Prevalence and predictors of water insecurity in low- and middle-income countries

Hilary J. Bethancourt 1, Edward A. Frongillo 2, Sera L. Young 1

1 Department of Anthropology, Institute for Policy Research, Northwestern University, Evanston, IL
2 Department of Health Promotion, Education, and Behavior, University of South Carolina, Columbia, SC

Objectives

- Global health, nutrition, and food security are closely tied to water security, defined as reliable and sufficient water access and use.
- Interventions aiming to address food insecurity need to be informed of which segments of their target populations are also water insecure.
- Using nationally representative data, we investigated the 1) prevalence and 2) demographic and socioeconomic predictors of water insecurity in low- and middle-income countries.

Methods

Data collection

- In 2020 and 2021, Gallup World Poll collected data on water insecurity from adults aged ≥15 y (n=45,555) in 31 low- and middle-income countries.

Water insecurity as measured by the Individual Water Insecurity Experiences (IWISE) scale

- The IWISE scale comprises 12 items on the frequency that individuals experienced water problems in the prior 12 months.
- Responses to each item were scored as:
  0 = "never"
  1 = "1-2 months."
  2 = "some, not all months"
  3 = "almost every month"
- Summed IWISE scores range from 0-36. Water insecurity was defined as scores ≥12.

Identifying which segments of the population are water insecure

- Multiple logistic regression models controlling for country fixed effects and specifying normalized sampling weights examined the odds of water insecurity in relation to demographic and socioeconomic characteristics.

Results

Sample characteristics (n=43,463)

- Sample was 50% female.
- Median per capita household income 781 international dollars.
- Mean age was 34.2±14.4 years.
- 57.1% reported difficulty getting by on current household income.
Mean response score for each IWISE item, by country (n=31)

Range of IWISE scores and prevalence of water insecurity

- Cameroon had the highest mean IWISE score (15.4±9.6) and prevalence of water insecurity (66.6%).
- China had the lowest mean IWISE score (1.6±3.9) and prevalence of water insecurity (3.4%).

Prevalence of water insecurity by sociodemographic and socioeconomic factors in 31 low- and middle-income countries (unadjusted)

Factors related to higher odds of water insecurity were:
- Younger age OR (95% CI) P
  - <15 y 1.91 (1.67, 2.18) <0.0001
  - 15-24 y 1.04 (1.02, 1.06) <0.0001
  - 25-39 y 1.12 (1.12, 1.19) <0.0001
  - 40+ y (ref)

Factors related to lower odds of water insecurity were:
- Higher per capita household income OR (95% CI) P
  - LnIncome+1 0.96 (0.94, 0.98) <0.0001

Factors unrelated to odds of water insecurity were:
- Gender
- Marital status
- Number of resident adults
- Urban/rural residence

Conclusions

- Water insecurity is a concern in many low- and middle-income countries, though with varying degrees of prevalence across the globe.
- Those most vulnerable to water insecurity include younger adults (<40 y) and adults with more resident children, lower per capital household income, and difficulty getting by on current household income.
- Given the critical role water plays in agriculture and food systems, addressing water insecurity among these vulnerable segments of the global population will be key to improving global health and nutrition.

Support and Acknowledgements

Support for this research was provided by the Carnegie Corporation and United State Agency for International Development Cooperative Agreement

Sample was 50% female.

- Median per capita household income 781 international dollars.
- Mean age was 34.2±14.4 years.
- 57.1% reported difficulty getting by on current household income.

Sample was 50% female.

- Median per capita household income 781 international dollars.
- Mean age was 34.2±14.4 years.
- 57.1% reported difficulty getting by on current household income.

Support for this research was provided by the Carnegie Corporation and United State Agency for International Development Cooperative Agreement

Sample was 50% female.

- Median per capita household income 781 international dollars.
- Mean age was 34.2±14.4 years.
- 57.1% reported difficulty getting by on current household income.

Support for this research was provided by the Carnegie Corporation and United State Agency for International Development Cooperative Agreement