# IR Mapper User Guide

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## *Anopheles* and *Aedes* IR Mapper platform

To launch IR Mapper, go to www.irmapper.com on your browser (Figure 1). Recommended browsers: Google Chrome, Firefox 28 and above, Internet Explorer 11 and above.

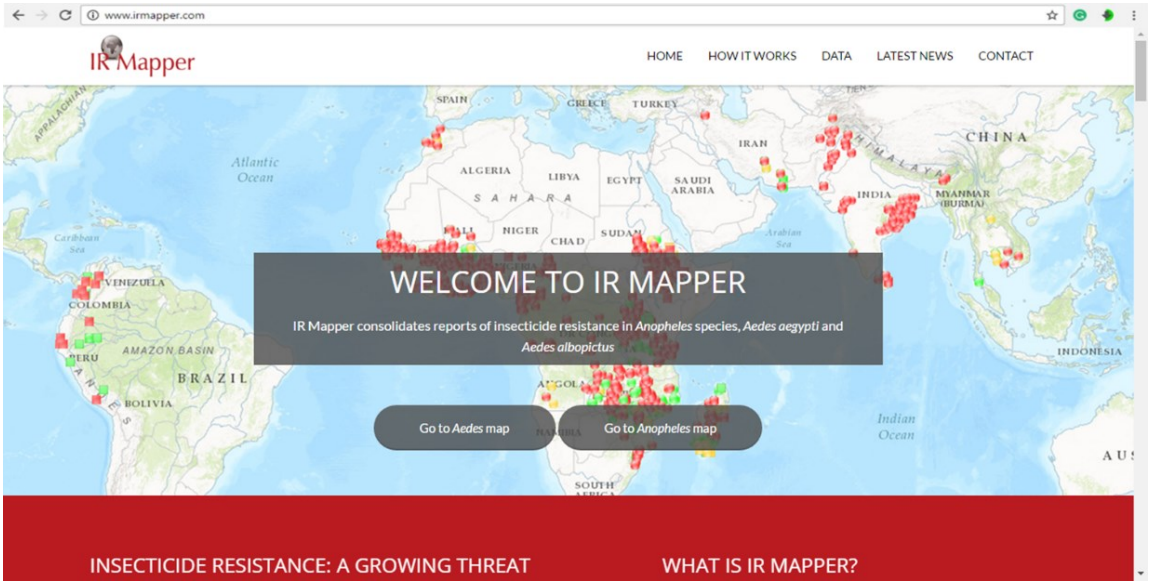



**Figure 1.** IR mapper homepage

You now have the choice of viewing the *Anopheles* or *Aedes* IR Mapper platform. To load the *Anopheles* mapping platform, click "Go to *Anopheles* map" (circled in yellow, Figure 2).

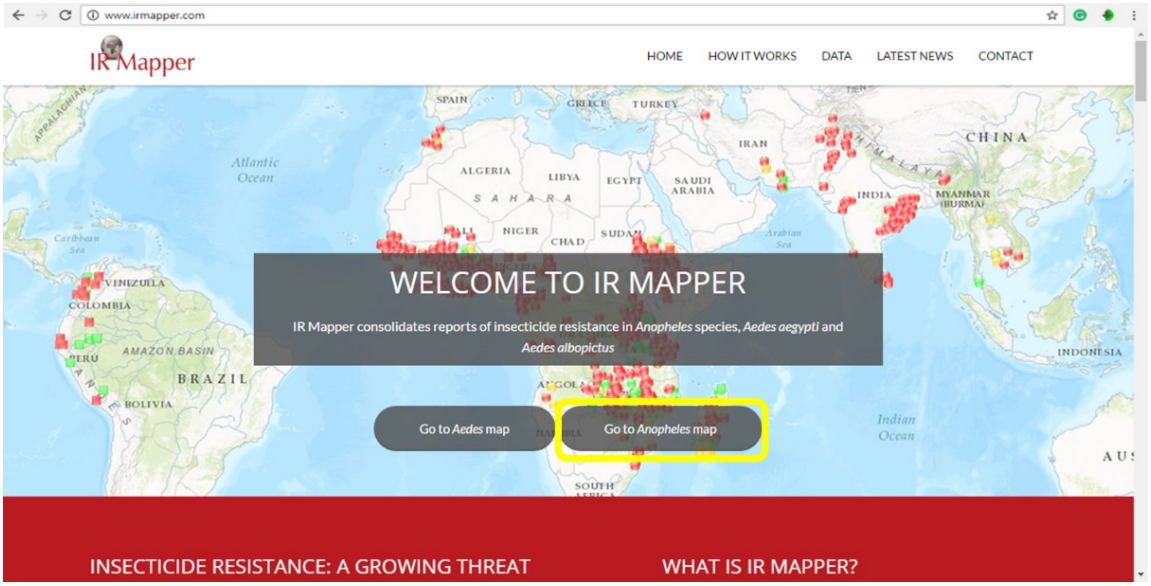



**Figure 2.** IR Mapper homepage "Go to *Anopheles* map"

Loading of the mapping platform may take a few minutes depending on your internet speed. The key features of IR Mapper include the legend and filter menu (Figure 3).

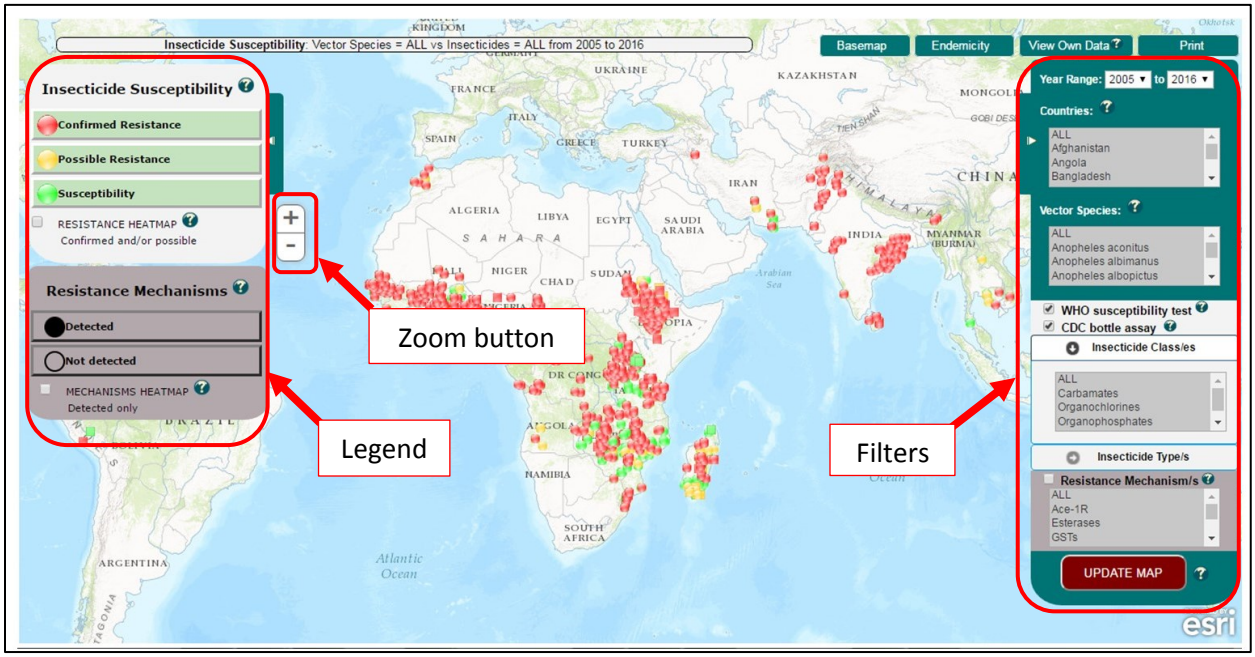
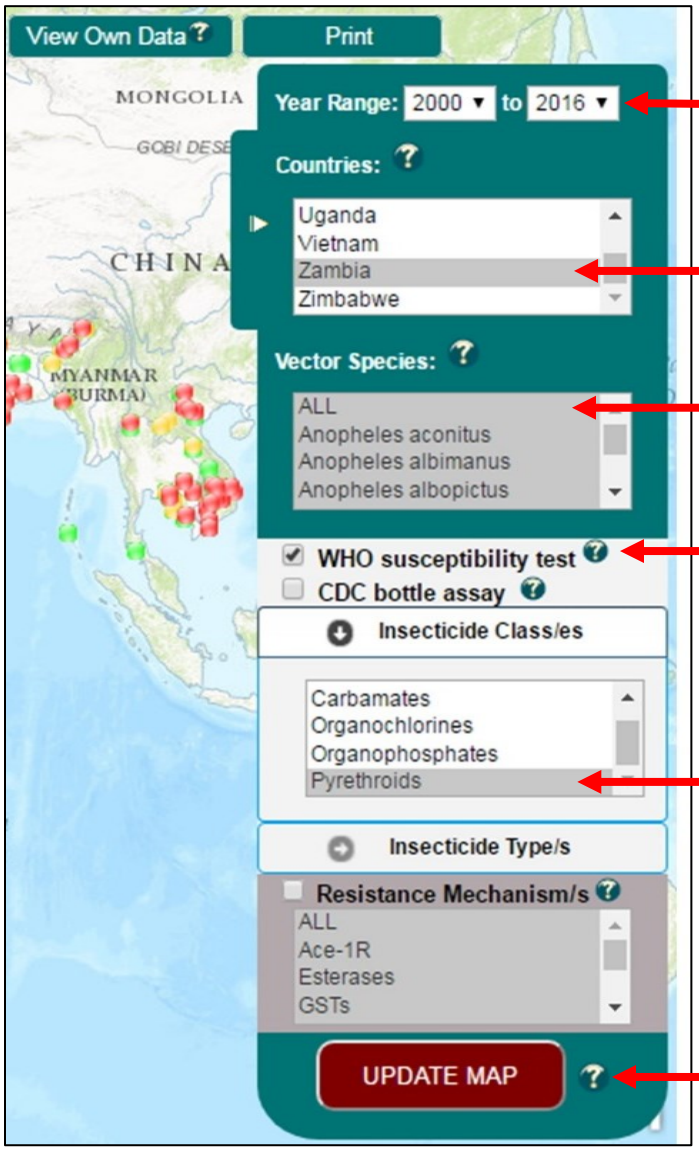



Figure 3. IR Mapper *Anopheles* mapping platform with the legend, zoom button and filter menu labelled

# Filtering insecticide resistance data

The filter menu on IR Mapper allows you to filter and view data by year, country, vector species, test method, insecticide class or type and/or insecticide resistance mechanisms.

For example, to view pyrethroid resistance data in *Anopheles* species within Zambia between 2000 and 2016 based on the WHO susceptibility test, follow steps 1 to 6 in Figure 4.




1. Select the year range 2000 to 2016 from the drop down menu
2. Under "countries" select "Zambia"
3. Under "vector species" select "All"
4. Select only WHO susceptibility test
5. Under "insecticide classes" select "Pyrethroids"
6. Click "update map" to load and view selected data on the map

Figure 4. IR Mapper data filtering steps

After step 6, data according to the filter criteria loads on the map (Figure 5a). To view reports of confirmed resistance only, click off 'susceptibility' and 'possible resistance' buttons (Figure 5b).

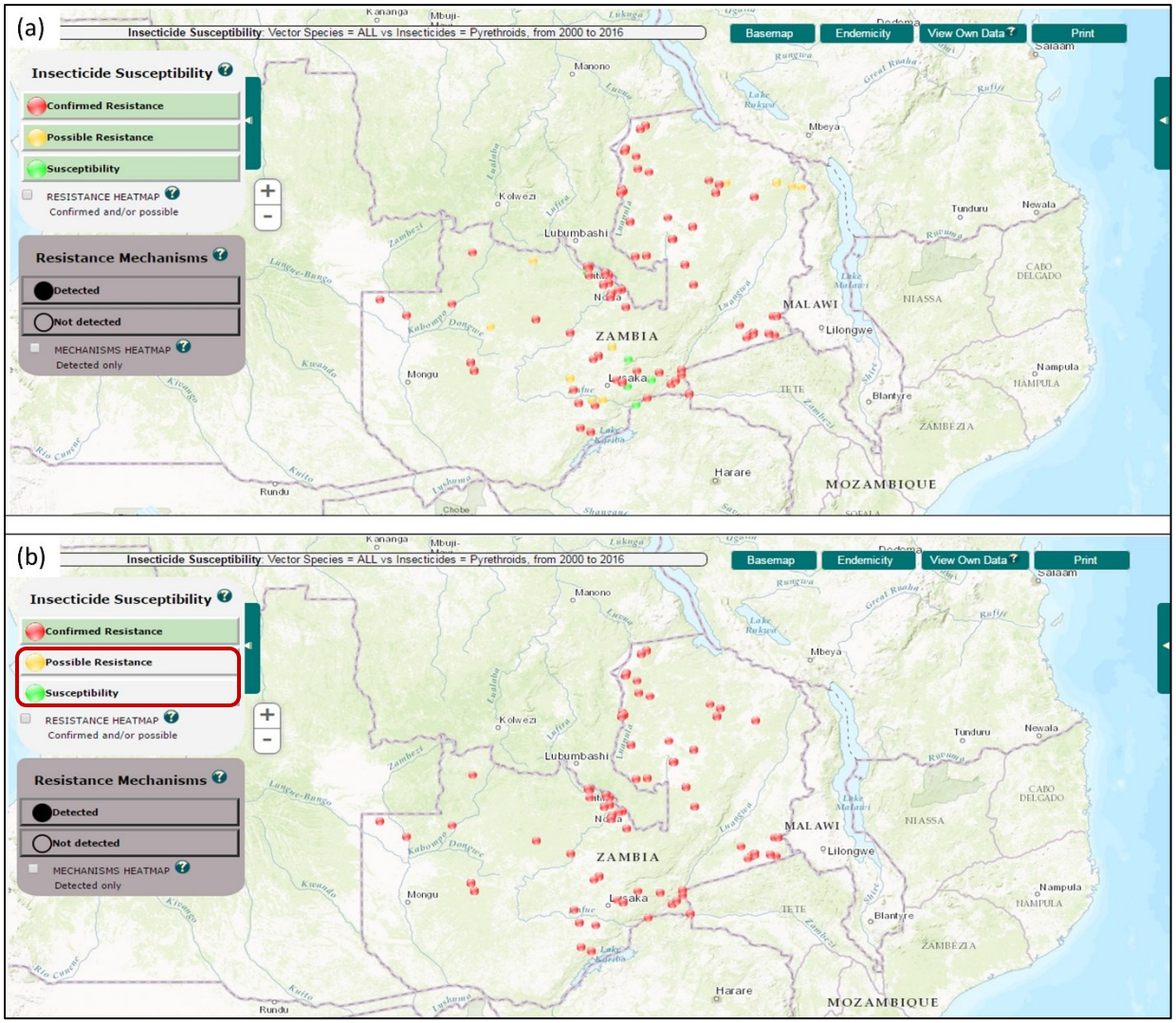



Figure 5. **(a)** Pyrethroid resistance in Zambia 2000 to 2016; **(b)** Reports of confirmed resistance only in Zambia 2000 to 2016

When you click on a data point, a box appears displaying the test details such as insecticide and mortality results (Figure 6). Clicking “Publication” under URL loads a separate window with the source publication.

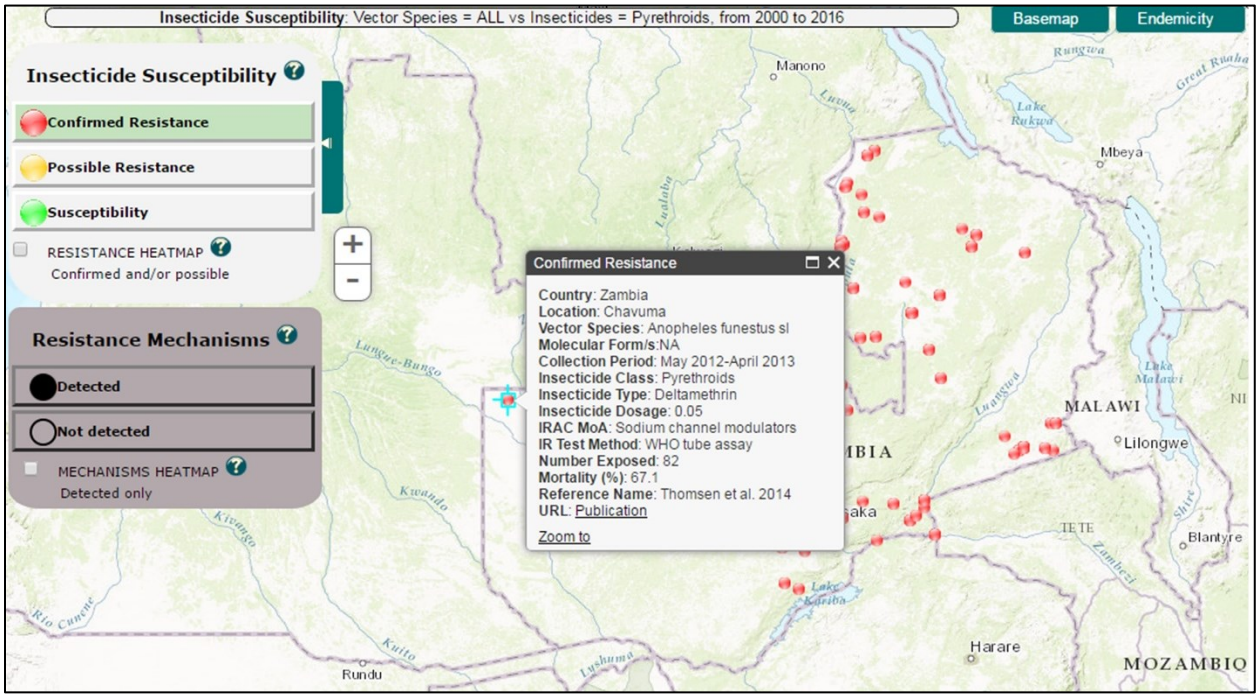



Figure 6. Test details of a data point displayed in a box

# Printing or saving maps

To print or save the map displayed, on the top left menu bar click “Print” (Figure 7a). The print screen appears and from here you can choose your printer by clicking “Change” under “Destination” or “Save as PDF” (Red circle, Figure 7).

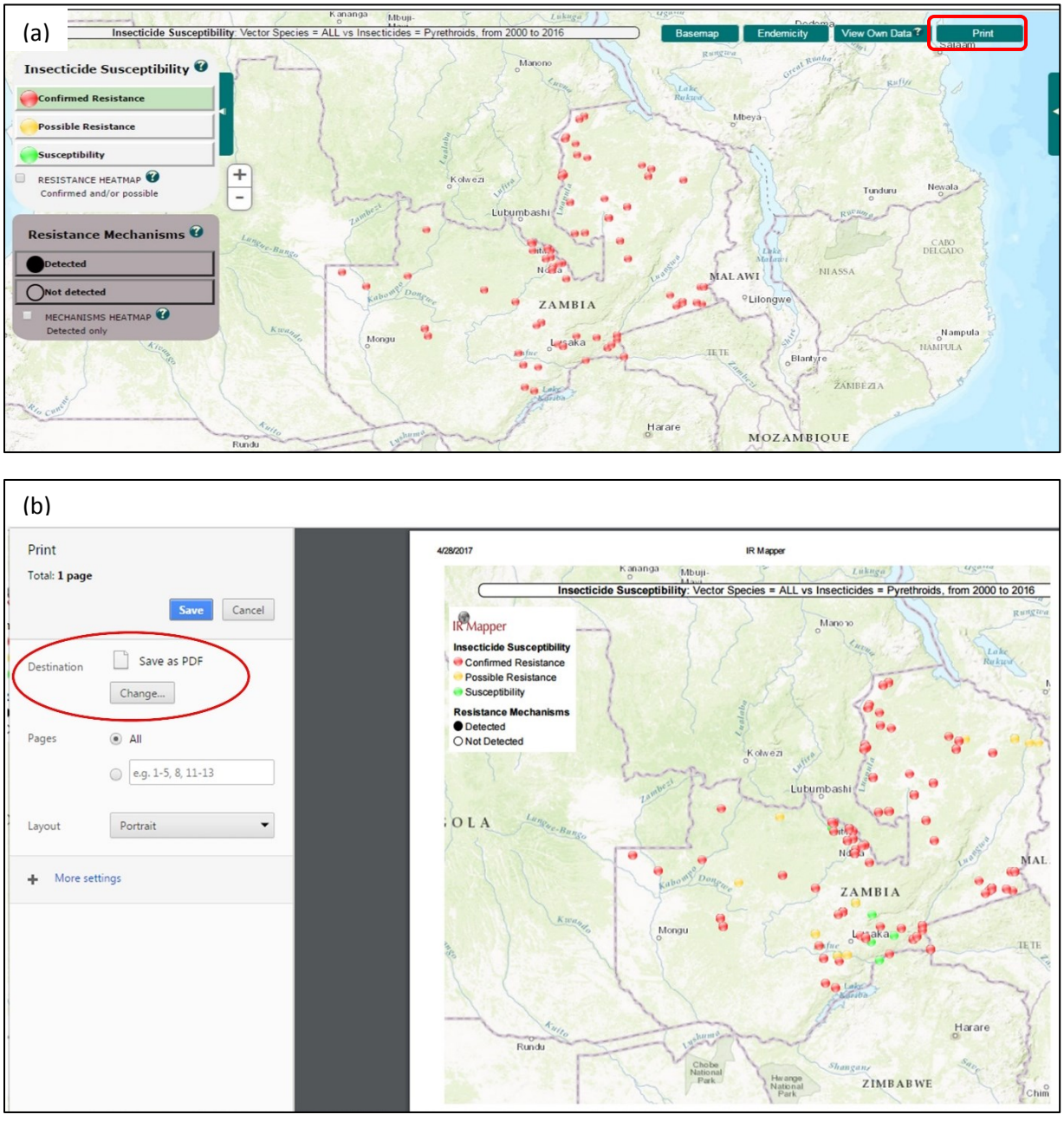



Figure 7 (a) & (b). Printing or saving maps

# Viewing insecticide resistance mechanisms

In addition to phenotypic data, IR Mapper can display insecticide resistance mechanisms data. For example, to view insecticide resistance mechanisms in *Anopheles* species in Zambia from 2000 to 2016, follow steps 1 to 7 in Figure 8.

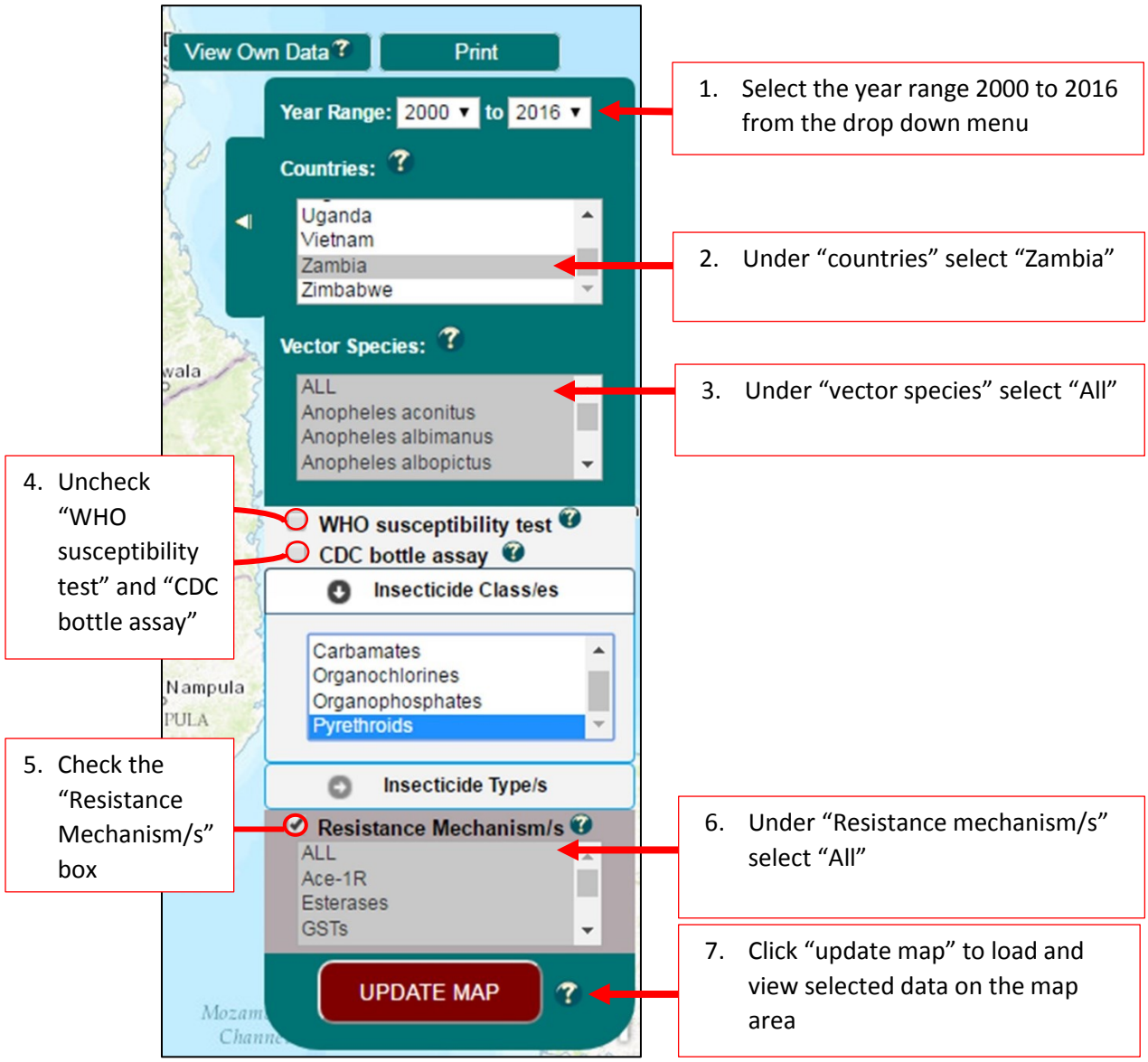



Figure 8. Steps to viewing insecticide resistance mechanisms

The filtered criteria displays on the map area (Figure 9a). To view only detected resistance mechanisms, click off 'undetected" (circled in red, Figure 9b).

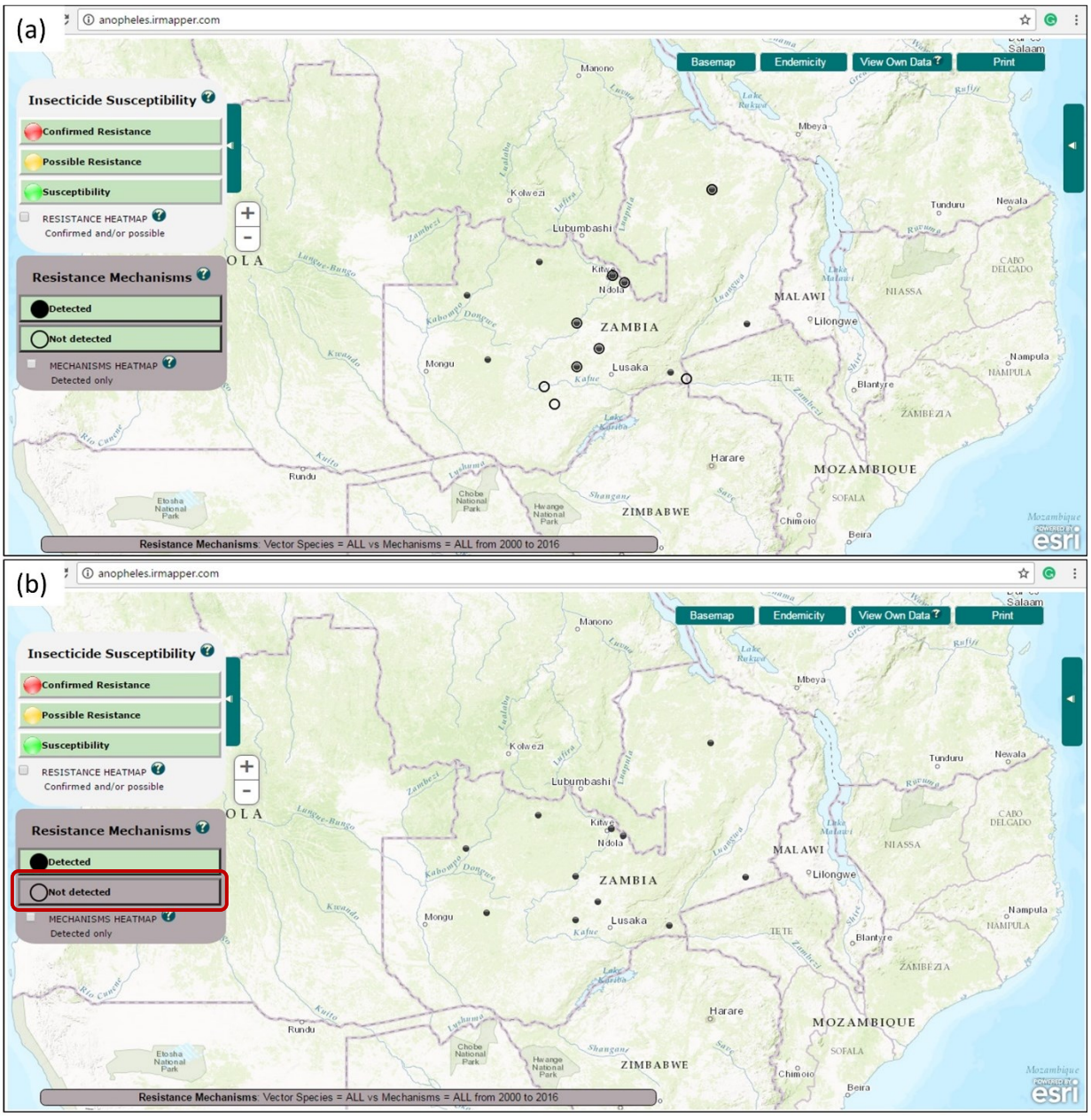



Figure 9. **(a)** Report of insecticide resistance mechanisms tested in Zambia 2000-2016 **(b)** Reports of detected resistance mechanisms in Zambia 2000-2016

# Viewing your own data on IR Mapper

IR Mapper has a feature that allows for viewing of your own data on the IR Mapper platform. For example, to view the example data from Nigeria in Table 1, follow steps I to IV.

Table 1: WHO susceptibility test results of *Anopheles gambiae s.l.* from various localities in Nigeria

| Locality | Latitude | Longitude | Insecticide | Dosage (%) | Number exposed | Mortality (%) |
|---|---|---|---|---|---|---|
| A | 10.889644 | 5.543014 | Permethrin | 0.075 | 100 | 40 |
| B | 9.050482 | 4.782643 | Permethrin | 0.075 | 100 | 20 |
| C | 8.394592 | 7.203559 | Deltamethrin | 0.05 | 100 | 95 |
| D | 7.353086 | 8.127291 | Permethrin | 0.075 | 100 | 40 |
| E | 12.143862 | 9.232383 | Deltamethrin | 0.05 | 100 | 100 |
| F | 7.778127 | 11.224061 | Deltamethrin | 0.05 | 100 | 94 |
| G | 4.803227 | 7.600404 | Deltamethrin | 0.05 | 100 | 70 |

Collections were made between July and September 2016

Step I. On the top left menu bar, click "View Own Data" (circled in red, Figure 10). From the drop down menu that appears, read the instructions and download the data template (Figure 10).

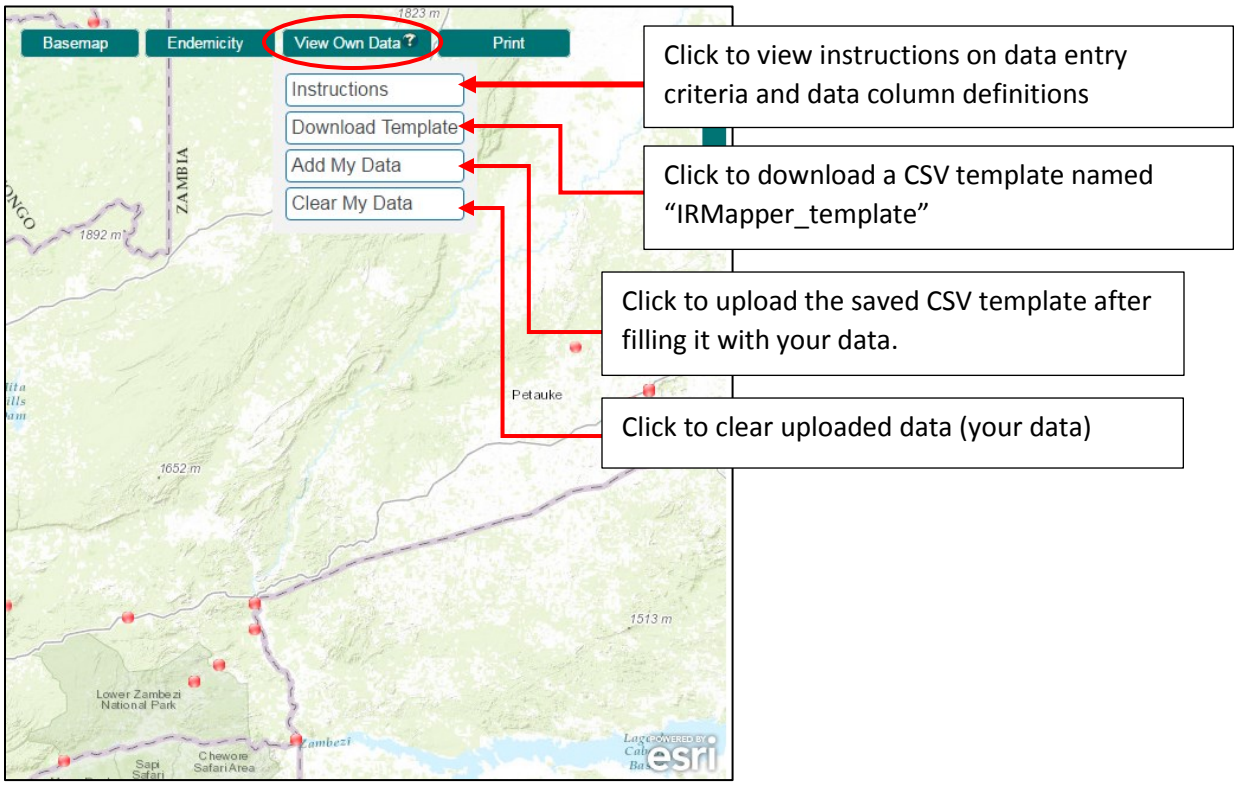
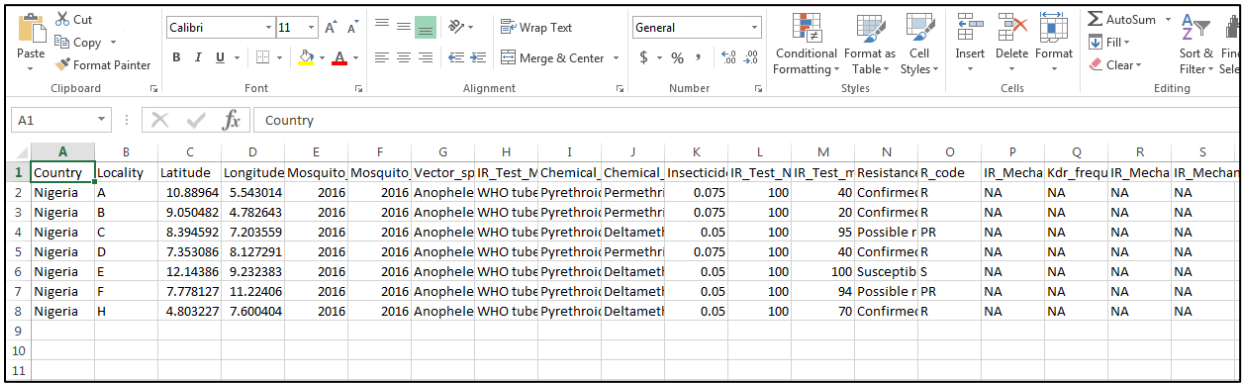



Figure 10. "View Own Data" menu

Step II. Following the instructions, fill the data into the appropriate columns in the template (Figure 11)



| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Country | Locality | Latitude | Longitude | Mosquito | Mosquito | Vector_sp | IR_Test_M | Chemical_ | Chemical_ | Insecticid | IR_Test_N | IR_Test_m | Resistanc | R_code | IR_Mecha | Kdr_frequ | IR_Mecha | IR_Mechan |
| 2 | Nigeria | A | 10.88964 | 5.543014 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Permethri | 0.075 | 100 | 40 | Confirme | R | NA | NA | NA | NA |
| 3 | Nigeria | B | 9.050482 | 4.782643 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Permethri | 0.075 | 100 | 20 | Confirme | R | NA | NA | NA | NA |
| 4 | Nigeria | C | 8.394592 | 7.203559 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Deltametl | 0.05 | 100 | 95 | Possible r | PR | NA | NA | NA | NA |
| 5 | Nigeria | D | 7.353086 | 8.127291 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Permethri | 0.075 | 100 | 40 | Confirme | R | NA | NA | NA | NA |
| 6 | Nigeria | E | 12.14386 | 9.232383 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Deltametl | 0.05 | 100 | 100 | Susceptib | S | NA | NA | NA | NA |
| 7 | Nigeria | F | 7.778127 | 11.22406 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Deltametl | 0.05 | 100 | 94 | Possible r | PR | NA | NA | NA | NA |
| 8 | Nigeria | H | 4.803227 | 7.600404 | 2016 | 2016 | Anophele | WHO tube | Pyrethroi | Deltametl | 0.05 | 100 | 70 | Confirme | R | NA | NA | NA | NA |
| 9 | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | |

**Figure 11.** IR Mapper template filled with exampled data from Nigeria

Step III. When ready, back in the "View Own Data" menu select "Add My Data" (Figure 10) to upload the saved template.

Step IV. The uploaded user data points appear as triangles alongside the existing IR Mapper data points. To view only the uploaded user data, click off IR Mapper data points from the legend (circled in red, Figure 12)

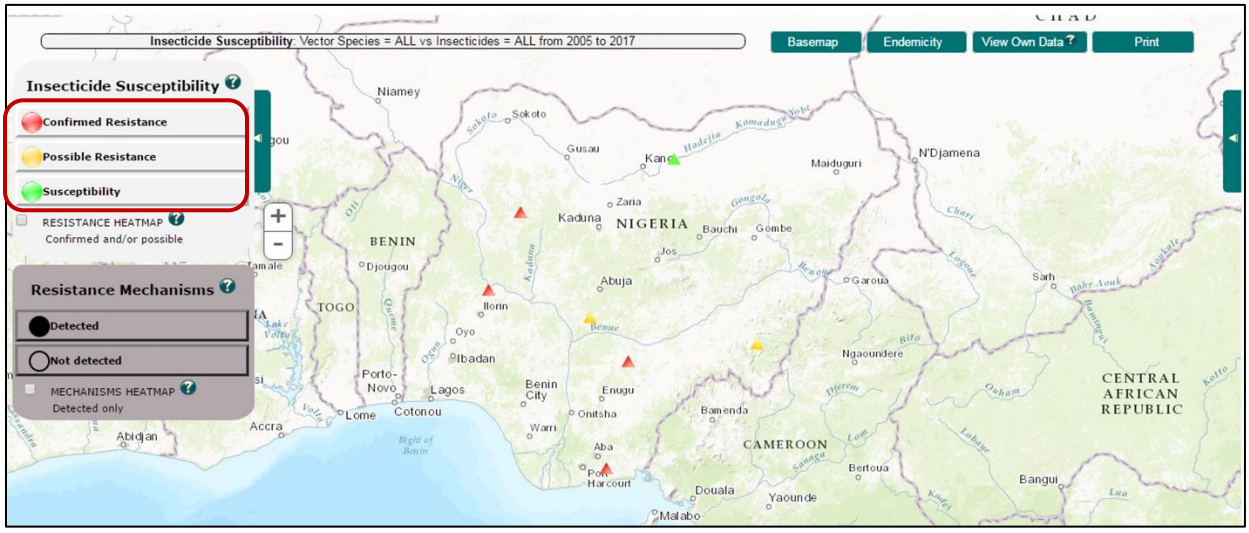



**Figure 12.** Example data from Nigeria displayed on the platform. IR Mapper data is clicked-off on the legend.

Step V. Uploaded user data is never saved onto the IR Mapper database. It will be cleared automatically when the browser is closed. To manually clear the uploaded data click "Clear My Data" in the 'View Own Data" menu (Figure 10).