Outbreak Investigation Tool — Instruction Manual

Oct 7, 2026 · @Mesiddu

About this tool

The Outbreak Investigation Tool turns one field investigation, entered once, into tracing windows, an epidemic curve, a spread map with control zones, a ranked list of probable causes and a finished report. It covers four diseases: Foot-and-Mouth Disease (FMD), Highly Pathogenic Avian Influenza (HPAI), Lumpy Skin Disease (LSD) and Glanders.

It is meant for the veterinary officer or rapid response team investigating an outbreak in the field. It works on a phone, tablet or computer, needs no login, and keeps working without a connection once it is open.

An investigation follows the same path every time:

1. Record the investigation, the cases, the specimens and the risk factors.
2. Read the curve, the map, the tracing windows and the decision support.
3. Write the conclusion, submit to the central register and download the report.

Getting started

Open the tool, choose the disease, then work through the four data-entry tabs from left to right. The analysis tabs fill themselves in as you go.

1. **Open the tool.** Use the standalone copy (the file `Outbreak-Investigation-Tool.html` or its web address) for real investigations. Only the standalone copy can submit to the central register and download files directly.
2. **Choose the disease** with the buttons at the top right: FMD, HPAI, LSD or Glanders. This sets the incubation period, species lists, expected signs, risk questions, control measures and default zone sizes.
3. **Enter data** on tabs 1 to 4.
4. **Read the analysis** on tabs 5 to 8.
5. **Finish** on tab 9: write recommendations, submit, and download the PDF.

No.	Tab	Group	What it is for
1	Investigation	Data entry	Who, where, the affected unit, key dates, control measures

No.	Tab	Group	What it is for
2	Cases	Data entry	Case line list, daily mortality (poultry), clinical picture
3	Specimens	Data entry	Samples collected, where sent, results
4	Risk factors	Data entry	Checklist of risk questions for the source window
5	Epi curve	Analysis	Mortality curve (poultry) and epidemic curve
6	Spread map	Analysis	Cases on a map, control zones, distances
7	Tracing windows	Analysis	Source and spread windows, movement register
8	Decision support	Analysis	Overall assessment and probable causes
9	Report	Analysis	Submit, save, download, summary

The timeline at the top stays visible on every tab. It shows the source window, the spread window and the quiet period before measures can be lifted, with markers for likely exposure, Day 0, samples collected, samples sent, laboratory confirmation, Day C and the earliest lifting date. It appears once Day 0 is entered.

Saving. Everything is saved automatically in the browser on that device. Closing and reopening the tool on the same device brings the investigation back. To move it to another device, download the data file from the Report tab.

Step 1: Investigation tab

This tab records who is investigating, where, what unit is affected and the three dates every calculation depends on.

Investigation header

- The **Investigation ID** is generated for you from the state, district, disease and date. You cannot type in it.
- Pick the **State** first. The District list then shows only that state's districts, and the Block list only that district's blocks. If a new district or block is missing, choose "Other" and type it.
- Enter the **index farm latitude and longitude**, or press **Use my current location** while standing on the farm. The control zones are drawn around these coordinates, so capture them at the farm, not at the office.

Affected unit

- Enter the farm name, owner, species affected, production system, housing, water, feeding and vaccination status.
- For HPAI, extra fields appear for the farm address, farm code, owner's address, farm veterinarian, type of farm, production line, housing system, hatchery of origin, ventilation and weekly deaths in the six weeks before the first signs.
- Enter the four totals: **susceptible population, cases, deaths, culled**. The attack rate, mortality rate and case fatality rate are worked out below them.
- For poultry, the susceptible population and deaths are filled in for you when you enter bird counts on the Cases tab.

Key dates

Date	Meaning	What it drives
Day 0	The day the first animal or bird showed signs	Source window, spread window, every delay
Date of most recent case	The latest onset	The quiet period and the earliest lifting date
Day C	The day control measures were applied	The end of the spread window

Choose the **incubation period basis**: Biological (as seen in the field) or Regulatory (the longer period used for zones and movement control). The note under the box gives the figures in use.

Control measures applied

Tick each measure in place from Day C. The list changes with the disease.

Step 2: Cases tab

Enter one row per animal for FMD, LSD and Glanders, and one row per affected shed, flock or farm for poultry. Never enter one row per bird.

Case line list

- **Add case** adds one row; **Add 5 rows** adds five. **Paste from spreadsheet** imports many rows at once in the column order shown above the paste box.
- Each row holds ID, species, age class, sex, date of onset, latitude, longitude, outcome, unit and signs.

- The **date of onset** places the case on the epidemic curve. The **coordinates** place it on the map. A row without a date is left off the curve; a row without coordinates is left off the map.
- Coordinates: press the GPS button on a row to capture this device's location, tick **Capture coordinates automatically for every new case**, or use **Copy farm coordinates to blank rows**.
- **Signs:** click the box to open the list of expected signs for the disease and tap each one seen. You can also type your own. These feed the clinical fit check.
- The table scrolls sideways on a narrow screen.

Poultry only: birds in shed and dead

With HPAI selected, each row has two extra columns, **Birds in shed** and **Dead**. As you type them, the sums are copied to "Total susceptible population" and "Total deaths to date" on the Investigation tab. A line under the table shows the sums. "Total cases to date" is not filled in for you.

Poultry only: daily mortality

- Enter the deaths for each day, one row per day. If sheds are counted separately, add one row per shed for the same day.
- **Add a day** starts at Day 0 and then moves on one day at a time. **Paste from spreadsheet** takes date, deaths and shed.
- The line under the table compares the daily total with "Total deaths to date". If they differ, **Use as total deaths to date** copies the daily total across.
- These counts draw the mortality curve on the Epi curve tab.

Clinical picture

- The expected presentation and the standard case definition (suspected, probable, confirmed) for the disease are shown for reference.
- **Outbreak case definition** is optional: your own working definition by animal, place and time. **Start from the standard definition** copies the standard wording in for you to edit.
- For HPAI there is also a box for gross (post-mortem) findings.
- Samples and laboratory results are recorded on the Specimens tab.

Step 3: Specimens tab

Add one entry for each batch of specimens, and a new entry each time samples are collected or sent again. The tab works the same way for all four diseases.

Press **Add a specimen batch** and fill in the three parts:

Part	Fields	Question it answers
Collection	Specimen collected, taken from (live, dead, both, environment), number of samples, date collected, collected by, shed or animal IDs	What, how many, when, by whom
Dispatch	Sent to (laboratory), date sent, date received at the laboratory, packing and transport, sent by and reference	Where and when it was sent
Result	Test done, samples tested, samples positive, result, agent or subtype, date of result, laboratory report number, remarks	What came back

- "Sent to" and "Test done" offer suggestions, and any other name can be typed.
- "Collected by" starts with the investigating officer's name; change it if someone else took the samples.
- Leave **Result** as "Awaited" until the report arrives, then come back and complete the result fields.
- Each batch shows coloured labels: the result, how long dispatch took, and how many days from collection to result. A red label warns when the dates are out of order.
- To remove a batch, press **Remove** twice.

The four figures at the top add up all batches: samples collected, the date first sent, samples tested and positive, and the **laboratory status**. The status becomes "Confirmed" as soon as any batch is marked Positive, and shows the confirmation date and the number of days after Day 0.

The dates of first collection, first dispatch and confirmation appear as markers on the timeline and on the mortality curve.

The **Remarks** box at the bottom is for anything else about the samples or the laboratory work.

Step 4: Risk factors tab

Ask every question about the source window shown in the blue box at the top, not about how things are today. The box gives the exact dates once Day 0 is entered.

- Each question is answered **Yes, No, Don't know or N/A**, with a detail box for names, dates and places.
- Each question carries a label:

Label	Yes means	No means
Good practice	Safe	A risk
Risk practice	A risk	Safe

- Your answer turns **green** when it is safe and **red** when it adds risk, so you do not need to remember which way a question runs.
- Use "Don't know" honestly. Each one is counted and reported as a question that could change the ranking of causes.
- Phrase questions around landmarks such as market days, festivals and deliveries; owners remember those better than dates.
- For HPAI, the box also gives a second period for movements and contacts: the 20 days before the first signs, up to the date of restriction.

The **Checklist progress** card shows how many risks were found, how much of the checklist is done, and a list of the risks identified. Those risks become the candidate sources on the Decision support tab.

Epi curve tab

For poultry the tab shows two charts: deaths by day in the flock, then cases by date of onset. For the other diseases it shows only the second.

Daily mortality in the affected flock (HPAI only)

- One bar per day, drawn from the Daily mortality table.
- Dashed lines mark Day 0, samples collected, samples sent, laboratory confirmation and Day C on the same scale.
- Four figures sit under the chart: deaths recorded, highest daily count, **dead by the day of confirmation**, and the samples that confirmed the flock.
- The note below explains the reading: the flock is the unit, the samples confirm the flock, and the size of the outbreak is the number of birds that died or were culled.

Epidemic curve

- One bin per day by date of onset, taken from the case rows. For poultry each bar is a shed, flock or farm, not a bird.
- The amber bar shows one average incubation period to scale. The blue dashed line is Day C.

Pattern reading

The tool names the likely pattern (point source, continuous common source, propagated, or mixed) and says why and what to do with it. Treat it as a first reading. With fewer than three dated cases the pattern is not used in the ranking of causes.

Spread map tab

The map plots every case that has coordinates, in order of onset, with the alert and surveillance zones drawn around the index farm.

Base layer

Choice	When to use it
Scaled plot	Works offline with no internet; shows distances to scale without a background map
Real map	Street, satellite or terrain background; needs internet, no key or account
Google Maps	Needs your own Google Maps key

The real map and Google Maps load only in the standalone copy.

Control zones

- Type the **alert zone radius** and the **surveillance zone radius** in km. For HPAI they start at 1 km and 10 km. Leave a box blank to use the default; type 0 to hide a zone.
- The alert zone is drawn as a red disc and the surveillance zone as an amber band around it, both centred on the index farm.
- **Zoom the map to** switches between both zones around the farm, a close-up of the cases and the alert zone, and the cases only.
- The **Control zones** card counts the cases in each zone and outside them.
- If the index farm coordinates are far from the cases, the zones are drawn around Case 1 and a red note explains why. **Set the index farm coordinates to Case 1** corrects it in one press.

Watching the spread

Press **Play**, or drag the slider, to see the cases appear day by day. Numbers on the markers are the order of onset; Case 1 is the index case.

Spread measurements give the furthest case from the index case, the rate of spread in km a day, and how many cases have coordinates.

Taking the map elsewhere

Download KML opens in Google My Maps or Google Earth. **Download GeoJSON** opens in QGIS. Both include the cases and the zones.

Tracing windows tab

The tool counts two windows from Day 0, and the movement register is checked against both.

Window	Runs from	Runs to	Tells you
Source window (trace back)	Day 0 minus the longest incubation period	Day 0 minus the shortest incubation period	When infection most likely came in; the priority days sit in the middle
Spread window (trace forward)	The start of the source window	Day C, or the most recent case if Day C is not set	When anything leaving the unit could have carried infection out

Contact and movement register

Press **Add movement** for everything that entered or left the unit: animals or birds, vehicles, people, feed, eggs, litter, dead bird collection, shared staff and equipment.

- **Date** and **Direction** (In, Out, Both) decide which window the record falls in.
- **Type** decides which cause it supports on the Decision support tab.
- **Place / person** and **Distance km** identify what to trace.
- **Risk** (High, Medium, Low) raises or lowers the weight of the record.
- **Action taken** records the follow-up. An outward movement with nothing written here is reported as still to be traced.

The **In window** column labels each record:

Label	Meaning
Priority	Inside the most likely exposure days
Source	Inside the source window
Spread	Inside the spread window
Outside	Outside both windows

Inward records point to the source. Outward records point to the spread.

Lifting control measures shows the earliest date the measures can be lifted, counted from the most recent case, and a more cautious date at twice the longest incubation period.

Decision support tab

This tab reads everything entered on the other tabs and sets out what it shows, what needs doing and what most probably caused the outbreak. It refreshes each time you open it.

Overall assessment of this investigation

- The row of chips at the top shows which inputs have been entered: cases, dates, numbers, deaths, locations, risk factors, tracing windows, movements, specimens and control measures. A dash means that input is missing.
- **Needs action now** lists the urgent points in one place.
- Below it, findings are grouped under seven headings, each with a label:

Label	Meaning
Act	Needs action now
Check	Something is missing, inconsistent or worth a second look
In order	Checked and satisfactory
Note	Information to be aware of

Heading	What it looks at
Cases, numbers and deaths	Rates, totals that disagree, deaths per shed, spread between sheds, whether daily deaths had peaked
Dates and delays	Reporting delay, days to control measures, sampling to confirmation, cases that began after the measures should have stopped them
Locations and spread	Furthest case, km a day, cases in each zone and outside the zones
Risk factors	Questions answered, heaviest risks, number of "don't know" answers

Heading	What it looks at
Tracing windows and movements	Inward movements to trace back, outward movements to trace forward, records without dates or action
Laboratory and diagnosis	Laboratory status, results awaited, how well the signs fit the disease
Control measures	How many measures are applied

Does the clinical picture fit the disease you selected?

The signs recorded against the cases are compared with the expected sign groups for the disease, and with the other diseases that affect the same species. It reads only what was typed in the Signs column, so it supports the diagnosis; laboratory confirmation settles it.

Most probable causes of this outbreak

Each risk answer shown in red is weighted and assigned to a pathway, such as introduction of infected animals, vehicles and equipment, people, feed, wild birds or local spread. The ranking is then adjusted by:

- inward movements inside the source window, weighted by their risk rating;
- the shape of the epidemic curve, when there are at least three dated cases;
- the distance between cases and whether any lie outside the control zones.

Each cause shows its share, the evidence behind it and what to do next. The box underneath says how complete the ranking is.

Contributing factors and flags

These are not sources. Contributing factors, such as a vaccination gap or a biosecurity failure, explain why the outbreak took hold. Flags need separate action: **onward spread** is raised for anything that left the unit during the spread window, and human exposure risk is raised where it applies.

Your conclusion

Press **Use this as my conclusion** under the cause you agree with. The tool writes a draft covering the likely exposure date, the evidence, the laboratory status, the rates and the outward movements still to trace. Edit the wording freely, then choose your confidence: Confirmed, Probable, Possible or Unknown. The ranking is a prompt, not a verdict.

Report tab

Finish the investigation here: write the recommendations, submit it to the central register and download the report.

Submit this investigation

- **Submit to central register** sends the whole investigation. The label beside the button shows the state: not submitted yet, waiting to send, submitted (with date and time), or changed since the last submission.
- With no connection, the submission is kept on the device and sent automatically when the connection returns.
- After a correction, submit again. The new entry replaces the earlier one for the same Investigation ID.

Save your work

Button	What you get
Download report (PDF)	The full report, built on the device; nothing is uploaded
Report as plain text	The same report as text, for pasting into a message or letter
Download case line list (CSV)	The case rows, for a spreadsheet
Download data file (JSON)	The whole investigation, to keep as a backup or open on another device
Open a saved JSON file	Loads an investigation saved earlier
Print	Prints the report from the browser
Start a new investigation	Clears everything; press twice to confirm

What the PDF contains

1. Investigation
2. Affected unit, with rates
3. Key dates and tracing windows
4. Epidemic curve, with the daily mortality chart for poultry
5. Spread map
6. Control zones
7. Case line list

8. Case definition, specimens and laboratory results
9. Risk factors in the source window
10. Contact and movement register
11. Control measures applied
12. Decision support analysis, starting with the overall assessment
13. Conclusion and recommendations
14. Avian influenza epidemiological information (HPAI only)

Investigation summary shows the main facts on one screen. **Recommendations and follow-up** has two boxes, for immediate actions and for the follow-up plan with a review date; both are printed in the report.

Worked example: a poultry farm of 3,000 birds

A layer farm has 3,000 birds in two sheds. Ten samples were sent and all ten came back positive. The other 2,990 birds died. Enter the farm as one outbreak with two shed rows, not 3,000 rows and not 10.

Where	What to enter
Investigation, Affected unit	Total cases 3,000. Susceptible population and deaths fill in from the shed rows.
Investigation, Key dates	Day 0 = the day the first birds showed signs; Day C = the day restrictions began
Cases, case line list	Two rows, Shed A and Shed B: date of first signs in each shed, coordinates, outcome "Died", signs, birds in shed, dead
Cases, Daily mortality	Deaths for each day, adding up to 2,990
Specimens	One batch: 10 samples, where and when sent, 10 tested, 10 positive, result "Positive", subtype, date of result

The ten sampled birds are cases either way, because they are infected birds in the flock:

- Sampled from carcasses: they are already among the deaths, so deaths are 3,000.
- Swabbed alive and then culled: enter 10 under "Culled / destroyed" and keep deaths at 2,990.

What the tool then shows

- Laboratory status "Confirmed", with the number of days from first signs to confirmation.
- A mortality curve of the 2,990 deaths by day, with sampling, dispatch, confirmation and Day C marked, and the number of birds dead by the day of confirmation.
- An epidemic curve with two bars, one per shed.
- An attack rate of 100% and a mortality rate of 99.7%.

The ten positive samples confirm the flock. The 2,990 deaths are the size of the outbreak.

Tips, limits and troubleshooting

Good practice in the field

- Enter Day 0 first. Nothing else can be calculated without it.
- Capture coordinates while standing at the farm or shed.
- Record every movement with a date and a direction, even when it looks unimportant.
- Return to the Specimens tab when results arrive, then submit again.
- Download the data file (JSON) at the end of each day as a backup.

Limits to keep in mind

- Work is stored in the browser of one device. Clearing the browser's data, or using a private window, removes it. Keep the data file.
- The PDF uses Latin letters only; text typed in other scripts may not print correctly.
- Incubation periods, case definitions, specimen lists and the rules behind the Act and Check labels are reference values. Check them against the national control programme before a regulatory decision.
- Decision support is an aid. The investigating officer makes the conclusion.

If something does not work

Problem	What to do
Submit button is greyed out	You are viewing the tool inside Claude, or the copy is not connected to a register. Use the standalone copy.
The map background does not load	Use the standalone copy with internet, or switch the base layer to "Scaled plot".
"Use my current location" fails	Allow location access for the browser, move outdoors, or type the coordinates.

Problem	What to do
The zones are drawn away from the cases	The index farm coordinates are wrong. Press "Set the index farm coordinates to Case 1" or retype them.
No timeline, windows or curve	Day 0 is missing, or the case rows have no date of onset.
The mortality curve is empty	Select HPAI and enter deaths in the Daily mortality table on the Cases tab.
Totals disagree	Follow the Check notes on the Decision support tab; they name the two figures that differ.
Dates on a specimen batch are flagged	Collection must come before dispatch, and dispatch before the result.