# Modification of the impact of access to water on childhood diarrhoea by socioeconomic status in the Gaza Strip from 2000 to 2014: a cross-sectional study

*Victoria Ponce Hardy, Amira Shaheen, Ai Milojevic*

## Abstract

**Background** Access to unsafe water is a concern in the Gaza Strip, where water supplies continue to degrade owing to regional sanctions, bombardment, and mismanagement. Our previous study found that decreased access to public water networks was associated with increased diarrhoea prevalence in children younger than 5 years in the Gaza Strip. This study examined the role of socioeconomic status as an effect modifier in this association.

**Methods** We used data from five consecutive demographic health surveys and multiple indicator cluster surveys conducted by the Palestinian Central Bureau of Statistics in 2000, 2004, 2006/2007 (December, 2006, to March, 2007), 2010, and 2014. Multivariable logistic regression models were applied to pooled data with prevalence of diarrhoea as the outcome and access to water as the main exposure of interest, with adjustment for age, sex, governorate, and survey year (to adjust for the seasons or other administrative conditions, for each survey). Access to water was characterised by the type of source, namely piped, other improved (eg, public standpipe, borehole, protected dug well, protected spring, and rainwater collection), or unimproved, as defined by the WHO. We defined socioeconomic status in the analysis using maternal education, refugee status, and locality type (urban, rural, or camp).

**Findings** The odds ratio (OR) of diarrhoea for children with access to unimproved water sources was higher than for those with access to piped water sources when mothers had only primary education (OR 1·35; 95% CI 1·07–1·71) than when mothers also had secondary or higher education (1·09; 0·93–1·27). The OR for children in camps was 1·32 (1·10–1·57) compared with 1·19 in urban areas (1·05–1·36). Point estimates of ORs suggested strong effect modification by refugee status, although with wider CIs for non-registered refugee children (4·95; 1·58–15·55) than for registered refugees (1·35; 1·18–1·53) or non-refugees (1·18; 1·07–1·43).

**Interpretation** Our results suggest that, in the Gaza strip, children with lower socioeconomic status experience a greater burden of diarrhoea morbidity risk than children with higher socioeconomic status, even when using the same type of water source. Changes to policy are required to address such disproportionate burden of diarrhoea risk in the occupied Palestinian territory.

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**Maternal, Adolescent, Reproductive and Child Health Centre** (V Ponce Hardy MSc) **and Department of Public Health, Environments and Society** (A Milojevic PhD), **London School of Hygiene and Tropical Medicine, London, UK; and Division of Public Health, Faculty of Medicine and Health Sciences, An-Najah National University, Nablus, Palestine** (A Shaheen PhD)

Correspondence to:
Victoria Ponce Hardy,
London School of Hygiene and Tropical Medicine, London WC1E 7HT, UK
**victoria.ponce-hardy1@lshtm.ac.uk**

**Contributors**
VPH and AM developed the concept and study design. VPH, AS, and AM secured data access. VPH conducted data collection, management, and analysis. VPH and AM contributed to interpretation of the results. VPH, AS, and AM wrote and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

**Declaration of interests**
We declare no competing interests.