# Introduction

This document describes the web-based application implementation for COVID-19 vulnerability index ranking of Addis Ababa sub-cities.

Implementation of the web application is based on indicators. Indicators are parameters give to system to calculate risk index. Indicators have categorizing conditions that yield ranks. Then ranks are used to calculate the risk index. To implement this logic, we used this flow

**Flow**

* Sub-cities, woreda, indicators are inserted to Database therefor they are static
* administrators are divided into two
  + **admin** is responsible of managing all uses and assign admin, subcity admin, expert, encoder, physician and setting
  + **subcity admin** is restricted to their assigned subcity. They are responsible of managing subcity uses; can assign encoder roles only
* **encoders** insert indicators value using their dashboard as they do, they also insert ketenas population that will propagate to woredas population and sub-cities population
* system calculates risk index for all three class (infection, hospitalization, death) using the conditions for ranking
* based on the indicators value and risk index **experts** give review for sub-cities using they’re on dashboard

# main areas codding guides

## administrator controller

**file name:** **adminController.php**

**description**

controls admin dashboard. Register, update, delate users

### Functions

**function name:** **store($request)**

**description**

register uses

**parameters**

request from user-add form. Contains user name, user email, role

**procedure**

// \*\* input validation \*\*\*\*\*\*\*

// \*\* data preparation \*\*\*\*\*\*\*

// \*\* generate random password

// \*\* compose mail and send it \*\*\*

// \*\* save data \*\*\*\*\*\*\*

## Encoders controller

**File name:** **IncoderController.php**

**Description**

controls encoders dashboard. inserts ketenas indicator values, updated risk index calculation for ketana level, woreda level and subcity level

### Functions

**function name:** **store($request)**

**description**

updated indicators value, ketene population, risk index for ketene, woreda, subcity

**parameters**

request from user-add form. Contains user name, user email, role

**procedure**

/\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* LOGIC \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FOR EACH INCODED INDICATOR

RETREVE RISK INDEX FROM CalculateRI

IF NOT IN DATA TABELE INSERT ITS VALUE BUT IF EXISTS UPDATE

UPDATE WOREDA RISK INDEX

UPDATE SUBCITY RISK INDEX

\*/

// \*\* input validation \*\*\*\*\*\*\*

// \*\* data preparation

// \*\* special indicator value for HH Size \*\*\*\*\*\*

// \*\* retrying indicators ranking index from **calculateRI** **get**\_ri function \*\*\*\*\*\*\*\*\*

// \*\* update data table \*\*\*\*\*\*\*\*\*

// \*\* INSERT KETENA POPULATION \*\*\*\*\*\*\*\*\*\*\*\*\*

// \*\* update subcity risk index using **upate\_subcity\_ri()** function inside calculateRI controler \*

// \*\* update woreda risk index using **updte\_woreda\_ri()** function inside calculateRI controler

## Calculate risk index

**File name:** **calculateRI.php**

**Description**

Responsible for each indicators risk index selection, risk index calculation for all criteria infection, hospitalization, death. Also updates risk index of woredas and sub-cities

### Functions

**function name:** **get\_ri($indicator\_name, $percentage)**

**description**

selects indicators risk level for each classification (infection, hospitalization, death) and calculate risk index respectively returns infection risk index, hospitalization risk index and death risk index for the indicator

**parameters**

indicator name and indicator percentage from total population of request aria (ketene, woreda or subcity)

**procedure**

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* LOGIC \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SELECT INDICATORS RISK VALUE USING THE PERCENTAGE

CALCULATE THE RISK INDEX VALUE USING

(SCORE – MIN RISK VALUE) / (MAX RISK VALUE – MIN RISK VALUE)

\*/

// \*\* indicators ranking conditions selector using percentage value \*\*\*\*\*\*\*\*\*

// \*\* calculate risk index for infection, hospitalization and death

// \*\* return calculated risk index value for the indicator

**function name:** **update\_woreda\_ri()**

**description**

update woreda population and risk index for all indicators

**parameters**

none

**procedure**

/\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* LOGIC \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

For all indicators retrieve sum of portion from ketenas in that woreda

Request risk index using indicator and percentage of portion

Update table using risk index and population

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// \*\* retrieve woreda population

// \*\* update woreda population

// \*\* retrieve indicators portion

// \*\* for all woredas request indicators index and update or insert data

**function name:** **update\_subcity\_ri()**

**description**

update sub-cities population and risk index for all indicators

**parameters**

none

**procedure**

/\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* LOGIC \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

For all indicators retrieve sum of portion from woreda in that subcity

Request risk index using indicator and percentage of portion

Update table using risk index and population

\*/

// \*\* retrieve subcity population

// \*\* update subcity population

// \*\* retrieve indicators portion

// \*\* for all subcity request indicators index and update or insert data