

## S1: Report template

|                                                      |  |                       |  |
|------------------------------------------------------|--|-----------------------|--|
| Name                                                 |  |                       |  |
| Date                                                 |  | Country               |  |
| Name of contributors<br>(add more rows if necessary) |  | Email of contributors |  |

This report template has the objective of gathering information about the national ruminant production sector, and six ruminant diseases - anthrax, brucellosis, Crimean Congo haemorrhagic fever (CCHF), foot-and-mouth disease (FMD), lumpy skin disease (LSD) and peste des petits ruminants (PPR) - including the related risk factors, surveillance, and control strategies.

Please follow the structure provided below to write the report, replying to each question in detail, and referencing complementary documents, which do not need to be translated at this stage.

These complementary documents should be attached as appendices. They may include:

- Internal industry reports.
- Veterinary Service or Laboratory reports.
- National databases, e.g.: outbreaks, surveillance results, livestock numbers, etc.
- National agricultural magazine's articles.
- National scientific publications.
- Maps/ Graphs.
- Master or PhD thesis (documents not published in international journals).

### Note:

**a.** If the source document is written in a language other than English, indicate it with reference to the question and add a brief summary of the information it contains and the language, so we can decide if it needs translation.

**b.** Scientific publications in international journals (in English) do not need to be included, since they will be covered by FAO research partner.

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## RUMINANT SPECIFIC INFORMATION

1. Include data at the maximum resolution level (i.e. individual farm or the lowest administrative level available). Please note that the classification provided is generic, but may be different in your country. Please provide additional categories (e.g. mixed purpose, dairy goats or sheep, extensive systems, nomadic herds, etc. to reflect the existing categories within your country).

- Refer to an Excel file

2. Provide an outline or narrative of the main commercial and/or backyard ruminant production systems in the country and their characteristics, e.g. definition of each farm type (how is a backyard, commercial or semi-commercial defined), how do they operate in rough terms, proportion of farms with mixed species, etc.
3. Did the proportion of ruminant farms/ animals change in the last 5 years? Describe how.
4. Provide an outline of the value chains for ruminant production in the country (i.e. who is involved and what is the contribution and the profit of the participants). If available, provide also major documents/studies about this topic.
5. Animal trade markets: describe where live animals are traded, how often, and under what conditions.
6. **Animal movements**
  - 6.1. Are movements between farms recorded and available in a database? If so, please describe the data fields captured and the level of detail. Please describe the rough amount and type of movements that are not recorded.
  - 6.2. Are there seasonal animal movements, e.g. animals that go to summer pastures or large nomadic/transhumance movements? If yes, are these movements recorded in a database and available? If so, please describe the data fields captured and the level of detail. If not, describe the movement season and pattern (i.e. frequency and location), as well as the approximate number of animals involved.
7. **Trade**
  - 7.1. For each ruminant species, describe imports and exports of the following products, including countries involved and quantities:
    - 7.1.1. Live animals
    - 7.1.2. Animal products
      - 7.1.2.1. Meat
      - 7.1.2.2. Milk and dairy products
      - 7.1.2.3. Semen and embryos
      - 7.1.2.4. Hides
  - 7.2. Main trade routes within the country. Describe the geographical aspect of trade routes and transport media for the domestic market, as well as the actors involved, e.g. existence of middlemen, live animal markets or agricultural fairs, animals are sent straight to slaughterhouses, etc.
  - 7.3. Has illegal animal trade been identified within the country and with other countries? Describe in what instances this happens and what are the most difficult borders to control.

## DISEASE-SPECIFIC INFORMATION

| Disease     | Endemic / Sporadic / Absent | If absent or sporadic, state the date of the last introduction | Is the disease reportable? |
|-------------|-----------------------------|----------------------------------------------------------------|----------------------------|
| Anthrax     |                             |                                                                |                            |
| Brucellosis |                             |                                                                |                            |
| CCHF        |                             |                                                                |                            |
| FMD         |                             |                                                                |                            |
| LSD         |                             |                                                                |                            |
| PPR         |                             |                                                                |                            |

### 8. For each specified disease

8.1. Provide the database for the outbreaks and/or surveillance results existent in the country in the last 10 years (if available one row per affected farm), if possible, with the following information:

- 8.1.1. Date
- 8.1.2. Location (or region)
- 8.1.3. Geocoordinates (if available)
- 8.1.4. Species (i.e. cattle, goat or sheep) plus production system if available, e.g. dairy, beef, extensive, etc.
- 8.1.5. Number of animals present on the farm.
- 8.1.6. Number of animals affected.
- 8.1.7. Number of dead animals.
- 8.1.8. List other fields captured in the national database.

8.2. Provide the database of the cases in humans in the last 10 years for anthrax, brucellosis, and CCHF, if possible, with the following information:

- 8.2.1. Disease (anthrax, brucellosis, or CCHF)
- 8.2.2. Date
- 8.2.3. Location
- 8.2.4. List other fields captured in the national database.

8.3. For each disease, if there is no outbreak database, please describe the outbreaks that occurred in the last 10 years:

- 8.3.1. Where did it occur in the country?
- 8.3.2. What was the source of the introduction of disease into the country?
- 8.3.3. How did it spread?
- 8.3.4. How many animals were affected/ killed?
- 8.3.5. Economic impact?
- 8.3.6. How was it controlled?

## **9. Surveillance Plans**

- 9.1. Are National Surveillance Programmes implemented? If yes, describe the surveillance program for each of the diseases.

## **10. Control measures**

- 10.1. Is there a national vaccination plan for the different diseases or any other sort of control plan? If yes, please describe.
- 10.2. Is it common practice the application of insecticides/repellents/acaricides on ruminants to control ticks? (Possible vectors of LSD and CCHF)
- 10.3. Are there any distribution maps and info about relevant vectors for CCHF, i.e. Hyalomma ticks? If yes, please describe.
- 10.4. Are there any wild animals known or suspected to be responsible for the spreading or being reservoirs of any of these diseases in the country? If yes, please describe.

## **11. Disease Awareness**

- 11.1. Do authorities (or others) organize training sessions, seminars, brochures, and leaflets to inform/prevent (about) the referred diseases? Indicate for which diseases this has been done and describe briefly the awareness actions implemented.
- 11.2. Are there any biosecurity improvement programs?

## **12. University/ NGOs/ Government research of disease**

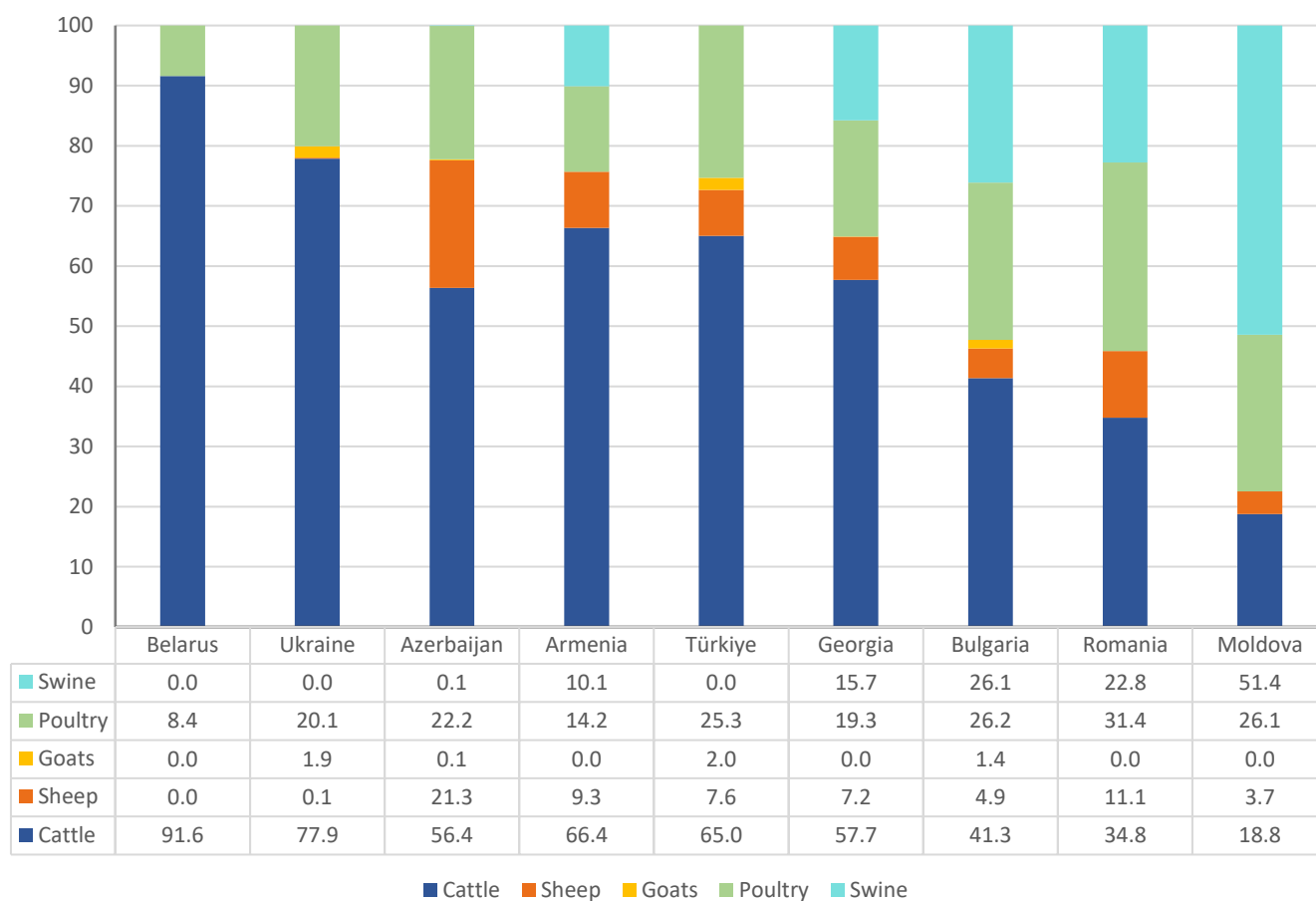
- 12.1. Indicate if there is any national research for any of the six diseases in agricultural/ veterinary schools/ NGOs. If yes, could you provide a contact person and/ or any publication/ report referring to it? Please include their contact details (i.e. email) and area of expertise.

**S2: Demographics, economic indicators, and ruminant production indicators in the study region.**

| Country    | Human population (2020) <sup>2</sup> | GDP/capita (2020-\$) <sup>3</sup> | % Livestock production/ agricultural GDP (2020) <sup>1</sup> | % GPV ruminants/ GPV domestic species (2020) <sup>1</sup> | LR population* |                | LR production types (%)* |                  | SR population* |                | SR production types (%)* |                  | Animal identification and traceability system | International trade (live animals)           |                                           |
|------------|--------------------------------------|-----------------------------------|--------------------------------------------------------------|-----------------------------------------------------------|----------------|----------------|--------------------------|------------------|----------------|----------------|--------------------------|------------------|-----------------------------------------------|----------------------------------------------|-------------------------------------------|
|            |                                      |                                   |                                                              |                                                           | Head (Thous.)  | % LR in region | Smallholder farms        | Commercial farms | Head (Thous.)  | % SR in region | Smallholder farms        | Commercial farms |                                               | Exports to                                   | Imports from                              |
| Armenia    | 2 963 234                            | 4 266                             | 46                                                           | 76                                                        | 600            | 1.8            | 95                       | 5                | 690            | 3              | 95                       | 5                | No (under development)                        | GEO, Middle East                             | EU, KAZ, RF, UKR                          |
| Azerbaijan | 10 093 121                           | 4 221                             | 43                                                           | 78                                                        | 2 484          | 7.5            | 91                       | 9                | 8 189          | 10.2           | 82                       | 18               | No (under development)                        | GEO, TK, UAE                                 | BLR, EU, GEO, KAZ, RF, TK, UKR            |
| Belarus    | 9 379 952                            | 6 424                             | 57                                                           | 92                                                        | 4.300          | 13.1           | 2                        | 98               | 148            | 0.2            | 91                       | 9                | Yes                                           | KAZ, UZB                                     | EU SR: low imports                        |
| Bulgaria   | 6 934 015                            | 10 079                            | 23                                                           | 48                                                        | 722            | 2.2            | 60                       | 40               | 2 015          | 2.5            | 76                       | 24               | Yes                                           | Balkans, Caucasus, TK                        | EU                                        |
| Georgia    | 3 722 716                            | 4 267                             | 38                                                           | 65                                                        | 721            | 2.2            | 95.5                     | 4.5              | 685            | 0.9            | 95                       | 5                | No (under development)                        | ARM, AZE, Iran, Middle East                  | ARM, AZE, BLR, EU, RF, UKR                |
| Moldova    | 2 620 495                            | 4 547                             | 23                                                           | 23                                                        | 159            | 0.5            | 74                       | 16               | 845            | 1.1            | 87                       | 13               | Yes                                           | AZE, Middle East                             | BLR, CH, EU, KAZ, RF, Serbia, TK, UKR, UK |
| Romania    | 19 257 520                           | 12 896                            | 31                                                           | 46                                                        | 1 867          | 8.8            | 95                       | 5                | 12 541         | 15.6           | 96                       | 4                | Yes                                           | EU, Middle East <sup>4</sup>                 | EU <sup>4</sup>                           |
| Türkiye    | 84 339 067                           | 8 536                             | 29                                                           | 76                                                        | 18 158         | 55.1           | 80 <sup>5</sup>          | 20 <sup>5</sup>  | 54 113         | 67.3           | 93                       | 7                | Yes                                           | AZE, Cyprus, Iraq, Middle East, PK           | AZE, EU, South America                    |
| Ukraine    | 44 132 049                           | 3 725                             | 24                                                           | 80                                                        | 2 900          | 8.8            | 66                       | 44               | 1 144          | 1.4            | 87                       | 13               | Yes                                           | ARM, AZE, EU, KAZ, MDV, Middle East, TK, UZB | EU                                        |

\* Ruminant census values refer to 2021. GPV: Gross production value, LR: large ruminants, SR: small ruminants, Thous.: Thousand

**S3: Proportion of gross production value (GPV) per production species (cattle, goats, poultry, sheep, swine) in each studied country, in 2020.**



\*Source FAOSTAT<sup>1</sup>

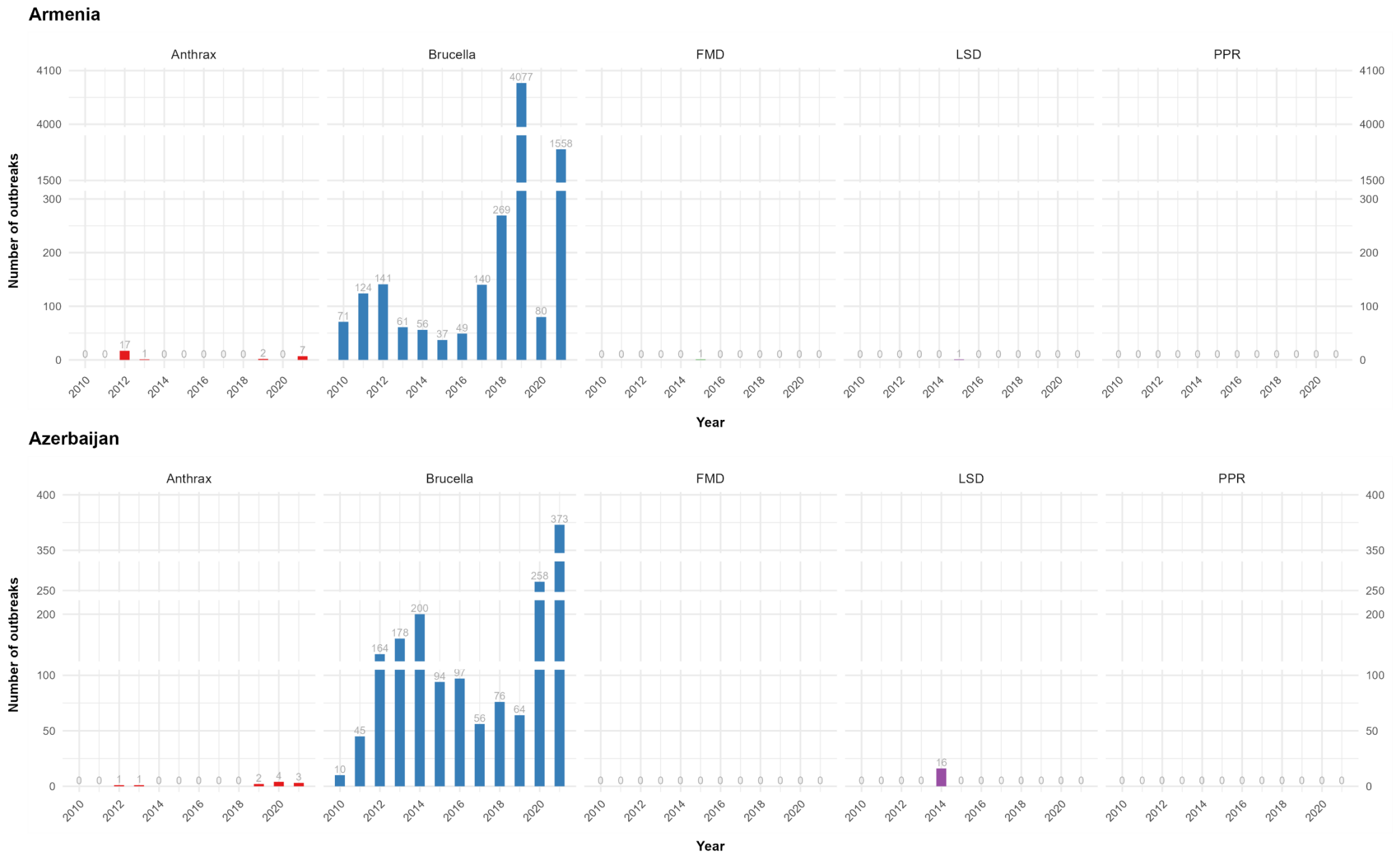
**S4:** Overview of disease status, surveillance activities, and vaccination in the study region in 2021, for domestic large ruminants (LR) and small ruminants (SR).

| Country<br>Disease | Armenia                                                                                                    | Azerbaijan                                                                                                                                                         | Belarus                                                           | Bulgaria                                                                                                                 | Georgia                                                       | Moldova                                    | Romania                                                                                           | Türkiye                                                                                                                                                                       | Ukraine                                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Anthrax</b>     | Armenia                                                                                                    | Azerbaijan                                                                                                                                                         | Belarus                                                           | Bulgaria                                                                                                                 | Georgia                                                       | Moldova                                    | Romania                                                                                           | Türkiye                                                                                                                                                                       | Ukraine                                                                                                                                                      |
| Status             | Sporadic                                                                                                   | Endemic                                                                                                                                                            | Sporadic                                                          | Sporadic                                                                                                                 | Endemic                                                       | Endemic                                    | Sporadic                                                                                          | Endemic                                                                                                                                                                       | Sporadic                                                                                                                                                     |
| Last outbreak      | 2019                                                                                                       | -                                                                                                                                                                  | 1*                                                                | 2018                                                                                                                     | -                                                             | 2016                                       | 2020                                                                                              | -                                                                                                                                                                             | 2017                                                                                                                                                         |
| Surveillance       | Passive                                                                                                    | Passive                                                                                                                                                            | Passive                                                           | Passive                                                                                                                  | Passive                                                       | Passive                                    | Passive                                                                                           | Passive                                                                                                                                                                       | Passive                                                                                                                                                      |
| Vaccination        | Yes<br>LR: young 2x/ yr.,<br>adult: 1x/ yr.<br>SR: risk-based 1x/ yr.                                      | Yes<br>LR & SR<br>1 <sup>st</sup> year: 2x/yr.<br>Adults: 1x/yr.                                                                                                   | No                                                                | Yes (risk-based)<br>All SR & LR kept or moved<br>to areas w/ 1 (or +) past<br>outbreaks in last 50 yrs.: 1x<br>or 2x/yr. | Yes (risk-based)<br>Susceptible LR & SR in<br>high-risk areas | Yes (All)                                  | Yes (risk-based)                                                                                  | Yes (risk-based)<br>Susceptible animals before<br>seasonal movements                                                                                                          | Yes (risk-based)<br>areas w/outbreaks in<br><5yrs: all LR & SR<br>(2x/yr.), stalling/ grazing<br>>5yrs: adult LR & SR -<br>1x/yr., young LR & SR -<br>2x/yr. |
| <b>Brucellosis</b> | Armenia                                                                                                    | Azerbaijan                                                                                                                                                         | Belarus                                                           | Bulgaria                                                                                                                 | Georgia                                                       | Moldova                                    | Romania                                                                                           | Türkiye                                                                                                                                                                       | Ukraine                                                                                                                                                      |
| Status             | Endemic                                                                                                    | Endemic                                                                                                                                                            | Absent<br>WOAH official free<br>status                            | Sporadic                                                                                                                 | Endemic                                                       | Absent                                     | Absent                                                                                            | Endemic                                                                                                                                                                       | Absent                                                                                                                                                       |
| Last outbreak      | -                                                                                                          | -                                                                                                                                                                  | XX century                                                        | 2019                                                                                                                     | -                                                             | 1995                                       | 1965                                                                                              | -                                                                                                                                                                             | 2*                                                                                                                                                           |
| Surveillance       | Active<br>Roz-Bengal (risk-based):<br>ELISA/CFT confirmation<br>All LR & SR: 2x/yr.<br>(spring and autumn) | Active<br>ELISA and Roz-Bengal<br>Sample of 50% of LR and<br>20% of SR.                                                                                            | Active<br>Every 3 yrs. to<br>maintain the official<br>free status | Active, passive<br>LR: non-dairy: 1x/yr. >24m<br>2x/yr. BTM; SR: 1x/yr. for<br>SR >6m based on herd size                 | Passive (2018–present)                                        | Active, passive<br>ELISA and<br>Roz-Bengal | Active, passive<br>All LR: BTM<br>>3x/yr. ea.3m. or<br>blood sample 1x/yr.<br>[3;12]m; SR: 1x/yr. | Active, passive                                                                                                                                                               | Active<br>LR & SR 1x/yr for all<br>adult animals                                                                                                             |
| Vaccination        | No                                                                                                         | Yes (REV1 and S19)<br>LR: S19 to all females 3-<br>8m and all non-pregnant<br>females.<br>SR: REV1 all female 3-<br>8m and all non-pregnant<br>female <sup>6</sup> | No                                                                | No                                                                                                                       | Yes<br>Started in 2019                                        | No                                         | No                                                                                                | Yes (all female LR and SR)<br>LR: first dose 3–6m; second<br>dose: 4 to 12m after the 1 <sup>st</sup> ;<br>SR: 3–6m-old female lambs<br>and kids and breeding male<br>animals | No                                                                                                                                                           |
| <b>CCHF</b>        | Armenia                                                                                                    | Azerbaijan                                                                                                                                                         | Belarus                                                           | Bulgaria                                                                                                                 | Georgia                                                       | Moldova                                    | Romania                                                                                           | Türkiye                                                                                                                                                                       | Ukraine                                                                                                                                                      |
| Status             | Absent                                                                                                     | Absent                                                                                                                                                             | Absent                                                            | Absent                                                                                                                   | Endemic                                                       | Absent                                     | Absent                                                                                            | Endemic                                                                                                                                                                       | Absent                                                                                                                                                       |
| Last outbreak      | Never reported                                                                                             | Never reported                                                                                                                                                     | Never reported                                                    | Never reported                                                                                                           | -                                                             | Never reported                             | Never reported                                                                                    | -                                                                                                                                                                             | Never reported                                                                                                                                               |
| Surveillance       | No surveillance                                                                                            | No surveillance                                                                                                                                                    | No surveillance                                                   | No surveillance                                                                                                          | Passive<br>Non-notifiable disease                             | No surveillance                            | No surveillance                                                                                   | Passive<br>Non-notifiable disease                                                                                                                                             | No surveillance                                                                                                                                              |
| Vaccination        | Not available                                                                                              | Not available                                                                                                                                                      | Not available                                                     | Not available                                                                                                            | Not available                                                 | Not available                              | Not available                                                                                     | Not available                                                                                                                                                                 | Not available                                                                                                                                                |

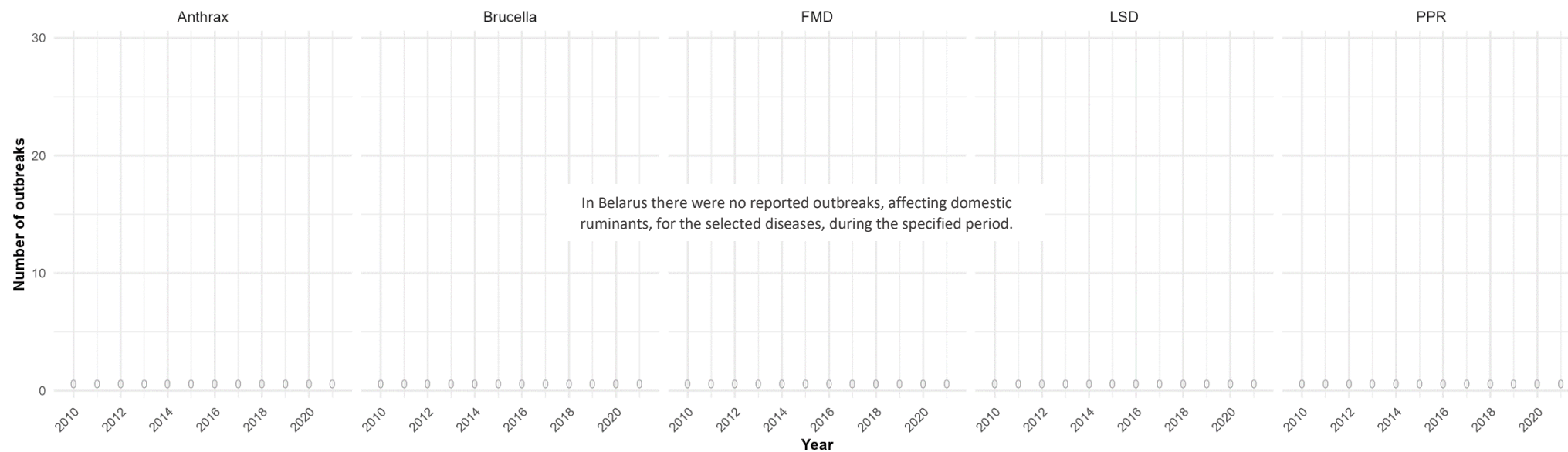
| <b>FMD</b>                | Armenia                                                                           | Azerbaijan                                                                 | Belarus                                                      | Bulgaria                                                                                                                                | Georgia                                                                         | Moldova                                                      | Romania                                                                       | Türkiye                                                                                                           | Ukraine                                                      |
|---------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Status                    | Sporadic                                                                          | Absent (of clinical cases)<br>No WOA official status                       | Absent<br>Free without vaccination<br>(WOAH official status) | Absent<br>Free without vaccination<br>(WOAH official status)                                                                            | Absent (of clinical cases)<br>No WOA official status                            | Absent<br>Free without vaccination<br>(WOAH official status) | Absent<br>Free without vaccination<br>(WOAH official status)                  | Anatolia region Endemic,<br>Thrace (Free zone w/<br>vaccination since 2010)<br>Thrace has the WOA official status | Absent<br>Free without vaccination<br>(WOAH official status) |
| Last outbreak             | 2016                                                                              | 2001                                                                       | 1982                                                         | 2011                                                                                                                                    | 2002 <sup>7</sup>                                                               | 1979                                                         | Never reported                                                                | -                                                                                                                 | 1988                                                         |
| Surveillance              | Active<br>Risk-based, (NSP, SP)<br>1x/yr. post-vaccination<br>spring/autumn       | Active<br>Risk-based (NSP, SP)<br>1x/yr. post-vaccination<br>spring/autumn | Passive                                                      | Active in 6 southern regions<br>bordering Thrace, tests every<br>3m.<br>Passive in whole country                                        | Active<br>Risk-based (NSP, SP)                                                  | Active                                                       | Active, passive<br>Clinical exam. &<br>serosurveillance in<br>high-risk areas | Active<br>Clinical exam. since 2013<br>Thrace(only):<br>serosurveillance                                          | Active                                                       |
| Vaccination               | Yes<br>High-risk areas<br>LR: 2x/yr.<br>SR: 1x/yr.                                | Yes<br>LR: 2x/yr. spring-autumn<br>SR: 1x/yr. spring/autumn                | No                                                           | No                                                                                                                                      | Yes (Risk-based since<br>2017)<br>All susceptible LR& SR<br>in high-risk areas) | No                                                           | No                                                                            | Yes<br>LR: 2x/yr. spring-autumn<br>SR: only Thrace, 1x/yr. 21d<br>pre-seasonal pastures                           | No                                                           |
| <b>LSD</b>                | Armenia                                                                           | Azerbaijan                                                                 | Belarus                                                      | Bulgaria                                                                                                                                | Georgia                                                                         | Moldova                                                      | Romania                                                                       | Türkiye                                                                                                           | Ukraine                                                      |
| Status                    | Sporadic                                                                          | Sporadic                                                                   | Absent                                                       | Absent                                                                                                                                  | Absent                                                                          | Absent                                                       | Absent                                                                        | Sporadic                                                                                                          | Absent                                                       |
| Last outbreak             | 2016                                                                              | 2014                                                                       | Never reported                                               | 2016                                                                                                                                    | 2018                                                                            | Never reported                                               | Never reported                                                                | 2021                                                                                                              | Never reported                                               |
| Surveillance              | Passive                                                                           | Passive                                                                    | Active (clinical<br>examination)<br>Passive                  | Active: regions bordering<br>Thrace, clinical exam.<br>Passive: whole country                                                           | Active, passive                                                                 | Passive                                                      | Passive                                                                       | Active, passive                                                                                                   | Passive                                                      |
| Vaccination<br>(Only LR)  | Yes<br>Adult cattle: high-risk<br>zones (borders with<br>neighbouring countries)  | Yes                                                                        | No                                                           | Yes<br>2016: blanket vaccination<br>Last 5 yrs.: vaccination<br>coverage 84% to 98%                                                     | Yes<br>Risk-based                                                               | No                                                           | No                                                                            | Yes<br>>3m whole country                                                                                          | No                                                           |
| <b>PPR</b>                | Armenia                                                                           | Azerbaijan                                                                 | Belarus                                                      | Bulgaria                                                                                                                                | Georgia                                                                         | Moldova                                                      | Romania                                                                       | Türkiye                                                                                                           | Ukraine                                                      |
| Status                    | Absent                                                                            | Absent                                                                     | Absent                                                       | Absent                                                                                                                                  | Absent                                                                          | Absent                                                       | Absent                                                                        | Anatolia: Endemic<br>Thrace: PPR-protected area                                                                   | Absent                                                       |
| Last outbreak             | Never reported                                                                    | Never reported                                                             | Never reported                                               | 2018                                                                                                                                    | 2016                                                                            | Never reported                                               | Never reported                                                                |                                                                                                                   | Never reported                                               |
| Surveillance<br>(Only SR) | Active<br>Risk-based<br>(ELISA and PCR<br>in 2019/2020 w/ no<br>positive results) | Active<br>ELISA                                                            | No programme                                                 | Active & risk-based (regions<br>bordering Thrace): samples<br>every 2m; Enhanced in regions<br>w/ PPR in 2018<br>Passive: whole country | Active                                                                          | Passive                                                      | Active, passive<br>Clinical exam.<br>before & after<br>pasture season         | Passive                                                                                                           | Passive                                                      |
| Vaccination               | No                                                                                | No                                                                         | No                                                           | No                                                                                                                                      | Yes                                                                             | No                                                           | No                                                                            | Thrace: No (since March<br>2021); Anatolia: >3m;<br>unvaccinated adults + all SR<br>in outbreak areas             | No                                                           |

LR: large ruminants, SR: small ruminants, yr.: year; m: month; d: day, BTM: Bulk tank milk. <sup>1</sup>\*last reported case affected equine (2019); <sup>2</sup>\*last reported case affected swine (2008).

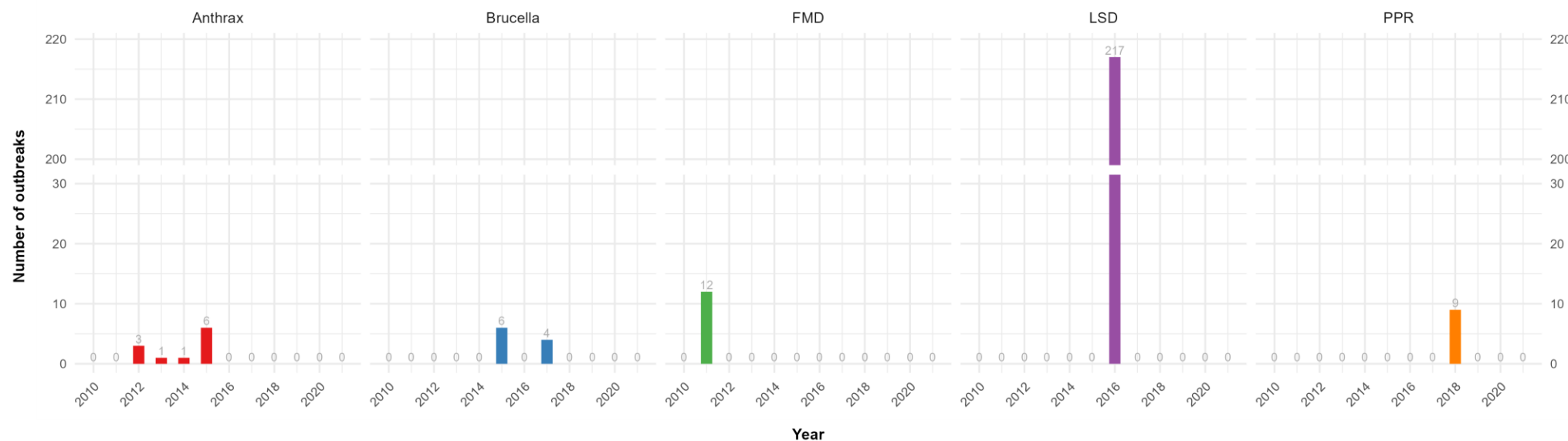
S5: Temporal distribution from 2010 to 2021 of outbreaks in large ruminants (LR) and small ruminants (SR) for the selected diseases by country.



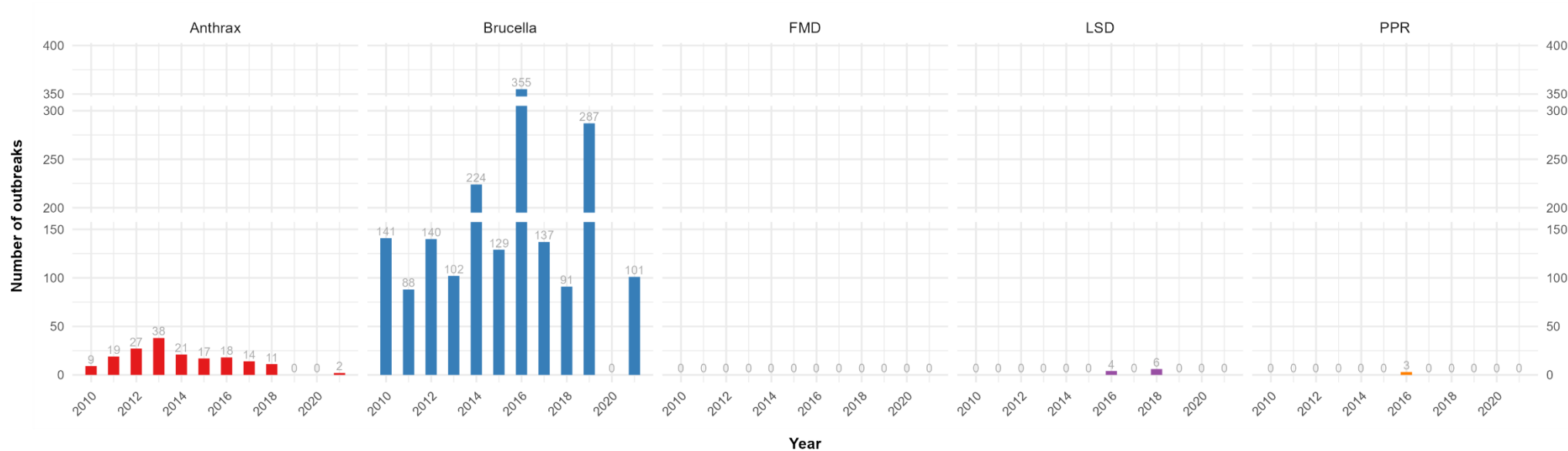
## Belarus



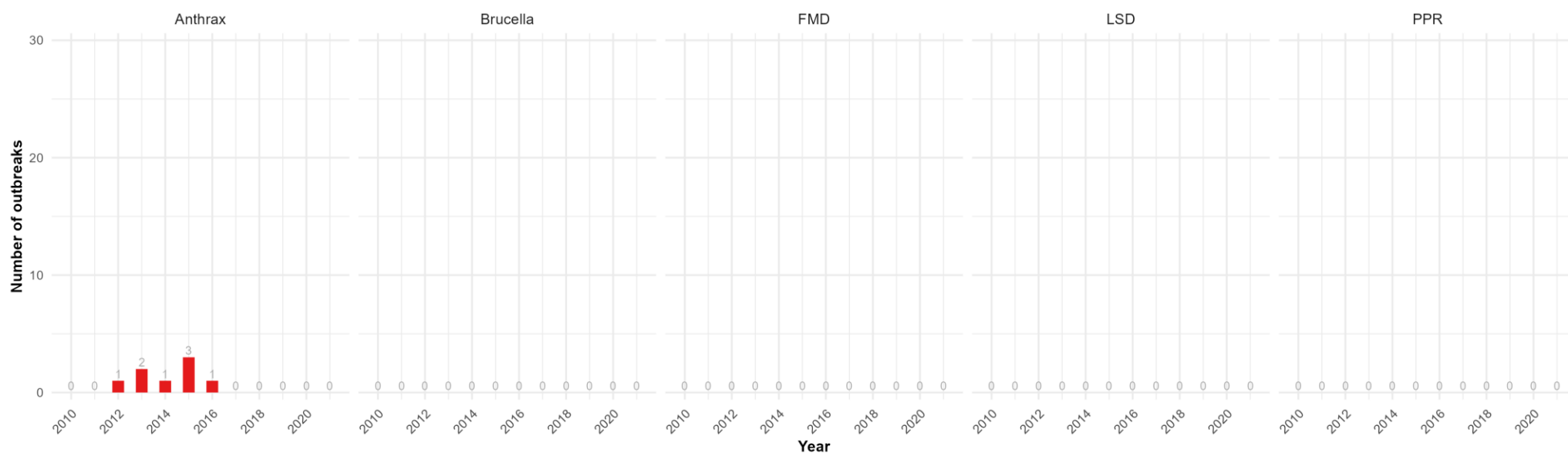
## Bulgaria



## Georgia



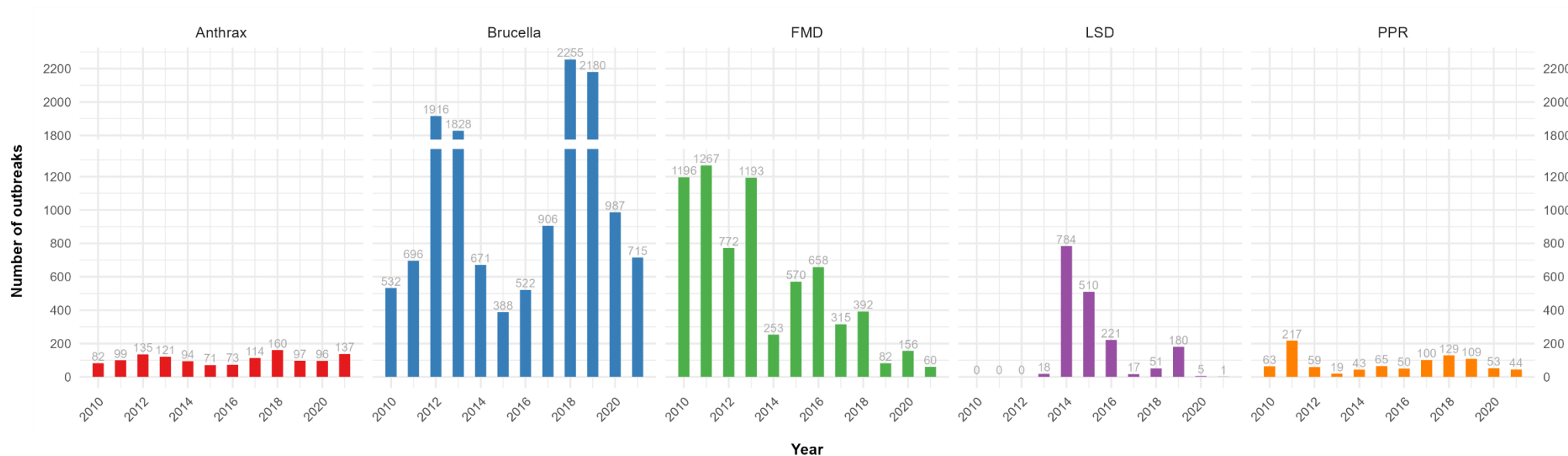
## Moldova



## Romania



## Türkiye





## S6: Definitions

### Farm type classification:

- **Smallholder farms**, interchangeably called family or backyard farms, include a range of producers, from the most impoverished to those that gradually become involved with markets at a local or national level<sup>8</sup>. This term is related to a holding with a smaller size (lower number of animal heads), often characterized by having fewer resources and low productivity, and its main purpose is subsistence or semi-subsistence.
- **Commercial farms** are defined as having a larger scale and a higher number of animals. They are associated with a high investment, for their use of modern technology and wider access to resources, present higher efficiency, and have the main purpose of commercializing final products.

**Pastoralism** is an extensive livestock production practised in drylands and characterised by seasonal movements and common use of natural resources<sup>9</sup>.

- **Nomadism** is based on the flexible seasonal migration of livestock that rarely has a home base.
- **Transhumance** is the regular movement of herd animals between fixed points to utilize pasture and water seasonal availability. It can be vertical when movements are based on ancient routes to mountainous regions; or horizontal, based on opportunistic movements developed over a few years, in disrupted areas due to climatic, political, and/or economic changes.
- **Agropastoralism** is the mixed production of crops and livestock that are grazed close to their village<sup>10</sup>.

### Disease Status

- **Sporadic disease**: is a disease that occurs infrequently and irregularly in space and time<sup>11,12</sup>.
- **Endemic disease**: is the presence of a disease or infectious agent over a long time in a population within a geographical area<sup>11,12</sup>.
- **Transboundary animal diseases (TADs)**, as the key feature that defines them, are diseases that can spread rapidly between countries and reach epidemic proportions, leading to significant socioeconomic impacts in a region<sup>13,14</sup>. Moreover, effectively managing and controlling these diseases requires constant cooperation between countries<sup>14</sup>. Which justifies constant cooperation between countries for effective disease management and control<sup>14</sup>.
- **Zoonoses**: are naturally transmissible diseases between animals and humans<sup>15</sup>, that raise additional concerns for public health, in addition to their impact on livestock.

## References

1. FAO. FAOSTAT. Published 2022. Accessed July 5, 2022. <https://www.fao.org/faostat/en/#data/QV>
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