**A Budget Impact Analysis on Immunisation Coverage: Evidence from UNICEF Global Immunization Budget Database in LMICs (2021–2025)**

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**Background:** Budgeting is essential to the continuity and effectiveness of immunisation programmes, but accessing government financial data has been challenging. Since June 2025, UNICEF’s Global Immunization Budget Database (GIBD) has addressed this by using artificial intelligence to extract and classify budget data. This study evaluates how changes in immunisation budgets impact vaccination coverage.

**Methods:** A series of Bayesian temporal models are fitted using the Integrated Nested Laplace Approximation (INLA) framework. The fixed-effect predictor is the annualized percentage change in national immunisation budget allocations (nominal US$) in function level 1 (L1), obtained from UNICEF GIBD, covering the years 2021 to 2024 in low income and lower middle income countries (LMICs) with at least three years of identified data. In each model, the outcome variable is the percentage change in vaccine coverage for a single antigen-dose combination, based on the WHO and UNICEF Estimates of National Immunization Coverage (WUENIC), including measles-containing vaccine (MCV1/MCV2), diphtheria-tetanus-pertussis containing vaccine (DTPCV1/DTPCV2), Bacillus Calmette-Guérin (BCG), poliomyelitis-containing vaccine (IPV1/IPV2/POL3), and pneumococcal conjugate vaccine (PCV3). 95% credible interval (CrI) for the predictor is computed to assess statistical significance. Significant models are fitted to project 2025 coverage where budget data are available.

**Results:** In 19 selected LMICs, the median (IQR) budget allocation was US$5,400,762 (1,852,953 to 12,974,416), with a median increase rate of 1.17% (-24.9% to 29.9%). Positive posterior means are observed for all antigens except MCV2 and IPV2. However, a significant association between budget increase to coverage improvement is identified only for DTPCV1 (posterior mean: 0.42%, 95% CrI: 0.02% to 0.82%). The 2025 outlook for DTPCV1 coverage in Kenya, Madagascar, Mali, Togo, and Zambia is an average increase of 0.5% (95% CrI: -4.6% to 5.5%), corresponding to an expected average coverage of 88.6% (95% CrI: 84.2% to 93.0%).

**Conclusion:** Immunisation function L1 budget increases demonstrate a small but consistent influence on DTPCV1 coverage in LMIC settings. Unlike lagging expenditure data, budget data are typically available prior to programme implementation, making GIBD a valuable tool for early coverage outlooks, particularly in outbreaks. Further exploration is needed on antigen-specific immunisation function data and their links to health financing indicators.