Report on

The Distribution of FCI Pedigree Dogs in the European Union in 2022

Attila Márton

Introduction

Dogs have played a significant role in human society for thousands of years. According to the current tendencies, dogs are kept as companion animals; therefore, the human emotional bonding toward dogs may be deeper than ever before.

Dog welfare is a crucial topic for dog lovers. Lawmakers and law enforcement authorities do their best to comply with our current understanding and expectations of our recent ideas of animal welfare.

Preventive and problem-solving strategies can only be effective when all underlying factors and mechanisms contributing to health and welfare issues are detected.

Understanding the proportion of pedigree dogs informs breed-specific health and welfare strategies. It carries weight in broader discussions surrounding pet commerce, legislative measures, and societal attitudes towards dog breeding and ownership.

It is important to note that the Fédération Cynologique Internationale (FCI) does not have a monopoly on registering purebred dogs. Other organisations registering dogs are exempt from the current report.

Despite the increasing sophistication of canine welfare and a growing cultural emphasis on responsible pet ownership, comprehensive data on dog populations remain surprisingly sparse.

This report aims to shed light on the distribution of FCI pedigree dogs across the EU by piecing together fragmented data and drawing informed estimates where gaps exist.

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Attila Márton

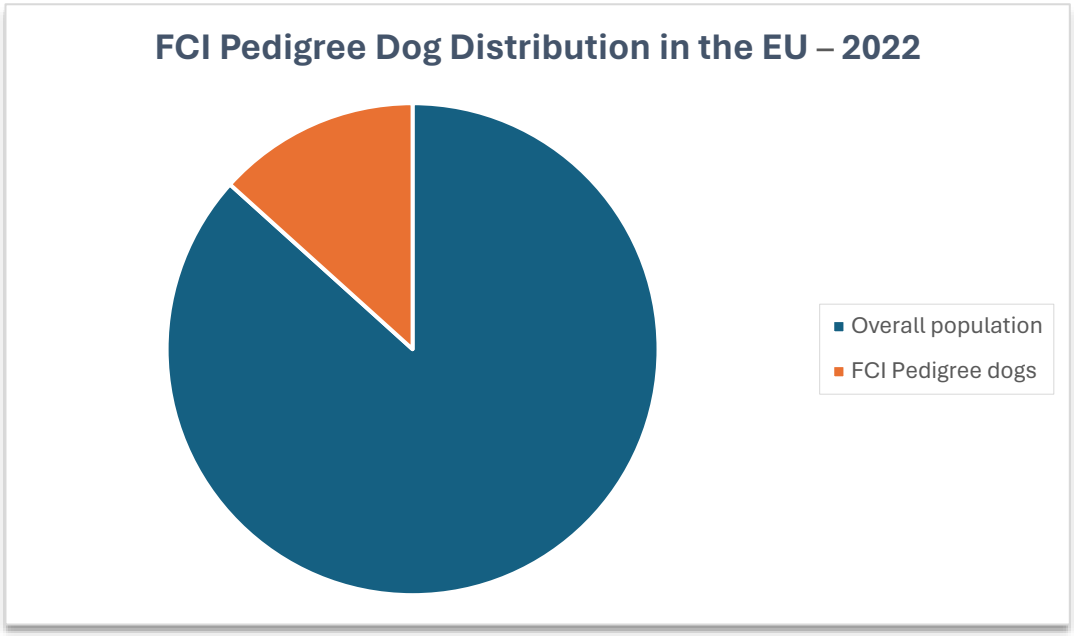
Conclusion

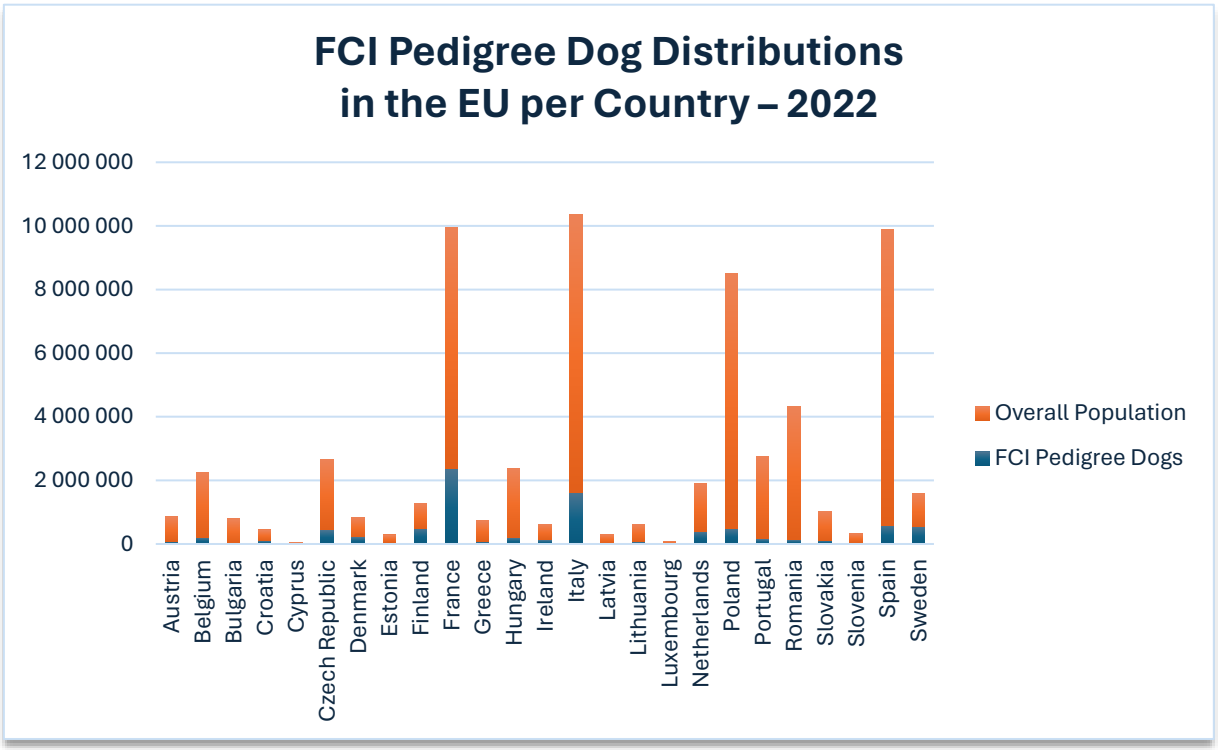
The distribution of FCI pedigree dogs across European countries presents a varied landscape. The **EU average is 15.36%**, with a ***standard deviation of 14.83%***.
56% of the countries have a national distribution of FCI pedigree dogs **below the EU average**, while **44% exceed** it.

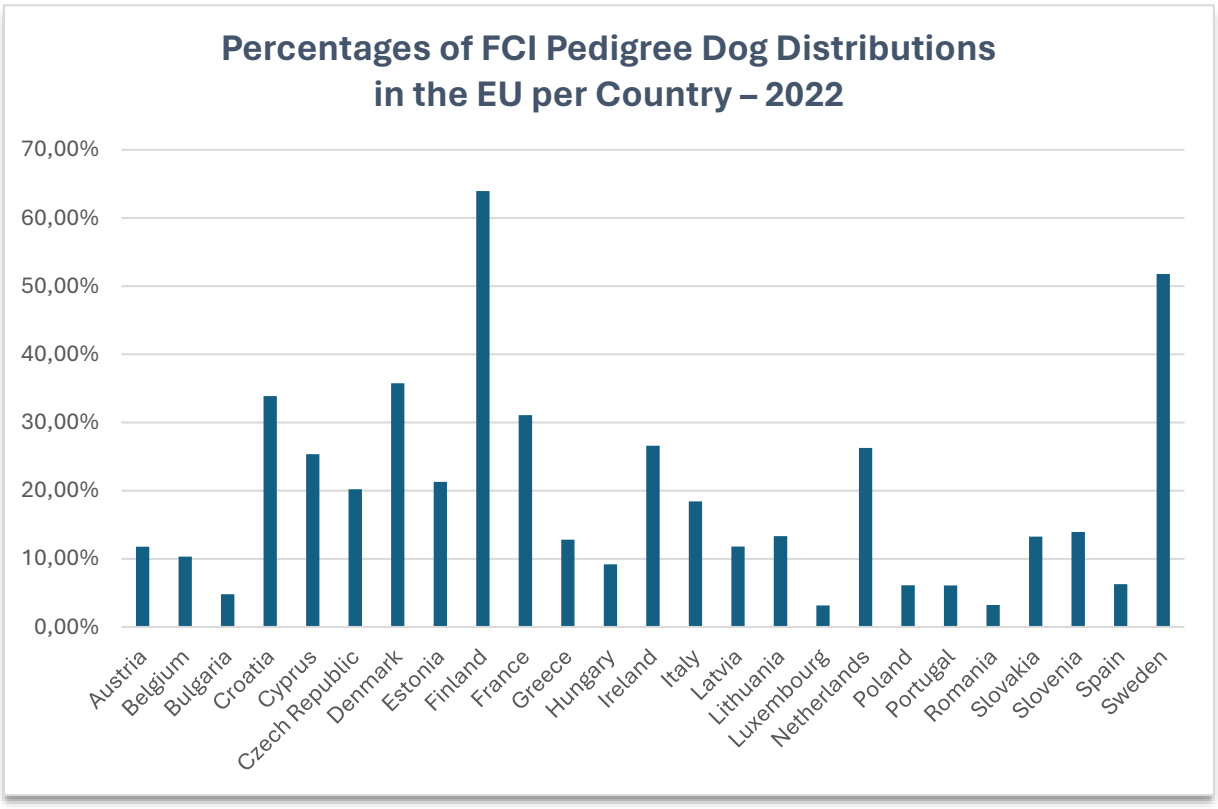
It's clear that FCI pedigree dogs do not form an overwhelming proportion of the overall dog population.

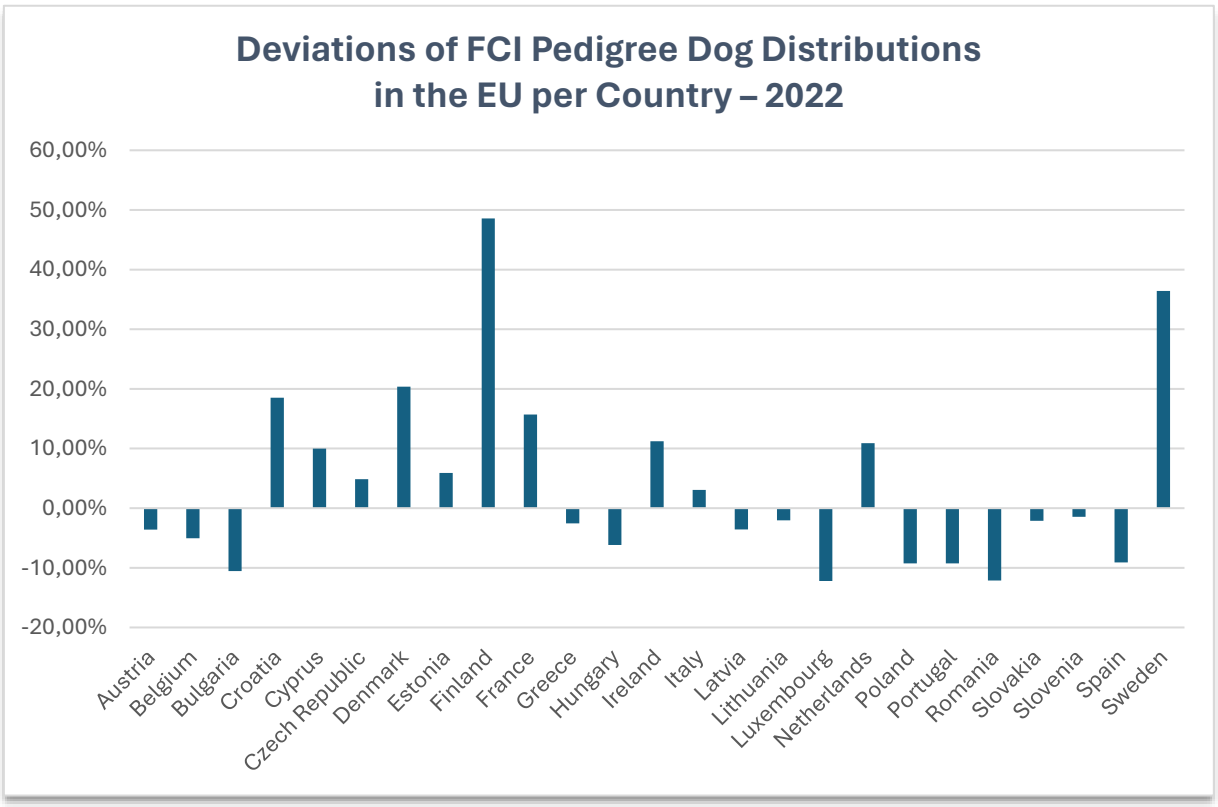
Significant disparities from country to country indicate diverse cultural attitudes toward ownership cultures and preferences.

Country	Overall population	FCI Pedigree dogs	Distribution	Deviation
Austria	766 000	90 120	**11,77%**	**-3,60%**
Belgium	2 029 000	209 203	**10,31%**	**-5,05%**
Bulgaria	750 000	36 083	**4,81%**	**-10,55%**
Croatia	330 000	111 774	**33,87%**	**18,51%**
Cyprus	48 648	12 335	**25,35%**	**9,99%**
Czech Republic	2 211 000	446 921	**20,21%**	**4,85%**
Denmark	617 000	220 509	**35,74%**	**20,38%**
Estonia	235 000	50 007	**21,28%**	**5,92%**
Finland	781 000	499 363	**63,94%**	**48,58%**
France	7 600 000	2 361 793	**31,08%**	**15,71%**
Germany	10 600 000	N/A	**N/A**	**N/A**
Greece	657 000	84 128	**12,80%**	**-2,56%**
Hungary	2 172 000	199 404	**9,18%**	**-6,18%**
Ireland	495 000	131 576	**26,58%**	**11,22%**
Italy	8 755 000	1 612 490	**18,42%**	**3,06%**
Latvia	270 000	31 843	**11,79%**	**-3,57%**
Lithuania	550 000	73 313	**13,33%**	**-2,03%**
Luxembourg	83 400	2 640	**3,17%**	**-12,20%**
Malta	N/A	14 468	**N/A**	**N/A**
Netherlands	1 500 000	394 007	**26,27%**	**10,90%**
Poland	8 019 000	490 367	**6,12%**	**-9,25%**
Portugal	2 605 000	158 909	**6,10%**	**-9,26%**
Romania	4 193 000	135 568	**3,23%**	**-12,13%**
Slovakia	915 000	121 192	**13,25%**	**-2,12%**
Slovenia	295 000	41 074	**13,92%**	**-1,44%**
Spain	9 313 000	583 884	**6,27%**	**-9,09%**
Sweden	1 044 000	540 635	**51,78%**	**36,42%**
Total: (Excluding Germany & Malta)	**56 234 048**	**8 639 135**	**15,36%**	**14,83%**


FCI Pedigree Dog Distribution in the EU – 2022
Overall population
FCI Pedigree dogs


FCI Pedigree Dog Distributions in the EU per Country – 2022
12 000 000
10 000 000
8 000 000
6 000 000
4 000 000
2 000 000
0
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
Overall Population
FCI Pedigree Dogs


Percentages of FCI Pedigree Dog Distributions in the EU per Country – 2022
70,00%
60,00%
50,00%
40,00%
30,00%
20,00%
10,00%
0,00%
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden


Deviations of FCI Pedigree Dog Distributions in the EU per Country – 2022
60,00%
50,00%
40,00%
30,00%
20,00%
10,00%
0,00%
-10,00%
-20,00%
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden

Methodology

Interpretation

Given these considerations, the 15.36% figure should be viewed as a broad indicator of the proportion of FCI pedigree dogs within the EU. It is not meant to convey a precise measurement but rather to provide insight into the general scale of the FCI pedigree dog population relative to the total dog population. The aim is to highlight that, despite the presence of FCI pedigree dogs within the EU, they constitute a minority of the overall dog population, far below hypothetical figures of 60% or 90%.

The figure 15.36% represents a rough estimation of the percentage of FCI pedigree dogs compared to the total dog population within the European Union. This estimate is derived from a comprehensive analysis, yet it is essential to recognise the inherent limitations and assumptions underlying this calculation.

This percentage is calculated by dividing the estimated number of registered FCI pedigree dogs by the estimated total dog population across the EU.

The estimation takes into account:

- ***Yearly registration data:*** The number of new FCI pedigree dogs registered each year, summed over a period that accounts for the average lifespan of dogs.
- ***Total dog population estimates:*** Broad approximations of the dog population, including both pedigree and non-pedigree dogs, derived from available data.

General Limitations and Assumptions

The primary challenges in arriving at this figure include:

- ***Lack of national-level records:*** Comprehensive, country-specific data on dog populations and registrations is not uniformly available across all EU member states.
- ***Inaccuracy in population data:*** The total dog population figure is an estimate subject to variances due to the methodology used, the quality of data inputs, and the assumption of uniform reporting and registration practices across countries.
- ***Missing data on FCI pedigree dogs:*** The calculation assumes that the available registration data accurately reflects new registrations of pedigree dogs, which may not account for all FCI pedigree dogs due to missing or incomplete data.

Assessment of the Total Dog Population in the EU

Overview

Accurate quantification of the total dog population in the European Union is challenging. Even though many EU States have compulsory dog identification systems in place, comprehensive and accessible data remain elusive. This lack of transparency and availability of data presents a significant obstacle in obtaining a precise count of the canine inhabitants across the EU.

Data Sources

In light of these limitations, the primary source of data for the overall dog population within this report is derived from the European Pet Food Industry Federation (FEDIAF). FEDIAF's industry report[1] is widely utilised and cited and is believed to predominantly cover pet dogs that are living with families or individuals.

Limitations of FEDIAF Data

While FEDIAF provides an invaluable dataset, it is critical to acknowledge that:

- The report is based on estimated volumes rather than administrative registrations, leading to a reliance on approximations.
- A considerable segment of the dog population, namely stray dogs, may not be included in this data. Given the significant presence of stray dogs in certain regions, their exclusion could result in a substantial underestimation of the total dog population.

Inclusion of Non-FEDIAF-Covered Countries

For countries not encompassed by the FEDIAF report, such as Croatia, Cyprus, Luxembourg, and Malta, the research expanded to incorporate extensive public domain exploration to uncover any available data. In the absence of official figures, the research pivoted to utilising information from National Canine Organisations (NCOs) as members of the Fédération Cynologique Internationale (FCI). This approach was adopted to harness a more expansive dataset, albeit recognising its limitations.

Notable Exemptions

Two countries stand out in the context of our report:

- **Malta** is exempted from the dataset due to the unavailability of data regarding the overall dog population.
- **Germany** is notably absent in the final analysis, stemming from a lack of accessible FCI pedigree dog population data from the German NCO.

Conclusion

While the data employed in this report offers a pertinent glimpse into the canine demographic of the EU, it is essential to interpret the findings within the context of the acknowledged constraints. The figures presented serve as a foundation for discussion.

[1] https://europeanpetfood.org/about/annual-report/

Estimation of the Total FCI Pedigree Dog Population

The FCI does not register dogs and has no direct access to the national pedigree databases. The dataset used for this report shows the number of newly registered dogs by the NCO during a calendar year.

The NCOs, as members of the FCI, report basic statistics to the FCI annually and nonmandatorily. The dataset is publicly available[2].

Assumptions

- ***Average life expectancy of dogs:*** The analysis was guided by the assumption that the average life expectancy of dogs is around ten years, which influences the relevance of yearly registration data.
- ***Growth rate consistency:*** We assumed that the growth rate of dog registrations within a country would be relatively consistent over time, allowing us to use historical data to project missing values.

Methodology

Given the limitations and availability of direct data, the estimation of the total FCI pedigree dog population was based on the following key components and assumptions:

- ***Yearly registration data:*** The primary data source was the annual registration numbers for new FCI pedigree dogs in various EU countries. While robust, this data only directly accounts for new registrations each year and not the total living population of pedigree dogs.
- ***Life expectancy assumption:*** To convert yearly registrations into an estimate of the total population, an assumed average life expectancy of 10 years for dogs was utilised. This assumption allows for estimating the population size by accounting for the expected lifespan of registered dogs, thereby providing a means to approximate the number of living FCI pedigree dogs derived from the registration data over a decade.
- ***Cumulative calculation:*** By summing the registrations over the past ten years and adjusting for the life expectancy of dogs, the estimated total population of FCI pedigree dogs at any given time was calculated. This approach inherently assumes that the number of deaths approximately equals the number of new registrations each year, providing a steady-state model of the FCI pedigree dog population.

Steps in the Estimation Process of Missing Data

With some years of data missing for specific countries, we systematically estimated the missing information. The process considered the available data's patterns and aimed to provide a realistic approximation of the missing values based on several key assumptions and techniques.

1. ***Data preparation:*** Initial examination and cleaning of the dataset to ensure readiness for analysis.
2. ***Linear interpolation:*** For countries with sequential years of data missing between two known points, we used linear interpolation to estimate the values for the missing years, assuming a linear trend between the known data points.

[2] https://www.fci.be/en/statistics/

3. ***Calculation of average growth rate:*** We calculated the average year-over-year growth rate of dog registrations for all countries with at least two consecutive years of data. This involved computing the percentage change in registrations from one year to the next and averaging these rates across all available country data.
4. ***Application of average growth rate:*** We applied the average growth rate to estimate missing values for countries with extensive missing data or where previous methods were unsuitable. This was done by increasing the last known value by the average growth rate for each subsequent missing year.
5. ***Logical bounds and final adjustments:*** Ensured all estimated values were within logical bounds (e.g., non-negative). Filled any remaining gaps using the nearest known values within each country's data series, applying a forward-fill followed by a backward-fill method to ensure all years had estimated values.

Rationale

The rationale behind this methodology includes:

- ***Data availability:*** Direct counts of the total FCI pedigree dog population are not fully available for all EU countries. Thus, utilising registration data presents a viable method to approximate the population size.
- ***Simplicity and feasibility:*** The method provides a straightforward and feasible approach to estimating the population size without the need for complex demographic modelling, which may not be possible due to data constraints.
- ***Reasonable assumptions:*** The assumption of a 10-year life expectancy for dogs is based on veterinary science and demographic studies of canine populations, offering a realistic basis for estimation.

Considerations and Limitations

It's important to note the following limitations:

- ***Variability in life expectancy:*** Life expectancy can vary significantly among breeds, which might affect the accuracy of the population estimate.
- ***Static assumption:*** The methodology assumes a relatively static population growth rate, not accounting for significant year-over-year fluctuations in registrations.

Conclusion

Despite the inherent limitations and assumptions, this methodology provides a structured and reasoned approach to estimating missing data in the context of FCI pedigree dog registrations. It serves as a critical reference point for stakeholders in animal welfare, veterinary medicine, and policy-making.

Acknowledgement of AI Utilization in Analysis

This report incorporates advanced analytical methodologies, including using Artificial Intelligence (AI) tools to model missing data, collect background information, and support the estimation processes described herein.

Specifically, the following AI platforms were engaged:

Data Analyst (OpenAI's ChatGPT): Utilised to model missing data.

Perplexity AI: Engaged to gather background information and insights relevant to the report.

Gemini AI: Employed to collect data and assist in refining data sets.

Ethical Considerations and Transparency

The employment of AI technologies in this analysis underscores our commitment to leveraging cutting-edge tools to enhance our understanding and provide accurate estimations within the constraints of available data. However, it's important to acknowledge that:

- The outputs of AI tools are dependent on the data and algorithms that power them, which may introduce biases or limitations reflective of those inherent in the source material.
- AI-generated insights and data modelling supplement traditional research and analysis methods, filling gaps in available data and offering informed estimations where empirical data is lacking.

Number of Yearly Registered FCI Pedigree Dogs – 2013 – 2022.

Country	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	TOTAL
Austria	9 350	9 565	8 557	8 705	8 690	8 736	9 090	9 162	9 053	9 212	**90 120**
Belgium	19 727	24 462	24 225	23 989	23 752	23 515	17 968	15 194	17 188	19 183	**209 203**
Bulgaria	2 024	2 736	3 448	4 160	4 254	4 240	4 225	3 878	3 881	3 237	**36 083**
Croatia	11 387	14 083	12 040	10 552	10 157	10 705	10 619	10 852	10 503	10 876	**111 774**
Cyprus	1 457	1 406	1 355	1 304	1 253	1 202	1 151	1 174	1 355	678	**12 335**
Czech Republic	48 235	54 853	47 626	44 427	43 694	42 060	41 132	40 401	46 618	37 875	**446 921**
Denmark	22 481	28 292	23 742	21 589	20 687	20 555	22 311	20 441	20 293	20 118	**220 509**
Estonia	5 532	5 945	5 189	5 030	4 872	4 938	4 522	4 537	4 862	4 580	**50 007**
Finland	52 195	52 771	51 297	47 749	49 890	49 051	48 639	49 362	48 874	49 535	**499 363**
France	258 110	275 407	245 553	233 802	234 073	235 312	230 341	215 510	218 320	215 365	**2 361 793**
Germany	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Greece	7 670	8 791	9 700	7 421	7 916	8 443	7 557	10 937	7 453	8 240	**84 128**
Hungary	26 738	27 590	23 660	21 126	20 008	16 156	15 704	14 489	14 045	19 888	**199 404**
Ireland	170	138	112	8 647	17 182	25 717	17 189	18 998	20 807	22 616	**131 576**
Italy	176 004	201 800	161 053	156 859	162 788	167 123	168 696	159 204	134 767	124 196	**1 612 490**
Latvia	3 833	4 070	3 381	3 377	3 223	2 471	3 119	2 940	2 760	2 669	**31 843**
Lithuania	8 660	9 792	7 956	6 759	6 759	7 107	6 981	6 847	6 337	6 115	**73 313**
Luxembourg	247	247	247	247	247	247	264	281	298	315	**2 640**
Malta	1 746	1 668	1 590	1 512	1 434	1 356	1 278	1 200	1 295	1 389	**14 468**
Netherlands	35 465	41 193	48 736	39 597	38 798	38 000	38 023	35 880	38 065	40 250	**394 007**
Poland	68 964	75 646	16 609	66 066	53 676	53 000	48 583	12 043	62 980	32 800	**490 367**
Portugal	16 297	18 659	14 854	17 734	14 408	14 378	14 879	15 173	15 900	16 627	**158 909**
Romania	16 601	15 850	15 098	14 347	13 595	13 182	13 182	12 141	11 238	10 335	**135 568**
Slovakia	15 126	15 947	13 905	12 957	12 878	12 570	12 116	11 578	3 009	11 106	**121 192**
Slovenia	4 873	5 117	4 336	3 880	3 757	3 819	3 871	3 866	3 867	3 688	**41 074**
Spain	64 488	69 545	40 646	55 459	56 262	59 836	59 942	59 339	57 961	60 406	**583 884**
Sweden	49 507	62 894	57 076	51 454	50 531	51 059	51 049	50 234	51 111	65 720	**540 635**

(Data in black cells are estimated.)