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INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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STATUS AND TRENDS OF ANIMAL GENETIC RESOURCES - 2020¹

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¹ Based on data reported by National Coordinators for the Management of Animal Genetic Resources to DAD-IS by February 2021.

The boundaries and names shown and the designations used on these map(s) do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

I. INTRODUCTION

According to the request of the Twelfth Regular Session of the Commission on Genetic Resources for Food and Agriculture (Commission),² this report follows the structure set out in the document *Format and content of future status and trends reports on animal genetic resources*,³ taking into account the amendments requested by the Commission at its Fourteenth Regular Session.⁴ The analysis is based on FAO's Global Databank for Animal Genetic Resources (Global Databank), the backbone of the Domestic Animal Diversity Information System (DAD-IS). It updates the data published in the report *Status of animal genetic resources – 2018*.⁵

Prior to the analysis, all National Coordinators for the Management of Animal Genetic Resources (NC-AnGR) were asked to update their national data as completely as possible by 31 January 2021.

The present report begins by describing the state of reporting on animal genetic resources for food and agriculture and the progress made in this respect during the reporting period. A description of the current regional distribution of livestock species and breeds is then presented, followed by an overview of the status of the world's livestock breeds for risk of extinction (risk status). Calculations are based on the data available in DAD-IS as of 3 February 2021. DAD-IS applies the method for assigning breeds to risk-status categories according to the FAO guidelines on *In vivo conservation of animal genetic resources*,⁶ which was approved with the endorsement of the guidelines by the Commission at its Fourteenth Regular Session.^{7,8} No indicators based on the breed classification of “adaptedness” (locally adapted versus exotic) are presented, inasmuch as the amount of information available in DAD-IS by February 2021 was still insufficient for a sound interpretation of those indicators. The report presents indicators that are directly linked to the 2030 Agenda for Sustainable Development and Sustainable Development Goals (SDG)⁹ of the United Nations, specifically to Target 2.5 of Goal 2: “End hunger, achieve food security and improved nutrition and promote sustainable agriculture.” The annexes to the report provide a detailed breakdown of the state of reporting, by country and by region.

II. STATE OF REPORTING

The Global Databank currently contains data from 182 countries (and 15 dependent territories) and for 37 species. The total number of national breed populations recorded in the Global Databank increased slightly during the reporting period (Table 1). The total number of mammalian national breed populations recorded in February 2021 was 11 409, as compared to 11 371 in March 2018. The total number of avian national breed populations recorded in 2021 was 3 706, as compared to 3 689 in 2018.

Since 2018, the percentage of avian national breed populations for which some population data are available (including those populations for which no updates have been provided during the last ten years) has increased from 58 percent to 61 percent, whereas for mammals the proportion has increased from 62 percent to 66 percent (Table 1). Figure 1 presents data on reporting activity according to region. The level of activity in updating data differs substantially among countries and regions. As shown in Figure 2, 63 countries have updated the census information for at least one of their national breed populations in 2018 or later. For 10 countries the last update was done between 2014 and 2017 and for 10 countries the last update was between 2012 and 2013. For these 10 countries, this means that if no update is provided during the next two years, all breeds will be considered to have “unknown” risk status when calculating official indicators for risk of

² CGRFA-12/09/Report, paragraph 39.

³ CGRFA/WG-AnGR-5/09/3.2.

⁴ CGRFA-14/13/Report, paragraphs 28-32.

⁵ CGRFA-17/19/Inf.4 (<http://www.fao.org/3/my867en/my867en.pdf>).

⁶ <http://www.fao.org/docrep/018/i3327e/i3327e.pdf>

⁷ CGRFA-14/13/Report paragraph 60.

⁸ CGRFA-14/13/12, paragraph 12.

⁹ <https://sdgs.un.org/goals>

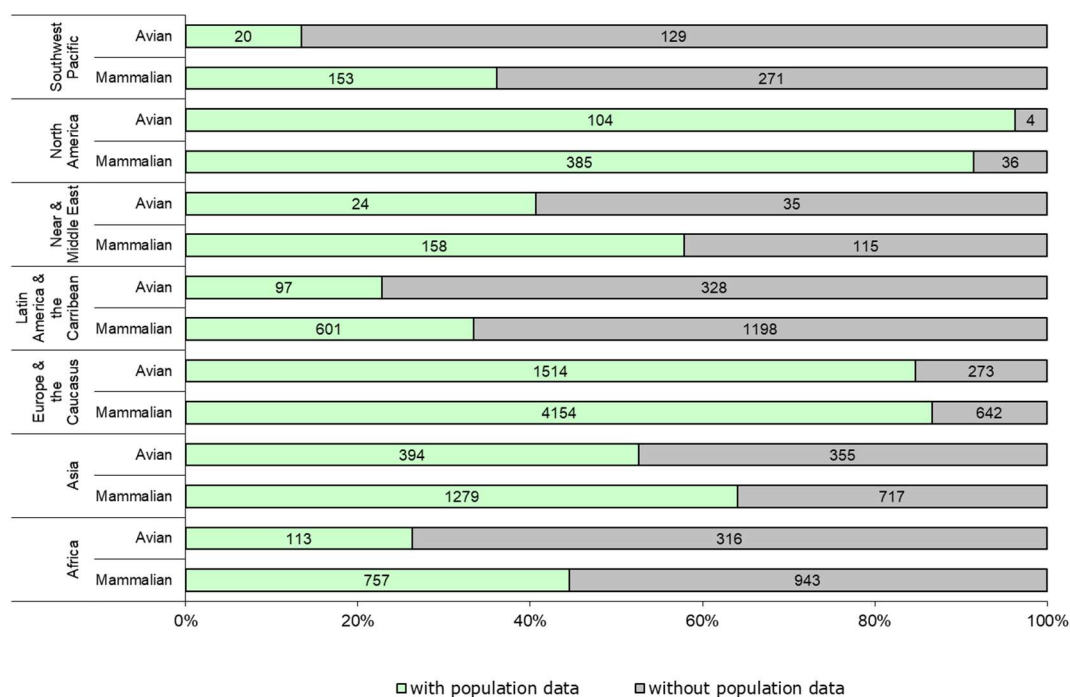
extinction¹⁰ and in the next status and trends report. In total, for 99 countries there have been no population updates since 2011.

Table 1. Status of information recorded in the Global Databank for Animal Genetic Resources

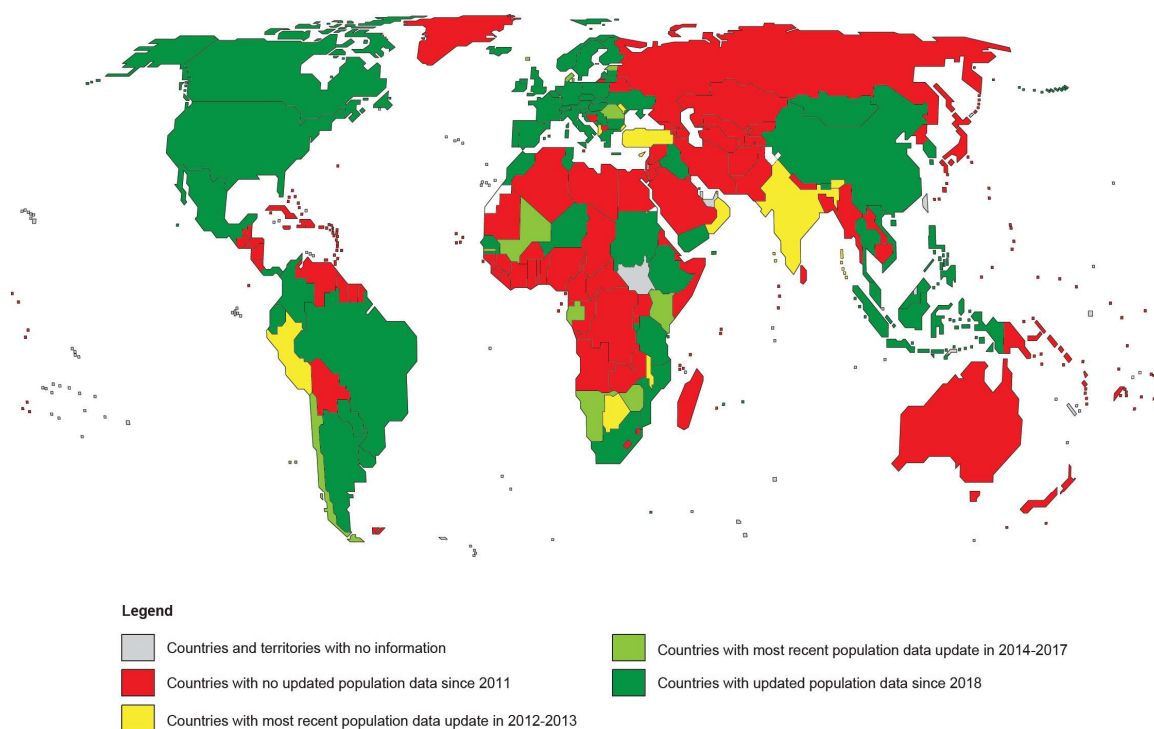
Year of analysis	Mammalian species		Avian species		Countries covered
	Number of national breed populations	Proportion with population data (%)	Number of national breed populations	Proportion with population data (%)	
1993	2719	53	–	–	131
1995	3019	73	863	85	172
1999	5330	63	1049	77	172
2006	10512	43	3505	39	181
2008	10550	52	3450	47	181
2010	10507	54	3414	47	182
2012	10712	57	3482	48	182
2014	11062	60	3807	56	182
2016	11116	61	3799	57	182
2018	11371	62	3689	58	182
2021	11409	66	3706	61	182

No data recorded for Andorra, Brunei Darussalam, Holy See, Liechtenstein, Marshall Islands, Micronesia (Federated States of), Monaco, Nauru, Qatar, San Marino, Singapore, South Sudan, Timor-Leste, United Arab Emirates, Western Sahara.

Figure 1. Proportions (% - relative length of coloured bars) and numbers of national breed populations for which population data have been reported per region



¹⁰ CGRFA-14/13/Report, paragraph 29.

Figure 2. The timing of the most recent population updates for each country

As of February 2021, 9 571 (63 percent) national breed populations remained unclassified by NC-AnGR with regard to adaptedness (locally adapted versus exotic), compared to 9 970 (66 percent) in 2018. Although the proportion of classified breeds has continued to increase (from 34 percent to 37 percent), the proportion was still considered too small to justify further analysis of breed populations according to their adaptedness. Therefore, no indicator based on this classification system is presented in this report.

III. BREED DIVERSITY

A global total of 8 771 breeds (compared to 8 803 in 2018 and 8 822 in 2016) has been reported; 7 700 are local (reported in only one country) breeds (compared to 7 745 in 2018 and 7 761 in 2016)¹¹ and 1 071 are transboundary (reported in more than one country) breeds (compared to 1 058 in 2018 and 1 061 in 2016). Among the transboundary breeds, 513 (compared to 511 in 2018 and 499 in 2016) are regional transboundary (reported in only one region) breeds and 558 (compared to 547 in 2018 and 562 in 2016) are international transboundary (reported in more than one region) breeds. Presently, 7 percent or 619 breeds (compared to 600 in 2018 and 643 in 2016) are classified as extinct, of which 11 are transboundary breeds (compared to 6 in 2018 and 4 in 2016). Two of the extinct breeds are considered as cryoconserved only, i.e. having enough genetic material stored to allow potentially their reconstitution. Unless otherwise indicated, extinct breeds were excluded from the analyses undertaken to produce the results presented in the subsequent sections of this document.

Figure 3a shows the shares of local, regional transboundary and international transboundary breeds among the mammalian and avian breeds of the world. Approximately 72 percent of reported breeds belong to mammalian species. In mammalian species, the number of regional transboundary breeds is nearly the same as the number of international transboundary breeds. Conversely, in avian species, international transboundary breeds outnumber regional transboundary breeds by a 2-to-1 margin.

¹¹ The decreases in numbers of local breeds in recent years is related to corrections in inventories made by some countries.

Mammalian breeds outnumber avian breeds in all regions of the world (Figure 3b). Considerable variation exists among regions in terms of the proportions of the three geographic classes of breeds. In all regions but North America and Southwest Pacific local breeds make up more than 60 percent of all breeds. Conversely, in those two regions, international transboundary breeds constitute the majority of breeds (Figure 3b).

Regional transboundary mammalian breeds are relatively numerous (more than 5 percent of the respective total number of breeds in the region) in Europe and the Caucasus, Africa, and North America. In only Europe and the Caucasus are there large numbers of regional transboundary avian breeds (68 such breeds in Europe and the Caucasus versus fewer than 10 in each of the other regions).

Figure 3a. Numbers of local and transboundary breeds at global level

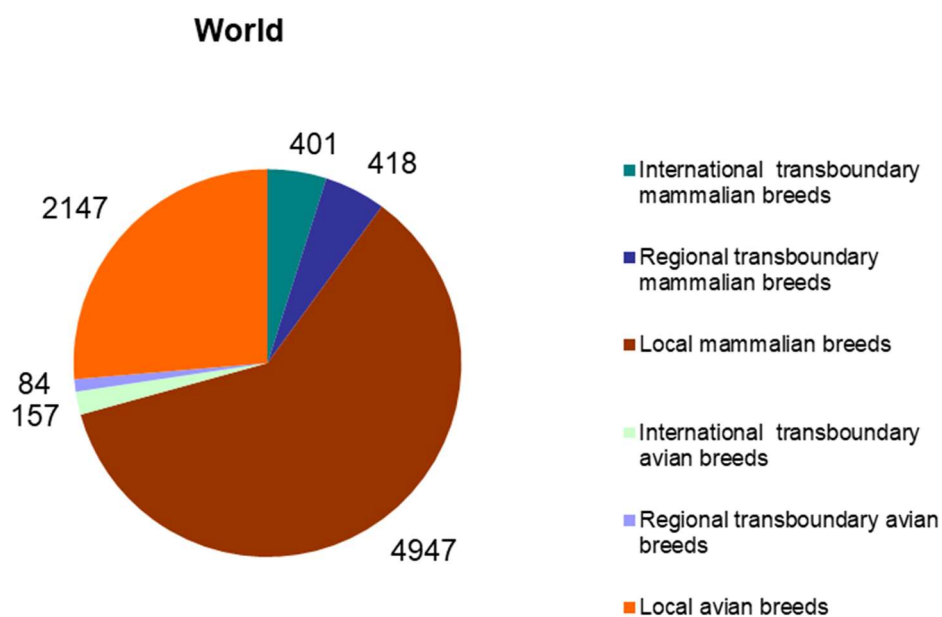
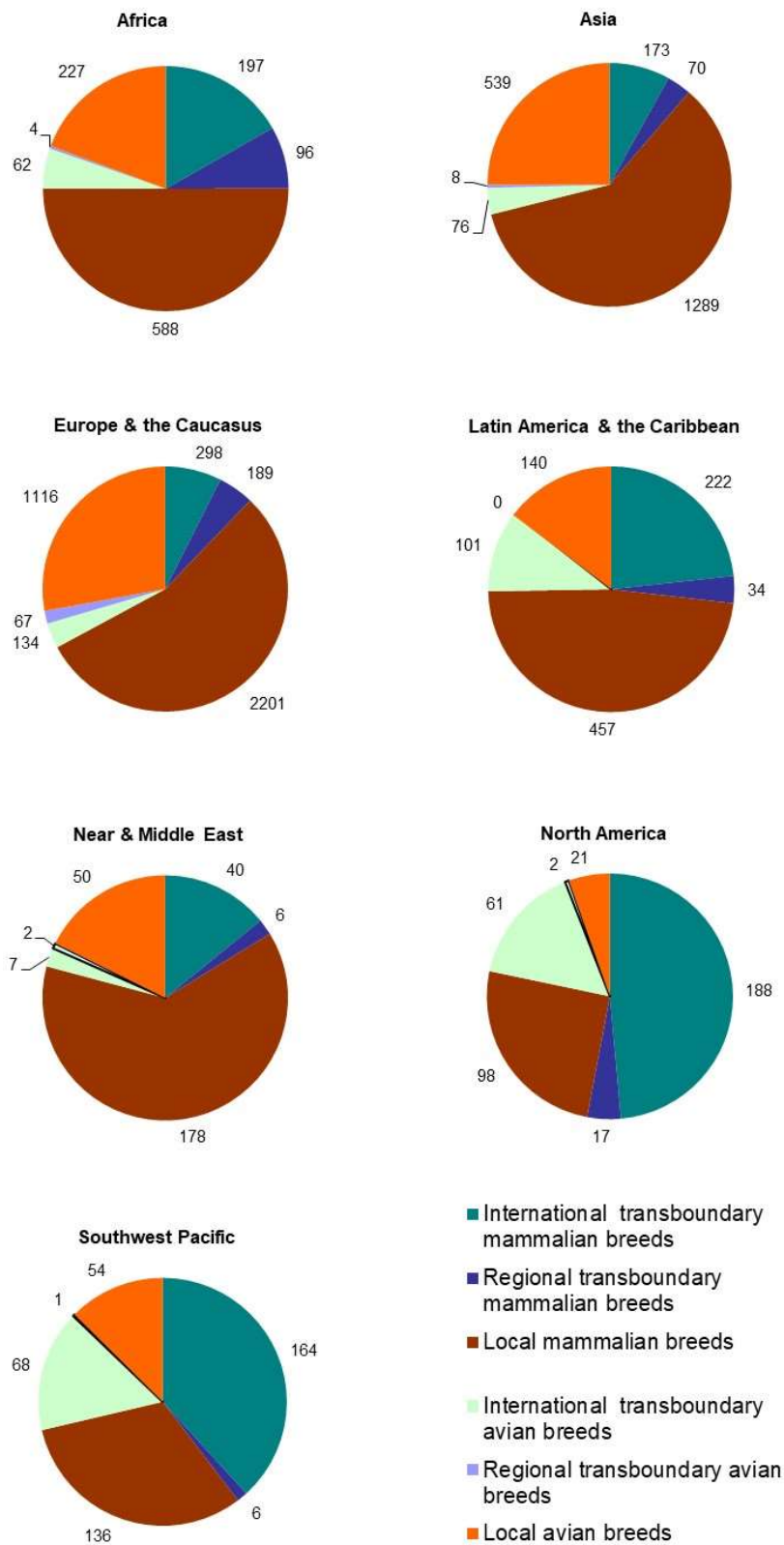


Figure 3b. Number of local and transboundary breeds at regional level



Note: International transboundary breeds are counted in each region where they occur. Therefore, for this category of breeds, the global total is not the sum of the regional totals.

Tables 2 and 3, respectively, show the numbers of reported local breeds of mammalian and avian species for each region of the world. For most livestock species, Europe and the Caucasus and Asia have the largest number of local breeds. The dromedary, with most local breeds located in Africa and the Near and Middle East; and the guinea pig, with most local breeds located in Latin America and the Caribbean, are exceptions to this pattern. The totals in some categories have decreased relative to past years, because some countries have corrected their inventories.

Table 2. Mammalian species – numbers of reported local breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	23	39	48	24	13	6	3	156
Bactrian camel		12	3					15
Buffalo	3	92	8	9	5	1	2	120
Cattle	192	251	389	141	31	14	32	1050
Dromedary	48	13	1		24		2	88
Goat	97	194	213	36	34	6	11	591
Guinea pig	4			13				17
Horse	50	136	378	78	15	25	25	707
Pig	55	227	200	61	1	10	15	569
Rabbit	11	16	253	14	7	8		309
Sheep	97	263	615	64	48	21	38	1146
Yak		29	2			1		32
Others	8	17	90	17		6	8	146
Total	588	1289	2200	457	178	98	136	4946

Note: Figures exclude extinct breeds. Figures for Alpaca, American bison, deer, dog, dromedary × Bactrian camel, guanaco, llama and vicuña are combined in the “others” category

Table 3. Avian species – numbers of reported local breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	132	318	771	87	32	11	30	1381
Duck	16	99	100	20	3	1	12	251
Goose	10	43	113	5	2		2	175
Muscovy duck	4	8	5	1	1		2	21
Pigeon	7	13	41	7	8	1	2	79
Quail	3	23	19	4				49
Turkey	11	11	42	9	2	8	5	88
Others	44	24	24	7	2		1	102
Total	227	539	1115	140	50	21	54	2146

Note: Figures exclude extinct breeds. Figures for cassowary, Chilean tinamou, duck × Muscovy duck, emu, guinea fowl, ñandu, ostrich, partridge, peacock, pheasant and swallow are combined in the “others” category.

Tables 4 and 5, respectively, show the numbers of reported regional transboundary breeds of mammalian and avian species in each region of the world. For several mammalian species; including sheep, horses, rabbit and pigs; Europe and the Caucasus has the largest number of regional transboundary breeds. Africa has more regional transboundary breeds of cattle and goats than any other region. Europe and the Caucasus, however, has by far the most regional transboundary breeds among avian species.

The existence of large numbers of regional transboundary breeds has implications for management and conservation of animal genetic resources for food and agriculture, and highlights the need for cooperation at regional or subregional levels.

Table 4. Mammalian species – numbers of reported regional transboundary breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	4	3	1	1	0	0	0	9
Buffalo	1	8	1	1	0	0	0	11
Cattle	37	18	26	9	1	3	1	95
Deer	0	1	1	0	0	0	0	2
Dromedary	1	1	0	0	0	0	0	2
Goat	16	13	14	2	1	4	1	51
Guinea pig	0	0	0	2	0	0	0	2
Horse	7	10	31	5	0	4	0	57
Pig	3	2	13	3	0	2	0	23
Rabbit	3	0	30	1	0	0	0	34
Sheep	24	14	72	9	4	4	4	131
South American camelids	0	0	0	1	0	0	0	1
Total	96	70	189	34	6	17	6	418

Note: Figures exclude extinct breeds.

Table 5. Avian species – numbers of reported regional transboundary breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	4	3	41	2	0	1	1	52
Duck	0	2	12	0	0	0	0	14
Goose	0	2	7	0	0	0	0	9
Quail	0	1	0	0	0	0	0	1
Turkey	0	0	7	0	0	1	0	8
Total	4	8	67	2	0	2	1	84

Note: Figures exclude extinct breeds.

Tables 6 and 7, respectively, show the numbers of reported international transboundary mammalian and avian breeds. Cattle, sheep, horses and chicken are the species that have the greatest numbers of international transboundary breeds.

Table 6. Mammalian species – numbers of reported international transboundary breeds

Species	Number of breeds
Ass	5
Bactrian camel	2
Buffalo	4
Cattle	114
Deer	9
Dromedary	2
Goat	36
Horse	71
Pig	33
Rabbit	25
Sheep	97
South American camelids	3
Total	401

Note: Figures exclude extinct breeds.

Table 7. Avian species – numbers of reported international transboundary breeds

Species	Total
Cassowary	1
Chicken	103
Duck (domestic)	12
Emu	1
Goose (domestic)	14
Guinea fowl	5
Muscovy duck	1
Ostrich	3
Pigeon	1
Turkey	16
Total	157

Note: Figures exclude extinct breeds.

IV. RISK STATUS OF ANIMAL GENETIC RESOURCES

Upon the request of the Commission at its Fourteenth Regular Session, the method for assigning breeds to risk-status categories was amended by the introduction of a cut-off point of ten years, beyond which the risk status of a breed is considered to be unknown if no updated population data have been reported.¹² The results presented in this section regarding breeds with unknown status are therefore comparable with those presented in the *Status and trends of animal genetic resources – 2014*,¹³ 2016¹⁴, and 2018¹⁵ but not to earlier reports. With exception of the unknown status, the other risk categories can only be compared with the status and trends report 2018, because, as was noted previously in this report, the risk classification was made according to the FAO guidelines on *In vivo conservation of animal genetic resources*¹⁶ and has been implemented in DAD-IS since 2018 only.

¹² CGRFA-14/13/Report, paragraph 29.

¹³ CGRFA-15/15/Inf.18

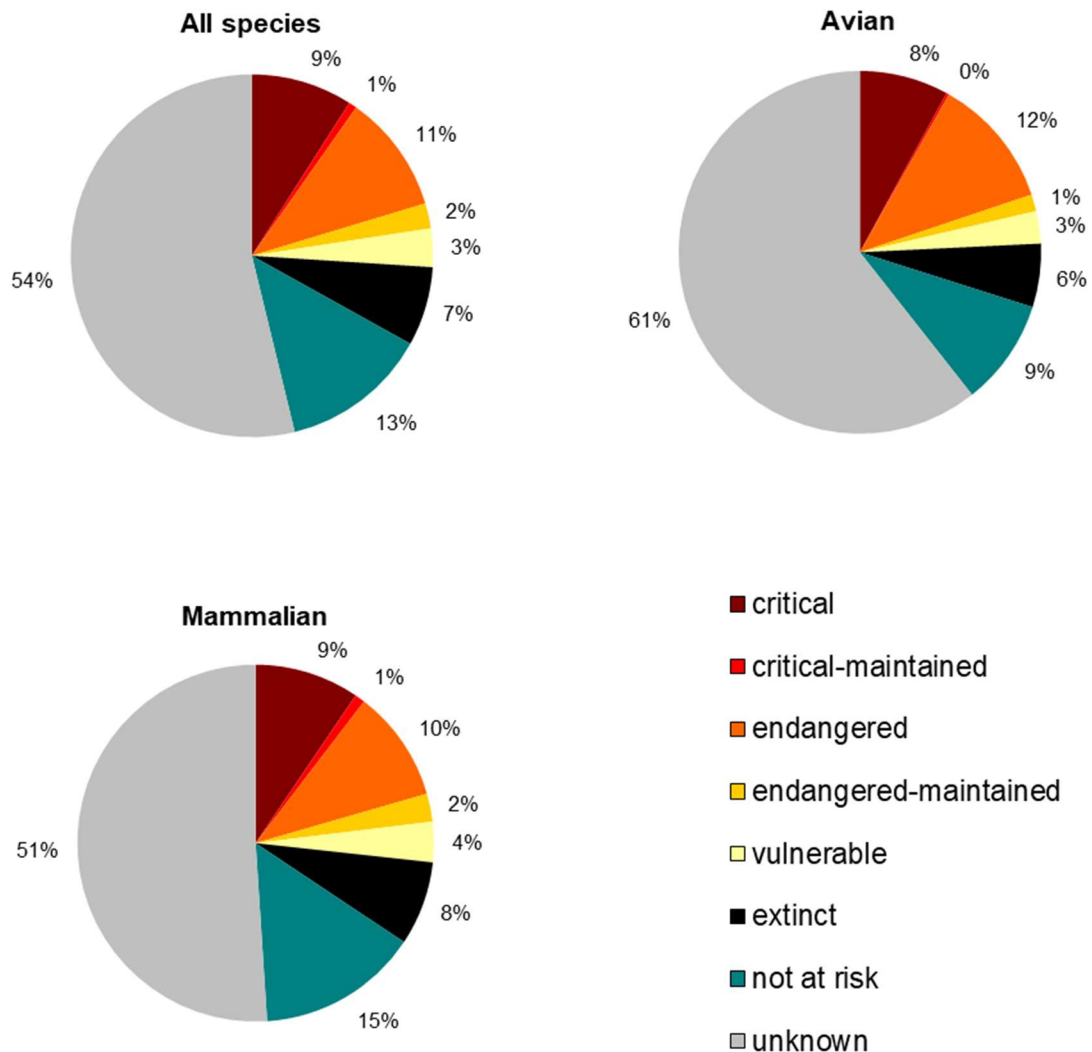
¹⁴ CGRFA-16/17/Inf.15

¹⁵ CGRFA-17/19/11.2/Inf.4

¹⁶ <http://www.fao.org/docrep/018/i3327e/i3327e.pdf>

A total of 2 281 breeds are classified as being at risk of extinction (26 percent of all breeds including those that are extinct). The percentage of breeds classified as being of unknown risk of extinction is approximately 54 percent, which is less than in 2018 (59 percent) (Figure 4).

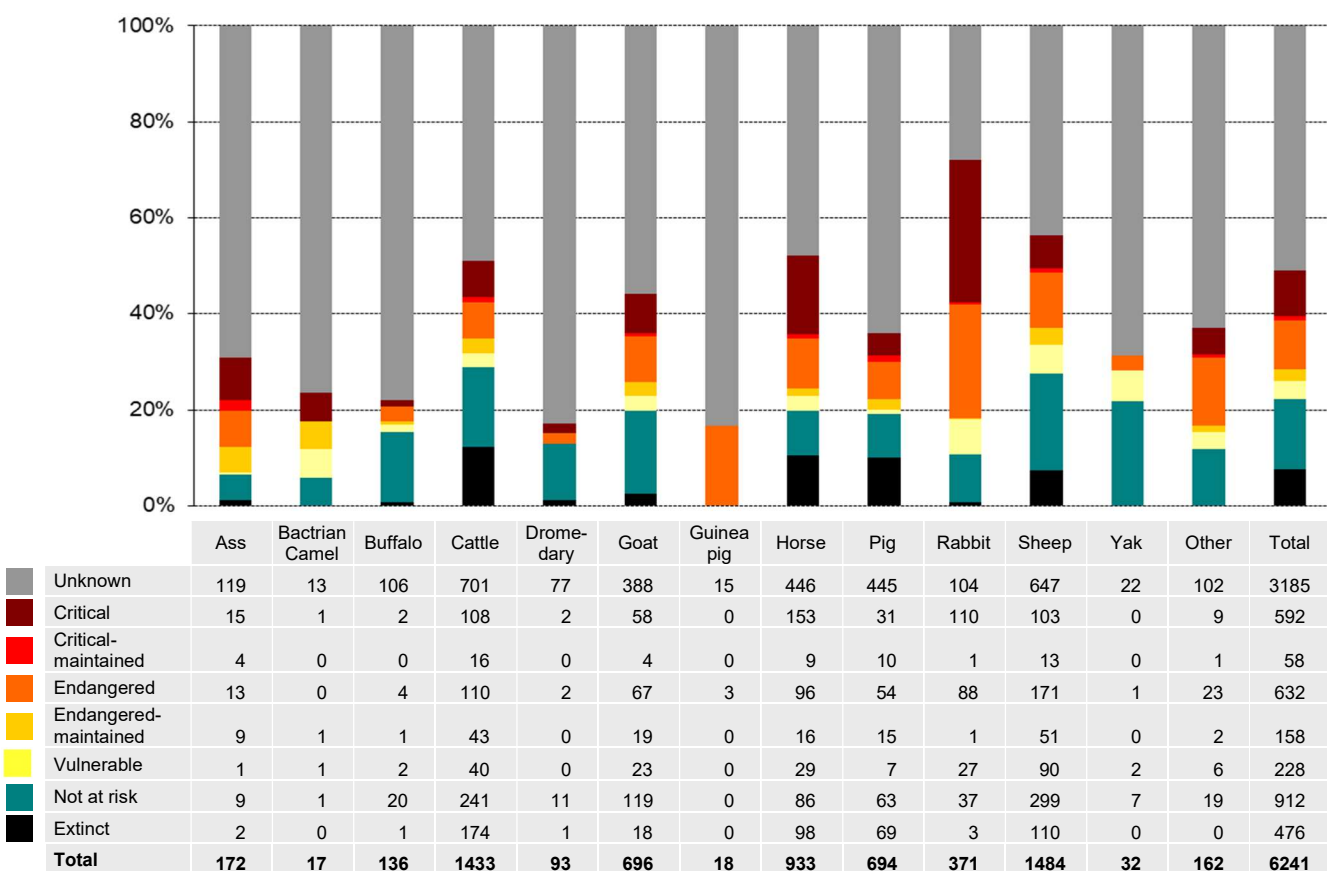
Figure 4. Proportions of the world's breeds by risk status category, overall and according to species type (mammalian and avian)



Among mammalian species, sheep, cattle and horse have the largest numbers of breeds at risk. However, rabbits (61 percent), horses (32 percent) and sheep (29 percent) are the species with the largest proportions of breeds at risk. Figure 5 also shows the large number of breeds for which no risk-status data are available. This problem is especially notable in particular species, including bactrian camel breeds (76 percent), buffalo breeds (78 percent) and dromedary breeds (83 percent). This lack of data is a serious constraint to effective prioritization and planning of breed conservation measures. Cattle are the species with the largest number of breeds (174) reported as extinct. Large numbers of extinct breeds of sheep (110), pig (69) and horse (98) are also reported. Some breeds may have become extinct without being ever documented. Any such breeds will, clearly, be missing from this analysis.

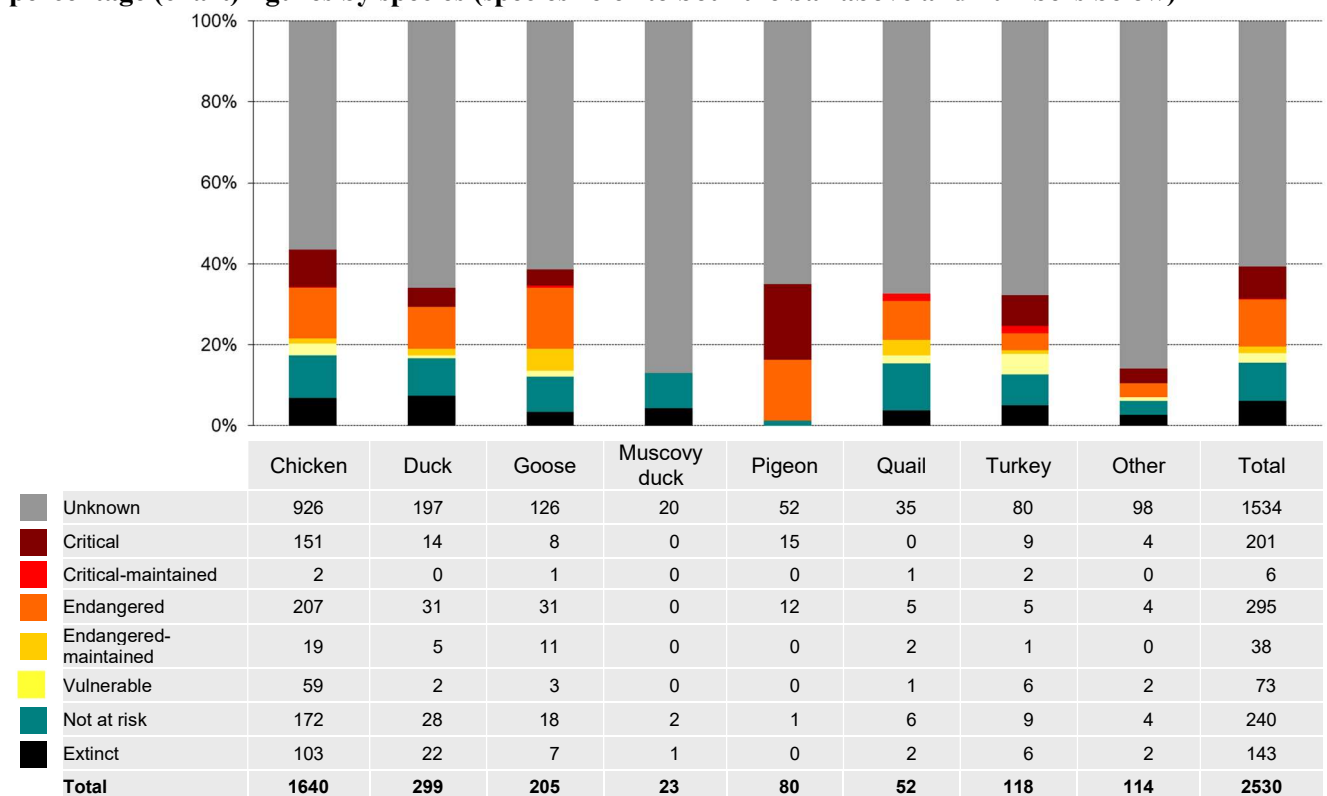
Among avian species, chickens have by far the greatest number of breeds at risk on a global scale (Figure 6). The proportion of avian breeds of unknown risk status is even greater than for mammalian species. Extinct breeds have mainly been reported among chickens. A few cases among ducks, geese, muscovy ducks, quail and turkeys have also been reported.

Figure 5. Risk status of the world's mammalian breeds in February 2021: absolute (table) and percentage (chart) figures by species (species refer to both the bar above and numbers below)



* Other: Alpaca, Bactrian camel × dromedary crosses, deer, guanacos, vicuñas and dogs.

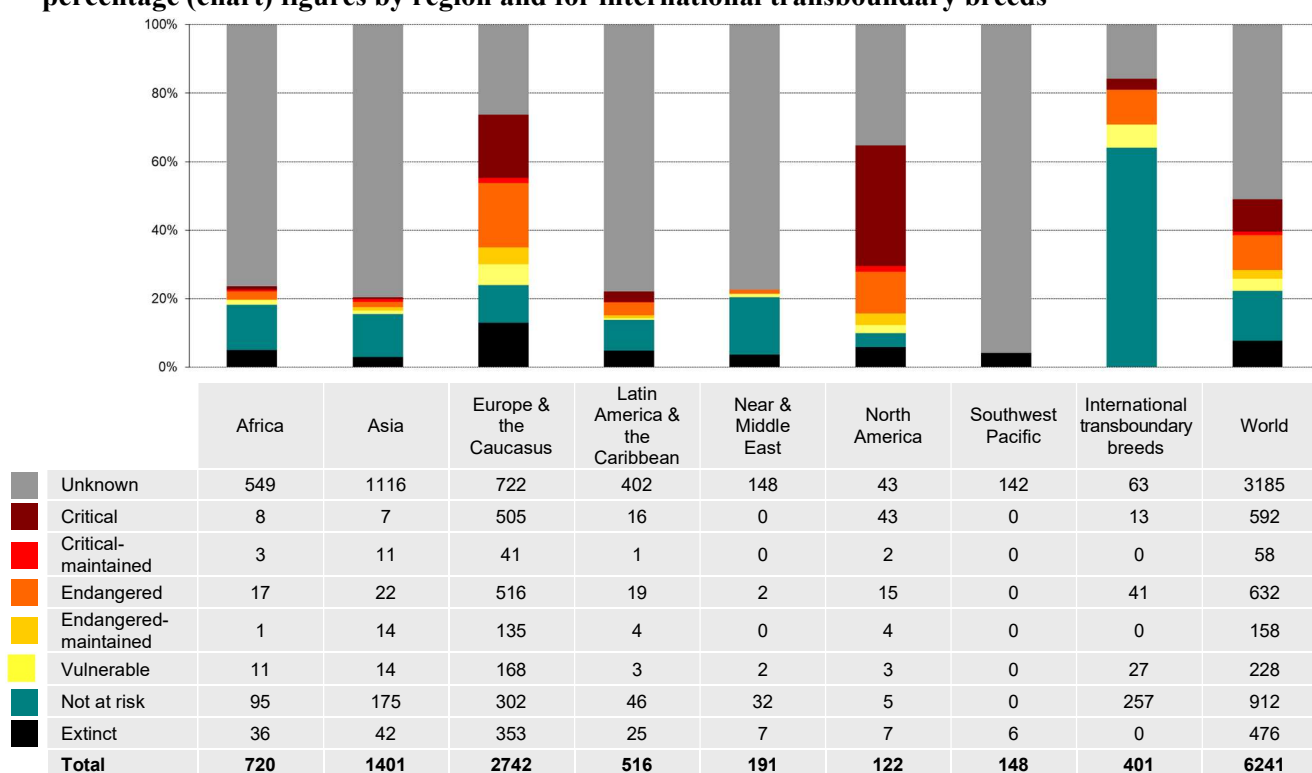
Figure 6. Risk status of the world's avian breeds in February 2021: absolute (table) and percentage (chart) figures by species (species refer to both the bar above and numbers below)



* Other: duck × Muscovy duck crossings, Chilean tinamou, cassowaries, emus, ñandus, peacocks and swallows.

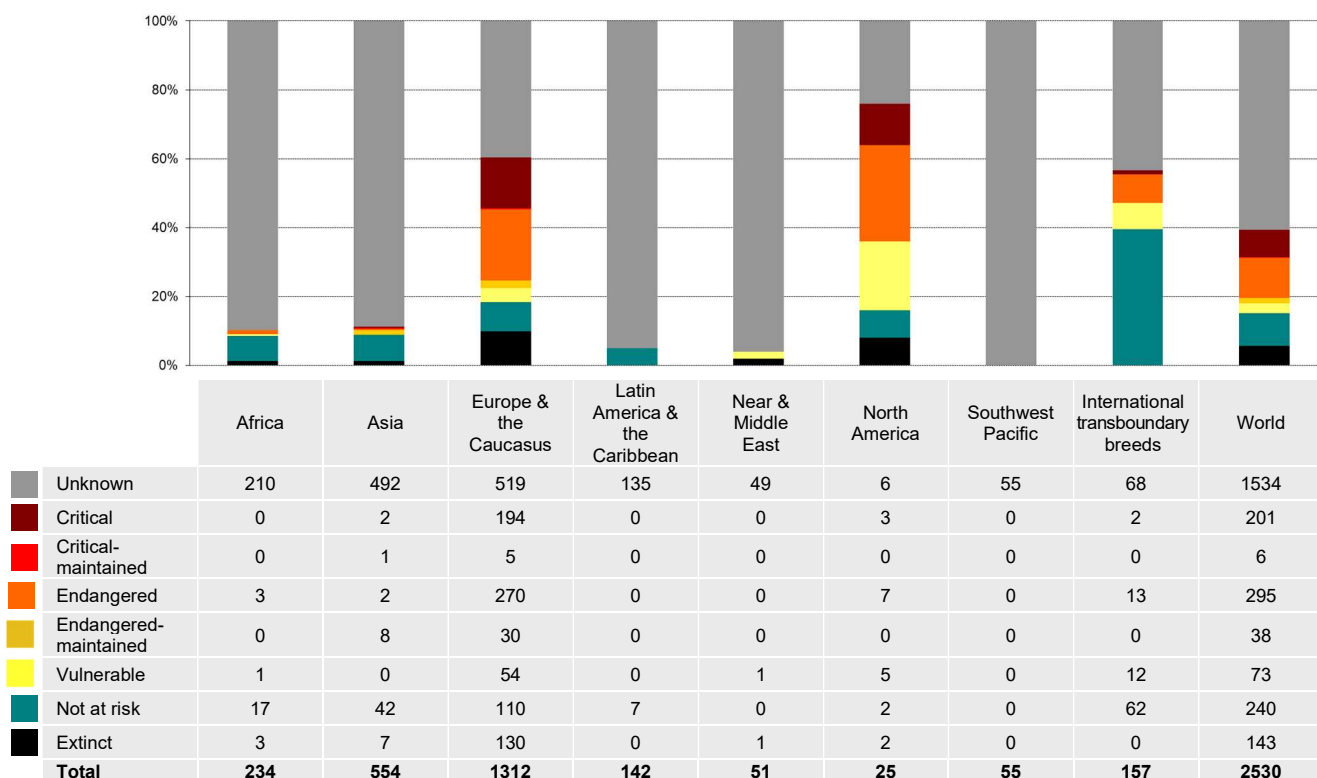
Figures 7 and 8 show the distribution of breeds at risk by region for mammalian and avian species. The regions with the greatest proportions of breeds classified as at risk are North America and Europe and the Caucasus for both mammalian breeds (55 and 50 percent, respectively) and avian breeds (60 and 42 percent, respectively). These are the regions that have the most highly specialized livestock industries, in which production is dominated by a small number of breeds. In absolute terms, the Europe and the Caucasus region has by far the largest number of at-risk breeds. Despite the seemingly large proportions of at-risk breeds of these two regions, problems in other regions may be obscured by the large number of breeds with unknown risk status. In the other regions, 80 percent or more of breeds are of unknown risk status. Southwest Pacific reports no updated population data for any of their avian and mammal breeds, while Latin America and the Caribbean and the Near and Middle East report no updated population data for nearly all of their avian breeds. Likewise, for 90 percent of Africa's breeds and 89 percent of Asia's breeds, the lack of recent population data means that no risk status could be assigned for any avian breeds.

Figure 7. Risk status of the world's mammalian breeds in February 2021: absolute (table) and percentage (chart) figures by region and for international transboundary breeds



Note: The region name refers to both the bar above and the data in the table immediately below.

Figure 8. Risk status of the world's avian breeds in February 2021: absolute (table) and percentage (chart) figures by region and for international transboundary breeds



Note: The region name refers to both the bar above and the data in the table immediately below.

Tables 8 and 9 present the numbers of extinct mammalian and avian breeds by species and region. The numbers of breeds reported to be extinct increased from 2018 to 2021, from 600 to 619. Europe and the Caucasus region has reported far more extinct mammalian and avian breeds than any other region – 74 percent of the extinct mammalian breeds and 91 percent of avian breeds are reported from this region. The predominance of Europe and the Caucasus in terms of the number of breeds reported as extinct may relate, at least in part, to the relatively advanced state of breed inventory and monitoring in this region, in addition to socioeconomic factors affecting breed development. The year of extinction has been reported for only 53 percent of such cases (327). A total 216 breeds became extinct after 2000 (Table 10), a large number (106) of which were avian breeds, mostly industrial lines that are no longer maintained and actively bred.

Table 8. Numbers of extinct mammalian breeds, by species and region

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	International transboundary breeds	World
Ass	0	0	1	0	1	0	0	0	2
Buffalo	0	0	1	0	0	0	0	0	1
Cattle	23	18	105	21	5	0	2	0	174
Dromedary	1	0	0	0	0	0	0	0	1
Goat	1	2	15	0	0	0	0	0	18
Horse	6	1	83	2	0	5	1	0	98
Pig	0	15	52	1	0	0	1	0	69
Rabbit	0	0	2	1	0	0	0	0	3
Sheep	5	6	94	0	1	2	2	0	110
Total	36	42	353	25	7	7	6	0	476

Table 9. Numbers of extinct avian breeds, by species and region

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	1	6	95	0	1	0	0	103
Duck	0	0	22	0	0	0	0	22
Goose	0	0	7	0	0	0	0	7
Guinea fowl	2	0	0	0	0	0	0	2
Muscovy duck	0	1	0	0	0	0	0	1
Quail	0	0	2	0	0	0	0	2
Turkey	0	0	4	0	0	2	0	6
Total	3	7	130	0	1	2	0	143

Table 10. Numbers and proportions of breeds, according to their reported years of extinction

Year	Number of breeds	Proportion (%)
Unspecified	292	47
1900 and before	8	1
1901–2000	103	17
2001–2010	81	13
After 2010	135	22
Total	619	100

V. TRENDS IN BREED STATUS

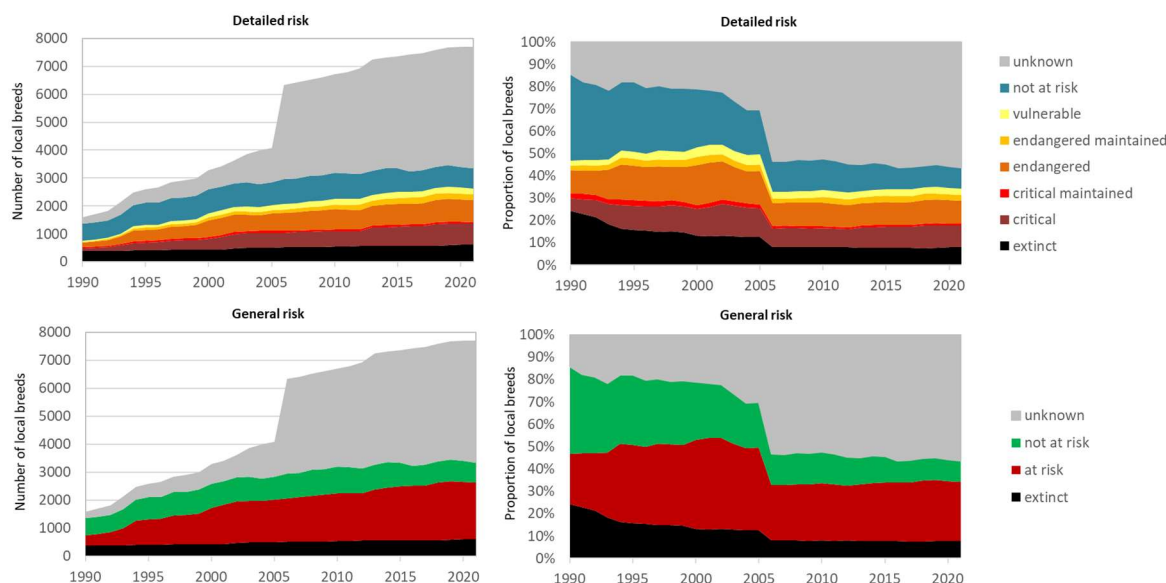
The data presented in Figure 9 show the evolution of risk status of local breeds for the period 1990-2021.¹⁷ During this period, the number of extinct breeds increased slightly, while its relative proportion decreased. As stated earlier, the year of extinction is unknown for the majority of those breeds. The drastic change in terms of total number of breeds is linked to the countries' preparation processes for the first report on *The State of the World's Animal Genetic Resources for Food and Agriculture*¹⁸ and the adoption of *The Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration*¹⁹, which resulted in a large number of new breed records created in DAD-IS for the first time in 2006. However, relatively few of those breed records were accompanied by information on the population size, resulting in a significantly increased proportion of local breeds with unknown risk status. The situation has been relatively stable since then, with the proportion of local breeds (considering also extinct breeds in the total) of unknown risk status increasing slightly from 55 to 57 percent during the last ten years. Other risk categories have remained relatively stable over time.

¹⁷ Due to adjustments in the computation of trends in combination with countries' updates, the figure differs from the one presented in CGRFA-17/19/Inf.4 document (<http://www.fao.org/3/my867en/my867en.pdf>).

¹⁸ <http://www.fao.org/docrep/010/a1250e/a1250e00.htm>

¹⁹ <http://www.fao.org/docrep/010/a1404e/a1404e00.htm>

Figure 9. Changes in risk status of local breeds from 1990 to 2020, expressed in terms of numbers and proportions (%) and according to detailed and general risk classification systems



Note: In the general risk classification system; vulnerable, endangered, endangered maintained, critical and critical maintained breeds are combined into an overall “at risk” category.

VI. ANIMAL GENETIC RESOURCES REFLECTED IN THE SUSTAINABLE DEVELOPMENT GOALS

The 2030 Agenda for Sustainable Development was adopted at the UN Post-2015 Summit on 25 September 2015. It includes 17 SDG and 169 targets.²⁰ The United Nations Statistical Commission (UNSC) at its Forty-Sixth Session (3-6 March 2015) discussed and agreed on the process and modalities for the development of the indicator framework. It endorsed the establishment of the Inter-Agency and Expert Group on SDG indicators (IAEG-SDG), consisting of national statistical offices, and as observers the regional, and international organizations and agencies. The Report of the IAEG-SDG from February 2016²¹ invited the Statistical Commission to adopt two indicators directly related to animal genetic resources for food and agriculture, related to SDG Target 2.5.

Target 2.5 is described as “By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed”.

The global indicator framework was adopted by the General Assembly on 6 July 2017 and is contained in the Resolution adopted by the General Assembly on Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313).²² The following two indicators related to this target were adopted:

SDG Indicator 2.5.1b: Number of animal genetic resources for food and agriculture secured in either medium or long term conservation facilities;

SDG Indicator 2.5.2: Proportion of local breeds, classified as being at risk, not-at risk or unknown level of risk of extinction.

²⁰ <https://sustainabledevelopment.un.org/>

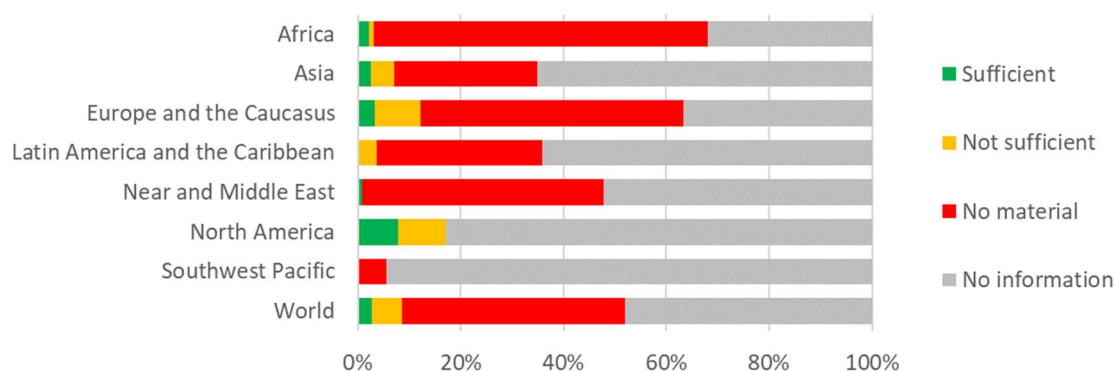
²¹ E/CN.3/2016/2/Rev.1.

²² <http://undocs.org/A/RES/71/313>

With regard to SDG Indicator 2.5.1b, DAD-IS has provided the possibility for countries to report information on cryoconservation programmes for each local breed only since 21 November 2017. The analysis of the Country Reports provided by 128 countries for the preparation of *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*²³ provides a baseline with regard to the proportion of national breed populations where sufficient material is stored for population reconstitution, of about 7 percent. However, the information reported in DAD-IS (Figure 10) is still scarce, with cryoconservation status known for only 52 percent of local breeds. According to DAD-IS, genetic material is cryoconserved for only a very small proportion (9 percent) of local breeds and for only around 3 percent of breeds is the quantity of stored material considered to be sufficient for population reconstitution.²⁴ The data from the Country Reports are not directly comparable with the data in DAD-IS, because the Country Reports refer also to transboundary breeds. However, when compared with the previous status and trends report, the figures underline the large progress in countries' reporting information on cryoconservation to DAD-IS since 2018.²⁵

Results for SDG indicator 2.5.2 are presented in Figure 11. Across the world, when excluding extinct breeds, 61 percent of local breeds are classified as of unknown status for risk of extinction, 29 percent as at risk, and 10 percent as not at risk. This result differs substantially from the proportions obtained when considering local and transboundary breeds together (Figure 4), because the majority of transboundary breeds are considered as not at risk. Results also differ widely across regions. For example, in the Southwest Pacific region, 100 percent of local breeds are currently of unknown risk status, because the most recent data were provided more than ten years ago. In all regions except Europe and the Caucasus and North America, more than 80 percent of local breeds are of unknown risk status. In Europe and the Caucasus, 35 percent of local breeds have unknown risk status, 54 percent are considered as at risk, and 11 percent not at risk.

Figure 10. Indicator 2.5.1b of the Sustainable Development Goals on the proportions (%) of local breed populations with material stored in a cryobank by region

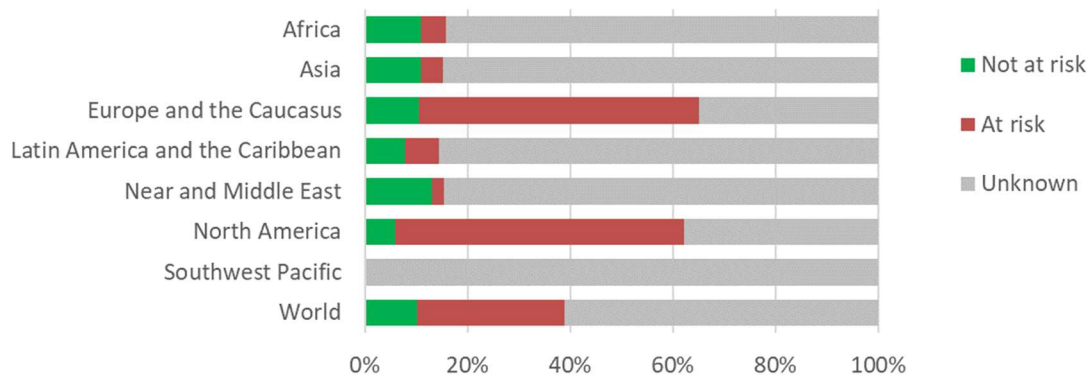


²³ <http://www.fao.org/publications/sowangr/en/>

²⁴ Compared to 2021 SDG reporting, there is slight difference in results due to computation adjustments.

²⁵ CGRFA/WG-AnGR-11/21/Inf.5

Figure 11. Indicator 2.5.2. of the Sustainable Development Goals on the proportions (%) of local breeds, classified as being at risk, not at risk or unknown level of risk of extinction



VII. CONCLUSIONS

During the period between March 2018 and February 2021 the coverage of the Global Databank remained rather stable. Breed-related information still remains far from complete. For 54 percent of all reported breeds, status for risk of extinction is unknown because of missing population data or the lack of recent updates.

Due to the lack of data regarding the “adaptedness” (i.e. locally adapted versus exotic) classification of breeds (this information is missing for 63 percent of national breed populations), indicators, figures and tables based on this classification system were not calculated and presenting such data in future reports will depend on availability of data. Adaptness is an important characteristic, as locally adapted breeds are logical candidates for genetic improvement to increase food security, either through pure- or cross-breeding programmes. Locally adapted breeds are those that have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country.²⁶ Breeds can usually be classified for adaptedness based on local knowledge, without the need for a breed-wise census. Therefore, the large proportion of missing information suggests a need for greater attention by many NC-AnGR in providing breed data.

On the other hand, since the last report, the quantity of data in DAD-IS regarding the cryoconservation status of national breed populations has increased substantially. SDG Indicator 2.5.1b now provides a greatly improved picture regarding the cryoconservation status of local breeds, as the proportion of breeds lacking information decreased from around 95 percent to about 50 percent. Indicator 2.5.1b reveals, however, that efforts need to be strengthened in the collection of genetic material for local breeds, as currently less than 10 percent of local breeds are reported to have genetic material stored in a gene bank. Cryoconservation is a powerful tool for both ensuring a population is safe from extinction and for management of genetic diversity *in situ*.²⁷

Explicit reporting on the proportions of local breeds classified as being at risk of extinction, not at risk or unknown is an inherent part of status and trends reports, thereby linking these reports directly to SDG Indicator 2.5.2. These data, either alone or in combination with SDG Indicator 2.5.1b, reflect a dramatic situation for local breeds. First, for 61 percent of local breeds no population size data have been reported within the last 10 years. This large proportion of missing data obscures somewhat the overall situation for risk of extinction. Considering only the local breeds for which information is provided, more than 70 percent are classified as being at risk. Moreover, for only a small proportion of local breeds has some cryoconserved material been reported to exist.

²⁶ CGRFA/WG-AnGR-7/12/Inf.7.

²⁷ CGRFA/WG-AnGR-11/21/Inf.4.

DAD-IS is the authorized information system for monitoring the livestock diversity aspects of Target 2.5 under the SDGs, in addition to serving its long-term purpose as the Convention on Biological Diversity Clearing House for information on diversity of animal genetic resources for food and agriculture. The new version of DAD-IS allows the regular provision of up-to-date data for the annual reports on the SDGs, but the comprehensiveness of the information relies upon more frequent reporting of breed data by countries.

Annex 1

Status of population data reported by each country and region

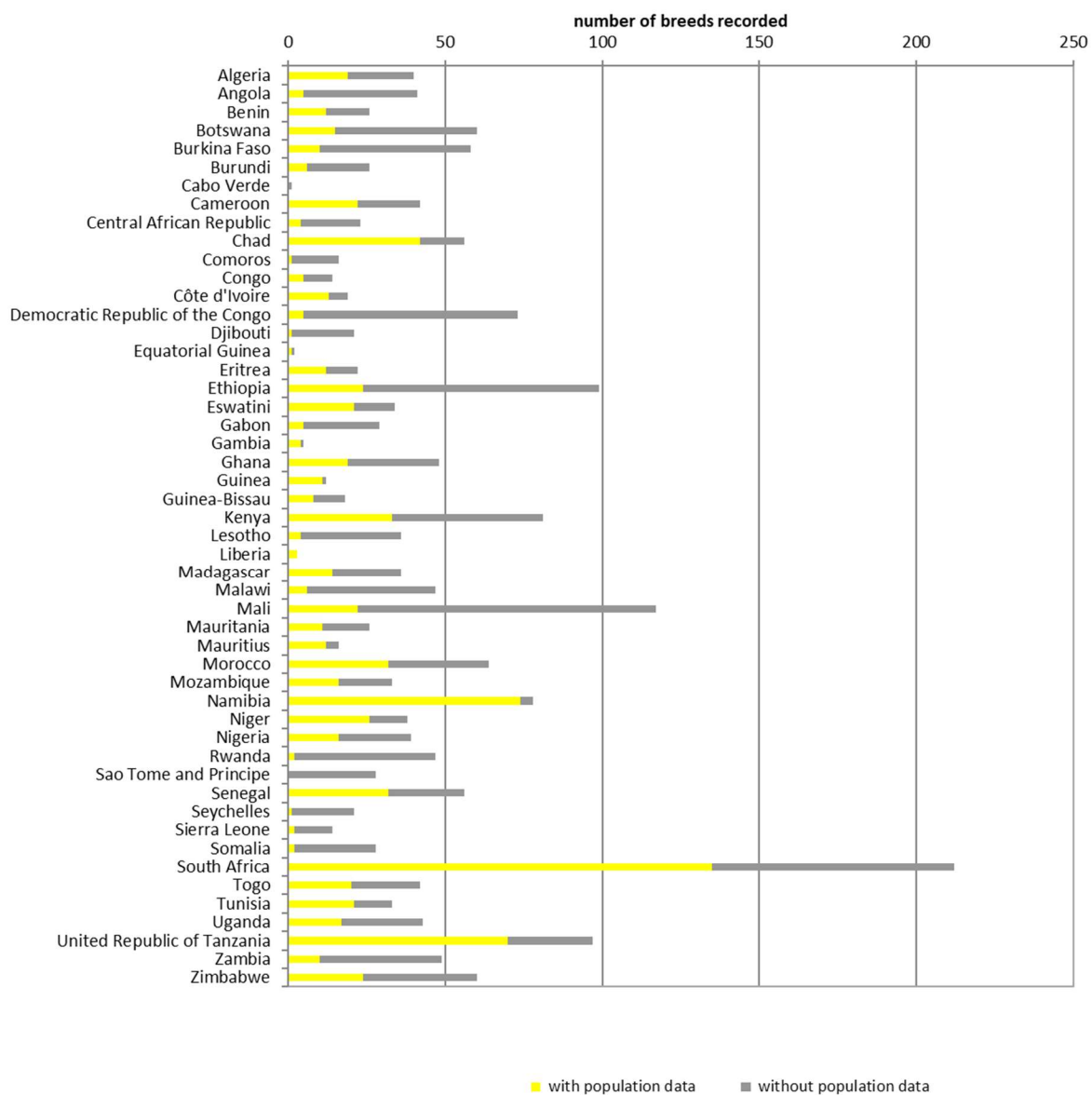
- 1.1. Africa
- 1.2. Asia
- 1.3. Europe and the Caucasus
- 1.4. Latin America and the Caribbean
- 1.5. Near and Middle East
- 1.6. North America
- 1.7. Southwest Pacific

This annex allows countries to view the state of completeness of their breed population data in DAD-IS. They can also see how their progress in entering population data compares to that of other countries in their respective regions and the world.

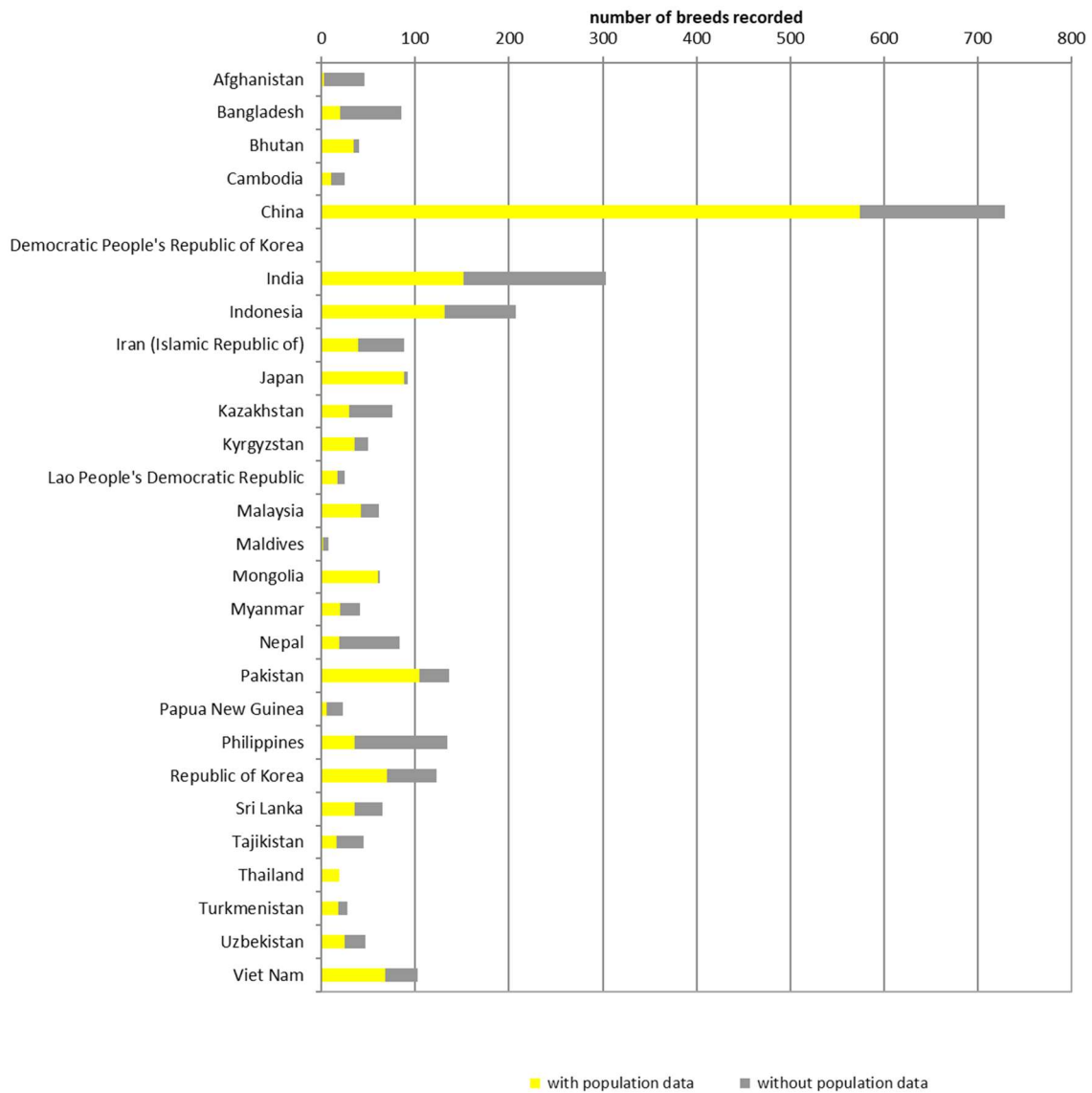
The graphics show the number of breeds for which population data have been recorded and the number of breeds included in DAD-IS for which no population data have yet been recorded, in countries and territories. Dependent territories are listed below the respective country.

Unless otherwise indicated, the country names follow the UN M49 classification. The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

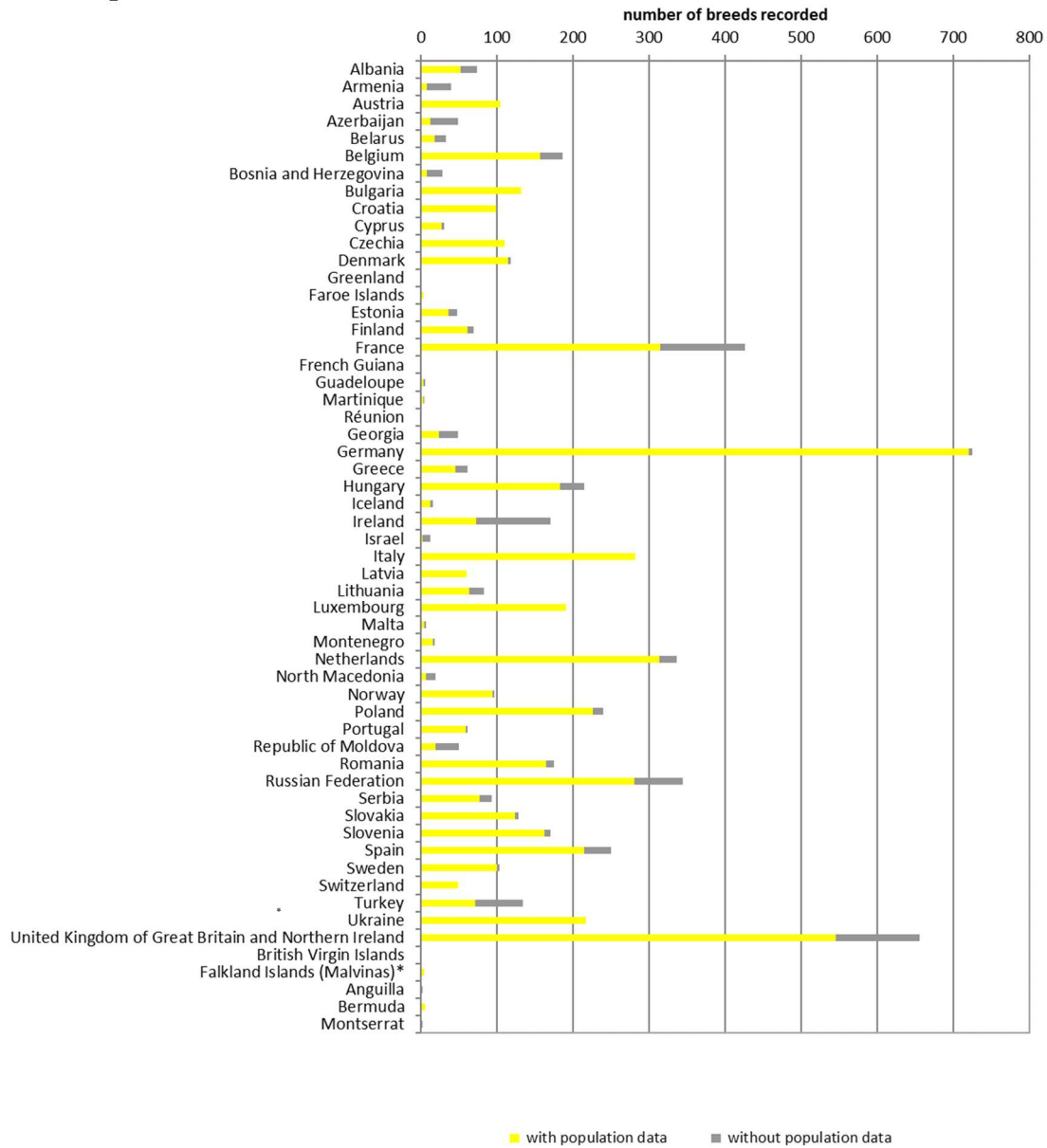
1.1 Africa



1.2 Asia

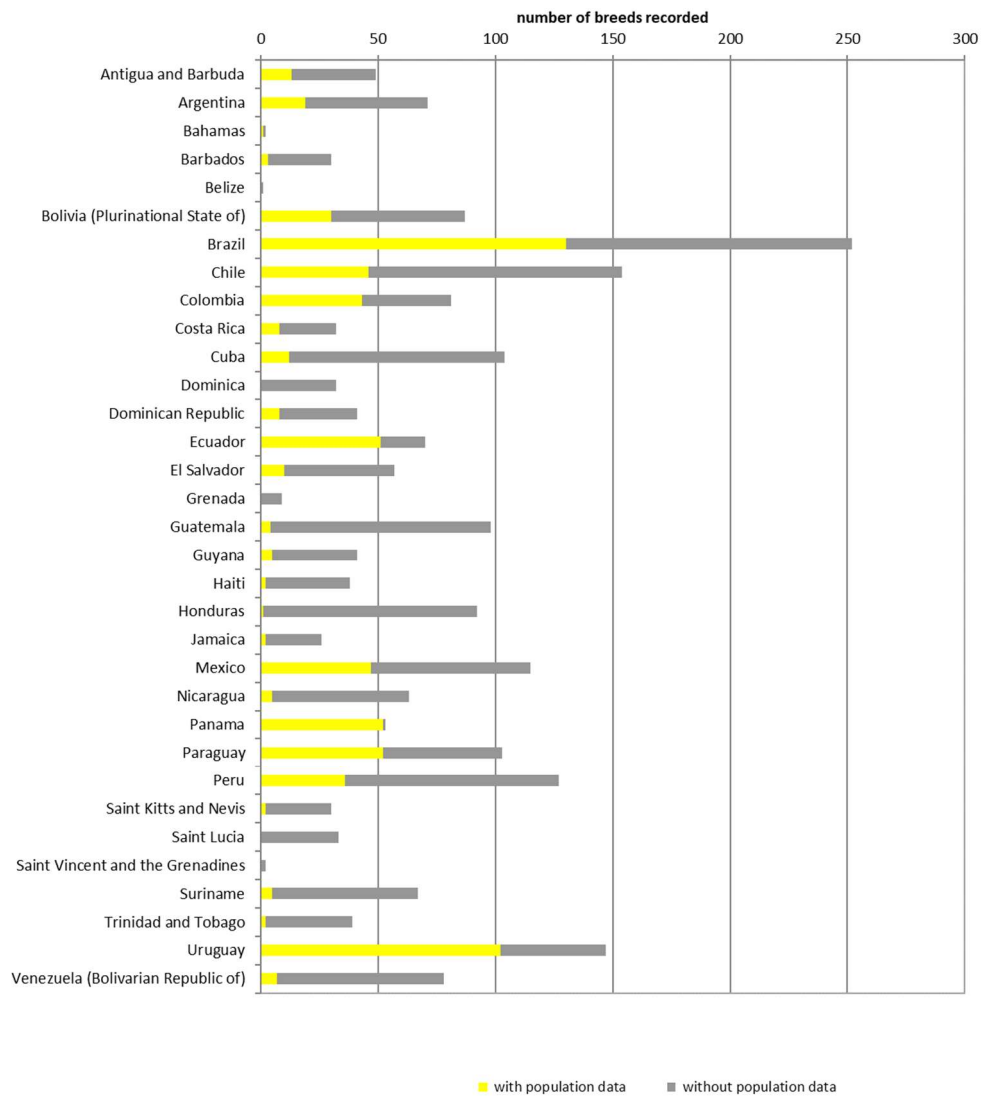


1.3 Europe and the Caucasus

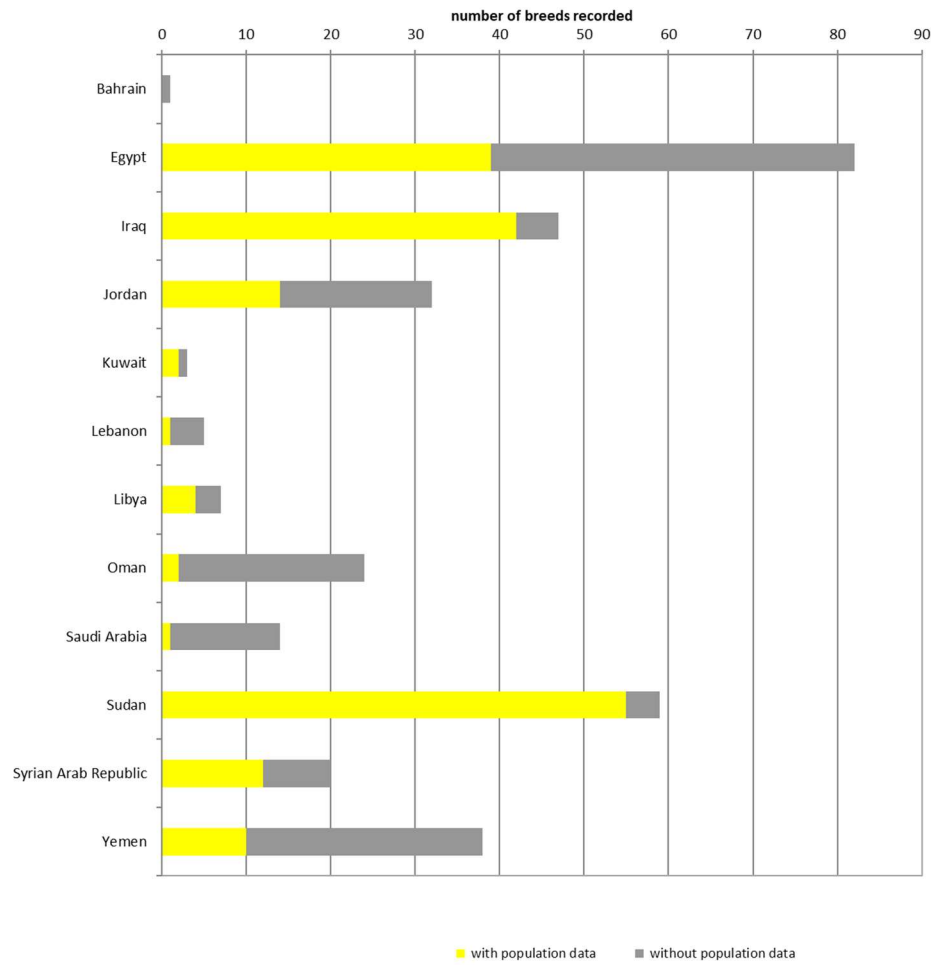


*A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas). (Editorial directive ST/CS/SER.A/42, United Nations Secretariat, 3 August 1999).

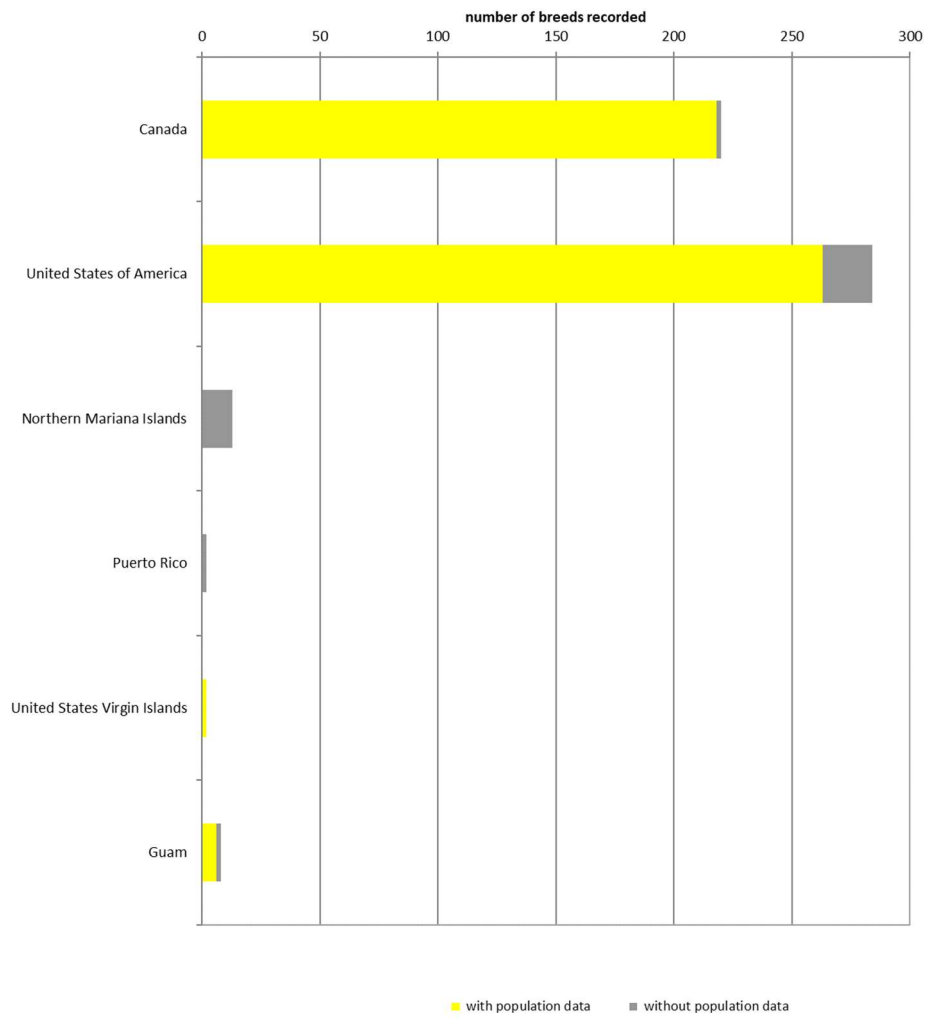
1.4 Latin America and the Caribbean



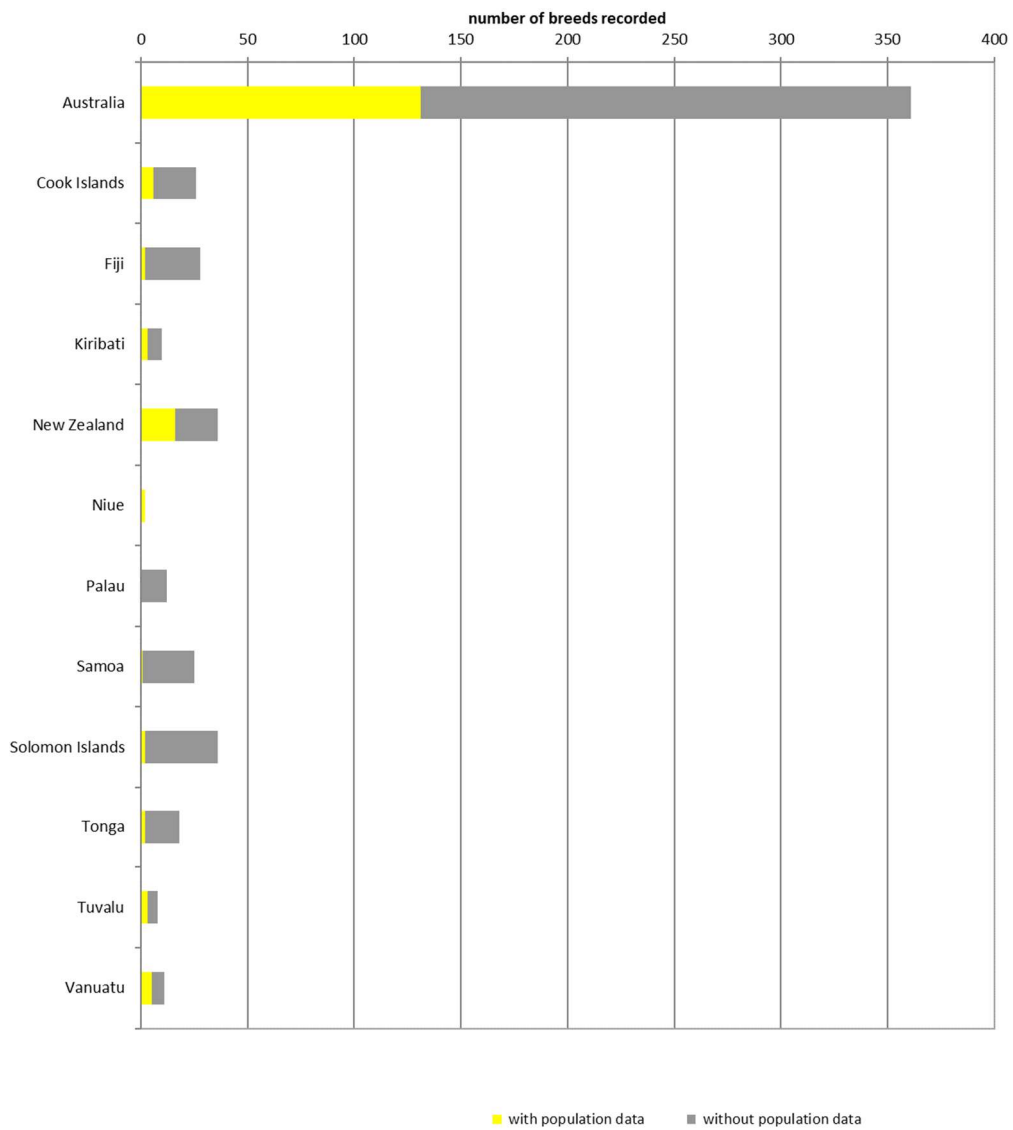
1.5 Near and Middle East



1.6 North America



1.7 Southwest Pacific



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Annex 2

Numbers of local and transboundary breeds by risk status category reported by each country and region

- 2.0. Regional overview
 - 2.1. Africa
 - 2.2. Asia
 - 2.3. Europe and the Caucasus
 - 2.4. Latin America and the Caribbean
 - 2.5. Near and Middle East
 - 2.6. North America
 - 2.7. Southwest Pacific

The tables in this annex show the numbers of local, regional transboundary and international transboundary breeds and their respective risk status by region and by country for which national breed populations have been reported in DAD-IS. Dependent territories are listed below the respective country. Unless otherwise indicated, the country names follow the UN M49 classification. The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The tables will help countries to identify the need for action in surveying and monitoring and in conservation.

2.0 Regional Overview	Local			Regional			International			Total
Region	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Africa	27	67	719	3	19	75	40	160	69	1179
Asia	49	100	1640	2	7	71	31	136	88	2124
Europe and the Caucasus	1717	320	1344	121	59	92	92	221	105	4071
Latin America and the Caribbean	14	15	583	2	4	22	53	194	68	955
Near and Middle East	0	0	233	0	0	5	1	30	24	293
North America	69	5	59	10	0	9	48	127	18	345
Southwest Pacific	6	2	182	1	0	4	45	143	46	429
World	1882	509	4760	139	89	278	112	267	167	8203

2.1 Africa	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Algeria	0	0	16	0	1	7	1	12	1	38
Angola	0	0	18	0	1	2	0	20	0	41
Benin	0	0	10	0	2	5	0	8	0	25
Botswana	3	1	9	0	2	4	1	39	1	60
Burkina Faso	0	0	22	0	3	9	0	20	4	58
Burundi	0	4	6	0	0	0	0	14	2	26
Cabo Verde	0	0	21	0	4	6	1	7	0	39
Cameroon	0	0	0	0	0	0	0	1	0	1
Central African Republic	0	0	9	0	5	1	0	7	1	23
Chad	0	0	35	0	1	10	0	8	2	56
Comoros	0	0	7	0	0	1	0	7	1	16
Congo	0	0	3	0	1	2	1	7	0	14

2.1 Africa	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Côte d'Ivoire	0	0	10	0	3	3	0	3	0	19
Democratic Republic of the Congo	0	0	25	0	1	4	1	39	3	73
Djibouti	0	0	15	0	0	3	0	2	1	21
Equatorial Guinea	0	0	0	0	1	0	0	1	0	2
Eritrea	0	0	6	0	0	11	1	4	0	22
Eswatini	0	0	15	0	3	1	0	15	0	34
Ethiopia	1	2	71	0	0	2	0	20	3	99
Gabon	0	0	9	1	3	3	0	11	2	29
Gambia	0	0	0	0	1	0	0	3	0	4
Ghana	0	0	21	0	3	4	0	14	5	47
Guinea	0	0	6	0	1	1	0	2	1	11
Guinea-Bissau	0	0	4	0	1	1	0	12	0	18
Kenya	0	1	26	1	3	6	2	38	4	81
Lesotho	0	0	10	0	1	0	1	23	0	35
Liberia	0	0	0	0	1	1	0	1	0	3
Madagascar	0	0	17	0	0	0	0	17	2	36
Malawi	0	4	10	0	1	2	0	26	3	46
Mali	0	3	54	0	7	12	0	36	5	117
Mauritania	0	0	6	0	4	7	0	9	0	26
Mauritius	1	0	5	0	0	1	0	8	0	15
Morocco	1	11	20	0	1	0	0	24	6	63
Mozambique	0	3	8	0	4	2	0	16	0	33
Namibia	15	9	3	2	2	0	1	46	0	78
Niger	2	11	11	0	6	1	0	4	1	36
Nigeria	0	0	16	0	5	12	0	4	0	37
Rwanda	0	0	12	0	0	1	1	29	4	47
Sao Tome and Principe	0	0	6	0	0	1	1	20	0	28
Senegal	3	8	8	0	5	3	0	21	7	55
Seychelles	0	0	1	0	0	2	0	15	3	21
Sierra Leone	0	0	0	0	1	0	1	11	1	14
Somalia	0	0	18	1	0	4	0	3	2	28
South Africa	6	2	60	2	3	5	15	99	7	199
Togo	0	0	7	0	2	9	1	12	10	41
Tunisia	1	4	2	0	0	1	0	12	10	30
Uganda	0	0	13	0	3	7	0	18	2	43
United Republic of Tanzania	6	27	16	2	10	3	1	28	1	94
Zambia	0	0	15	0	0	2	2	26	4	49
Zimbabwe	0	0	4	1	6	2	4	37	3	57

2.2 Asia	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	un-known	
Afghanistan	0	0	37	0	0	7	0	2	0	46
Bangladesh	0	0	48	0	1	5	1	17	10	82
Bhutan	7	16	2	0	2	1	0	10	2	40
Cambodia	0	0	16	0	0	5	0	4	0	25
China, mainland	2	3	602	0	1	9	7	49	12	685
Democratic People's Republic of Korea	0	0	1	0	0	0	0	0	0	1
India	0	1	222	0	6	27	3	32	7	298
Indonesia	5	41	111	0	2	3	5	34	26	227
Iran (Islamic Republic of)	0	0	59	0	0	5	3	13	8	88
Japan	0	0	48	0	0	1	4	26	10	89
Kazakhstan	0	0	46	0	0	11	2	11	6	76
Kyrgyzstan	0	0	26	0	0	8	0	9	6	49
Lao People's Democratic Republic	0	0	16	0	0	3	0	3	3	25
Malaysia	4	2	18	1	1	4	1	25	4	60
Maldives	0	0	4	0	0	0	0	3	1	8
Mongolia	0	1	40	0	0	6	0	10	2	59
Myanmar	0	0	19	0	0	1	1	17	3	41
Nepal	0	0	33	0	0	14	3	24	7	81
Pakistan	0	0	104	0	0	13	2	12	4	135
Papua New Guinea	0	0	9	0	0	1	0	13	0	23
Philippines	0	0	45	0	0	4	5	52	13	119
Republic of Korea	20	4	22	0	0	1	4	41	8	100
Sri Lanka	4	6	12	0	3	6	1	30	3	65
Tajikistan	0	0	20	0	1	11	0	10	1	43
Thailand	1	4	14	1	0	4	0	1	0	25
Turkmenistan	0	0	10	0	0	8	1	4	1	24
Uzbekistan	0	0	21	0	0	12	0	7	5	45
Viet Nam	6	22	35	0	0	5	2	22	5	97

2.3 Europe and the Caucasus	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	unknown	
Albania	5	4	34	2	0	2	0	26	0	73
Armenia	0	0	13	1	0	7	0	17	1	39
Austria	21	2	0	10	9	0	3	38	0	83
Azerbaijan	0	0	29	2	0	8	1	6	0	46
Belarus	0	0	15	0	1	2	0	10	1	29
Belgium	47	2	26	11	12	2	10	68	2	180
Bosnia and Herzegovina	0	0	19	0	2	0	0	4	0	25
Bulgaria	61	16	0	3	1	0	1	37	0	119
Croatia	35	8	2	2	4	0	1	43	0	95
Cyprus	0	1	16	0	1	0	0	11	0	29
Czechia	26	5	0	11	7	0	5	54	0	108
Denmark	41	7	4	5	6	0	7	47	0	117
Faroe Islands	0	0	1	0	0	0	0	0	0	1
Greenland	1	1	0	0	0	0	0	1	0	3
Estonia	1	0	10	0	0	3	3	24	5	46
Finland	13	3	8	2	2	2	2	36	1	69
France	78	20	158	26	12	4	16	85	2	401
French Guyana	0	0	1	0	0	0	0	0	0	1
Guadeloupe	0	0	0	0	0	0	0	3	2	5
Martinique	0	0	0	0	0	0	0	3	1	4
Réunion	0	0	0	0	0	0	0	1	0	1
Georgia	0	0	24	3	0	16	0	2	1	46
Germany	395	47	28	43	28	2	26	105	0	674
Greece	22	9	5	1	0	0	1	20	0	58
Hungary	63	32	38	6	5	5	4	53	6	212
Iceland	2	4	4	0	1	0	0	5	0	16
Ireland	15	3	20	5	4	16	19	69	18	169
Israel	0	0	3	0	0	0	0	4	5	12
Italy	199	21	0	11	5	0	7	38	1	282
Latvia	17	0	0	3	2	0	1	36	0	59
Lithuania	15	2	6	5	5	3	1	43	3	83
Luxembourg	113	1	0	14	12	0	7	44	0	191
Malta	0	0	2	1	0	0	0	4	0	7
Montenegro	10	2	1	0	1	0	0	4	0	18
Netherlands	91	9	11	35	24	5	32	122	6	335
North Macedonia	0	0	7	0	1	1	0	9	1	19
Norway	40	5	5	0	2	0	2	28	0	82
Poland	106	18	10	9	5	3	5	45	2	203
Portugal	30	19	1	1	1	0	0	9	0	61
Republic of Moldova	0	0	17	0	2	2	0	20	6	47
Romania	0	0	93	8	2	9	7	34	2	155
Russian Federation	0	0	178	3	5	21	0	55	19	281
Serbia	17	1	10	2	13	1	2	43	2	91
Slovakia	17	2	6	19	10	1	7	58	1	121
Slovenia	25	5	33	16	9	2	12	54	10	166
Spain	103	54	50	1	3	0	1	24	0	236
Sweden	45	2	5	4	1	2	5	31	3	98

2.3 Europe and the Caucasus	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	unknown	
Switzerland	17	8	1	7	2	1	1	9	0	46
Turkey	12	16	59	2	0	2	2	15	3	111
Ukraine	47	13	2	7	7	4	4	60	9	153
United Kingdom of Great Britain and Northern Ireland	76	11	195	31	11	30	57	138	31	580
Anguilla	0	0	0	0	0	0	0	1	1	2
Bermuda	0	0	2	0	0	1	0	2	0	5
British Virgin Islands	0	0	1	0	0	0	0	0	0	1
Falkland Islands (Malvinas)	0	0	3	0	0	0	0	0	1	4
Montserrat	0	0	0	0	0	0	0	1	1	2

2.4 Latin America and the Caribbean	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	unknown	
Antigua and Barbuda	0	0	8	0	0	0	1	34	6	49
Argentina	1	3	20	1	1	0	4	40	1	71
Bahamas	0	0	1	0	0	0	0	1	0	2
Barbados	0	0	6	0	0	0	2	21	1	30
Belize	0	0	1	0	0	0	0	0	0	1
Bolivia (Plurinational State of)	0	0	26	1	1	3	4	49	3	87
Brazil	8	6	74	0	0	2	14	120	13	237
Chile	3	12	43	0	1	3	5	72	14	153
Colombia	5	15	7	1	1	1	3	46	2	81
Costa Rica	0	0	4	1	0	2	1	21	2	31
Cuba	0	0	44	0	1	1	5	48	5	104
Dominica	0	0	3	0	0	0	2	25	2	32
Dominican Republic	0	0	6	0	1	3	1	27	2	40
Ecuador	2	5	20	0	1	1	1	40	0	70
El Salvador	0	0	8	1	1	3	2	35	7	57
Grenada	0	0	1	0	0	0	0	7	1	9
Guatemala	0	0	21	1	1	6	4	58	7	98
Guyana	0	0	11	0	0	2	0	28	0	41
Haiti	0	0	9	0	0	3	1	20	4	37
Honduras	0	0	21	0	0	6	3	60	1	91
Jamaica	0	0	8	0	0	0	1	16	1	26
Mexico	0	2	35	1	2	4	7	62	2	115
Nicaragua	0	0	9	1	1	1	2	45	3	62
Panama	6	1	0	0	1	0	2	43	0	53
Paraguay	3	0	14	1	1	1	2	78	3	103
Peru	4	1	29	0	2	5	8	72	6	127
Saint Kitts and Nevis	0	0	19	0	0	0	0	10	1	30
Saint Lucia	0	0	14	0	0	0	2	16	1	33
Saint Vincent and the Grenadines	0	0	0	0	0	0	0	1	1	2
Suriname	0	0	13	0	0	3	3	43	5	67
Trinidad and Tobago	0	0	5	0	0	1	1	25	7	39
Uruguay	7	2	4	2	2	3	11	103	8	142
Venezuela (Bolivarian Republic of)	0	0	27	1	1	4	2	38	3	76

2.5 Near and Middle East	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	unknown	
Bahrain	0	0	1	0	0	0	0	0	0	1
Egypt	0	0	62	0	0	1	1	13	5	82
Iraq	0	0	22	0	0	2	1	14	1	40
Jordan	0	0	22	0	0	1	0	8	1	32
Kuwait	0	0	0	0	0	2	0	1	0	3
Lebanon	0	0	1	0	0	1	0	2	1	5
Libya	0	0	3	0	0	1	0	1	2	7
Oman	0	2	17	0	0	0	0	5	0	24
Saudi Arabia	0	0	9	0	1	1	0	2	1	14
Sudan	5	27	17	0	2	0	1	7	0	59
Syrian Arab Republic	0	0	8	0	0	1	1	5	4	19

2.5 Near and Middle East	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	unknown	
Yemen	0	1	31	0	1	0	1	2	2	38

2.6 North America	Local			Regional			International			Total
Country	at risk	not at risk	unknown	at risk	not at risk	unknown	at risk	not at risk	unknown	
Canada	23	1	1	14	0	0	51	128	0	218
United States of America	44	6	37	8	0	4	44	129	5	277
Guam	0	0	5	0	0	0	0	2	1	8
Northern Mariana Islands	0	0	1	0	0	0	0	11	1	13
Puerto Rico	0	0	0	0	0	0	0	1	1	2
United States Virgin Islands	0	0	1	0	0	0	0	1	0	2

2.7 Southwest Pacific	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Australia	0	0	126	0	0	5	41	145	40	357
Cook Islands	0	0	8	0	0	1	1	13	3	26
Fiji	0	0	12	0	0	1	1	13	1	28
Kiribati	0	0	2	0	0	0	0	6	2	10
New Zealand	0	0	17	0	0	3	3	9	2	34
Niue	0	0	2	0	0	0	0	0	0	2
Palau	0	0	0	0	0	1	0	11	0	12
Samoa	0	0	3	0	0	0	0	21	1	25
Solomon Islands	0	0	8	0	0	0	2	23	3	36
Tonga	0	0	3	0	0	0	0	14	1	18
Tuvalu	0	0	3	0	0	0	0	5	0	8
Vanuatu	0	0	6	0	0	0	0	4	1	11