Blue Pulse– User Guide

Last Update: 6 April 2025

Water and Health Indicators Dictionary- Overview

Water Stress

Definition: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources

The level of water stress is the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after taking into account environmental water requirements. Main sectors, as defined by ISIC standards, include agriculture; forestry and fishing; manufacturing; electricity industry; and services. This indicator is also known as water withdrawal intensity.

Open Defecation

Definition: People practicing open defecation (% of population)

This metric refers to the percentage of the population defecating in the open, such as in fields, forest, bushes, open bodies of water, on beaches, in other open spaces or disposed of with solid waste.

Basic Drinking Water Services

Definition: People using at least basic drinking water services (% of population)

The percentage of people using at least basic water services. This indicator encompasses both people using basic water services as well as those using safely managed water services.

Basic drinking water services is defined as drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip. Improved water sources include piped water, boreholes or tubewells, protected dug wells, protected springs, and packaged or delivered water.

Basic Sanitation Services

Definition: People using at least basic sanitation services (% of population)

The percentage of people using at least basic sanitation services, that is, improved sanitation facilities that are not shared with other households. This indicator encompasses both people using basic sanitation services as well as those using safely managed sanitation services.

Improved sanitation facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, compositing toilets or pit latrines with slabs.

Water Productivity

Definition: Water productivity, total (constant 2015 US$ GDP per cubic meter of total freshwater withdrawal)

Water productivity is calculated as GDP in constant prices divided by annual total water withdrawal.

Our Shiny app deals with environmental, health, or sustainability data.

The first part of dictionary allows users to get familiar with technical terms and indicators commonly used in the fields of water, sanitation, and health: water stress, open defecation, basic drinking water services, basic sanitation services, and water productivity.

The purposes of dictionary are:

- **Improve user understanding**
- **Ensure consistent interpretation**
- **Build trust and transparency**
- **Enhances data literacy**
- **Support decision-making**
- **Improve usability**

Water and Health Indicators Dictionary- Overview (cont'd)

Health Indicators

Hepatitis A

Definition: Acute hepatitis A incidence rate

Hepatitis A is a liver disease caused by the hepatitis A virus. The disease is closely associated with unsafe water, inadequate sanitation and poor personal hygiene.

Diarrheal Diseases

Definition: Diarrheal diseases incidence rate

Diarrheal diseases are a group of conditions caused by infection and inflammation of the gastrointestinal tract. These diseases are strongly linked to conditions of poor water quality, sanitation, and hygiene.

Typhoid Fever

Definition: Typhoid fever incidence rate

Typhoid fever is a bacterial infection caused by Salmonella Typhi. It is transmitted through the ingestion of food or water contaminated by the feces or urine of infected people.

Our Shiny app deals with environmental, health, or sustainability data.

The second part of dictionary allows users to get familiar with key health-related terms and disease indicators: Hepatitis A, Diarrheal Diseases, and Typhoid Fever.

The purposes of dictionary are:

- **Improve user understanding**
- **Ensure consistent interpretation**
- **Build trust and transparency**
- **Enhances data literacy**
- **Support decision-making**
- **Improve usability**

Exploratory Data Analysis (EDA)

EDA allows users to interact with the data intuitively and visually explore trends and patterns, understand data distributions across water and health indicators using historical data from 2006 to 2021, covering 140 countries and seven global regions. This section helps users generate hypotheses and build a deeper understanding of the dataset before conducting more detailed or targeted analyses.

1) Options for water and disease indicators visualization. Users can specify the parameters to explore and compare water and health indicators.

Users can:

a. Specify a year (2006-2021)
b. Filter by region or country
c. Choose a region name if "Region" is selected
d. Choose a country name if "Country" is selected

2) Plot type: Users can

- Select Boxplot to visualize differences between regions and country (highlights median, quartiles, and outliers)
- Select Violin Chart to visualize the changes by region or country using group data by year ranges: 2006-2010, 2011-2015, 2016-2021

Exploratory Data Analysis (EDA) (cont'd)

EDA allows users to interact with the data intuitively and visually explore trends and patterns, understand data distributions across water and health indicators using historical data from 2006 to 2021, covering 140 countries and seven global regions. This section helps users generate hypotheses and build a deeper understanding of the dataset before conducting more detailed or targeted analyses.

Data Table

Show 10 entries 3 Search:

	year	country	region	open_defecation
1	2021	Arab Republic of Egypt	Middle East & North Africa	0.00683491
2	2021	Australia	East Asia & Pacific	0
3	2021	Belize	Latin America & Caribbean	0.569863505
4	2021	Brunei Darussalam	East Asia & Pacific	0
5	2021	Burkina Faso	Sub-Saharan Africa	35.22758501
6	2021	Canada	North America	0
7	2021	Central African Republic	Sub-Saharan Africa	25.19570959
8	2021	Czech Republic	Europe & Central Asia	0
9	2021	Democratic Republic of Sao Tome and Principe	Sub-Saharan Africa	42.29018938
10	2021	Democratic Republic of Timor-Leste	East Asia & Pacific	11.62849036

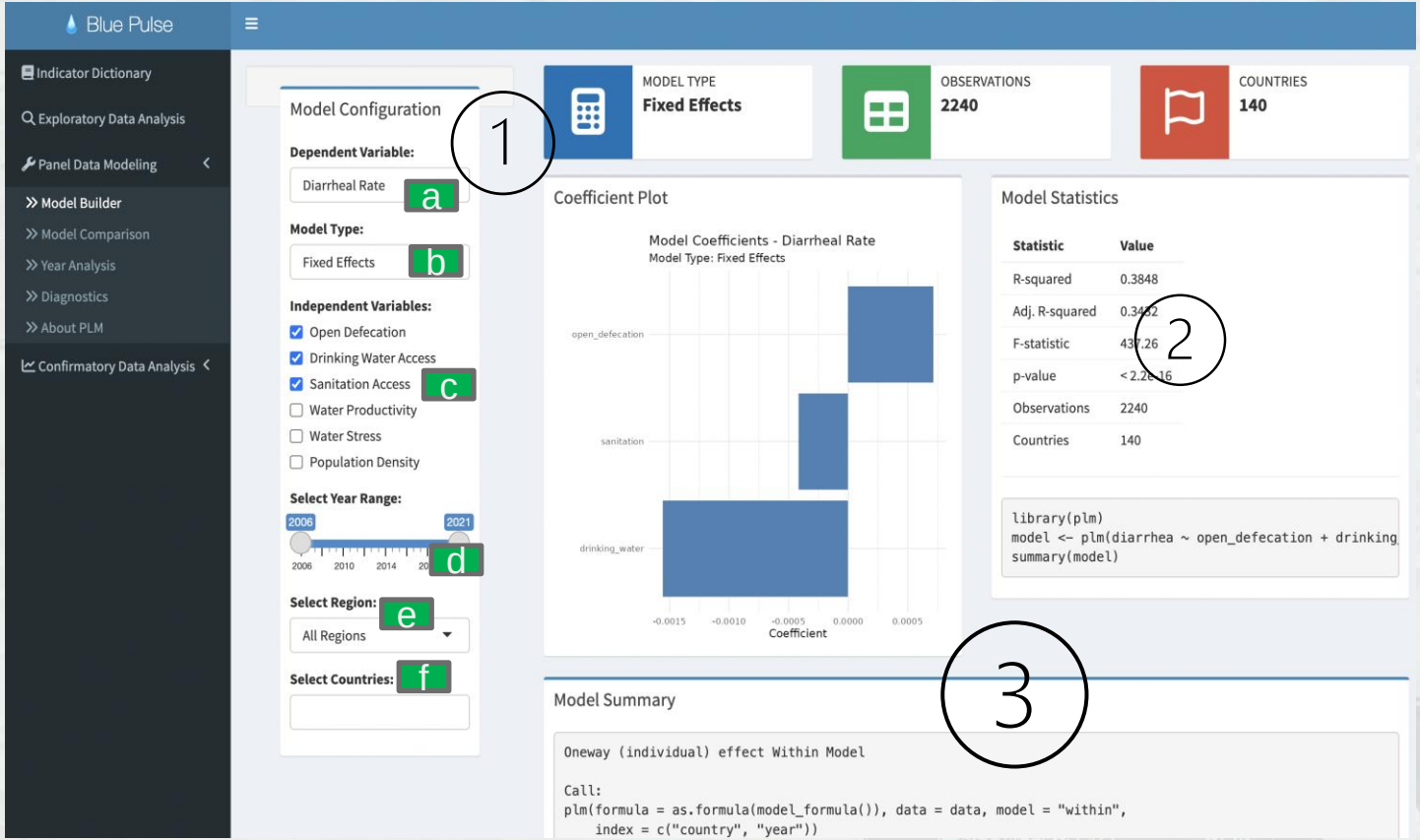
Showing 1 to 10 of 140 entries

Previous 1 2 3 4 5 … 14 Next

3) Data Table: Display detailed data for any country/ region based on the selected parameters from the chosen indicator.

Panel Data Modeling- Model Builder

This part allows users to analyze data that combines across-region and time-series. It provides more informative data, more variability, and more complex relationships than purely cross-sectional or time-series data. Users can select and build customized panel data models: Fixed Effects, Random Effects, Pooled OLS, Fixed effects with Time, and Dynamic panel. It provides users with flexibility to test various approaches.



1) Options for Model Settings. User can:

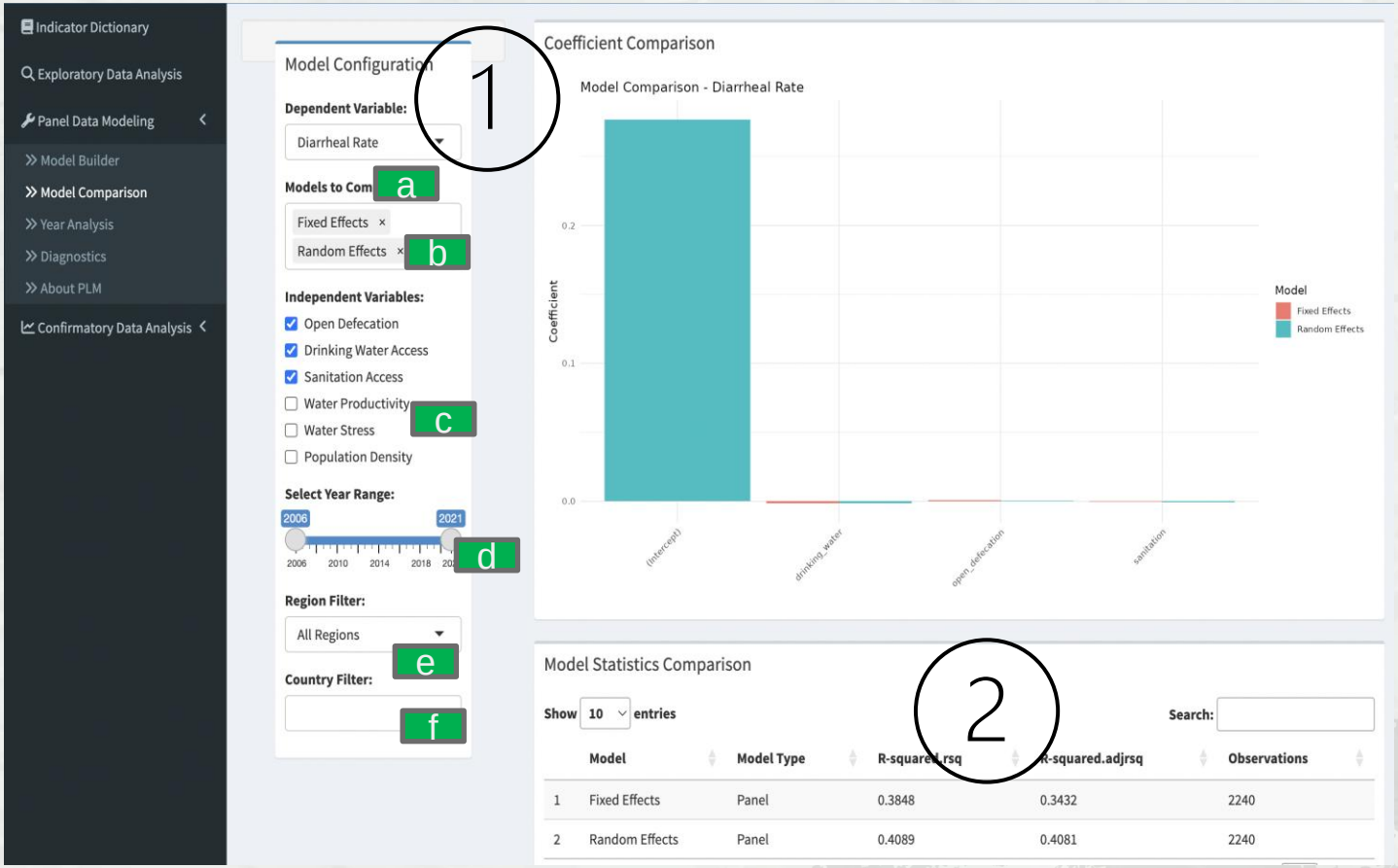
a. Select one dependent variable: any one of disease indicators
b. Select one Model Type
c. Select multiple independent variables: water indicators
d. Select year range between 2006 and 2021
e. Select all regions/ any one region
f. User is not able to select country

2) Model Statistics: Help users evaluate the performance, significance, and appropriateness of the model.

3) Model Summary: Help users identify the water indictors have significant associations with the disease indicator.

Panel Data Modeling- Model Comparison

This part allows users to analyze data that combines across-region and time-series. It provides more informative data, more variability, and more complex relationships than purely cross-sectional or time-series data. It allows user to select multiple models to make side-by-side comparisons.



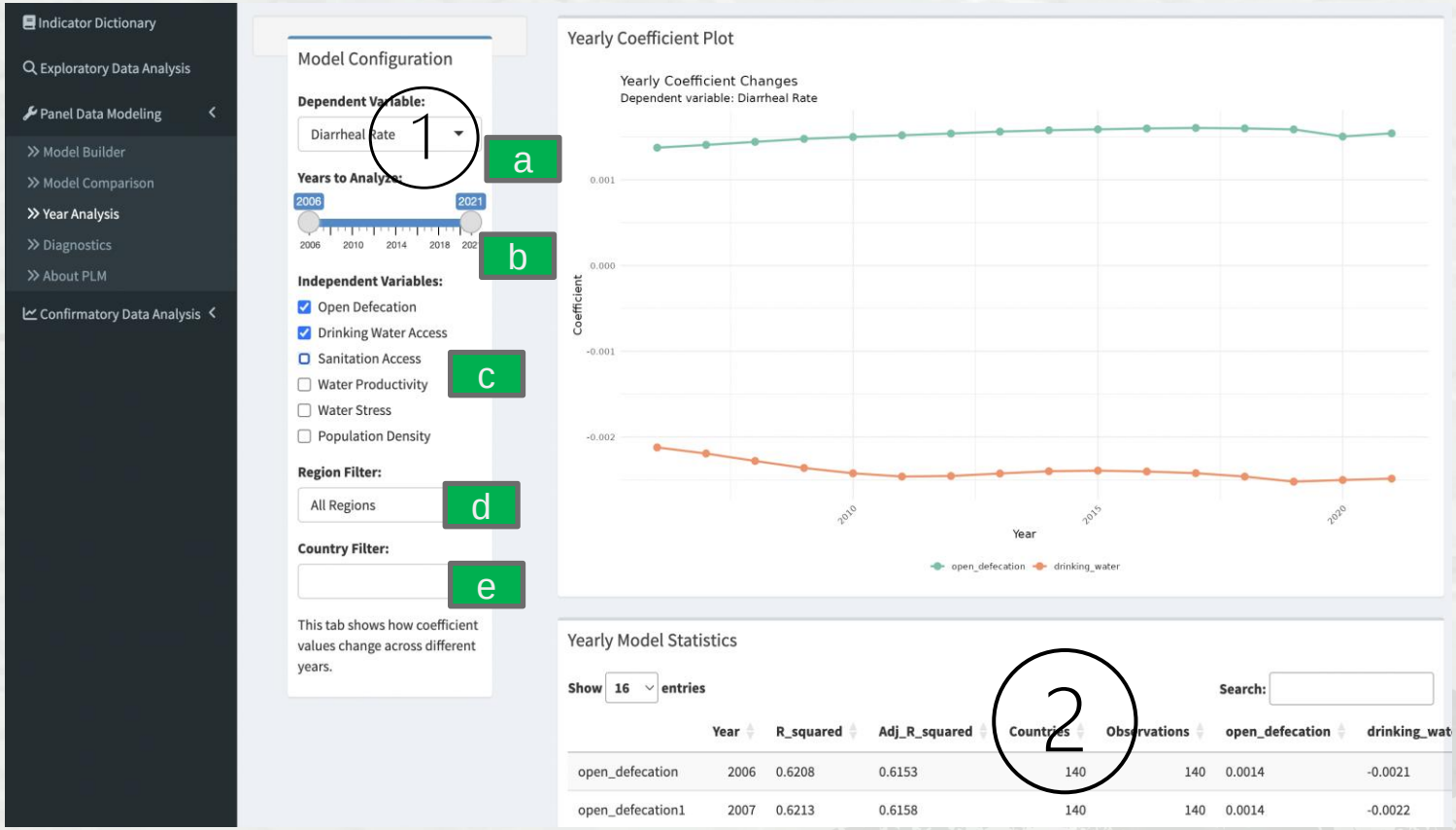
1) Options for Model Comparison. User can:

- **a. Select one dependent variable: any one of disease indicator**
- **b. Select multiple Model Types they wish to make comparison**
- **c. Select multiple independent variables: water indicators**
- **d. Select year range between 2006 and 2021**
- **e. Select all regions/ any one region**
- **f. User is not able to select country**

2) Model statistics Comparison: Indicates how much variation in the dependent variable is explained by the model.

Panel Data Modeling- Year Analysis

This part allows users to analyze data that combines across-region and time-series. It provides more informative data, more variability, and more complex relationships than purely cross-sectional or time-series data. It allows user to explore how independent variables change over time.



1) Options for Year Analysis for variables.

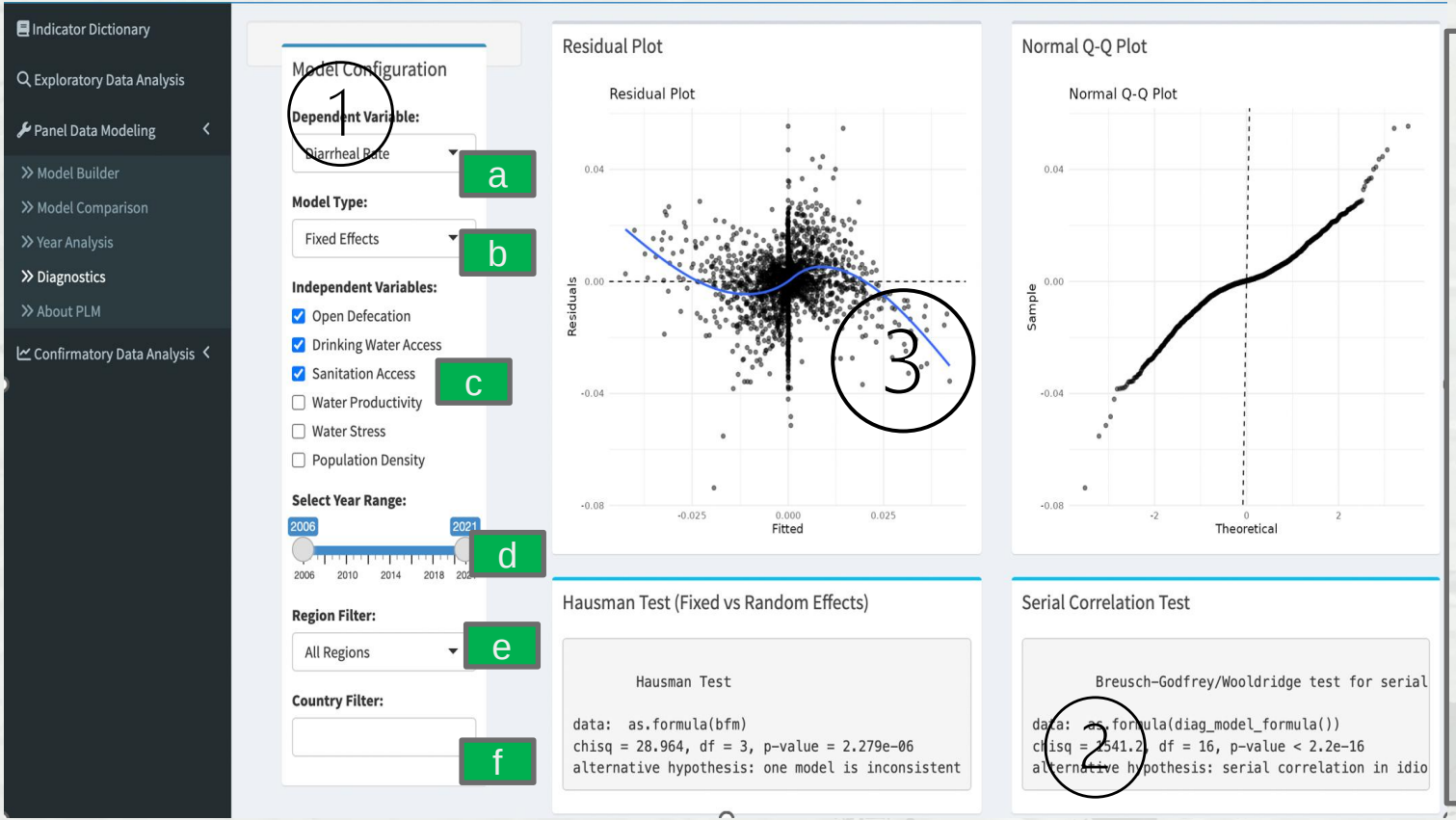
User can:

a. Select one dependent variable: any one of disease indicator
b. Select year range between 2006 and 2021
c. Select multiple independent variables: water indicators
d. Select all regions/ any one region
e. User is not able to select country

2) Yearly Model statistics: Helps user to compare the effect of multiple water indicators on one disease indictor over time.

Panel Data Modeling- Diagnostics

This part allows users to analyze data that combines across-region and time-series. It provides more informative data, more variability, and more complex relationships than purely cross-sectional or time-series data. Users can visually assess model assumptions such as linearity, homoscedasticity, and normality of residuals.



1) Options for Model Diagnostic plots

User can:

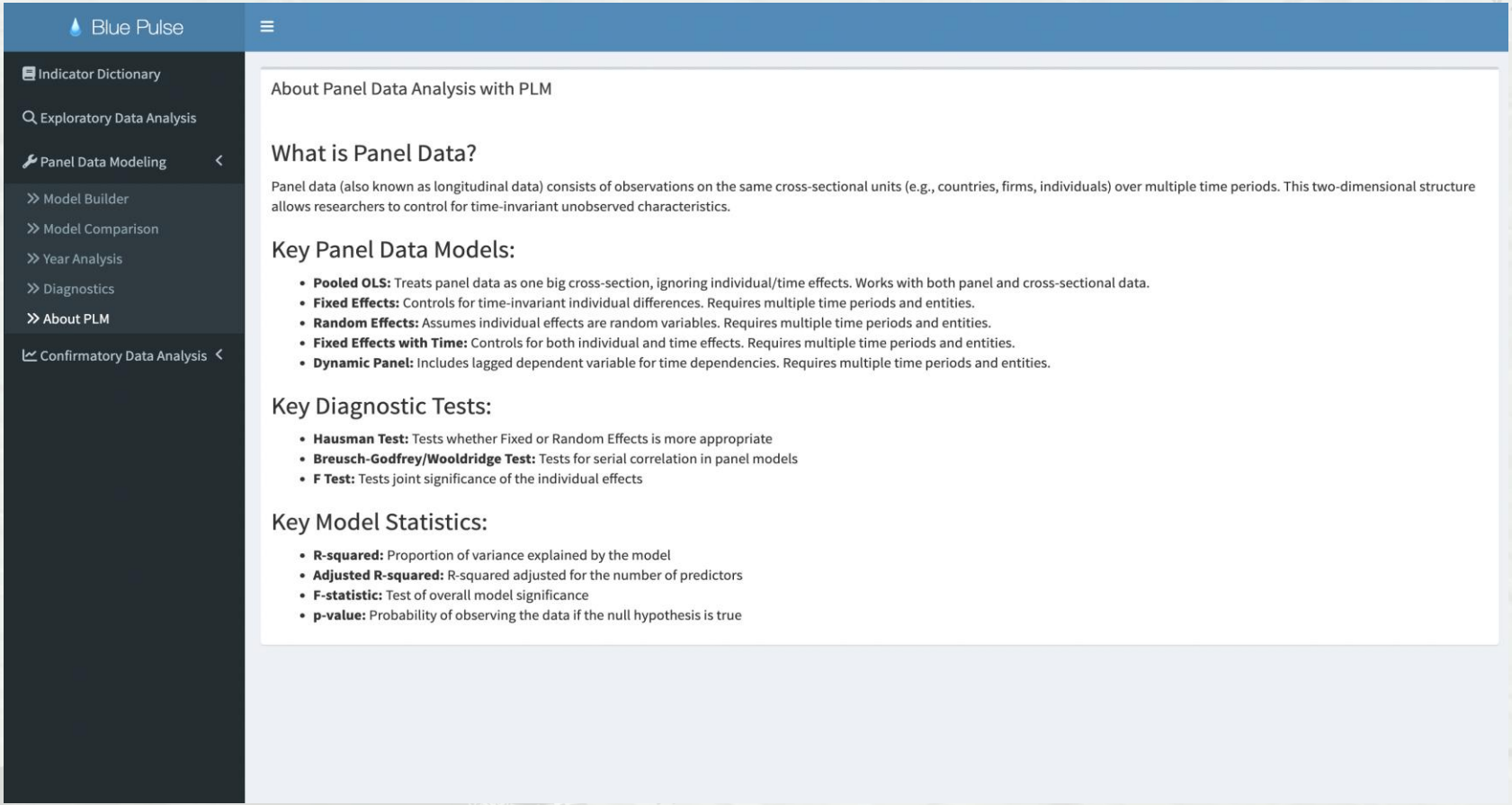
a. Select one dependent variable: any one of disease indicator
b. Select one Model Type
c. Select multiple independent variables: water indicators
d. Select year range between 2006 and 2021
e. Select all regions/ any one region
f. User is not able to select country

2) Hausman Test and Serial correlation Test: help users decide between model types and assess assumptions.

3) Residual Plot and Normal Q-Q Plot: Visually check the assumptions of models.

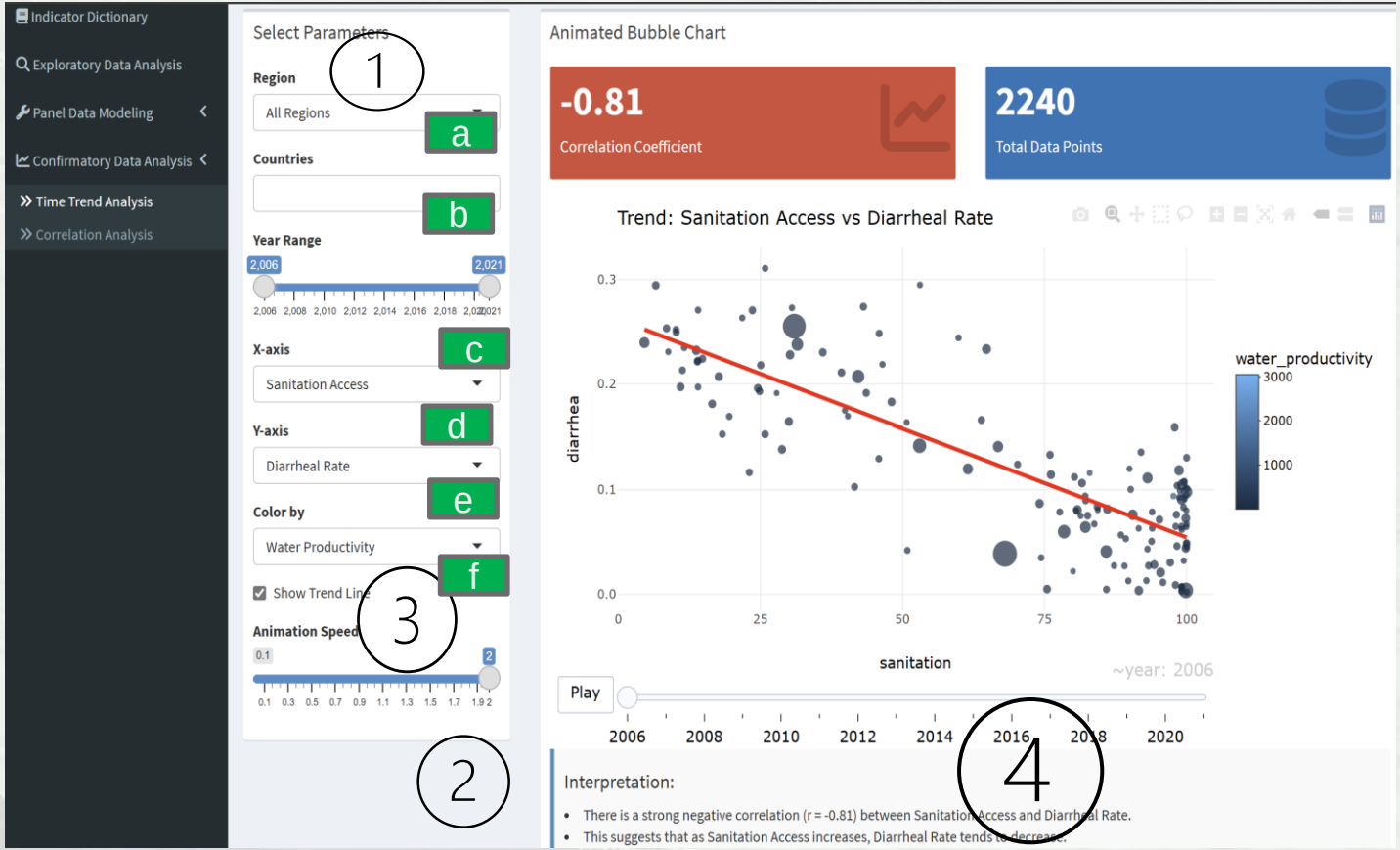
Panel Data Modeling- About Panel Data Analysis with PLM

This part educates users on panel data, explains key concepts, guides users in model selection, and enhances App usability



Confirmatory Data Analysis (CDA) – Time Trend Analysis

CDA will help you validate the assumptions or patterns observed in your Exploratory Data Analysis (EDA) and determine if there's a real relationship between water and health outcomes. Incorporating an Animated Bubble Chart for Time Trend Analysis is a great way to visualize the relationship over time between water indicators and health indicators



1) Options to plot animated bubble chart over time.
Users can:
a. Specify region (all regions or any one region)
b. Specify country
c. Choose a year range between 2006 to 2021
d. Choose one of water indicators as x-axis
e. Choose one of disease indicators as y-axis
f. Visualize a third indicator using color in a chart

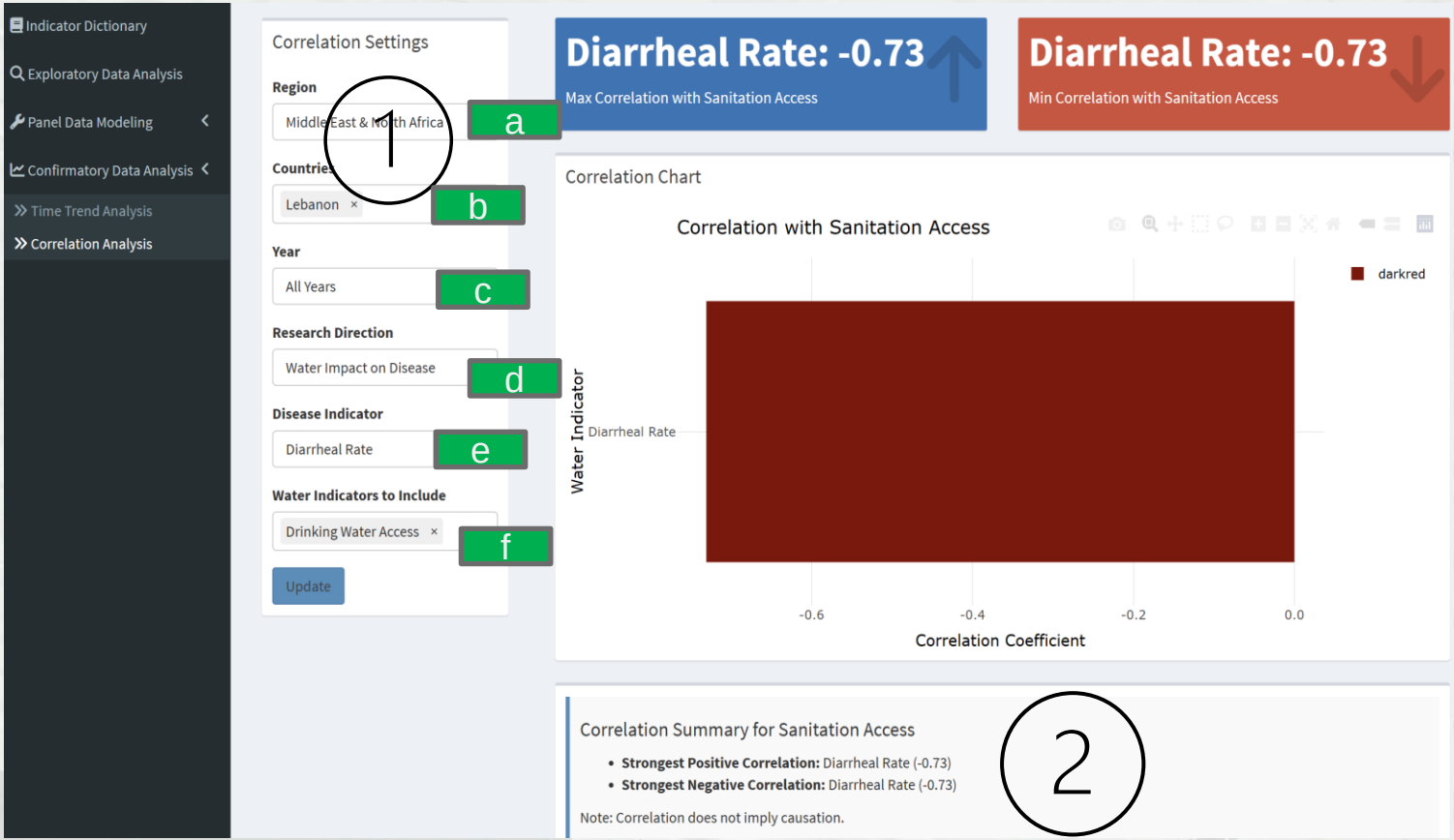
2) Animation Speed: Users can adjust animation speed to control how long each frame of the animation is displayed

3) Trend Line: Users can select the check box to display trend line based on the selected parameters

4) Chart Interpretation: users can get a brief explanation on how to interpret the correlation value and what the details on the chart mean

Confirmatory Data Analysis (CDA) – Correlation Analysis

CDA will help you validate the assumptions or patterns observed in your Exploratory Data Analysis (EDA) and determine if there's a real relationship between water and health outcomes. This part helps user to distinguish between the directions of the relationships



1) Options to plot animated bubble chart over time.

Users can:

a. Specify region (all regions or any one region)

b. Specify country

c. Choose a year between 2006 to 2021 when selecting region and choose "all years" when selecting country

d. Correlation Setting: Causal Hypothesis V.S Reverse Causality Hypothesis

e. Choose one of disease indicators

f. Choose one of water indicators

2) Chart Interpretation: users can get exact value of positive correlation and negative correlation.

- **Positive correlation suggests that both variables move in the same direction**
- **Negative correlation suggests that one variable increases while the other decreases**