riycf Package

Independent Study Planning

Nicholus Tint Zaw

## Background Information

The first 1,000 days of life (from pregnancy to a child’s 2nd birthday) are critical for addressing childhood malnutrition, especially stunting. Infant and young child feeding practices (IYCF) largely overlap with this period as they cover breastfeeding and complementary feeding practices for the first two years of a child’s life. They also have a significant impact on childhood health, nutrition outcomes, and child survival. It is, therefore, critical for countries to measure IYCF practices as part of their efforts to monitor their progress toward Sustainable Development Goal 2. It is also important for development agencies to be able to monitor and evaluate their programs aimed at improving infant and young child feeding practices towards improved overall childhood nutrition.

WHO and UNICEF released the first IYCF indicators definition and measurement guidelines in 2008. In 2021, these guidelines were updated along with a revised standard questionnaire to capture the information required to calculate the updated IYCF indicators since the first initial publication.

Although published in 2008 with many humanitarian organizations and country health ministries implementing these indicators, no comprehensive statistical programming package to calculate these indicators is yet available. This project aims to address this technical gap by providing an easy-to-use package for the [R language for statistical computing](https://www.r-project.org) to calculate these IYCF indicators. This project also aims to develop an IYCF questionnaire based on the recommendations of the current guidelines built using [XLSForm standard](https://xlsform.org) that can be deployed using any [Open Data Kit](https://getodk.org) platform for computer-assisted personal interviews (CAPI).

## Objectives

* To develop an R package to generate IYCF indicators according to the indicators’ definition provided by the WHO/UNICEF 2021 guideline.
* To develop a questionnaire using the XLSForm standard based on WHO/UNICEF IYCF indicators standard questionnaire.
* To publish the riycf package at The Comprehensive R Archive Network
* To deploy a package website that explains the IYCF indicators and demonstrates the application of the functions available in the package.
* To draft a concept note and flowchart for the development of a Shiny app that uses the riycf package and aims to provide a dashboard for reporting indicator results.

## Project Organization

* [Professor Rebecca Wolfe](https://harris.uchicago.edu/directory/rebecca-wolfe): Academic Supervisor
* [Ernest Guevarra](https://ernest.guevarra.io/): Technical Resource Person
* Nicholus Tint Zaw: Student and Lead author of the package

## Workflow Management

* A weekly update to share with the academic supervisor and technical resource person
* Hold regular bi-weekly meetings with the academic supervisor to update the project progress and other project-related issues
* Hold regular weekly meetings with technical resource person to review the codes
* Use GitHub platform for version control, coding task management, and publication

## Timeline and Project Milestones

**Duration**: Spring Quarter (28th March 2022 - 4th June 2022)

**Milestones**

* Step 1: XLXForm development
* Step 2: Completion of breastfeeding-related indicators
* Step 3: Completion of complementary feeding-related indicators
* Step 4: Development of general user guidelines for using the riycf package
* Step 5: Submit package for publication to CRAN
* Step 6: Development of Shiny app (concept note and flowchart)

## Project Plan

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| --- | --- | --- | --- | --- |
| **No.** | **Activity Description** | **Responsible Person** | **Time-line** | **Deadline** |
| 1 | Project kick-off meeting | Professor Rebecca Wolfe  Nicholus Tint Zaw | 28th-31th March | TBC |
|  | **Step 1** |  |  |  |
| 2 | XLS form programming | Nicholus Tint Zaw | 28th-30th March | 1st April |
| 3 | Review XLS programming | Ernest Guevarra | 31th March - 1st April | 1st April |
|  | **Step 2** |  |  |  |
| 4 | Breastfeeding indicators development | Nicholus Tint Zaw | 4th-6th April | 6th April |
| 5 | Breastfeeding indicators  code review | Ernest Guevarra | 7th - 8th April | 8th April |
| 6 | Project Progress Meeting | Professor Rebecca Wolfe  Nicholus Tint Zaw | 11th-15th April | TBC |
|  | **Step 3** |  |  |  |
| 7 | Complementary indicators development | Nicholus Tint Zaw | 11th-13th April | 13th April |
| 8 | Complementary indicators  code review | Ernest Guevarra | 14th - 15th April | 15th April |
|  | **Step 4** |  |  |  |
| 9 | Development of R Documentation File (Vignettes) | Nicholus Tint Zaw | 18th-22th April | 22th April |
| 10 | Project Progress Meeting | Professor Rebecca Wolfe  Nicholus Tint Zaw | 25th-29th April | TBC |
| 11 | R Documentation File  (Vignettes) review | Ernest Guevarra | 25th-29th Apri | 29th April |
|  | **Step 5** |  |  |  |
| 12 | Final Review on R-package  (prepare for CRAN submission) | Nicholus Tint Zaw | 2nd-6th May | 6th May |
| 13 | Project Progress Meeting | Professor Rebecca Wolfe  Nicholus Tint Zaw | 9th-13th May | TBC |
| 14 | Project Website Development | Nicholus Tint Zaw | 9th-11th May | 11th May |
| 15 | Project Website  code review | Ernest Guevarra | 12th - 13th May | 13th May |
|  | **Step 6** |  |  |  |
| 16 | Shiny App Development (concept note) | Nicholus Tint Zaw | 16th-20th May | 20th May |
| 17 | Project Progress Meeting | Professor Rebecca Wolfe  Nicholus Tint Zaw | 23th-27th May | TBC |
| 18 | Shiny App Development  Concept note review | Ernest Guevarra | 23th-27th May | 27th May |
| 19 | R-package and Website Launching | All | 30th-31th May | 31th May |

## Project Outputs

**Output-1: XLS programming form for standard IYCF indicators questionnaires**

Ready to deploy XLS programming form for any XLS form supported platform (for example, SurveyCTO, ONA, ODK, KoboToolbox, etc.). A brief user guide will be provided as part of the output, and the form will be also published on the riycf-package website.

**Output-2: riycf-package**

The r-function package calculates all the IYCF indicators provided in the WHO guideline. Each function will be performed to check the type of input parameters variables are consistent with the kind of variable to calculate the IYCF indicator variable. If not, the error message will be provided to notify the user to check the input parameter variables. If there were no issues with the input parameters, the indicator calculation process would continue, and the respective IYCF indicator will be returned as the final output of each function.

The additional variables check function will be available for the user who uses the XLS form provided by our package. This function will check whether the required variables’ names are present in the provided data frame or not, and those variables have the correct variable type to calculate the IYCF indicators.

**Output-3: r-package Guideline Website**

This website will host information about XLS form and riycf-package and articles which explain the step-by-step demonstration on the usage of the XLS form and r-package. The shiny app link will be provided on that website.

**Output-4: riycf Shiny App Concept Note**

This concept note will help map out the feature and function of the riycf shiny app, which continues to work after this project. The main idea of this shiny app is to provide the ’riycf-packageto the user community who don't wish to use statistical softwareR` for their regular monitoring and evaluation work (especially the INGOs country office teams).

## Reference Documents and Reading