**EASTERN AFRICA STATISTICAL TRAINING CENTRE (EASTC)**



**BACHELOR DEGREE OF SCIENCE**

**MODULE: RESEARCH METHODOLOGY**

**COURSE CODE: DSU08101**

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**INDIVIDUAL ASSIGNMENT**

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**TITLE: SPATIAL ANALYSIS OF MEASLES-RUBELLA VACCINATION COVERAGE AMONG CHILDREN AGED 9 – 59 MONTHS IN TANZANIA**

**Objectives of the Study**

**Main Objective**

To determine the measles-rubella vaccination coverage among children aged 9-59 months in Tanzania.

**Specific Objectives**

1. Determine MR campaign vaccination coverage in children aged 9-59 months by region.
2. Assess MR vaccination coverage of children aged 9-59 months by caretaker education levels.
3. Identify reasons for not receiving the MR vaccine during the vaccination.
4. Examine the sources of information for the vaccination.

**Methodology**

**Main Objective:** To determine the measles-rubella vaccination coverage among children aged 9-59 months in Tanzania.

**Methodology:**  
Vaccination coverage will be estimated using survey data and verified vaccination cards. Descriptive statistics, including proportions and 95% confidence intervals (C.I.), will summarize coverage at national and regional levels. GIS tools will be employed to map spatial patterns of vaccination, identifying hotspots of low coverage.

**Specific Objectives and Methodologies**

**Objective 1:** Determine MR campaign vaccination coverage in children aged 9-59 months by region.

**Methodology:**  
Quantitative data will be collected from vaccination records, health facility reports, and structured household surveys. Regional vaccination rates will be calculated and reported with 95% confidence intervals to ensure statistical reliability. GIS spatial analysis tools will visualize regional disparities, and spatial regression will identify predictors of low coverage.

**Objective 2:** Assess MR vaccination coverage of children aged 9-59 months by caretaker education levels.

**Methodology:**  
Caretakers' education levels will be categorized (e.g., no formal education, primary, secondary, and higher education) and linked to vaccination status. Logistic regression analysis will quantify the association between education levels and vaccination uptake, adjusting for potential confounders (e.g., socioeconomic status, urban/rural residence). Odds ratios (OR) and 95% C.I. will be reported to measure the strength of associations.

**Objective 3:** Identify reasons for not receiving the MR vaccine during the vaccination.

**Methodology:**  
A mixed-methods approach will be used:

* **Quantitative:** Structured questionnaires will be used to quantify reasons for non-vaccination, such as logistical barriers or misconceptions. Proportions and 95% C.I. will be calculated for each reason.
* **Qualitative:** Focus group discussions with caregivers and in-depth interviews with health workers will explore barriers in detail. Thematic analysis will identify recurring issues and provide deeper insights into the challenges faced.

**Objective 4:** Examine the sources of information for the vaccination.

**Methodology:**  
Quantitative surveys will assess the reach and effectiveness of communication channels (e.g., radio, health workers, posters). Proportions and their 95% C.I. will be calculated to measure the prevalence of each information source.  
Qualitative data from interviews with campaign coordinators and health workers will be analyzed thematically to understand the strengths and limitations of communication strategies.

**Data Sources**

The data for this spatial analysis of measles-rubella (MR) vaccination coverage among children aged 9 to 59 months in Tanzania will be secondary data derived from multiple sources, ensuring comprehensive and reliable coverage. These include:

1. **Household Survey Data:** Data collected through nationally representative household surveys, including vaccination records from health cards or caretaker recall.
2. **Health Facility Records:** Routine immunization data from health facilities, including vaccination registers and monthly immunization summary reports.
3. **Demographic and Health Surveys (DHS):** Relevant DHS data providing contextual information on child health, caretaker education levels, and household characteristics.
4. **Community Survey Data:** Data from local-level surveys assessing community awareness, vaccination campaign reach, and barriers to vaccination.

**Research Gap**

Despite the extensive literature on factors influencing measles-rubella (MR) vaccination uptake, significant gaps remain in understanding the spatial disparities and multifaceted determinants of vaccination coverage among children aged 9-59 months in Tanzania. For instance, while Chacha (2021) highlighted geographic disparities in vaccination coverage between urban and rural areas, with urban regions achieving higher coverage, there is a lack of detailed spatial mapping to pinpoint localized areas of concern.

Similarly, Kabula et al. (2022) identified logistical barriers and cultural misconceptions as key challenges, but their qualitative approach did not integrate these factors into a spatial framework that could guide targeted interventions. Additionally, while Rashid et al. (2019) emphasized the effectiveness of tailored campaigns in rural areas in India, comparable region-specific strategies for Tanzania remain unexplored. Aina (2023) underlined the importance of trusted communication channels such as radio and community health workers in Uganda, yet the relative effectiveness of various information sources in Tanzania's diverse regions has not been thoroughly evaluated. Furthermore, innovative approaches, such as the use of financial incentives as demonstrated by Singh et al. (2020) in Bangladesh, have not been considered in the Tanzanian context.

These gaps highlight the need for a comprehensive study that integrates spatial analysis with the examination of sociodemographic, economic, and cultural determinants to provide actionable insights and inform region-specific strategies to enhance vaccination uptake.