

# Title: Effects of extreme climate events and child mortality on total fertility rate in Bangladesh

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**Abstract:** Floods, storms, and temperature extremes are examples of extreme weather events that have a substantial influence on a country's demographic dynamics, including migration, fertility, and mortality. Changes in [population size](#), composition, and distribution may result from these occurrences. This study, which spans the years 1966–2018, looks at how Bangladesh's total [fertility rate](#) (TFR) is affected by extreme weather events and child mortality, including neonatal, infant, male infant, and under-five mortality. We use data from secondary publicly accessible sources, such as the World Bank and The Emergency Events Database (EM-DAT), and we investigate the correlations using the autoregressive integrated moving average model (ARIMA), complemented by bivariate and multivariable analyses.

Our findings from the univariate analysis are noteworthy. Total extreme climate events ( $\beta = -0.345$ , 95 % CI: 0.510,  $-0.180$ ), as well as individual extreme climate events, such as extreme temperatures ( $\beta = -1.176$ , 95 % CI: 1.88,  $-0.47$ ), floods ( $\beta = -0.644$ , 95 % CI: 1.0729,  $-0.216$ ), and storms ( $\beta = -0.351$ , 95 % CI: 0.63159,  $-0.07154$ ), exhibited negative associations with the TFR. Additionally, factors such as [contraceptive](#) prevalence rate (CPR) ( $\beta = -0.085$ , 95 % CI: 0.09072,  $-0.07954$ ) and [gross national income](#) (GNI) per capita ( $\beta = -0.003$ , 95 % CI: 0.0041123,  $-0.0024234$ ) were negatively correlated with the TFR. Conversely, various categories of child mortality, namely, infants ( $\beta = 0.041$ , 95 % CI: 0.040474, 0.042748), males ( $\beta = 0.038$ , 95 % CI: 0.037719, 0.039891), and under-five ( $\beta = 0.026$ , 95 % CI: 0.025684, 0.026979) – are positively associated with TFR. Controlling for two pivotal [confounding factors](#), time and GNI per capita, yielded consistent results in the [multivariate analysis](#). These findings provide insight on the dual impact of extreme weather events, which can reduce TFR while also raising it through infant mortality. This phenomena may be due to the increased vulnerability of [younger children](#) in climate-event-prone areas, prompting parents to seek additional children as both a replacement for lost [offspring](#) and an insurance mechanism against future child loss.

**Keywords:** Extreme weather events; Total fertility rate (TFR); Child mortality; Neonatal mortality; Infant mortality; Under-five mortality; Bangladesh

<https://doi.org/10.1016/j.heliyon.2024.e35087>

<https://www.sciencedirect.com/science/article/pii/S2405844024111188>