate over the mean
 - Other robustness checks yield range of effects between 12 and 24% increase
- Results suggest high potential for increased home livestock production and consumption to result in food-related illness
- However, food safety risks must be weighed against potential nutritional gains
 - More research into tradeoff
 - Importance of basic food safety interventions