The European Union summary report on surveillance for the presence of transmissible spongiform encephalopathies (TSE) in 2020

European Food Safety Authority (EFSA)

Abstract

This report presents the results of surveillance on transmissible spongiform encephalopathies (TSE) in cattle, sheep, goats, cervids and other species, and genotyping in sheep, carried out in 2020 by 27 Member States (MS, EU27), the United Kingdom (UK) and other seven non-EU countries: Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland. In total, 1,122,671 cattle were tested by EU27 and the UK (−2.4%, compared with 2019), and 51,775 cattle by the other seven non-EU, with three cases of H-BSE in France, Ireland and Spain, and two L-BSE in France and Switzerland. In total, 332,579 sheep and 120,615 goats were tested in the EU27 and the UK (−1.6% and −16%, respectively). In sheep, 688 cases of scrapie were reported by 16 MS and the UK: 589 classical scrapie (CS) by seven MS [81 index cases (IC), one of ARR/ARR genotype and 97% with genotypes of susceptible groups], 98 atypical scrapie (AS) (88 IC) by 14 MS and the UK, and one CH1641-like. In addition, Italy reported 12 inconclusive cases. In total, 26,053 sheep and 712 goats were tested in the other non-EU countries with 53 CS in Iceland and 12 AS in Norway. Random genotyping was reported by nine MS: with Cyprus excluded, 8.8% carried the genotypes of susceptible groups. In goats, 328 cases of scrapie were reported: 319 CS (52 IC) by six MS and the UK, and nine AS (9 IC) by five MS. The last of the 3-year surveillance programme for chronic wasting disease (CWD) in Estonia, Finland, Latvia, Lithuania, Poland and Sweden resulted in 6,974 tested cervids and two CWD cases in wild moose, in Finland and Sweden. Other six MS and the UK tested 2,197 cervids, all negative. Norway tested 22,528 cervids of which one wild moose and one wild reindeer were positive. In total, 101 animals from three other species tested negative in Finland.

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Summary

This report of the European Food Safety Authority (EFSA) presents the detailed results of surveillance activities on animal transmissible spongiform encephalopathies (TSE) carried out during 2020 in the European Union (EU), in the United Kingdom (UK) and in other seven non-Member States (MS), i.e. Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland, as well as genotyping data in sheep. With regard to the withdrawal of the UK from the EU, on 29 October 2019 (European Council Decision (EU) 2019/1810), the European Council agreed to an extension of Art. 50 of the Treaty on European Union (2012/C 326/01) until 31 January 2020. On this basis, the UK remained a Member State (MS) with all rights and obligations until 31 January 2020 (included) and became a non-member country on 1 February 2020.

TSE monitoring data for cattle, sheep, goats, cervids and species other than domestic ruminants are reported by country according to Regulation (EC) 999/2001 (the TSE Regulation) and consist of testing and case data. Surveillance data were mainly submitted through the EFSA TSE data reporting tool. Six MS submitted data directly as eXtensible Markup Language (XML) files by using their own system for the automatic upload of data into the EFSA Data Collection Framework (DCF), whereas the rest of the reporting countries submitted XML files by the EFSA TSE data collection tool. The electronically submitted data were extracted from the EFSA database and further processed and validated to summarise the information and to draft the summary tables presented in the current EU summary report (EUSR).

To allow direct comparisons of 2020 data with those of the previous year at EU level and to obtain comparable trend data, in this report, the 2020 EU27 data (i.e. data from the current 27 European Union MS, referred to in the report as ‘EU27’) have been summed up with those provided by the UK. However, all tables have been amended by presenting separately the EU27 totals and those including EU27 data plus the UK data. Totals obtained from the three European Free Trade Association (EFTA) countries (Iceland, Norway and Switzerland) and the four non-EFTA IPA (Instrument for Pre-Accession Countries) (Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia) were referred as to other non-EU reporting countries (shortened in the text ‘other non-EU’).

In total, 1,122,671 cattle were tested in 2020 in the EU27 and the UK, a 2.4% reduction compared with the previous year. Over 88.5% of all cattle tested in the EU27 and the UK was concentrated in the group of risk animals [emergency slaughtered animals (ES), animals with clinical signs at ante-mortem inspection (AM) and fallen stock (FS)], with FS being the largest contributor with 924,698 cattle tested in 2020 (93.1% of all cattle in the risk group). Additional 51,775 cattle were tested by the other seven non-EU. Serbia (the main contributor with 13,978 cattle tested) and Bosnia and Herzegovina reported mostly cattle from the healthy slaughtered (HS) target group (12,848).

In the EU, four atypical cases of BSE were confirmed in 2020 by France (one H-BSE and one L-BSE), Ireland (one H-BSE) and Spain (one H-BSE), all born between 2003 and 2008 and detected in the FS testing group. In addition, one L-BSE case, submitted to the ES testing group, was reported by Switzerland.

In total, 453,194 small ruminants were tested in 2020 in the EU27 and the UK: 332,579 sheep (a 1.6% decrease from 2019) and 120,615 goats (a 16% decrease). In addition, 26,053 sheep were tested by four of the seven other non-EU, namely Iceland, North Macedonia, Norway and Serbia, and 712 goats by three, namely, Iceland, North Macedonia and Norway.

In sheep, 688 scrapie cases were reported in the EU27 and the UK in 2020, 309 less cases than in 2019. In total, 589 cases of scrapie in sheep were reported by two (Iceland and Norway) of the four other non-EU that tested sheep. Classical scrapie (CS) was reported by seven MS and one other non-EU, namely Bulgaria, Cyprus, Greece, Italy, Portugal, Romania, Spain and Iceland; whereas atypical scrapie (AS) was reported by 14 MS, namely Belgium, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Romania, Slovakia, Spain, Sweden; plus the United Kingdom and other non-EU (Norway). An additional total of 12 cases in sheep were reported as inconclusive by Italy, which are not included in the total scrapie caseload for this country. Most of the ovine cases in the EU27 were CS cases (85.7%) and 98 were AS (14.3%) and Italy reported one CH1641-like case. Among the other non-EU, 53 CS cases were reported by Iceland and 12 AS cases by Norway. In sheep, 24.6% (169) of all cases in the EU27 and the UK reported in 2020 were index cases (IC), with a much higher proportion in AS cases (89.8%) compared with CS cases (13.8%). In total, 97% of the CS cases in sheep reported in 2020 with known National Scrapie Plan
(NSP) genotypes belonged to animals holding genotypes of the susceptible groups (NSP3, NSP3O, NSP4 or NSP5). One CS case was reported by Romania in a sheep carrying the ARR/ARR genotype, a very rare occurrence.

In goats, in total, 328 scrapie cases were reported in the EU27 and the UK: nine were AS cases and 319 CS (97.3 with Cyprus accounting for 74% of these). Compared with 2019, when 379 CS cases were reported, there was a 15.8% reduction (~60) mainly due to the situation in Cyprus that has improved continuously over the last 7 years. Four MS (Bulgaria, Cyprus, Romania, Greece) and the UK reported CS, whereas three MS (Denmark, France, and Portugal) reported AS. Italy and Spain reported both CS and AS. The three other non-EU (Iceland, Serbia and Norway) that reported tested goats did not report any scrapie cases.

In goats, 18.6% of all cases reported in the EU27 and the UK in 2020 were IC, higher than in 2019 (8.7%), with a higher proportion in AS (100%) than in CS (16.3%).

CS is still the most frequently reported type of scrapie in the EU in both species.

With regard to the long-term trends (cases per 10,000 tests), the situation in 2020 confirmed the 10-year statistically significant decrease in sheep (5% annually for both CS and AS) and no detectable trends in goats for either CS or AS.

In 2020, the genotyping activity from random samples of the national EU sheep populations was carried out by nine MS: Belgium, Cyprus (where genotyping is conducted systematically in the breeding sheep population), France, Germany, Greece, Italy, Latvia, the Netherlands and Poland. After excluding Cyprus, 8.8% of the randomly genotyped sheep still carried genotypes of the susceptible groups, lower than the 15.7% in 2019. The percentage of susceptible sheep stands at 44.4% in Greece and 27.3% in Italy, two of the countries with the highest case load in 2020, whereas it was between 12% and 30% in the remaining six MS.

The enforcement of a 3-year surveillance programme for CWD in six MS – Estonia, Finland, Latvia, Lithuania, Poland and Sweden – resulted in 2020 in the testing of 6,974 cervids and the confirmation of two cases of CWD in wild moose, one in Finland and one in Sweden. The implementation of the mandatory surveillance in the six MS is quite heterogeneous in terms of design [number and characteristics of the declared primary sampling units (PSU)], number of cervids tested in general and per PSU and distribution of testing by species and target groups. In 2020, the hunted/slaughtered fit for human consumption (HSHC) animals was the most tested target group with 56.8% of all tested cervids, as observed in the first 2 years of implementation, consolidating a situation in which the sensitivity of the surveillance system to detect cases of CWD was lower than expected. The other six MS – Austria, Belgium, Hungary, Italy, Romania and Spain – and the UK – tested 2,197 cervids, all with negative results and with Romania accounting for 68.9% of all cervids tested by them. In 2020, Norway continued its intensified testing programme in wild and captive cervids and tested 22,528 animals, mostly semi-domesticated reindeer (28.9%), followed by wild moose (27.5%) leading to the detection of two cases (one wild reindeer and one wild moose). Additionally, Iceland and Serbia reported testing of 33 and 76 cervids, respectively, which were all negative.

In total, a total of 101 animals of other species were TSE tested by Finland: 15 raccoon dogs (Nyctereutes procyonoides), 51 American minks (Neovison vison) and 35 foxes (genus Vulpes). None of them tested positive.
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1. Introduction

1.1. Background and Terms of Reference

According to Part I.A, Chapter B, Annex III of Regulation (EC) 999/20011 (here referred to as the transmissible spongiform encephalopathy (TSE) Regulation), the information to be presented by MS in their annual report, as provided for in Article 6(4), includes:

1) The number of suspected cases placed under official movement restrictions in accordance with Article 12(1), per animal species.
2) The number of suspected cases subject to laboratory examination in accordance with Article 12(2), per animal species, including the results of the rapid and confirmatory tests (number of positives and negatives) and, with regard to bovine animals, the age distribution of all tested animals. The age distribution should be grouped as follows: 'below 24 months', distribution per 12 months between 24 and 155 months and 'above 155 months' of age.
3) The number of flocks where suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2).
4) The number of bovine animals tested within each subpopulation referred to in Chapter A, Part I, points 2.1, 2.2, 3.1 and 5. The method of the sample selection, the results of the rapid and confirmatory tests and the age distribution of the tested animals grouped as set out in point 2 should be provided.
5) The number of ovine and caprine animals and flocks tested within each subpopulation referred to in Chapter A, Part II, points 2, 3, 5 and 6 together with the method for sample selection and the results of the rapid and confirmatory tests.
6) The geographical distribution, including the country of origin if not the same as the reporting country, of positive cases of BSE and scrapie. The year, and where possible the month of birth should be given for each TSE case in bovine, ovine and caprine animals. TSE cases that have been considered atypical shall be indicated. For scrapie cases, the results of the primary and secondary molecular testing, referred to in Annex X, Chapter C, point 3.2 (c), shall be reported, when appropriate.
7) In animals other than bovine, ovine and caprine animals, as well as in cervids other than those covered by the 3-year CWD monitoring programme referred to in Part III.A of Chapter A of this Annex, the number of samples and confirmed TSE cases per species.
8) The genotype, and, where possible, the breed, of each ovine animal found positive to TSE and sampled in accordance with Chapter A, Part II, point 8.
9) For Member States covered by the 3-year CWD monitoring programme referred to in Part III.A of Chapter A of this Annex, the annual report for the years 2018, 2019 and 2020 shall include:
   a) The number of cervid samples submitted for testing, by target group according to the following criteria:
      – Primary Sampling Unit (PSU) identifier,
      – species,
      – management system (farmed, captive, wild or semi-domesticated),
      – target group,
      – sex.
   b) The results of the rapid and confirmatory tests (number of positives and negatives) and, where applicable, of further isolate characterisation investigations, the tissue sampled and the rapid test and confirmatory technique used.
   c) The geographical location, including the country of origin if not the same as the reporting Member State, of positive cases of TSE.
   d) The genotype and species of each cervid found positive for TSE.
   e) Where tested, the genotype of cervids tested and found negative for TSE.

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1 Regulation (EC) No 999/2001 of the European Parliament and of the Council of 22 May 2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies. OJ L 147, 31.5.2001, p. 1–40.
Changes in points 7 and 9 are the result of the amendment following Commission Regulation (EU) 2017/1972, amending Annexes I and III of the TSE Regulation (see Section 1.2.4).

According to Part I.B, Chapter B of the same Annex III:

‘The compilation of reports containing the information referred to in Section A and submitted to the Commission (which shall send it to the European Food Safety Authority) on a monthly basis in the electronic format agreed between the Member States, the Commission and the European Food Safety Authority or, with regard to the information referred to in point 8 on a quarterly basis, may constitute the annual report as required by Article 6(4), provided that the information is updated whenever additional information becomes available.’

According to Part II of Chapter B, the Union summary shall be presented in a tabled format covering at least the information referred to in Part I.A for each Member State.

### 1.2. Surveillance of TSE in the European Union

#### 1.2.1. Legal basis

Animals suspected of a TSE should be examined in accordance with Article 12.2 of the TSE regulation. The legal framework for the active surveillance (i.e. the testing of animals not reported as suspected of being infected by a TSE) of ruminants for the presence of TSE is laid down in Article 6 of the TSE regulation, and specified in its Annex III, Chapter A.

Commission Decision 2009/719/EC allowed MS to apply a revised BSE monitoring programme. Commission Implementing Decision 2013/76/EU of 4 February 2013, amending Commission Decision 2009/719/EC, authorised 25 MS to decide to stop testing slaughtered bovine animals for human consumption. Following the EFSA scientific report on the valuation of the revision of the BSE monitoring regime in Croatia (EFSA, 2016) and the Commission Implementing Decision (EU) 2016/851, Croatia was allowed to discontinue the testing of slaughtered bovine animals for human consumption, that is still required for Bulgaria and Romania.

With regard to the withdrawal of the United Kingdom (UK) from the EU, on 29 October 2019 (European Council Decision (EU) 2019/1810), the European Council agreed to an extension of Art. 50 of the Treaty on European Union (2012/C 326/01) until 31 January 2020. On this basis, the UK remained an MS with all rights and obligations until 31 January 2020 (included) and became a third country on 1 February 2020. A transition period was agreed as part of the Agreement of the withdrawal and ended on 31 December 2020.

The legal basis for the sample collection and for the test methods is laid down in Chapter C of Annex X of the TSE regulation. From 2005, Annex X [as amended by Commission Regulation (EC) No 36/2005] also provides for mandatory discriminatory testing for BSE of TSE cases detected in small ruminants.

There were two amendments of the TSE Regulation in 2020 affecting TSE surveillance:

Commission Regulation (EU) 2020/772 of 11 June 2020 amended Annexes I, VII and VIII to Regulation (EC) No 999/2001 regarding the eradication measures for transmissible spongiform encephalopathies in goats and endangered breeds: The amendment allows the exemption of caprine animals carrying K222, D146 and S146 from cull and complete destruction as they confer genetic resistance against CS.

Commission Regulation (EU) 2017/1972 of 30 October 2017 amending Annexes I and III to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards a surveillance programme for chronic wasting disease in cervids in Estonia, Finland, Latvia, Lithuania, Poland and Sweden and repealing Commission Decision 2007/182/EC.

Since 2018, TSE data are submitted by reporting countries directly to the European Food Safety Authority (EFSA) with different frequency and periodicity.

Commission Decision 2009/719/EC of 28 September 2009 authorising certain Member States to revise their annual BSE monitoring programmes. OJ L 256, 29.9.2009, p. 35–37.

Commission Implementing Decision of 4 February 2013 amending Decision 2009/719/EC authorising certain Member States to revise their annual BSE monitoring programmes.

Commission Implementing Decision (EU) 2016/851 of 26 May 2016 amending the Annex to Decision 2009/719/EC as regards the authorisation for Croatia to revise its BSE annual monitoring programme. OJ L 141, 28.5.2016, p. 131–132.

European Council Decision (EU) 2019/1810 taken in agreement with the United Kingdom of 29 October 2019 extending the period under Article 50(3)TEU XT/20024/2019/REV/2. OJ L 278I, 30.10.2019, p. 1-3.

Commission Regulation (EC) No 36/2005 of 12 January 2005 amending Annexes III and X to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards epidemic-surveillance for transmissible spongiform encephalopathies in bovine, ovine and caprine animals. OJ L 10, 13.1.2005, p. 9–17.
Commission Regulation (EU) 2020/1593 of 29 October 2020 on the further examination of positive cases of transmissible spongiform encephalopathies in ovine and caprine animals.\(^9\) Based on the low probability of BSE occurrence, for case of positive TSE cases in ovine and caprine animals, the new provision requires the discriminatory testing conducted only to the ‘index case’, amending point 3.2 of Chapter C of Annex X to Regulation (EC) No 999/2001. For previous amendments, see 2019 EFSA EUSR (EFSA, 2020).

### 1.2.2. BSE surveillance of bovine animals

As described in the 2016 European Union Summary Report (EUSR) (EFSA, 2017) on TSE, the BSE surveillance of bovine animals is based on the testing of samples from the following target groups: emergency slaughtered animals (ES); animals with clinical signs at ante-mortem (AM); fallen stock (FS); healthy slaughtered animals (HS); animals clinically suspected of being infected by BSE (SU); and animals culled under BSE eradication measures (EM).

The categories of bovine animals to be submitted for BSE testing are defined in the TSE Regulation and are based on a combination of age (age limits have been changed over time) and surveillance target groups. The general rules for BSE surveillance in EU, applied in 2020, are summarised in Table 1. A table summarising the evolution of the changes (age limits for different target groups) was published in the 2015 EUSR on TSE (EFSA, 2016).

However, there are still some differences in the application of these general rules due to specific national rules that provide some residual testing of HS or the testing of at-risk animals (AM, ES and FS) at younger age. The age limits (in months) of bovine animals tested for BSE surveillance applied in 2020 by Member State (MS), UK or the other non-EU (Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland) are shown in Table 2.

#### Table 1: Criteria for BSE surveillance in bovine animals as applied in 2020 by country, age limit and surveillance target group, based on the TSE Regulation, as last amended, Commission Implementing Decision 2013/76/EU of 4 February 2013 and Commission Implementing Decision (EU) 2016/851 of 26 May 2016

| Surveillance target group | EU25 + UK | Romania, Bulgaria\(^{(a)}\) |
|---------------------------|-----------|-----------------------------|
| Emergency slaughtered animals (ES) | > 48 months | > 24 months |
| Animals with clinical signs at ante-mortem (AM) | | |
| Fallen stock (FS) | No mandatory testing required | > 30 months |
| Healthy slaughtered animals (HS) | No mandatory testing required | |
| Animals clinically suspected of being infected by BSE (BSE suspects) (SU) | All | All |
| Animals culled under BSE eradication measures (EM) | | |

(a): Different criteria were applied in 2020 because Bulgaria and Romania were not in the list of the 25 Member States and UK authorised to revise their BSE annual surveillance programmes.

#### Table 2: Age limits (in months) of bovine animals tested for BSE surveillance applied in 2020 by reporting country and surveillance target group

| Country | ES | AM | FS | HS | SU | EM |
|---------|----|----|----|----|----|----|
| AT      | > 24 | > 24 | > 48\(^{(a)}\) | No testing | No age limit | No age limit |
| BE      | > 48 | > 48 | > 48 | No testing | No age limit | > 24 |
| BG      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| CY      | > 48 | > 48 | > 48 | No testing | No age limit | > 48 |
| CZ      | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| DE      | > 48 | > 24 | > 48 | No testing | No age limit | No age limit |

\(^9\) Commission Regulation (EU) 2020/1593 of 29 October 2020 amending Annex X to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards further examination of positive cases of transmissible spongiform encephalopathies in ovine and caprine animals. OJ L 360, 30.10.2020, p. 13-15.
As described in the 2016 EUSR on TSE (EFSA, 2017), the surveillance of ovine and caprine animals for the presence of TSE is performed based on testing samples obtained from the following surveillance target groups: animals culled under TSE eradication measures (EM); animals not slaughtered for human consumption (NSHC); healthy animals slaughtered for human consumption (SHC) and animals clinically suspected of being infected by TSE (SU).

| Country | ES | AM | FS | HS | SU | EM |
|---------|----|----|----|----|----|----|
| DK      | > 48 | > 48 | > 48 | No testing | No age limit | > 48 |
| EE      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| EL      | > 48 | > 48 | > 48 | > 72 | No age limit | No age limit |
| ES      | > 48 | > 48 | > 48 | Born before 2001 and coming from herds with BSE-positive cases | No age limit | No age limit |
| FI      | > 48 | > 48 | > 48 | No testing | No age limit | No age limit |
| FR      | > 48 | > 48 | > 48 | Born before 1/1/2002 | No age limit | > 48 |
| HR      | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| HU      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| IE      | > 48 | > 48 | > 24 | No testing | No age limit | > 48 |
| IT      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| LT      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| LU      | > 48 | > 48 | > 24 | No testing | No age limit | > 48 |
| LV      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| MT      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| NL      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| PL      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| PT      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| RO      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| SE      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| SI      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| SK      | > 24 | > 24 | > 24 | No testing | No age limit | No age limit |
| UK      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| BA      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| CH      | > 48 | > 48 | > 24 | No testing | No age limit | No age limit |
| IS      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| ME      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| MK      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| NO      | > 24 | > 24 | > 24 | > 30 | No age limit | No age limit |
| RS      | > 24 | > 24 | > 24 | > 72 | No age limit | No age limit |

ES: emergency slaughtered; AM: animals with clinical signs ante-mortem; FS: fallen stock; HS: healthy slaughtered; SU: animals clinically suspected of being infected with BSE; EM: animals culled under BSE eradication measures.

The eight non-EU (UK from 1 February 2020) are included in the table for information. The TSE regulation does not apply to the eight non-EU except UK (until 31 January 2020), in accordance with the Agreement on the Withdrawal of the UK from the EU, and in particular with the established transition period, the EU requirements on data sampling also applied to the UK (2019/C 384 I/01).

### 1.2.3. TSE surveillance of small ruminants

As described in the 2016 EUSR on TSE (EFSA, 2017), the surveillance of ovine and caprine animals for the presence of TSE is performed based on testing samples obtained from the following surveillance target groups: animals culled under TSE eradication measures (EM); animals not slaughtered for human consumption (NSHC); healthy animals slaughtered for human consumption (SHC) and animals clinically suspected of being infected by TSE (SU).

The term TSE surveillance is used in small ruminants as both scrapie and BSE have been detected naturally in small ruminants. When reporting TSE cases in small ruminants, the TSE type assigned is scrapie, unless stated otherwise.
Target surveillance groups in small ruminants to be reported for surveillance for TSE in 2020 based on the infection status of flock/ herd/ holding, the case type detected and the control measures taken according to the TSE Regulation have been summarised in Table 3.

The minimal sample sizes for NSHC and SHC are set out in Tables A and B of Annex III, Chapter A, Section II, point 3 and point 2(a) and (b), respectively, of the TSE Regulation. The application of the quotas according to sheep and goat populations in each MS is displayed in Table 4. MS may choose to replace up to a maximum of 50% of their SHC ovine and caprine animals by animals obtained from NSHC, e.g. dead ovine and caprine animals over the age of 18 months and up to a maximum of 10% of their ovine and caprine animals tested in SHC and NSHC by animals (> 18 months of age) killed as part of disease eradication campaign(s) at a ratio of 1:1.

1.2.3.1. Genotyping in sheep

The prion protein genotype for the codons 136, 154 and 171 should be determined for each positive TSE case in sheep.

As described in the 2018 EUSR on TSE (EFSA, 2019), the Regulation (EC) 894/2017 amended in 2017 the TSE Regulation with regard to representative genotyping activities in the ovine populations. The changes in the TSE regulation no longer require genotyping a minimum sample of at least 600 animals for MS with an adult sheep population of > 750,000 animals, and for other MS, to genotype a minimum sample of at least 100 animals. The new requirements establish to genotype once every 3 years with a minimum sample of at least 1,560 ovine animals; or at a frequency and with a sample size determined by the MS based on compliance with a set of criteria.
**Table 3:** Target surveillance groups in small ruminants to be reported for surveillance for TSE based on the infection status of flock/herd/holding, the case type detected, and the control measures taken according to the TSE Regulation

| Reported flock/herd status | Index case | Case type | Control measures taken | Sampled population | Surveillance target group to be reported |
|---------------------------|------------|-----------|------------------------|--------------------|----------------------------------------|
| Non-infected flock/herd<sup>(b)</sup> | Yes | CS or AS | n/a | Slaughtered for human consumption. Annex III, Chapter A, Part II, point 2 | SHC |
| | | | | Not slaughtered for human consumption. Annex III, Chapter A, Part II, point 3 | NSHC |
| | | | | TSE suspects | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Killing and complete destruction of all animals (option 1), TSE Regulation, Annex VII, Chapter B, point 2.2.2<sup>(b)</sup> or killing and complete destruction of the susceptible animals only (option 2<sup>(a)</sup>) Annex VII, Chapter B, point 2.2.2<sup>(c)</sup> | Culled and destroyed under options 1 or 2 | EM |
| | | | | Slaughtered for human consumption after application of option 1 or option 2<sup>(a)</sup> | SHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1 and 2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Follow-up after implementation of control measures according to Annex VII, point 2. Intensified TSE monitoring protocol (Annex VII, point 3) after option 1 or option 2, or if derogation of option 2 was established, after complete destruction or slaughtering for human consumption of identified animals. | Slaughtered for human consumption point 3.1.<sup>(a)</sup> | SHC |
| | | | | Not slaughtered for human consumption point 3.1.<sup>(b)</sup> | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1 and 2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Follow-up after implementation of control measures according to Annex VII, point 2. Intensified TSE monitoring protocol (Annex VII, point 4) after option 3. | Slaughtered for human consumption point 4.1.<sup>(a)</sup> | SHC |
| | | | | Not slaughtered for human consumption point 4.1.<sup>(b)</sup> | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1 and 2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | CS | Intensified TSE monitoring protocol pending the implementation of control measures according to the derogation in point 2.2.2.(c)(iii) and after the implementation of the control measures | Slaughtered for human consumption. Points 4.1.<sup>(a)</sup> and 3.1.<sup>(a)</sup> | SHC |
| | | | | Not slaughtered for human consumption. Points 4.1.<sup>(b)</sup> and 3.1.<sup>(b)</sup> | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1 and 2 | SU |
| TSE infected flock/herd under official control at sampling<sup>(c)</sup> | No | AS | Intensified TSE monitoring protocol after the detection of an Atypical Scrapie case (Annex VII point 2.2.3) | Slaughtered for human consumption point 2.2.3 | SHC |
| | | | | Not slaughtered for human consumption point 2.2.3 | NSHC |
| | | | | TSE clinical suspects Chapter 4, Article 12, points 1 and 2 | SU |
TSE: transmissible spongiform encephalopathy; CS: classical scrapie; AS: atypical scrapie; EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption SU: animals clinically suspected of being infected by TSE.
(a): Option 2 can be applied both to sheep and goats (genotyping and culling).
(b): Sheep flocks or goat herds that are not under control measures or intensified TSE protocols or a sheep flock or goat herd that has never been infected with scrapie and for which every new detected case will be an index case.
(c): Sheep flocks or goat herds that are under control measures or intensified TSE protocols or a sheep flock or goat herd that has been infected during reporting year.
Table 4: Minimum sample size for the TSE surveillance in small ruminants by reporting country in 2020

| Country | Sheep | Goats |
|---------|-------|-------|
|         | Population size(a) | Surveillance target group | Population size(a) | Surveillance target group |
|         | SHC | NSHC | SHC | NSHC |
| AT | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| BE | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| BG | > 750 | 10,000 | 10,000 | 40–250 | 0 | 100% up to 500 |
| CY | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| CZ | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| DE | > 750 | 10,000 | 10,000 | 40–250 | 0 | 100% up to 500 |
| DK | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| EE | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| EL | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| ES | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| FI | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| FR | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| HR | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 500 |
| HU | > 750 | 10,000 | 10,000 | < 40 | 0 | 100% up to 100 |
| IE | > 750 | 10,000 | 10,000 | < 40 | 0 | 100% up to 100 |
| IT | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| LT | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| LU | < 40 | 0 | 100% up to 100 | < 40 | 0 | 100% up to 100 |
| LV | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| MT | < 40 | 0 | 100% up to 100 | < 40 | 0 | 100% up to 100 |
| NL | 100–750 | 0 | 1,500 | 250–750 | 0 | 1,500 |
| PL | 100–750 | 0 | 1,500 | 40–250 | 0 | 100% up to 100 |
| PT | > 750 | 10,000 | 10,000 | 250–750 | 0 | 1,500 |
| RO | > 750 | 10,000 | 10,000 | > 750 | 10,000 | 10,000 |
| SE | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| SI | 40–100 | 0 | 100% up to 500 | < 40 | 0 | 100% up to 100 |
| SK | 100–750 | 0 | 1,500 | < 40 | 0 | 100% up to 100 |
| UK | > 750 | 10,000 | 10,000 | 40–250 | 0 | 100% up to 500 |
| BA | > 750 | 40–250 | 40–250 |
| CH | – | – | – |
| IS | 100–750 | < 40 |<40 |
| ME | 100–750 | < 40 |<40 |
| MK | 100–750 | 40–250 | 40–250 |
| NO | > 750 | 40–250 | 40–250 |
| RS | > 750 | 1,000(b) | 40–250 | 1,000(c) | 1,000(c) |

**NSHC:** animals not slaughtered for human consumption; **SHC:** animals slaughtered for human consumption; **TSE:** transmissible spongiform encephalopathy. (-): No active surveillance system (in CH only suspect animals are tested).

The eight non-EU reporting countries (UK from 1 February 2020) are included in the table for information. The TSE regulation does not apply to the eight non-EU except UK (until 31 January 2020), in accordance with the Agreement on the Withdrawal of the UK from the EU, and in particular with the established transition period, the EU requirements on data sampling also applied to the UK (2019/C 384 I/01).

(a): Thousand heads.

(b), (c): The 1,000 animals targeted are split between SHC and NSHC. Live sheep population in 2020 (or latest available) extracted from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=apro_mt_lsheep&lang=en Live goat population in 2020 (or latest available) extracted from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=apro_mt_lsgoat&lang=en
1.2.4. TSE surveillance in cervids and other species

By Commission Regulation (EU) 2017/1972\textsuperscript{11} requirements for a 3-year surveillance programme for chronic wasting disease (CWD) in cervids in Estonia, Finland, Latvia, Lithuania, Poland and Sweden were established. Annexes I and III of Regulation (EC) No 999/2001 are amended in accordance with the Annex to this Regulation, which describes the surveillance programme.

The MS that have a wild and/or farmed and/or semi-domesticated population of moose and/or reindeer (Estonia, Finland, Latvia, Lithuania, Poland and Sweden) had to carry out a 3-year monitoring programme for CWD in cervids, from 1 January 2018 to 31 December 2020. The 3-year monitoring programme for CWD in cervids is described in detail in Annex III, Chapter A, Part III of the TSE Regulation. Other MS and non-EU reporting countries may carry out monitoring for CWD in cervids on a voluntary basis.

1.3. Testing protocols

The testing protocol for BSE surveillance in bovine animals is described in pages 8 and 9 of the 2016 EUSR on TSE (EFSA, 2017). The testing protocol for TSE surveillance in small ruminants is described in pages 13 and 14 of the 2016 EUSR on TSE (EFSA, 2017).

2. Data and methods

2.1. Origin of the data

The raw data are electronically submitted by MS and non-EU. The data to be submitted consist of testing data and case-based data for bovine animals, small ruminants, cervids and other species, according to the reporting periods (monthly basis) as described in Chapter B.I of Annex III of the TSE Regulation.

Surveillance data were mainly submitted through the EFSA TSE data reporting tool for the reporting of surveillance data on TSE as required by the TSE Regulation. The tool allows reporting countries to edit and automatically upload the data to the EFSA Data Collection Framework (DCF) for inclusion in the EFSA Scientific Data Warehouse (DWH). The tool has been applied for the first time during the 2018 TSE data collection period. Six reporting countries (CZ, ES, FI, FR, IT and SE) transmitted data directly as eXtensible Markup Language (XML) files in 2020 by using their own system for the XML file generation and the upload of data into the DCF, whereas the rest of the reporting countries transmitted XML files to the DCF by the EFSA TSE data collection tool. All data were then submitted to the EFSA DWH and confirmed by the reporting countries. The electronically submitted data were extracted from the EFSA DWH and further processed and validated by EFSA to summarise the information and to draft the summary tables presented in the current EUSR. The validation dashboard, available to all reporting countries to visualise the data since 2018, has been updated for 2020 data visualisation.

Finally, information on the population of small ruminants in 2020 as presented in Table 4 were obtained from the 2020 or latest available Eurostat annual data (https://ec.europa.eu/eurostat/data/database). The number of BSE cases worldwide (Table 12) was obtained from the last available report on the monitoring and testing of ruminants for the presence of TSE in the EU (European Commission, 2016) and the OIE animal information system OIE-WAHIS (https://wahis.oie.int/#/home). During validation of the data with the reporting countries, additional information was asked with relation to the reporting according to (i) Annex III, Chapter B, Section 1.A, point 1 of the TSE Regulation: the number of suspected cases placed under official movement restrictions in accordance with Article 12 (1), per animal species; (ii) Annex III, Chapter B, Section 1.A, point 3 of the TSE Regulation: the number of flocks for which suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2); and (iii) the number of ovine and caprine flocks tested within each subpopulation referred to in Annex III, Chapter A, Part II, points 2, 3, 5 and 6. The results of this questionnaire are summarised in Appendix D.

The data in this report refer only to the samples collected and confirmed cases reported between 1 January 2020 and 31 December 2020 in the EU (referred to in the report as 'EU27') and other eight additional non-EU reporting countries (referred to in the report as 'non-EU'): Bosnia and Herzegovina,

\textsuperscript{11} Commission Regulation (EU) 2017/1972 of 30 October 2017 amending Annexes I and III to Regulation (EC) No 999/2001 of the European Parliament and of the Council as regards a surveillance programme for chronic wasting disease in cervids in Estonia, Finland, Latvia, Lithuania, Poland and Sweden and repealing Commission Decision 2007/182/EC. OJ L 281, 31.10.2017, p. 14–20.
Iceland, Montenegro, North Macedonia, Norway, Serbia and Switzerland and the UK (from 1 February 2020). Bosnia and Herzegovina (non-EU and non-EFTA country) submitted TSE data to EFSA for the first time and accepted their data to appear in the EUSR summary report.

EFSA validated the 2020 data by checking for inconsistencies in the electronically extracted data, and by comparing the reported data with previous years. Members of the TSE subgroup of the Scientific Network for Zoonoses Monitoring Data in the reporting countries were consulted during this validation. The data validation started on 1 June 2021 and was finalised on 12 July 2021. The results and tables presented in the current EUSR are based on the data retrieved from the EFSA Scientific Data Warehouse on 13 July 2021. An additional consultation with reporting countries was conducted between 22 September 2021 and XX October 2021. If data were corrected by the reporting countries in the report but not updated in the EFSA Scientific Data Warehouse, the corrections will only be mentioned by means of footnotes in the current or future EUSR.

Historical data (data between 2001 and 2020 with focus on the last 5 years in cattle and sheep) are presented in tables and figures. As certain MS and non-EU may calculate their annual statistics using different reporting criteria (e.g. based on the date of final test results rather than the date of sampling), the data summarised in this report may differ slightly from the national figures published by single MS for 2020. In addition, subsequent submissions of updated/amended data by MS may have resulted in differences in the figures included in this report when compared with the same data presented in previous EUSR.

2.2. Presentation of the data

The current report should be considered the EU summary report for 2020 in compliance with Section II, Chapter B, Annex III of the TSE Regulation. The 27 EU MS or EU27, the UK (from 1 February 2020 non-EU), the three EFTA members, Iceland, Norway and Switzerland, and the non-EFTA IPA (Instrument for Pre-Accession Countries) countries, Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia are the reporting countries included in this report. The data reported by Switzerland include those of Lichtenstein. The countries are quoted in this report by using the country codes from the Nomenclature of Units for Territorial Statistics (NUTS) or the English name according to Regulation (EC) No 1059/2003.

To allow direct comparisons of 2020 data with those of the previous years at EU level, the 2020 EU27 data have been summed up in this report with those provided by the UK. However, all tables have been amended by presenting separately the EU27 totals and those including EU27 data plus the UK data. Totals obtained from the three EFTA countries and the four non-EFTA IPA were referred as to ‘Other non-EU MS’.

For some tables and figures, the surveillance target groups were combined: FS, ES and AM in bovine animals have been included in the group ‘risk animals’. The word ‘risk animals’ is used here to indicate those animals in which the probability of detecting the disease is higher than in the surveillance target group of HS animals. However, this does not imply that the risk animals experienced a higher level of exposure than normal (Doherr et al., 2001). The same holds for small ruminants from the NSHC target group (Bird, 2003) when tested from non-infected flocks/herds.

2.3. Methods

2.3.1. Descriptive methods

To describe the results of the TSE surveillance programme in the EU in 2020, a number of figures and tables have been produced along with a short narrative text to describe the main findings. The report is split into four sections: bovine animals (cattle), small ruminants (sheep and goats), cervids and species other than bovine, ovine and caprine animals and cervids. Both EU aggregated data and data at the national level are presented. When it was considered relevant, multi-year and historical data are shown. Surveillance data were available in the period 2001–2020, 2002–2020 and 2018–2020 for bovine animals, small ruminants, and cervids and other species, respectively.

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12 Data collected by the UK during 2020 and until end of transition period (i.e. until 31 December/12/2020) are used in this report. In accordance with the Agreement on the Withdrawal of the UK from the EU, and in particular with the established transition period, the EU requirements on data sampling also applied to the UK.

13 Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS). OJ L 154, 21.6.2003, p. 1.
For bovine animals, summary statistics were obtained based on the total number of tests performed in 2020 by reporting country and surveillance target group. In addition, historical data on confirmed cases since 2016 are presented in detail whereas those on the 2001–2015 period have been summed up. This 5-year period has been selected as during the period 2016–2020 a harmonised EU-wide, active BSE surveillance was applied and restricted to at-risk animals of ≥ 48 months of age, even though few exceptions are still in place in some countries as shown in Table 2.

Additional epidemiological parameters have been presented: number of cases by case type (e.g. C-BSE, H-BSE, L-BSE), target group and proportions (cases per million tests) by case type and year. These have been used to describe the development of the BSE epidemic and to put into context the findings of the reporting year.

To obtain relevant epidemiological information about the BSE cases detected in 2020, EFSA asked for additional information from the individual concerned reporting countries by a small questionnaire.

For small ruminants, summary statistics are presented in this report, and when possible, stratified according to the relevant variables in the database such as surveillance target group (SHC, NSHC, SU, EM), flock/herd status (infected, non-infected, unknown/not available), surveillance type (passive surveillance restricted to SU vs. active surveillance restricted to SHC and NSHC in non-infected flocks/herds), country, year (since 2002), case type (CS or AS), index case (yes/no). In particular, when active surveillance restricted to SHC and NSHC in non-infected flocks/herds is applied in one country, the results were used to summarise and describe the data on genotyping.

For small ruminants, summary statistics are presented in this report, and when possible, stratified according to the relevant variables in the database such as surveillance target group (SHC, NSHC, SU, EM), flock/herd status (infected, non-infected, unknown/not available), surveillance type (passive surveillance restricted to SU vs. active surveillance restricted to SHC and NSHC in non-infected flocks/herds), country, year (since 2002), case type (CS or AS), index case (yes/no). In particular, when historical data have been considered for trend analysis, the last 10-year period (2011–2020) has been included in the analysis.

Based on the minimum testing requirements for TSE surveillance in small ruminants (Table 4), a check has been carried out of the compliance of each MS. For assessing compliance, the following criteria have been applied:

- For testing in the NSHC surveillance target group: If the difference between observed testing and expected testing (minimum requirements) was positive, then the MS is compliant with the testing requirements.
- For testing in the SHC surveillance target group: If the difference between observed testing and expected testing (minimum requirements) was positive, the MS is compliant. When the difference was negative, a further calculation was performed to check if the MS compliance had been achieved by applying the derogation provided by the TSE Regulation (according to point II.2(c), Chapter A, Annex III of the TSE Regulation), i.e. replacing up to 50% of its minimum SHC sample size by testing dead ovine or caprine animals over the age of 18 months at the ratio of 1:1 and in addition to the minimum sample size for NSHC.
- If the MS is required to test 100% up to 500 of the NSHC in sheep, and the reported number of tested sheep was, e.g. 350, – the MS was categorised as compliant as the total subpopulation of NSHC in the country is not known.

An MS has been considered to meet the minimum requirements when the above criteria have been met in both target groups.

The reporting system of TSE surveillance data does not allow the collation of the number of newly infected flocks and herds during the reporting year but only the number of IC, considered to be a proxy for the number of incident scrapie cases.

Finally, the classification originally developed by the Great Britain’s National Scrapie Plan (NSP) was used to summarise and describe the data on genotyping. To describe and plot the reported data, some assumptions were made for reporting the results in bovine animals and small ruminants (sheep and goats):

- To present the temporal change in evolution of BSE cases (C-BSE, L-BSE and H-BSE) in tables or graphs, cases for which the type was reported as ‘unknown’ or was missing were considered for reporting purposes as C-BSE, since most of these were reported before 2005.
- To plot the reported scrapie cases according to the flock/herd status, it was assumed that flocks/herds with status reported as ‘unknown’, ‘other’ or blank was considered for reporting purposes as ‘non-infected flocks/herds’.
- To describe the change in evolution of the total number of scrapie IC, it was assumed that all IC were confirmed in non-infected flocks/herds. If a case was reported as non-index or unknown index status, it was considered for reporting purposes as ‘infected flocks/herds’.
- To describe the results of the discriminatory TSE testing, it was assumed that all scrapie cases with ‘BSE-like’, ‘non-BSE-like’ or ‘inconclusive’ results in the primary or secondary molecular tests have been submitted for discriminatory testing.
For cervids, summary statistics were extracted and presented in tabular format as follows:

- For all reporting countries, number of tested cervids in 2020 by reporting country, species and management system (wild and semi-domesticated/farmed).
- For the six MS subject to mandatory surveillance, number of PSU declared, proportion tested and median, minimum and maximum number of tested cervids in 2020 per PSU by MS and management system.
- For all reporting countries, the number of tested cervids in 2020 by target group, species, management system and reporting country.

A number of tested animals in species other than cattle, sheep, goats and cervids tested for TSE in reporting countries in 2020 are presented in tabular format by species and reporting country.

2.3.2. Data analysis methods

With regard to surveillance in cattle, the average number of cases detected per million tests at the EU level in both the risk animals and HS target groups (period 2011–2020) has been used to check if any significant temporal trend was detectable. For this purpose, a Poisson regression model has been fitted for each BSE type (C-BSE, H-BSE and L-BSE) separately, using the number of cases as dependent variable and the year as a continuous independent variable. The number of tests was taken into account in the model (offset). The target group (risk animals vs. HS), potentially affecting the probability of detecting the disease, was added to the model as covariate to adjust for any confounding effect. The relative risk (RR) obtained by exponentiating the beta coefficient associated with the 'year' variable was used as a measurement of the annual variation in the probability of detection, i.e. the temporal trend for the entire period. In the model, the RR indicates the average annual change in the proportion of cases per animals tested corresponding to the annual probability of detecting the disease: an RR > 1 indicates an average annual increase in the number of cases per million whereas an RR < 1 indicates an average annual decrease.

TSE data of small ruminants from the last 10 years (period 2011–2020) have been used to check if any significant temporal trend was detectable. As per BSE, a Poisson regression model has been fitted for each case type (CS and AS) and for each species (ovine and caprine) separately, using the number of cases as dependent variable and the year as continuous independent variable. The number of tests was taken into account in the model (offset). The target group (NSHC vs. SHC), potentially affecting the probability of detecting the disease, was added to the model as covariate to adjust for any confounding effect. The RR obtained by exponentiating the beta coefficient associated with the 'year' variable was used as a measurement of the annual variation in the probability of detection, i.e. the temporal trend for the entire period. In the model, the RR indicates the average annual change in the proportion of cases per animals tested corresponding to the annual probability of detecting the disease: an RR > 1 indicates an average annual increase in the number of cases per million whereas an RR < 1 indicates an average annual decrease.

Over the same 10-year period, and considering cases from all reporting countries, the mean age of the AS cases has been compared with that of CS cases in sheep and goats by applying a two-sample t-test with unequal variances.

A p ≤ 0.05 was considered statistically significant for all the above-described statistical analyses.

3. Assessment

3.1. BSE surveillance in bovine animals

Approximately 119.9 million bovine animals have been tested for BSE in EU, including UK, since 2001. In 2020, there was a 2.4% reduction in the number of tested bovine animals in the EU27 and UK, from 1,150,388 in 2019 to 1,122,671 in 2020. This reduction was due to a reduction in the HS target group of 17.7% (from 156,229 in 2019 to 128,648 in 2020) mainly due to the decrease of 23.7% in the number of tested animals in Romania from 121,599 in 2019 to 92,727 in 2020 despite the increase of 44.6% and 32.2% in the number of cattle tested by Lithuania and Bulgaria, respectively. A slight overall increase of animals tested in the FS group (from 918,182 in 2019 to 924,698 in 2020) was observed in 2020. Romania and Bulgaria continue being the main contributors to the HS testing group with 115,428 (89.7%) tested cattle.

The other seven non-EU (Bosnia and Herzegovina, Iceland, Montenegro, Norway, North Macedonia, Serbia and Switzerland) tested 51,775 cattle in 2020. Serbia was the main contributor with 13,978
cattle tested (a reduction of 30.5% from 2019), followed by Bosnia and Herzegovina, a country reporting data for the first time, that tested 12,848 cattle. Both countries reported mostly cattle tested in the HS target group. Serbia and Switzerland tested 19 and 24 cattle, respectively, as clinical suspect and Norway reported 113 animals with clinical signs at AM inspection.

The number of animals tested in the risk group (ES + AM + FS) remained stable, from 993,332 in 2019 to 993,190 in 2020 (~0.01%), in EU27 and the UK. Similar to the previous year, cattle in the risk group accounted for over 88.5% of all tested cattle in the EU27 and UK and cattle tested in the FS target group accounted for 93.1% of all risk cattle tested.

The number of cattle tested for BSE per reporting country for each target group in 2020 is shown in Table 5.

Table 5: Number of bovine animals tested for BSE by reporting country and surveillance target group in 2020 in the EU and other reporting countries

| Country | Risk animals | Other target groups | Total |
|---------|--------------|---------------------|-------|
|         | ES | AM | FS | Subtotal risk animals | HS | SU | EM | Subtotal other target groups |       |
| AT      | 2,932 | 16 | 15,494 | 18,442 | 61 | 8 | 69 | 18,511 |
| BE      | 758 | 2 | 25,555 | 26,315 | 6 | 6 | 12 | 26,327 |
| BG      | 2,860 | 7 | 4,501 | 7,368 | 29,355 | 29,355 | 36,723 |
| CY      | 53 | 1,751 | 1,804 | 50 | 50 | 1,854 |
| CZ      | 4,255 | 2 | 21,336 | 25,593 | 14 | 5 | 19 | 25,612 |
| DE      | 9,530 | 165,837 | 175,367 | 427 | 697 | 1,124 | 176,491 |
| DK      | 1,756 | 22,450 | 24,206 | 0 | 24,206 |
| EE      | 136 | 61 | 3,494 | 3,691 | 0 | 3,691 |
| EL      | 609 | 7 | 1,021 | 1,637 | 8,106 | 8,106 | 9,743 |
| ES      | 802 | 46 | 61,510 | 62,358 | 206 | 1 | 207 | 62,565 |
| FI      | 7 | 11,240 | 11,247 | 4 | 4 | 11,251 |
| FR      | 1,723 | 198,599 | 200,322 | 3,893 | 3 | 3,896 | 204,218 |
| HR      | 10 | 4,924 | 4,934 | 132 | 2 | 134 | 5,068 |
| HU      | 97 | 9 | 10,714 | 10,820 | 10 | 13 | 23 | 10,843 |
| IE      | 358 | 63,618 | 63,976 | 9 | 9 | 63,985 |
| IT      | 14,811 | 299 | 33,953 | 49,063 | 210 | 210 | 49,273 |
| LT      | 15 | 5 | 4,136 | 4,156 | 0 | 4,156 |
| LU      | 2,724 | 2,724 | 2,724 | 2 | 2 | 2,726 |
| LV      | 213 | 136 | 2,910 | 3,259 | 1 | 1 | 3,260 |
| MT      | 97 | 194 | 291 | 2 | 2 | 293 |
| NL      | 5,868 | 54,113 | 59,981 | 6 | 1 | 7 | 59,988 |
| PL      | 8,139 | 1,122 | 43,579 | 52,840 | 32 | 4 | 36 | 52,876 |
| PT      | 1,301 | 1,023 | 14,727 | 17,051 | 14 | 14 | 17,065 |
| RO      | 2,363 | 1,563 | 2,689 | 6,615 | 86,073 | 39 | 86,112 | 92,727 |
| SE      | 142 | 39 | 8,868 | 9,049 | 10 | 10 | 9,059 |
| SI      | 362 | 74 | 5,781 | 6,217 | 52 | 16 | 68 | 6,285 |
| SK      | 18 | 1 | 9,814 | 9,833 | 0 | 9,833 |
| Total EU27 | 58,857 | 4,770 | 795,532 | 859,159 | 128,639 | 831 | 0 | 129,470 | 988,629 |
| UK      | 4,372 | 493 | 129,166 | 134,031 | 9 | 2 | 11 | 134,042 |
| Total EU27 + UK | 63,229 | 5,263 | 924,698 | 993,190 | 128,648 | 833 | 0 | 129,481 | 1,122,671 |
| BA      | 22 | 22 | 12,826 | 12,826 | 12,848 |
| CH      | 4,097 | 6,954 | 11,051 | 24 | 24 | 11,075 |
The distribution of the number of bovine animals tested for BSE by age group, surveillance target group and reporting country in 2020 can be found in the following link https://doi.org/10.5281/zenodo.5602749 distributed as follows:

- **Table 6**: Number of bovine animals tested by age group in the EU MS and non-EU reporting countries in 2020.
- **Table 7**: Number of bovine animals in the risk group (animals with clinical signs at ante-mortem, emergency slaughtered and fallen stock), by age group, tested in EU MS and non-EU reporting countries in 2020.
- **Table 8**: Number of tested healthy slaughtered bovine animals by age group in EU MS and in non-EU reporting countries in 2020.
- **Table 9**: Number of BSE suspected bovine animals, by age group, tested in EU MS and in non-EU-reporting countries in 2020.
- **Table 10**: Number of bovine animals culled under BSE eradication measures, by age group, tested in EU MS and in non-EU-reporting countries in 2020. The table is empty because no animals in this category were tested for the year 2020.

In the EU27 and UK, four BSE cases were reported in 2020, all atypical BSE submitted to the FS testing group: three H-type (one by Spain, one by France and one by Ireland) and one L-type (by France). Switzerland has also reported an L-type case submitted to the ES testing group. Table 11 reports the main clinical and epidemiological data of all the positive cases. No other cases of BSE were reported in the rest of the world in 2020 (https://wahis.oie.int/#/home).

The number of H-type and L-type BSE cases was in line with the number of cases reported in the last few years. Figure 1 illustrates the proportion of cases per million tests from 2015 to 2020. Most of the atypical cases reported in 2020 were detected in beef cattle older than 12 years.

Based on 119 atypical BSE cases with known age since 2001, the average age at detection was 11.9 years (range: 5.5–18.5 years) and tested in the FS target group that accounts, as mentioned above, for most of the tested animals.

The number of BSE cases by reporting country, type and year (up to 2020, with a focus on the last 5 years) is shown in Tables 12–14 for total cases, classical BSE and atypical BSE, respectively.

Time series analysis carried out over the last 10-year period (period 2011–2020) shows a significant decreasing trend in the occurrence of C-BSE (annual RR = 0.59, i.e. an annual decrease of 41% in the proportion of cases per tested animals; p < 0.0001), whereas no significant trend for the two atypical BSE forms was found (H-BSE: 1.06 p = 0.93; L-BSE: 1.05 p = 0.54).

Maps showing the geographical distribution of the cumulative number of cases and the cumulative proportion of cases per million tests of C-BSE cases born after the total (reinforced) feed ban (BARB), H-BSE and L-BSE for the period 2001–2020 are shown in Appendix B.
Table 11: Clinical and epidemiological description of the BSE cases detected in 2020

| Country | CH - atypical 1 | ES - atypical 2 | FR- atypical 3 | FR- atypical 4 | IE- atypical 5 |
|---------|-----------------|-----------------|----------------|----------------|----------------|
| Surveillance target group | Emergency slaughter | Fallen stock | Fallen stock | Fallen stock | Fallen stock |
| Case type | L-BSE | H-BSE | L-BSE | H-BSE | H-BSE |
| Month and year of birth | November 2006 | April 2003 | March 2008 | March 2004 | March 2006 |
| Age at detection (in months) | 158 | 212 | 143 | 191 | 171 |
| BARB status | – | – | – | – | – |
| Clinical signs | Recumbency at the transfer to the abattoir | No | No | No | n/a |
| Cattle type | Dairy cattle | Beef cattle | Beef cattle | Beef cattle | Beef cattle |
| Breed | Brown-Swiss | Mixed | Charolaise | Limousine | Limousine Cross |
| Location (NUTS3) of natal herd or herd where case found | Canton of Schwyz | Viniegra de Arriba, La Rioja | Cher (18) | Aquitaine (24) | Tipperary |
| Herd size | 124 (23,1,2020) | 353 | 1 | 120 | 63 |
| Herd type | Unknown | Beef cattle | Beef cattle | Beef cattle | Suckler |
| Feeding system during first year of life | Unknown | Mixed | Milk, grass and hay | Suckled till 8 months, Calf ration at 12 weeks to 52 weeks, Grass fed thereafter |
| Feed cohorts? Tested? If Yes: Results (number tested; number positives) | No | 9 tested/all negative | 6 tested/all negative | 14 tested/all negative | No |
| Birth cohorts? Tested? If Yes: Results (number tested; number positives) | No | 9 tested/all negative | 13 tested/all negative | 2 tested/all negative | 7 tested/all negative |
| Offspring? Tested? If Yes: Results (number tested; number positives) | No | 15: 4 stay alive; 11 were sacrificed at lower age (< 24 m) | No | No | 1 negative progeny |
| Sire? Tested? (Yes/No), If Yes: Results (positive? Negative?) | No | No | No | No | No |
| Dam? Tested (Yes/No), If Yes: Results (positive? Negative?) | No | No | No | No | No |

BARB: born after the revised feed ban; H-BSE: H-type bovine spongiform encephalopathy; L-BSE: L-type bovine spongiform encephalopathy; n/a: Not available.
Table 12: Total number of reported BSE cases (classical-BSE + atypical H-BSE + atypical L-BSE) in reporting countries and worldwide by year (period 1991–2020) and country

| Country | Year | Up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
|---------|------|------------|------|------|------|------|------|-------|
| AT      |      | 8          |      |      |      |      |      | 8     |
| BE      |      | 133        |      |      |      |      |      | 133   |
| CZ      |      | 30         |      |      |      |      |      | 30    |
| DE      |      | 421        |      |      |      |      |      | 421   |
| DK      |      | 16         |      |      |      |      |      | 16    |
| EL      |      | 1          |      |      |      |      |      | 1     |
| ES      |      | 813        | 1    | 3    | 2    | 1    |      | 820   |
| FI      |      | 1          |      |      |      |      |      | 1     |
| FR      |      | 1,000      | 4    | 2    | 3    | 4    | 2    | 1,015 |
| IE      |      | 1,660      | 1    |      |      |      | 1    | 1,662 |
| IT      |      | 147        |      |      |      |      |      | 147   |
| LU      |      | 3          |      |      |      |      |      | 3     |
| NL      |      | 88         |      |      |      |      |      | 88    |
| PL      |      | 74         |      | 1    |      |      |      | 75    |
| PT      |      | 1,086      |      |      |      |      |      | 1,086 |
| RO      |      | 2          |      |      |      |      |      | 2     |
| SE      |      | 1          |      |      |      |      |      | 1     |
| SI      |      | 9          |      |      |      |      |      | 9     |
| SK      |      | 27         |      |      |      |      |      | 27    |
| Total EU27 |   | 5,520      | 5    | 6    | 3    | 7    | 4    | 5,545 |
| UK      |      | 184,594    | 1    |      |      |      |      | 184,595 |
| Total EU27 + UK | | 190,114 | 5 | 6 | 4 | 7 | 4 | 190,140 |
| BRA     |      | 2          |      |      |      |      |      | 3     |
| CAN     |      | 20         |      |      |      |      |      | 20    |
| ISR     |      | 1          |      |      |      |      |      | 1     |
| JPN     |      | 36         |      |      |      |      |      | 36    |
| LI      |      | 2          |      |      |      |      |      | 2     |
| NO      |      | 1          |      |      |      |      |      | 1     |
| CH      |      | 465        | 1    |      | 1    |      |      | 466   |
| USA     |      | 4          | 1    |      |      | 1    |      | 6     |
| Total other non-EU | | 531 | 0 | 1 | 1 | 1 | 1 | 535 |
| Total |      | 190,645 | 5 | 7 | 5 | 8 | 5 | 190,675 |

BRA: Brazil; BSE: bovine spongiform encephalopathy; CAN: Canada; H-BSE: H-type BSE; ISR: Israel; JPN: Japan; L-BSE: L-type BSE; USA: United States of America.

Each cell reports the total number of BSE cases (C-BSE + H-BSE + L-BSE). Grey-shaded cells indicate the year(s) and Member State where at least one BARB case was detected (EFSA BIOHAZ Panel, 2017a). EU countries without BSE cases (Bulgaria, Cyprus, Estonia, Croatia, Hungary, Lithuania, Latvia and Malta) are not reported.

(a): Included imported cases: Canada one case in 1993; Denmark one case in 1992; France one case in 1999; Germany one case in 1992, three cases in 1994, two cases in 1997; Ireland five cases in 1989, one case in 1990, two cases in 1991 and 1992, one case in 1994 and one case in 1995; Italy two cases in 1994, 2001 and 2002; Portugal one case in 1990, 1991, 1992, 2000 and 2004 and three cases in 1993; Slovenia one case in 2004; Switzerland one case in 2012; USA one case in 2003.

(b): Cavier-Widén et al. (2008).

Source: Data on non-EU cases and cases in EU Member States for the period 1987-2002 were made available by the European Commission (European Commission, 2016). Data were retrieved from the EU TSE Database and the OIE website (https://wahis.oie.int/#/home).
Table 13: Number of reported classical BSE cases in the reporting countries by year (period 1991–2020) and country

| Country code | Year up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
|--------------|----------------|------|------|------|------|------|-------|
| AT           | 5              | 133  | 29   | 416  | 15   | 1    | 55    |
| BE           |                | 133  |      |      |      |      |       |
| CZ           | 29             |      |      |      |      |      |       |
| DE           | 416            |      |      |      |      |      |       |
| DK           | 15             |      |      |      |      |      |       |
| EL           | 1              |      |      |      |      |      |       |
| ES           | 798            |      |      |      |      |      |       |
| FI           | 1              |      |      |      |      |      |       |
| FR           | 968            |      |      |      |      | 1    | 969   |
| IE           | 1,656          |      |      |      |      |      | 1,656 |
| IT           | 142            |      |      |      |      |      | 142   |
| LU           | 3              |      |      |      |      |      | 3     |
| NL           | 84             |      |      |      |      |      | 84    |
| PL           | 60             |      |      |      |      |      | 60    |
| PT           | 1,079          |      |      |      |      |      | 1,079 |
| SI           | 8              |      |      |      |      |      | 8     |
| SK           | 27             |      |      |      |      |      | 27    |
| Total EU27   | 5,425          | 1    | 0    | 0    | 0    | 0    | 5,426 |
| UK           | 184,578        |      |      |      | 1    |      | 184,579 |
| Total EU27 + UK | 190,003        | 1    | 0    | 1    | 0    | 0    | 190,005 |
| CH           | 464            |      |      |      |      |      | 464   |
| Total other non-EU | 464           | 0    | 0    | 0    | 0    | 0    | 464   |
| Total        | 190,467        | 1    | 0    | 1    | 0    | 0    | 190,469 |

BSE: bovine spongiform encephalopathy.
Each cell reports the total number of C-BSE cases.
Reporting countries that have never reported classical cases are not included in the table.
Grey-shaded cells indicate the year and Member State where at least one BARB case was detected (EFSA BIOHAZ Panel, 2017a).
Source: Data were retrieved from the EU TSE Database and from the OIE website for CH.

Table 14: Number of reported BSE atypical cases in the reporting countries by year (period 2001–2020), type and country

| Country code | Year up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
|--------------|----------------|------|------|------|------|------|-------|
| AT           | 1              | 2    |      |      |      |      | 1     |
| CZ           | 1              |      |      |      |      |      | 1     |
| DE           | 2              | 3    |      |      |      |      | 2     |
| DK           | 1              |      |      |      |      |      | 1     |
| ES           | 7              | 8    | 1    | 1    | 2    | 2    | 12    |
| FR           | 15             | 17   | 3    | 1    | 1    | 2    | 25    |
| IE           | 4              |      |      |      |      | 1    | 5     |
| IT           | 5              |      |      |      |      |      | 5     |
| NL           | 1              | 3    |      |      |      |      | 1     |
| PL           | 2              | 12   |      |      |      |      | 2     |
| PT           | 7              |      |      |      |      |      | 7     |
| RO           | 2              |      |      |      |      |      | 2     |

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www.efsa.europa.eu/efsajournal
The number of historical reported BSE cases can be found in the following link https://doi.org/10.5281/zenodo.5602725, as follows:

- **Table 15**: Number of BSE cases per country and year until 2000 (included) in the EU and non-EU countries.
- **Table 16**: Number of classical BSE cases per country and year from 2001 in the EU and non-EU reporting countries.
- **Table 17**: Number of atypical H-BSE cases per country and year from 2001 in the EU and non-EU reporting countries.
- **Table 18**: Number of atypical L-BSE cases per country and year from 2001 in the EU and non-EU reporting countries.

| Country code | H  | L  | H  | L  | H  | L  | H  | L  | H  | L  | Year | Total |
|--------------|----|----|----|----|----|----|----|----|----|----|------|-------|
| SE           | 1  |    |    |    |    |    |    |    |    |    |      | 1     |
| SI           |    | 1  |    |    |    |    |    |    |    |    |      | 1     |
| Total EU27   | 42 | 53 | 4  | 0  | 2  | 4  | 1  | 2  | 6  | 1  |      | 58    |
| UK           | 7  | 9  |    |    |    |    |    |    |    |    |      | 7     |
| Total EU27 + UK | 49 | 62 | 4  | 0  | 2  | 4  | 1  | 2  | 6  | 1  |      | 65    |
| NO           |    |    |    |    |    |    |    |    |    |    |      | 1     |
| CH           | 1  |    | 1  |    |    |    |    |    |    |    |      | 1     |
| Total other non-EU | 2 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |      | 2     |
| Total        | 51 | 62 | 4  | 0  | 2  | 4  | 1  | 2  | 6  | 1  |      | 67    |

Each cell reports the total number of H-BSE and L-BSE cases. EU countries without atypical cases are not included in the table.

(a): In 2012, PL reported an atypical BSE case without specifying the type.

Source: Data were retrieved from the EU TSE Database and from the OIE website for CH.
3.2. TSE surveillance in small ruminants

Since 2002, more than 10 million small ruminants have been tested as part of the official EU TSE surveillance in the EU, including the UK. In 2020, 453,194 small ruminants were tested by the 27 MS and the UK: 332,579 sheep (73.4%) and 120,615 goats (26.6%), which represents an overall 5.9% decrease (28,433) in the number of tested small ruminants in the EU, compared with that of 2019.

In four of the seven other non-EU (Iceland, North Macedonia, Norway, Serbia), in total 26,765 small ruminants were tested: 26,053 sheep (97.3%) and 712 goats (2.7%), an increase of 3,075

BSE: bovine spongiform encephalopathy; C-BSE: classical BSE; H-BSE: H-type BSE; L-BSE: L-type BSE.
Black numbers in white background: number of cases.

Figure 1: Cases per million tested bovine animals by surveillance target group and case type for the period 2015–2020 in the EU and the UK

3.2. TSE surveillance in small ruminants

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In four of the seven other non-EU (Iceland, North Macedonia, Norway, Serbia), in total 26,765 small ruminants were tested: 26,053 sheep (97.3%) and 712 goats (2.7%), an increase of 3,075
(+13%) from 2019, mostly due to the increase in testing by Iceland and Norway. Bosnia and Herzegovina, Montenegro and Switzerland did not report data on small ruminants.

In sheep, the decrease in the total tested in the EU27 and the UK was 1.6% (332,579 tested in 2020 compared with 338,098 in 2019), due to the decrease of testing in TSE-infected flocks with a 29.4% decrease in 2020 (from 41,197 in 2019 to 29,094 in 2020), whereas testing in the non-TSE infected flocks had a 2.2% increase in 2020 (from 294,527 in 2019 to 301,089 in 2020). The number of sheep tested from flocks with unknown status remains the same, since Czechia Republic is the only country that does not report flock status (2,374 in 2019 and 2,396 in 2020).

In goats, there was also a 16% decrease in the tested animals in the EU27 and the UK (120,615 in 2020 compared with 143,529 in 2019), due to the decrease of testing in both TSE-infected herds with a 38% decrease in 2020 (from 13,013 in 2019 to 8,063 in 2020) and in non-TSE-infected herds with a 13.9% decrease in 2020 (from 129,810 in 2019 to 111,817 in 2020). The number of goats tested from herds with unknown status remains the same (Czechia with 706 in 2019 and 735 in 2020).

The numbers of sheep and goats tested for TSE by reporting country, surveillance target group and flock/herd status in 2020 are summarised in Tables 19 and 20, respectively. Taking into account the number of samples tested in the SHC and NSHC target groups and those required according to the TSE Regulation (Table 4) and the criteria described in Section 2.3.1, 23 countries in the group EU27 and the UK fulfilled the requirements for sheep testing. Four of the five non-complaint reporting countries were very close to reach the required quota. In goat surveillance, 24 countries in the group EU27 and the UK fulfilled the requirements for goat testing.

The pattern of testing in 2020 in sheep by country and flock status was very similar to that of 2019. In 2020, for each sheep tested in a TSE-infected flock in the EU27 and the UK, there were more than 10 (10.3) sheep tested in non-TSE-infected flocks. The small decrease in the overall testing of sheep in 2020 is due to the balance between the higher level of testing in Bulgaria and Spain, with an overall increase of 17,060 (+82.4%) and 2,066 (+6%) sheep tested, respectively, and the lower level of testing in other five MS: Romania, Italy, France, Greece and Poland with an overall decrease of 12,288 (−28.2%), 5,329 (−16.3%), 1,629 (−6.5%), 1,505 (−23.6%) and 1,484 (−4.6%) sheep tested, respectively. It is important to highlight that Bulgaria is the reporting country with the largest contribution to the SHC in non-TSE-infected flocks with 32,978 (24.2% of the total in EU27 and the UK).

The pattern of testing in 2020 in goats by country and flock status was different to that of 2019. In 2020, for each goat tested in a TSE-infected herd in the EU27 and the UK, there were 14 (13.9) goats tested in non-TSE-infected herds, higher than that in 2018 and 2019 (with a value of approximately 10), but much lower than in 2017 with nearly 31 goats tested in non-TSE-infected herds in 2017. The decrease in the overall testing of goats in 2020 is mostly due to the throughput of Romania, Italy, Cyprus and Spain with an overall decrease of 16,014 (−44.3%), 3,114 (−8.6%), 2,757 (−37%) and 2,134 (−9.6%) goats tested, respectively.
Table 19: Number of sheep tested for TSE by reporting country, surveillance target group and flock status in 2020 in the EU and other reporting countries

| Flock status | TSE infected flocks | Non-infected flocks | Unknown/not available | Total |
|--------------|---------------------|---------------------|-----------------------|-------|
| Surveillance Target group | EM | NSHC | SHC | SU | Subtotal TSE infected flocks | EM | NSHC | SHC | SU | Subtotal Non-infected flocks | EM | NSHC | SHC | SU | Subtotal Unknown | |
| AT | 5 | 5 | 2,753 | 145 | 2,898 | 2,903 |
| BE | 1 | 1 | 1,495 | 3 | 1,498 | 1,499 |
| BG | 2 | 2 | 4,789 | 32,978 | 37,767 | 37,771 |
| CY | 682 | 377 | 1,059 | 1,556 | 14 | 1,570 | 2,629 |
| CZ | | | | | 2,382 | 14 | 2,396 | 2,396 |
| DE | 34 | 34 | 9,155 | 10,117 | 31 | 19,303 | 19,337 |
| DK | | | | | 509 | 509 | 509 |
| EE | | | | | 235 | 235 | 235 |
| EL | 521 | 1,667 | 295 | 2,483 | 936 | 1,458 | 5 | 2,399 | 4,882 |
| ES | 14,720 | 14,720 | 12,599 | 9,447 | 2 | 22,048 | 36,768 |
| FI | 47 | 47 | 1,576 | 21 | 1,597 | 1,644 |
| FR | 38 | 38 | 18,694 | 4,706 | 23,400 | 23,438 |
| HR | | | | | 1,544 | 1 | 1,545 | 1,545 |
| HU | 1,758 | 481 | 2,239 | 9,849 | 9,483 | 19,332 | 21,571 |
| IE | 41 | 64 | 105 | 12,188 | 9,301 | 1 | 21,490 | 21,595 |
| IT | 2,644 | 513 | 805 | 3,962 | 12,084 | 11,333 | 3 | 23,420 | 27,382 |
| LT | 664 | 664 | 98 | 98 | 365 | 365 | 365 |
| LU | | | | | 102 | 18 | 120 | 120 |
| LV | | | | | 1,568 | 1,568 | 1,568 |
| MT | | | | | 9,967 | 20,823 | 2 | 30,792 | 30,792 |
| NL | | | | | 373 | 372 | 5 | 750 | 20,267 | 21,017 |
| PL | | | | | 14,114 | 15,306 | 26 | 29,446 | 31,286 |
| PT | | | | | 22 | 69 | 91 | 1,679 | 10 | 1,689 | 1,780 |
| SI | 2,344 | 168 | 7 | 2,519 | 2,519 |
| Flock status | TSE infected flocks | Non-infected flocks | Unknown/not available |
|--------------|---------------------|---------------------|----------------------|
| Surveillance Target group | EM | NSHC | SHC | SU | Subtotal TSE infected flocks | EM | NSHC | SHC | SU | Subtotal Non-infected flocks | EM | NSHC | SHC | SU | Subtotal Unknown | Total |
| SK | 564 | 718 | 1,282 | 13,002 | 13,002 | 2,382 | 14 | 2,396 | 310,597 |
| Total EU27 | 18,332 | 5,676 | 4,652 | 28,660 | 149,183 | 130,277 | 81 | 279,541 | 2,382 | 14 | 2,396 | 310,597 |
| UK | 4 | 430 | 434 | 15,489 | 6,059 | 21,548 |
| Total EU27 + UK | 18,336 | 6,106 | 4,652 | 29,094 | 164,672 | 136,336 | 81 | 301,089 | 2,382 | 14 | 2,396 | 332,579 |
| BA | | | | | | | | | |
| CH | | | | | | | | | |
| IS | 2,412 | 2,412 | 201 | 4,992 | 7 | 5,200 | 7,612 |
| ME | | | | | | | | | |
| MK | | | | | | | | | |
| NO | 67 | 67 | 9,758 | 7,997 | 47 | 17,802 | 17,869 |
| RS | 74 | 206 | 280 | 280 | 280 |
| Total other non-EU | 2,479 | 2,479 | 10,033 | 13,487 | 54 | 23,574 | 26,053 |
| Total | 20,815 | 6,106 | 4,652 | 31,573 | 174,705 | 149,823 | 135 | 324,663 | 2,382 | 14 | 2,396 | 358,632 |

EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by TSE (transmissible spongiform encephalopathies).
Table 20: Number of goats tested for TSE by reporting country, surveillance target group and herd status in 2020 in the EU and other reporting countries

| Herd status | Infected herds | Non-infected herds | Unknown/not available |
|-------------|----------------|-------------------|-----------------------|
| Surveillance Target group | Subtotal | EM | NSHC | SHC | SU | Subtotal | EM | NSHC | SHC | SU | Subtotal | EM | NSHC | SHC | SU | Subtotal |
| AT | 904 | 865 | 39 | 904 | | | | | | | | | | | | | | |
| BE | 826 | 825 | 1 | 826 | | | | | | | | | | | | | | |
| BG | 3,485 | 15 | 3 | 18 | 574 | 2,893 | 3,467 | | | | | | | | | | |
| CY | 4,693 | 2,809 | 1,052 | 130 | 3,991 | 634 | 68 | 702 | | | | | | | | | |
| CZ | 735 | 735 | 735 | | | | | | | | | | | | | | |
| DE | 1,977 | 1,699 | 262 | 16 | 1,977 | | | | | | | | | | | | | |
| DK | 92 | 92 | | | | | | | | | | | | | | | |
| EE | 6 | 6 | | | | | | | | | | | | | | | |
| EL | 1,579 | 187 | 52 | 239 | 603 | 732 | 5 | 1,340 | | | | | | | | | |
| ES | 20,048 | 2,098 | 2 | 2,100 | 10,646 | 7,302 | 17,948 | | | | | | | | | | |
| FI | 291 | 291 | | | | | | | | | | | | | | | |
| FR | 21,172 | 16,953 | 4,219 | 21,172 | | | | | | | | | | | | | | |
| HR | 377 | 376 | 1 | 377 | | | | | | | | | | | | | | |
| HU | 264 | 132 | 132 | | | | | | | | | | | | | | |
| IE | 93 | 93 | | | | | | | | | | | | | | | |
| IT | 33,089 | 400 | 70 | 334 | 804 | 6,369 | 25,916 | 32,285 | | | | | | | | | |
| LT | 32 | 32 | | | | | | | | | | | | | | | |
| LU | 101 | 101 | | | | | | | | | | | | | | | |
| LV | 32 | 31 | 1 | 32 | | | | | | | | | | | | | | |
| MT | 120 | 100 | 20 | 120 | | | | | | | | | | | | | | |
| NL | 1,568 | 1,568 | | | | | | | | | | | | | | | |
| PL | 4,939 | 3,563 | 1,372 | 4 | 4,939 | | | | | | | | | | | | | |
| PT | 1,593 | 14 | 14 | 1,579 | | | | | | | | | | | | | | |
| RO | 20,126 | 1 | 1 | 5,738 | 14,386 | 1 | 20,125 | | | | | | | | | | |
| SE | 122 | 1 | 1 | 120 | 1 | 121 | | | | | | | | | | | |
| SI | 560 | 509 | 47 | 4 | 560 | | | | | | | | | | | | | |
| Herd status                  | Infected herds | Non-infected herds | Unknown/not available |
|-----------------------------|----------------|-------------------|-----------------------|
|                             | EM  | NSHC | SHC | SU | EM  | NSHC | SHC | SU | EM  | NSHC | SHC | SU | EM  | NSHC | SHC | SU |
| Surveillance Target group   |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| SK                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| Total EU27                  |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| Total EU27 + UK             |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| BA                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| CH                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| IS                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| ME                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| MK                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| NO                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| RS                          |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| Total other non-EU         |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |
| Total                       |     |      |     |    |     |      |     |    |     |      |     |    |     |      |     |    |

EM: animals culled under TSE eradication measures; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by TSE (transmissible spongiform encephalopathies).
In total, 688 scrapie cases in sheep were reported in the EU27 and the UK in 2020, 309 (31.1%) less than in 2019. They were reported by 16 MS and the UK (two countries more than in 2019). All countries that reported cases in 2019 also reported cases in 2020 plus Bulgaria that reported CS cases and Belgium and Sweden that reported AS cases. In addition, 65 scrapie cases in sheep were reported by two other non-EU reporting countries: Iceland and Norway.

CS was reported by seven MS and one non-EU: Bulgaria, Cyprus, Greece, Italy, Portugal, Romania, Spain and Iceland, whereas AS was reported by 14 MS, the UK and by one other non-EU: Belgium, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Romania, Slovakia, Spain, Sweden, the UK and Norway. Most of the ovine CS cases in the EU27 and the UK (97.5%) were reported by four countries, namely Greece, Italy, Romania and Spain, as it was the case in the previous years.

Out of the 688 sheep scrapie cases reported in the EU27 and the UK in 2020: 589 were CS cases (85.7%), 98 were AS cases (14.3%) and Italy reported 1 CH1641-like case. Among the non-EU countries, 53 CS cases were reported by Iceland and 12 AS cases by Norway. Table 21 shows the number of scrapie cases in sheep by reporting country, case type, index case status and surveillance target group in 2020 (the Italian CH1641-like case is not shown). The geographical distribution of AS and CS in 2020 in sheep is shown in Appendix C. An additional total of 12 cases in sheep were reported as inconclusive by Italy (see Table 31) which are not included in the caseload for this country.

In sheep, 24.6% (169) of all cases in the EU27 and the UK reported in 2020 were IC. This percentage is higher than the previous year (17.8% in 2019) even though the absolute number of all cases (177 in 2019) fell by 4.5%. There was a much higher proportion of IC in AS cases (88/98: 89.8%) than in CS cases (81/589: 13.8%), reflecting the within-flock spread of CS. Using the absolute number of IC as a proxy for the flock-level incidence in sheep and comparing 2019 with 2020, there was a decrease in the number of CS IC (from 97 in 2019 to 81 in 2020, -16.5%) and an increase in the number of AS IC (from 80 to 88, +10%). Six of the 53 CS cases reported by Iceland were IC (11.3%), and so were the 12 AS cases reported by Norway (100%).

In total, 328 scrapie cases in goats were reported in the EU27 and the UK in 2020, with a 15.9% reduction (−62) compared with 2019 when 390 cases were reported. This change is due mainly to the decrease in the number of cases in goats in Cyprus (from 309 to 236 cases). Only Italy and Spain reported both CS and AS. Bulgaria, Cyprus, Greece, Romania and the UK reported only CS cases whereas Denmark, France and Portugal reported only AS cases. As mentioned previously, most of the CS cases were reported by Cyprus with a slight decrease in the contribution of this country to the CS caseload in 2020 (from 81.3% in 2019 to 72% in 2020). The three other non-EU countries that reported tested goats did not report any scrapie cases.

In total, 319 caprine cases in the EU27 and the UK in 2020 were CS cases (97.3%) and nine were AS (2.7%). Table 22 shows the number of scrapie cases in goats by reporting country, case type, index case status and surveillance target group in 2020. The geographical distribution of AS and CS in 2020 in goats is shown in Appendix C.

In goats, 18.6% (61) of all cases reported in the EU27 and the UK in 2020 were IC. This percentage is higher than the 8.7% (34) observed in 2019, with a higher proportion in AS (9/9: 100%) than in CS (52/319: 16.3%). Cyprus and Greece accounted for 54% (33/61) of all IC in goats. Using the absolute number of IC in goats as a proxy for the herd-level incidence in goats and comparing 2020 with 2019, there was an increase in the number of CS IC (from 24 to 52, 116.7%) and there was nearly no difference in the number of AS IC (from 10 to 9).

In general, considering the total number of cases by type and without restricting the calculation to IC only, CS is still the most frequently reported type of scrapie in the EU27 and the UK in both the species. In 2020, the CS/AS ratio was 6:1 in sheep (lower than in 2019: 10.6:1) and 35.4:1 in goats (slightly higher than in 2019: 34.4:1). If, for goats, Cyprus is excluded, the CS/AS ratio was 9.2:1 in 2020 compared with 7.1:1 in 2019.
Table 21: Number of scrapie cases in sheep by country, case type, index case status, surveillance target group in 2020 in the EU and other reporting countries

| Index case | Atypical scrapie (AS) | Classical scrapie (CS) | Total CS | Total |
|------------|----------------------|------------------------|----------|-------|
| Surveillance target group | No | Yes | Subtotal | No | Yes | Subtotal | No | Yes | Subtotal | No | Yes | Subtotal |
| BE | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BG | 14 | 14 | 14 | 8 | 8 | 16 | 14 |
| CY | 1 | 1 | 1 | 63 | 66 | 4 | 133 | 33 | 6 | 43 | 176 | 177 |
| DE | 2 | 4 | 4 | 10 | 12 | 241 | 241 | 3 | 3 | 244 | 256 |
| EL | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 6 | 6 | 12 |
| FI | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 6 | 6 | 12 |
| FR | 2 | 1 | 3 | 4 | 7 | 11 | 14 | 14 |
| HU | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 6 | 6 | 12 |
| IT | 2 | 3 | 1 | 4 | 6 | 52 | 28 | 6 | 86 | 9 | 7 | 16 | 102 | 108 |
| PL | 13 | 18 | 18 | 4 | 4 | 1 | 1 | 5 | 5 | 23 |
| RO | 1 | 1 | 2 | 6 | 53 | 53 |
| SE | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 6 | 6 | 12 |
| SK | 1 | 1 | 4 | 4 | 5 | 5 | 14 |
| Total EU27 | 4 | 3 | 2 | 9 | 51 | 22 | 2 | 75 | 360 | 98 | 50 | 508 | 53 | 24 | 4 | 81 | 589 | 673 |
| UK | 1 | 1 | 9 | 4 | 13 | 14 | 14 |
| Total EU27 + UK | 4 | 4 | 2 | 10 | 60 | 26 | 2 | 88 | 98 | 360 | 98 | 50 | 508 | 53 | 24 | 4 | 81 | 589 | 687 |
| IS | 7 | 5 | 12 | 12 | 47 | 47 | 3 | 1 | 2 | 6 | 53 | 53 |
| NO | 0 | 7 | 5 | 12 | 12 | 47 | 47 | 3 | 1 | 2 | 6 | 53 | 53 |
| Total other non-EU | 0 | 7 | 5 | 12 | 12 | 47 | 47 | 3 | 1 | 2 | 6 | 53 | 53 |
| Total | 4 | 4 | 2 | 10 | 67 | 31 | 2 | 100 | 110 | 407 | 98 | 50 | 555 | 56 | 25 | 6 | 87 | 642 | 752 |
Table 22: Number of scrapie cases in goats by country, case type, index case status, surveillance target group in 2020 in the EU and other reporting countries

| Case type       | Atypical scrapie (AS) | Classical scrapie (CS) |
|-----------------|-----------------------|------------------------|
|                 | No | Yes | Total | No | Yes | Total | Total |
| Index case      |    |     |       | EM | NSHC | SHC | Subtotal | EM | NSHC | SHC | SU | Subtotal | EM | NSHC | SHC | SU | Subtotal |
| Surveillance target group |     |     |       |     |      |     |         |     |      |     |    |         |     |      |     |    |         |
| BG              | 3  | 3   | 7     | 7  |      |     |         | 28 | 29   | 57  |    |         |     |      |     |    |         |
| CY              | 90 | 34  | 100   | 224| 10   | 2   | 236     | 93 | 2    | 12  | 2  | 326     |     |      |     |    |         |
| DK              | 1  | 1   | 1     | 1  |      |     |         |    |      |     |    |         |     |      |     |    |         |
| EL              | 4  | 2   | 6     | 12 | 7    | 2   | 21      | 27 | 2    | 12  |    | 27     |     |      |     |    |         |
| ES              | 3  | 3   | 3     | 23 | 2    | 5   | 29      | 32 | 3    | 6   |    | 32     |     |      |     |    |         |
| FR              | 1  | 1   | 1     | 1  |      |     |         |    |      |     |    |         |     |      |     |    |         |
| IT              | 3  | 3   | 3     | 2  | 3    | 5   | 13      | 16 | 1    | 1   |    | 16     |     |      |     |    |         |
| PT              | 1  | 1   | 1     | 1  |      |     |         |    |      |     |    |         |     |      |     |    |         |
| Total EU27      | 9  | 9   | 9     | 28 | 29   | 57  | 317     | 326| 3    | 6   |    | 328    |     |      |     |    |         |
| UK              |    | 1   | 1     | 1  |      |     |         | 1  |      |     |    |         |     |      |     |    |         |
| Total EU27 + UK | 9  | 9   | 9     | 28 | 30   | 52  | 319     | 328| 3    | 2   |    | 328    |     |      |     |    |         |
| Total other non-EU | 0 | 0   | 0     | 0  |      |     |         | 0  |      |     |    |         |     |      |     |    |         |
| Total           | 9  | 9   | 9     | 28 | 30   | 52  | 319     | 328| 3    | 2   |    | 328    |     |      |     |    |         |

EM: animals culled under TSE eradication measures; NSHC: Animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption; SU: animals clinically suspected of being infected by a TSE (transmissible spongiform encephalopathies).

Only the reporting countries in which scrapie cases in goats were detected in 2020 are included in the table.

(a): A CH1641-like case was reported by Italy. It is not included in the total. An additional total of 12 cases were reported as inconclusive by Italy (see Table 31). They are not included in the total.
Focusing on the last 10 years, the evolution in the number of scrapie cases detected at EU27 and the UK level is shown for each species and by case type in Figure 2. After the 2006 peak in the number of reported scrapie cases in sheep with 2,596 CS cases (when the number of tests also peaked), CS cases have decreased from 1,444 in 2011 to 554 in 2016. An increase was observed in 2017 (839 CS and unknown cases), and a similar order of magnitude was observed in 2018 (820 cases). A new increase to 911 was evident in 2019, mainly due to CS cases from TSE-infected flocks reported by Greece, Italy and Spain. A decrease to 589 CS cases was reported in EU27 and the UK in 2020, largely as a result of the decrease in cases in Greece, Spain, Italy and Romania with 100 (−36.2%), 68 (−21.8%), 69 (−40.4%) and 89 (−63.1%) less cases than in the previous year, respectively. This trend was likely to be associated with the decrease in the testing of TSE-infected flocks and the reduction of the number of IC in those four countries, 73 in 2020, 21 less than that in 2019 (94).

In goats, the decreasing trend in the absolute number of CS cases continued in 2020. The evolution is mainly affected by one single MS (Cyprus), where the number of detected cases has consistently declined since the peak in 2013 when 1,678 cases were reported by Cyprus and 1,799 in total including all other MS. Since then, the total number of CS cases in EU27 and the UK has consistently decreased to 319 in 2020. In 2020 compared with 2019, there was also a small reduction in the number of CS in goats in Italy and Spain from 26 to 13 and from 35 to 29, respectively. Greece reported nearly a fourfold increase in the number of CS cases in 2020 (27), compared with 2019 (7). Cyprus, Greece and Spain reported an increase in index CS cases, from 8 to 12, from 2 to 21 and from 2 to 4, respectively. Italy reported a reduction in the number of index CS cases, from 10 to 6.

**Figure 2:** Number of reported scrapie cases in the EU and the UK by case type in the period 2011–2020 in (a) sheep and (b) goats

Based on the 35,269 cases of scrapie with known type, species and age between 2002 and 2020 in sheep, the average age of AS cases (82 months) is significantly higher ($p < 0.001$) than that of CS cases (47.8 months). Similarly, in goats, the average age of AS cases (84 months) is significantly
higher ($p < 0.001$) than that of CS cases (51.6 months). When comparing sheep with goats, there was no significant difference in the average age for AS ($p = 0.52$) whereas the average age for CS in sheep in lower than in goats ($p < 0.001$).

Tables 23 and 24 show the cases of CS and AS, respectively, in sheep for the period 2002–2020, with a focus on the last 5 years. Tables 25 and 26 show the cases of CS and AS, respectively, in goats for the period 2002–2020, with a focus on the last 5 years.

In sheep, in 2020, the number of IC of CS and AS per 10,000 tests carried out by target group at EU27 and the UK level was: (1) for CS: 3.2 in NSHC and 1.7 in SHC; (2) for AS: 3.9 in NSHC and 2.5 in SHC.

In goats, in 2020, the number of IC of CS and AS per 10,000 tests carried out by target group at EU27 and the UK level was: (1) for CS: 5.1 in NSHC and 2.8 in SHC; (2) for AS: 1.5 in NSHC and 0 in SHC.

Table 23: Number of classical scrapie cases in sheep by year and reporting country up to 2020

| Country | Up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total CS |
|---------|------------|------|------|------|------|------|----------|
| BE      | 38         |      |      |      |      |      | 38       |
| BG      | 11         | 1    | 5    | 8    | 2    | 25    |          |
| CY      | 3,197      | 7    | 2    | 4    | 1    | 2    | 3,213    |
| CZ      | 56         |      |      |      |      |      | 56       |
| DE      | 116        |      |      |      |      |      | 116      |
| EL      | 5,517      | 227  | 247  | 178  | 276  | 176  | 6,621    |
| ES      | 1,048      | 91   | 247  | 279  | 312  | 244  | 2,221    |
| FR      | 1,532      | 2    |      |      |      |      | 1,534    |
| HU      | 10         |      |      |      |      |      | 10       |
| IE      | 574        | 1    | 11   | 1    |      |      | 587      |
| IT      | 2,516      | 143  | 240  | 150  | 171  | 102  | 3,322    |
| NL      | 401        |      |      |      |      |      | 401      |
| PT      | 26         | 7    |      | 1    | 5    |      | 39       |
| RO      | 658        | 75   | 76   | 203  | 141  | 52   | 1,205    |
| SI      | 174        |      |      |      |      |      | 174      |
| SK      | 107        | 10   | 15   |      |      |      | 132      |
| Total EU27 | 15,981 | 563  | 839  | 820  | 902  | 589  | 19,694   |
| UK      | 1,995      |      |      |      | 9    |      | 2,004    |
| Total EU27+UK | 17,976 | 563  | 839  | 820  | 911  | 589  | 21,698   |
| IS      | 195        | 11   | 1    | 21   | 21   | 53   | 302      |
| NO      | 12         |      |      |      |      |      | 12       |
| Total other non-EU | 207  | 11   | 1    | 21   | 21   | 53   | 314      |
| Total   | 18,183     | 574  | 840  | 841  | 932  | 642  | 22,012   |

Note: Only the reporting countries in which classical scrapie cases in sheep were detected are included in the table. EU and reporting countries without classical scrapie cases in sheep are not included in the table. The table with all historical cases can be found at https://doi.org/10.5281/zenodo.5602725

(a): The number of total cases in Greece in 2018 has been amended following the footnote in the republished 2018 TSE EUSR.
(b): The number of total cases up to 2014 in Slovenia has been amended following notification by the Slovenian competent authority. Subtotal and totals have been amended accordingly.

Table 24: Number of atypical scrapie cases in sheep by year and country up to 2020 in the reporting countries

| Country | Up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total AS |
|---------|------------|------|------|------|------|------|----------|
| AT      | 12         | 1    | 1    | 1    |      |      | 15       |
| BE      | 8          |      |      |      | 2    |      | 10       |
| BG      | 4          | 2    |      |      |      |      | 6        |
| CZ      | 5          | 2    | 1    |      |      |      | 8        |
| DE      | 115        | 5    | 4    | 4    | 4    | 14   | 146      |
Table 25: Number of classical scrapie cases in goats by year and country up to 2020 in the reporting countries

| Country | Up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total CS |
|---------|------------|------|------|------|------|------|----------|
| BG      | 12         | 1    |      | 1    |      |      |          |
| EE      | 2          |      |      |      |      |      |          |
| EL      | 30         | 2    |      |      | 1    |      |          |
| ES      | 198        | 13   | 12   | 9    | 7    | 12   | 251      |
| FI      | 11         | 2    |      | 2    | 3    | 1    | 19       |
| FR      | 550        | 4    | 3    | 6    | 8    | 3    | 571      |
| HR      | 2          |      |      |      |      |      |          |
| HU      | 106        | 23   | 14   | 13   | 17   | 14   | 187      |
| IE      | 34         | 1    | 1    | 8    | 6    | 1    | 51       |
| IT      | 86         | 5    | 3    | 8    | 7    | 6    | 115      |
| NL      | 18         |      |      |      |      |      |          |
| PL      | 39         | 8    | 7    | 6    | 4    | 5    | 69       |
| PT(a)   | 591        | 26   | 29   | 30   | 20   | 18   | 714      |
| RO      | 1          |      |      |      |      |      |          |
| SE      | 42         | 3    | 2    | 2    | 1    |      | 50       |
| SI      | 7          | 3    |      |      |      |      | 10       |
| SK      | 22         | 5    | 5    | 6    | 4    | 5    | 47       |
| Total EU27 | 1,894 | 106 | 82 | 96 | 80 | 84 | 2,342 |
| UK      | 319        |      |      |      |      |      |          |
| Total EU27 + UK | 2,213 | 120 | 94 | 113 | 86 | 98 | 2,724 |
| IS      | 8          |      |      |      |      |      |          |
| NO      | 124        | 14   | 13   | 8    | 10   | 12   | 169      |
| Total other non-EU | 132 | 14 | 13 | 8 | 10 | 12 | 189 |
| Total  | 2,345      | 134  | 107  | 121  | 96   | 110  | 2,913    |

EU and reporting countries without atypical scrapie cases in sheep are not included in the table.

(a): In 2018, it includes one imported case: an animal imported for slaughter from Spain that died at lairage/resting area of the slaughterhouse and was tested as NSHC.
The number of historical reported scrapie cases can be found in the following [link to ZENODO](https://doi.org/10.5281/zenodo.5602725), as follows:

| Table 27: Number of classical scrapie cases in sheep per country and year from 2002 in the EU and non-EU reporting countries. |
|---|
| Table 28: Number of atypical scrapie cases in sheep per country and year from 2002 in the EU and non-EU reporting countries. |
| Table 29: Number of classical scrapie cases in goats per country and year from 2002 in the EU and non-EU reporting countries. |
| Table 30: Number of atypical scrapie cases in goats per country and year from 2002 in the EU and non-EU reporting countries. |

Over the last 10 years (2011–2020), the number of cases (index only) per 10,000 tested animals considering both the case types and the species ranged between 0.5 and 5.4. Figure 3 shows the 10-year trend in the EU27 and the UK by target group of the number of scrapie cases per 10,000 tests of TSE non-infected flocks/herds and separately per case type. The results of the Poisson regression models, in sheep, showed a statistically significant decreasing trends for CS (annual RR: 0.946, p < 0.0001) and AS (annual RR = 0.951, p < 0.0001), i.e. in both cases, the average decrease was 5% per year. In goats, the model did not show any statistically significant trend for either CS or AS (p = 0.141 and 0.7, respectively).

The probability of detecting CS in the NSHC surveillance target group was higher than in the SHC one in both sheep (RR: 1.54, p < 0.0001) and goats (RR: 1.7, p < 0.0001). In AS, a statistically significant higher probability was only observed in sheep (RR = 1.6, p < 0.0001).

### Table 26: Number of atypical scrapie cases in goats by year and country up to 2020 in the EU and other reporting countries

| Country | Up to 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total AS |
|---|---|---|---|---|---|---|---|
| AT | 1 | | | | | | 1 |
| CY | 1 | 1 | 1 | 1 | | | 4 |
| DE | 1 | 1 | | | | | 2 |
| DK | | | 1 | 1 | | | 2 |
| EL | 3 | 1 | 1 | | | | 5 |
| ES | 44 | 5 | 2 | 2 | 2 | 3 | 58 |
| FI | 1 | | | | | | 1 |
| FR | 53 | 3 | 2 | 3 | 1 | | 62 |
| IT | 18 | 3 | 3 | 2 | 3 | 3 | 32 |
| PL | | | 1 | | | | 1 |
| PT | 12 | 1 | | 1 | | | 15 |
| SI | 1 | | | | | | 1 |
| Total EU27 | 135 | 13 | 9 | 6 | 11 | 9 | 183 |
| UK | | | | | | | 0 |
| Total EU27+UK | 135 | 13 | 9 | 6 | 11 | 9 | 183 |
| NO | | | | | | | 1 |
| Total other non-EU | 1 | | | | | | 1 |
| Total | 136 | 13 | 9 | 6 | 11 | 9 | 184 |

EU and reporting countries without atypical scrapie cases in goats are not included in the table.
Tables 31 and 32 summarise the number of discriminatory tests performed by country in 2020 for CS and AS in sheep. Tables 33 and 34 summarise the number of discriminatory tests performed by country in 2020 for CS and AS in goats. In sheep, 597 (99.2%) of the CS and all the inconclusive cases reported in the EU27 and the UK were submitted for discriminatory testing and so were 50 of the AS cases (51%). The 53 cases of CS reported by Iceland and the 12 cases of AS reported by Norway were also submitted to discriminatory testing. All sheep scrapie cases submitted for discriminatory testing were confirmed as ‘BSE excluded’, except 12 cases reported by Italy, that were declared ‘inconclusive’. One Italian case (with a result of ‘BSE excluded’) was characterised as CH1641-like. In goats, 92 (28.8%) of the CS reported in the EU were submitted for discriminatory testing and six of the AS cases (66.7%). All goat cases subjected to discriminatory testing were confirmed as ‘BSE excluded’.

Note: This figure is restricted to active surveillance data, i.e. testing performed in NSHC and SHC target groups from non-infected flocks/herds or not previously known as infected. AS: Atypical scrapie; CS: classical scrapie; NSHC: animals not slaughtered for human consumption; SHC: animals slaughtered for human consumption.

Figure 3: Number of scrapie (index) cases per 10,000 tests in the EU and the UK in (a) sheep and (b) goats in non-TSE-infected flocks/herds, reported by case type and target group in the period 2011–2020.
Table 31: Number of discriminatory tests and results in classical scrapie cases in sheep in 2020 by reporting country

| Country | No. of classical scrapie, CH1641-like and inconclusive cases | Cases submitted for discriminatory testing | % of classical scrapie, CH1641-like and inconclusive cases(b) |
|---------|-------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------|
|         | No. of classical scrapie, CH1641-like and inconclusive cases | BSE-not excluded | BSE-excluded | Inconclusive(a) | Total |                                   |
| BG      | 8                                            | 8                          | 8            | 100%            |
| CY      | 2                                            | 1                          | 1            | 50%             |
| EL      | 176                                          | 176                        | 176          | 100%            |
| ES      | 244                                          | 244                        | 244          | 100%            |
| IT      | 115(c)                                       | 103(c)                     | 12           | 115             | 100%  |
| PT      | 5                                            | 1                          | 1            | 20%             |
| RO      | 52                                           | 52                         | 52           | 100%            |
|         | Total EU27                                   | 602                        | 0            | 585             | 12    | 597                            | 99.2% |
| IS      | 53                                           | 53                         | 53           | 100%            |
|         | Total other non-EU                           | 53                         | 0            | 53              | 0     | 53                            | 100%  |
|         | Total                                        | 655                        | 0            | 638             | 12    | 650                           | 99.2% |

Reporting countries without classical scrapie cases in sheep are not included in the table.
(a): The inconclusive cases have not been included in the total number of sheep scrapie cases of 2020.
(b): It indicates the proportion of classical TSE and inconclusive cases that are submitted to discriminatory testing by each reporting country.
(c): One CH1641-like case has been included.

Table 32: Number of discriminatory tests and results in atypical scrapie cases in sheep in 2020 by reporting country

| Country | No. of atypical scrapie cases | Cases submitted for discriminatory testing | % of total atypical scrapie cases(a) |
|---------|------------------------------|-------------------------------------------|-----------------------------------|
|         | No. of atypical scrapie cases | BSE-not excluded | BSE-excluded | Total |                                   |
| BE      | 2                            | 1                          | 1            | 1     | 50%                             |
| DE      | 14                           |                            |              |       | 0%                              |
| EL      | 1                            |                            |              |       | 0%                              |
| ES      | 12                           | 12                        | 12           | 100%  |
| FI      | 1                            |                            |              |       | 0%                              |
| FR      | 3                            |                            |              |       | 0%                              |
| HU      | 14                           | 14                        | 14           | 100%  |
| IE      | 1                            |                            |              |       | 0%                              |
| IT      | 6                            | 6                          | 6            | 100%  |
| PL      | 5                            | 2                          | 2            | 40%   |
| PT      | 18                           |                            |              |       | 0%                              |
| RO      | 1                            | 1                          | 1            | 100%  |
| SE      | 1                            |                            |              |       | 0%                              |
| SK      | 5                            |                            |              |       | 0%                              |
|         | Total EU27                    | 84                         | 0            | 36    | 36                             | 42%   |
| UK      | 14                           |                            |              |       | 100%                           |
|         | Total EU27+UK                 | 98                         | 0            | 50    | 50                             | 51%   |
| NO      | 12                           |                            |              |       | 100%                           |
|         | Total other non-EU            | 12                         | 0            | 12    | 12                             | 100%  |
|         | Total                        | 110                        | 0            | 62    | 62                             | 56.4% |

BSE: bovine spongiform encephalopathy, TSE: transmissible spongiform encephalopathies.
EU and reporting countries without atypical scrapie cases in sheep are not included in the table.
(a): Indicates the proportion of atypical TSE cases that are submitted to discriminatory testing by each reporting country.
3.2.1. Genotyping in sheep

The classification of genotypes of the sheep prion protein PRNP gene used in this report and based on to the Great Britain’s NSP is summarised in Table 35.

Table 33: Number of discriminatory tests and results in classical scrapie cases in goats in 2020 by reporting country

| Country | No. of classical scrapie cases | Cases submitted for discriminatory testing | % of total classical scrapie cases<sup>(a)</sup> |
|---------|-------------------------------|-------------------------------------------|---------------------------------------------|
|          |                               | BSE-not excluded | BSE-excluded | Total |                               |
| BG      | 7                             | 3              | 3            | 42.9% |
| CY      | 236                           | 13             | 13           | 5.5%  |
| EL      | 27                            | 27             | 27           | 100%  |
| ES      | 29                            | 29             | 29           | 100%  |
| IT      | 13                            | 13             | 13           | 100%  |
| RO      | 5                             | 5              | 5            | 100%  |
| Total EU27 | 317                     | 0              | 90          | 28.4% |
| UK      | 2                             | 2              | 2            | 100%  |
| Total EU27+UK | 319              | 0              | 92          | 28.8% |
| Total other non-EU | 0                  | 0              | 0            | 0%    |
| Total   | 319                           | 0              | 92          | 28.8% |

BSE: bovine spongiform encephalopathy, TSE: transmissible spongiform encephalopathies.

EU and reporting countries without atypical scrapie cases in goats are not included in the table.

(a): It indicates the proportion of classical TSE cases that are submitted to discriminatory testing by each reporting country.

Table 34: Number of discriminatory tests and results in atypical scrapie cases in goats in 2020 by reporting country

| Country | No. of atypical scrapie cases | Cases submitted for discriminatory testing | % of total atypical scrapie cases<sup>(a)</sup> |
|---------|-------------------------------|-------------------------------------------|---------------------------------------------|
|          |                               | BSE-not excluded | BSE-excluded | Total |                               |
| DK      | 1                             | 0              | 0            | 0.0%  |
| ES      | 3                             | 3              | 3            | 100.0% |
| FR      | 1                             | 0              | 0            | 0.0%  |
| IT      | 3                             | 3              | 3            | 100.0% |
| PT      | 1                             | 0              | 0            | 0.0%  |
| Total EU27 | 9                  | 0              | 6            | 66.7% |
| Total   | 9                             | 0              | 6            | 66.7% |

BSE: bovine spongiform encephalopathy, TSE: transmissible spongiform encephalopathies.

EU and reporting countries without atypical scrapie cases in goats are not included in the table.

(a): It indicates the proportion of atypical TSE cases that are submitted to discriminatory testing by each reporting country.
Table 35: Classification of the genotypes of the sheep prion protein PRNP gene according to Great Britain’s National Scrapie Plan (NSP) and the three tiers of report groups

| NSP group | Genotype | Comment | Report group |
|-----------|----------|---------|--------------|
| NSP1      | ARR/ARR  | Genetically most resistant | Resistant     |
| NSP2      | ARR/ARQ; ARR/ARH; ARR/AHQ | Genetically resistant | Semi-resistant |
| NSP3      | ARQ/ARQ  | Genetically little resistant (ARQ/ARQ may be scientifically reviewed) | Susceptible    |
| NSP3 other (NSP3O) | AHQ/AHQ; ARH/ARH; ARH/ARQ; AHQ/ARH; AHQ/ARQ | Genetically susceptible | Susceptible    |
| NSP4      | ARR/VRQ  | Genetically highly susceptible | Susceptible    |
| NSP5      | ARQ/VRQ; ARH/VRQ; AHQ/VRQ; VRQ/VRQ | | |

Table 36 shows the genotypes of sheep scrapie cases in 2020 in the EU and other reporting countries.

In total, 541 (97%) of the 558 cases of CS in sheep with NSP genotype reported in the EU27 and the UK in 2020 (91.9% of the total CS caseload) were from the susceptible genotype groups (NSP3, NSP3O, NSP4 and NSP5). This is similar to previous years in which over 98.7% of all CS cases with known genotypes were from the susceptible groups. In the other non-EU reporting countries, all CS cases reported by Iceland were from the susceptible genotype groups or other non-NSP genotypes. In the current year, Romania has reported one case of CS in a sheep with the ARR/ARR genotype (NSP1), a very rare event already reported by Spain in 2019.

Among ovine AS cases, the same genotype groups (NSP3, NSP3O, NSP4 and NSP5) accounted for 49.5% (46/93) of all cases with known genotype (46.9% of the total AS caseload), very similar to 2019. Figure 4 shows the frequency distribution of genotypes of sheep scrapie cases by case type, year and NSP group in the period 2011–2020 in the reporting countries.

Table 37 shows the genotypes obtained in 2020 from the random samples of tested sheep in the reporting countries. In the EU27 and the UK, following the changes in the legislation that entered into force in 2018, nine MS conducted the genotype to a random sample of sheep: Belgium, Cyprus where genotyping is conducted systematically in the breeding sheep population, France, Germany, Greece, Italy, Latvia, the Netherlands and Poland. One of the seven other non-EU reporting countries, Iceland, also reported random genotype results. In the subset of EU27 and the UK that carried out the activity in 2020, and excluding data from Cyprus, 8.8% of the sheep population (with known NSP genotype) were susceptible to CS (NSP3, NSP3O, NSP4 and NSP5), lower than the 15.7% in 2019 and the 19.2% in 2018. This percentage stands at 44.4% in Greece and 27.3% in Italy, two of the countries with the highest case load in 2020, whereas it was between 12% and 30% in the remaining six MS.

Considering the past 10 years of random genotyping and excluding Cyprus, the proportion of sheep in the resistant genotype group (NSP1; black colour in the bars of Figure 5) shifted from 28.6% of the total number of genotyped sheep in 2011 (in which 23 MS contributed) to 70.1% in 2020 (in which eight MS contributed).
Table 36: Distribution of genotypes of confirmed scrapie cases in sheep by reporting country and National Scrapie Plan (NSP) group

| Country/NSP types | NSP1 | NSP2 | NSP3 | NSP4 | NSP5 | Unknown(a) | N/G(b) | Total AS | NSP1 | NSP2 | NSP3 | NSP4 | NSP5 | Unknown | N/G | Total CS | NSP3 | NSP3O | Unknown | Total inconclusive | NSP3 | Total CH1641-like | Total scrapie cases |
|-------------------|------|------|------|------|------|------------|--------|----------|------|------|------|------|------|-----------|------|----------|------|-------|----------|-------------------|------|------------------|-------------------|
| BE                | 2    |      |      |      |      |            |        |          | 0    |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 2                 |
| BG                |      | 8    |      |      |      |            |        |          | 0    |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 8                 |
| CY                |      |      | 1    |      |      |            |        |          | 0    |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 2                 |
| DE                | 1    | 8    | 5    |      |      |            |        |          | 14   |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 14                |
| EL                | 1    |      | 1    | 7    | 32   | 3          |        |          | 176  |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 177               |
| ES                | 2    | 2    | 5    | 1    | 1    | 12         |        |          | 225  | 7    |      |      |      |            |      |          |      |       |          |                   |      |                  | 256               |
| FI                |      | 1    | 1    |      |      |            |        |          | 0    |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 1                 |
| FR                | 1    |      | 3    |      |      |            |        |          | 0    |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 3                 |
| IE                |      |      | 1    |      |      |            |        |          | 0    |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 1                 |
| IT                | 1    | 4    | 1    |      |      | 6          |        | 84      | 5    | 3    | 10   | 102  | 3    | 1         |      | 12      | 1    | 1    | 121      |                   |      |                  | 121               |
| PL                | 1    | 2    | 2    |      |      | 5          |        | 0       |      |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 5                 |
| PT                | 1    | 5    | 10   | 2    |      | 18         |        | 3       | 1    | 1    |      |      |      |            |      | 0       |      |       |          |                   |      |                  | 23                |
| RO                |      | 1    | 1    | 7    | 18   | 3          | 3      | 20      | 52   |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 53                |
| SE                |      |      | 1    |      |      | 1          |        | 0       |      |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 1                 |
| SK                | 2    | 1    | 1    | 5    |      |            |        | 0       |      |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 5                 |
| Total EU27        | 11   | 26   | 20   | 20   | 0    | 2          | 5      | 84      | 1    | 16   | 463  | 48   | 4    | 26         | 31   | 589     | 7    | 2    | 12       | 1                | 1    | 1                 | 686               |
| UK                |      | 3    | 7    | 3    | 1    | 14         |        | 0       |      |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 14                |
| Total EU27 + UK   | 14   | 33   | 23   | 21   | 0    | 2          | 5      | 98      | 1    | 16   | 463  | 48   | 4    | 26         | 31   | 589     | 7    | 2    | 12       | 1                | 1    | 1                 | 700               |
| IS                |      |      |      |      |      |            |        | 0       |      |      |      |      |      | 90         | 44   | 53      |      |      |          |                   |      |                  | 53                |
| NO                | 5    | 7    | 12   |      |      |            |        | 0       |      |      |      |      |      |            |      |          |      |       |          |                   |      |                  | 12                |
| Total other non-EU| 0    | 5    | 0    | 0    | 0    | 12         |        | 0       |      |      |      |      |      | 90         | 44   | 53      | 0    | 0    | 0        | 0                | 0    | 0                 | 65                |
| Total             | 14   | 38   | 23   | 28   | 0    | 2          | 5      | 110     | 1    | 16   | 472  | 48   | 4    | 26         | 75   | 642     | 7    | 2    | 12       | 1                | 1    | 1                 | 765               |

(a): Unknown: genotype other than those included in the NSP list.
(b): N/G: not genotyped.
(a) Atypical scrapie. (b) Classical scrapie. NSP1: resistant (black); NSP2: semi-resistant (grey); NSP3 (orange) + NSP3O (yellow) + NSP4 (red) + SNP5 (purple): susceptible as referred to in Table 35.

**Figure 4:** Frequency distribution of genotypes of sheep scrapie cases by case type, year and National Scrapie Plan (NSP) group in the period 2011–2020 in the reporting countries
**Table 37:** Number of genotyped animals (% of sample within country) in randomly selected sheep in the EU and other reporting countries in 2020 by reporting country and National Scrapie Plan (NSP) group, in accordance with Regulation (EC) 999/2001, Annex VII, Chapter C, Part I, point 8

| Country | Number of genotyped animals (% of sample within country) | NSP1 | NSP2 | NSP3 | NSP3O | NSP4 | NSP5 | Other/unknown | Total |
|---------|--------------------------------------------------------|------|------|------|-------|------|------|---------------|-------|
| AT      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| BE      | 488 (68%)                                              | 145 (20.2%) | 41 (5.7%) | 33 (4.6%) | 7 (1%) | 4 (0.6%) | 0 (0%) | 718 |
| BG      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| CY     | 57,833 (91.6%)                                         | 4,677 (7.4%) | 197 (0.3%) | 64 (0.1%) | 156 (0.2%) | 17 (0%) | 222 (0.4%) | 63,166 |
| CZ      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| DE      | 3,780 (78.9%)                                          | 803 (16.8%) | 125 (2.6%) | 64 (1.3%) | 11 (0.2%) | 1 (0%) | 8 (0.2%) | 4,792 |
| DK      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| EE      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| EL      | 18 (13.5%)                                             | 56 (42.1%) | 42 (31.6%) | 12 (9%) | 3 (2.3%) | 2 (1.5%) | 0 (0%) | 133 |
| ES      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| FI      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| FR      | 255 (64.9%)                                            | 95 (24.2%) | 26 (6.6%) | 4 (1%) | 8 (2%) | 5 (1.3%) | 0 (0%) | 393 |
| HR      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| HU      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| IE      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| IT      | 175 (28.3%)                                            | 272 (44%) | 126 (20.4%) | 29 (4.7%) | 2 (0.3%) | 11 (1.8%) | 3 (0.5%) | 618 |
| LT      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| LU      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| LV      | 39 (59.1%)                                             | 14 (21.2%) | 13 (19.7%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 66 |
| MT      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| NL      | 810 (67.5%)                                            | 260 (21.7%) | 47 (3.9%) | 27 (2.3%) | 27 (2.3%) | 5 (0.4%) | 24 (2%) | 1,200 |
| PL      | 31 (31%)                                                | 39 (39%) | 13 (13%) | 2 (2%) | 8 (8%) | 7 (7%) | 0 (0%) | 100 |
| PT      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| RO      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| SE      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| SI      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| SK      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| Total EU27 | 63,429 (89.1%)                                          | 6,361 (8.9%) | 630 (0.9%) | 235 (0.3%) | 222 (0.3%) | 52 (0.1%) | 257 (0.4%) | 71,186 |
| UK      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| Total EU27+UK | 63,429 (89.1%)                                          | 6,361 (8.9%) | 630 (0.9%) | 235 (0.3%) | 222 (0.3%) | 52 (0.1%) | 257 (0.4%) | 71,186 |
| BA      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| CH      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| IS      | 0 (0%)                                                  | 0 (0%) | 634 (76.8%) | 133 (16.1%) | 0 (0%) | 58 (7%) | 0 (0%) | 825 |
| ME      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| MK      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| NO      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
| RS      | Not done                                               | Not done | Not done | Not done | Not done | Not done | Not done | Not done |
3.3. TSE surveillance in cervids

In 2020, 9,171 cervids were tested for TSE in the EU27 by 12 MS and the UK. Six of them (Estonia, Finland, Latvia, Lithuania, Poland and Sweden, from this point forwards referred to as the MS6) were subject to mandatory surveillance (Section 1.2.4) and reduced the number of cervids tested compared with 2019, from 7,980 to 6,974 (−12.6%), but increased compared with 2018 when 5,110 were tested. The six MS not subject to mandatory surveillance that contributed to the monitoring were Austria, Belgium, Hungary, Italy, Romania and Spain that, together with the UK, tested 2,197 cervids (24% of the total). However, Austria, Belgium and the UK only reported three, one and two tested cervids, respectively.

Out of the 6,974 cervids tested by the MS6, 1,829 (26.2%) were captive, farmed or semi-domesticated animals, mostly reindeer (1,615), followed by red deer (206). Among the 5,145 (73.8%) wild cervids tested by the MS6, 3,178 (61.8%) were roe deer and 1,088 European moose (21.1%).

The table below the figure describes the numbers of contributing MS (Cyprus excluded).

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|------|------|------|
| Number of contributing MS | 23   | 22   | 24   | 25   | 25   | 25   | 20   | 7    | 7    | 8    |
| Total genotyped | 8,889 | 8,390 | 8,340 | 9,437 | 9,823 | 9,413 | 8,871 | 2,713 | 3,180 | 7,985 |

Data from Cyprus were excluded. NSP1: resistant (black); NSP2: semi-resistant (grey); NSP3 (orange) + NSP3O (yellow) + NSP4 (red) + SNP5 (blue): susceptible as referred to in Table 36.

Figure 5: Frequency distribution of the six genotype National Scrapie Plan (NSP) groups in sheep sampled for genotyping in the EU in the period 2011–2020 according to Regulation (EC) 999/2001, Annex III, Chapter A, Part II, point 8 until end of 2017 and Annex VII, in Chapter C, in Part 1, point 8 from 2018

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Out of the 6,974 cervids tested by the MS6, 1,829 (26.2%) were captive, farmed or semi-domesticated animals, mostly reindeer (1,615), followed by red deer (206). Among the 5,145 (73.8%) wild cervids tested by the MS6, 3,178 (61.8%) were roe deer and 1,088 European moose (21.1%).
During the third year of mandatory surveillance in MS6, two cases of CWD in wild moose were reported by Finland and Sweden. The number of cervids tested in 2020 by management system, species and reporting country are displayed in Table 38. The description of the four CWD cases in 2020 is shown in Table 41.

When considering the target groups, the most common target group tested by the MS6 was the ‘Hunted/slaughtered fit for human consumption’ (HSHC) that accounted for 3,959 (56.8% of all tested cervids, being the main target group for Estonia, Lithuania, Latvia and Sweden). All the rest were risk animals in the different target groups: road/predator killed (RK): 1,953 (28%); fallen/culled (FC): 947 (13.6%); clinical suspect animals (SUS): 34 (0.5%); hunted/slaughtered not fit for human consumption (HSNHC): 81 (1.2%). There is a large variability between MS6 countries in the proportion of cervids tested in the HSHC, ranging from 8.9% tested by Poland to 92% by Latvia. The numbers of tested cervids by reporting country, management system and target group in 2020 are displayed in Table 39.

In terms of testing at PSU\textsuperscript{14} level, the number and proportion of PSU for wild/semi-domesticated and farmed/captive cervids declared and tested by the MS6 are shown in Table 40. There is a large variability in the proportion of PSU from which samples have been collected, which is determined by the number of PSU included in the sampling programme. The PSU data ranged from an average of one animal sampled from 6.7% (1/15) of the wild PSU in Estonia to an average of 5 (1–422) animals sampled from the 92% (46/50) of the wild PSU in Sweden. The same variability is also present in the captive/farmed deer PSU data; for some countries, the data were incomplete. Median, minimum and maximum number of cervids tested in the different types of PSU and countries of the MS6 are also displayed in Table 40.

Among the non-MS6 and the UK, Romania accounted for 68.9% of all tested cervids (1,515), followed by Italy with 437. Most tested cervids by the non-MS6 and the UK were roe deer (64.8%) due to the 70% of all cervids tested by Romania being roe deer, followed by red deer and unspecified deer. All tested cervids by the non-MS6 resulted negative.

Norway continued its intensified testing programme in wild and captive cervids and tested 22,528 animals in 2020, mostly semi-domesticated reindeer (28.9%), followed by wild moose (27.5%), leading to the detection of two cases of CWD: one in wild reindeer and one in moose (Table 41). Iceland and Serbia also reported 33 and 76 cervids tested in 2020, respectively, all negative.

\textsuperscript{14} The criteria to identify the Primary Sampling Units (PSU) by each of the MS6 are described in the 2018 EFSA EUSR (EFSA, 2019).
Table 38: Number of cervids tested in the reporting countries in 2020 by management system, species and country

| Management system species (a) | Semi-domesticated/farmed deer species | Wild deer species | Total |
|------------------------------|---------------------------------------|------------------|-------|
| Country (b) | Deer | Moose | Fallow deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | Deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | Total |
|-------------------------|-----|-------|----------|--------|--------|--------|-----------------|----------|-----|--------|--------|--------|-----------------|----------|-------|
| AT                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 3     |
| BE                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 1     |
| ES                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 225   |
| HU                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 14    |
| IT                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 428   |
| RO                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 1,515  |
| Subtotal non-MS6        |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 2,182  |
| UK                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 2     |
| Subtotal non-MS6 + UK   |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 2,197  |
| EE (c)                  |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 1,435  |
| FI                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 1,436  |
| LT                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 584    |
| LV                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 1,212  |
| PL                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 844    |
| SE                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 944    |
| Subtotal MS6            |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 1,118  |
| TOTAL EU27 + UK         |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 5,145  |
| IS                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 6,974  |
| NO                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 22,528 |
| RS                      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 15,053 |
| TOTAL other non-EU      |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 22,637 |
| TOTAL                   |     |       |          |        |        |        |                 |          |     |        |        |        |                  |          | 31,808 |

(a): Deer: not specified. Moose (or Eurasian/European elk) (Alces alces alces). Fallow deer (Dama dama). Reindeer: Eurasian tundra reindeer (Rangifer tarandus tarandus) in Sweden; Finnish (Eurasian) forest reindeer (Rangifer tarandus fennicus) in Finland; Roe deer (Capreolus capreolus); Red deer (Cervus elaphus). White-tailed deer (Odocoileus virginianus).

(b): Only countries that reported tested cervids are included in the table.

(c): Shaded in grey: MS conducting mandatory surveillance from 2018 (MS6).
### Table 39: Number of cervids tested in the EU and reporting countries by management system, species, country and target group in 2020 (extended version of Table 38)

| Management system species(a) | Country(b) and target group(c) | Semi-domesticated/farmed deer species | Wild deer species | Total |
|------------------------------|---------------------------------|--------------------------------------|-------------------|-------|
|                              |                                 | Deer | Moose | Fallow deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | Deer | European Moose | Fallow deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | |
| Semi-domesticated/farmed     |                                 |      |       |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| Deer                         |                                 |      |       |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| Wild deer species            |                                 |      |       |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| Total                        |                                 |      |       |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| AT                           | SUS                             | 2    | 2     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | HSNHC                           | 1    | 1     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 3    | 3     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| BE                           | FC                              |      |       |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 1    | 1     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| ES                           | SUS                             | 2    | 2     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | RK                              | 60   | 14    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | HSNHC                           | 30   | 14    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 90   | 14    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| HU                           | SUS                             | 61   | 1    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | FC                              | 6    | 1     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 67   | 1    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| IT                           | SUS                             | 1    | 1     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | RK                              | 1    | 1     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | FC                              | 6    | 1     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 10   | 2     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| RO                           | RK                              | 3    | 8     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | FC                              | 15   | 11    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | HSNHC                           | 172  | 61    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 190  | 72    |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| UK                           | SUS                             | 2    | 2     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
|                              | Total                            | 2    | 2     |             |          |          |         |                |          |      |               |             |          |          |         |                |          | |
| Subtotal non-MS6 + UK        |                                 | 2    | 0     | 6           | 0        | 2        | 5        | 0               | 15       | 280  | 0             | 120        | 0        | 1,422  | 360      | 0              | 2,182    | 2,197 |

EUSR on transmissible spongiform encephalopathies in 2020

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## EUSR on transmissible spongiform encephalopathies in 2020

| Management system species(a) | Country(b) and target group(c) | Semi-domesticated/farmed deer species | Wild deer species | Total |
|------------------------------|---------------------------------|--------------------------------------|------------------|-------|
|                              | Deer   | Moose | Fallow deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | Deer | European Moose | Fallow deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | Total |
| EE(d)                        | RK     | 0     | 10         | 265      | 275      | 275      | 31             | 31             | 32   | 1           | 1             | 1128     | 1,128     | 1,145     | 1,436     | 1,436     | 1,436     | 1,436     |
|                    | FC     | 1     | 1          | 31       | 31       | 31       | 1             | 1             | 1    | 1           | 1             | 1128     | 1,128     | 1,145     | 1,436     | 1,436     | 1,436     | 1,436     |
|                    | HSNHC  |       |            |          |          |          | 1             | 1             | 1    | 1           | 1             | 1128     | 1,128     | 1,145     | 1,436     | 1,436     | 1,436     | 1,436     |
|                    | HSHC   |       |            |          |          |          | 301           | 636           | 191  | 1128        | 1,128         | 1128     | 1,128     | 1,145     | 1,436     | 1,436     | 1,436     | 1,436     |
|                    | Total  | 1     | 312        | 932      | 1,435    | 1,436    |               |               |      |             |               |          |           |           |           |           |           |           |
| FI                          | RK     | 406   | 406        | 42       | 216      | 1        | 82            | 345           | 751  | 2           |               |          |           |           |           |           |           |           |
|                    | FC     | 155   | 3          | 158      | 60       | 3        | 25            | 123           | 281  | 55          |               |          |           |           |           |           |           |           |
|                    | HSNHC  | 45    | 45         | 7        | 3        | 3        | 3             | 55            |      | 55          |               |          |           |           |           |           |           |           |
|                    | HSHC   | 1     | 18         | 90       | 14       | 2        | 106           |               |      | 125         |               |          |           |           |           |           |           |           |
|                    | Total  | 1     | 624        | 3        | 628      | 199      | 7             | 255           | 122  | 584         |               |          |           |           |           |           |           |           |
| LT                          | RK     | 5     | 31         | 31       | 139      | 139      |               |               |      |             |               |          |           |           |           |           |           |           |
|                    | FC     | 3     | 3          | 8        | 36       | 15       | 59            | 62            |      | 1           |               |          |           |           |           |           |           |           |
|                    | HSNHC  |       |            |          |          |          | 1             | 1             |      | 1           |               |          |           |           |           |           |           |           |
|                    | HSHC   | 5     | 5          | 52       | 3        | 3        | 395           | 187           | 637  | 642         |               |          |           |           |           |           |           |           |
|                    | Total  | 8     | 8          | 65       | 3        | 535      | 233           | 836           | 844  |             |               |          |           |           |           |           |           |           |
| LV                          | SUS    | 1     | 1          | 2        | 5        | 2        | 9             | 10            |      |             |               |          |           |           |           |           |           |           |
|                    | RK     |       |            |          |          |          |               |               |      |             |               |          |           |           |           |           |           |           |
|                    | FC     | 2     | 18         | 3        | 23       | 23       |               |               |      |             |               |          |           |           |           |           |           |           |
|                    | HSNHC  | 7     | 28         | 9        | 44       | 44       |               |               |      |             |               |          |           |           |           |           |           |           |
|                    | HSHC   | 21    | 21         | 187      | 445      | 236      | 868           | 889           |      |             |               |          |           |           |           |           |           |           |
|                    | Total  | 1     | 21         | 22       | 198      | 496      | 250           | 944           | 966  |             |               |          |           |           |           |           |           |           |
| PL                          | RK     |       |            |          |          |          |               |               |      |             |               |          |           |           |           |           |           |           |
|                    | FC     | 55    | 55         | 20       | 237      | 9        | 266           | 321           |      |             |               |          |           |           |           |           |           |           |
|                    | HSNHC  | 5     | 1          | 6        |          |          |               |               |      |             |               |          |           |           |           |           |           |           |
|                    | HSHC   | 40    | 41         | 1        | 38       | 20       | 59            | 100           |      |             |               |          |           |           |           |           |           |           |
|                    | Total  | 1     | 95         | 96       | 66       | 889      | 67            | 1,022         | 1,118 |             |               |          |           |           |           |           |           |           |
| Management system species<sup>(a)</sup> | Semi-domesticated/farmed deer species | Wild deer species | Total |
|--------------------------------------|--------------------------------------|------------------|-------|
| Country<sup>(b)</sup> and target group<sup>(c)</sup> | Deer | Moose | Fallow deer | Reindeer | Roe deer | Red deer | White-tailed deer | Subtotal | Deer | European | Moose | Fallow deer | Reindeer | Red deer | White-tailed deer | Subtotal | Total |
| SE | SUS | 1 | 991 | 82 | 1,074 | 248 | 3 | 71 | 2 | 324 | 1,398 |
| | RK | 54 | 54 | 2 | 18 | 20 | 74 |
| | FC | 1 | 38 | 7 | 46 | 111 | 1 | 47 | 2 | 161 | 207 |
| | HSNHC | 2 | 1 | 3 | 13 | 2 | 15 | 18 |
| | HSHC | 897 | 74 | 971 | 103 | 1 | 104 | 1,075 |
| Total | 1 | 991 | 82 | 1,074 | 248 | 3 | 71 | 2 | 324 | 1,398 |
| Subtotal MS6 | 1 | 1 | 2 | 1,615 | 1 | 206 | 3 | 1,829 | 0 | 1,088 | 6 | 7 | 3,178 | 744 | 122 | 5,145 | 6,974 |
| Total EU+UK | 3 | 1 | 8 | 1,615 | 3 | 211 | 3 | 1,844 | 280 | 1,088 | 126 | 7 | 4,600 | 1,104 | 122 | 7,327 | 9,171 |
| IS | RK | 1 | 32 | 3 | 35 | 38 | 3 | 50 | 3 | 57 | 67 |
| | HSNHC | 32 | | | | | | | | | |
| Total | 33 | 33 | 33 | |
| NO | RK | 2 | 27 | 29 | 3 | 325 | 1,209 | 256 | 1793 | 1,822 |
| | FC | 1 | 1 | 30 | 2 | 17 | 51 | 41 | 358 | 45 | 349 | 192 | 985 | 1,036 |
| | HSNHC | 42 | 87 | 6,460 | 806 | 7,395 | 317 | 5,516 | 5 | 3,165 | 271 | 3,001 | 12275 | 19,670 |
| Total | 45 | 1 | 87 | 6,517 | 2 | 823 | 0 | 7,475 | 361 | 6,199 | 5 | 3,210 | 1,829 | 3,449 | 15,053 | 22,528 |
| RS | RK | 3 | 3 | 6 |
| | HSNHC | 46 | 24 | 70 |
| Total | 49 | 27 | 76 |
| Total non-EU | 45 | 1 | 87 | 6,517 | 51 | 850 | 0 | 7,551 | 361 | 6,199 | 5 | 3,243 | 1,829 | 3,449 | 0 | 15,086 | 22,637 |
| Total | 48 | 2 | 95 | 8,132 | 54 | 1,061 | 3 | 9,395 | 641 | 7,287 | 131 | 3,250 | 6,429 | 4,553 | 122 | 22,413 | 31,808 |

(a): Deer: not specified. Moose (or Eurasian/European elk) (*Alces alces alces*). Fallow deer (*Dama dama*). Reindeer: Eurasian tundra reindeer (*Rangifer tarandus tarandus*) in Sweden; Finnish (Eurasian) forest reindeer (*Rangifer tarandus fennicus*) in Finland. Roe deer (*Capreolus capreolus*); Red deer (*Cervus elaphus*). White-tailed deer (*Odocoileus virginianus*).

(b): Only countries that reported tested cervids are included in the table.

(c): SUS: clinical suspect animals; RK: road/predator killed; FC: fallen/culled; HSNHC: hunted/slaughtered not fit for human consumption; HSHC: hunted/slaughtered fit for human consumption.

(d): Shaded in grey: MS conducting mandatory surveillance from 2018 (MS6).
Table 40: Number of PSU by management type in the six MS with mandatory CWD surveillance in 2020

| Management system | PSU (wild) | PSU (captive/farmed deer) |
|-------------------|-----------|--------------------------|
|                   | Number PSU declared | Number of PSU tested (%) | Median number of cervids tested (min – max) | Number of PSU tested (%) | Median number of cervids tested (min – max) | Number PSU declared | Number of PSU tested (%) | Median number of cervids tested (min – max) |
| EE                | 15 | 1 (6.7%) | 1 (1–1) | 15 | 11 (73%) | 159 (2–285) | 15 | 11 (73%) | 123 (1–285) |
| FI(a)             | 295 | 56 (19%) | 9 (1–38) | 54(b) | 102 (188%) | 2 (1–80) | 349 | 155 (43.2%) | 2 (1–80) |
| LT                | 51 | Not available | 655(c) | Not available | 176 | 5 (1–29) | 100 | 179 (179%) | 5 (1–29) |
| LV(d)             | | 3 | 8 (1–12) | | | | | | |
| PL(e)             | 16 | 2 (18.8%) | 4 (1–7) | 16 | 14 (93.7%) | 15 (2–42) | 16 | 14 (93.7%) | 12 (1–42) |
| SE(f)             | 50 | 46 (92%) | 5 (1–422) | 160 (109 (farmed) + 51 semi-domesticated) | 44 (27.5%) | 4 (1–74) | 210 | 90 (43%) | 5 (1–422) |

CWD: chronic wasting disease, PSU: primary sampling units.
(a): 1 semi-domesticated cervid reported with unknown PSU ID excluded.
(b): Semi-domesticated PSU.
(c): Each farm and each facility in which cervids are kept in an enclosed territory shall be considered as a PSU. There are approximately 655 permissions issued by the Ministry of the Environment for keeping wild animals, including cervids, but the active number (with cervids) is unknown.
(d): 1 semi-domesticated/farmed and 8 wild cervids reported with unknown PSU ID excluded.
(e): 88 semi-domesticated/farmed and 768 wild cervids reported with unknown PSU ID excluded.
(f): 1 semi-domesticated/farmed and 3 wild cervids reported with unknown PSU ID excluded.
### Table 41: Description of the CWD cases in 2020

| Country | National case ID | Management system | Species | Sex | Age group | Target group | Part sampled | Analytical method type | Analytical method | Result |
|---------|------------------|-------------------|---------|-----|-----------|--------------|--------------|------------------------|------------------|--------|
| EU      |                  |                   |         |     |           |              |              |                        |                  |        |
| FI      | E20201029-178/   | Wild deer         | European moose | Female | ≥ 12 months | FC (a)       | Brain         | Confirmatory           | Bio-Rad TeSeE Western blot | Positive |
|         | HVCW-1296        |                   |         |     |           |              |              |                        |                  |        |
| SE      | 6.3.17-14619/2020| Wild deer         | European moose | Female | ≥ 12 months | HSNHC (b)   | Obex          | Screening              | Bio-Rad TeSeE SAP rapid test (using the CWD protocol) | Positive |
|         |                   |                   |         |     |           |              |              |                        |                  |        |
|         |                   |                   |         |     |           |              |              | Screening              | Bio-Rad TeSeE SAP rapid test (using the CWD protocol) | Negative |
|         |                   |                   |         |     |           |              |              | Confirmatory           | Bio-Rad TeSeE Western blot | Positive |
|         |                   |                   | Retropharyngeal lymph node |        |     |           |              |                        |                  |        |
|         |                   |                   |         |     |           |              |              |                        |                  |        |
| Non-EU  |                  |                   |         |     |           |              |              |                        |                  |        |
| NO      | 4                | Wild deer         | European moose | Female | ≥ 12 months | FC           | Obex          | Screening              | Bio-Rad TeSeE SAP rapid test (using the CWD protocol) | Positive |
|         |                   |                   |         |     |           |              |              |                        |                  |        |
|         |                   |                   | Discriminatory test |        |     |           |              | APHA Bio-Rad TeSeE- based hybrid Western blotting Method | Positive |        |
|         | 7                | Wild deer         | Reindeer | Male | ≥ 12 months | HSHC (c)   | Retropharyngeal lymph node | Screening        | Bio-Rad TeSeE SAP rapid test (using the CWD protocol) | Positive |
|         |                   |                   |         |     |           |              |              |                        |                  |        |
|         |                   |                   | Discriminatory test |        |     |           |              | APHA Bio-Rad TeSeE- based hybrid Western blotting Method | Positive |        |

(a): FC: fallen/culled.
(b): HSNHC: hunted/slaughtered not fit for human consumption.
(c): HSHC: hunted/slaughtered fit for human consumption.
3.4. Other species

Only one MS, Finland, reported results on samples tested for TSE in species other than cattle, domestic sheep and goats, and cervids. In total, 101 samples were collected and tested from the following species: American mink (Neovison vison), raccoon dog (Nyctereutes procyonoides) and fox (genus Vulpes). None of them tested positive (Table 42).

Table 42: Numbers of animals in species other than cattle, sheep, goats and cervids tested for TSE in reporting countries in 2020

| Country | American mink (Neovison vison) | Raccoon dog (Nyctereutes procyonoides) | Fox (genus Vulpes) | Total |
|---------|-------------------------------|----------------------------------------|-------------------|-------|
| FI      | 51                            | 15                                     | 35                | 101   |
| Total   | 51                            | 15                                     | 35                | 101   |

4. Conclusions

As part of the BSE surveillance system in cattle in the EU, the EU27 and the UK tested over 1.12 million cattle in 2020, 2.4% less than in the previous year. The testing throughput combined with a risk-based strategy (88.5% of all tests targeted risk animals) contributed to maximise the sensitivity of the BSE surveillance system considering the EU27 and the UK as a single epidemiological unit. The epidemic of SARS-CoV-2 seems not to have affected the capacity of the reporting countries to collect, transport and test cattle samples in 2020.

In EU27, four atypical cases of BSE (one L-BSE and three H-BSE cases) were confirmed in 2020 by three reporting countries: France (one H-BSE and one L-BSE), Ireland (one L-BSE), and Spain (one H-BSE). In total, 51,775 cattle were tested by seven other non-EU reporting countries, with one additional L-BSE case reported by Switzerland. Among non-EU reporting countries, Serbia was the main contributor of testing activity with 13,978 cattle tested, followed by Bosnia and Herzegovina, a new reporting country, who tested 12,848 cattle. Both countries reported mostly cattle tested in the HS target group.

While 2017 was the first year in which there were no cases of C-BSE confirmed in the world, there have been for the first time two consecutive years (2019 and 2020) without C-BSE cases confirmed. The last case of C-BSE was reported in 2018. The monitoring of risk animals led the detection of H- and L- forms in both fallen stock (four cases) and emergency slaughter animals (the Swiss case). No other cases were reported outside Europe in 2020.

In total, 453,194 small ruminants were tested in 2020 in the EU27 and the UK, as part of the TSE surveillance system, leading to an overall testing of more than 10 million tests since 2002. Twenty-three countries in the group EU27 and the UK complied with the EU monitoring requirements for sheep and 24 countries for goats. Compared with 2019, there was a slight decrease in the detection of the ovine IC (CS and AS), from 177 to 169 and this occurred despite the 2.2% increase in the level of testing in non-infected flocks. This may be consistent with a continuous decrease in the overall incidence of the disease in this species. Over the same period, the number of caprine IC (CS and AS) increased by 79%, from 34 to 61, despite the 14% decrease in testing in non-infected herds. The new reporting country, Bosnia and Herzegovina, did not report any tests in small ruminants.

For CS in sheep in 2020 in the EU27 and the UK and compared with 2019, the caseload decreased by 35.4% as a result, partially, of a decrease in testing in TSE-infected flocks by 29.5%. The four largest contributors reduced their caseload from TSE-infected flocks: Greece by 36.2%, Italy by 40.4%, Romania by 63.1% and Spain by 21.8%. CS is reported by a minority of the MS, seven, as in 2019.

In goats, in total of 319 out of 328 scrapie cases reported in the EU27 and the UK in 2020 were CS (97.3%). They were reported by six MS and the UK. Compared with 2019 when 379 CS cases were reported, there was a 15.8% reduction (−60) mainly due to the situation in Cyprus that has improved continuously over the last 7 years.

When looking at the long-term trends of CS in terms of cases per 10,000 tests, the situation in 2020 confirmed the 10-year statistically significant decrease in sheep and no detectable trend in goats, respectively, as estimated by modelling of the available epidemiological data. Genetic-based culling and outbreak management in herds based on goats carrying at least one of the known resistant alleles (i.e.
K222, D146 and S146) are now applicable, following the amendment of the TSE regulation. If fully applied, the trend of CS in goats could be aligned with that of the CS in sheep in the next few years.

With regard to AS in sheep in EU27 and the UK, compared with 2019, testing activity resulted in a 14% increase in reported cases, from 86 in 2019 to 98 in 2020, which was similar for the proportion of cases per 10,000 tested animals (active surveillance) (from 2.5 to 2.6) and for the number of MS reporting cases (from 11 to 14). In goats, the AS situation was very similar to the previous year in terms of caseload and proportion of cases per 10,000 tested animals (0.76 in 2019 and 0.74 in 2020) and number of IC. With regard to the long-term trends of AS, there was also a 10-year statistically significant decreasing trend in sheep and no detectable trend in goats.

The genotyping data collected in 2020 from ovine CS cases consistently confirmed the association between the occurrence of the disease and the susceptible genotypes (NSP3, NSP3Q, NSP4 or NSP5), with 97% of the cases with known NSP genotype carrying them. Romania reported a CS case in a sheep holding the ARR/ARR genotype (NSP1), a very rare occurrence, that was also reported by Spain in one case in 2019. The 2020 genotyping data from random samples of the EU sheep population (data from eight MS after excluding Cyprus) did show an improvement compared with the previous years with an 8.8% of the genotyped sheep carrying genotypes of the susceptible group, compared with the 15.7% in 2019. The NSP1 group (i.e. ARR/ARR) accounted for 70% of all genotyped sheep. However, some caution is needed in interpreting this result as it could reflect the small number of MS contributing with data. Countries in which the caseload is large still showed a high proportion of susceptible sheep.

The enforcement of the 3-year CWD surveillance programme in six MS – Estonia, Finland, Latvia, Lithuania, Poland and Sweden – ended in 2020 with a 12.6% decrease in the number of cervids tested compared with the previous year and the confirmation of two cases of CWD in moose from Finland and Sweden. The implementation of the mandatory surveillance in the six MS has been quite heterogeneous in terms of the design (number and characteristics of the declared PSU), the number of cervids tested in general and per PSU in particular, and of the distribution of testing by species and target groups. The HSHC groups was the most tested group (56.8%) in 2020, consolidating a situation in which the sensitivity of the surveillance system to detect CWD is lower than expected following the proposed surveillance system by EFSA in 2017 (EFSA BIOHAZ Panel, 2017b).

The surveillance was complemented by the additional 2,197 cervids tested by other six MS (68.9% of them tested by Romania) with no additional cases detected. Iceland and Serbia also reported 33 and 76 cervids tested in 2020, all negative.

Norway continued its intensified testing programme in wild and captive cervids and tested 22,528 cervids in 2020, leading to the detection of two cases, one wild reindeer and one wild moose.

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### Abbreviations

| AM | Ante-mortem |
| AS | Atypical scrapie |
| BARB | Born After the Revised Feed Ban |
| BSE | Bovine spongiform encephalopathy |
| C-BSE | Classical bovine spongiform encephalopathy |
| CS | Classical scrapie |
| CWD | Chronic wasting disease |
| DCF | Data Collection Framework |
| DWH | Data Warehouse |
| EFTA | European Free Trade Association |
| EM | Eradication measures |
| ES | Emergency slaughtered |
| EUSR | European Union summary report |
| FC | Fallen/culled |
| FS | Fallen stock |
| H-BSE | H-type bovine spongiform encephalopathy |
| HS | Healthy slaughtered |
| HSHC | Hunted/slaughtered fit for human consumption |
| HSNHC | Hunted/slaughtered not fit for human consumption |
| IC | Index case/s |
| IPA | Instrument for Pre-Accession Countries |
| L-BSE | L-type bovine spongiform encephalopathy |
| MS | Member State(s) |
| MS6 | Estonia, Finland, Latvia, Lithuania, Poland and Sweden |
| NSHC | Not slaughtered for human consumption |
| NSP | National Scrapie Plan |
| NUTS | Nomenclature of Units for Territorial Statistics |
| PSU | Primary sampling units |
| RK | Road/predator killed |
| RR | Relative risk |
| SHC | Slaughtered for human consumption |
| SU | Clinical suspect |
| SUS | Clinical suspect (cervids) |
| TSE | Transmissible spongiform encephalopathies |

### Country codes

| Country          | Code |
|------------------|------|
| Austria          | AT   |
| Belgium          | BE   |
| Bosnia and Herzegovina | BA   |
EU-27 MS countries: AT; BE; BG; HR; CY; CZ; DK; EE; FI; FR; DE; EL; HU; IE; IT; LV; LT; LU; MT; NL; PL; PT; RO; SK; SI; ES; SE.
Non-EU countries: BA, CH (including Lichtenstein); IS; ME; MK; NO; RS; UK.
## Appendix A – Additional surveillance data

### Table A.1: BSE active monitoring in relation to the adult bovine population (age > 2 years) in 2020

| EU/non-EU groups | Country code | Adult cattle (> 2 years)\(^{(a)}\) | Number of tested bovine animals at risk\(^{(b)}\) | Proportion (%) of tested bovine animals at risk\(^{(b)}\) |
|------------------|-------------|-------------------------------------|-----------------------------------------------|-------------------------------------------------|
| **EU**           | AT          | 842,440                             | 18,442                                         | 2.2%                                            |
|                  | BE          | 1,162,810                           | 26,315                                         | 2.3%                                            |
|                  | BG          | 405,920                             | 7,368                                          | 1.8%                                            |
|                  | CY          | 40,270                              | 1,804                                          | 4.5%                                            |
|                  | CZ          | 640,010                             | 25,593                                         | 4%                                              |
|                  | DE          | 5,258,320                           | 175,367                                        | 3.3%                                            |
|                  | DK          | 697,000                             | 24,206                                         | 3.5%                                            |
|                  | EE          | 131,800                             | 3,691                                          | 2.8%                                            |
|                  | EL          | 295,000                             | 1,637                                          | 0.6%                                            |
|                  | ES          | 3,242,410                           | 62,358                                         | 1.9%                                            |
|                  | FI          | 344,310                             | 11,247                                         | 3.3%                                            |
|                  | FR          | 9,640,610                           | 200,322                                        | 2.1%                                            |
|                  | HR          | 166,000                             | 4,934                                          | 3%                                              |
|                  | HU          | 472,000                             | 10,820                                         | 2.3%                                            |
|                  | IE          | 2,764,830                           | 63,976                                         | 2.3%                                            |
|                  | IT          | 3,031,020                           | 49,063                                         | 1.6%                                            |
|                  | LT          | 332,400                             | 4,156                                          | 1.3%                                            |
|                  | LU          | 100,100                             | 2,724                                          | 2.7%                                            |
|                  | LV          | 221,188                             | 3,259                                          | 1.5%                                            |
|                  | MT          | 6,940                               | 291                                            | 4.2%                                            |
|                  | NL          | 1,716,000                           | 59,981                                         | 3.5%                                            |
|                  | PL          | 2,744,300                           | 52,840                                         | 1.9%                                            |
|                  | PT          | 908,730                             | 17,051                                         | 1.9%                                            |
|                  | RO          | 1,302,100                           | 6,615                                          | 0.5%                                            |
|                  | SE          | 603,140                             | 9,049                                          | 1.5%                                            |
|                  | SI          | 199,230                             | 6,217                                          | 3.1%                                            |
|                  | SK          | 229,260                             | 9,833                                          | 4.3%                                            |
| **Total EU**     |             | 37,499,000                          | 859,159                                        | 2.3%                                            |
| **UK**           |             | 3,994,000\(^{(c)}\)                | 134,031                                        | 3.4%                                            |
| **Total EU + UK**|             | 41,493,000\(^{(c)}\)               | 993,190                                        | 2.4%                                            |
| **Other non-EU** |             |                                    |                                                |                                                |
| BA               |             | 259,000                             | 22                                             | 0%                                              |
| CH               |             | n/a\(^{(d)}\)                       | 11,051                                         |                                                |
| IS               |             | 37,000                              | 14                                             | 0%                                              |
| ME               |             | n/a\(^{(d)}\)                       | 1                                              |                                                |
| MK               |             | 150,000                             | 0                                              | 0%                                              |
| NO               |             | 353,700                             | 6,704                                          | 1.9%                                            |
| RS               |             | 486,000                             | 3,926                                          | 0.8%                                            |
| **Total other non-EU** |       | 1,285,700                           | 21,718                                         | 1.7%                                            |
| **Total**        |             | 42,778,700                          | 1,014,908                                      | 4.1%                                            |

Norway’s cattle population taken from the TSE EUSR report 2019 (EFSA, 2020).

(a): Taken from https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=apro_mt_lscatl&lang=en (Bovine animals, 2 years or older).

(b): At-risk animals is the sum of animals with clinical signs at ante-mortem, emergency slaughtered and fallen stock.

(c): Taken from https://www.gov.uk/government/statistical-data-sets/structure-of-the-livestock-industry-in-england-at-December (Bovine animals, 2 years or older in June 2020).

(d): Not available.
Appendix B – Geographical distribution of BSE in the period 2001–2020

Figure B.1: Geographical distribution of cumulative number of cases of C-BSE (A), BARB cases (B), H-BSE (C) and L-BSE (D) in the period 2001–2020
The size of the circles is proportional to the measurements and are only comparable within the map but not between maps.

**Figure B.2:** Country-specific BSE cases per million tests by case type in the period 2001–2020 in the EU
Appendix C – Geographical distribution of scrapie in 2020

The size of the circles is proportional to the measurements and are only comparable within the map but not between maps.

**Figure C.1:** Geographical distribution of numbers of cases of ovine CS (A), caprine CS (B), ovine AS (C) and caprine AS (D) in 2020 in the reporting countries
The size of the circles is proportional to the measurements and is only comparable within the map but not between maps.

**Figure C.2:** Geographical distribution of proportion of cases per 10,000 tests of ovine CS (A), caprine CS (B), ovine AS (C) and caprine AS (D) in 2020
### Appendix D – Additional information asked by EFSA in relation to reporting, according to Annex III of Regulation 999/2001

**Table D.1:** The number of suspected cases placed under official movement restrictions in accordance with Article 12(1) in 2020

| Country | Cattle | Sheep | Goats |
|---------|--------|-------|-------|
| AT      | 9      | 0     | 0     |
| BE      | 0      | 0     | 0     |
| BG      | 0      | 8     | 7     |
| CY      | 0      | 7,690 | 19,673|
| CZ      | 5      | 0     | 0     |
| DE      | 0      | 12    | 8     |
| DK      | 1      | 0     | 1     |
| EE      | 0      | 0     | 0     |
| EL      | 763    | 560   | 494   |
| ES      | 0      | 0     | 259   |
| FI      | 0      | 0     | 0     |
| FR      | 3      | 0     | 0     |
| HR      | 0      | 0     | 0     |
| HU      | 13     | 0     | 0     |
| IE      | 2,742  | 12    | 0     |
| IT      | 0      | 3     | 0     |
| LT      | 0      | 0     | 0     |
| LU      | 0      | 0     | 0     |
| LV      | 1      | 0     | 1     |
| MT      | 0      | 0     | 0     |
| NL      | 0      | 0     | 0     |
| PL      | 1,052  | 2     | 0     |
| PT      | 14     | 0     | 0     |
| RO      | 406    | 5,402 | 260   |
| SE      | 0      | 0     | 0     |
| SI      | 0      | 0     | 0     |
| SK      | 0      | 0     | 0     |
| **Total EU27** | **5,009** | **13,689** | **20,703** |
| UK      | 1      | 0     | 1     |
| **Total EU27 + UK** | **5,010** | **13,689** | **20,704** |
| BA      | 0      | 0     | 0     |
| CH      | 24     | 0     | 0     |
| IS      | 0      | 0     | 0     |
| ME      | 0      | 0     | 0     |
| MK      | 0      | 0     | 0     |
| NO      | 0      | 2     | 0     |
| RS      | 2,696  | 0     | 0     |
| **Total other non-EU** | **2,720** | **2** | **0** |
| **Total** | **7,730** | **13,691** | **20,704** |
Table D.2: Number of flocks for which suspected cases in ovine and caprine animals have been reported and investigated pursuant to Article 12(1) and (2) in 2020

| Country | Sheep | Goats |
|---------|-------|-------|
| AT      | 0     | 0     |
| BE      | 0     | 0     |
| BG      | 6     | 4     |
| CY\(^{(a)}\) | 7     | 31    |
| CZ      | 0     | 0     |
| DE      | 12    | 8     |
| DK      | 0     | 1     |
| EE      | 0     | 0     |
| EL      | 3     | 1     |
| ES      | 0     | 1     |
| FI      | 0     | 0     |
| FR      | 0     | 0     |
| HR      | 0     | 0     |
| HU      | 0     | 0     |
| IE      | 2     | 0     |
| IT      | 1     | 0     |
| LT      | 0     | 0     |
| LU      | 0     | 0     |
| LV      | 0     | 1     |
| MT      | 0     | 0     |
| NL      | 0     | 0     |
| PL      | 2     | 0     |
| PT      | 0     | 0     |
| RO      | 14    | 5     |
| SE      | 1     | 1     |
| SI      | 0     | 0     |
| SK      | 0     | 0     |
| **Total EU27** | **48** | **53** |
| **UK**  | 0     | 1     |
| **Total EU27 + UK** | **48** | **54** |
| **Total other non-EU** | **8** | **1** |
| **Total** | **56** | **55** |

(a): In addition, 34 mixed flocks (sheep and goats).
Table D.3: Number of ovine and caprine flocks tested within each subpopulation referred to in Chapter A, Part II, points 2, 3, 5 and 6 together with the method for sample selection and the results of the rapid and confirmatory tests in 2020

| Country | Sheep SHC | Sheep NSHC | Sheep EM(a) | Goats SHC | Goats NSHC | Goats EM | Other(b) |
|---------|-----------|------------|-------------|-----------|------------|---------|----------|
| AT      | 113       | 1,761      | 1           | 26        | 529        | 0       | 0        |
| BE(c)   | 0         | n/a        | 0           | 0         | n/a        | 0       | 0        |
| BG      | 12        | 22         | 2           | 109       | 6          | 15      | 0        |
| CY(d)   | 0         | 569        | 0           | 0         | 270        | 0       | 57,288   |
| CZ      | 9         | 955        | 0           | 0         | 206        | 0       | 0        |
| DE      | 4,631     | 3,971      | 2           | 166       | 662        | 0       | 138      |
| DK(e)   | n/a       | n/a        | n/a         | n/a       | n/a        | n/a     | 0        |
| EE      | 0         | 58         | 0           | 0         | 3          | 0       | 0        |
| EL      | 228       | 195        | 23          | 58        | 68         | 8       | 0        |
| ES      | 812       | 4,424      | 68          | 823       | 2,005      | 12      | 0        |
| FI      | 5         | 424        | 0           | 0         | 47         | 0       | 0        |
| FR      | 4,706     | 18,694     | 41          | 4,219     | 16,953     | 0       | 0        |
| HR      | 0         | 770        | 0           | 0         | 221        | 0       | 0        |
| HU      | 1,619     | 1,755      | 0           | 38        | 48         | 0       | 0        |
| IE      | 4,840     | 7,721      | 0           | 0         | 40         | 0       | 0        |
| IT      | 4,015     | 5,286      | 44          | 4,161     | 3,635      | 21      | 0        |
| LT      | 0         | 648        | 0           | 0         | 32         | 0       | 0        |
| LU      | 0         | 98         | 0           | 0         | 101        | 0       | 0        |
| LV      | 0         | 69         | 0           | 0         | 13         | 0       | 0        |
| MT      | 13        | 45         | 0           | 10        | 66         | 0       | 0        |
| NL      | 0         | 1,568      | 0           | 0         | 1,568      | 0       | 0        |
| PL      | 1,258     | 3,239      | 0           | 141       | 1,157      | 0       | 0        |
| PT      | 1,130     | 5,627      | 43          | 0         | 803        | 3       | 0        |
| RO      | 9,648     | 5,506      | 10          | 2,383     | 1,985      | 2       | 0        |
| SE      | 2         | 964        | 0           | 0         | 66         | 0       | 0        |
| SI      | 49        | 1,286      | 0           | 14        | 363        | 0       | 0        |
| SK      | 7         | 482        | 0           | 1         | 83         | 0       | 0        |
| UK      | > 322     | > 6,128    | 1           | 0         | > 195      | 1       | 0        |
| BA      | 0         | 0          | 0           | 0         | 0          | 0       | 0        |
| CH      | n/a       | n/a        | n/a         | n/a       | n/a        | n/a     | 0        |
| IS      | 202       | 58         | 6           | 6         | 3          | 1       | 0        |
| ME      | 0         | 0          | 0           | 0         | 0          | 0       | 0        |
| MK      | 0         | 0          | 0           | 0         | 0          | 0       | 0        |
| NO      | 3,241     | 3,976      | 10          | 18        | 199        | 0       | 0        |
| RS      | 0         | 0          | 0           | 0         | 0          | 0       | 0        |

EM: emergency slaughter; NSHC: not slaughtered for human consumption; SHC: slaughtered for human consumption; n/a: not available.
(a): Flocks and herds tested under EM include classical scrapie and atypical scrapie affected establishments.
(b): Monitoring in other animals (= for dairy production, or from countries with indigenous TSE, or animals that have consumed potentially contaminated feeding stuffs, or animals born or derived from TSE-infected dams).
(c): The Belgian competent authority informed that, in the central database for sheep and goat identification, there is no direct link between the official ear tag number and the last holding where the sheep or goat was kept. Only the herd of birth is registered in the central database. At the rendering plant, sheep and goats are randomly sampled during the year.
(d): In addition, 34 mixed flocks (sheep and goats).
(e): The Danish competent authority informed that in the central database for sheep and goat identification, there is no direct link between the official ear tag number and the last holding where the sheep or goat was kept.
Appendix E – Country data sets

All country data sets containing the tables on the occurrence of TSE per country are available on the EFSA Knowledge Junction community on ZENODO. Please see below the list and corresponding link to the data sets. The countries that submitted data sets on the 2020 monitoring data year are the 27 EU Member States, the UK and seven other non-EU Member States.

Table E.1: Links to the TSE data sets for 2020 by reporting country

| Country         | Link to the data set                  |
|-----------------|---------------------------------------|
| **EU Member States** |                                       |
| AT              | https://doi.org/10.5281/zenodo.4091585 |
| BE              | https://doi.org/10.5281/zenodo.4091591 |
| BG              | https://doi.org/10.5281/zenodo.4091602 |
| CY              | https://doi.org/10.5281/zenodo.4091604 |
| CZ              | https://doi.org/10.5281/zenodo.4091616 |
| DE              | https://doi.org/10.5281/zenodo.4091621 |
| DK              | https://doi.org/10.5281/zenodo.4091627 |
| EE              | https://doi.org/10.5281/zenodo.4091635 |
| EL              | https://doi.org/10.5281/zenodo.4091641 |
| ES              | https://doi.org/10.5281/zenodo.4091643 |
| FI              | https://doi.org/10.5281/zenodo.4091647 |
| FR              | https://doi.org/10.5281/zenodo.4091649 |
| HR              | https://doi.org/10.5281/zenodo.4091653 |
| HU              | https://doi.org/10.5281/zenodo.4091655 |
| IE              | https://doi.org/10.5281/zenodo.4091659 |
| IT              | https://doi.org/10.5281/zenodo.4091663 |
| LV              | https://doi.org/10.5281/zenodo.4091665 |
| LU              | https://doi.org/10.5281/zenodo.4091671 |
| LT              | https://doi.org/10.5281/zenodo.4091673 |
| MT              | https://doi.org/10.5281/zenodo.4091678 |
| NL              | https://doi.org/10.5281/zenodo.4091684 |
| PL              | https://doi.org/10.5281/zenodo.4091686 |
| PT              | https://doi.org/10.5281/zenodo.4091688 |
| RO              | https://doi.org/10.5281/zenodo.4091691 |
| SE              | https://doi.org/10.5281/zenodo.4091703 |
| SI              | https://doi.org/10.5281/zenodo.4091693 |
| SK              | https://doi.org/10.5281/zenodo.4091709 |
| UK              | https://doi.org/10.5281/zenodo.4091711 |
| **Other non-EU Member States** | |
| BA              | https://doi.org/10.5281/zenodo.5652825 |
| CH              | https://doi.org/10.5281/zenodo.4091716 |
| IS              | https://doi.org/10.5281/zenodo.4091719 |
| ME              | https://doi.org/10.5281/zenodo.4091723 |
| MK              | https://doi.org/10.5281/zenodo.4091725 |
| NO              | https://doi.org/10.5281/zenodo.4091727 |
| RS              | https://doi.org/10.5281/zenodo.4091730 |