In order to best capacitate health programmes to deliver effectively, UNICEF provides ongoing support to improve the effectiveness and efficiency of these programmes. Part of this support requires the proper collection, validation, analysis and use of data – both from routine, administrative sources as well as from household surveys. UNICEF Data & Analytics Section in the New York headquarters office supports regional and country offices with the data and analytical assets to help them identify and quantify the progress in order to improve intervention coverage and quality of services. In order to provide quick analytical supports, it is necessary to build databases that are fit-for-purpose and easily manageable. At the same time, it is necessary to build analytical systems that can provide rapid insight from existing and new data.

Under the direction of the D&A Health focal point, the consultant will complement the Data & Analytics Health Team’s efforts to build immunization/health databases and statistical systems to analyse and visualize administrative and household survey data, essentially the Demographic and Health Surveys (DHS) and the Multiple Indicators Cluster Surveys (MICS). There are two main objectives for this consultancy: 1) Build the immunization and health database and 2) Develop a set of tools to produce quick analysis and routine products including visualizations.

Work with different teams in the Data and Analytics (D&A) section, in particular with the MICS team, to understand and document the definition used for the different indicators of interest.

Adapt existing SPSS and Stata codes for calculating the indicators and the disaggregation levels. In addition to the usual disaggregation (i.e. geography, sex, type of residence, wealth quintile, mother’s education, age cohort), extra dimensions will be added such as religion, ethnicity, urban-poor or some other combinations (to be determined).

Write R and/or Python programs to produce analytical and (interactive) visualizations. It should be possible to use these tools to quickly reproduce or extended analysis as new data becomes available. GGPlot2 and R-Shiny are the basic tools considered for the visualization work. However, it is likely that Plotly or equivalent packages will also be necessary. Depending on the profile of the consultant, equivalent packages in Python may be used.

Create tools for disparities and missed opportunities analysis of survey data. This product will be a mix of standard web-based profiles for monitoring of the inequities and a statistical system to conduct ad-hoc disparity analysis. A particular focus will be on communicating graphically the statistical significance of the disparities.
TERMS OF REFERENCE (TORs)

- Create a web-based product to provide visualizations of the WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) for the UNICEF regional and country offices. This product will generate some basic automated analysis with the standard graphs. The user should be able to download the associated data and have some flexibility on customizing the visualizations.
- Communicate ideas, processes, and results to all relevant teams in the section.
- Ensure full reproducibility of the processes.
- Ensure that the code is well-structured and documented.

All products (e.g. R/Python code, databases, visualizations) developed during this consultancy will be the sole and exclusive property of UNICEF.

EXPECTED RESULTS: (MEASURABLE RESULTS)
- Extract critical information from the DHS and MICS survey reports to include in the database.
- Write well-structured and documented R and Python codes to create the database, the analysis and visualization tools.
- Produce a database with estimates disaggregated accordingly to the requirements from the officer in charge.
- Standalone and web-based R and Python analyses and visualizations of immunization and health data.
- Weekly reports to the officer in charge detailing the progress on the assignments.
- Final documentation of all the indicators, programs and tools created during the consultancy.

DUTY STATION
UNICEF HQ, New-York NY, USA

TIMEFRAME

<table>
<thead>
<tr>
<th>DELIVERABLES</th>
<th>DURATION (ESTIMATED # OF DAYS)</th>
<th>DEADLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverable 1. Document the different methodologies for deriving the indicators of interest.</td>
<td>10</td>
<td>May 31, 2018</td>
</tr>
<tr>
<td>Deliverable 2. Standards visualizations for the WUENIC, analysis packages of the WUENIC data for the UNICEF regional offices. Briefing notes/package for the programme division immunization team. These will be based on a reproducible system.</td>
<td>15</td>
<td>July 13, 2018</td>
</tr>
<tr>
<td>Deliverable 3. Create, verify and document MICS-related database. The database will be disaggregated along relevant equity dimensions to support the disparity analysis.</td>
<td>40</td>
<td>Ongoing up to December 31, 2018</td>
</tr>
<tr>
<td>Deliverable 4. Create, verify and document DHS-related database. The database will be disaggregated along relevant equity dimensions to support the disparity analysis.</td>
<td>40</td>
<td>Ongoing up to December 31, 2018</td>
</tr>
<tr>
<td>Deliverable 5.</td>
<td>40</td>
<td>Ongoing up to December 31, 2018</td>
</tr>
</tbody>
</table>
### TERMS OF REFERENCE (TORs)

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverable 6. Standards visualizations for disaggregated data for global and country use (global, regional and country specific equity analysis). Set of tools and programs to reproduce the equity/disparity analysis.</td>
<td>Ongoing up to December 31, 2018</td>
</tr>
<tr>
<td>Deliverable 7. Support the team in developing R/Python programs to support the EPI survey work and in responding to ad-hoc data requests from programme division, regional and countries offices and other partners.</td>
<td>Ongoing up to December 31, 2018</td>
</tr>
</tbody>
</table>

**TOTAL** 175

### KEY COMPETENCES, TECHNICAL BACKGROUND, AND EXPERIENCE

- A minimum university degree (Bachelor’s) in Statistics, Data science, Computer science, or other relevant degree is required and a master degree in a relevant field is considered an asset.
- A junior data analysis with up to 5 years of experience. A master degree in a relevant field may be considered equivalent to a 2 year of experience. High proficiency in writing R code and solving computational problems. Good knowledge of Python desired.
- Familiarity with household surveys and immunization/health indicators highly desired.
- Familiarity with cloud computing is desired.
- English proficiency level and ability to work in a multicultural environment required.

UNICEF is committed to achieving workforce diversity in terms of gender, nationality and culture. Individuals from minority groups, indigenous groups and persons with disabilities are equally encouraged to apply. All applications will be treated with the strictest confidence.