# Guidance Manual

## Antimicrobial Resistance (AMR) Data Reporting using WHONET

## National AMR Surveillance Network (NARS-Net)



**National Center for Disease Control (NCDC)**
**Ministry of Health and Family Welfare, Government of India**
22, SHAM NATH MARG, DELHI 110054

**June 2022**

# Contents

# I. Introduction

Antibiotic susceptibility and resistance data from sentinel surveillance sites is crucial for understanding and monitoring the facility, state and national level AMR trends and guiding antimicrobial stewardship programs. This guidance manual was prepared to support National Antimicrobial Resistance Surveillance Network (NARS-Net) laboratories on WHONET-based data entry and reporting of priority bacterial pathogens and their Antibiotic Susceptibility (AST) data to NCDC.

This manual provides step-by-step instructions on using the pre-configured WHONET 2022 file provided by NCDC to record and report AST data and includes steps on how to

- **Download and install WHONET 2022 64-bit version. Assessed from http://www.whonet.org/software.html**
- **Create a new lab configuration in WHONET 2022 for reporting to NCDC;**
- **Modify bacterial isolate AST data in WHONET 2022**
- **Validate AST data file before sending to NCDC**
- **Export selected AST data file using WHONET**
- **Submit AST data of priority bacterial pathogens to NCDC**

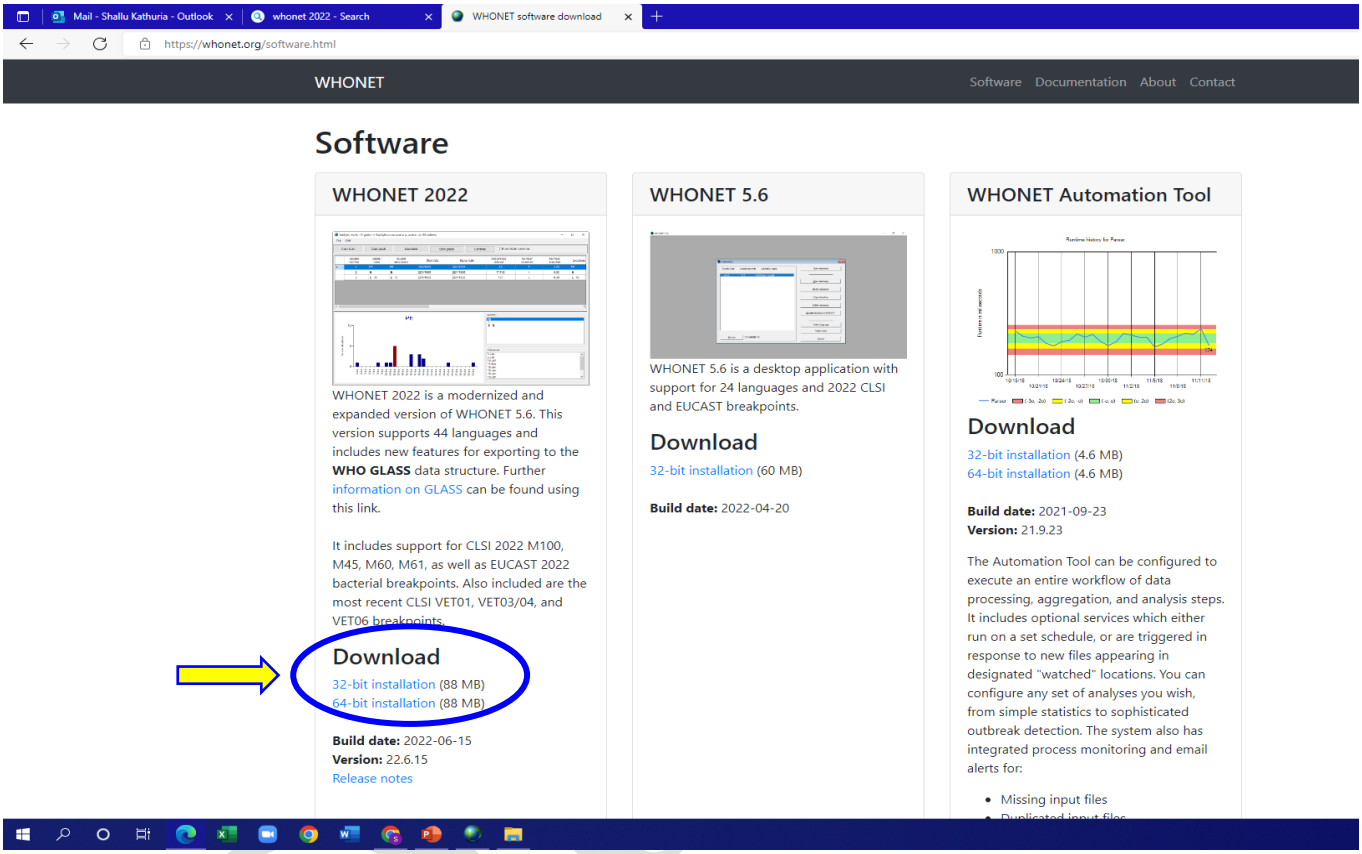
**NB: WHONET data entry and reporting guidance will be updated with improved data validation checks to minimize errors and guidance on Captura AMR Surveillance/Epidemiological reports once these options are fully functional in WHONET 2022.**

**Laboratories with a laboratory information management system (LIMS) for recording microbiology data are advised to contact NCDC for further guidance.**

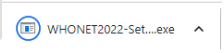
This guidance manual was prepared with technical support from US Centers for Disease Control and Prevention (CDC).

# II. Download and Install WHONET 2022 on Desktop/Laptop

The following steps are required to set up WHONET 2022 on your Desktop or Laptop with Microsoft Windows® operating system.




**Step 1:** Access the WHONET website: http://www.whonet.org/software.html.

**Step 2:** Click on "WHONET 2022 64-bit latest version installation". Once clicked the WHONET 2022 software begins to download, 

It is recommended to wait until the software is downloaded.

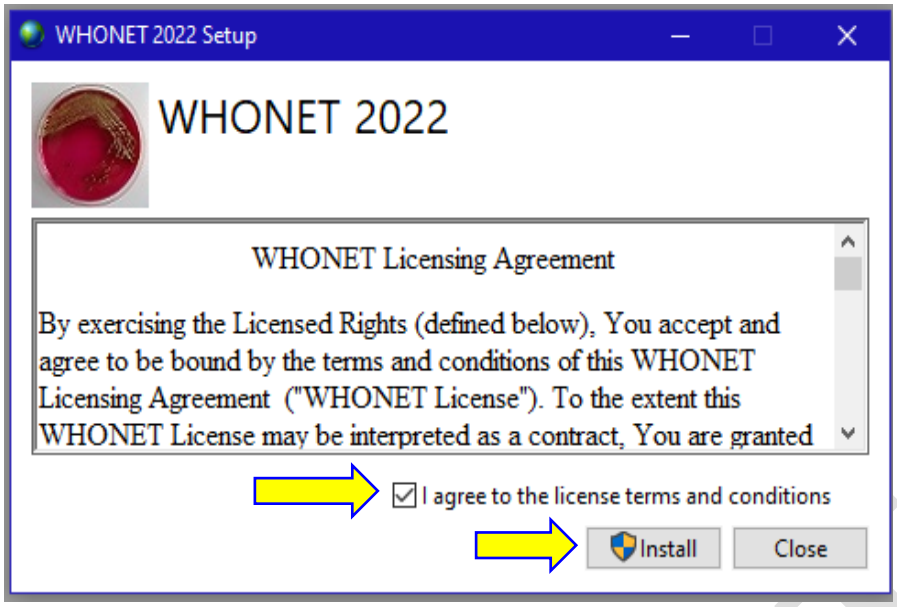
Once downloaded, the file is saved in the "Downloads" folder of the Desktop/Laptop.

**Step 3:** The Download file named as "WHONET2022-Setup-x64" would be available for installation in the downloads (or another specified folder) of your computer.

Copy the setup file to an external drive as backup for future use.

Step 4: Open the downloads folder

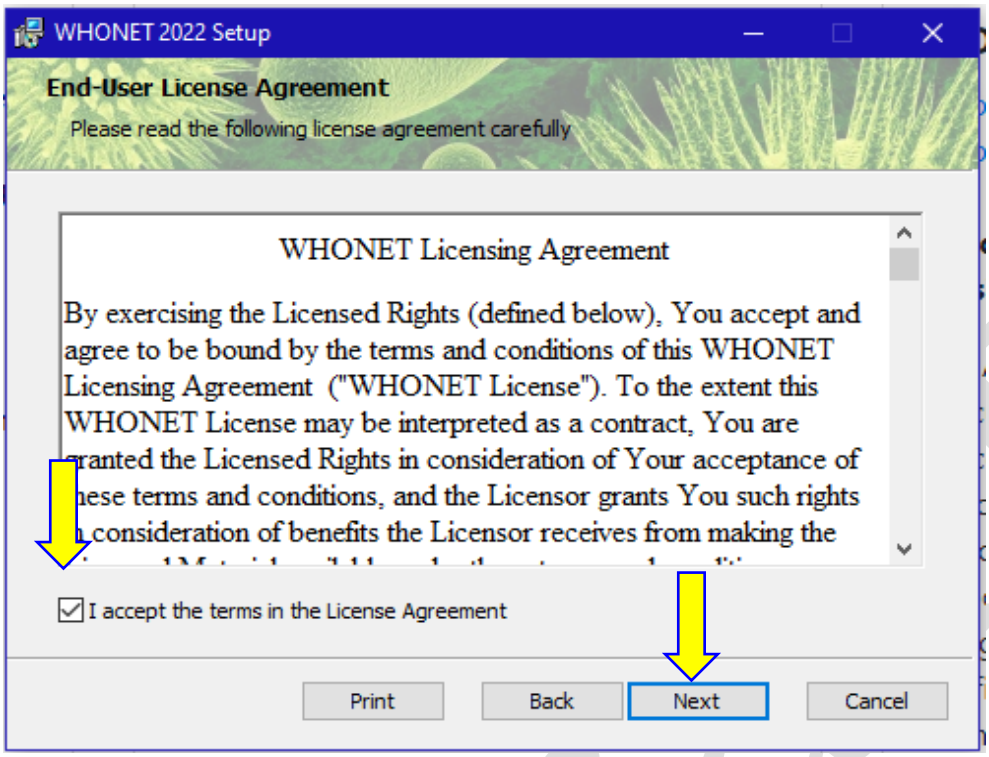
Step 5: Double click on WHONET2022-Setup-x64 and follow the onscreen instructions to set up and install the program (marked with a yellow arrow)



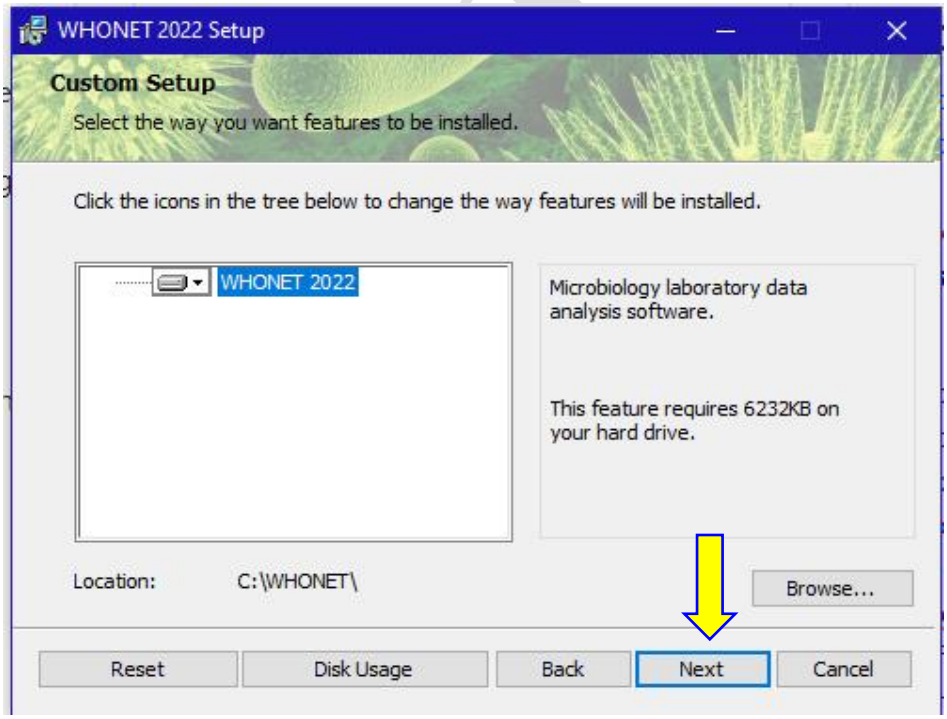

Step 6: Tick the checkbox which indicates "I Agree to the license terms and conditions" Click "Install". Following this, a window seeking permission to set up this software would open up. Click on "yes".

Step 7: The "WHONET 2022 Setup Wizard" screen would pop up. Click on the icon "Next".

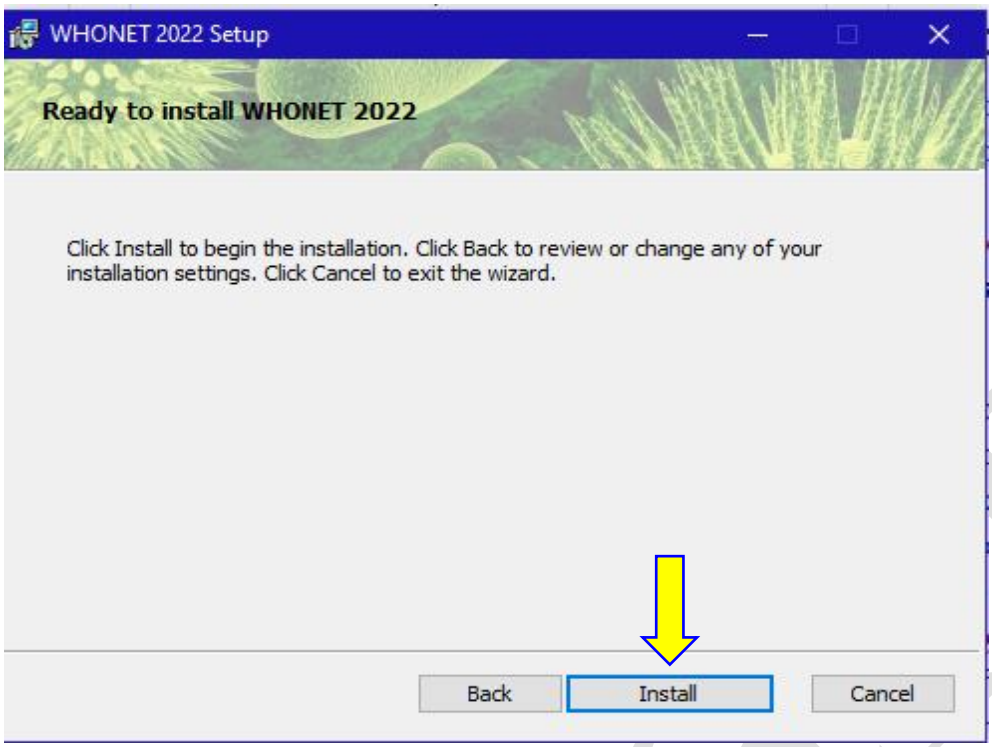
Step 7: A new window labelled  "End-User License Agreement" would appear. Upon reading the WHONET Licensing Agreement, click the checkbox that reads "I accept the terms in the License Agreement". Finally , click on the icon "Next".



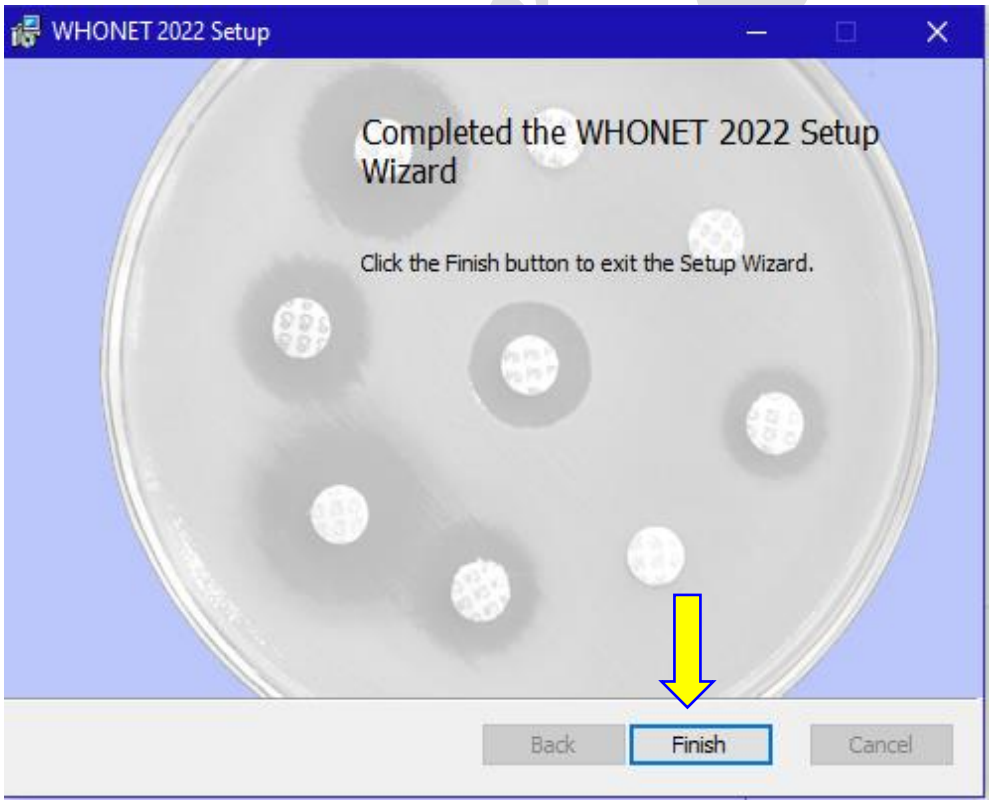

Step 8: A "Custom Setup" screen would appear. Follow the onscreen instructions and click "Next".



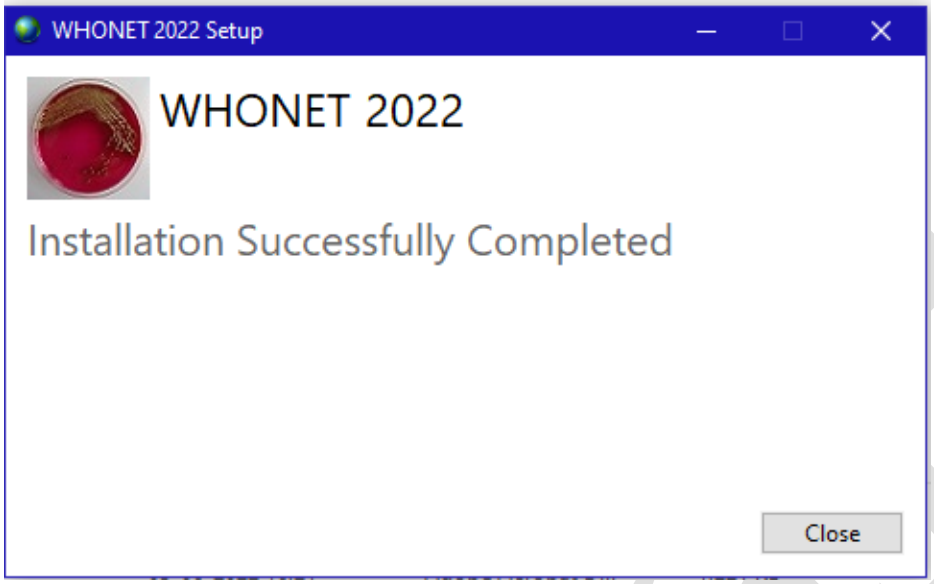
Step 9: The "Ready to Install WHONET 2022 screen will appear. Click "Install"



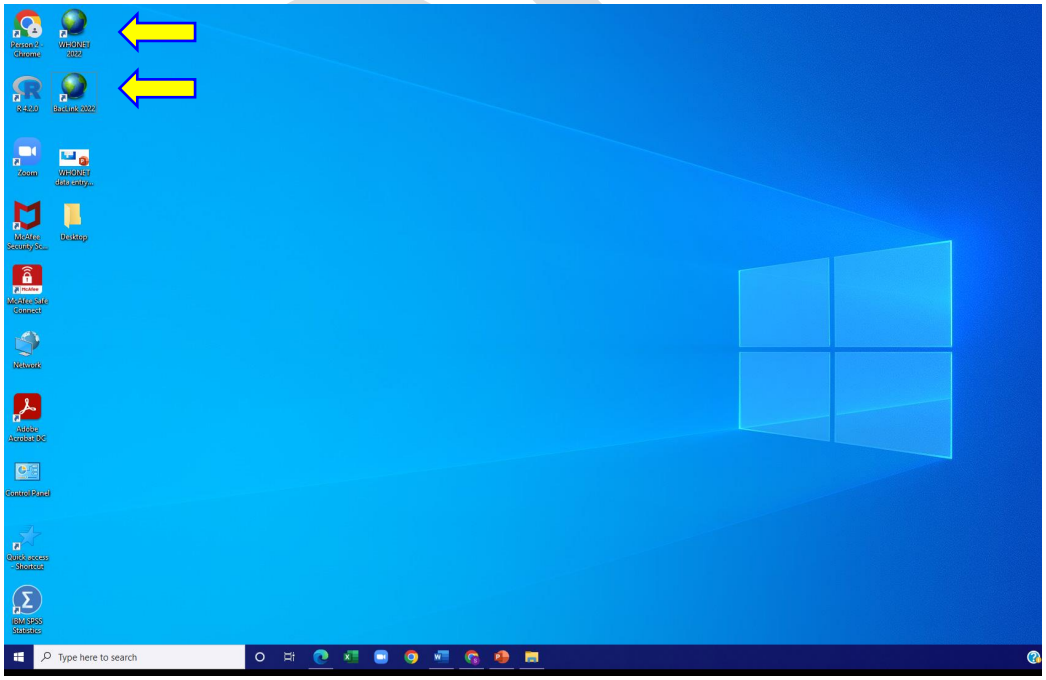

Step 10: Once the installation is fully complete, click the finish button to exit the setup wizard.



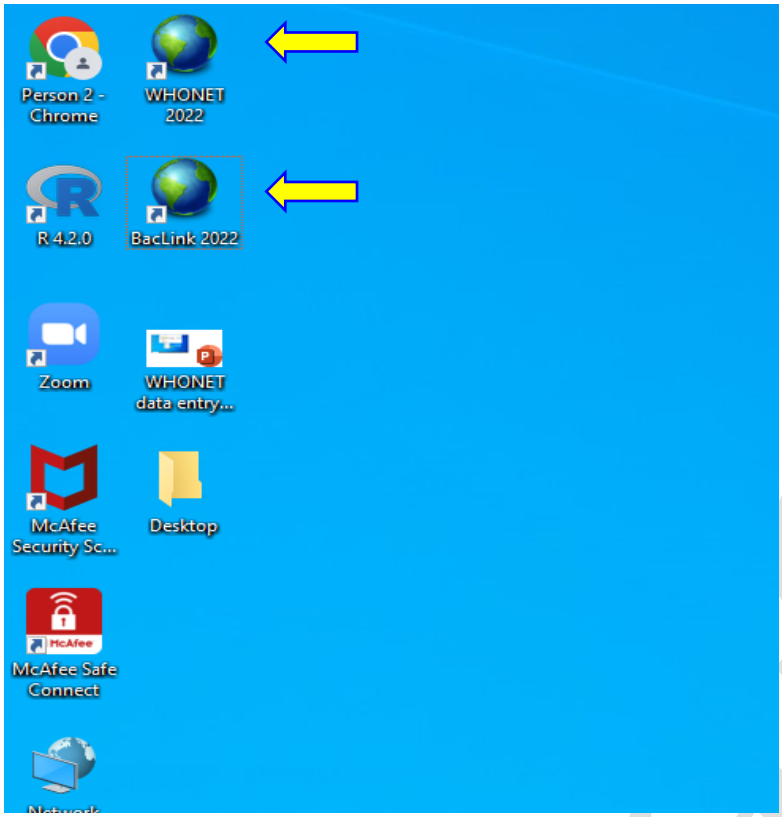
Step 10: Once the software is successfully installation, A new window that reads "Installation successfully completed" will appear. Click on the button "Close".




Once the installation is complete, two shortcuts labelled "WHONET 2022" and "BacLink" respectively will appear on your desktop, as seen in the picture below (Indicated by a yellow arrow).



Congratulations! You have successfully installed WHONET 2022.


Person 2 - Chrome
WHONET 2022
R 4.2.0
BacLink 2022
Zoom
WHONET data entry...
McAfee Security Sc...
Desktop
McAfee Safe Connect

# III. WHONET 2022 Laboratory Configuration for Reporting

WHONET 2022 is a Windows-based desktop application designed to manage and analyze microbiology laboratory data, focusing on antimicrobial susceptibility test results[1]. The latest edition of WHONET runs on Microsoft Windows (Vista, 10 and 11). Through Windows emulators, WHONET 2022 can be successfully run on Linux and Macintosh computers.

If **WHONET 2022** is installed and functional on your computer, the next step is to create a data file from a site-specific reporting configuration.

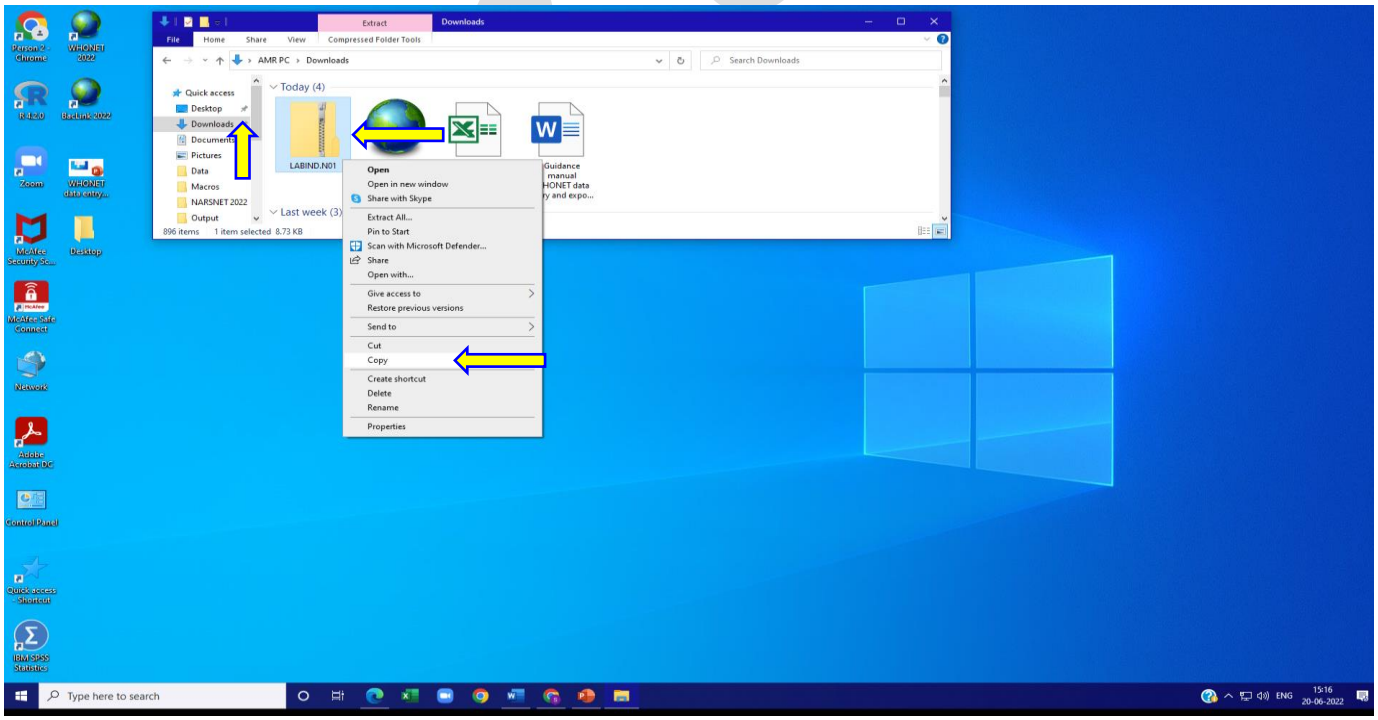
> If you are currently using WHONET 5.6 or older version, it is recommended to download and install WHONET 2022. Refer to section 1 for downloading and installing WHONET 2022

## Create a data file using a site-specific configuration file.

Each laboratory in the National AMR Surveillance Network that enters data in WHONET receives a unique site-specific configuration file labelled as (LABIND.XXX) from NCDC for WHONET data management and reporting. Each laboratory must download the configuration file and place it inside the WHONET 2022 folder.

The site-specific configuration file would be sent to an individual NARSNET laboratory in a "zipped folder" attachment from amrsurveillance@gmail.com

Step 1: Download the zipped folder attachment from the email received from amrsurveillance@gmail.com.




Step 2: Open "downloads" folder and you can access the "zipped folder" attachment.

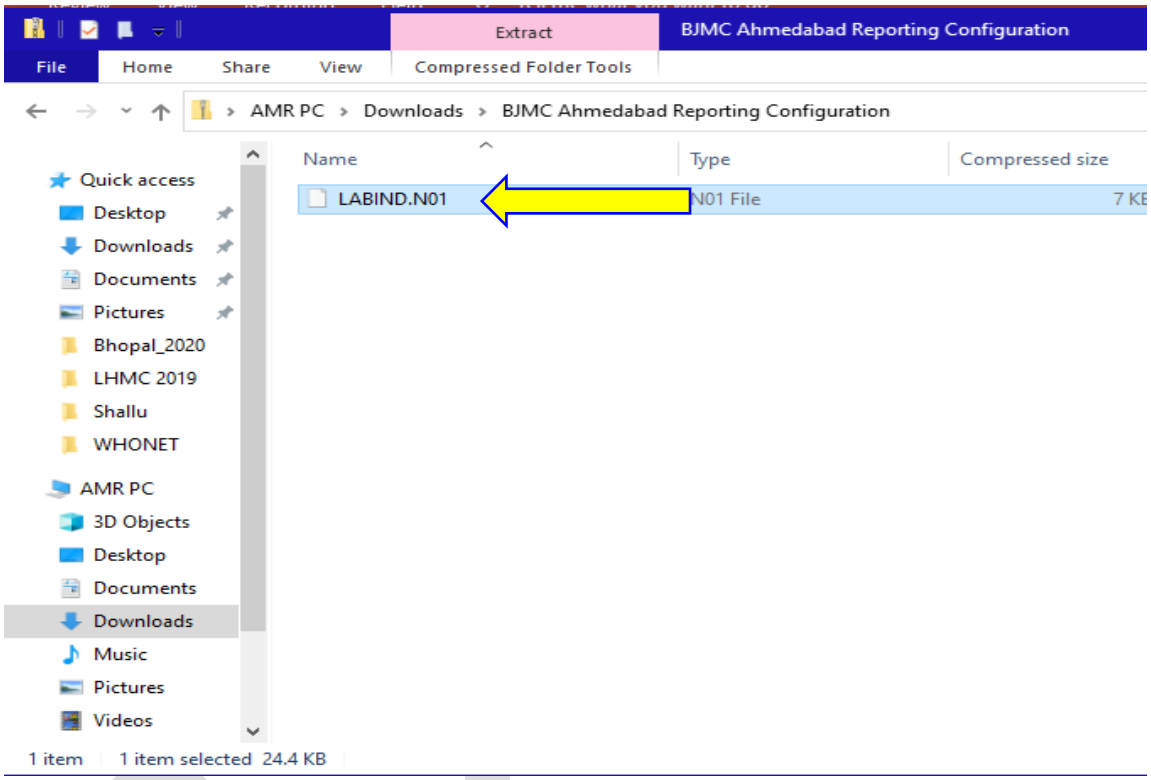
[1] http://www.who.int/medicines/areas/rational_use/AMR_WHONET_SOFTWARE/en/

Step 3: Unzip the file by double-clicking on the folder or using right-click option; you will get the menu for the extract all option.

*(In case of any difficulties in accessing the folder, please contact NCDC for further assistance)*

Step 4: The folder contains a site-specific configuration file named "LABIND.XXX" (wherein X denotes your laboratory code for the national AMR surveillance network lab assigned to each lab by NCDC).

The example below is the site-specific laboratory configuration file for network site BJMC where the configuration file is labelled as LABIND.N01 (Refer to Annexure 1 for Lab codes for reporting).

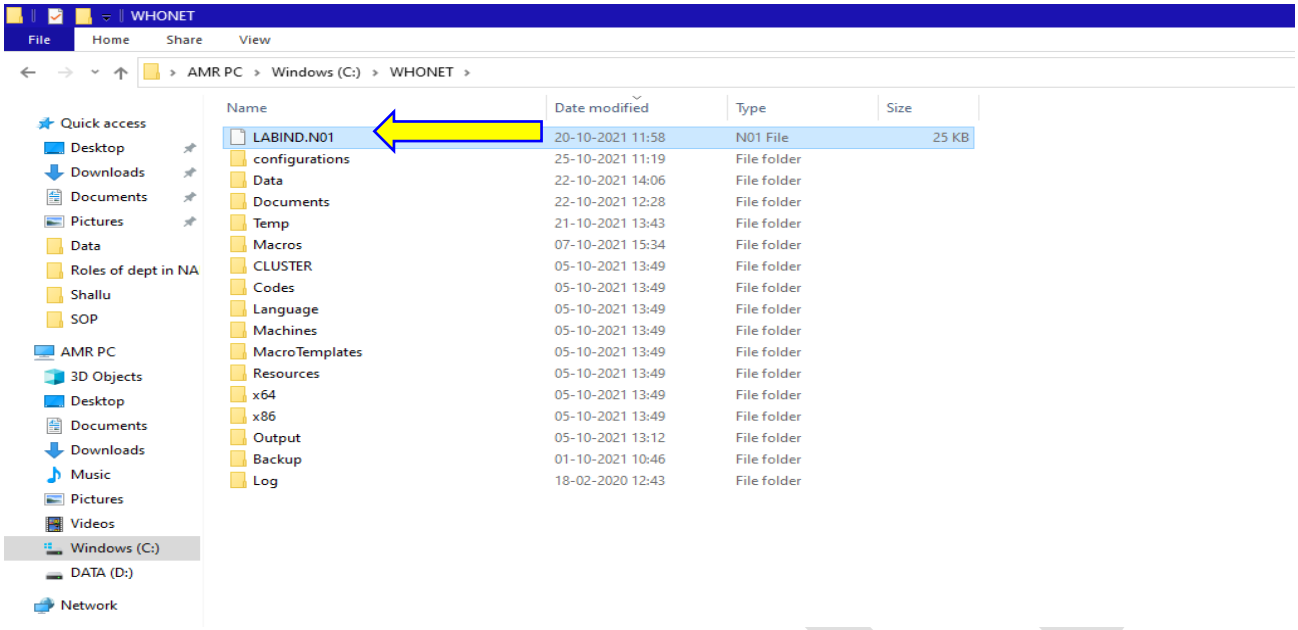



Step 5: Copy ("Control" + "C") this file. (You may also copy by right-clicking and selecting "copy" from the drop-down menu, as depicted above).

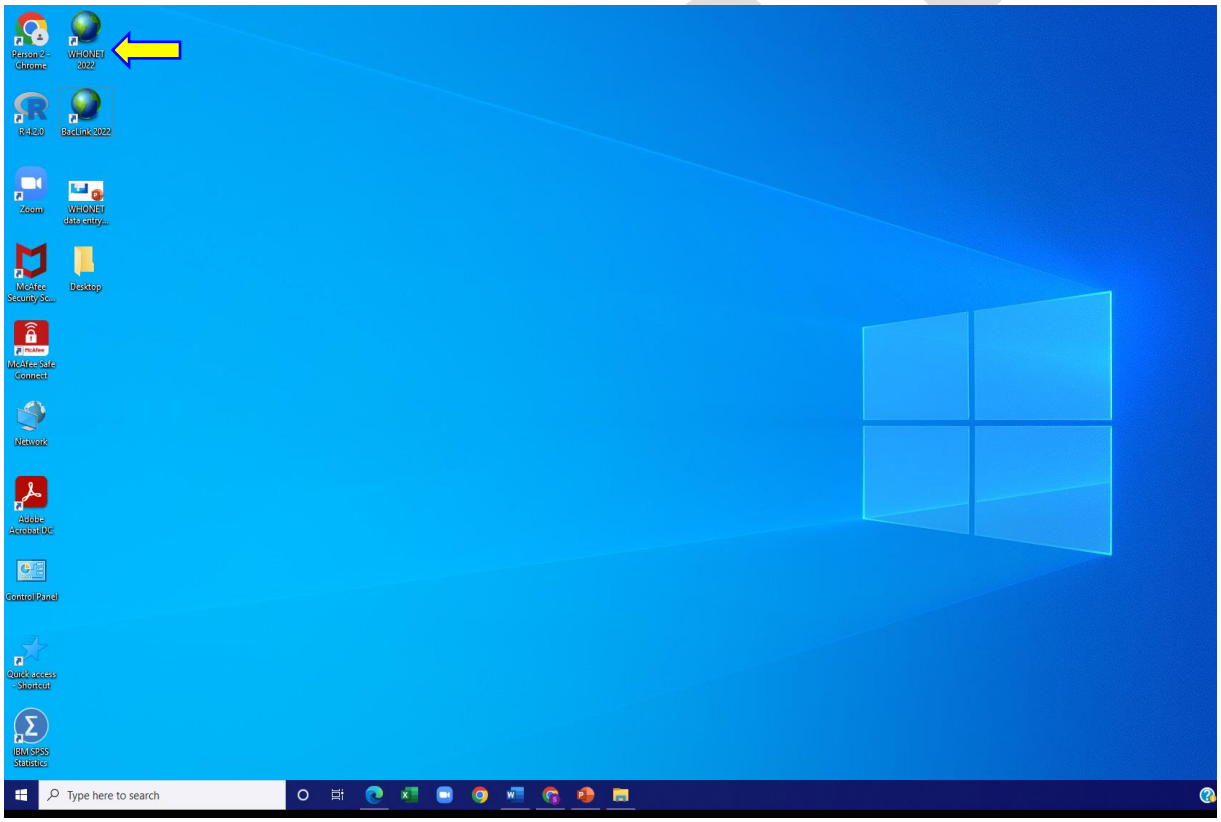
Once copied, open the WHONET folder on your computer > Click on "My computer"> click on "C" drive. Then click and open the "WHONET" folder.

(NB: You might see multiple configuration files inside the WHONET folder if you have already configured WHONET on your desktop/ laptop)

Step 6: Paste the LABIND.XXX configuration file in the WHONET folder by right-clicking and selecting "Paste" from the drop-down menu



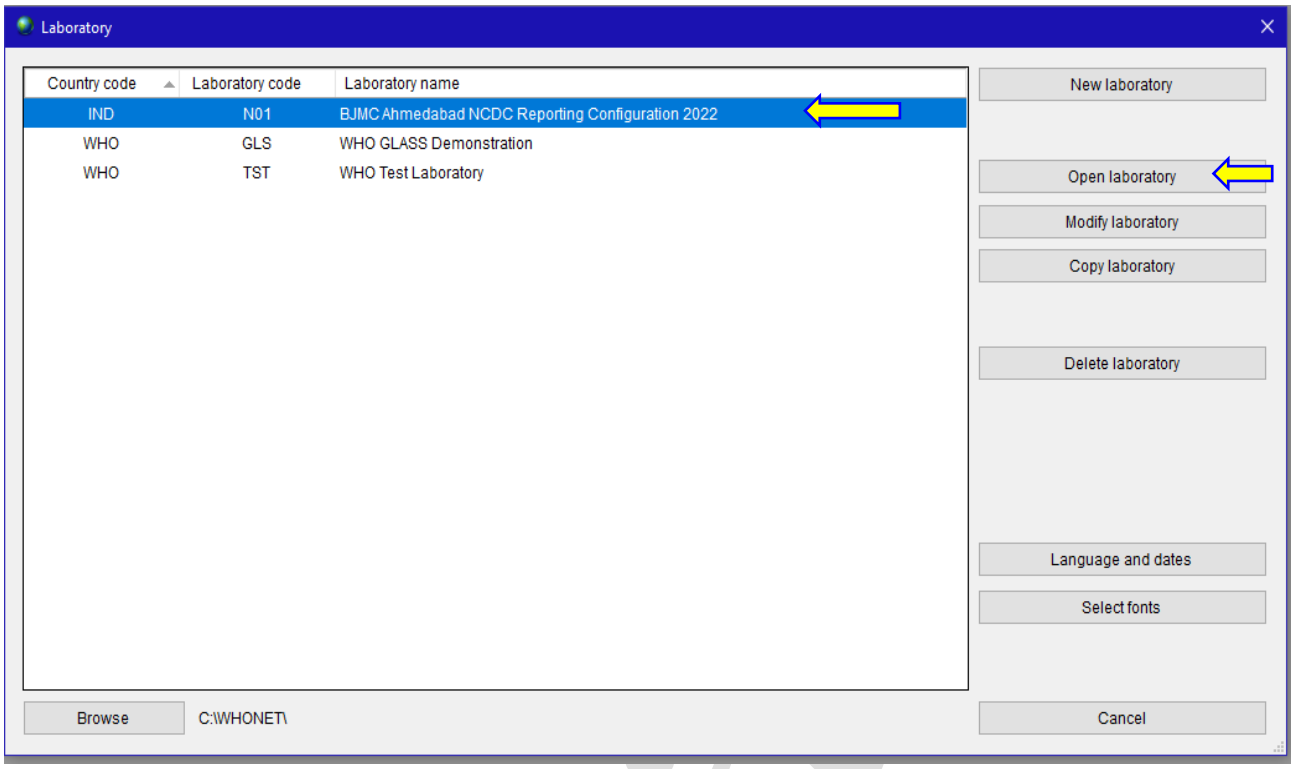

Step 7: Once the site-specific configuration file is saved in the WHONET folder, close the window and double-click on the WHONET 2022 icon on your desktop.



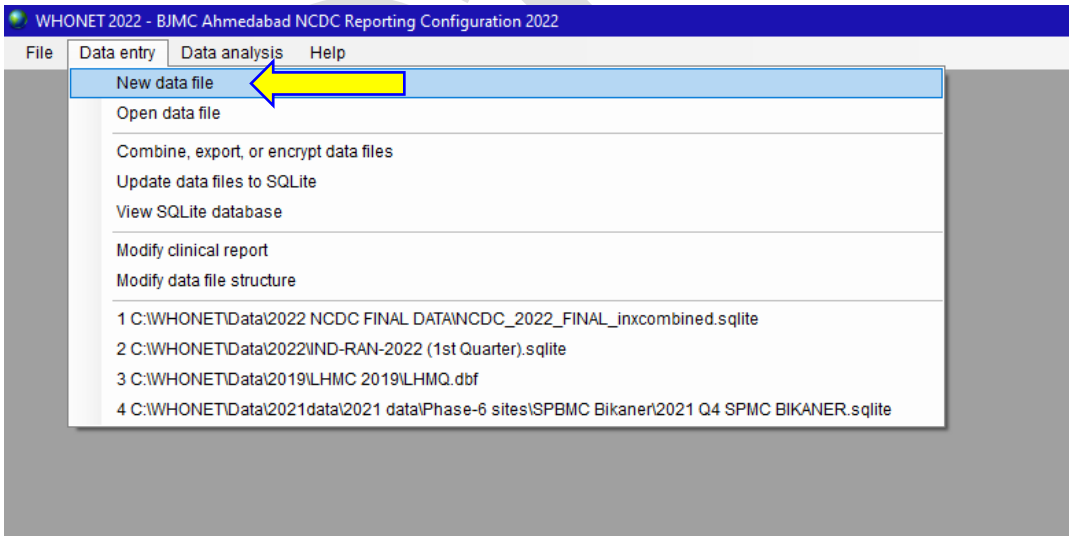

Step 8: Once WHONET 2022 software is open, you will see the recently copied configuration is displayed under the "Laboratory name"

In the example given below, BJMC Ahmedabad has an existing laboratory configuration designated by Laboratory code N01. Following the steps above, we have added a laboratory

configuration file for reporting set AMR data to NARSNET. In the same way, "Click on your laboratory's name and click on the "Open Laboratory".

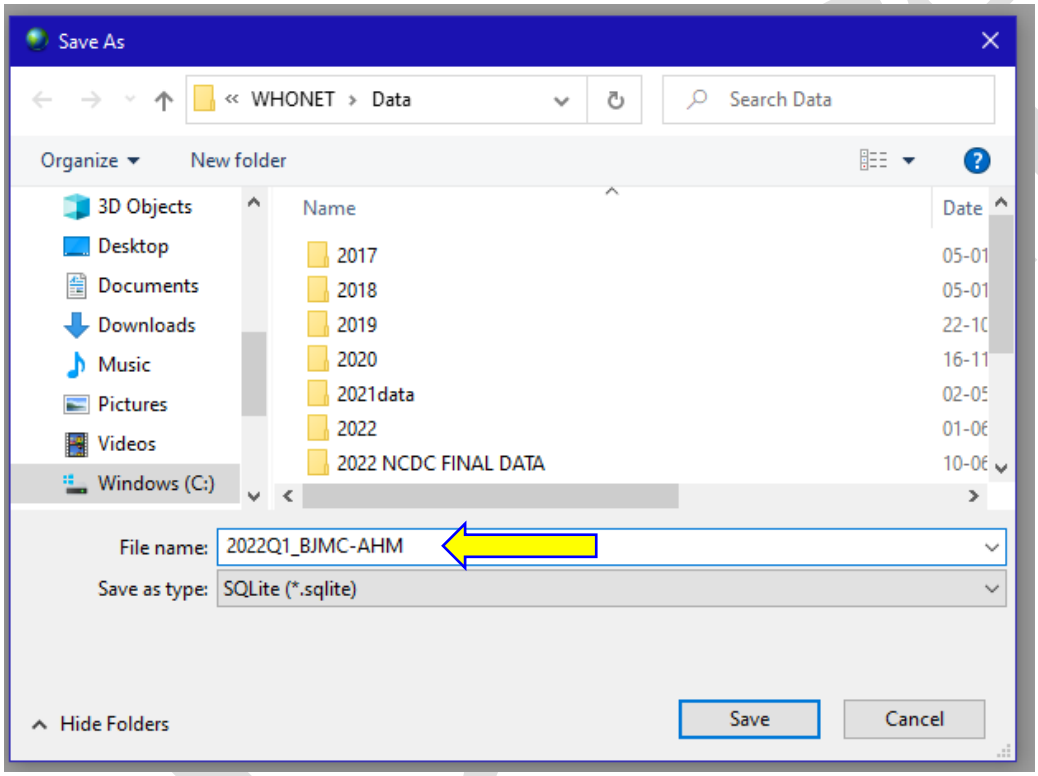



Step 10: The following window will automatically open. Click on the "data entry" tab and select "New data file" from the drop-down menu.



Step 11: Once the new data entry tab is selected, a pop window opens up for saving the newly created data file. These files, by default, are stored inside the "Data" folder inside WHONET Folder. We recommend naming your data file with your laboratory's reporting year, reporting Quarter, and 7-10 letter code (YYYY QD **XXXX-XXXX**). The image below shows that the data file is named "2022Q1_BJMC-AHM.sqlite". Once renamed, click "Save".

| | |
|---|---|
| 1. | **YYYY denotes reporting year (2021,2022)** |
| 2. | **QD denotes Quarter Of reporting (Q1, Q2, Q3, Q4)** |
| 3. | **XXXX-XXXX denotes lab code (Refer to Annexure, page 44-46 )** |




Step 12: A new window appears once you save the new data file allowing you to perform data entry. You are now ready to do data entry in your site's WHONET data file pre-configured.

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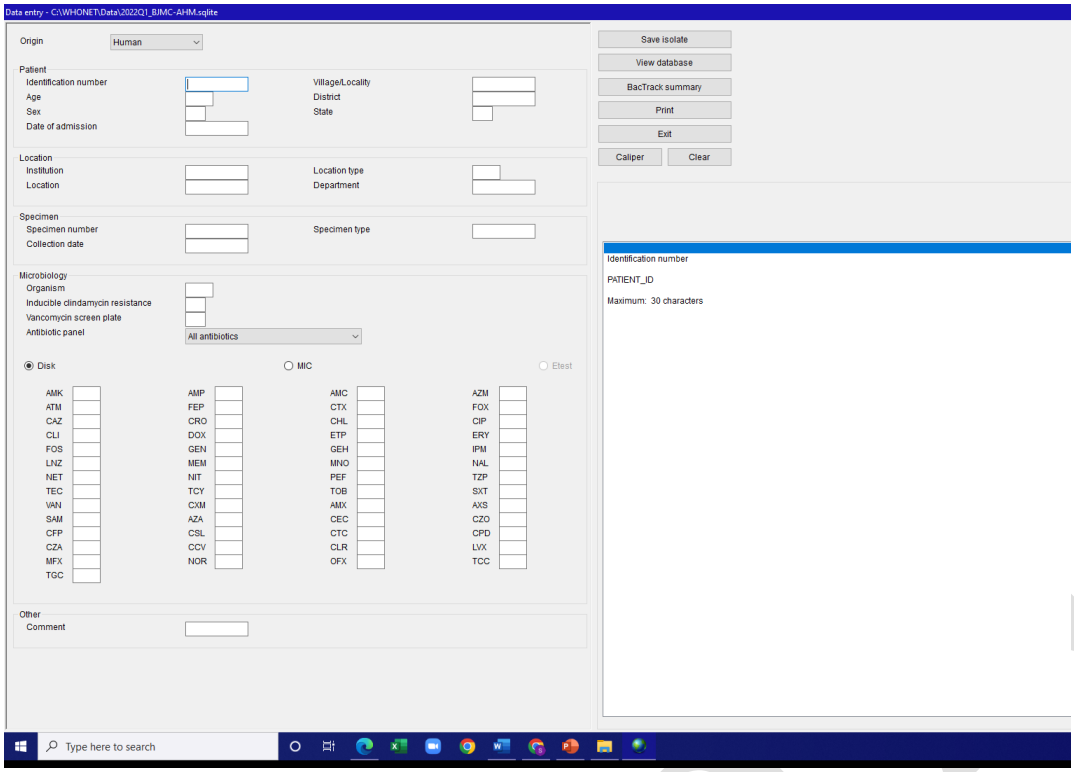
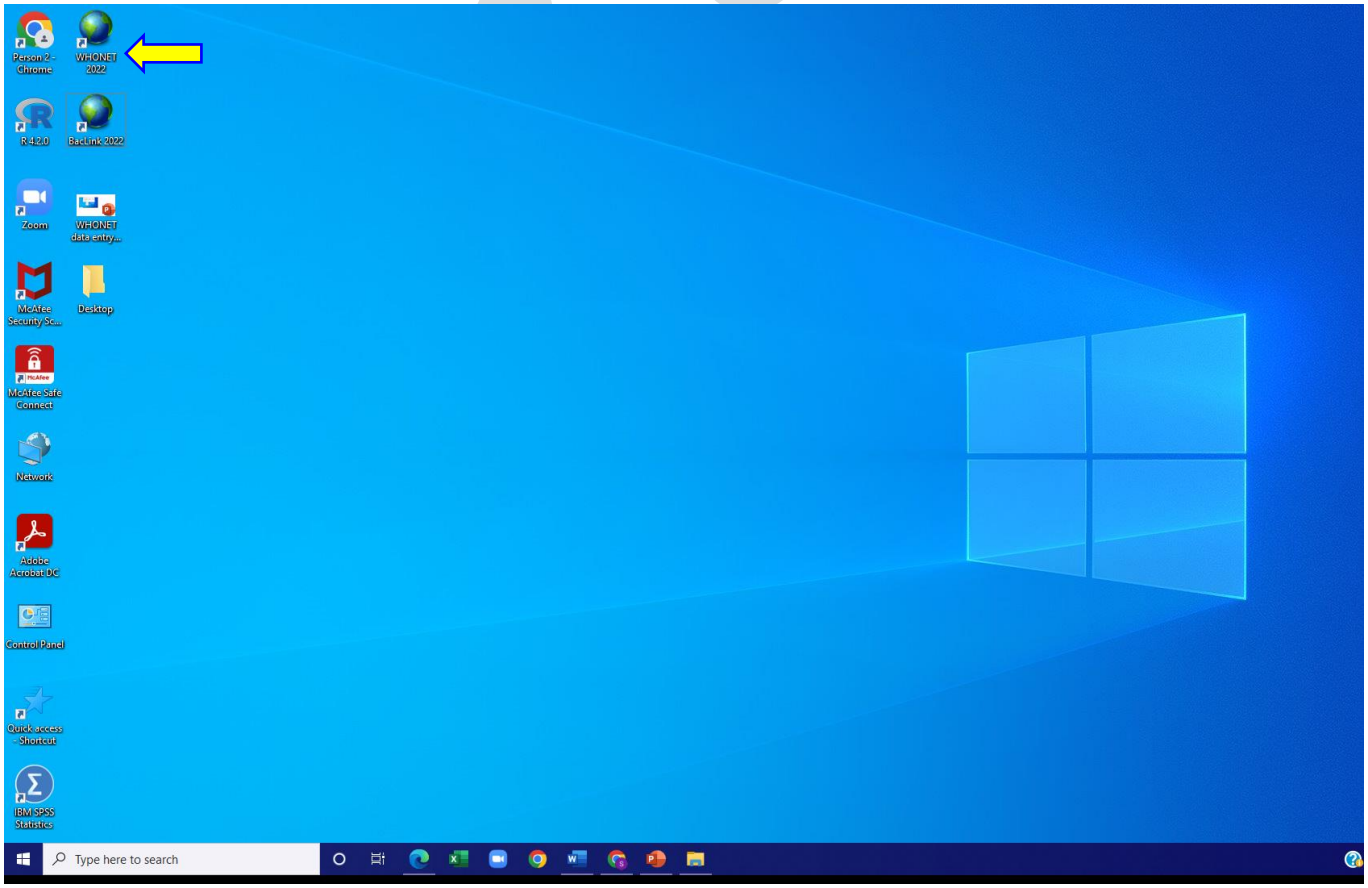
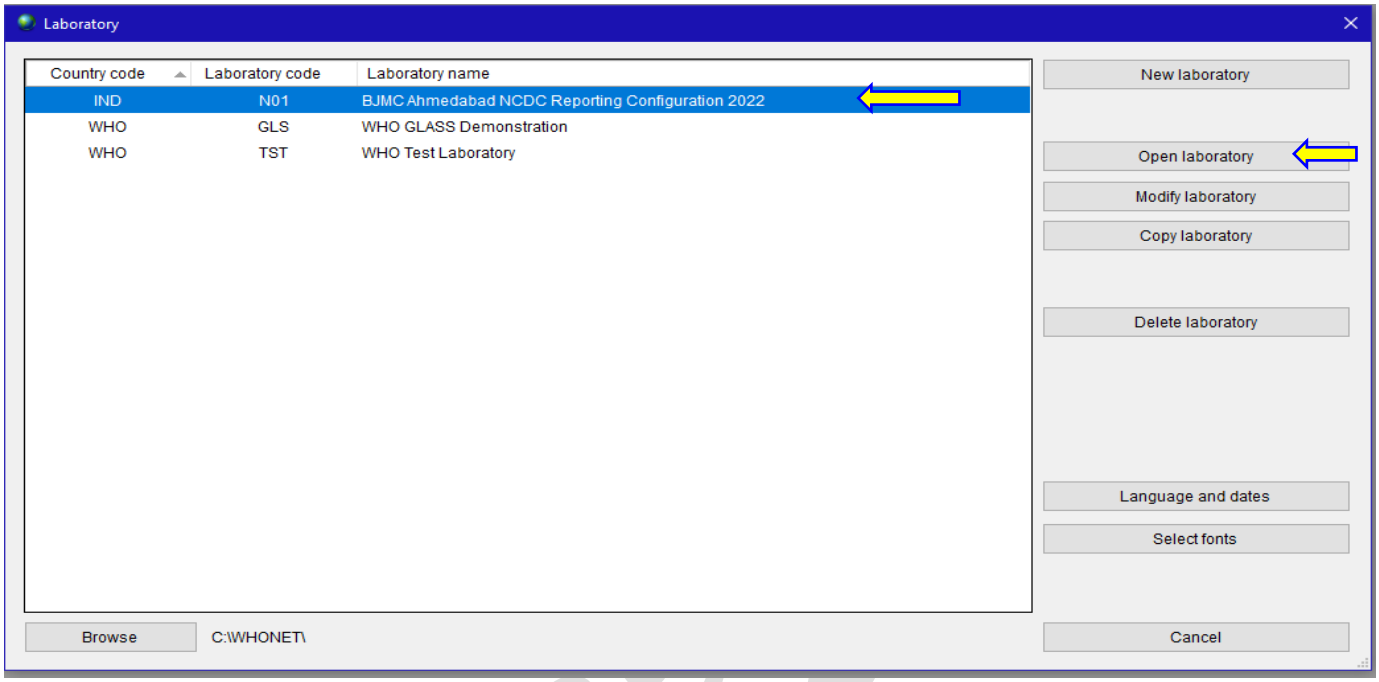



# II. Enter isolate results into WHONET 2022

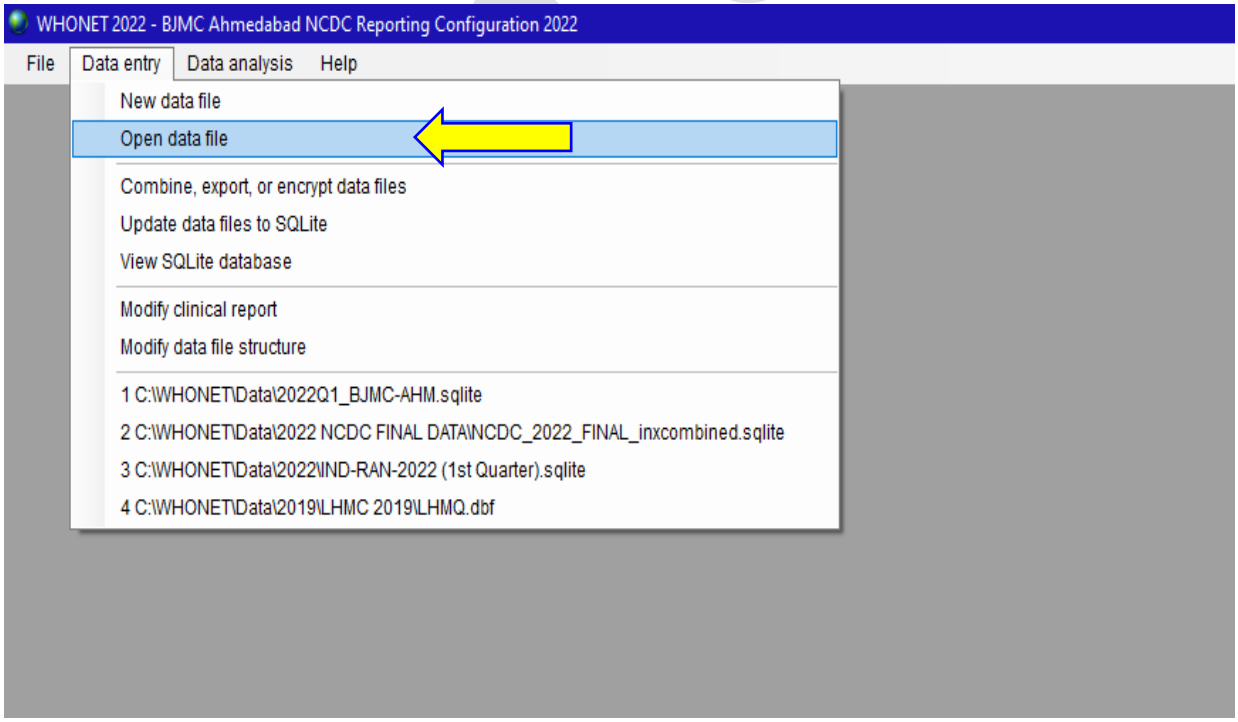
Step 1: Click to launch the WHONET 2022 application from the desktop.

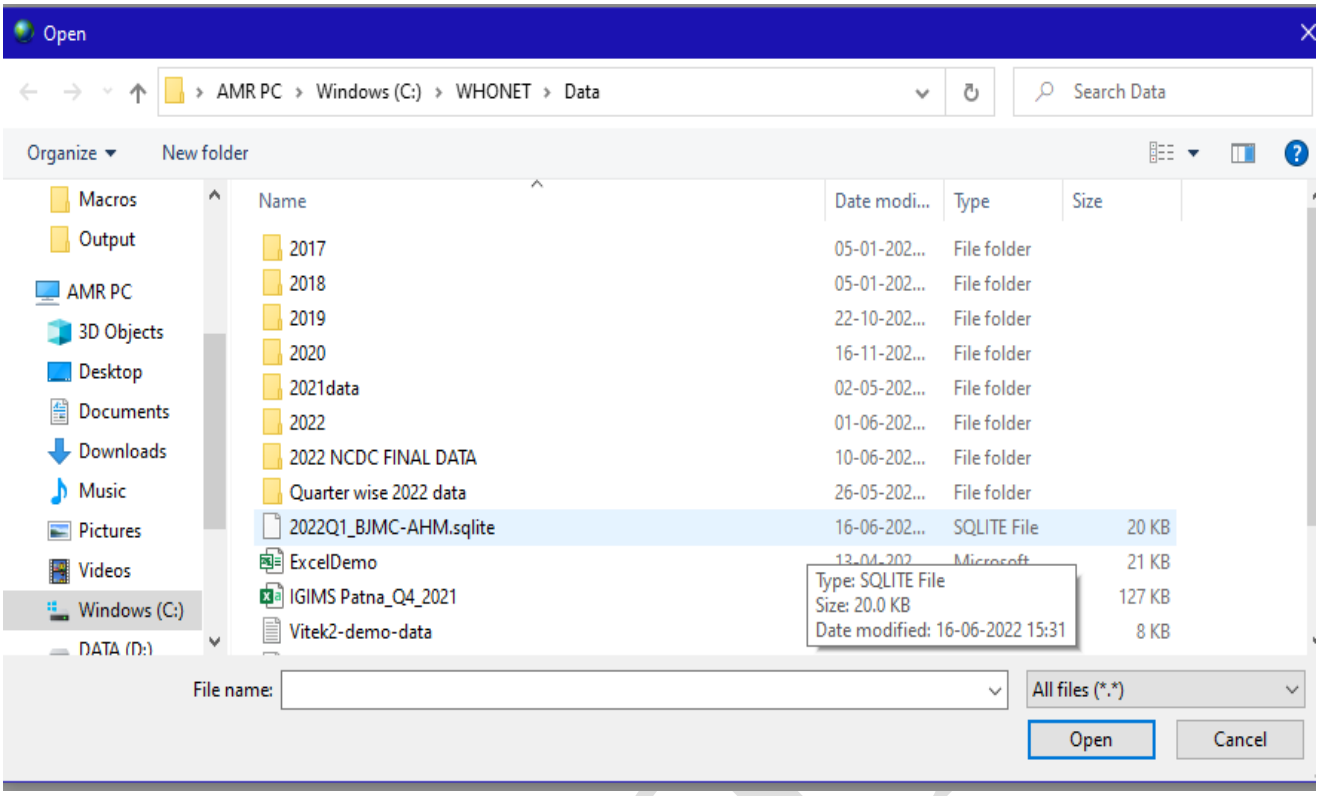


Step 2: select your laboratory under "laboratory name" and click "Open laboratory".



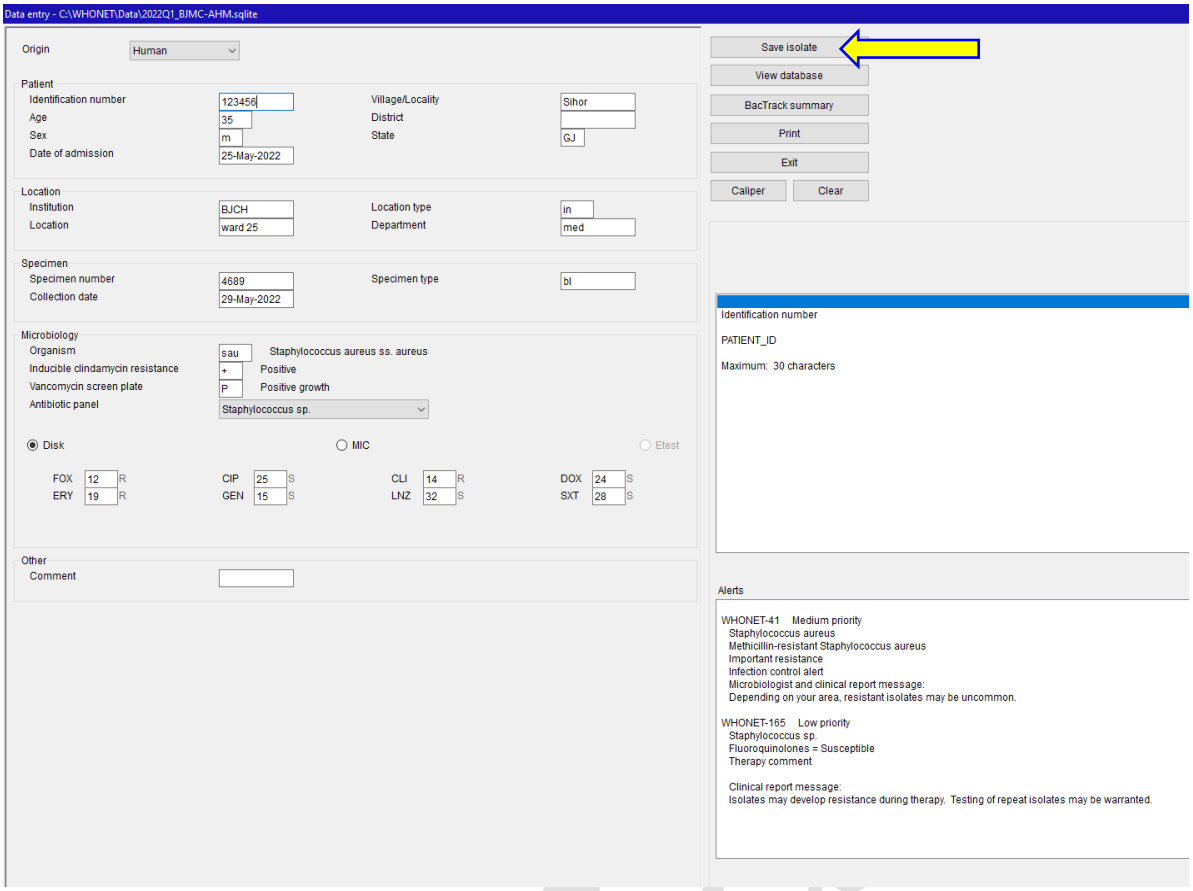

Step 3: Click the "Data entry" tab. From the drop-down menu, select "Open data file".






Step 4: The most recent data file can also be selected by sorting the date modified or selecting the file with the current date mentioned against it. Select the previously saved data file with date and lab name and click open

Step 5: Enter data, and click "Save isolate" for each isolate entry.



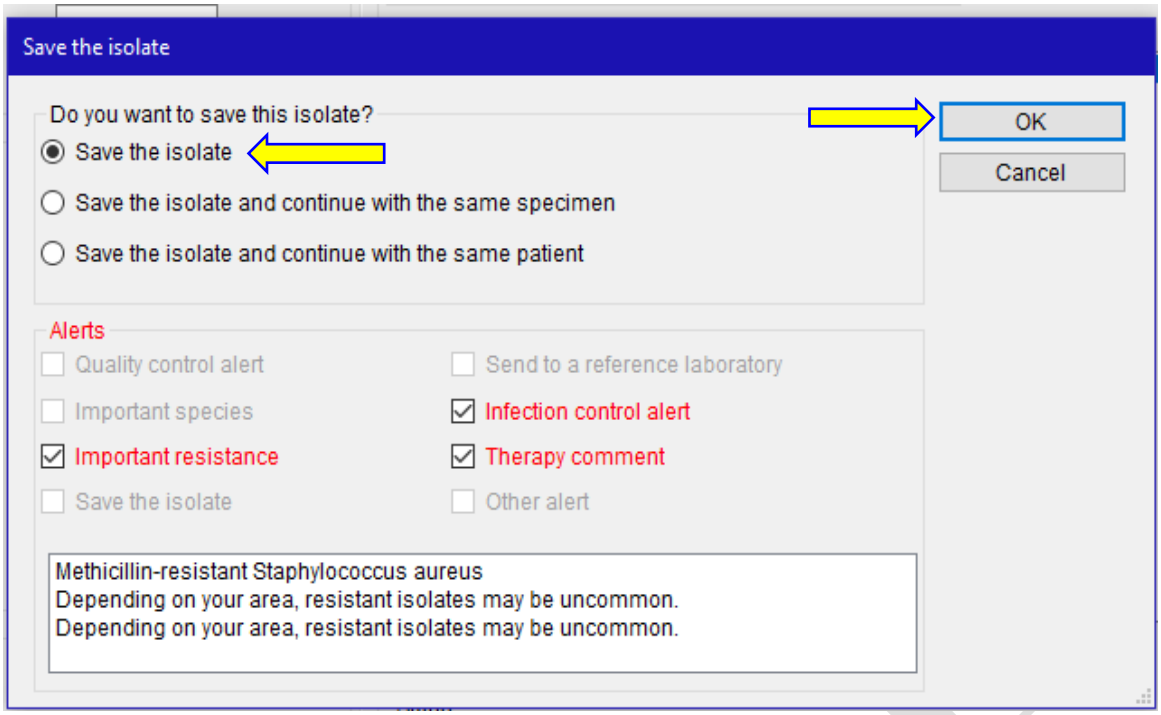

A new popup window will appear on the WHONET data entry page, which would prompt as "Do You want to save the isolate?" With three options

- Save the isolate
- Save the isolate and continue with the same specimen
- Save the isolate and continue with the same patient

The bottom right corner of the screen will also show if this is a critical isolate/ alert based on its sensitivity entered by providing eight different actions/hints for saving the isolate or sending it to the reference lab.

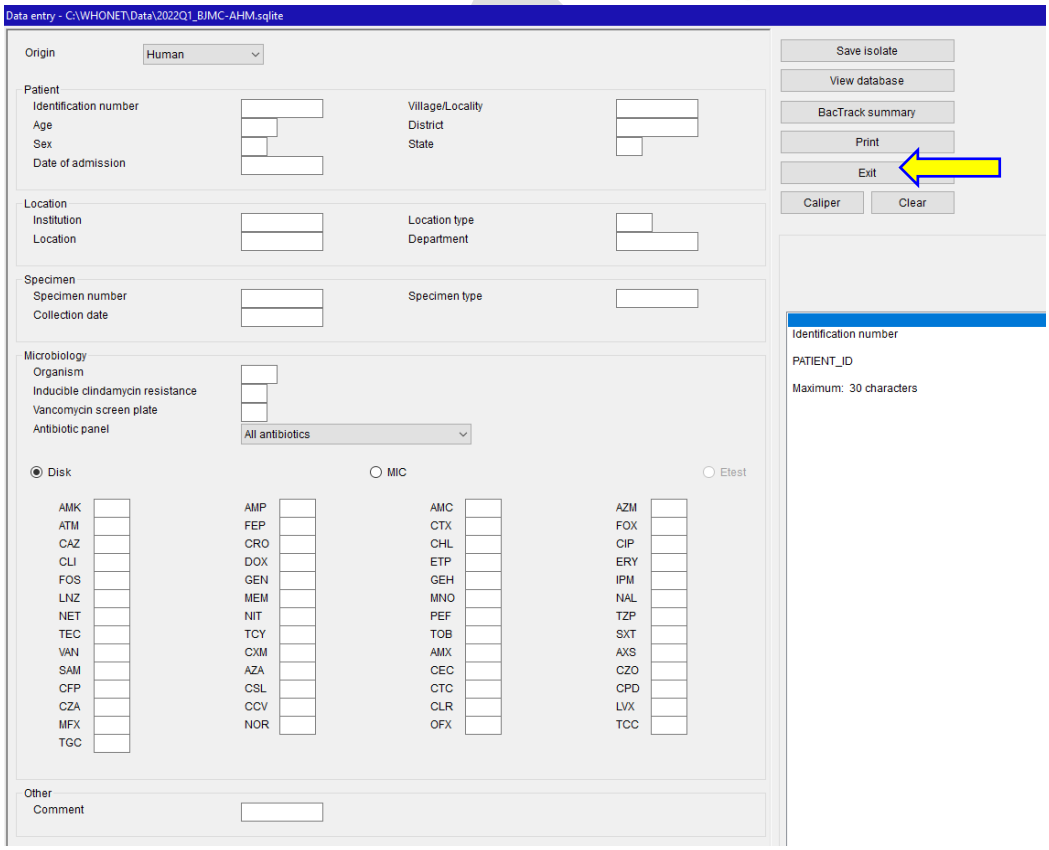
| | |
|---|---|
| −Quality control Alert | −Send to a Reference Lab |
| −Important Species | −Infection Control Alert |
| −Important Alert | −Therapy Alert |
| −Save the Isolate | −Other Alert |

Choose the appropriate option and click "Ok."




Step 6: Click on WHONET once the data entry is complete.

Once you have completed the data entry, ensure all the data fields are complete, then save the isolate and Click on "Exit."

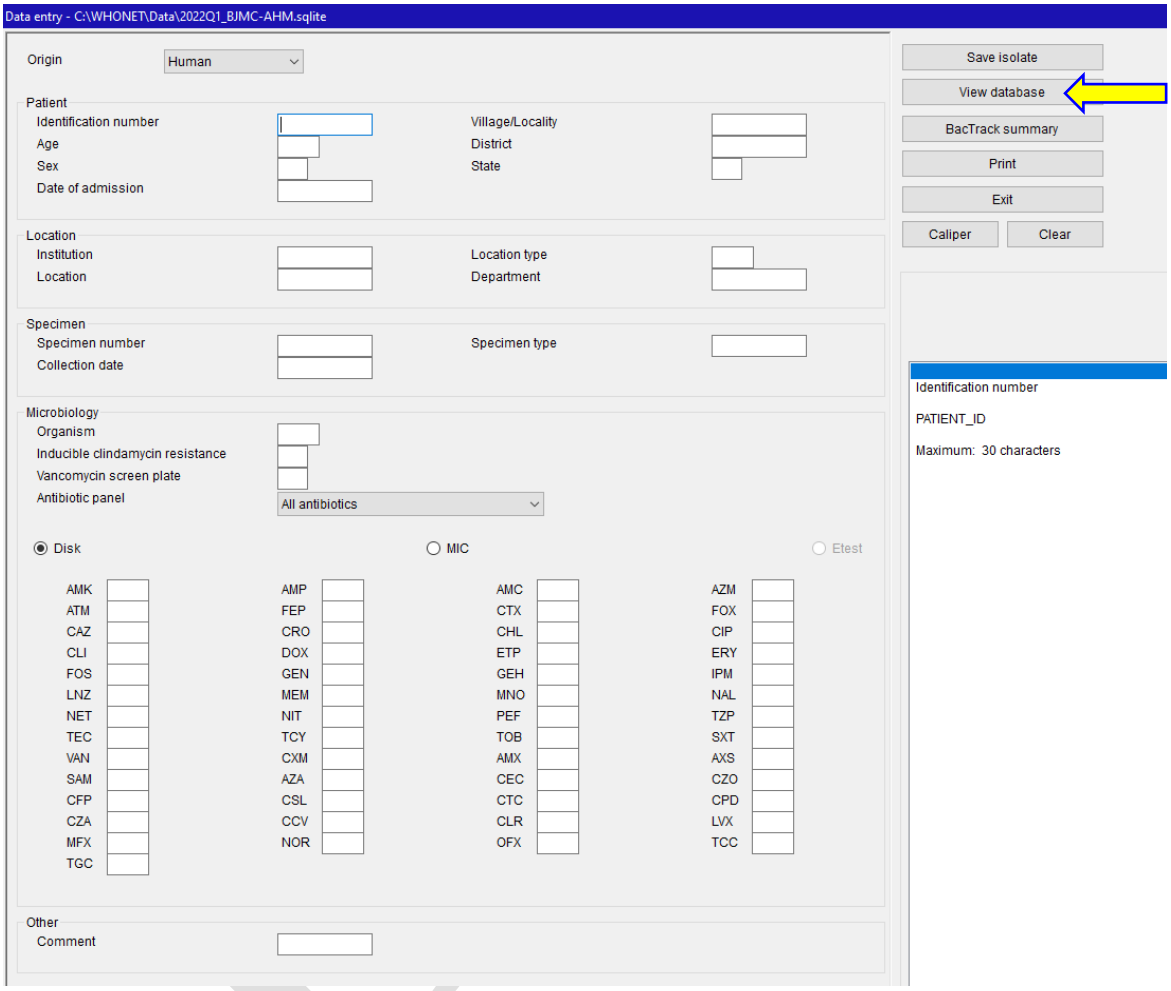


# III. To View and Edit AST data in WHONET 2022

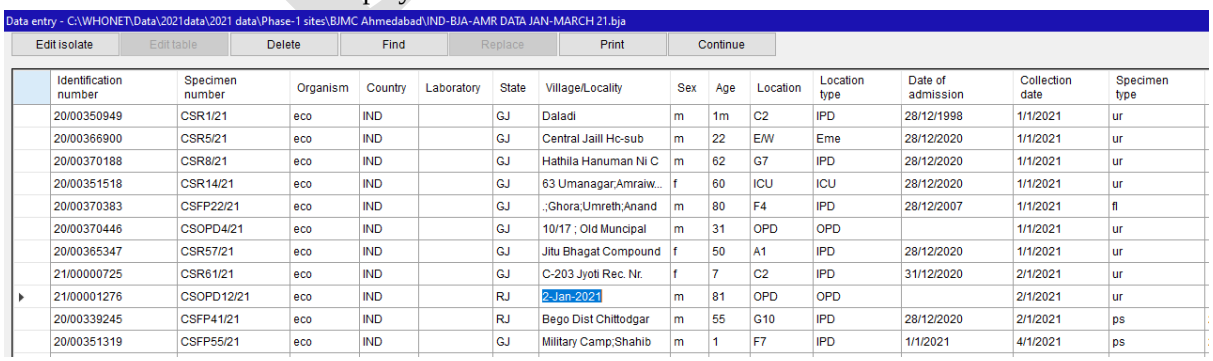
To view a previously entered data file, open WHONET, open the laboratory configuration and then click data entry  to choose the data file last entered and saved in the data folder.

After choosing the data file from the WHONET data entry, follow the steps below. Step 1:

Click on the "View database" tab.




The entire database will be displayed as shown below

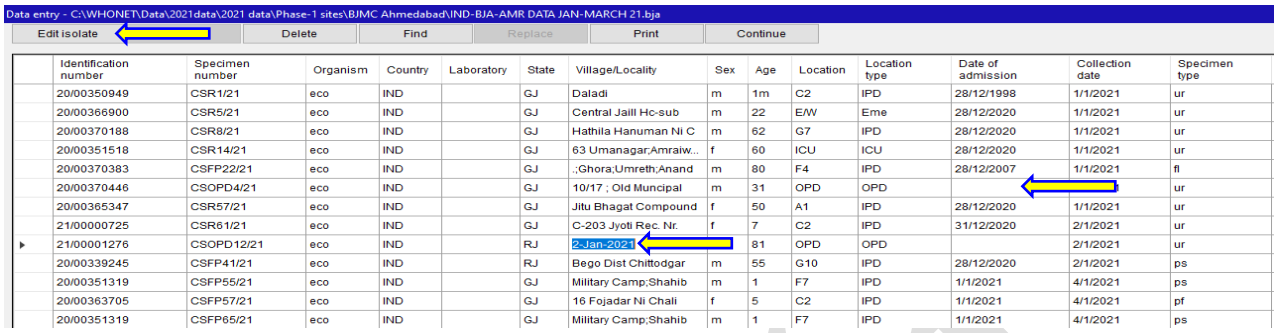



| Identification number | Specimen number | Organism | Country | Laboratory | State | Village/Locality | Sex | Age | Location | Location type | Date of admission | Collection date | Specimen type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20/00350949 | CSR1/21 | eco | IND | | GJ | Daladi | m | 1m | C2 | IPD | 28/12/1998 | 1/1/2021 | ur |
| 20/00366900 | CSR5/21 | eco | IND | | GJ | Central Jaill Hc-sub | m | 22 | E/W | Eme | 28/12/2020 | 1/1/2021 | ur |
| 20/00370188 | CSR8/21 | eco | IND | | GJ | Hathila Hanuman Ni C | m | 62 | G7 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 20/00351518 | CSR14/21 | eco | IND | | GJ | 63 Umanagar;Amraiw... | f | 60 | ICU | ICU | 28/12/2020 | 1/1/2021 | ur |
| 20/00370383 | CSFP22/21 | eco | IND | | GJ | .;Ghora;Umreth;Anand | m | 80 | F4 | IPD | 28/12/2007 | 1/1/2021 | fl |
| 20/00370446 | CSOPD4/21 | eco | IND | | GJ | 10/17 ; Old Muncipal | m | 31 | OPD | OPD | | 1/1/2021 | ur |
| 20/00365347 | CSR57/21 | eco | IND | | GJ | Jitu Bhagat Compound | f | 50 | A1 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 21/00000725 | CSR61/21 | eco | IND | | GJ | C-203 Jyoti Rec. Nr. | f | 7 | C2 | IPD | 31/12/2020 | 2/1/2021 | ur |
| 21/00001276 | CSOPD12/21 | eco | IND | | RJ | 2-Jan-2021 | m | 81 | OPD | OPD | | 2/1/2021 | ur |
| 20/00339245 | CSFP41/21 | eco | IND | | RJ | Bego Dist Chittodgar | m | 55 | G10 | IPD | 28/12/2020 | 2/1/2021 | ps |
| 20/00351319 | CSFP55/21 | eco | IND | | GJ | Military Camp;Shahib | m | 1 | F7 | IPD | 1/1/2021 | 4/1/2021 | ps |

If you choose to enter the data for the subsequent isolate,  click on "Continue."

Step 2: To Edit saved isolate details.

On reviewing the database, you may recognize certain data entry errors. For example, the date is mentioned in the village column inconsistent admission date in the database below.

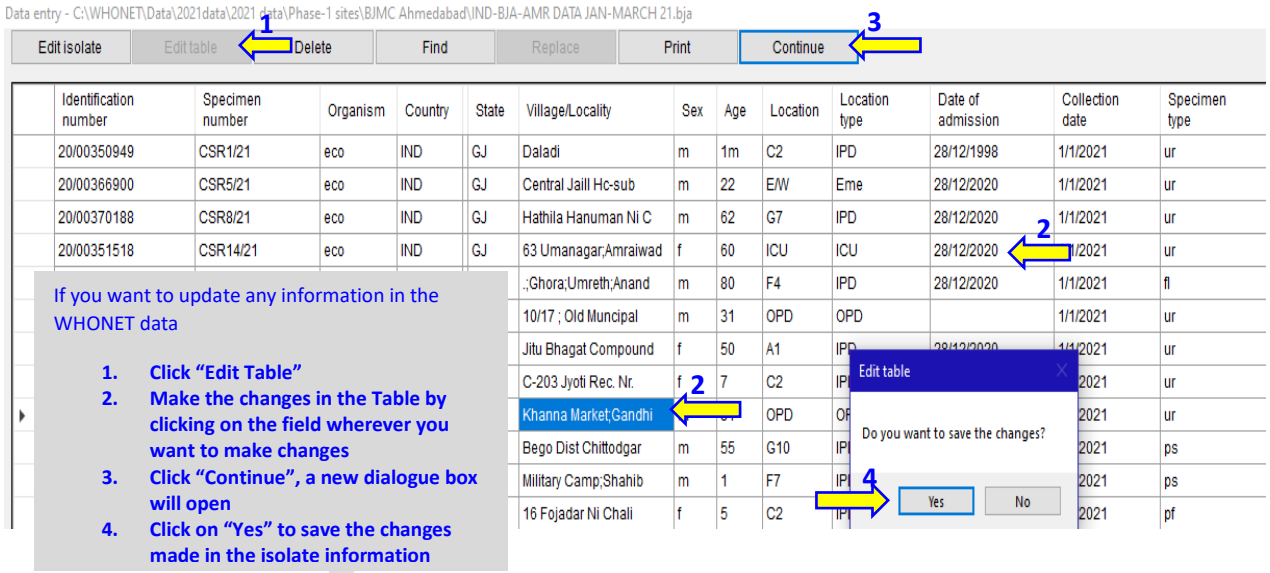



| Identification number | Specimen number | Organism | Country | Laboratory | State | Village/Locality | Sex | Age | Location | Location type | Date of admission | Collection date | Specimen type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20/00350949 | CSR1/21 | eco | IND | | GJ | Daladi | m | 1m | C2 | IPD | 28/12/1998 | 1/1/2021 | ur |
| 20/00366900 | CSR5/21 | eco | IND | | GJ | Central Jaill Hc-sub | m | 22 | E/W | Eme | 28/12/2020 | 1/1/2021 | ur |
| 20/00370188 | CSR8/21 | eco | IND | | GJ | Hathila Hanuman Ni C | m | 62 | G7 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 20/00351518 | CSR14/21 | eco | IND | | GJ | 63 Umanagar;Amraiw... | f | 60 | ICU | ICU | 28/12/2020 | 1/1/2021 | ur |
| 20/00370383 | CSFP22/21 | eco | IND | | GJ | .;Ghora;Umreth;Anand | m | 80 | F4 | IPD | 28/12/2007 | 1/1/2021 | fl |
| 20/00370446 | CSOPD4/21 | eco | IND | | GJ | 10/17 ; Old Muncipal | m | 31 | OPD | OPD | | | ur |
| 20/00365347 | CSR57/21 | eco | IND | | GJ | Jitu Bhagat Compound | f | 50 | A1 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 21/00000725 | CSR61/21 | eco | IND | | GJ | C-203 Jyoti Rec. Nr. | f | 7 | C2 | IPD | 31/12/2020 | 2/1/2021 | ur |
| 21/00001276 | CSOPD12/21 | eco | IND | | RJ | 2-Jan-2021 | | 81 | OPD | OPD | | 2/1/2021 | ur |
| 20/00339245 | CSFP41/21 | eco | IND | | RJ | Bego Dist Chittodgar | m | 55 | G10 | IPD | 28/12/2020 | 2/1/2021 | ps |
| 20/00351319 | CSFP55/21 | eco | IND | | GJ | Military Camp;Shahib | m | 1 | F7 | IPD | 1/1/2021 | 4/1/2021 | ps |
| 20/00363705 | CSFP57/21 | eco | IND | | GJ | 16 Fojadar Ni Chali | f | 5 | C2 | IPD | 1/1/2021 | 4/1/2021 | pf |
| 20/00351319 | CSFP65/21 | eco | IND | | GJ | Military Camp;Shahib | m | 1 | F7 | IPD | 1/1/2021 | 4/1/2021 | ps |

<u>If you want to update or modify this data to correct the respective data entry errors:</u>

Step 10: Click on the "Edit table" tab (Arrow 1 below), make the data modification (Arrow 2 ) and then click "Continue" (Arrow 3 below). A new window will pop up asking, "Do you want to save the changes". Click "Yes" (Arrow 4 below).

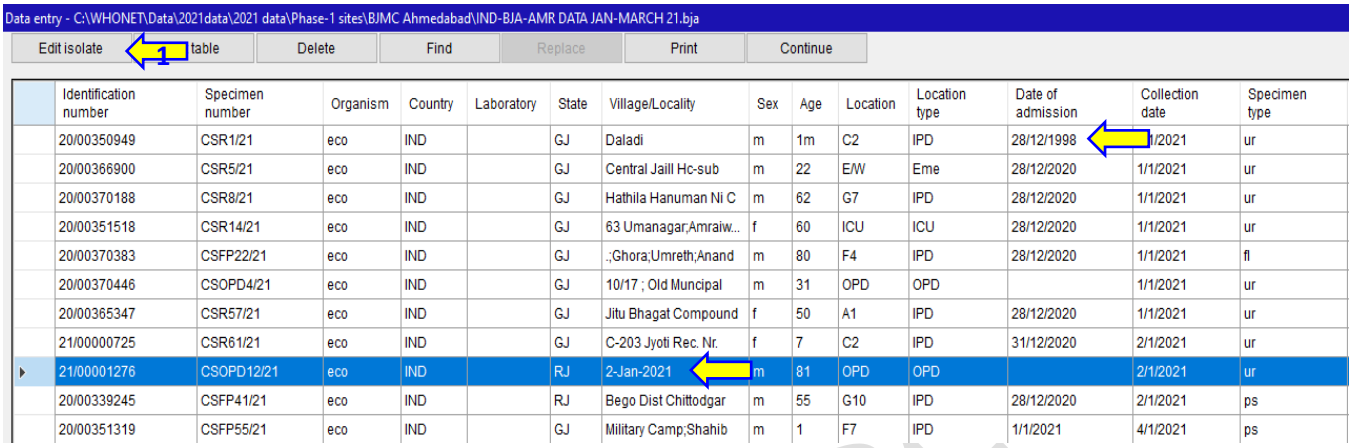
Your changes will be saved in your AST database.




| Identification number | Specimen number | Organism | Country | State | Village/Locality | Sex | Age | Location | Location type | Date of admission | Collection date | Specimen type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20/00350949 | CSR1/21 | eco | IND | GJ | Daladi | m | 1m | C2 | IPD | 28/12/1998 | 1/1/2021 | ur |
| 20/00366900 | CSR5/21 | eco | IND | GJ | Central Jaill Hc-sub | m | 22 | E/W | Eme | 28/12/2020 | 1/1/2021 | ur |
| 20/00370188 | CSR8/21 | eco | IND | GJ | Hathila Hanuman Ni C | m | 62 | G7 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 20/00351518 | CSR14/21 | eco | IND | GJ | 63 Umanagar;Amraiwad | f | 60 | ICU | ICU | 28/12/2020 | 1/1/2021 | ur |
| | | | | | .;Ghora;Umreth;Anand | m | 80 | F4 | IPD | 28/12/2020 | 1/1/2021 | fl |
| | | | | | 10/17 ; Old Muncipal | m | 31 | OPD | OPD | | 1/1/2021 | ur |
| | | | | | Jitu Bhagat Compound | f | 50 | A1 | IPD | | 1/1/2021 | ur |
| | | | | | C-203 Jyoti Rec. Nr. | f | 7 | C2 | IPD | | 1/1/2021 | ur |
| | | | | | Khanna Market;Gandhi | | | OPD | OPD | | 1/1/2021 | ur |
| | | | | | Bego Dist Chittodgar | m | 55 | G10 | IPD | | 1/1/2021 | ps |
| | | | | | Military Camp;Shahib | m | 1 | F7 | IPD | | 1/1/2021 | ps |
| | | | | | 16 Fojadar Ni Chali | f | 5 | C2 | IPD | | 1/1/2021 | pf |

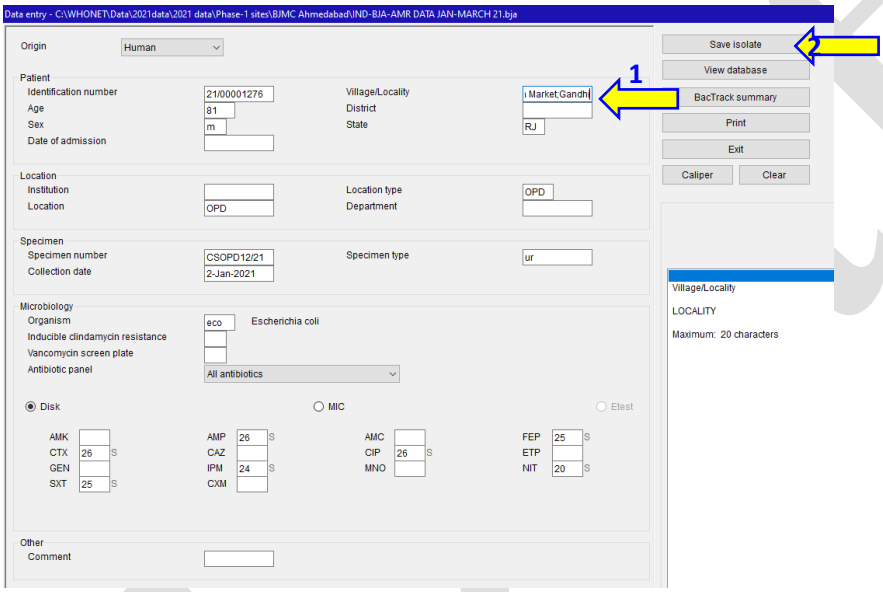
Once you have updated the details, click "Continue" again to continue data entry.

Alternately, you may edit data by clicking on the "Edit isolate" tab (Arrow number 1), make necessary data edits (Arrow number 2) and then click "Save isolate" (Arrow number 3).




| Identification number | Specimen number | Organism | Country | Laboratory | State | Village/Locality | Sex | Age | Location | Location type | Date of admission | Collection date | Specimen type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20/00350949 | CSR1/21 | eco | IND | | GJ | Daladi | m | 1m | C2 | IPD | 28/12/1998 | 1/1/2021 | ur |
| 20/00366900 | CSR5/21 | eco | IND | | GJ | Central Jaill Hc-sub | m | 22 | E/W | Eme | 28/12/2020 | 1/1/2021 | ur |
| 20/00370188 | CSR8/21 | eco | IND | | GJ | Hathila Hanuman Ni C | m | 62 | G7 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 20/00351518 | CSR14/21 | eco | IND | | GJ | 63 Umanagar;Amraiw... | f | 60 | ICU | ICU | 28/12/2020 | 1/1/2021 | ur |
| 20/00370383 | CSFP22/21 | eco | IND | | GJ | .;Ghora;Umreth;Anand | m | 80 | F4 | IPD | 28/12/2020 | 1/1/2021 | fl |
| 20/00370446 | CSOPD4/21 | eco | IND | | GJ | 10/17 ; Old Muncipal | m | 31 | OPD | OPD | | 1/1/2021 | ur |
| 20/00365347 | CSR57/21 | eco | IND | | GJ | Jitu Bhagat Compound | f | 50 | A1 | IPD | 28/12/2020 | 1/1/2021 | ur |
| 21/00000725 | CSR61/21 | eco | IND | | GJ | C-203 Jyoti Rec. Nr. | f | 7 | C2 | IPD | 31/12/2020 | 2/1/2021 | ur |
| 21/00001276 | CSOPD12/21 | eco | IND | | RJ | 2-Jan-2021 | m | 81 | OPD | OPD | | 2/1/2021 | ur |
| 20/00339245 | CSFP41/21 | eco | IND | | RJ | Bego Dist Chittodgar | m | 55 | G10 | IPD | 28/12/2020 | 2/1/2021 | ps |
| 20/00351319 | CSFP55/21 | eco | IND | | GJ | Military Camp;Shahib | m | 1 | F7 | IPD | 1/1/2021 | 4/1/2021 | ps |

Once you click edit isolate, Data entry window will reopen, edit the required changes in the data




Click "Save Isolate" and continue data entry for the subsequent isolate

# IV. How to prepare AMR Data for Reporting to NCDC

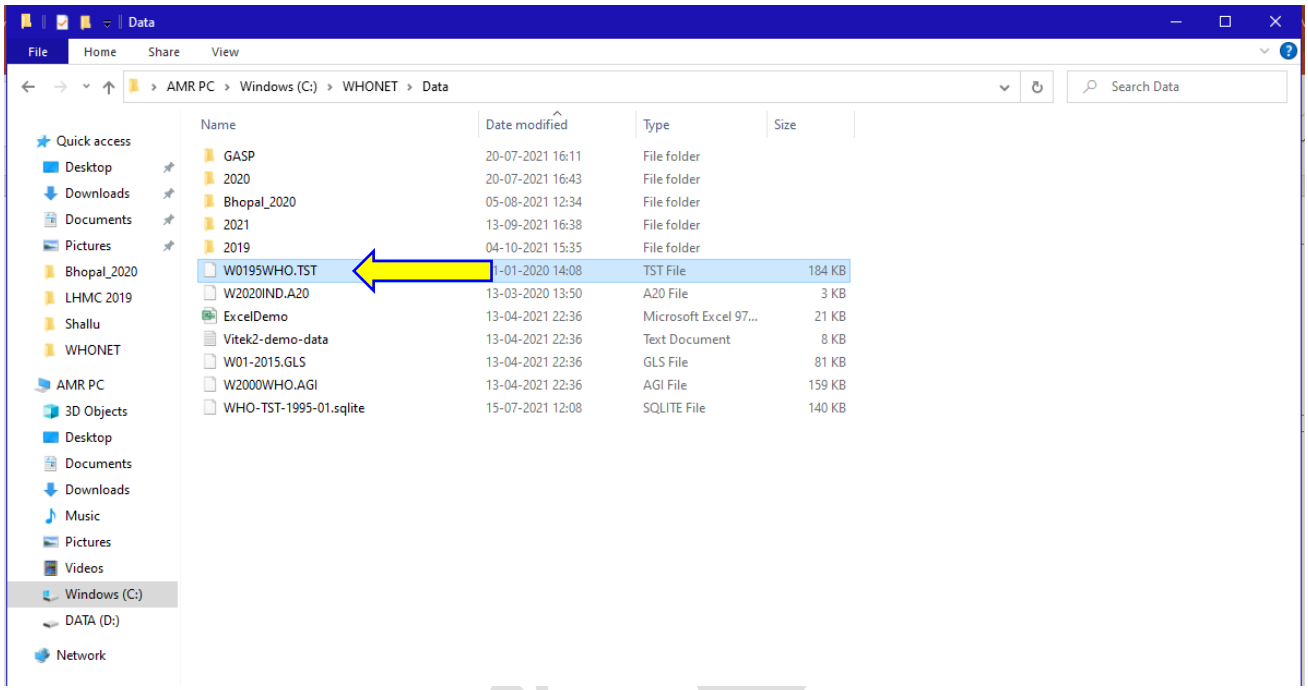
Laboratories participating in the NCDC AMR surveillance must use WHONET to record and report microbiology data unless there is a robust Laboratory information system (LIMS).

The data entry in the WHONET laboratory might depend on the availability of infrastructure, equipment, bacterial culture methods, local antibiotic policy, preferences from clinicians, and other needs.

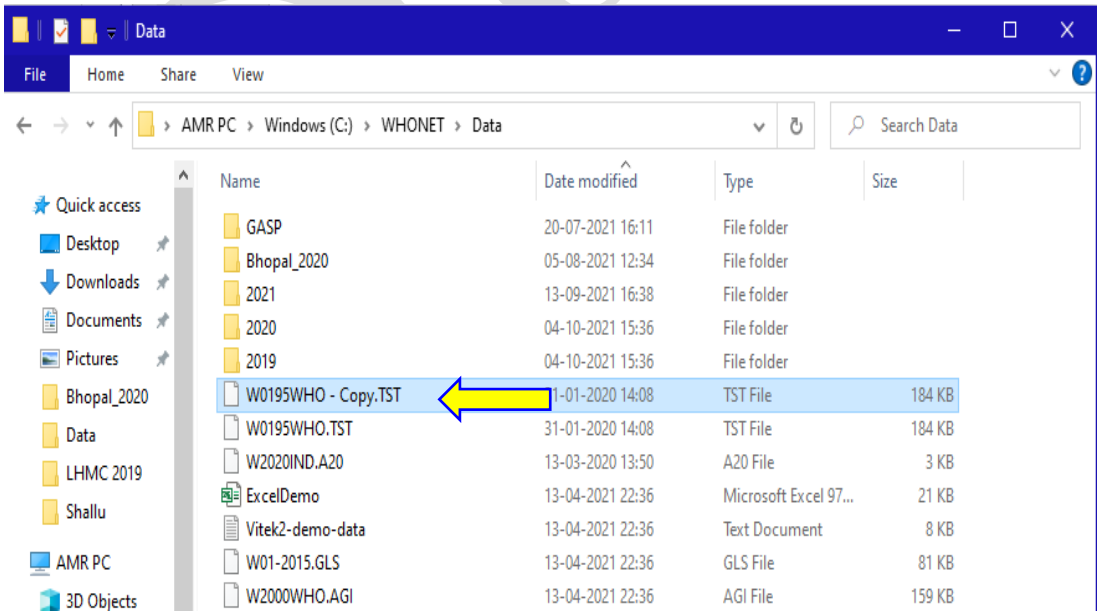
Only selected data fields in WHONET need to be NCDC for AMR surveillance. The section below describes how data managers at laboratories participating in the NCDC AMR surveillance network may modify existing laboratory data in WHONET to report only the selected data fields necessary for the surveillance network.

**This process of data export <u>does not</u> affect the original WHONET data file if all the steps are followed as specified. However, it is advisable to take a back up of your WHONET data files from C Drive into an external drive before starting this process of exporting data from WHONET for reporting to NCDC.**

Step 1: If your lab uses WHONET 2022, then navigate to the "Data" folder in the "WHONET" folder in the "C" drive (shown in the image below).




Step 2: Create a copy of your WHONET data file by copying and pasting the same file in the same folder as shown below. In this example, the file "W0195WHO.TST" has been duplicated by copying and pasting.

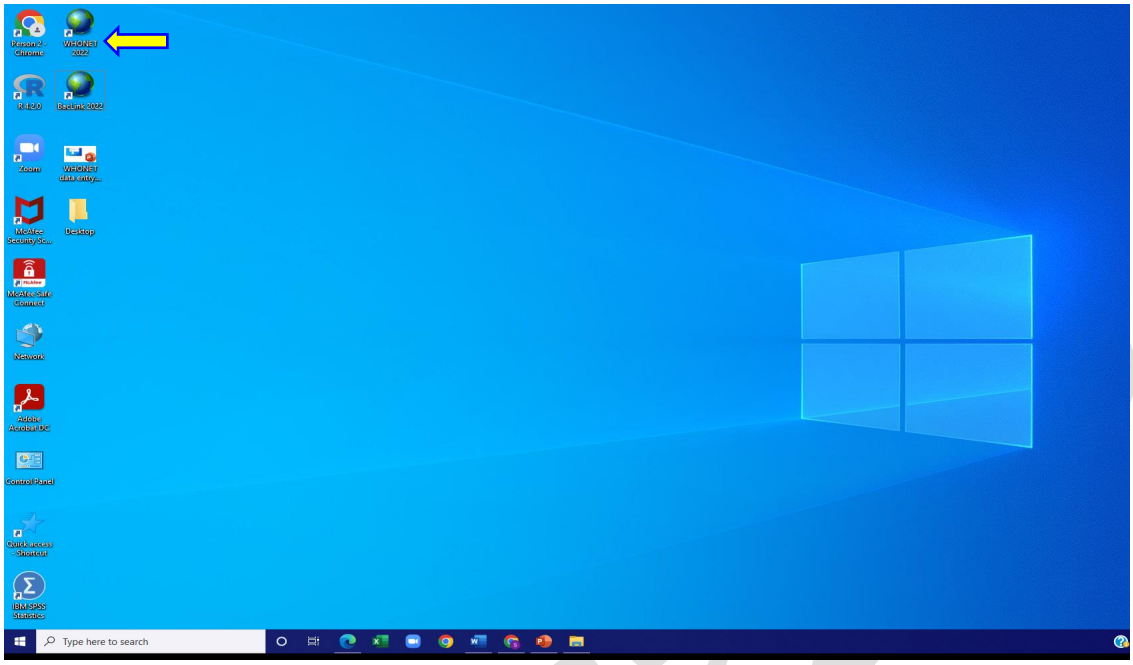



Step 3: You may close the folder once you have duplicated your original data file as described above.

# V. How to Modify the Data Fields for Reporting to NCDC

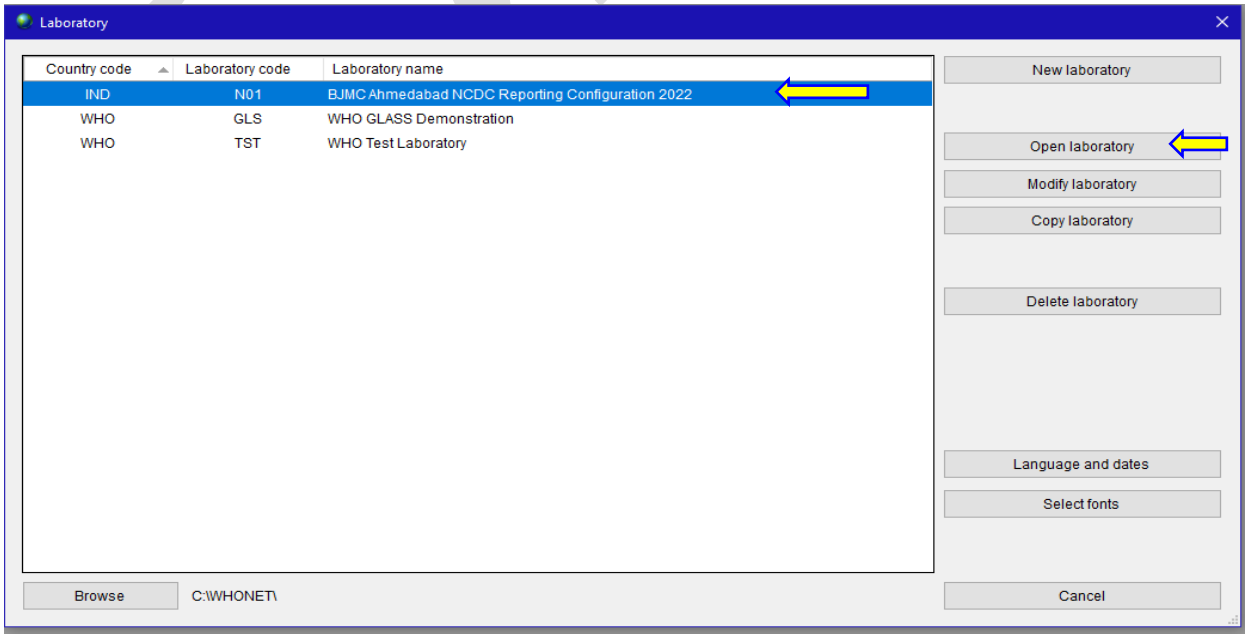
After duplicating your WHONET data file in your WHONET data folder, please follow the steps below for selecting the data fields for export.

Step 1: Launch the WHONET 2022 application from your desktop.

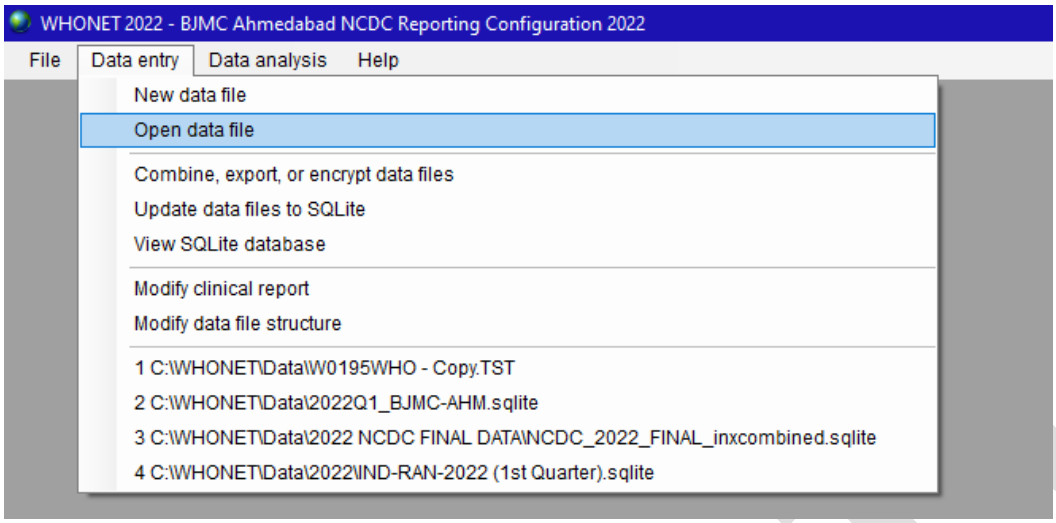


Step 2: select the NCDC reporting lab configuration already installed into your system and click open laboratory.

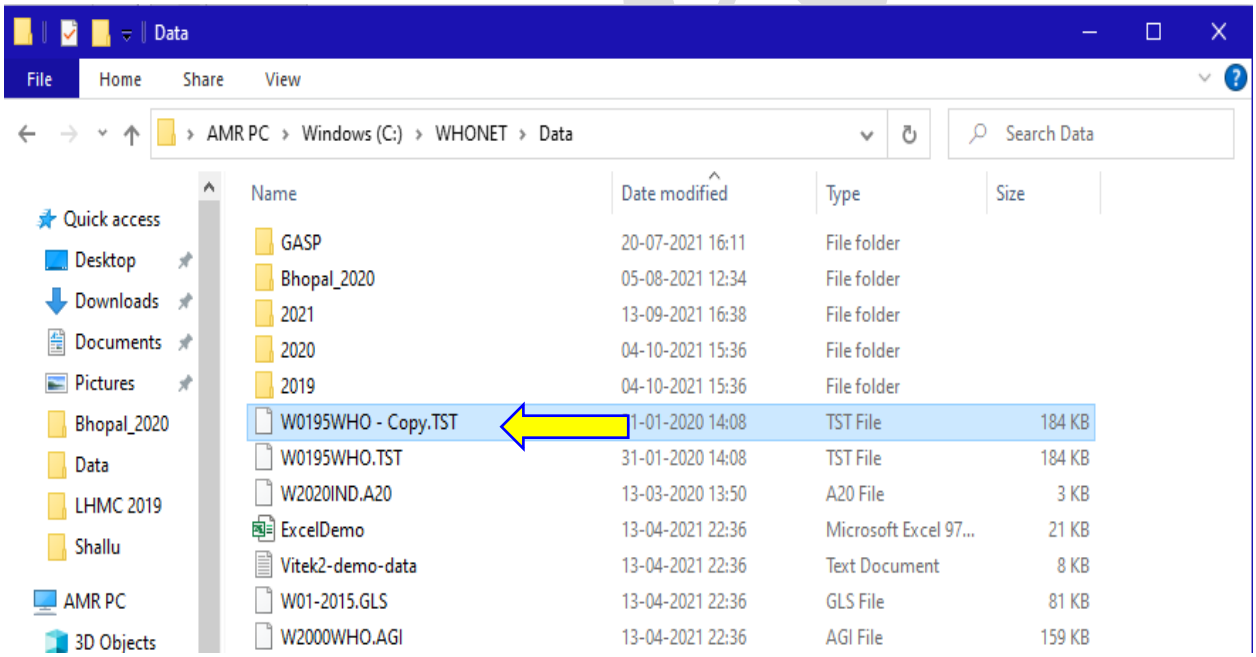
For example, "BJMC Ahmedabad for NCDC reporting configuration 2022" has been selected in the picture below.



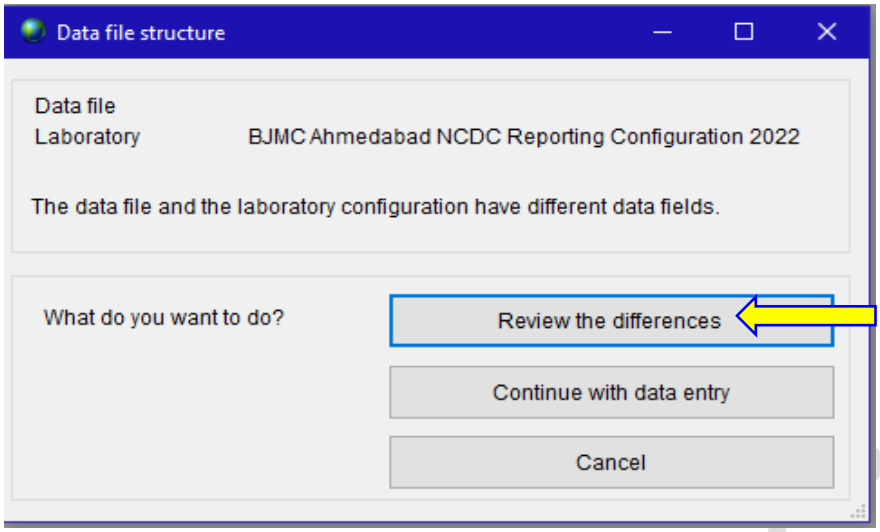
Step 3: Once the laboratory is open, click on the "Data entry" tab and click "Open data file" from the menu option.



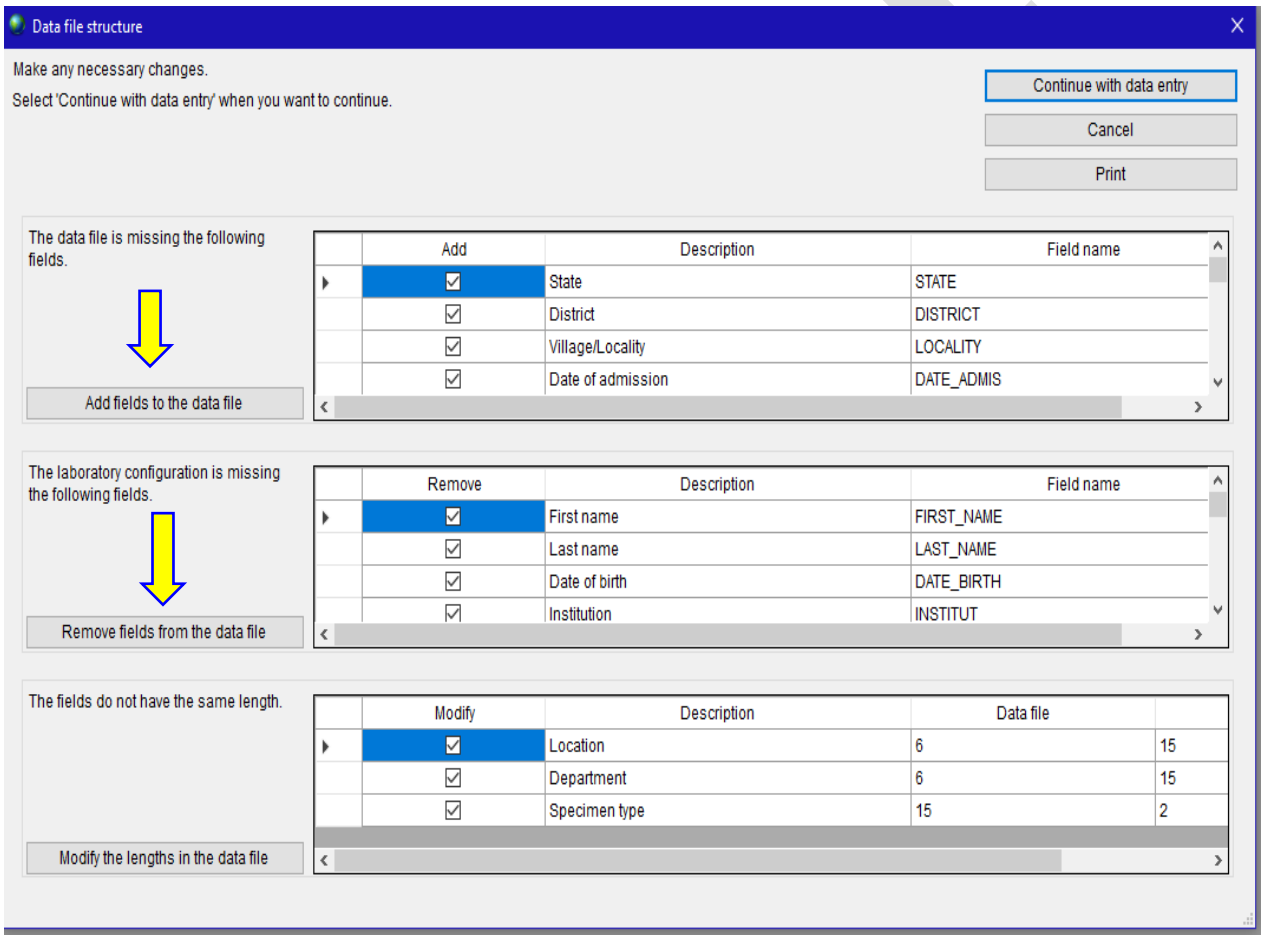

Step 4: Clicking on "Open data file" will direct you to the files in WHONET 2022 "Data" folder. Open the "Copy" file, which duplicates your original data file.



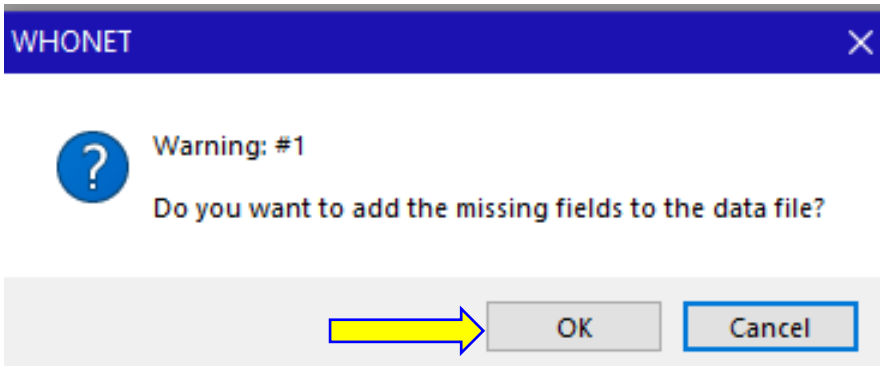

Step 5: Once you open the data file, you will see the following popup window ask, "What do you want to do" regarding the data file structure. You should click on the option to "Review the differences".



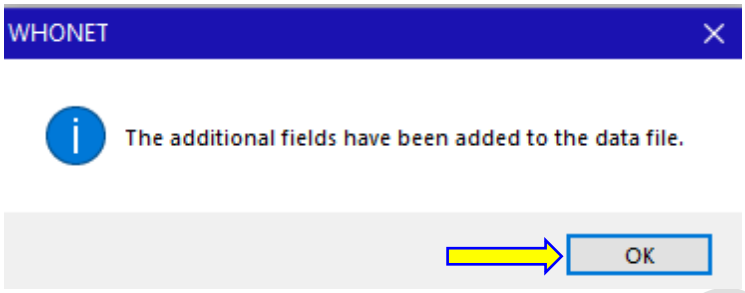

Step 6: You will be prompted for making necessary changes. click on the button "Add fields to the data file".



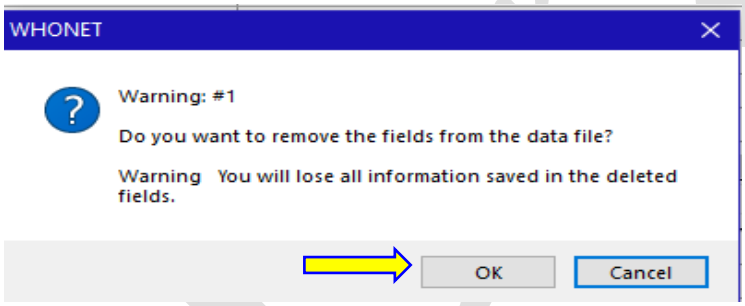

Step 7: You will be prompted twice to add the additional field with a warning message, as mentioned below. Click "OK" both the times.

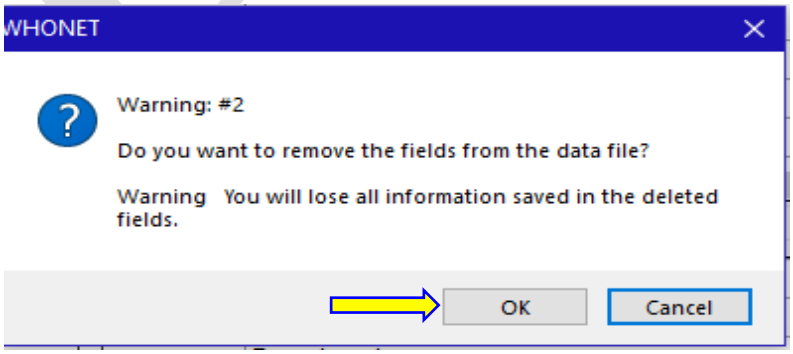


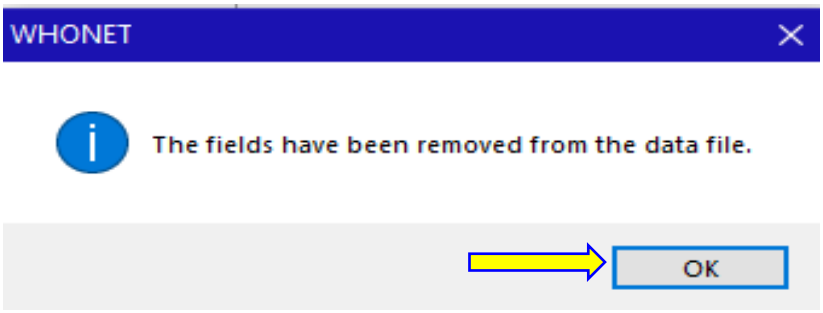

You will get a message as below. Click "OK".



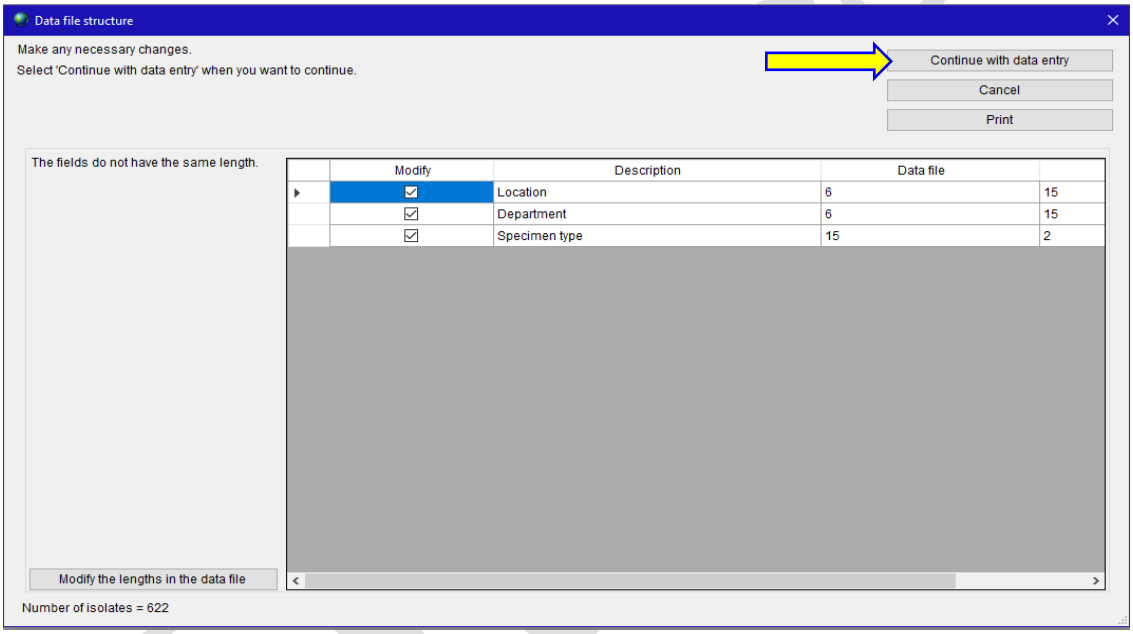

Step 8: Next, click the "Remove fields from the data file" button. You will encounter two warning messages confirming that you want to remove the fields from the data file. Click "OK" both times to proceed. A confirmation window pops up, indicating the selected data fields were removed from the database. Click "OK".



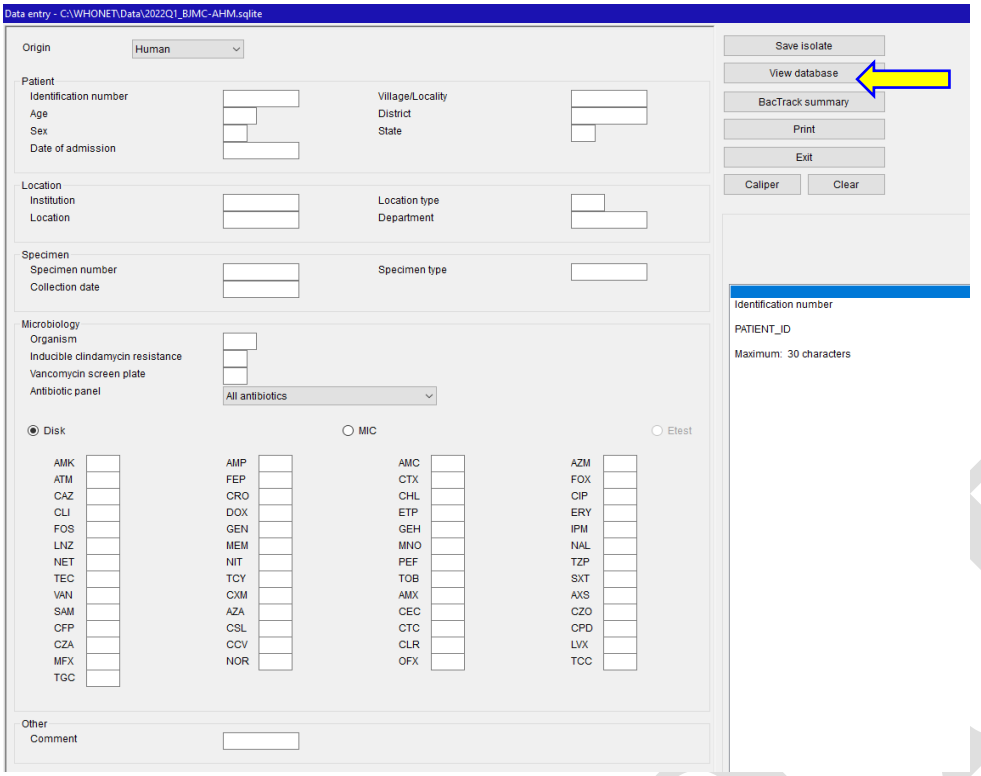



Step 9: Next, click on the "Continue with data entry" option

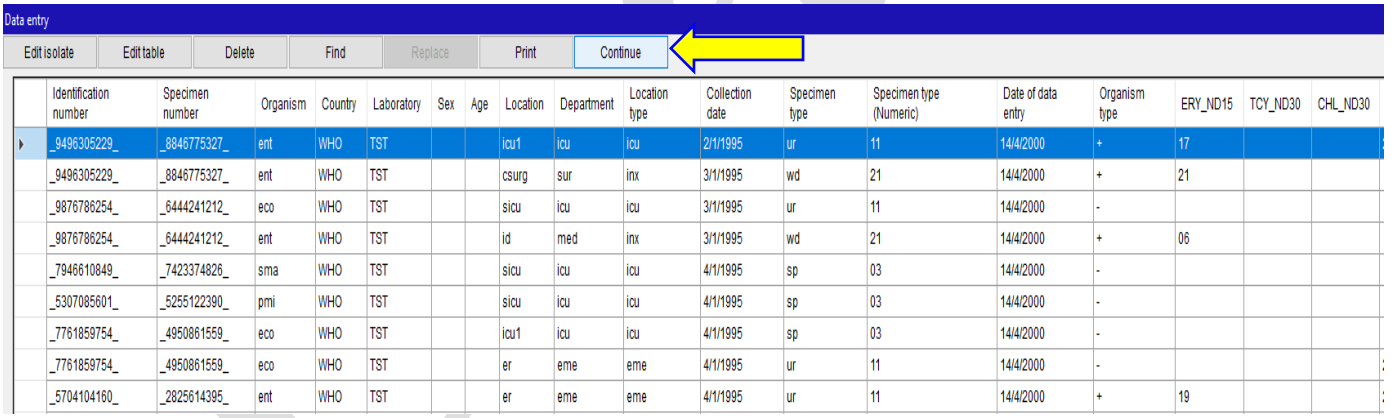



# VI. View the modified data

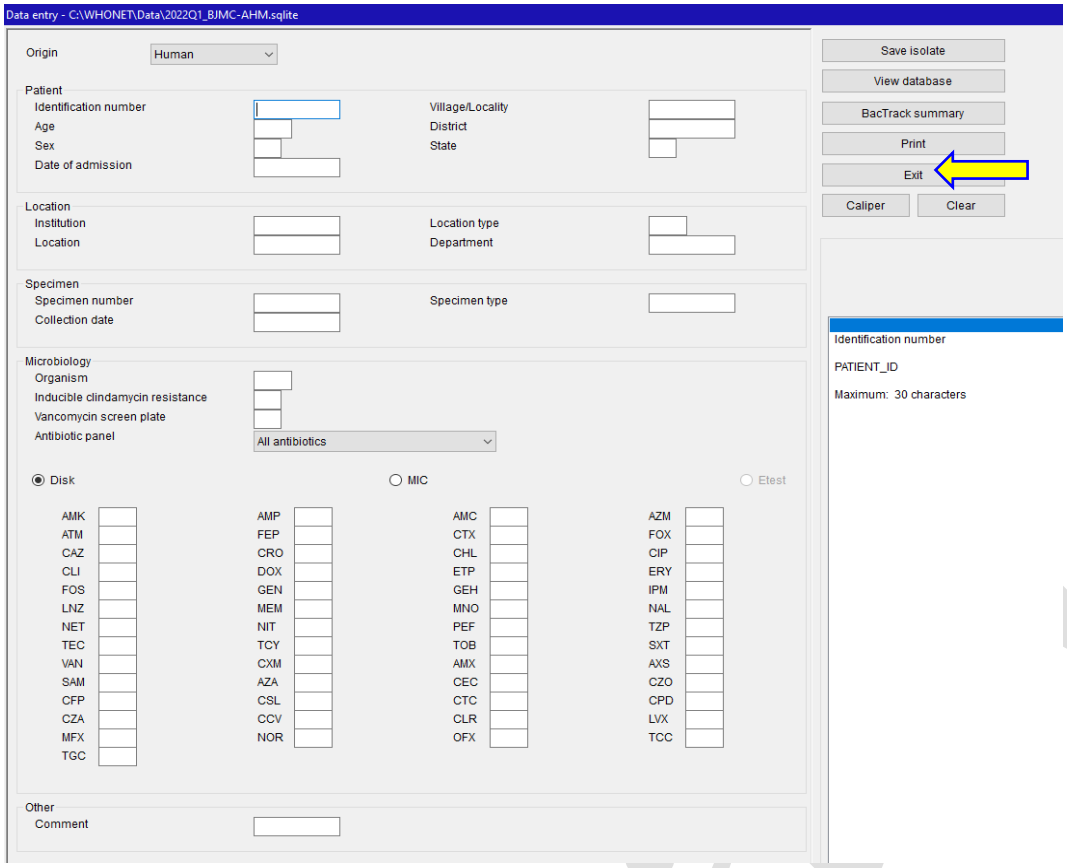
Once you have completed adding and removing data fields, you will encounter the data entry window as shown below. Click on the "View database" button.




Click on the "Continue" button to close the database and click on "Exit" from data entry.



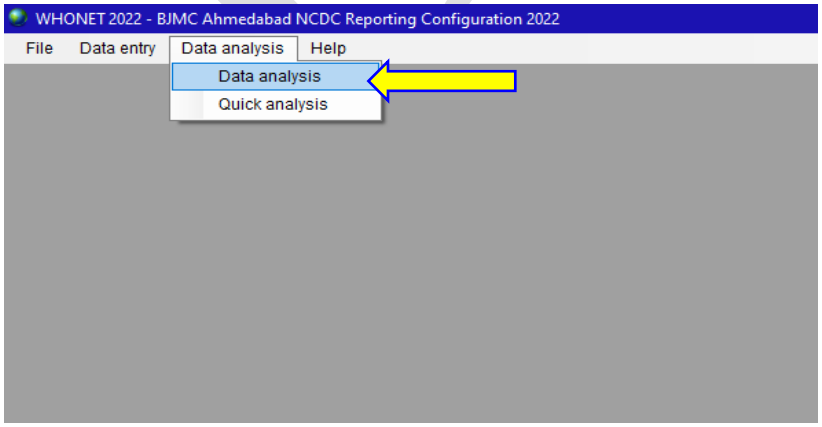

| Identification number | Specimen number | Organism | Country | Laboratory | Sex | Age | Location | Department | Location type | Collection date | Specimen type | Specimen type (Numeric) | Date of data entry | Organism type | ERY_ND15 | TCY_ND30 | CHL_ND30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| _9496305229_ | _8846775327_ | ent | WHO | TST | | | icu1 | icu | icu | 2/1/1995 | ur | 11 | 14/4/2000 | + | 17 | | |
| _9496305229_ | _8846775327_ | ent | WHO | TST | | | csurg | sur | inx | 3/1/1995 | wd | 21 | 14/4/2000 | + | 21 | | |
| _9876786254_ | _6444241212_ | eco | WHO | TST | | | sicu | icu | icu | 3/1/1995 | ur | 11 | 14/4/2000 | - | | | |
| _9876786254_ | _6444241212_ | ent | WHO | TST | | | id | med | inx | 3/1/1995 | wd | 21 | 14/4/2000 | + | 06 | | |
| _7946610849_ | _7423374826_ | sma | WHO | TST | | | sicu | icu | icu | 4/1/1995 | sp | 03 | 14/4/2000 | - | | | |
| _5307085601_ | _5255122390_ | pmi | WHO | TST | | | sicu | icu | icu | 4/1/1995 | sp | 03 | 14/4/2000 | - | | | |
| _7761859754_ | _4950861559_ | eco | WHO | TST | | | icu1 | icu | icu | 4/1/1995 | sp | 03 | 14/4/2000 | - | | | |
| _7761859754_ | _4950861559_ | eco | WHO | TST | | | er | eme | eme | 4/1/1995 | ur | 11 | 14/4/2000 | - | | | |
| _5704104160_ | _2825614395_ | ent | WHO | TST | | | er | eme | eme | 4/1/1995 | ur | 11 | 14/4/2000 | + | 19 | | |



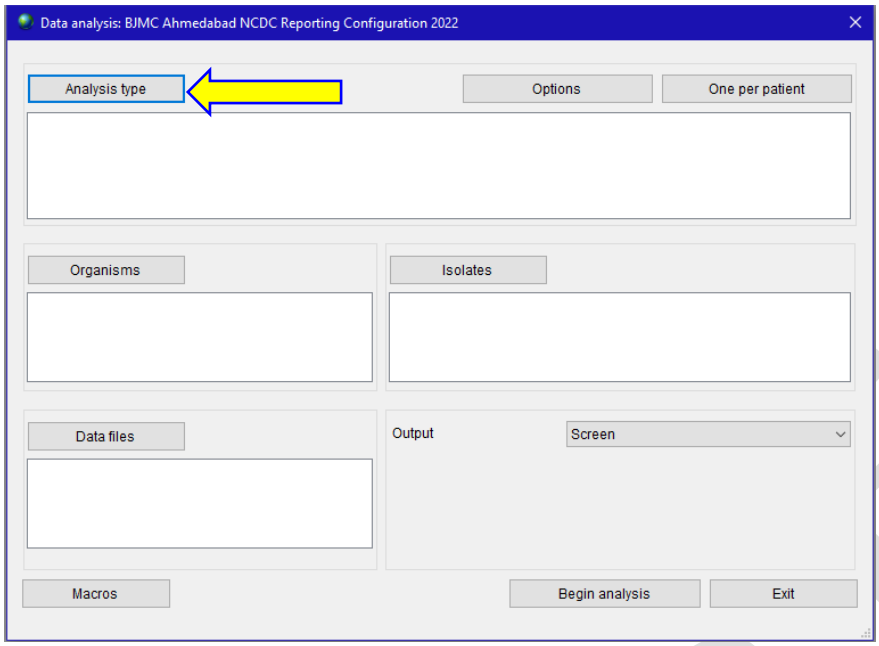

# VII. Exporting AMR Data to WHONET Output

Once you have confirmed that your isolate database contains only the data fields necessary for reporting to NCDC, the next step will be to export the isolate data.

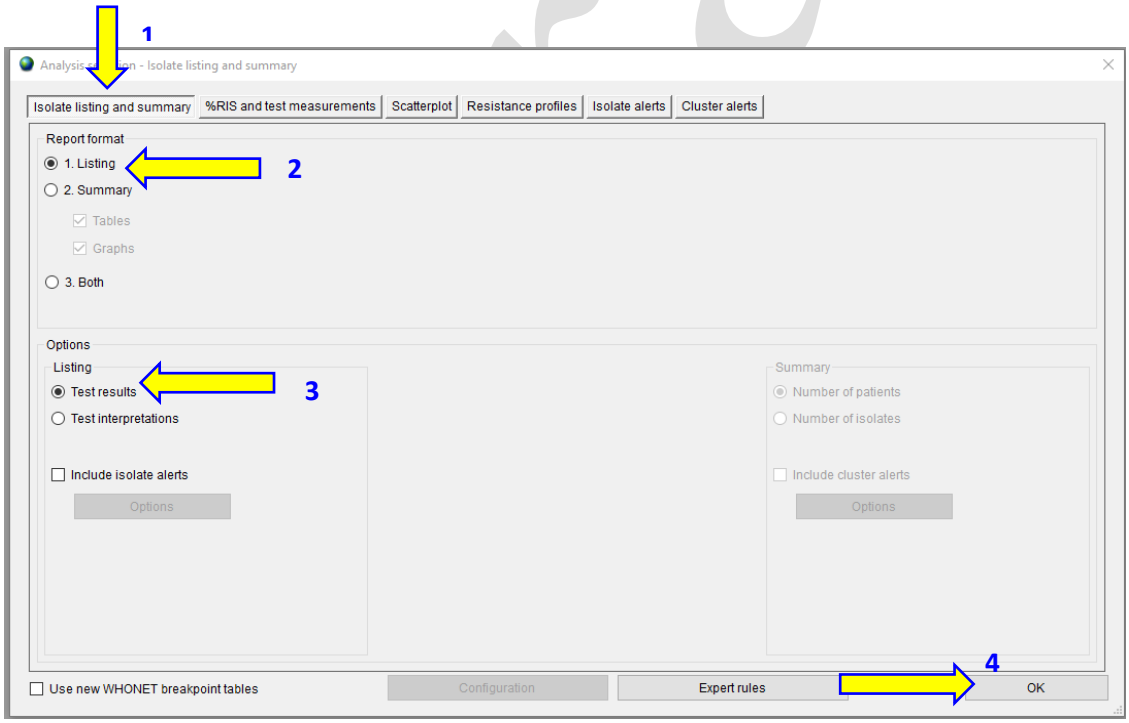
Step 1: After closing the data entry window, click on the "Data analysis" option under the "Data analysis" tab in WHONET, as shown below.



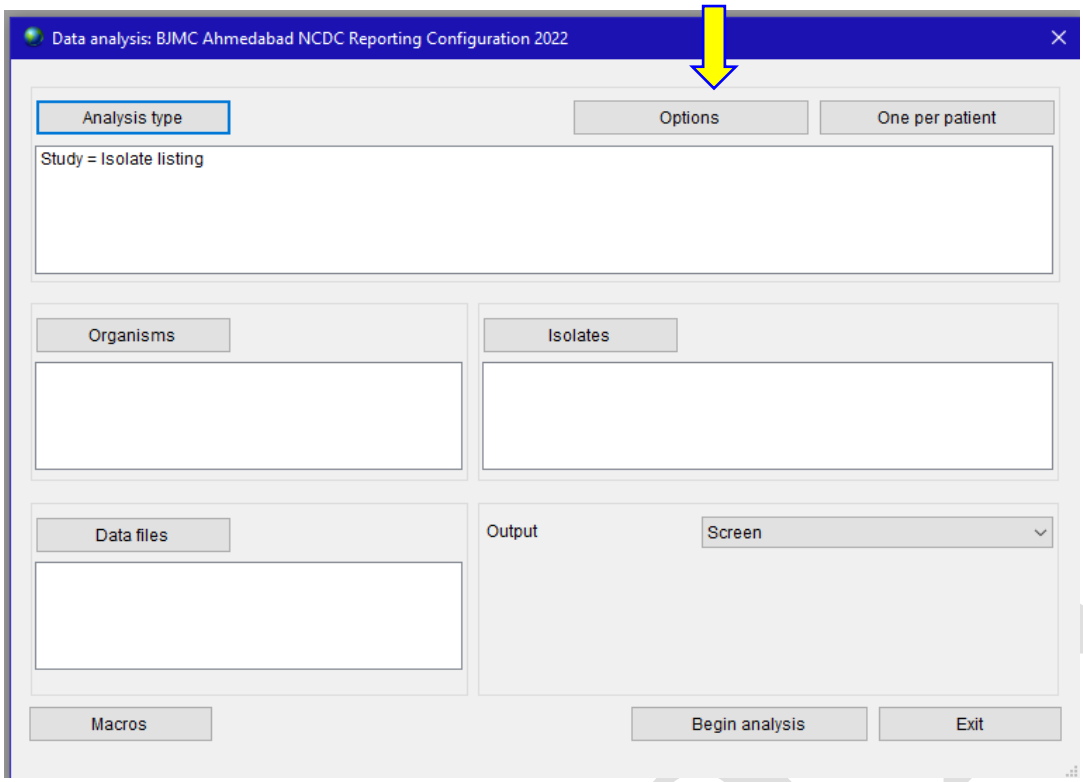
Step 2: This will open the data analysis window. Click on the "Analysis type" button to open a new "Analysis Section" window as shown below for BJMC Ahmedabad.




Step 3: Select "Isolate listing and summary" in the "Analysis Type" section and "Listing" in the "Report format" section, and then click "OK". In this section, confirm that "Test results" is checked. This option ensures that zone diameters and MIC values are reported. Then click "OK".

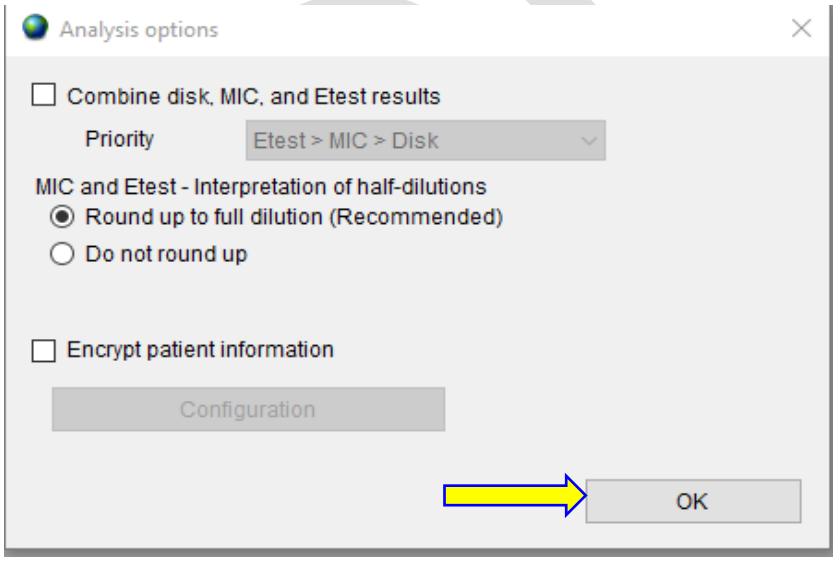



Step 4: Next, click on the "Options" button.



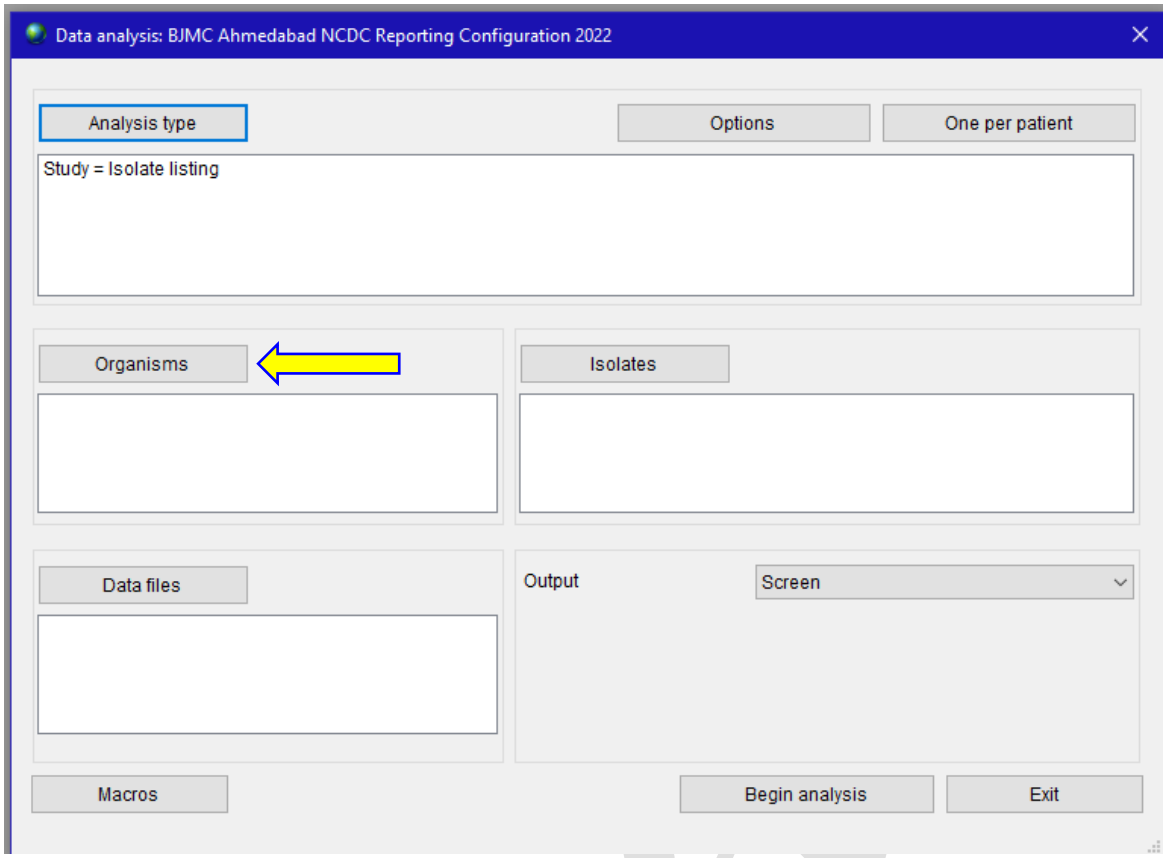

A window labelled "Analysis options" will open.

Step 5: In the "Analysis Options" section, tick the checkbox that reads "round up to full dilution". Once checked, click "OK".

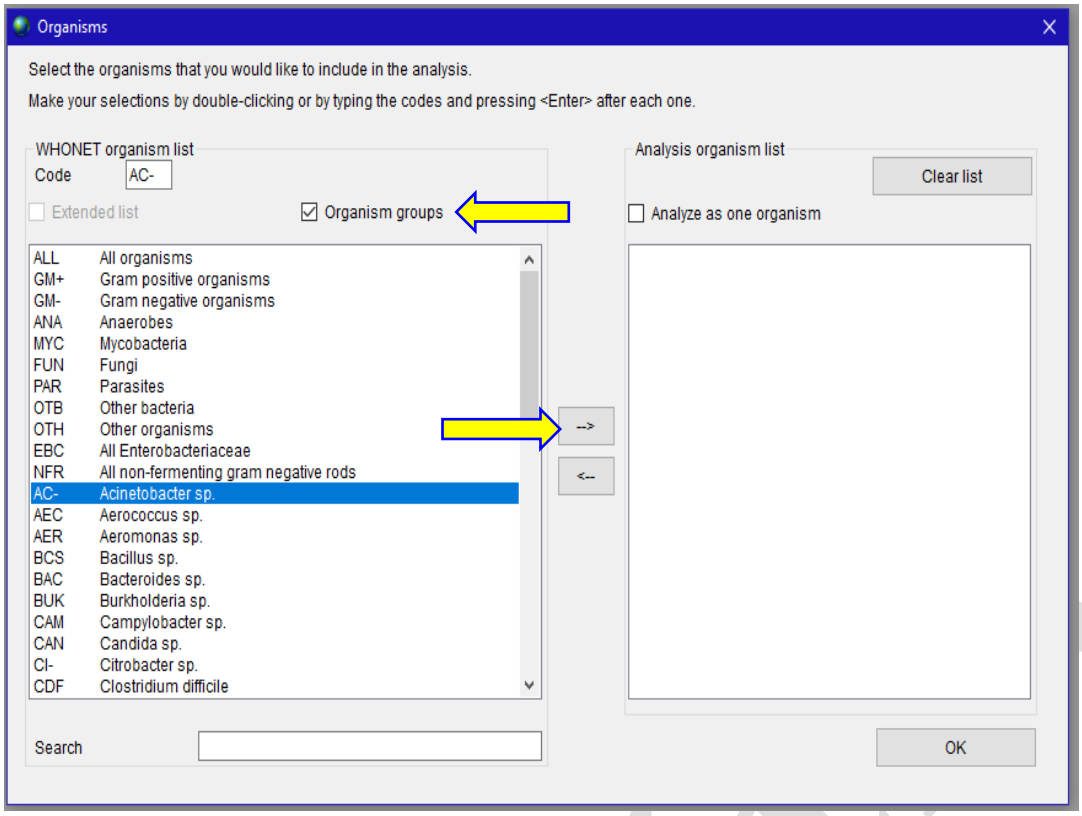


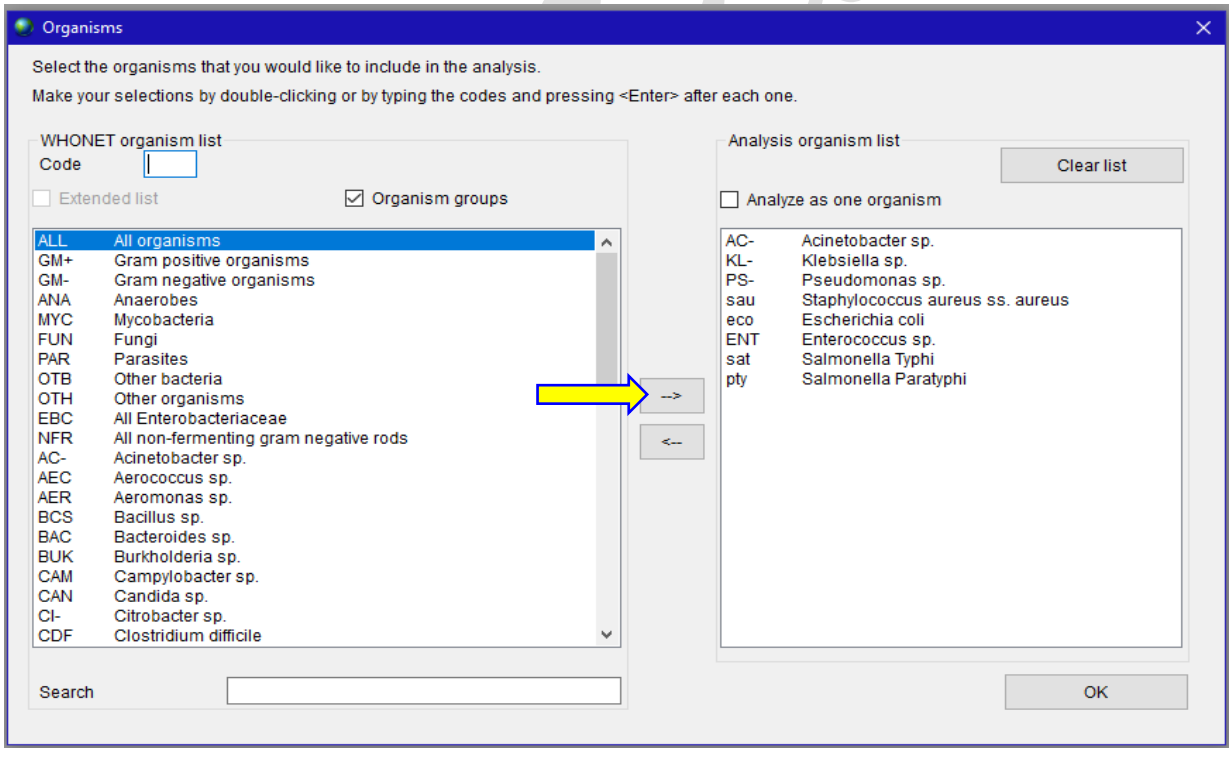

Step 6: To Select the organisms for reporting. Click on the "Organisms" button as shown below. Click on "Organisms groups" and enter each organism group per AMR Surveillance SOP.

**Note:** For including all species of one genera, use code in Capital letters. For example: Capital “KL-“ is used for all the species of *Klebsiella* including *Klebsiella* species in your data file. Small “kl” will select only *Klebsiella* species mentioned in your data file.




Select "Organism groups" as shown (Please refer to Annexure table 2a for a list of priority pathogens from the National AMR surveillance network SOP).

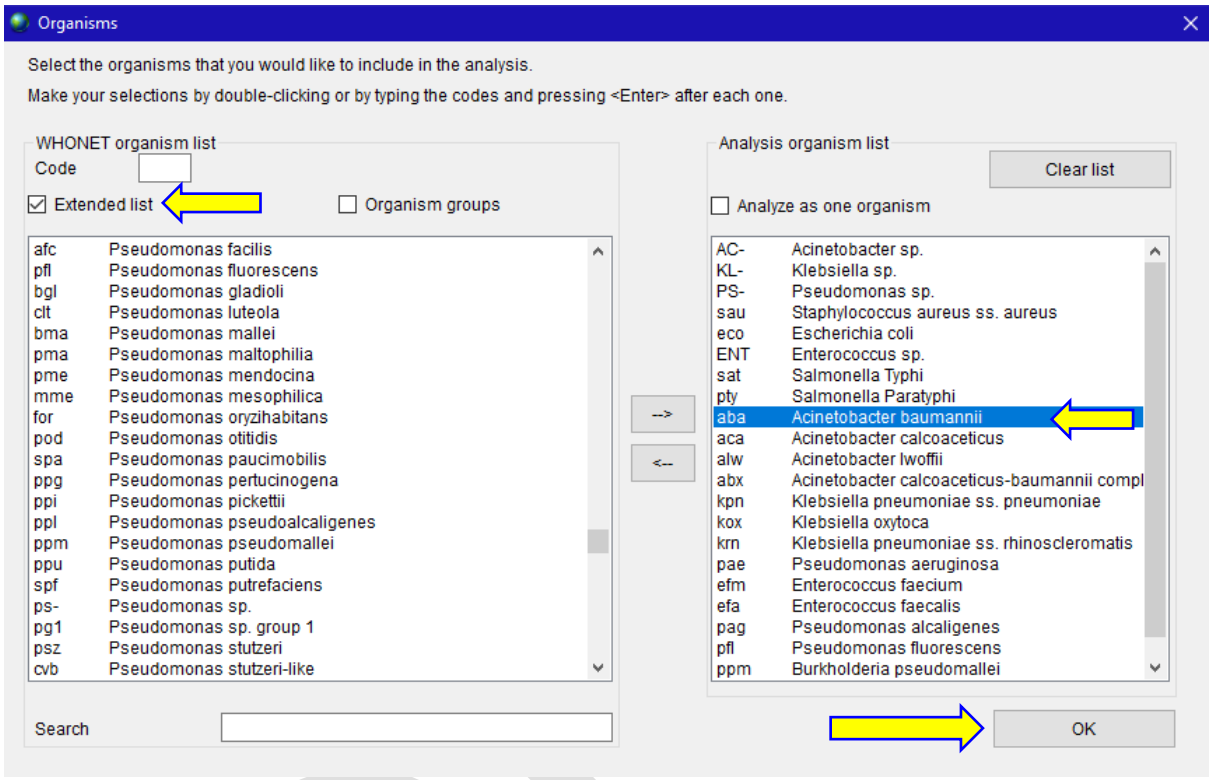



Once the list of priority pathogens groups isolated from your laboratory in the reporting period is populated, if WHONET data has any specific species, please select the species of priority pathogen from the extended list.

Once all the priority pathogen groups and species are selected, click "OK".

Before reporting the quarterly data to NCDC, the nodal officer of each site should check the data.



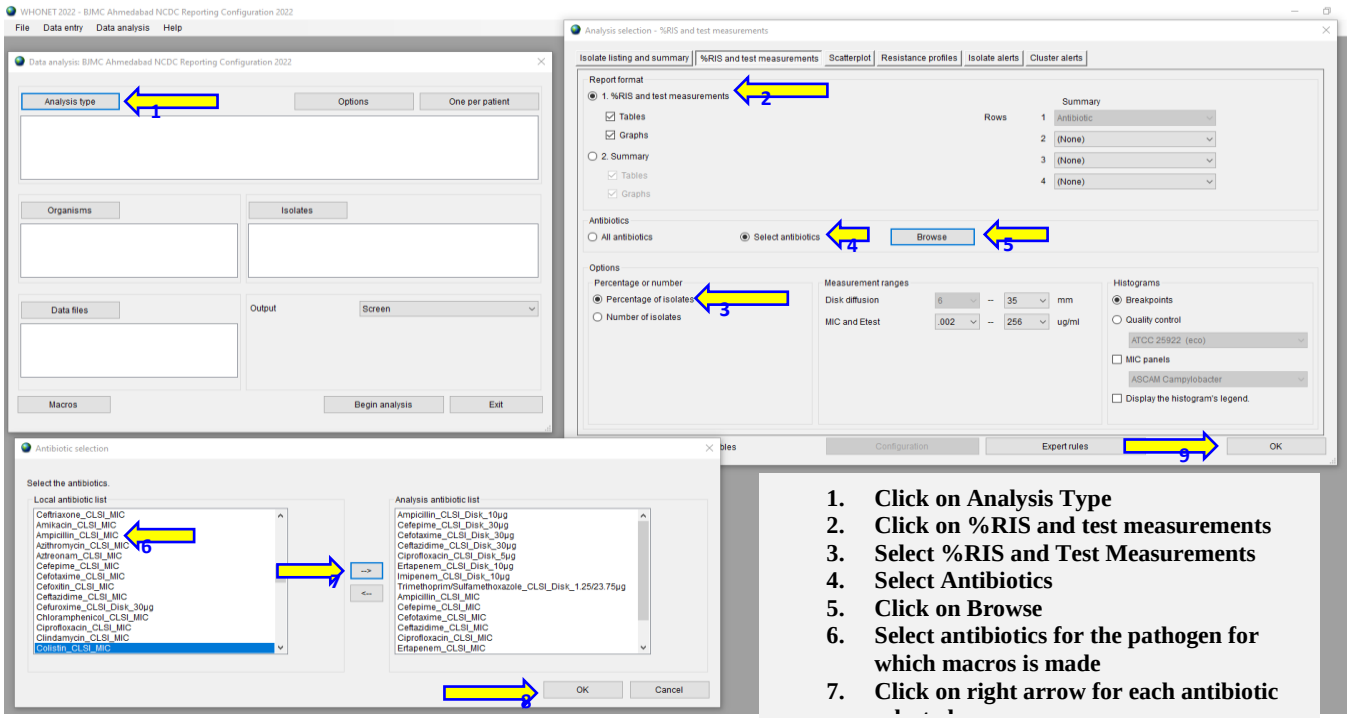

Once all the options for analysis type, organism and analysis options have opted on the data analysis screen, click on macros and save selected options as macros.

You may create macros for each priority pathogen for each specimen type that can be made once, and every month/ quarter/ Annually, AMR data can be checked using the exact macros.

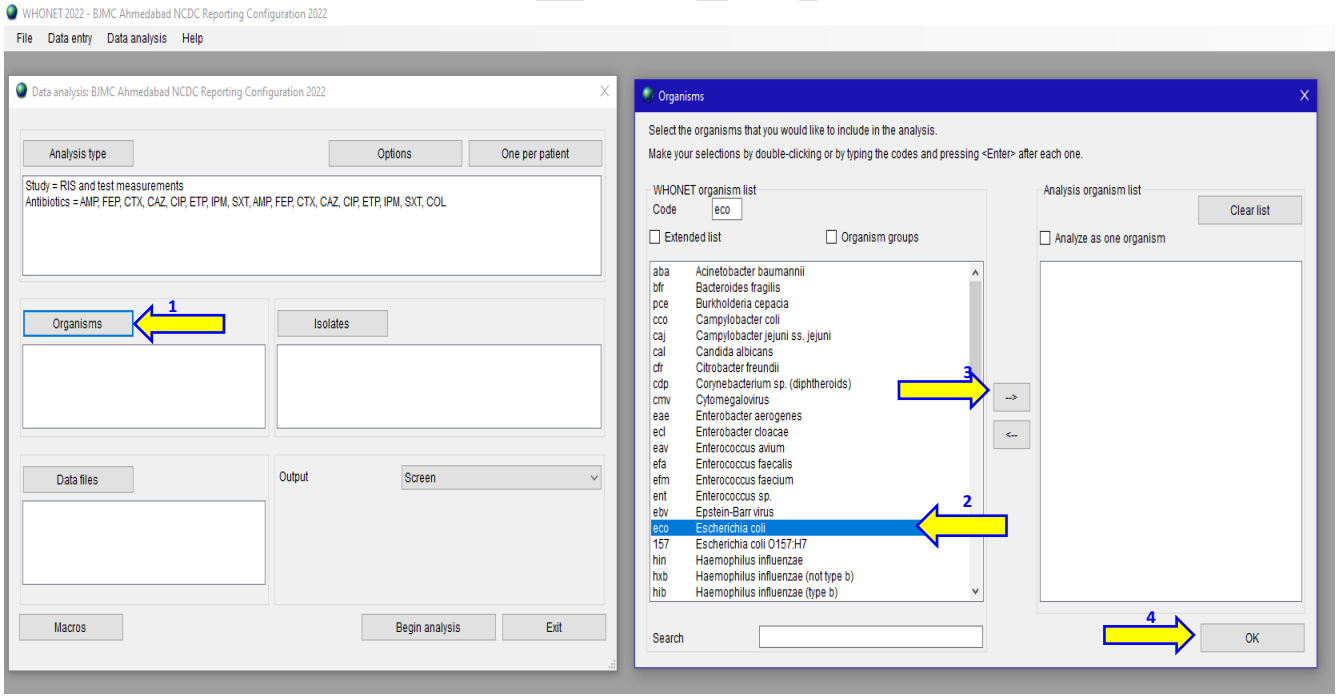
For example, AST macros for *E. coli* blood isolates can be created as follows.

1. **Step a): Click on "Analysis type" and select option %RIS and test measurements, select "%RIS and test measurements" and click on "select antibiotics", and browse antibiotics for *E. coli* (here antibiotics are selected which are in the AMR Surveillance panel for *E. coli* but each site can choose the number of antibiotics as per the local use.**

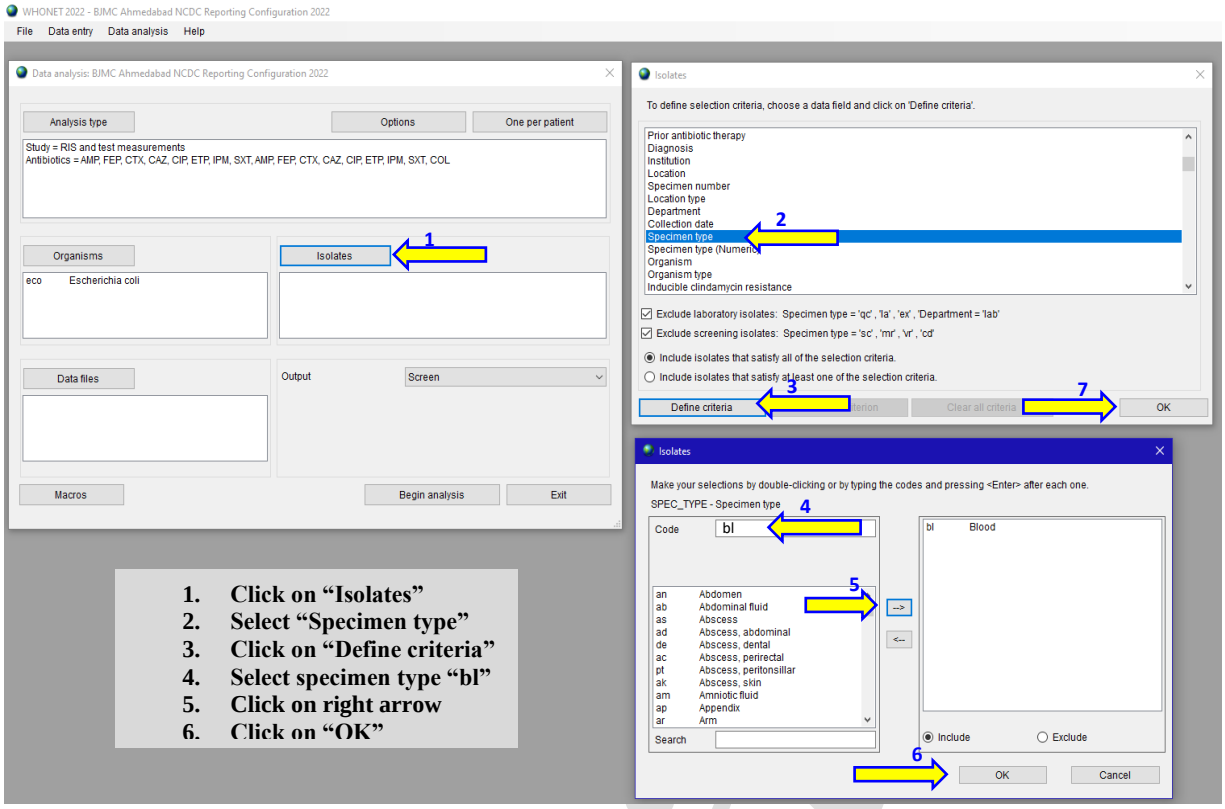
- **A new window opens with the option to make new macros. Click on "new."**
- **Another window will be opened that asks you to name this macro. Give "AMR Surveillance Reporting" and click on "save".**
- **Select "percentage of isolates" and click on "OK" in the options**




Step b): Click on "organisms to select the priority pathogen for which the macros are required. Select the specific pathogen and click on the right arrow. Click "OK"

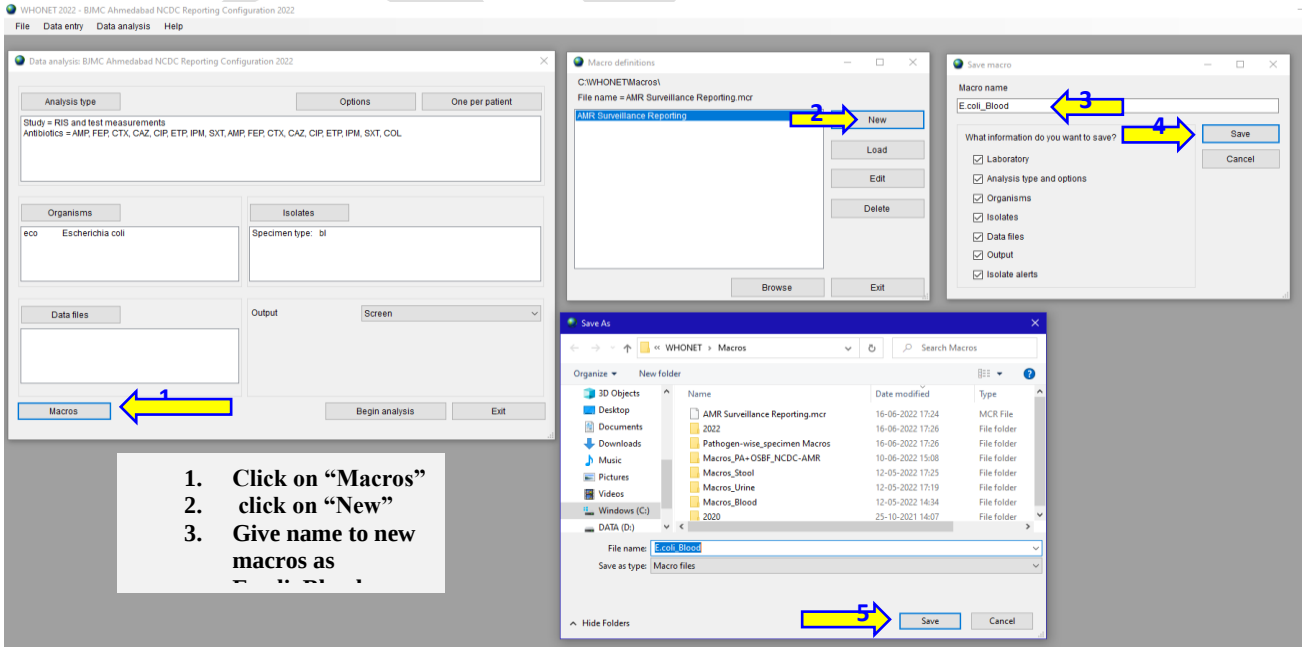


Step c): Click on "Isolates", and another window will be displayed. Scroll down and select "specimen type", and click on "define criteria" in the bottom left corner of this window. Now another window will pop up and search for the specimen to be analyzed; for example, select blood, click on the right arrow, click "OK", and again click "OK".




Step d): Now, to save this macro, click on macros.

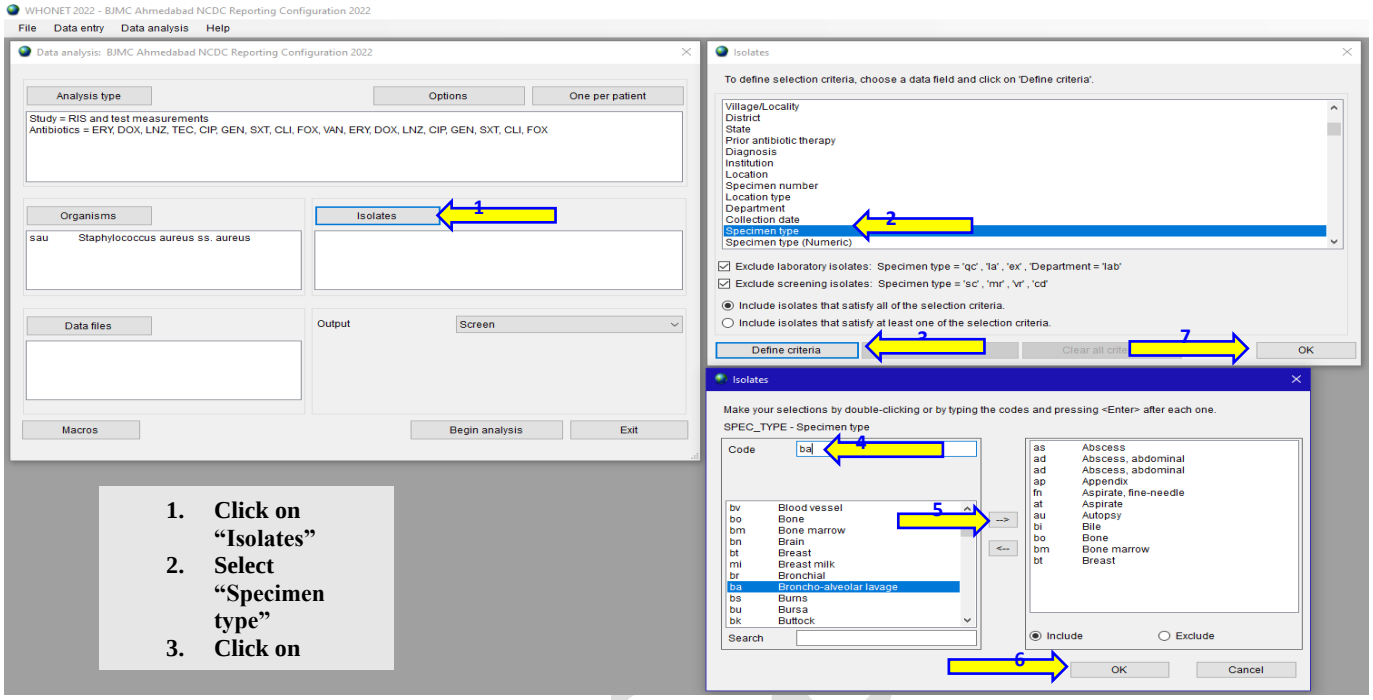
Step e): A new window is opened; click on "new", and another window will be displayed. Label your new macro, e.g. viz.: *E. coli* blood and click on save. Click on "save", and the newly created macros are saved in a macro folder which is inside the WHONET folder in C drive.

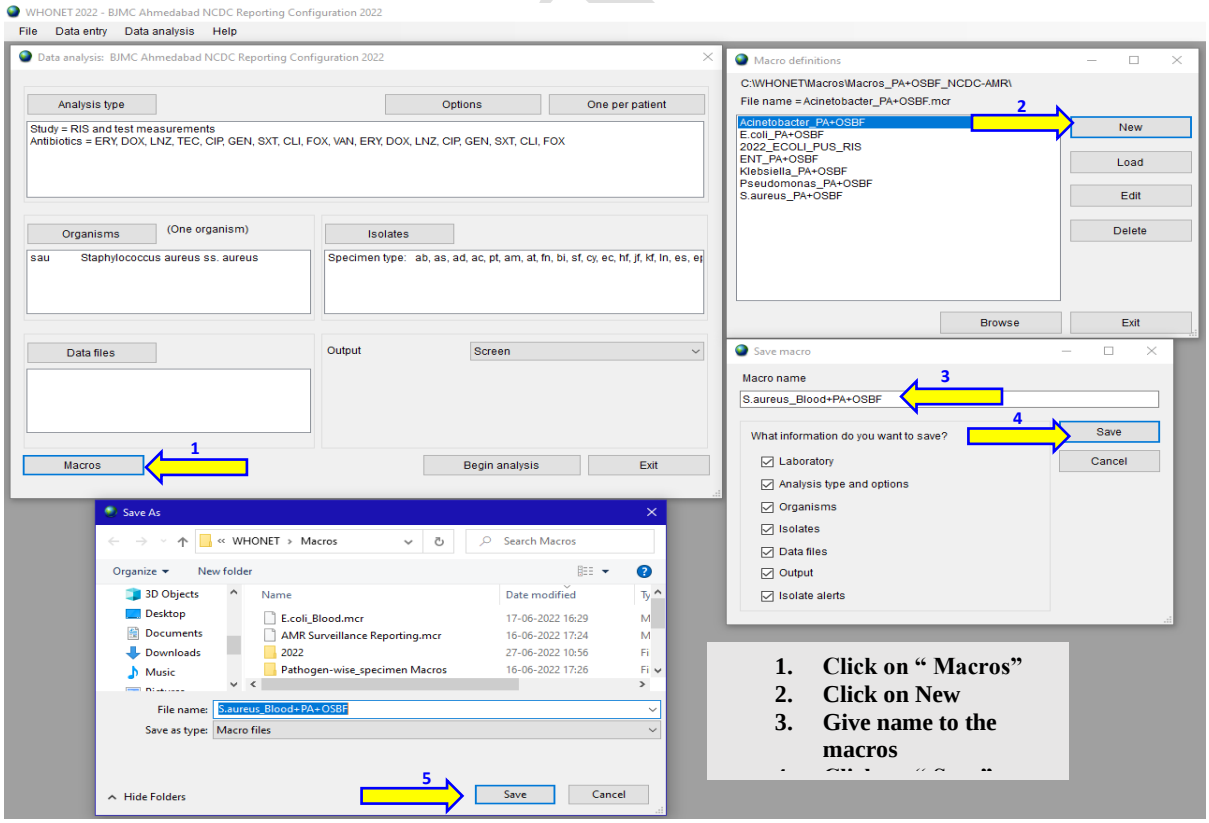



This newly created macros can be used quarterly to check the AST profile data for *E. coli* blood isolates; for this, follow the steps as follows:

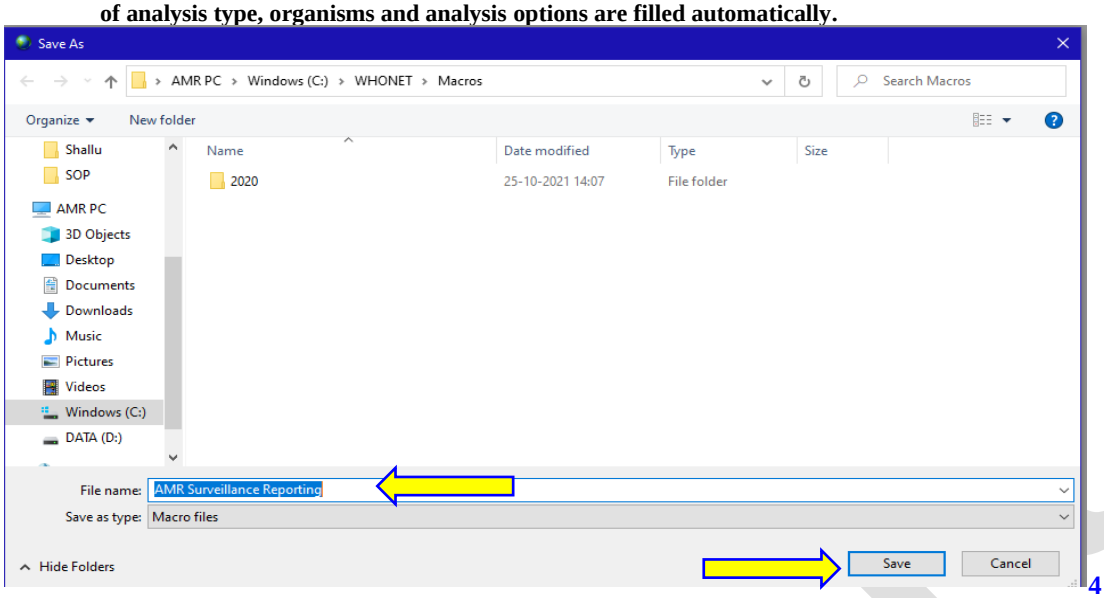
Step a): Click on macros, another window is opened and click on load and select the already created and saved macros; after loading this macro, all the prefilled information is seen, and every Quarter, the only data file is selected and analyzed.

Similarly, macros for all the priority pathogens with different specimen types are created and saved in the WHONET C drive macros folder.

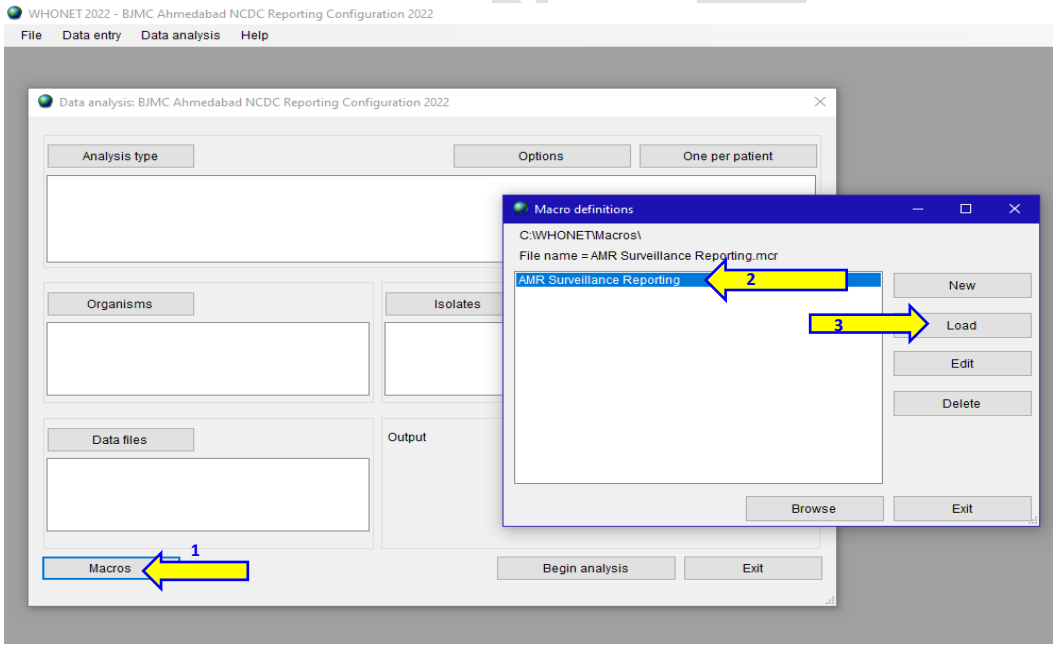


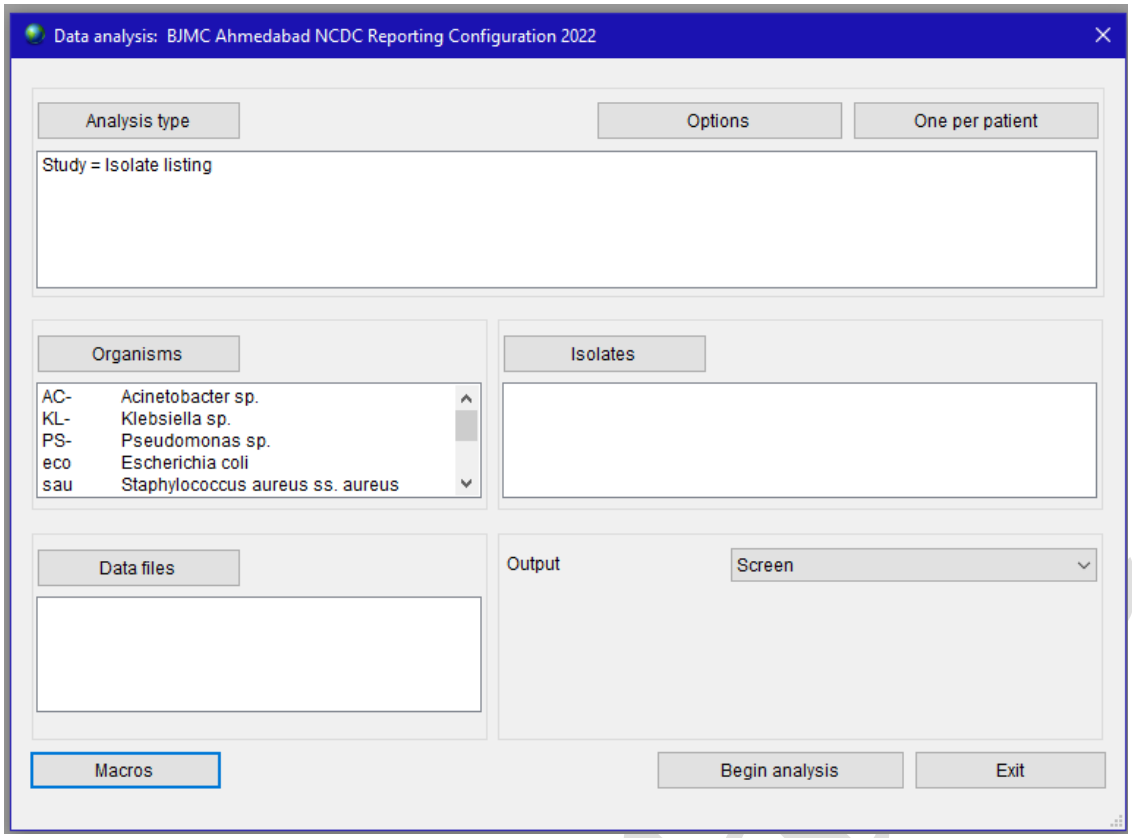



2. **A new window opens, and the newly created macros get saved in the macros folder of the WHONET folder in "C" drive by default.**
3. **Every Quarter while exporting WHONET data to NCDC, select this macro, avoiding steps 2 to 6. All the options of analysis type, organisms and analysis options are filled automatically.**

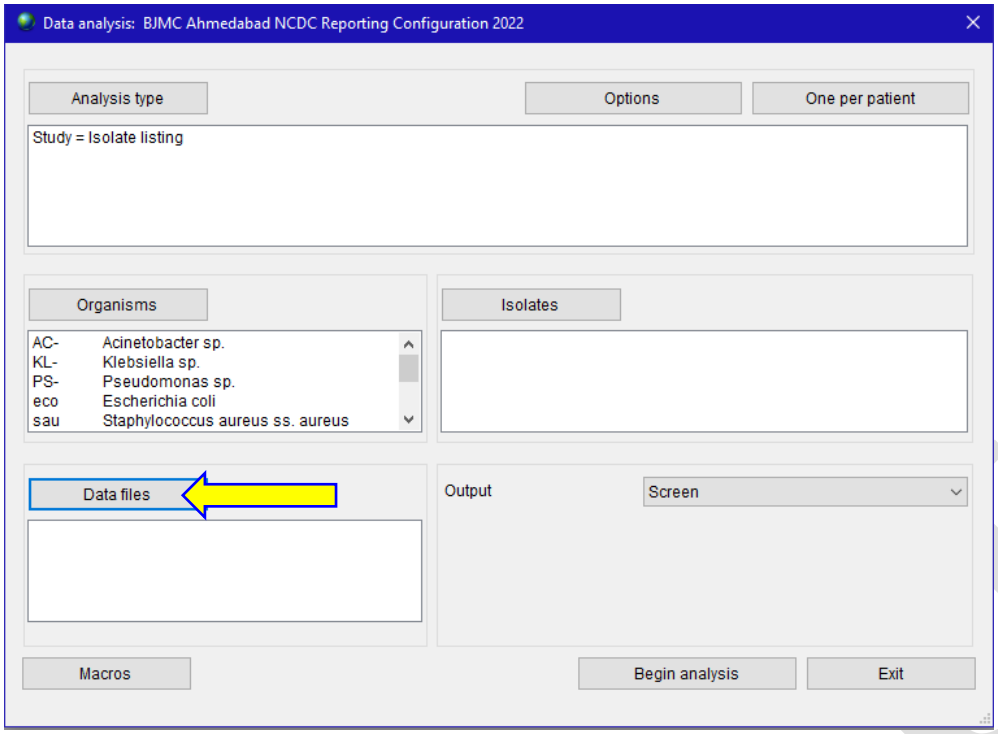



4. **To load the already created and saved macros, click on macros.**
5. **A new window is opened, which shows you the earlier created macros in the C drive WHONET macros folder. Click on "Load".**
6. **The main screen with prefilled information appears, then move on to step 7 for selecting the data file to be submitted.**
7.

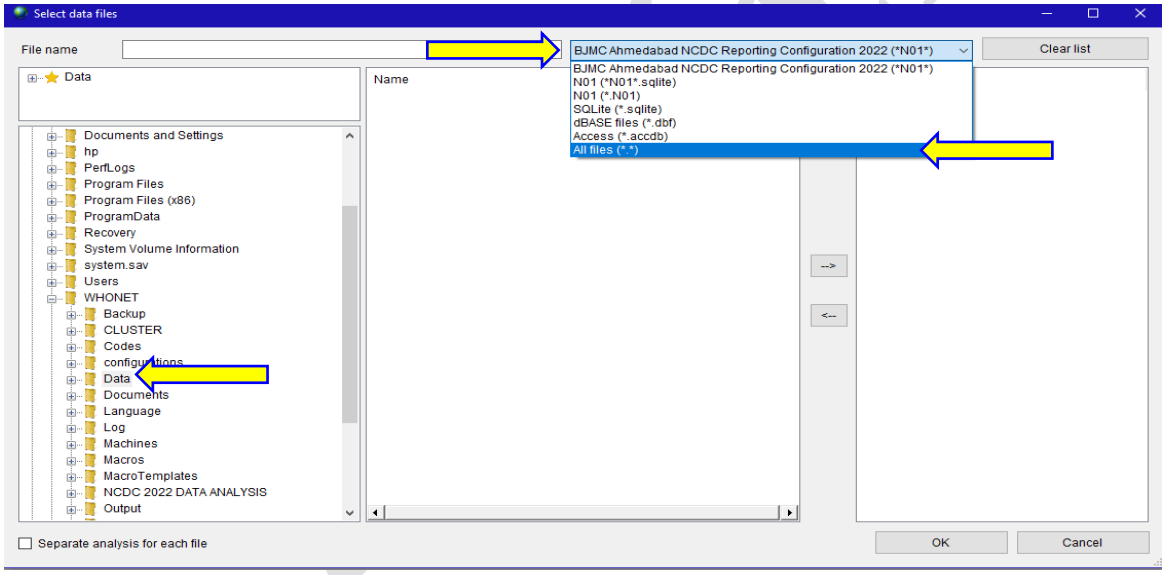





Step 7: Selecting data file: Click on the data file tab below.

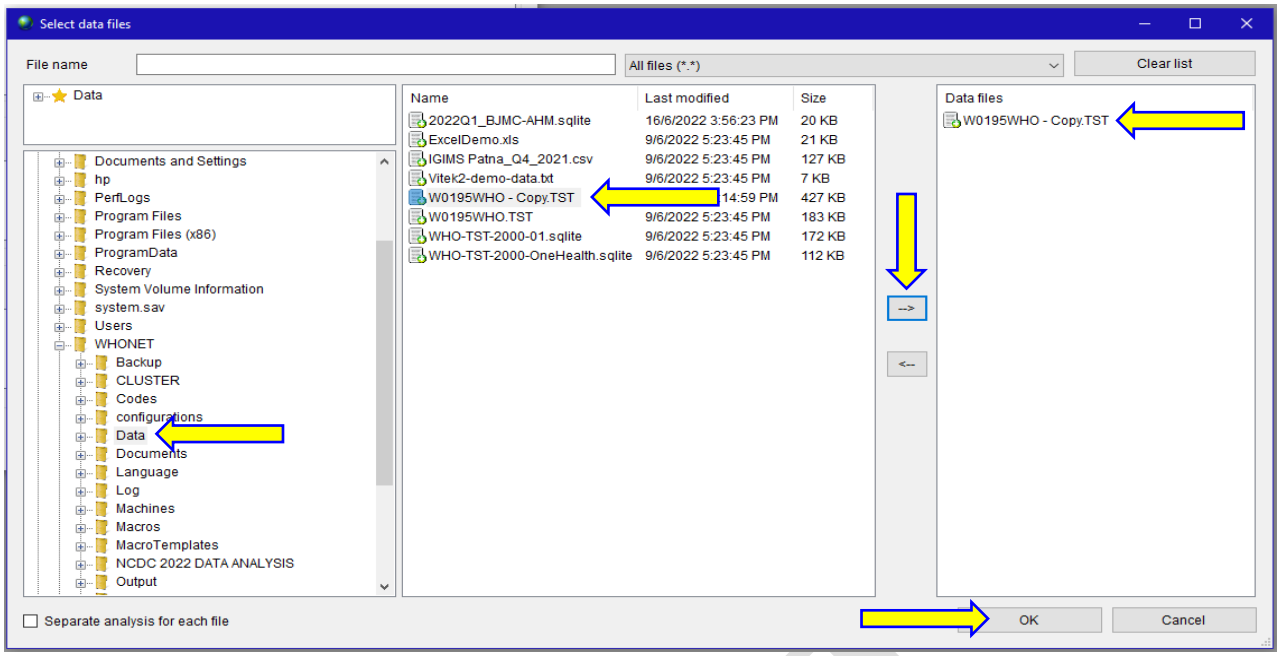



Please select the data file. Click on the drop-down menu for "Files of type", as shown below.

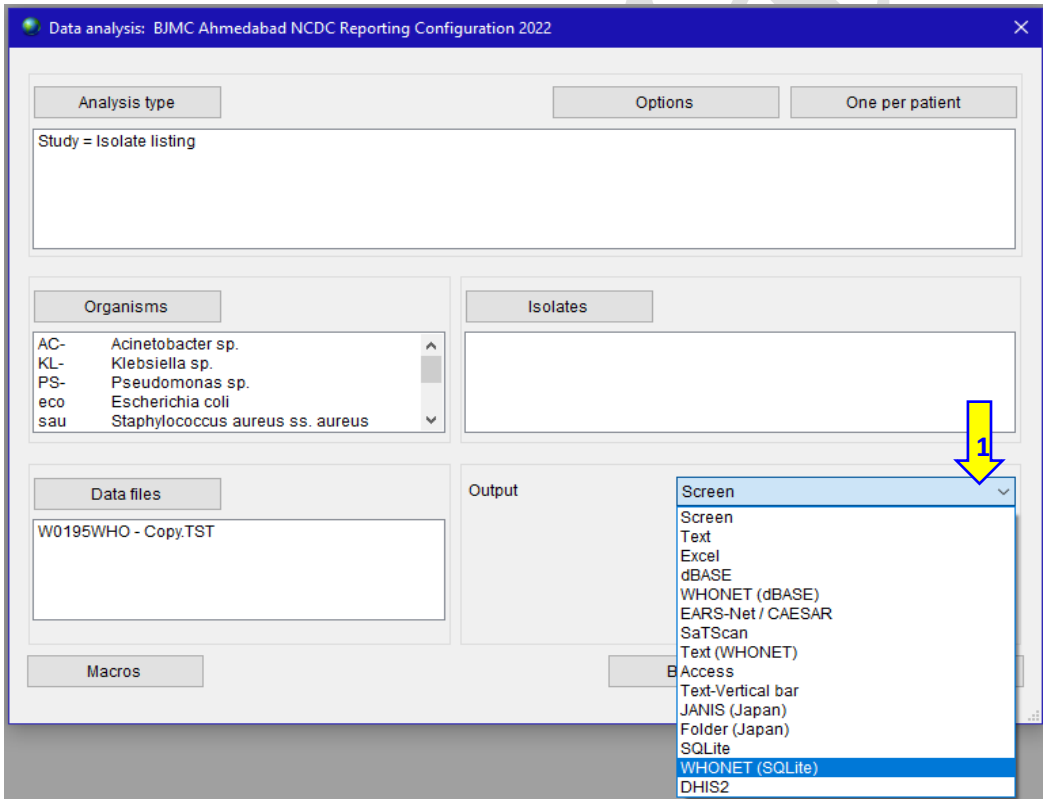



Step 8: Select "All files" from the "Files of type" drop-down menu. This would populate all the data files in the Data folder. Select the file's name created in the duplication step (see page 5). Then click on the Right Arrow in the middle portion of the window to bring the file's name to the right window panel labelled "Files for data analysis". Then click "OK".

NB: If you have multiple data files for one Quarter, you should select them, compile and send them to the right window panel.



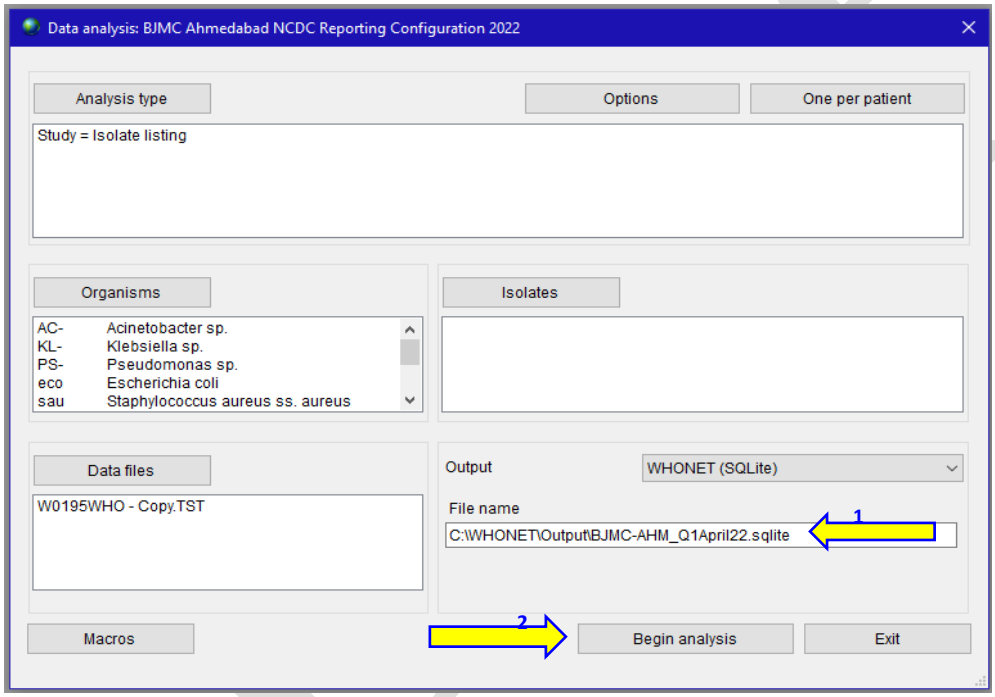

Step 9: In the drop-down menu to the right of the label "Output", select WHONET (SQLite) as the file format for exporting from WHONET.



After selecting "WHONET (SQLite)" next to "Output", enter the file name as **YYYY QD XXXXXX**

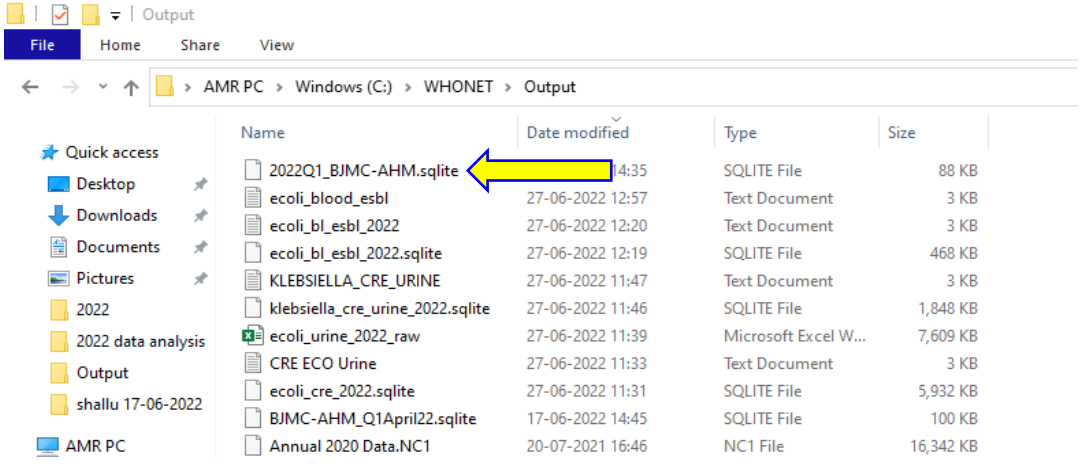
**YYYY** denotes reporting year (e.g., 2021, 2022)
**QD** denotes Quarter of reporting (e.g., Q1, Q2, Q3, Q4)
**XXXXXXX** denotes **lab code** (This is code corresponding to your lab in WHONET. We have populated new lab codes with a maximum of 10 letters specific for each network laboratories in column 2 of Annexure 1)
The extension of the file name with 3 letter AMR network lab code (refer to column 5 of Annexure 1) will be auto generated and stored in WHONET Output folder in "C" drive.

The example below demonstrates how BJ Medical College Ahmedabad would export data representing Quarter 1 of 2022 reported in April. You would be giving a file name "2022Q1_BJMC-AHM", as mentioned below




Once the "Filename" is entered, click "Begin analysis".

Click on exit once the analysis is completed. You can locate this exported data file with the name 2022Q1_BJMC-AHM.sqlite inside the "Output" folder of WHONET in the "C" drive. Please do not try to open this file from the "C" drive using any other application on your computer; This file must be read-only using WHONET software.



# How to Send the Modified WHONET 2022 Files to NCDC

Please follow the steps below to send the data files to NCDC from the WHONET folder.

Step 1: Right-click on the exported file from the WHONET "Output" folder in the "C "drive and click on "send to" compressed  Zip folder

Step 2: Rename this zipped folder as YYYY Q1 X**XXX-XXXX**

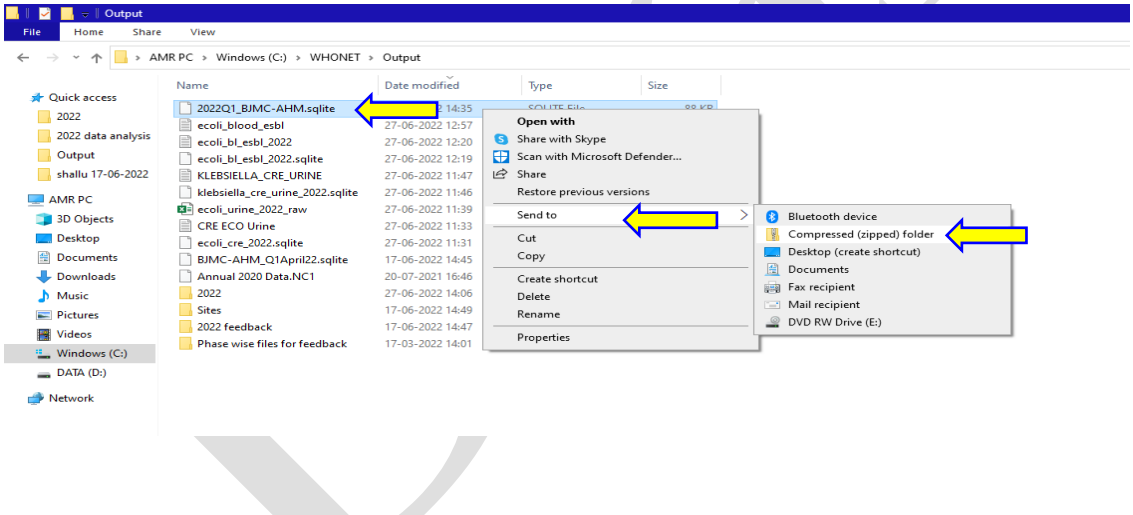
**YYYY** denotes reporting year (e.g., 2021, 2022)

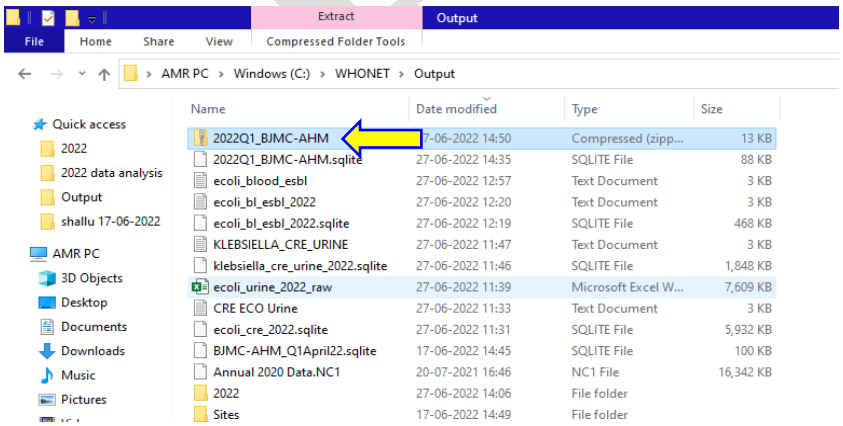
**QD** denotes Quarter of reporting (e.g., Q1, Q2, Q3, Q4)
**XXXX-XXXX** denotes 6-7 letter **lab code** (This is code corresponding to your lab in WHONET. We have populated new lab codes maximum of 10 letter for network laboratories in column 2 of Annexure 1)

In the following example, the name of the folder corresponds to the following details:

**2022**: Year 2021
**Q1**: Quarter 1 report
**BJMC-AHM**: BJ Medical College Ahmedabad

Please see the BJMC Ahmedabad AMR data file below.



Step 3: Email this zip file to amrsurveillance@gmail.com

If you have any queries regarding saving the file or need further assistance, please contact:

| Name | Designation | Email | Phone |
|---|---|---|---|
| **Dr Lata Kapoor** | Joint Director, NCDC | latakapoor@yahoo.co.in | 9811214482 |
| **Dr A.S. Valan** | Public Health Specialist, CDC India | ntq0@cdc.gov | 9205786734 |
| **Dr Shallu Kathuria** | ECHO (AMR) Project Manager, ASM | amrsurveillance@gmail.com | 8860915305 |

# VIII. Annexures:

## 1. Unique laboratory codes for WHONET data reporting

| Sl No | Current Lab Code | State | NCDC AMR Network Laboratory | Lab code for NCDC Reporting |
|---|---|---|---|---|
| 1 | **BJMC-AHM** | Gujarat | BJ Medical College, Ahmedabad | **N01** |
| 2 | **BJMC-PUNE** | Maharashtra | BJ Medical College, Pune | **N02** |
| 3 | **GMCH-CHG** | Chandigarh | Govt. Medical College, Chandigarh | **N03** |
| 4 | **GSVM-KAN** | Uttar Pradesh | Ganesh Shankar Vidyarthi Memorial Medical College, Kanpur | **N04** |
| 5 | **LHMC-DEL** | Delhi | Lady Hardinge Medical College, New Delhi | **N05** |
| 6 | **MMCRI-MYSR** | Karnataka | Mysore Medical College and Research Institute, Mysore | **N06** |
| 7 | **SMS-JAIPUR** | Rajasthan | Sawai Man Singh Medical College  Medical College, Jaipur | **N07** |
| 8 | **SAFDAR-DEL** | Delhi | VMMC, Safdarjung Hospital, New Delhi | **N08** |
| 9 | **GMC-TRV** | Kerala | Government Medical College, Trivandrum | **N09** |
| 10 | **KAPV-TRY** | Tamil Nadu | KAPV Government Medical College, Tiruchirappalli | **N10** |
| 11 | **GMC-GAUHAT** | Assam | Gauhati Medical College and Hospital, Guwahati | **N11** |
| 12 | **NIEGRIHMS** | Meghalaya | North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIMS), Shillong | **N12** |
| 13 | **MGMMC-INDO** | Madhya Pradesh | Mahatma Gandhi Memorial Medical College, Indore | **N13** |
| 14 | **IGMC-SHIML** | Himachal Pradesh | Indira Gandhi Medical College (IGMC), Shimla | **N14** |
| 15 | **GMC-AUG** | Maharashtra | GMC, Aurangabad, Panchakki Road, near Jubli Park Chowk, Aurangabad | **N15** |
| 16 | **OSMC-HYD** | Telengana | Osmania Medical College 5-1-890, Turrezbaz Khan Road, Koti, Hyderabad | **N16** |
| 17 | **GMC-GUNT** | Andhra Pradesh | Guntur Medical College, Guntur | **N17** |
| 18 | **AGMC-AGA** | Tripura | AGMC & GBP Hospital, P.O. Kunjauan, Agartala, Tripura (West) | **N18** |
| 19 | **SCBMC-CUT** | Odisha | SCB Medical College, Mangalabag, Cuttack, Odisha | **N19** |
| 20 | **GMCH-JMU** | Jammu & Kashmir | Government Medical College and Hospital, Department of Microbiology, Bakshi Nagar, Jammu | **N20** |

| | | | | |
|---|---|---|---|---|
| 21 | **BDSPGI-RTK** | Haryana | Pt. BDS Post Graduate Institute of Medical Sciences, Rohtak | **N21** |
| 22 | **RIMS-RAN** | Jharkhand | Rajendra Institute of Medical Sciences, Ranchi | **N22** |
| 23 | **IGIMS-PATN** | Bihar | Indira Gandhi Institute of Medical Science, Patna | **N23** |
| 24 | **GMCH-HALDW** | Uttarakhand | Govt. Medical College, Haldwani | **N24** |
| 25 | **JLNMC-CHAT** | Chhattisgarh | Pt. Jawahar Lal Nehru Medical College, Raipur | **N25** |
| 26 | **GMC-BHOPAL** | Madhya Pradesh | Gandhi Medical College, Bhopal | **N26** |
| 27 | **STM-KOLKTA** | West Bengal | Calcutta School of Tropical Medicine, Kolkata | **N27** |
| 28 | **GMERS-VALS** | Gujarat | GMERS Medical College and Hospital, Valsad | **N28** |
| 29 | **LLRM-MERIT** | Uttar Pradesh | Lala Lajpat Rai Memorial Medical College, Merrut | **N29** |
| 30 | **CMC-COIMB** | Tamil Nadu | Coimbatore Medical College, Coimbatore | **N30** |
| 31 | **MAMC-DEL** | Delhi | Maulana Azad Medical College, New Delhi | **N31** |
| 32 | **SPMCH-BIK** | Rajasthan | Sardar Patel Medical College & Hospital, Bikaner | **N32** |
| 33 | **KIMS-HUBLI** | Karnataka | Karnataka Institute of Medical Sciences, Hubli, Karnataka | **N33** |
| 34 | **IGMRI-PUDU** | Puducherry | Indira Gandhi Medical College & Research Institute, Puducherry | **N34** |
| 35 | **NAMO-SILVA** | Daman & Diu | NAMO Meri Silvassa, Daman & Diu | **N35** |
| 36 | **GMC-GOA** | Goa | Goa Medical College, Bambolim | **N36** |
| 37 | **STNM** | SIKKIM | Sir Thutob Namgiyal Memorial Hospital (STNM), Sikkim | **N37** |

## 2. List of priority pathogen codes for data entry in WHONET

| Priority Pathogen | WHONET code |
|---|---|
| *Enterococcus* species | ENT |
| *Staphylococcus aureus* | sau |
| *Escherichia coli* | eco |
| *Klebsiella* species | KL- |
| *Acinetobacter* species | AC- |
| *Pseudomonas* species | PS- |
| *Salmonella enterica Serotype Typhi* | sat |
| *Salmonella enterica Serotype Paratyphi* | pty |

## 2a. Priority pathogens; extended list of common species isolated

| Priority Pathogen | WHONET code |
|---|---|
| *Enterococcus faecalis* | efa |
| *Enterococcus faecium* | efm |
| *Enterococcus gallinarum* | ega |
| *Acinetobacter baumannii* | aba |
| *Acinetobacter calcoaceticus* | aca |
| *Acinetobacter calcoaceticus-baumannii complex* | abx |
| *Klebsiella pneumoniae* | kpn |
| *Klebsiella oxytoca* | kox |
| *Klebsiella rhinoscleromatis* | krn |
| *Pseudomonas* aeruginosa | pae |
| *Salmonella Paratyphi A* | saa |
| *Salmonella Paratyphi B* | sab |

## 3. Antibiotic codes for surveillance data entry in WHONET

| Antibiotic name with Disk Concentration | WHONET 2022 Data Entry code | Measurement |
|---|---|---|
| *Amikacin 30 µg* | **AMK** | Disk/ MIC |
| *Amoxicillin-clavulanate 20/10 µg* | **AMC** | Disk/ MIC |
| *Ampicillin 10 µg* | **AMP** | Disk/ MIC |
| *Ampicillin Sulbactam 10/10 µg* | **SAM** | Disk/ MIC |
| *Azithromycin 15 µg* | **AZM** | Disk/ MIC |
| *Aztreonam 30 µg* | **ATM** | Disk/ MIC |
| *Cefepime 30 µg* | **FEP** | Disk/ MIC |
| *Cefixime 5 µg* | **CFM** | Disk/ MIC |
| *Cefotaxime 30 µg* | **CTX** | Disk/ MIC |
| *Cefoxitin 30 µg* | **FOX** | Disk/ MIC |
| *Ceftazidime 30 µg* | **CAZ** | Disk/ MIC |
| *Ceftriaxone 30 µg* | **CRO** | Disk/ MIC |
| *Cefuroxime 30 µg* | **CXM** | Disk/ MIC |
| *Chloramphenicol 30 µg* | **CHL** | Disk/ MIC |
| *Ciprofloxacin 5 µg* | **CIP** | Disk/ MIC |
| *Clindamycin 2 µg* | **CLI** | Disk/ MIC |
| *Colistin* | **COL** | MIC |
| *Doxycycline 30 µg* | **DOX** | Disk/ MIC |
| *Erythromycin 15µg* | **ERY** | Disk/ MIC |
| *Ertapenem 10 µg* | **ETP** | Disk/ MIC |
| *Gentamicin 10 µg* | **GEN** | Disk/ MIC |
| *Gentamicin High 120 µg* | **GEH** | Disk/ MIC |
| *Imipenem 10 µg* | **IMP** | Disk/ MIC |
| *Linezolid 30 µg* | **LNZ** | Disk/ MIC |
| *Meropenem 10 µg* | **MEM** | Disk/ MIC |
| *Minocycline 30 µg* | **MNO** | Disk/ MIC |
| *Netilmicin 30 µg* | **NET** | Disk/ MIC |
| *Nitrofurantoin 300 µg* | **NIT** | Disk/ MIC |
| *Pefloxacin 10 µg* | **PEF** | Disk/ MIC |
| *Penicillin 10 Units* | **PEN** | Disk/MIC |
| *Piperacillin/Tazobactum 100/10 µg* | **TZP** | Disk/ MIC |
| *Teicoplanin* | **TEC** | Disk/ MIC |
| *Tetracycline 30µg* | **TCY** | Disk/ MIC |
| *Tobramycin 10 µg* | **TOB** | Disk/ MIC |
| *Trimethoprim/ Sulfamethoxazole 1.25/23.75 µg* | **SXT** | Disk/ MIC |
| *Vancomycin 30µg* | **VAN** | Disk/ MIC |