

Modification of the impact of access to water on childhood diarrhoea by socioeconomic status in the Gaza Strip, 2000-2014



Victoria Ponce Hardy¹, Amira Shaheen², Ai Milojevic¹

¹London School of Hygiene & Tropical Medicine, London, UK. ²An-Najah National University, Nablus, Palestine .

Background

Diarrhoea is a leading global cause of preventable child mortality causing an estimated 525,000 childhood deaths each year. (1) However, the majority of these lives could be saved with improved provision of safe and adequate water, sanitation and hygiene facilities. (2)

In the Gaza Strip, access to unsafe drinking water is a growing concern - over 95% of natural water supplies exceed safe salinity levels and remaining supplies continue to degrade. (3, 4) Decreased access to public water networks is associated with increased prevalence of diarrhoea among children under 5 years in the Gaza Strip (5); here, we further investigated the role of socioeconomic status as a confounder or effect modifier to this association.

Methods

Data from five countrywide cross-sectional surveys conducted by the Palestinian Central Bureau of Statistics (PCBS) in 2000, 2004, 2006/7, 2010 and 2014 were used within this analysis. Multivariable logistic regression models were applied to pooled data after adjustment for, and stratification by, indicators of socioeconomic status.

Outcome of interest	Prevalence of diarrhoea in children aged under 5 years
Definition	Self-reported presence of three or more loose stools per day, blood in the stools on any day, any other definition provided by the mother/caregiver
Exposure of interest	Access to water (any water source)
Definition	Type of source (piped, other improved, unimproved) Time to source (0-5 minutes, >5-30 minutes, >30 minutes round trip)

Socioeconomic status was defined in this analysis using three factors measured by the PCBS:

	Higher SES → Lower SES
Refugee status:	Non-refugee Registered refugee Non-registered refugee
Maternal education:	Secondary/higher Primary None
Locality type:	Urban Rural Camp

All models were adjusted for demographic factors (age, sex, governorate), breastfeeding (ever breastfed, period of breastfeeding) and survey year.

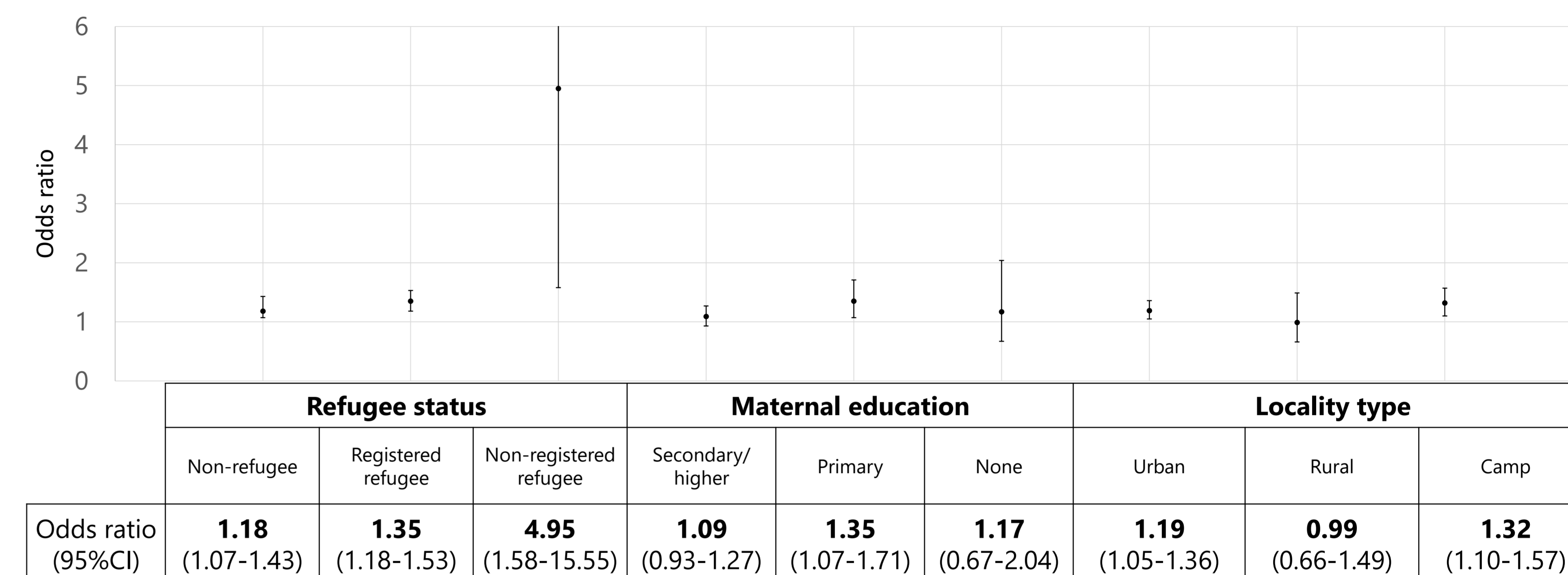
Limitations

Several limitations were encountered during the analysis, largely due to:

- Inconsistency within datasets
 - Inconsistent defining and reporting of diarrhoeal disease
 - High proportions of missing data, particularly of time to water source and covariates
 - Irregularities in reporting between years
- Unavailability of relevant data, due to time constraints and confidentiality of health data
- Lack of comparable water quality data for changing classifications of improved/unimproved and domestic/non-domestic water sources/uses in the Gaza Strip

Findings

Odds ratios of childhood diarrhoea associated with use of unimproved water sources by socioeconomic status



- Children who were non-registered refugees had an increased odds ratio of diarrhoea associated with access to unimproved water sources compared to piped sources than children who were registered refugees or non-refugees
- Children whose mothers had primary education had a higher odds ratio of diarrhoea associated with access to unimproved sources than children whose mothers had secondary/higher education
- Higher odds ratios of diarrhoeal disease were found to be associated with access to unimproved water sources in camps than in urban areas

Conclusions

There is evidence that the odds of childhood diarrhoea associated with access to water vary by socioeconomic status, particularly by refugee status, in the Gaza Strip. Children of lower SES experience higher odds of diarrhoea than children of higher SES, even while using the same water source. This suggests a disproportionate burden of diarrhoea associated with access to drinking water among children of lower socioeconomic status, with implications for environmental health equity.

Inconsistencies in the data limited the analysis, indicating a need for further and more coherent data collection and measurement as well as improved sharing of data for analysis in the Gaza Strip.

References

1. World Health Organisation (2017) Diarrhoeal disease: fact sheet
2. Pruss-Ustun et al. (2014) Burden of disease from inadequate water, sanitation and hygiene in low and middle-income settings: a retrospective analysis of data from 145 countries. *Tropical Medicine and International Health* 19(8):L 894-905
3. Aish, M. (2013) Drinking water quality assessment of the Middle Governorate in the Gaza Strip, Palestine. *Water Resources and Industry* 4:13-20
4. OCHA (2016) OCHA oPt: www.ochaopt.org
5. Legge, H., Shaheen, A., Shakhshir, G., Milojevic, A. (2018) Access to water source and morbidity in children in the occupied Palestinian territory, 2000-14: a repeated cross-sectional study. *Lancet*, 2018 Vol.391:S8, doi: 10.1016/S0140-6736(18)30374-X.