**Scope of Work**

Mentor-Mentee Program

**CONCEPT NOTE**

**SELECTED TOPIC:** Health workforce 8. Inequities in distribution of specialists in India & its correlation to district MNCH outcomes

**TITLE OF THE PROPOSED RESEARCH PROJECT:** Inequity in distribution of health infrastructure, human resources including specialists and its correlation with maternal, neonatal and child health outcomes in India – Findings from a nationally representative survey

**IMPORTANCE OF THE TOPIC**

Healthcare services in India are provided mainly through the three-tier healthcare delivery system i.e., community health centers (CHCs) at the top, primary health centers (PHCs) at the middle, and sub-centers (SCs) at the bottom. SCs and PHCs has been vested with the responsibility of providing essential health services through medical officers and nursing personnel, while the CHC is meant to provide specialist services like surgical, obstetric, gynaecological and paediatric services through a team of specialist doctors.

The shortage or unequal distribution of the health centers, general or specialist healthcare workers can have serious implications on the quality of healthcare delivery at higher levels like district or regional level hospital. This in turn will seriously impact the maternal, neonatal and child health outcomes of the poorer sections of society, as they rely mostly on the government funded facilities for their health needs. It also has serious economic impact, making them trapped into a vicious poverty cycle due to high direct and indirect costs when seeking care or consequence due to unavailability of care. Hence, we propose to conduct a study to identify the district wise inequity in the distribution of infrastructure, general healthcare workers and specialists and its correlation with maternal, neonatal and child health outcomes in India through a nationally representative survey (DLHS-4).

**APPROACH AND METHOD/METHODOLOGY**

**PHASE-I: SCOPING REVIEW:**

We will perform a scoping review guided by the Arksey and O’Malley’s framework to identify the variables for assessing the correlation between health infrastructure, human resources and maternal, neonatal and child health outcomes. This is because certain outcomes are influenced heavily by tertiary care services compared to services provided at primary or secondary level (e.g., availability of specialist services on still birth rate etc.,) and vice versa (e.g., availability of primary care services on the antenatal care coverage etc.,). Hence, this scoping review will help in identifying which level of care need to be correlated with which set of outcomes.

The scoping review consists of five stages: identification of research question, identification of relevant studies, study selection process, charting and collating the data, and reporting the results. We will follow the Preferred Reporting Items of Systematic Reviews and Meta Analysis extension for Scoping Reviews (PRISMA-ScR). Based on the findings of the review, we will identify the set of variables to perform equity analysis.

**PHASE-II: EQUITY ANALYSIS**

**Data source and variables:**

We will utilize the district level household survey (DLHS-4) data by obtaining prior permission from the International Institute of Population Sciences (IIPS) for accessing the dataset.

First, we will assess the inequity in the distribution of health infrastructure and human resources (primary, secondary and tertiary level) keeping district as the explanatory variable. Then, we will assess the inequity in the maternal, neonatal and child health outcomes keeping

the district wise distribution of health infrastructure and human resources as the explanatory variable (identified through the scoping review).

**Analysis plan:**

All the analyses will be performed using STATA 14.2 (StataCorp, College Station, TX, USA). Sampling weights will be included in the analysis to account for the differential probabilities of participation and selection. Clustering and stratification in the sampling

design were also accounted, after which *svyset* command was used to declare the datasets as survey type Point estimates will reported with 95% Confidence Interval (CI).

District level inequities in the health infrastructure and human resources will be assessed using the Theil index (relative measure of inequity for non-ordered groups). In Theil index, each district takes a non-negative fraction yi (i=1,2,3…n) of health infrastructure and human resources.

If there was perfect equity yi=1 /n (i=1, 2, 3… n), the entropy of distribution would be H(y) – log(n).

If there were complete inequity, the entropy H(y) would be zero.

Theil index will range from zero for complete equity to log(n) for complete inequity. Hence, the maximum possible value for Theil index depends on the n value i.e., number of districts in the overall dataset.

In addition, The Theil index helps in determining the sources of inequity by allowing decomposition of subgroups in the context of larger groups. It can be divided into two components and estimate the overall inequity in both the parts as a sum of ‘within group inequity’ and ‘between-group inequity’ component.

Then, we will plot the concentration curve and obtain concentration index to determine the inequity in maternal, neonatal and child health outcomes by keeping district wise distribution

of health infrastructure and human resources as explanatory variable. The concentration curve will be derived by plotting the cumulative proportion of maternal, neonatal or child health outcome against the cumulative proportion of the district ranked by the distribution of health infrastructure or human resources. If the concentration curve lies below the line of equality (i.e., 45° line), it means the outcomes are more concentrated amongst those with higher distribution of health infrastructure or human resources and vice versa. The “Lorenz” package in STATA will be used to obtain the concentration curves.

Then, the concentration index will be calculated using the “conindex” package. It is defined as twice the area between the concentration curve and the line of equality. It is done to assess the relationship between the cumulative proportions of maternal, neonatal or child health outcome against the cumulative proportion of the district ranked by the distribution of health infrastructure or human resources at primary, secondary or tertiary level. Its value ranges from -1 to +1. Value closer to zero indicates no inequity while value closer to +1 indicates total inequity. Values less than 0.2 indicate absolute equity, values between 0.2 and 0.3 indicate relative equity, 0.3 and 0.4 indicate proper inequity, and values above 0.4 indicate severe inequity. We will also conduct subgroup analysis based on wealth index, caste, sector (urban/rural), religion to determine the extent of inequity between each of these subgroups. Inequity between the groups will be considered statistically significant if p value was less than 0.05.

**PHASE-III: SCOPING REVIEW:**

We will again perform a scoping review to identify the set of policies or best practices to overcome inequity in distribution of health infrastructure and human resources. Based on the findings of the review, we will develop a framework of policies to ensure the equity in healthcare resources across the districts.

**EXPECTED TIMELINE**

The proposed timeline of the study is 2 months and 14 days (September 10 to November 22). The activities and the timeline of doing these activities from day 1 to day 74 (2 months and 17 days) is shown below in the Gantt Chart.

**TIMELINE (GANTT CHART - DAYS)**

Report writing

Phase-III: Scoping review

Phase-II: Equity analysis

Phase-I: Scoping review

Dataset access and permissions **7**

**14**

**150 10 20 30 40 50 60 70 80**

**30**

**Compensation**

The Consultancy fee for this engagement is USD 5,000(Inclusive of all indirect taxes). The payment will be disbursed in three instalments, in the proportions given below and the consultant should provide the invoice against each deliverable.

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| --- | --- | --- | --- |
| **Instalment** | **Percentage** | **Amount (USD)** | **Deliverable/ Milestone** |
| 1 | 25 | 1250 | On Signing Contract |
| 2 | 25 | 1250 | On submission of literature review and methodology (including stakeholders for a qualitative interview and analysis plan) approved by the Mentor, and |
| 3 | 50 | 2500 | On submission of the final deliverable approved and accepted by the Mentor & AHI Team. |

**Term**

This engagement shall commence upon execution of this Agreement. The Agreement shall continue in full force and is effect from **September 15, 2021** to **December 15, 2021** and is extendable based on the review of Consultant’s performance by the Foundation and mutual concurrence on revised terms of engagement.