

## STAR-IDAZ

# Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses



SEVENTH FRAMEWORK PROGRAMME  
Cooperation  
Theme 2: Food, Agriculture and Fisheries, and  
Biotechnology  
Project No. 265919



Work Package 2 - Sharing information on existing research programmes

## **REPORT ON BIBLIOMETRIC STUDY (2006-2013) ON ANIMAL INFECTIOUS DISEASES**

Christian Ducrot, Marjolaine Gautret, Thierry Pineau, André Jestin

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**Report authors:**

Christian Ducrot <sup>1</sup>, Marjolaine Gautret <sup>1</sup>, Thierry Pineau <sup>1</sup>, André Jestin <sup>2</sup>

<sup>1</sup> INRA, Animal Health Division, Nouzilly, France

<sup>2</sup> ANSES, Maisons-Alfort, France

The written English in the report was reviewed by Grace Delobel.

**Work Package 2 - Leader: Thierry Pineau**

INRA - Animal Health Division

37380 Nouzilly

France

## Table of contents

Objectives .....	5
Task team.....	5
<b>METHODS - DESIGN OF THE BIBLIOGRAPHIC DATABASE .....</b>	<b>6</b>
Overall procedure .....	6
Project schedule (Gantt chart).....	7
Step 1 - Inventory: ERA-Net EMIDA and ERA-Net ANIHWA.....	7
Step 2 - Scope.....	8
Step 3 - Establishing a thematic terminology.....	8
Step 4 - Definition of search queries.....	9
Step 5 - Construction of the database .....	10
Step 6 - Preparation of the database .....	12
Step 7 - Data analysis .....	14
<b>RESULTS - BIBLIOMETRIC ANALYSIS .....</b>	<b>16</b>
Volume of articles published on infectious animal diseases.....	16
At the world level.....	16
At the country level.....	17
Thematic approach: animal species and pathogens.....	18
By animal species group.....	18
By pathogen group.....	19
By animal species group and pathogen group.....	20
By family of pathogen .....	22
Collaboration networks.....	27
By continent .....	27
By geographical region.....	29
By animal species group and continent .....	31
By families of pathogens and continent.....	33
Co-authorship networks between geographical regions .....	42
<b>SYNTHESIS AND CONCLUSION .....</b>	<b>45</b>

**APPENDIX ..... 47**

Table 1: Number of publications by publication year for the period 2006-2013..... 48

Table 2: Number of publications by animal species group for the period 2006-2013..... 48

Table 3: Number of publications by pathogen for the period 2006-2013. .... 48

Table 4: Number of publications by species and pathogen for the period 2006-2013..... 49

Table 5: Number of publications by bacteria family for the period 2006-2013..... 51

Table 6: Number of publications by parasite family for the period 2006-2013..... 53

Table 7: Number of publications by prions for the period 2006-2013. .... 56

Table 8: Number of publications by virus family for the period 2006-2013. .... 56

Table 9: Number of publications by geographical continent for the period 2006-2013. .... 57

Table 10: Number of publications by geographical continent and partnerships for the period 2006-2013. .... 58

Table 11: Number of publications by geographical region and partnerships for the period 2006-2013..... 59

Table 12: Number of publications by geographical continent and species for the period 2006-2013..... 62

Table 13: Number of publications by pathogen in Africa for the period 2006-2013. .... 64

Table 14: Number of publications by pathogen in the Americas for the period 2006-2013. .... 68

Table 15: Number of publications by pathogen in Asia for the period 2006-2013..... 73

Table 16: Number of publications by pathogen in Europe for the period 2006-2013..... 78

Table 17: Number of publications by pathogen in Oceania for the period 2006-2013. .... 83

Table 18: Number of publications by journal for the period 2006-2013. .... 87

Table 19: Number of publications by journal impact factor class for the period 2006-2013. .... 89

## Objectives

This report is an output of Work Package 2 (WP 2) of the Star-Idaz project, which aims to improve coordination of research activities on the major infectious diseases of livestock and zoonoses. The goal of WP 2 is to analyse and share information on existing research activity.

Jean de Rycke produced a first report at the beginning of the Star-Idaz project <sup>1</sup> that focused on partner countries and explored the scientific literature produced from 2006 through June 2010. The analysis of research outputs in specific research fields was carried out at two different levels, countries and research institutions, with a focus on co-publication networks.

The aim of this report is slightly different. It is based on an updated publication database which includes papers from around the world published from 2006 through 2013 (an 8-year period). The analysis aims to describe the research subjects and international collaborations in the field of infectious diseases of production animals at the country level; there is no attempt to analyse scientific production by research institution.

## Task team

The task team was composed of both scientific experts and information specialists.

Scientific experts:

- Christian Ducrot - INRA
- André Jestin - ANSES



Information specialists:

- Marjolaine Gautret - INRA
- Guillaume Gourdon - 12 months fixed-term contract



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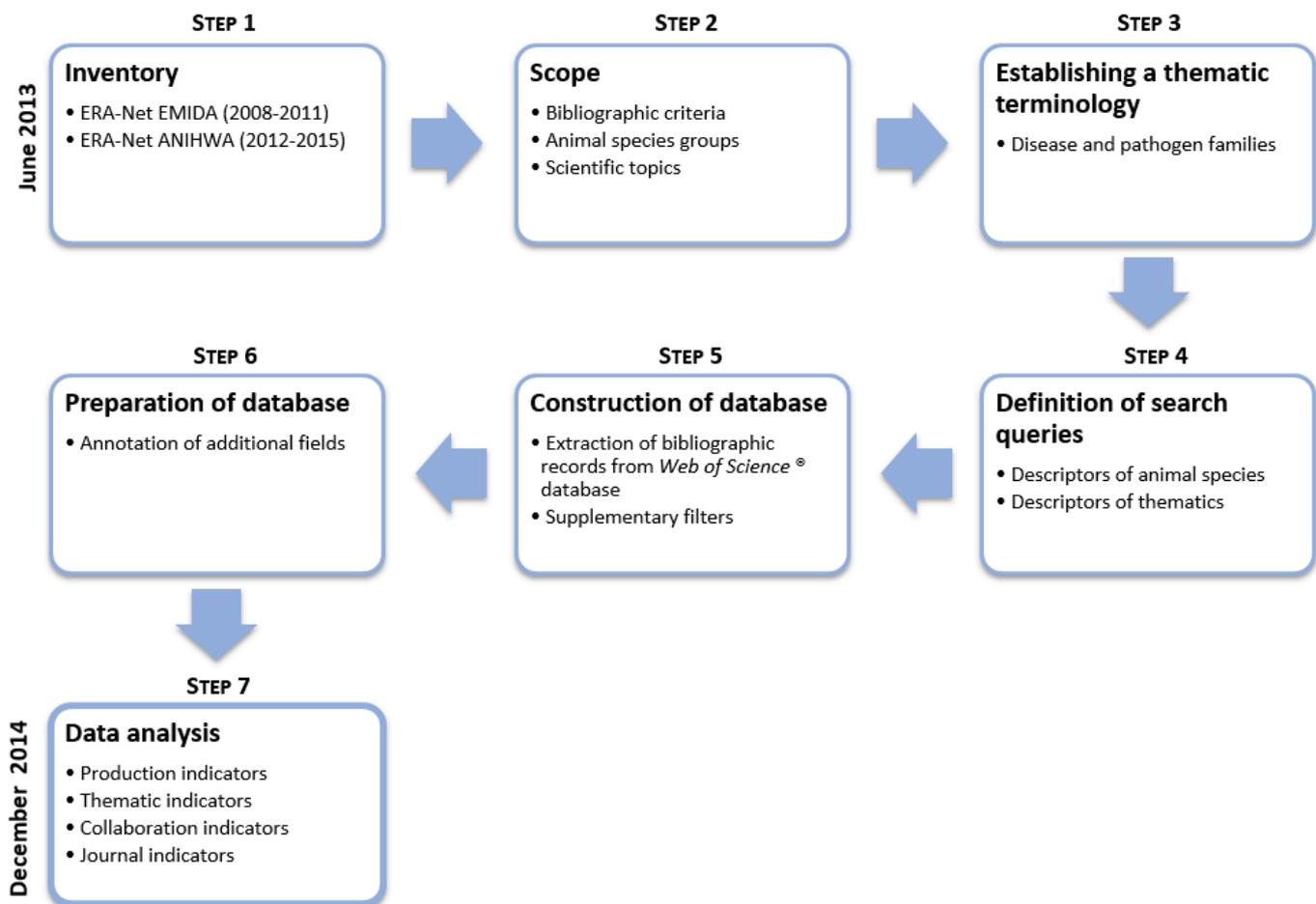
<sup>1</sup> De Rycke J. Star-Idaz database on infectious diseases in farmed animals : analysis of research output in partner countries (2006-2010). 2010, 47 p. Report.

[www.star-idaz.net/wp-content/uploads/2012/04/RAPPORT\\_130411.pdf](http://www.star-idaz.net/wp-content/uploads/2012/04/RAPPORT_130411.pdf)

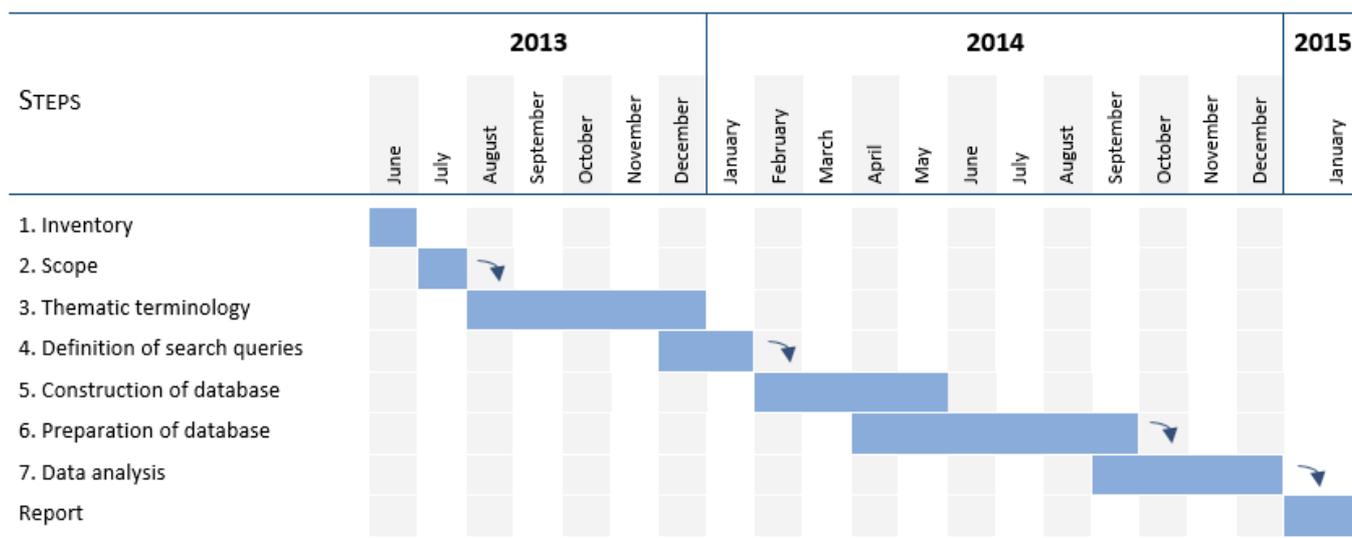
# METHODS - DESIGN OF THE BIBLIOGRAPHIC DATABASE

The design of the bibliographic database involved seven steps. The procedure focussed on developing effective search queries to extract records on the topic of interest from the *Web of Science*<sup>®</sup> and to build and clean the database.

## Overall procedure



## Project schedule (Gantt chart)



Both scientific experts and information specialists were involved throughout the process.

### Step 1 - Inventory: ERA-Net EMIDA and ERA-Net ANIHWA

Two recent European projects addressed questions similar to those of Star-Idaz; however, their scopes and scales were slightly different.



The now completed ERA-Net EMIDA (2008-2011) project focused on the field of emerging and major infectious diseases in livestock.

- DeRycke J. Design of an EMIDA database on European research institutions and their major publication topics. 2009, 14 p. Report. <sup>1</sup>
- DeRycke J. World research landscape mapping European research organisations: a bibliometrical analysis of research output (2004-2008). 2009, 60 p. Report. <sup>2</sup>
- DeRycke J. Bibliometric mapping of research disciplines in the field of infectious diseases of animals. 2010, 72 p. Report. <sup>3</sup>



The ongoing ERA-Net ANIHWA (2012-2015) project is focussing on both animal health (infectious and non-infectious diseases) and animal welfare in production animals.

- Boissy A, Gautret M, Jestin A, Messori S. First report on mapped scientific data information in Animal Health and Animal Welfare. 2014, 113 p. Report. <sup>4</sup>

<sup>1</sup> [www.scar-cwg-ahw.org/wp-content/uploads/2012/01/METHODOLOGY.pdf](http://www.scar-cwg-ahw.org/wp-content/uploads/2012/01/METHODOLOGY.pdf)

<sup>2</sup> [www.scar-cwg-ahw.org/wp-content/uploads/2012/01/Final-WP2-report-090407.pdf](http://www.scar-cwg-ahw.org/wp-content/uploads/2012/01/Final-WP2-report-090407.pdf)

<sup>3</sup> [www.scar-cwg-ahw.org/wp-content/uploads/2011/10/MAPPING\\_DISCIPLINES\\_V2.pdf](http://www.scar-cwg-ahw.org/wp-content/uploads/2011/10/MAPPING_DISCIPLINES_V2.pdf)

<sup>4</sup> [www.anihwa.eu/Work-packages/Work-package-2](http://www.anihwa.eu/Work-packages/Work-package-2)

## Step 2 - Scope

The bibliographic database on animal health has various specific characteristics that were identified to construct the database.

### Bibliographic source



The bibliographic source is the *Web of Science*<sup>®</sup>, available on the *ISI Web of Knowledge*<sup>™</sup> platform produced by *Thomson Reuters*. It is an international reference database covering academic and scientific research worldwide, and includes over 12 000 scientific journals. As journals written in languages other than English are comparatively less represented in the database, only articles available in English were considered in this bibliometric study.

*Web of Science*<sup>®</sup> covers all scientific disciplines, including animal health. Each document is allocated to an area classification named “subject categories”. The addresses of all of the authors of each document are available, which allows countries to be extracted to identify collaborative networks.

### Bibliographic criteria

- Time period: 2006-2013
- Type of document: primary articles and reviews
- Language of document: full text and summary in English

### Animal species groups

To match the scope of the Star-Idaz project, seven animal species groups were defined: Bees, Fishes, Horses, Pigs, Poultry, Rabbits and Ruminants.

### Scientific topics

Four different categories of pathogens were considered : bacteria, viruses, prions and parasites (including protozoa, worms and fungus).

## Step 3 - Establishing a thematic terminology

The previous work done in EMIDA was taken into account to identify the main infectious diseases. Each term was verified and implemented by the scientific experts.

A thematic terminology was established to link each disease with its corresponding source pathogen; this was done for each type of pathogen (bacteria, viruses and parasites). The terminology then was enriched by including the synonyms and different possible spellings of each term. Finally, taxonomic rank was added based on the phylogenetic tree: Domain, Kingdom, Phylum, Class, Order, Family.

The terminology was used to identify families in the corpus.

Description of the terminology:

- 630 diseases
- 600 pathogens classified in 201 families
  - 45 bacteria families
  - 31 virus families
  - 125 parasite families
- 69 vectors

## Step 4 - Definition of search queries

### Generalities

Final queries were built based on the structure of the *Web of Science*<sup>®</sup> database. They were a combination of: i) descriptors of animal species, ii) descriptors of thematic, iii) period of publication, iv) language of document and v) type of document.

TS=(descriptors of animal species)

AND TS=(descriptors of thematic)

AND PY=(2006-2011)

AND LA=(English)

AND DT=(Article OR Review)

The search queries took into account the specificity of the *Web of Science*<sup>®</sup> database, were applied on all fields of a bibliographic record, considered the coding specificity of the country, and considered how to make truncations and use lemmatisation. For each search query, all putative words were tested to discard all terms with multiple meanings. Words were truncated if necessary. Each query was specialised to prepare a first automatic annotation of the corpus with preset fields. It was exposed to a twin control and validated by both the scientific experts and the information specialists.

### Descriptors of animal species

Seven groups were defined with specific terms: male, female, baby animals, wild animals. Finally, a list of 130 descriptors was established:

- Bees: bee; apiformes; Apis...
- Fishes: fish; shellfish; trout; salmon; cyprinus; carassius...
- Horses: horse; donkey; stallion; foal...
- Pigs: pig; piglet; porcine; swine; sow; pork; suid; boar; razorback...
- Poultry: poultry; avian; chicken; duck; goose; broiler; pheasant; psittaciformes...
- Rabbits: rabbit; hare; leveret...
- Ruminants: ruminant; cow; bovine; sheep; goat; buffalo; deer; ewe; lamb; veal...

To be as accurate as possible, both common and Latin forms were used.

## Descriptors of thematics

The challenge was to determine correct terms which did not call up too many publications outside the scope of the study nor overlook too many publications within it. The method applied sought to strike the right balance between noise and silence, which could be obtained by gradually restricting the initially large corpus. Finally, there were approximately 800 descriptors of infectious diseases which were allocated to species and types of infectious diseases.

## Step 5 - Construction of the database

Each selected search query was run on the *Web of Science*<sup>®</sup> database. Selected data were then extracted into an Excel file with all fields to enable the most accurate analysis possible. To refine the accuracy of the extracted database, supplementary filters were applied to address non-specific terms and neighbouring topics. Filters were defined on various fields (title; abstract; author keywords; subject categories; journals) and interplay was applied between inclusive and exclusive filters. Samples were tested several times to assess the accuracy of the database; samples of papers were screened by two experts in the field to verify whether they fell within the scope of the study.

### Design of filters

The overall process was to use a funnel system to strike the right balance between noise (too many references outside the scope) and silence (too few references). The filters used to reduce the initial corpus extracted were defined progressively through a three-stage process. In each stage, the filters were tested on a sample of results to assess their relevance; only those validated were retained for the following stage.

- Stage 1: Lexical search and selection of terms to be used in filters.
  - Extraction of terms actually used in title or abstracts. Words selected must be sufficiently precise and specific to be used in only one area.
  - Search for terms in sub-bases on title, author keywords or abstracts fields.
  - Evaluation of relevance of each term.
- Stage 2: Definition of two approaches of filters to be applied on different fields in the record (title; abstract; author keywords; subject categories; journals).
  - Inclusive filter (keep records).
  - Exclusive filter (delete records).
- Stage 3: Determine how filters are to be combined and prioritized.
  - Definition of rules to apply filters: Interplay is applied between inclusive and exclusive filters.

### First refinement: thematic relevance

Records referring to human health, wild animals, and food were deleted from the database.

### Second refinement: species groups relevance

The identification of animal species in the records was based on the title, the authors' keywords when available, and the abstract. For animal health, some records were captured thanks to the name of the disease identified by OIE.

### Summary of refinement process

Definition of search queries
175 517 records
<b>First refinement: Thematic relevance</b>
» <b>1 inclusive filter</b> 36 subject categories terms.
» <b>5 exclusive filters</b> 34 thematic terms in title, abstract or author keywords. 65 journal titles.
<b>Second refinement: Species groups relevance</b>
» <b>2 inclusive filters</b> 130 species groups terms in title, abstract or author keywords. 108 thematic terms in title, abstract or author keywords.



**Final database**  
62 754 records

### Database accuracy

Samples were extracted to test the accuracy of the final database.

In April 2014, 175 517 records in animal health were extracted from the *Web of Science*<sup>®</sup> database. After filters were combined, prioritized, and applied, the final database on animal health contained 62 754 bibliographic references, or 36% of the initial total.

## Step 6 - Preparation of the database

Before a specific analysis could be carried out, additional fields were required. This step determined the relevance of the mapping analysis.

### Annotation of species groups

Each record was annotated with one or more species groups. Previously identified descriptors were used. The annotation process was as follows: if one descriptor of species was identified in the title, the species group was annotated. If the descriptor was not identified in the title, the process looked in authors keywords and then in abstracts. This process was defined to limit multi-species groups as far as possible.

### Annotation of additional fields

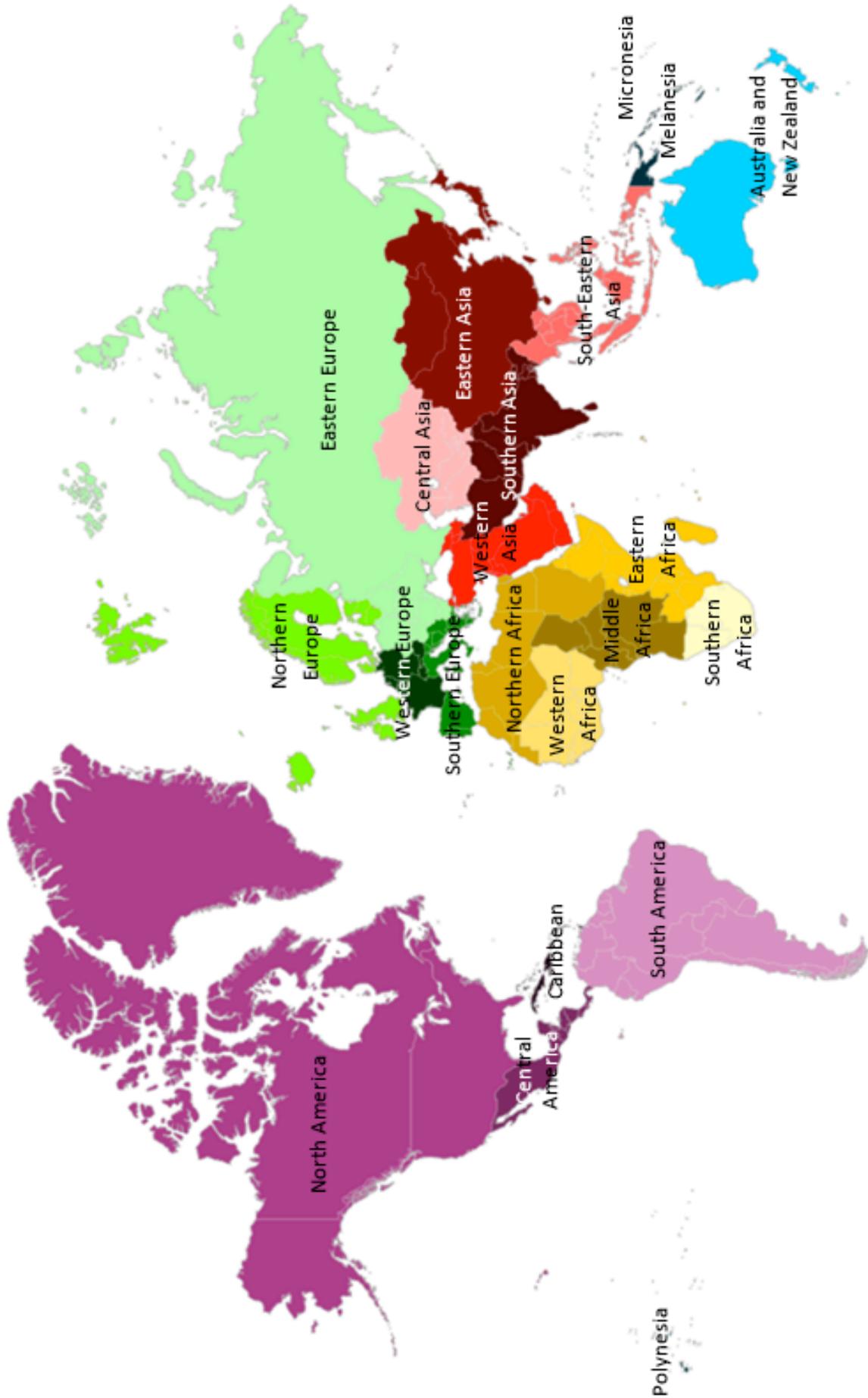
Since each query was a specific topic, automatic annotation was possible on additional fields for the animal health corpus. Some rules were defined to refine the annotation. On the Excel spreadsheet, the variables that qualified each record were the following:

- Bacteria / Parasites / Prions / Viruses

### Annotation of geographical regions

Continents and macro geographical regions were determined based on the definition established by the United Nations Statistics Division; the list is available at the following web address: <http://unstats.un.org/unsd/methods/m49/m49regin.htm>

Five continents and 22 different geographical regions were identified and used in the analysis.



## Annotation quality

Samples were extracted to test the quality of the annotation.

## Step 7 - Data analysis

### Definition of variables

- Multi-pathogens: pathogens of different families are referred to in the article
- Other bacteria: unassigned in families
- Other parasites: unassigned in families
- Other viruses: unassigned in families
- Miscellaneous helminths: taxonomy families not specified in the article
- Miscellaneous ectoparasites: taxonomy families not specified in the article
- Multispecies: several species of farm animals are referred to in the article
- National partnership: all authors are from the same country
- Intra continental partnership: all authors are from the same continent but from different countries
- Inter continental partnership: authors are from at least two different continents

### Period surveyed

The analysis was performed on the period 2006-2013.

### Counting method

The study used an integer count to measure the contribution of partners to a research activity. According to this method, each contributing partner (or co-author of a paper) is credited with a '1'. To affiliate an article with a continent, at least one author has to be from the continent. One point is then credited to that continent. If an article has multiple authors from different continents, the article is affiliated with each of those continents, with one point credited to each continent involved. The same article thus can be counted multiple times. The count consequently cannot be consolidated at all levels. However, as co-publishing indicates that a relationship has been established between different partners, it is an indicator that can be interpreted intuitively.

### Definition of the bibliometric indicators used

Bibliometrics refers to a statistical procedure used to describe or quantify according to defined aims. Quantification allowed us to demonstrate trends and highlight relationships which were previously difficult to grasp among the mass of data.

Data processing was rigorous to ensure the reliability and validity of results; due to a low number of publications, some results were not calculated. They are noted as "ns" (non-significant) in the tables. The threshold chosen was 400 publications for the period 2006-2013.

The growth rate and the average annual growth rate were calculated to highlight increases and decreases in the temporal evolution of the number of publications. Growth rate (GR) shows the evolution between the first and last year of the period; average annual growth rate (AAGR) is the arithmetic mean of the growth rate during a period and takes into account the evolution of each year of the period.

$$\text{Growth rate: } GR_{t,t+n} = \left( \frac{x_{t+n} - x_t}{x_t} \right) \times 100$$

$$\text{Average annual growth rate: } AAGR_{t,t+n} = \left( \sqrt[n]{\frac{x_{t+n}}{x_t}} - 1 \right) \times 100$$

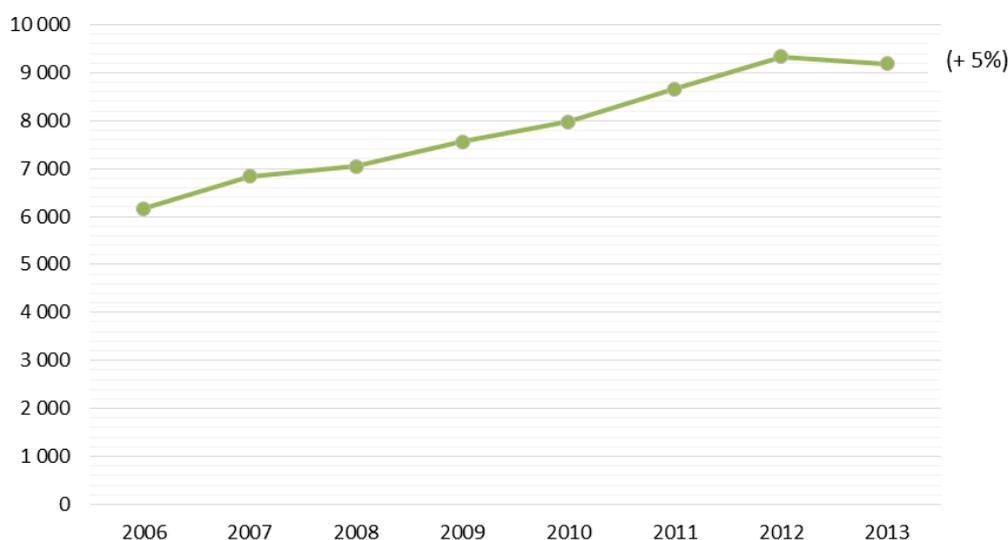
where  $x$  is the number of publications ;  $n$  is the number of years ;  $(t, t + n)$  is the period.

# RESULTS - BIBLIOMETRIC ANALYSIS

The results of the bibliometric analysis are presented in four sections: production volume and temporal trend; research themes (animal species, pathogen groups, families of pathogens); collaboration networks; journals used for publication. The detailed numbers are presented in tables in the annexes.

## Volume of articles published on infectious animal diseases

### At the world level



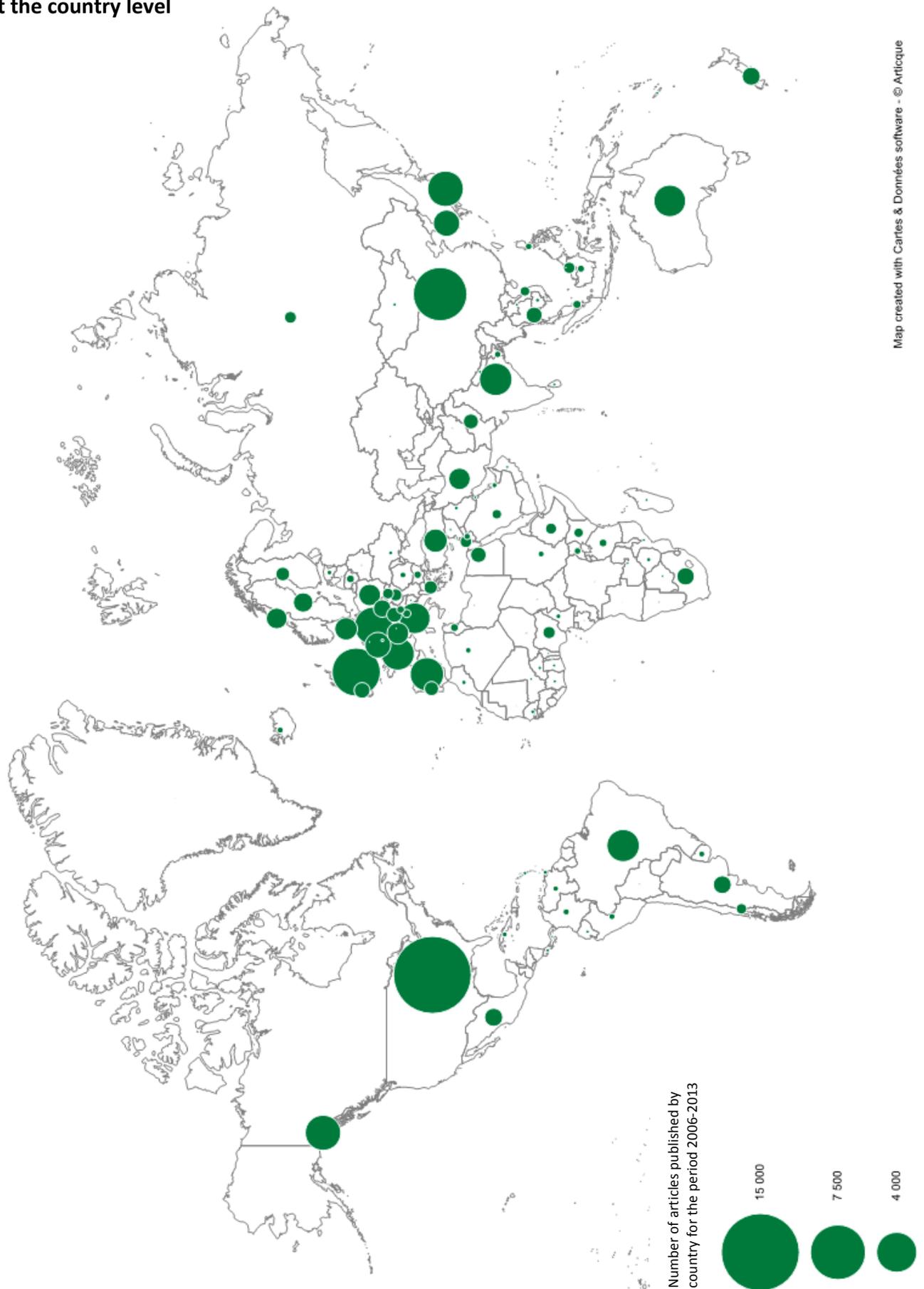
**Figure 1:** Evolution of the number of publications for the period 2006-2013 (*in brackets, average annual growth rate, for the period 2006-2013*).

The number of papers published per year on infectious diseases in production animals has increased regularly and is currently approximately 10 000 papers per year. The slight drop in the curve observed in 2013 is probably an artifact due to the fact that all papers published in 2013 were not yet incorporated in the *Web of Science*<sup>®</sup> when the database was created in the middle of 2014.

The average annual growth rate of the number of papers on infectious diseases in production animals is 5%. It is comparable to the average annual increase for all of the scientific production included in the *Web of Science*<sup>®</sup>, including all sciences.

This figure is important to keep in mind when analyzing the scientific production in different thematic fields. As preliminary example, the average annual growth rate of scientific production for bacteria is 4%, which means that research in this field is increasing at a rate lower than the overall trend (5%).

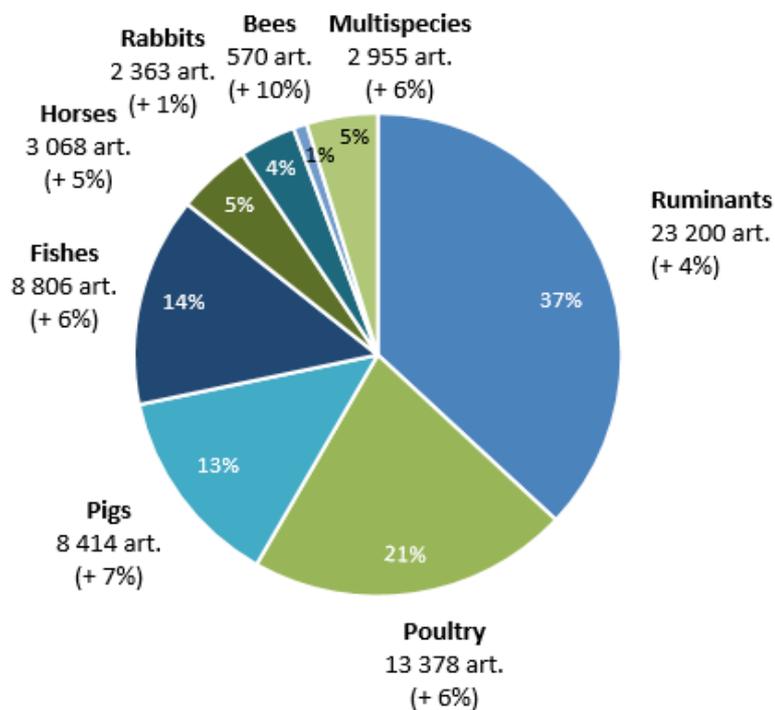
## At the country level



**Figure 2:** Number of articles published by country for the period 2006-2013.

## Thematic approach: animal species and pathogens

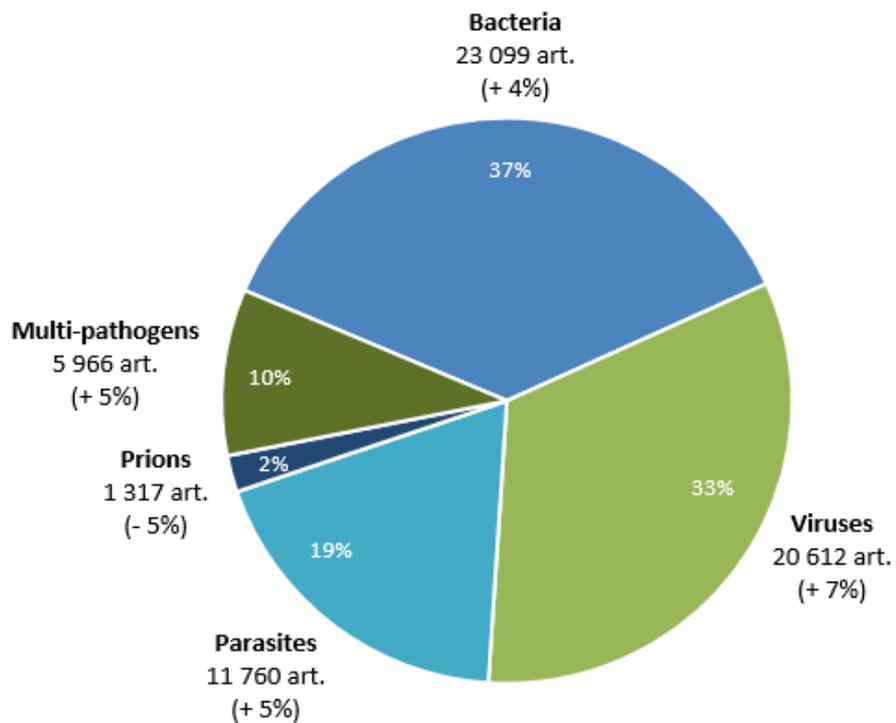
### By animal species group



**Figure 3:** Distribution of the number of articles by each animal species group for the period 2006-2013 (*inner edge of the diagram, share of articles; in brackets, significant average annual growth rate, for the period 2006-2013*).

One third (37%) of the total number of articles are dedicated to ruminant diseases, representing a total of 23 200 articles. Poultry, pigs and fishes represent respectively 21%, 13% and 14% of the total number of articles. Articles dedicated to horse and rabbit diseases represent respectively 5% and 4%. Bees represent a minor group (1%), but the average annual growth rate is the highest (10%), compared to 5-7% for horses, fishes, pigs and poultry. The average annual growth rate is 4% for ruminants and 1% for rabbits.

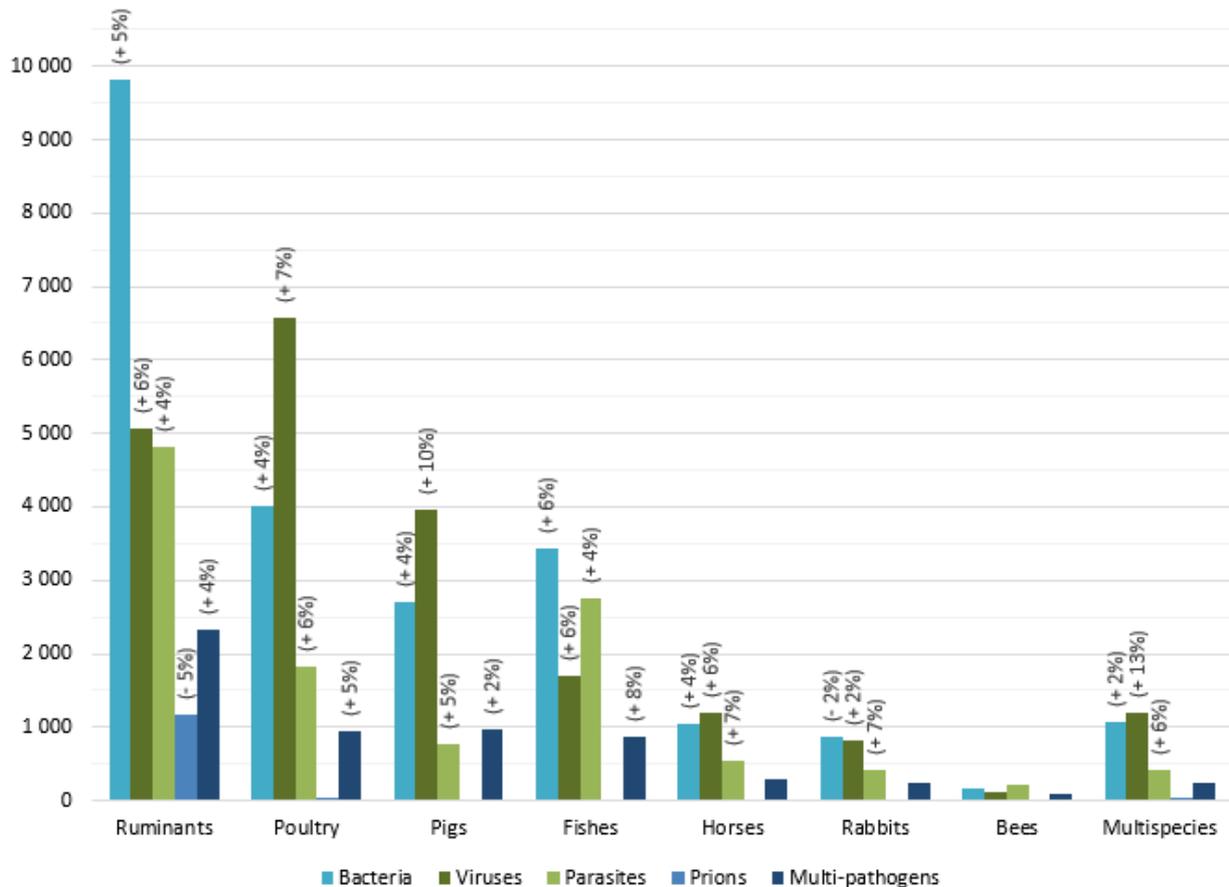
## By pathogen group



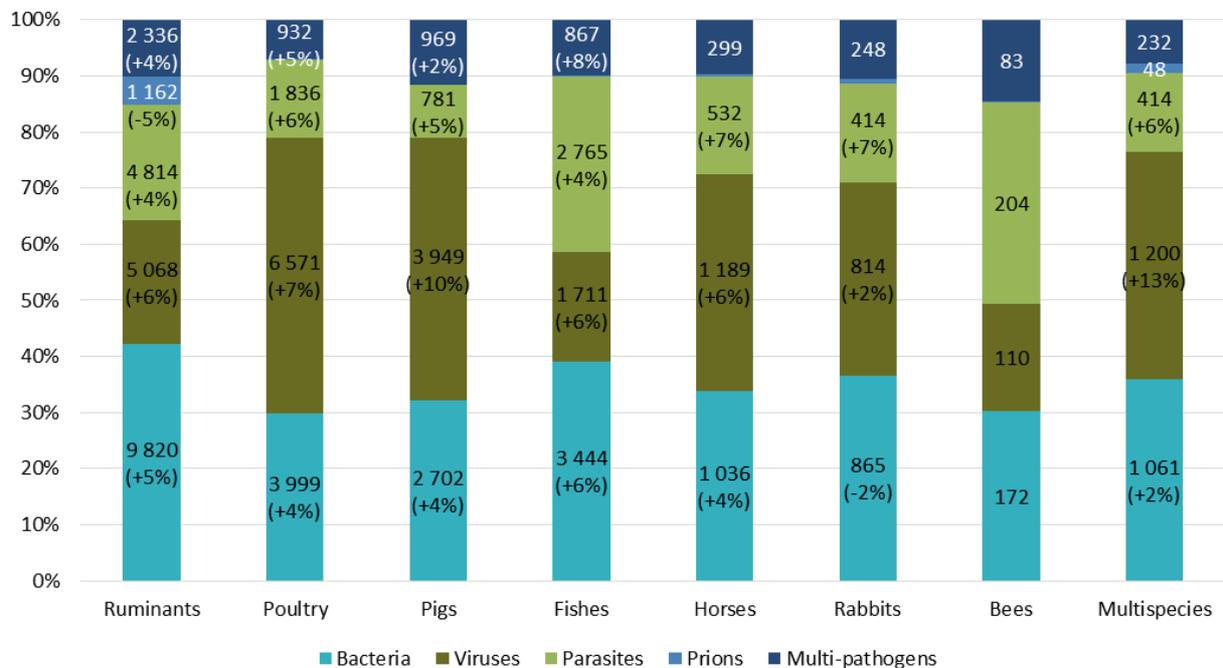
**Figure 4:** Distribution of the number of articles by each pathogen group for the period 2006-2013 (*inner edge of the diagram, share of articles; in brackets, significant average annual growth rate, for the period 2006-2013*).

Articles on bacteria, viruses and parasites represent respectively 37%, 33% and 19% of the total number of articles for the period of 2006-2013, corresponding respectively to 23 099, 20 612 and 11 760 articles. Articles dedicated to prions represent 2% of the global production, with 1 317 articles, and the average annual growth rate is decreasing (-5%).

## By animal species group and pathogen group



**Figure 5:** Distribution of the number of articles by pathogen and animal species group for the period 2006-2013 (in brackets, significant average annual growth rate, for the period 2006-2013).



**Figure 6:** Distribution of the number of articles by pathogen and animal species group for the period 2006-2013 (figures, number of articles; in brackets, significant average annual growth rate, for the period 2006-2013).

Ruminants (23 200): 42% of articles related to ruminant diseases deal with bacteria, and 21-22% with viruses and parasites. Average annual growth rates are equal (4-6%).

Poultry (13 378): In contrast with ruminants, 49% of articles related to poultry diseases deal with viruses, 30% with bacteria, and 14% with parasites. Like ruminants, the average annual growth rates are equal (4-7%).

Pigs (8 414): Pigs present the same figures as poultry; 47% of articles related to pig diseases deal with viruses, 32% with bacteria, and 9% with parasites. The average annual growth rates are not equal mainly due to the fact that the number of articles dedicated to pig viruses is increasing sharply (10%), whereas for bacteria and parasites the rates are respectively 4% and 5%.

Fishes (8 806): The situation is different for fishes. Bacteria and parasites are major groups, representing respectively 39% and 31%. Articles dedicated to fish viruses represent 19% of the total number. Average annual growth rates are equivalent (4-6%).

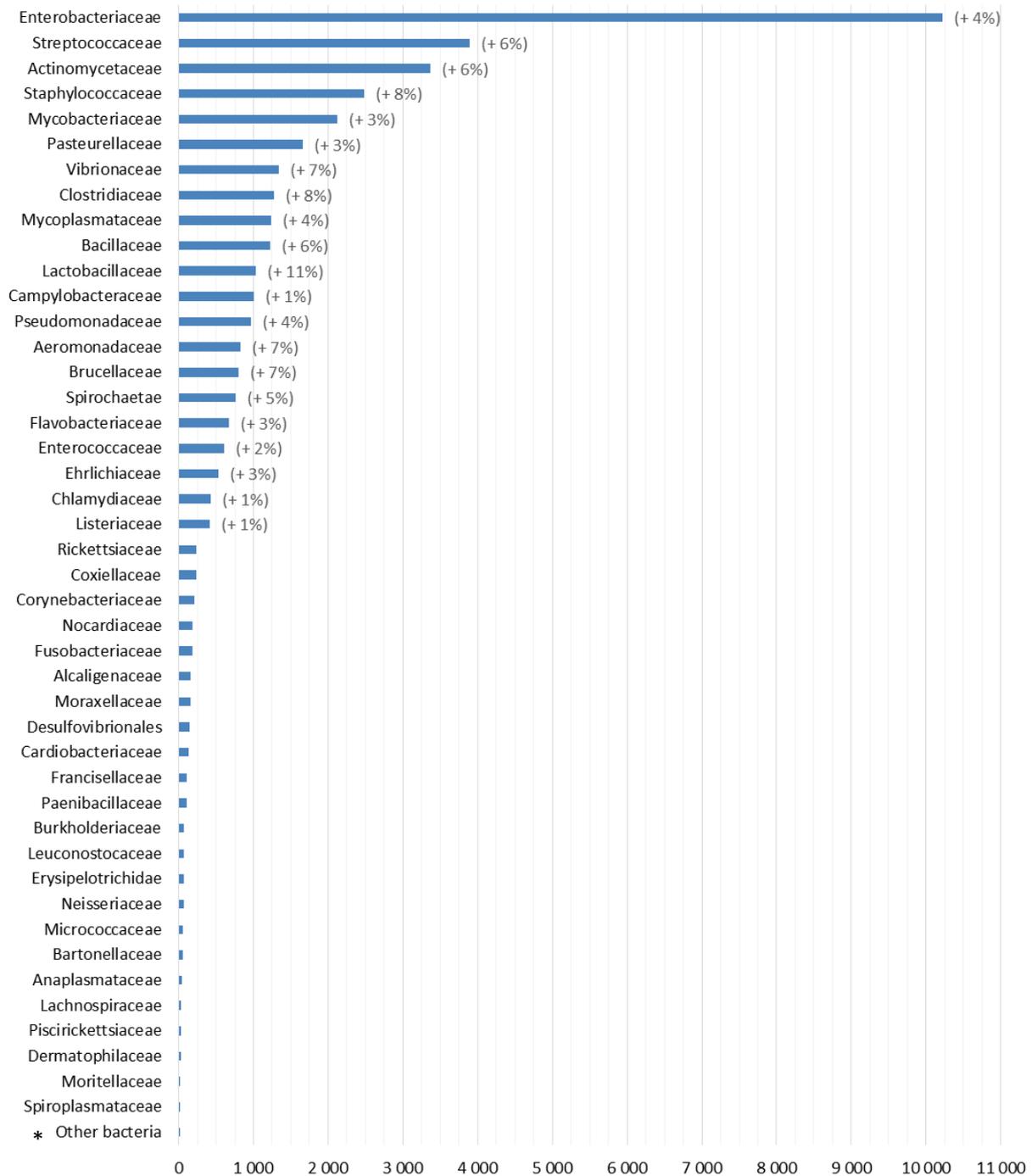
Horses (3 068): Horses have a different profile. Articles dealing with viruses and bacteria represent respectively 39% and 34%. Articles dedicated to horse parasites represent 17%. Average annual growth rates are equivalent (4-7%).

Rabbits (2 363): The profile for rabbits is similar to horses. Articles dealing with viruses and bacteria represent respectively 34% and 37%. Articles dedicated to rabbit parasites represent 18%. Average annual growth rate are decreasing for bacteria (-2%) and increasing for viruses (2%) and parasites (7%).

Bees (570) : For bees, the average annual growth rate is high (average 10%) and articles dealing with parasites and bacteria represent respectively 36% and 30%, articles dedicated to bee viruses represent 19%.

## By family of pathogen

- Bacteria**



\* Unassigned in families

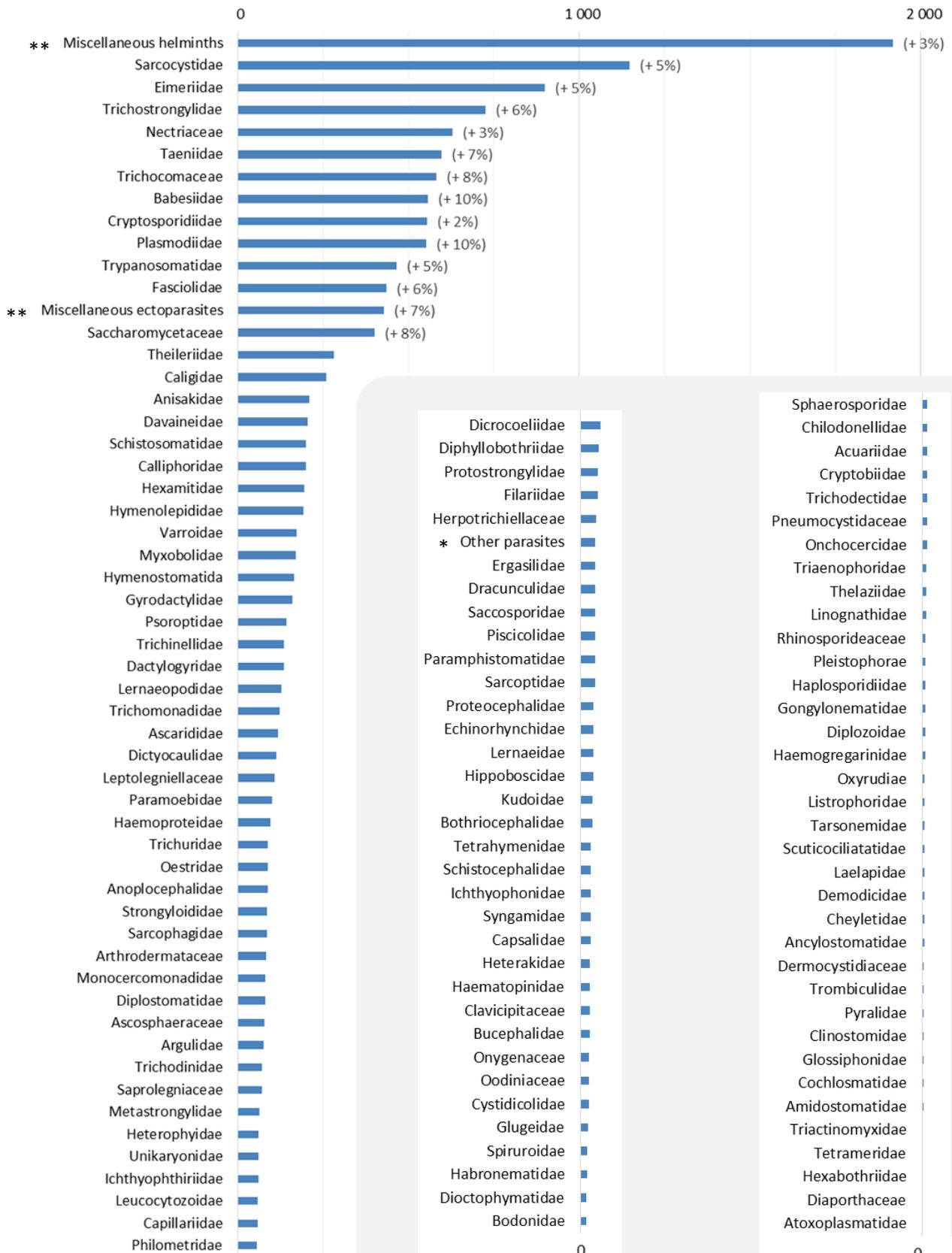
**Figure 7:** Distribution of the number of articles by each family of bacteria for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*).

Enterobacteriaceae is the family that received the most coverage during the study period with 10 217 publications, representing 36% of the total amount. Streptococcaeae and Actinomyssetaceae families came in second, representing respectively 14% and 12% of publications, followed by a third group which includes the Staphylococcaceae, Mycobacteriaceae and Pasteurellaceae families.

During this 8 year period, the trend was dominated by an 8% average annual growth rate of publications related to the Staphylococcaceae family, and a 7% average annual growth rate related to the Brucellaceae family. Surprisingly, Mycobacteriaceae and Campylobacteraceae families continue to be areas of interest for scientific communities, but to a lesser extent as the average annual growth rates were respectively 3% and 1%, which are lower than the average (5%).

The Lactobacillaceae family is studied extensively and its high average annual growth rate is related to publications dedicated to probiotics.

• Parasites



\* Unassigned in families

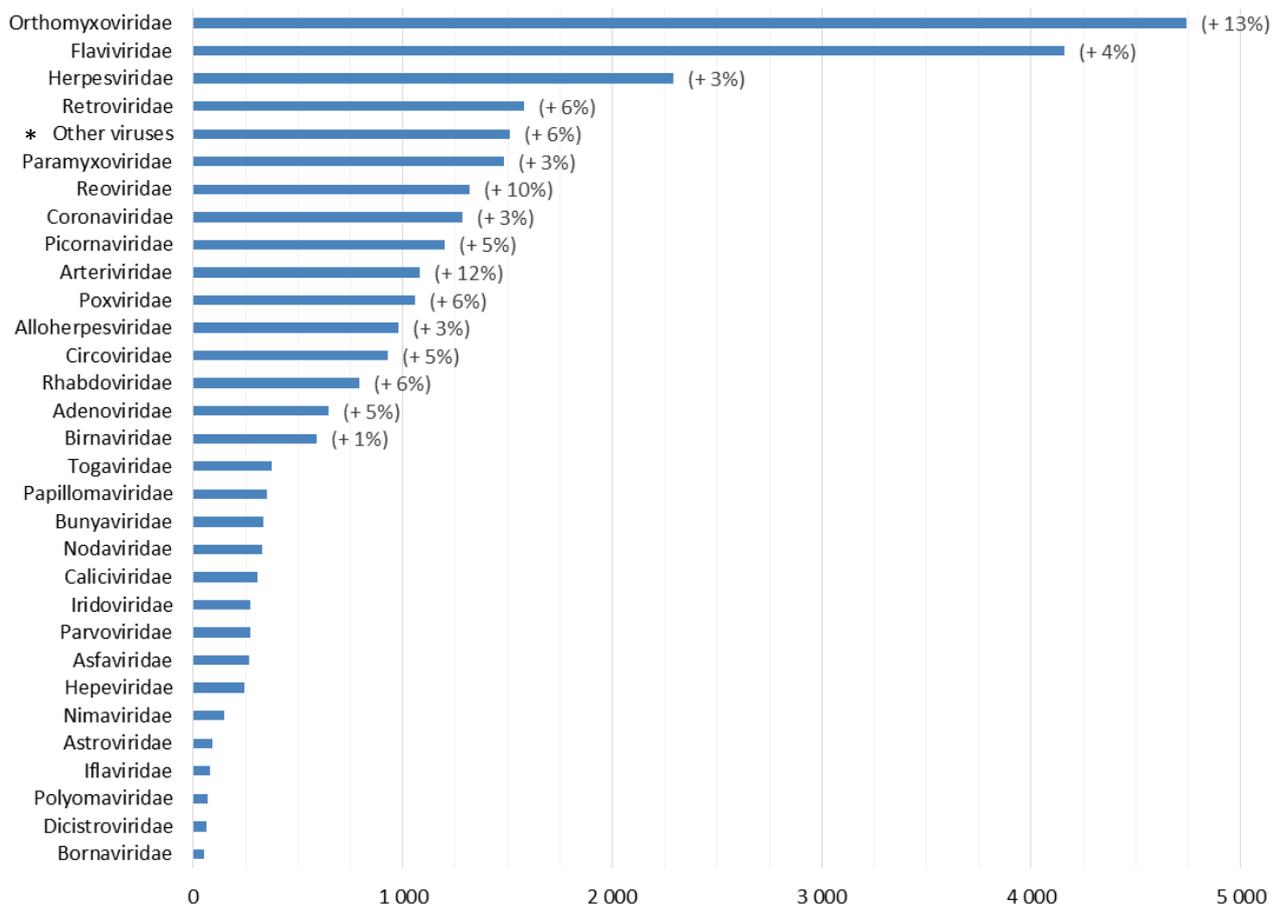
\*\* Taxonomy families not specified in article

**Figure 8:** Distribution of the number of articles by each family of parasites for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*).

Parasite families are not specified in several articles related to parasites. Instead, they are merged into a special group, the miscellaneous helminthes, which were covered in 1 919 articles, or 14% of the total. The second most represented group consists of the Sarcocystidae, Eimeriidae and Trichostrongylidae families, representing respectively 8%, 6% and 5% of the total number of articles.

During this 8 year period, the trend was dominated by a high average annual growth rate for Babesiidae (10%), Plasmodidae (10%) and Taeniidae (7%). In contrast, a low average annual growth rate was identified for the Cryptosporidiidae family (2%).

- Viruses



\* Unassigned in families

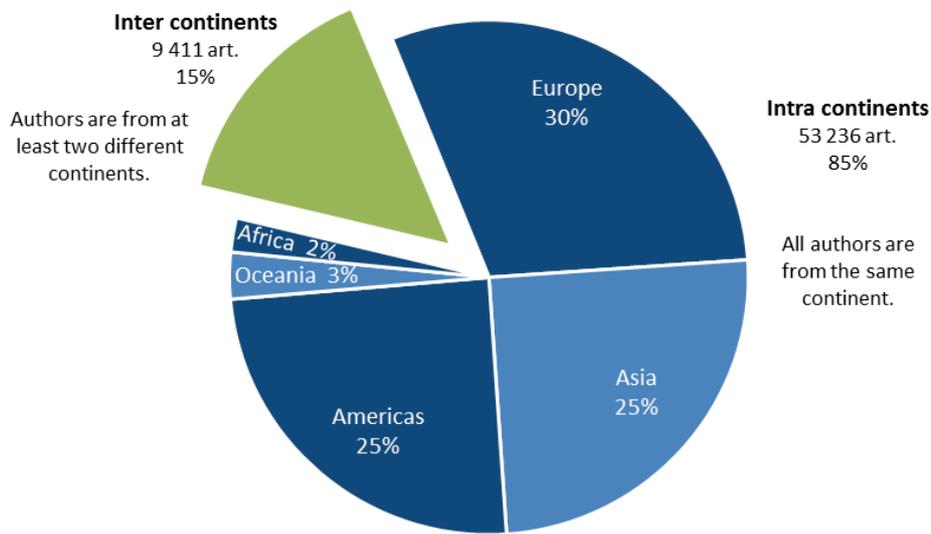
**Figure 9:** Distribution of the number of articles by each family of viruses for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*).

The Orthomyxoviridae and Flaviviridae families were a major focus over the entire 2006-2013 period. More than 4 000 articles were published on each of these two families, representing respectively 19% and 16% of the total number of publications on viruses. The Herpesviridae, Retroviridae, Paramyxoviridae families form a second group, representing respectively 9%, 6% and 6% of the publications on viruses. A third group includes the Reoviridae, Coronaviridae and Picornaviridae families.

During 8 year study period, the trend was dominated by a high average annual growth rate for the Orthomyxoviridae (13%), Arteriviridae (12%) and Reoviridae (10%) families. In contrast, a low average annual growth rate was identified for three viral families: Herpesviridae (3%), Paramyxoviridae (3%) and Birnaviridae (1%).

## Collaboration networks

### By continent



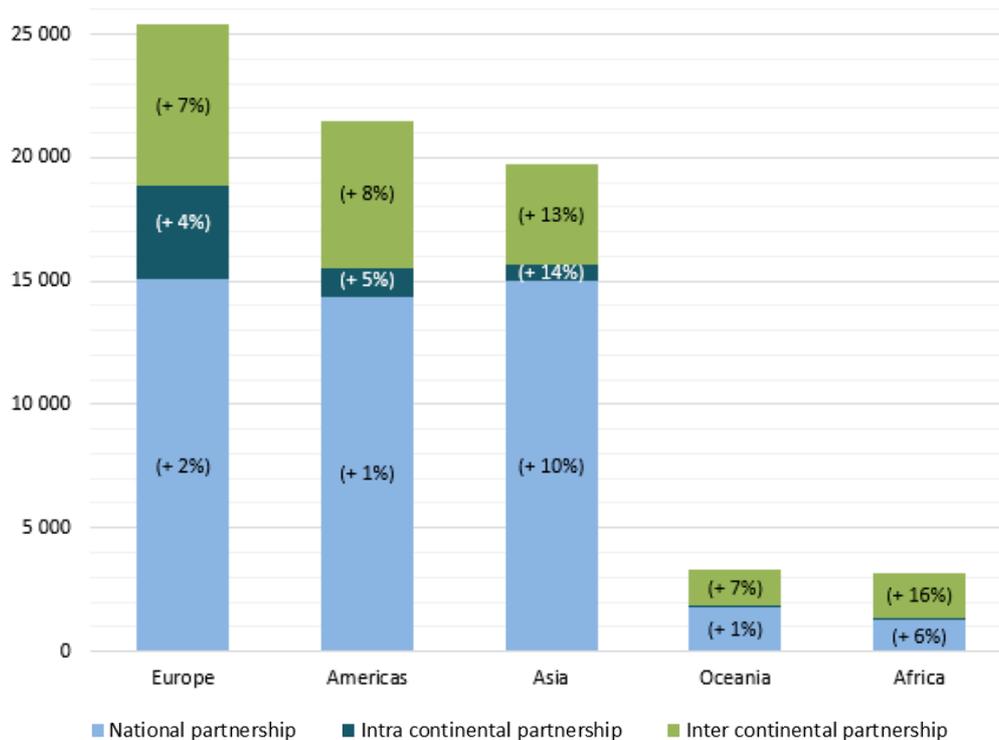
**Figure 10:** Distribution of the number of articles by author's home continent for the period 2006-2013 (*inner edge of the diagram, share of articles*). Continents are defined by the United Nations.

A total of 62 754 articles were published around the world between 2006 and 2013 on infectious diseases in production animals. These articles are divided into two categories based on authorship: intra-continent and inter-continent. For 53 236 articles (85%), the co-authors were from the same continent, and for 9 411 articles (15%), the co-authors were from at least two different continents.

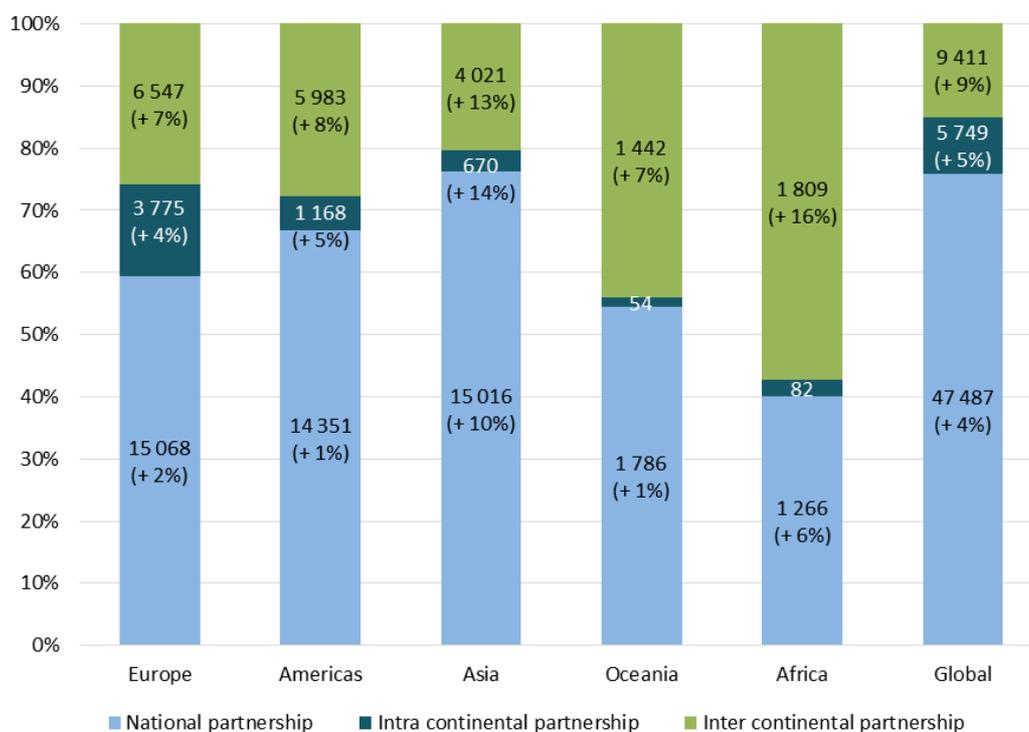
Two groups emerge out of the intra-continent category. In the first group, Europe, the Americas and Asia produced 18 843, 15 519 and 15 686 articles, representing respectively 30%, 25% and 25% of the total. In the second group, Oceania and Africa produced 1 840 and 1 348 articles, representing respectively 3% and 2%.

The average annual growth rates are respectively 10% and 7% for Asia and Africa. The rates for Europe and the Americas are lower at respectively 3% and 2%. This means that during the 8 year study period, Asia had a growth rate of 122%, indicating that the continent will take a leading role in the near future.

The average annual growth rate for articles whose authors were from at least two different continents was 9%. This means that during the study period, the growth rate in the number of articles produced by scientists working in collaboration between continents was 101%, predicting an inter-continental co-production of articles equivalent to the global production of Europe in coming years.

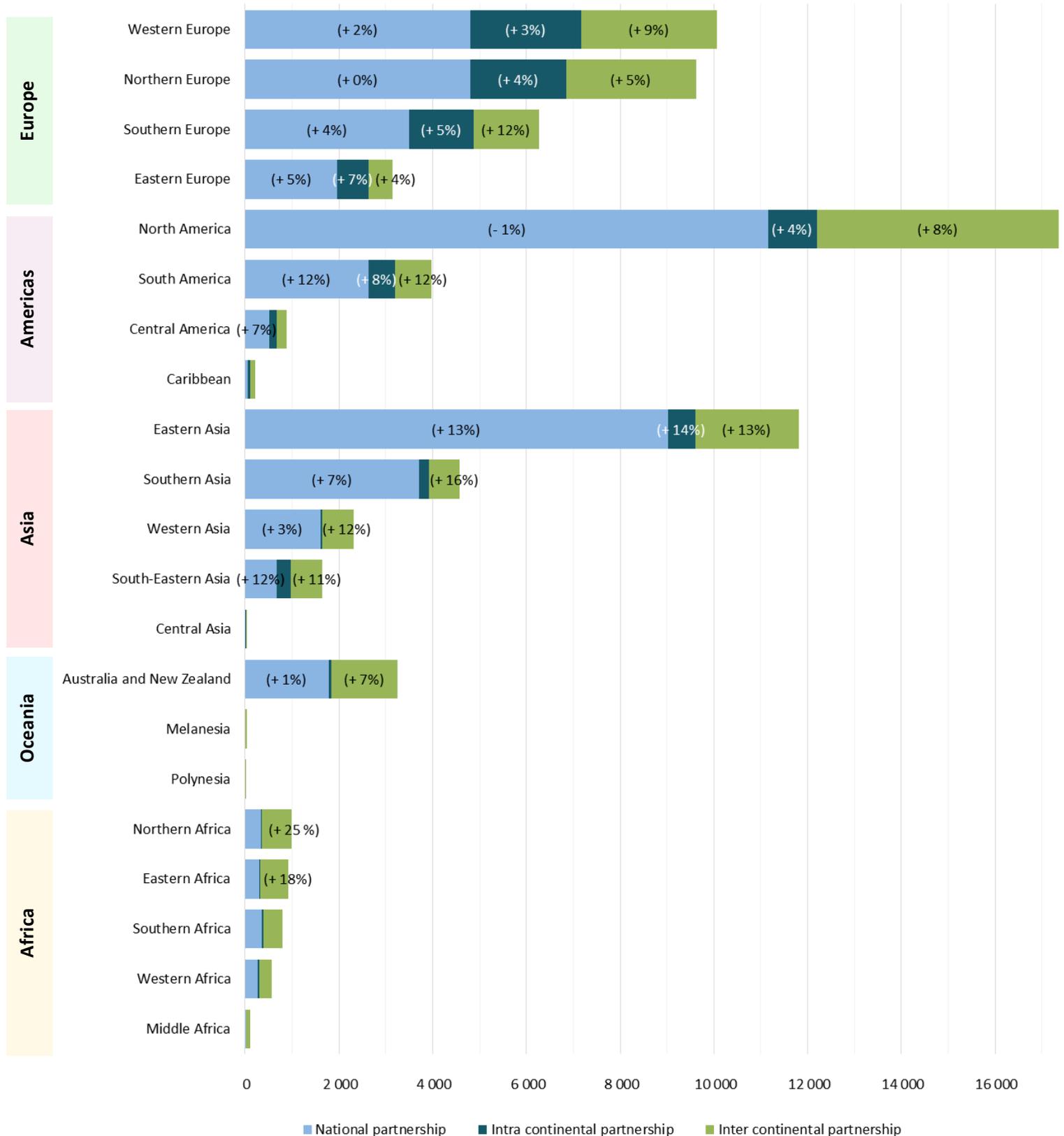


**Figure 11:** Distribution of authorship for each continent for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

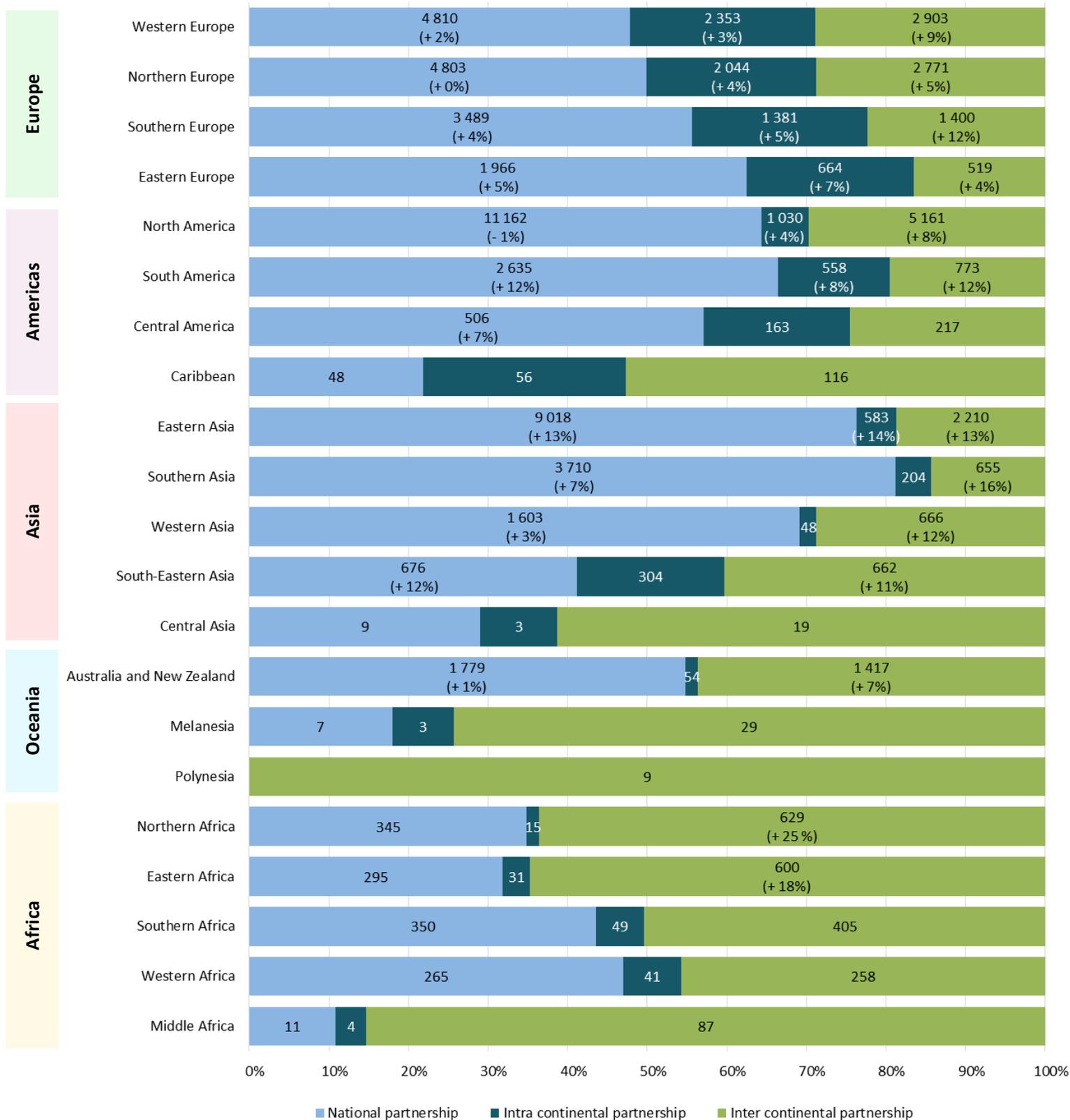


**Figure 12:** Distribution of authorship for each continent for the period 2006-2013 (*figures, number of articles and in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

## By geographical region

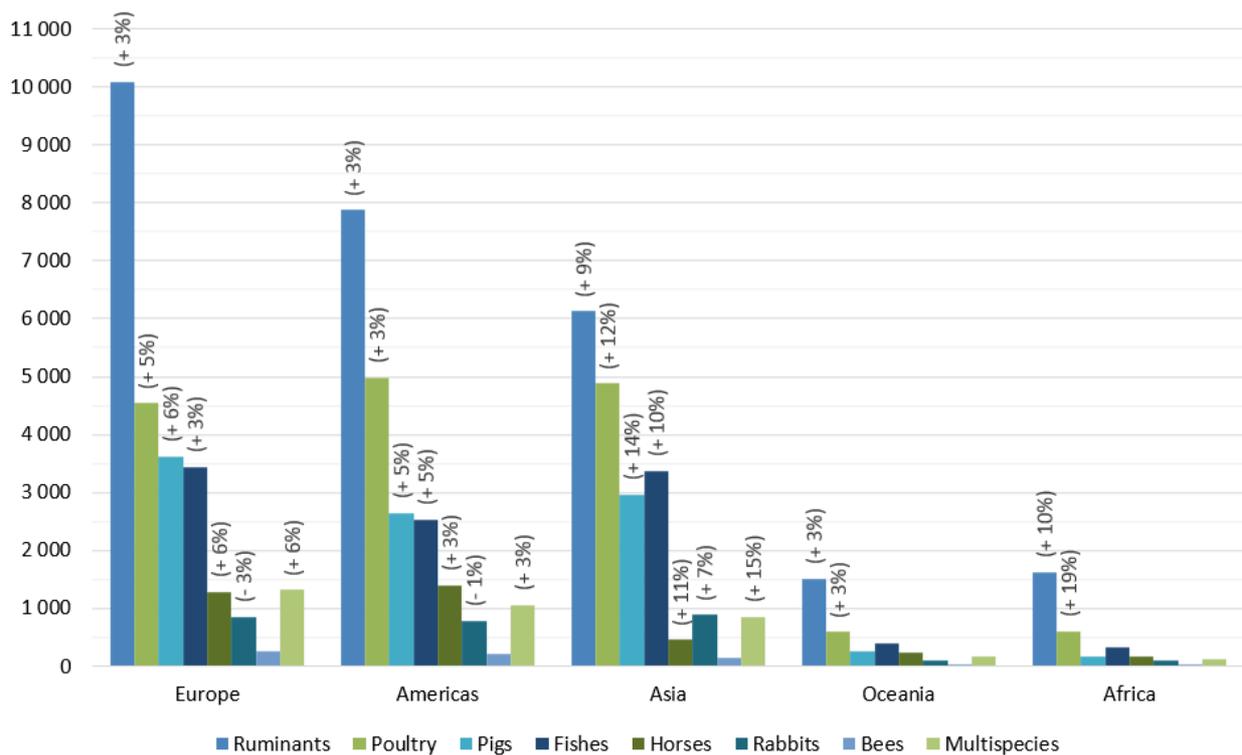


**Figure 13:** Distribution of authorship for each geographical region for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

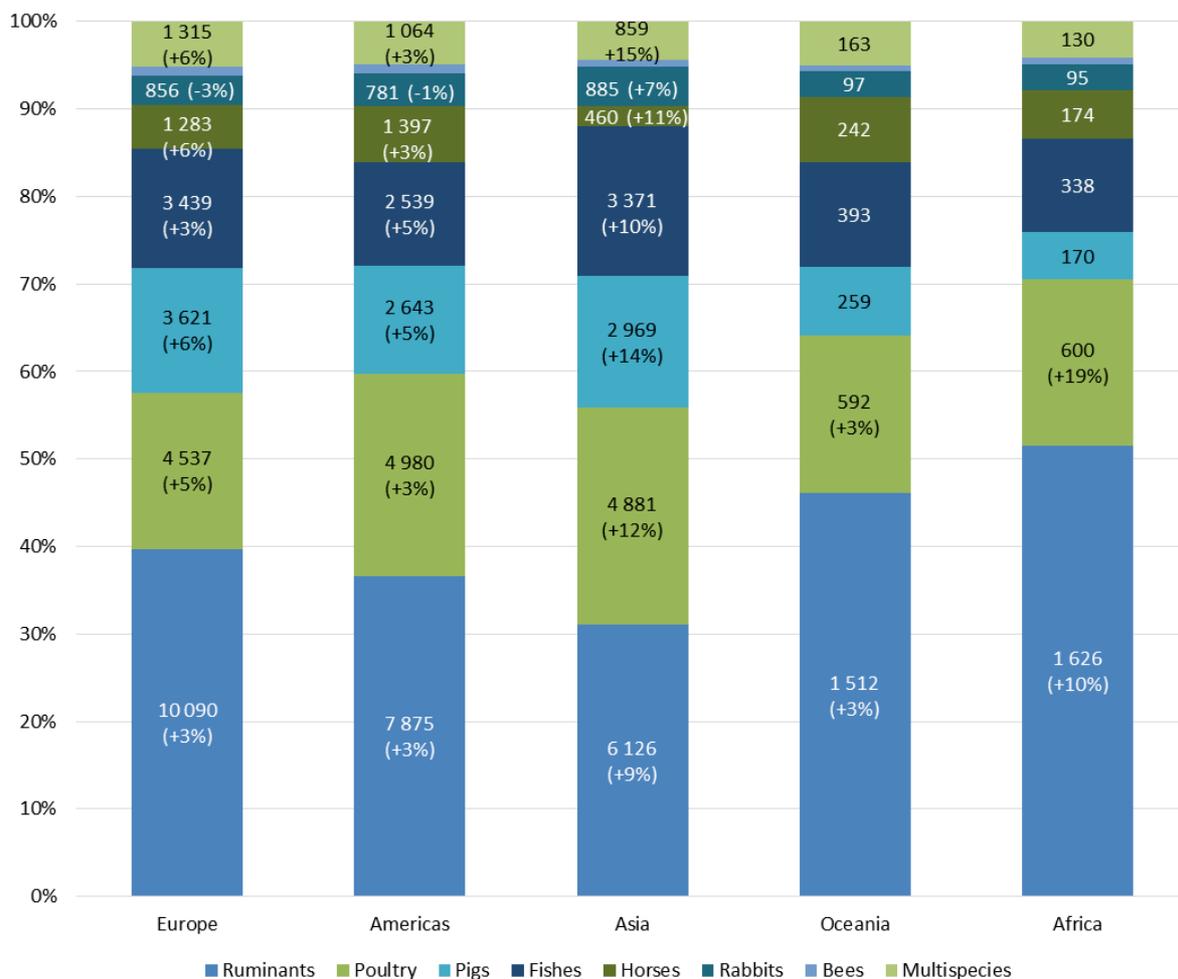


**Figure 14:** Distribution of authorship for each geographical region for the period 2006-2013 (*figures, number of articles and in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

## By animal species group and continent



**Figure 15:** Distribution of the number of articles by animal species group and continent for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.



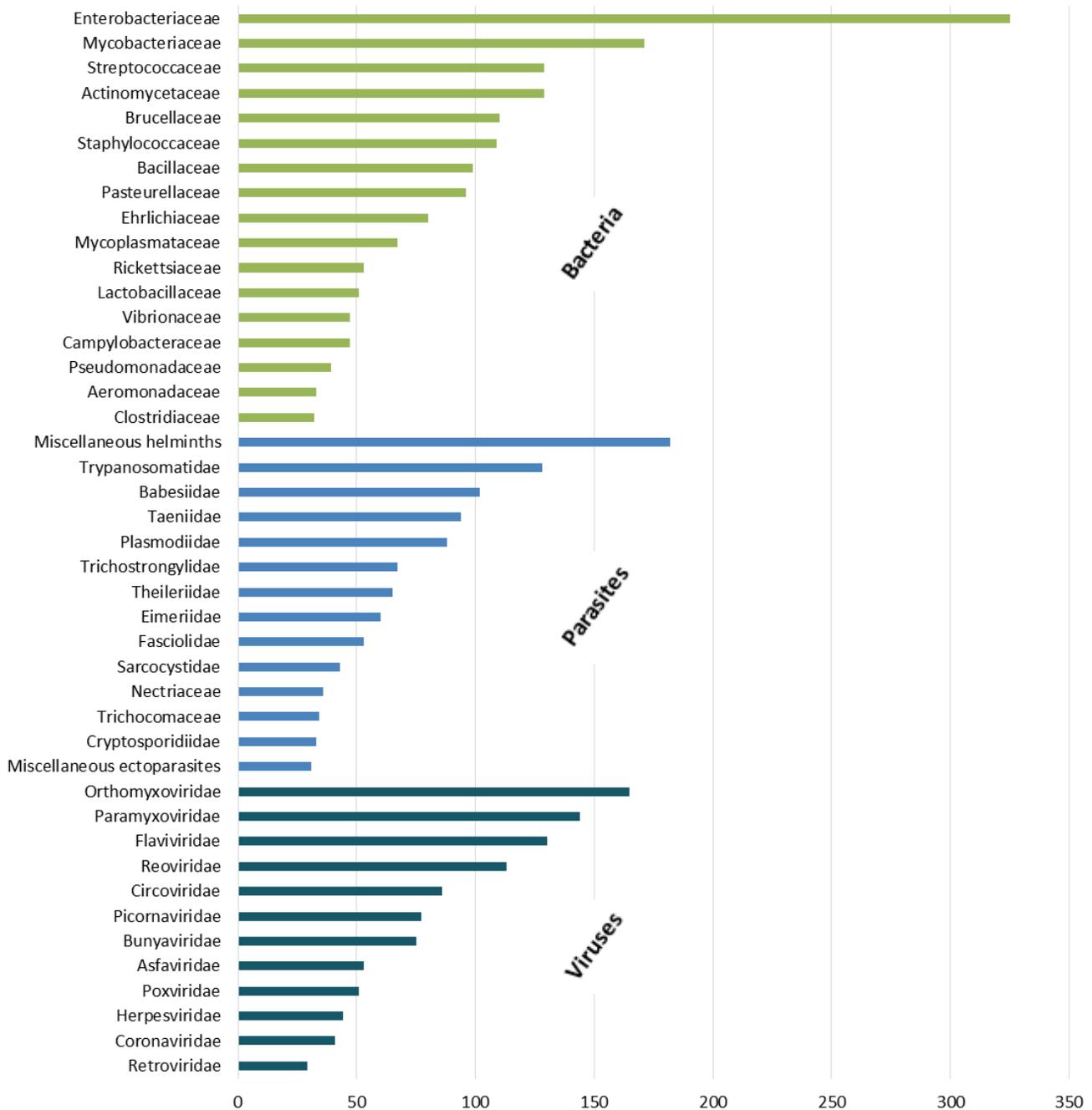
**Figure 16:** Distribution of the number of articles by animal species group and continent for the period 2006-2013 (figures, number of articles and in brackets, significant average annual growth rate, for the period 2006-2013). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

For all of the continents, published articles dedicated to ruminant diseases represent the major group, followed by poultry, pigs, and fishes with the exception of Asia, where the number of articles dedicated to fishes are higher than those dedicated to pigs.

Average annual growth rates are similar in Europe and the Americas, respectively 4% and 3%. Average annual growth rates are higher in Asia for pigs (14%), poultry (12%), horses (11%), fishes (10%) and ruminants (9%).

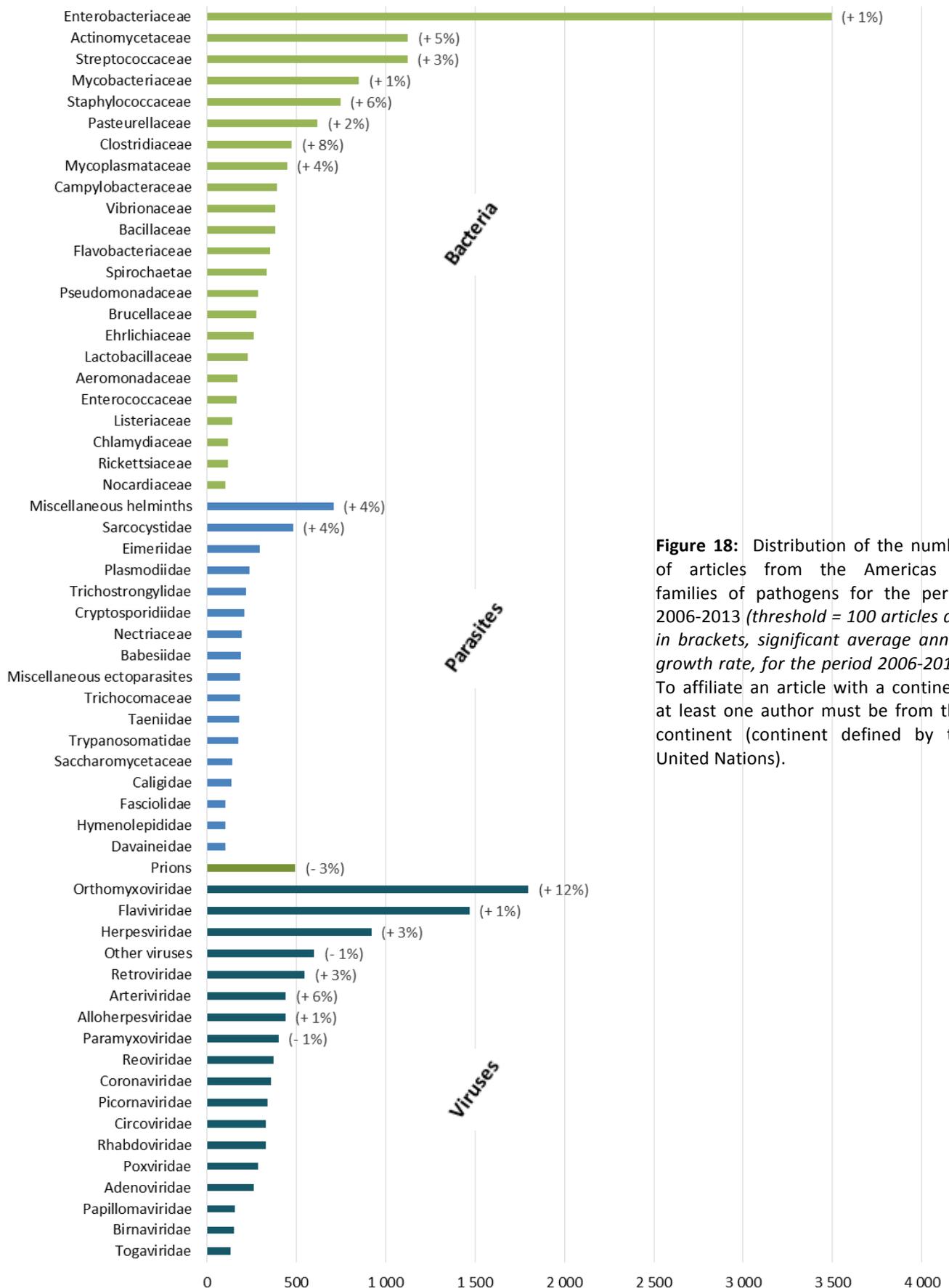
## By families of pathogens and continent

- Africa



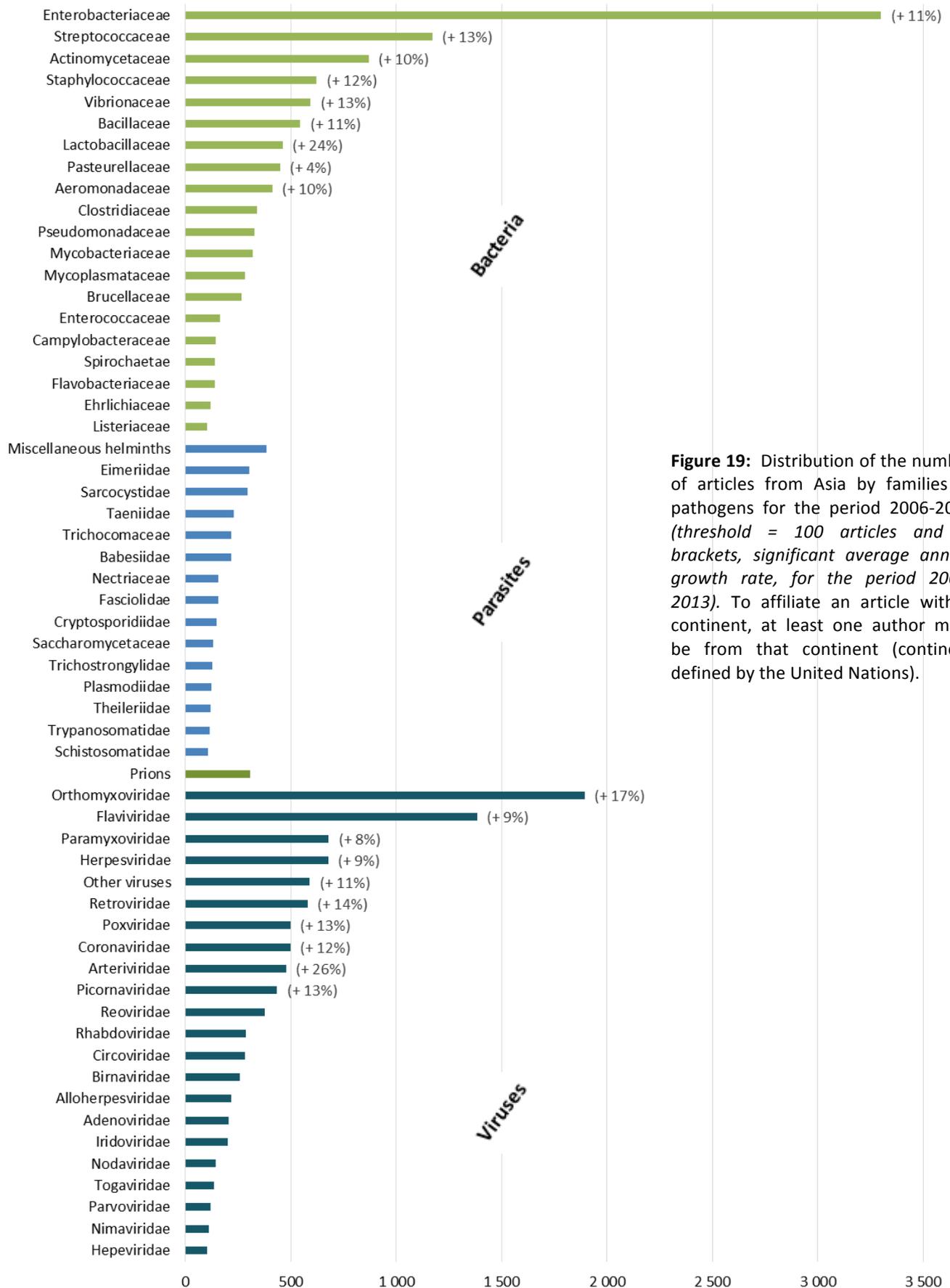
**Figure 17:** Distribution of the number of articles from Africa by families of pathogens for the period 2006-2013 (threshold = 25 articles and in brackets, significant average annual growth rate, for the period 2006-2013). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations).

• Americas



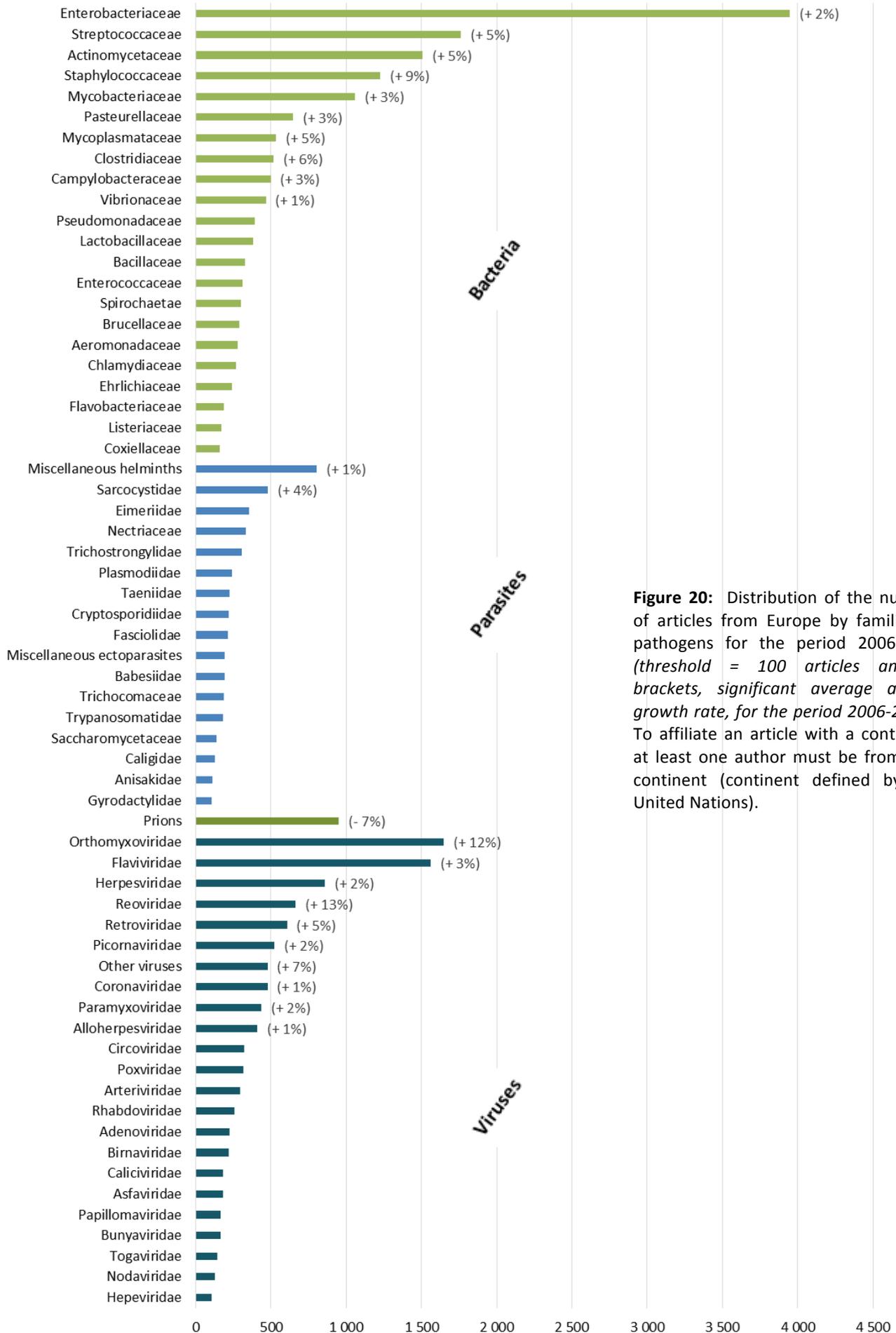
**Figure 18:** Distribution of the number of articles from the Americas by families of pathogens for the period 2006-2013 (*threshold = 100 articles and in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations).

• Asia



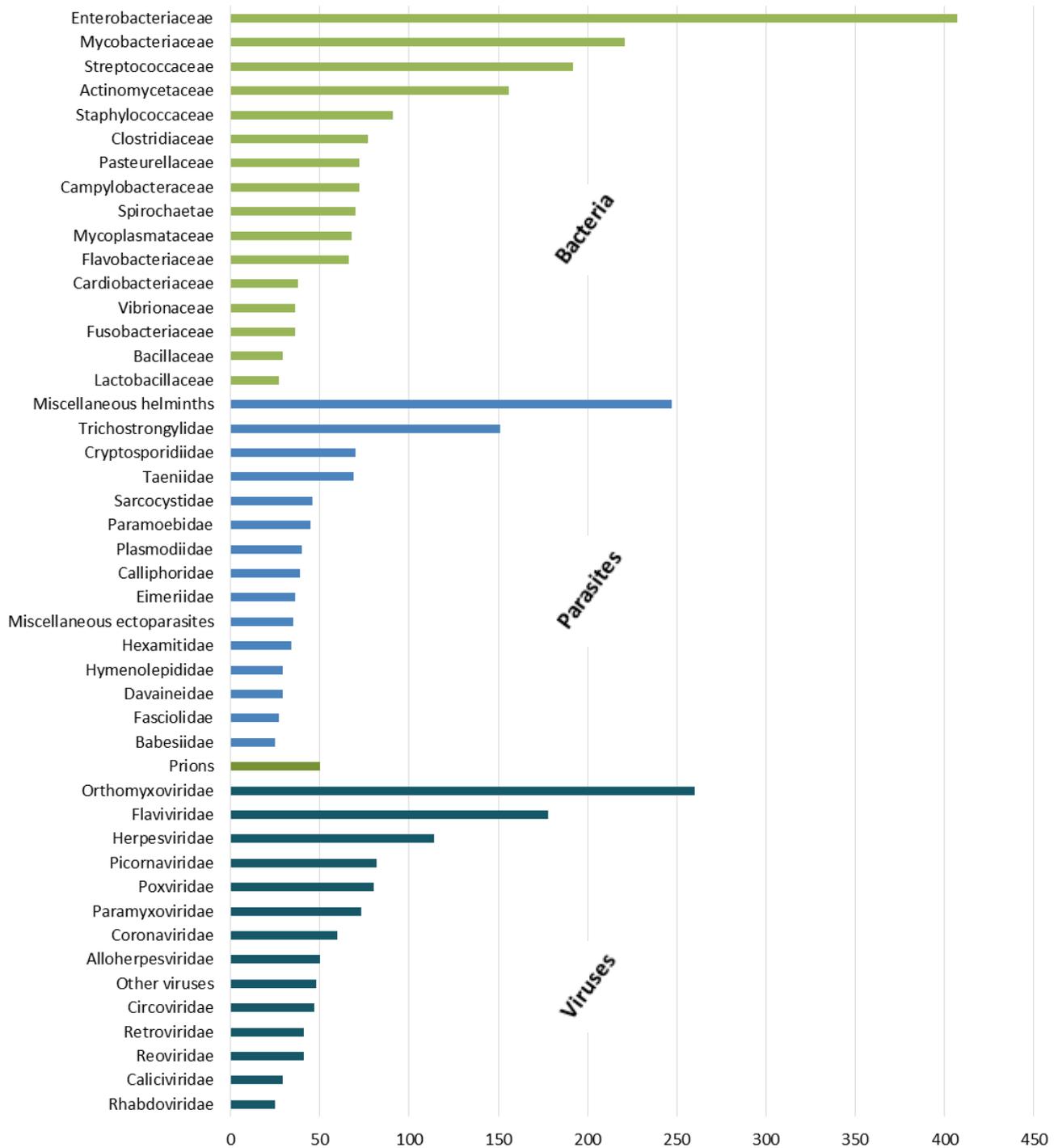
**Figure 19:** Distribution of the number of articles from Asia by families of pathogens for the period 2006-2013 (threshold = 100 articles and in brackets, significant average annual growth rate, for the period 2006-2013). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations).

• Europe



**Figure 20:** Distribution of the number of articles from Europe by families of pathogens for the period 2006-2013 (threshold = 100 articles and in brackets, significant average annual growth rate, for the period 2006-2013). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations).

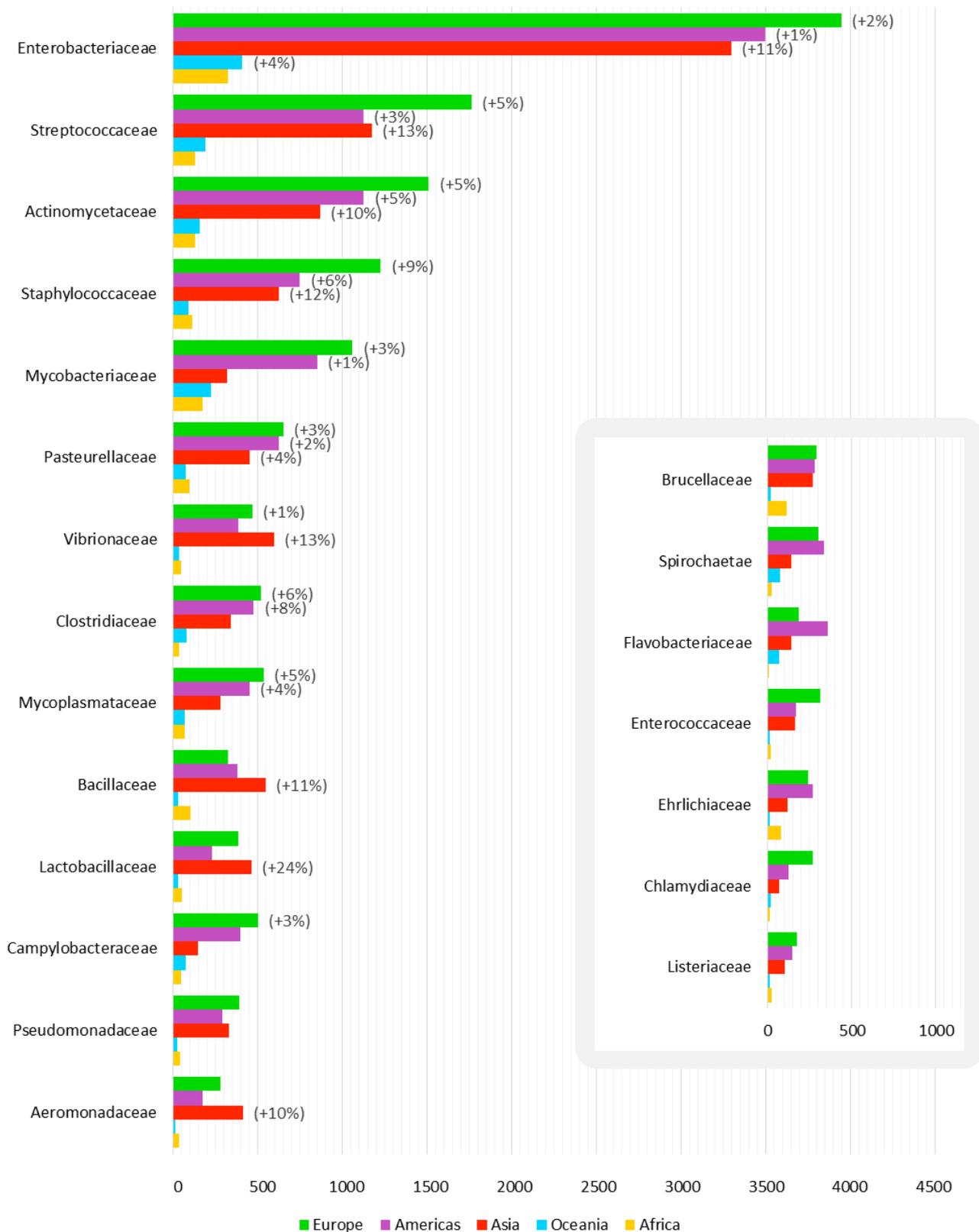
• Oceania



**Figure 21:** Distribution of the number of articles from Oceania by families of pathogens for the period 2006-2013 (*threshold = 25 articles and in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations).

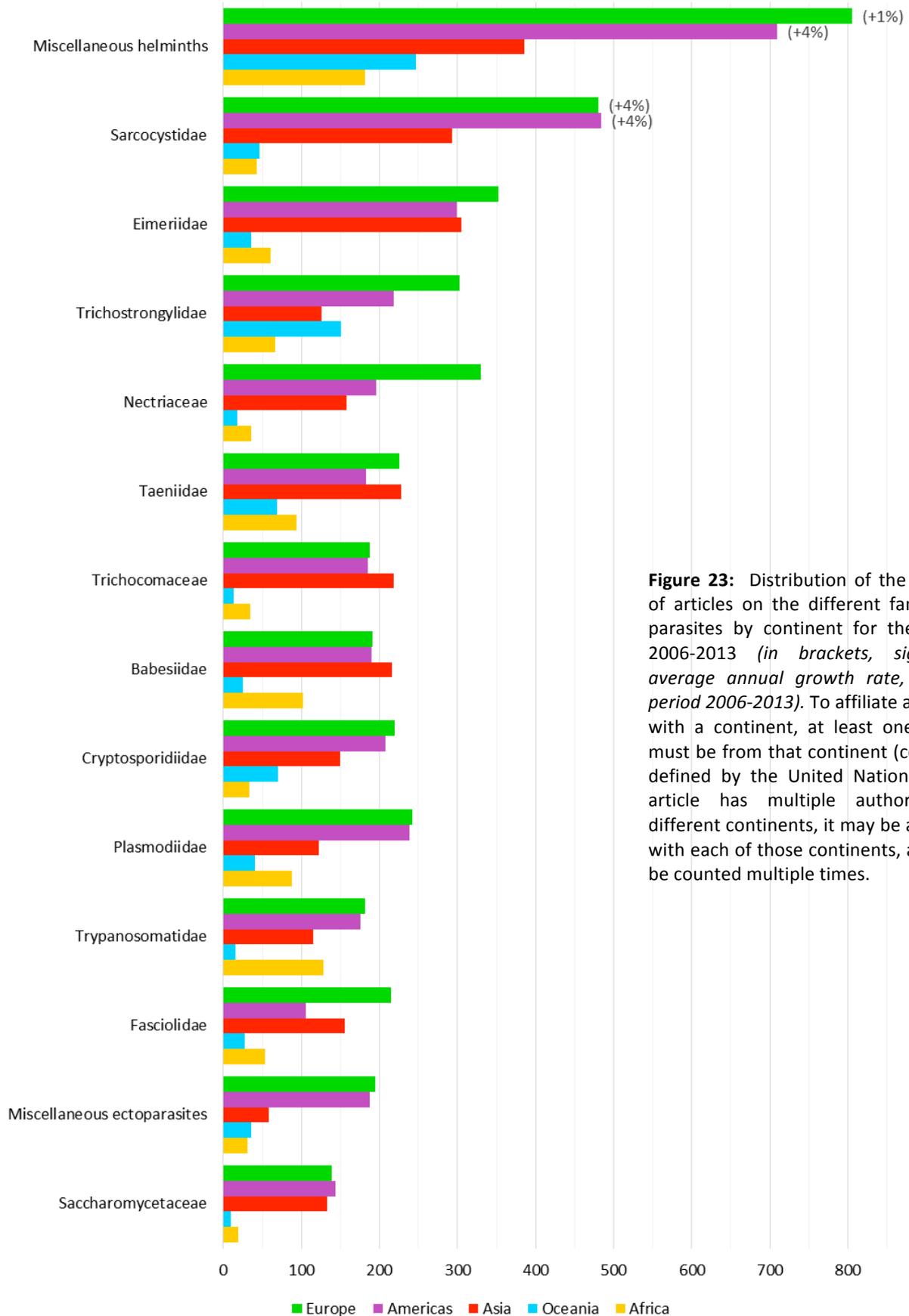
The following figures present a comparison of the distribution of the number of articles for the different families of pathogens on the different continents.

• **Bacteria**



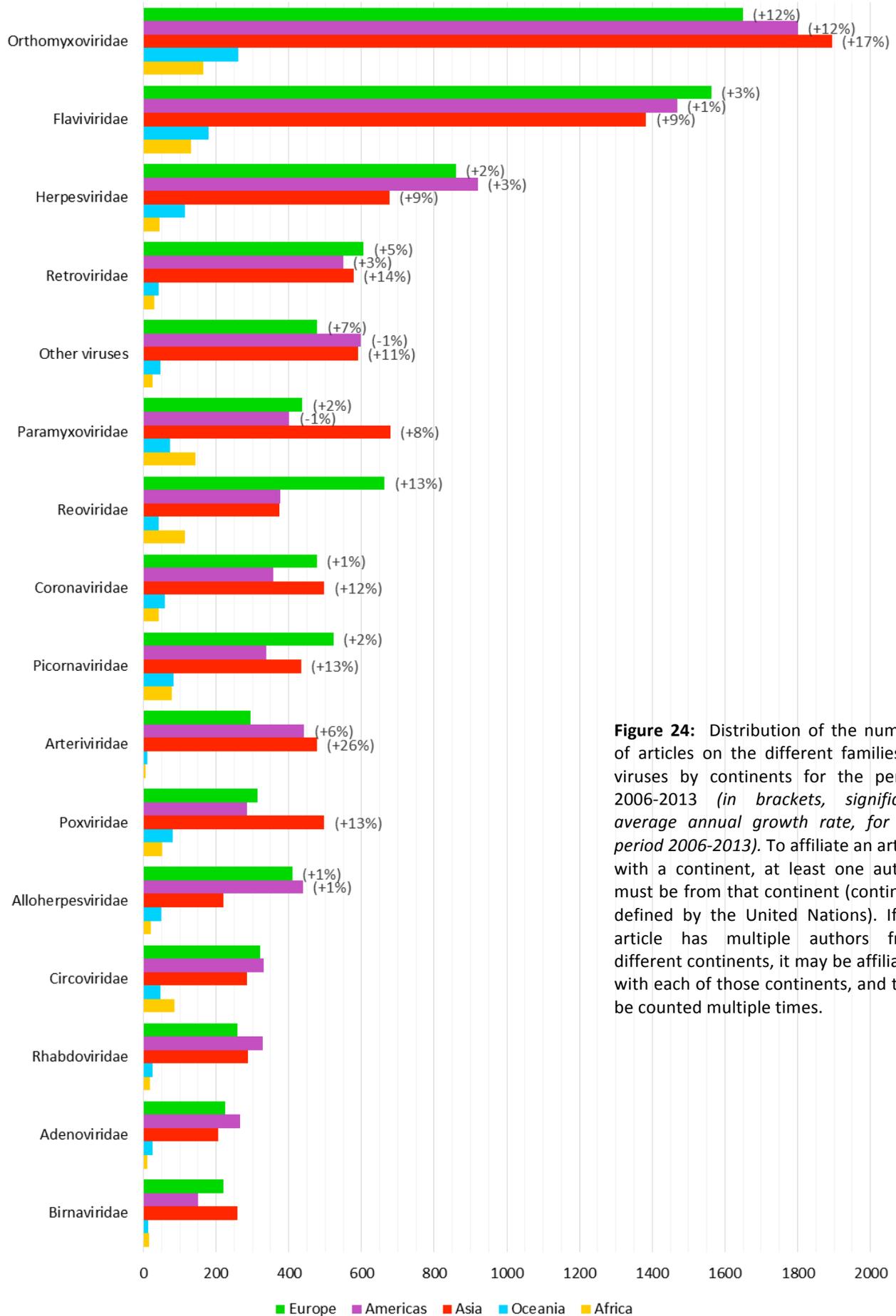
**Figure 22:** Distribution of the number of articles on the different families of bacteria by continent for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times

• Parasites



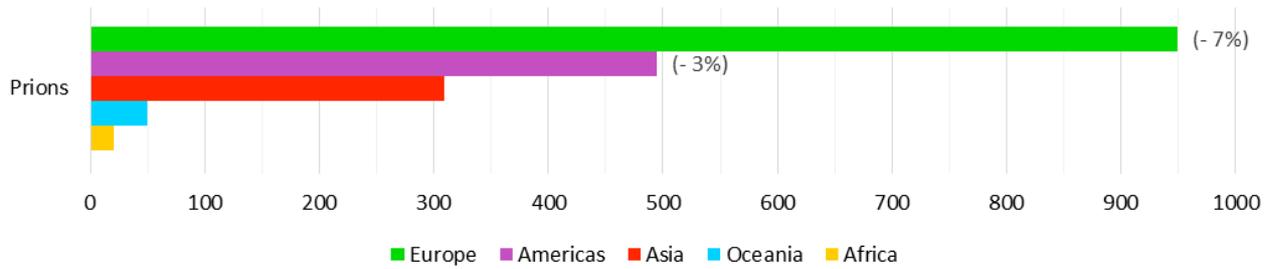
**Figure 23:** Distribution of the number of articles on the different families of parasites by continent for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

• Viruses



**Figure 24:** Distribution of the number of articles on the different families of viruses by continents for the period 2006-2013 (in brackets, significant average annual growth rate, for the period 2006-2013). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

- **Prions**



**Figure 25:** Distribution of the number of articles on prions by continent for the period 2006-2013 (*in brackets, significant average annual growth rate, for the period 2006-2013*). To affiliate an article with a continent, at least one author must be from that continent (continent defined by the United Nations). If an article has multiple authors from different continents, it may be affiliated with each of those continents, and thus be counted multiple times.

The lists of bacteria, viruses and parasites are similar between continents but their rankings can differ. Trends are different between continents.

Americas: The average annual growth rates for Orthomyxoviridae and Arteriviridae are respectively 12% and 6%.

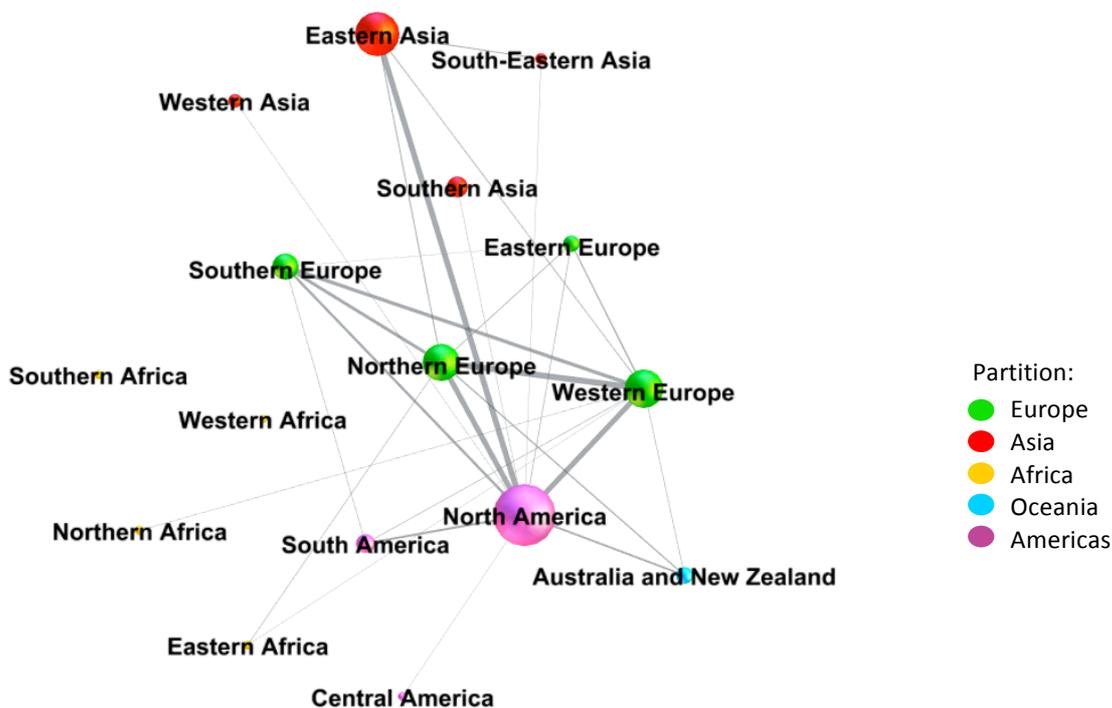
Europe: The average annual growth rates are high for Reoviridae (13%) followed by Orthomyxoviridae (12%).

Asia: The average annual growth rates are very high for Lactobacillaceae (24%) and Orthomyxoviridae (17%).

## Co-authorship networks between geographical regions

The graph below presents both the volume of scientific papers produced in each geographical region (size of the nodes) and the volume of collaborations (coauthorship) between regions (thickness of the edges). A paper with all authors from the same region is counted once in the region of the authors' origin; it appears in the node of the region. A paper with authors from two different regions is counted twice (once in each of the two regions); it appears in the node of each of the two regions as well as in the edge between the two regions.

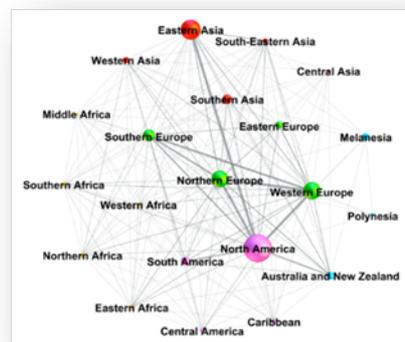
The entire graph is presented in the small inset below the main graph. In the main figure, only nodes and edges above a defined threshold are presented to highlight the most important points.



**Figure 26:** Co-authorship network of publications between geographical regions for the period 2006-2013 (Data base = 62 754 articles; Node threshold = 400 publications; Edge threshold = 200 co-publications). Geographical regions are defined by the United Nations.

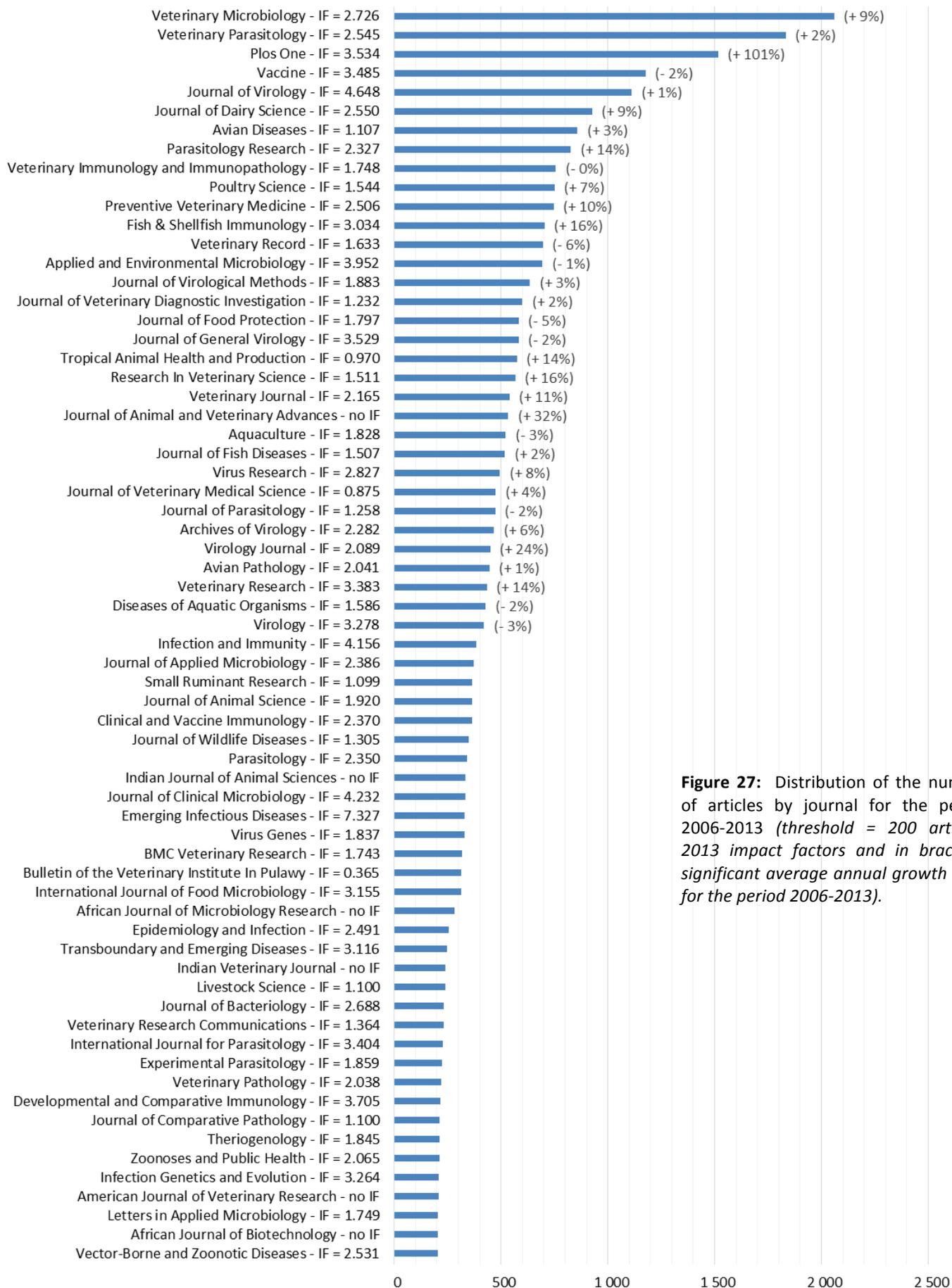
Network is created with Gephi, an open source graph visualization software. 

Network properties: Undirected graph; Fruchterman Reingold algorithm.  
 Metrics: Number of nodes = 21; Number of edges = 177; Network diameter = 2; Network density = 0.843  
 Node size: number of publications published by the region (max size = 17 353 publications).  
 Edge size: number of co-publications between 2 regions (max size = 1 423 co-publications).

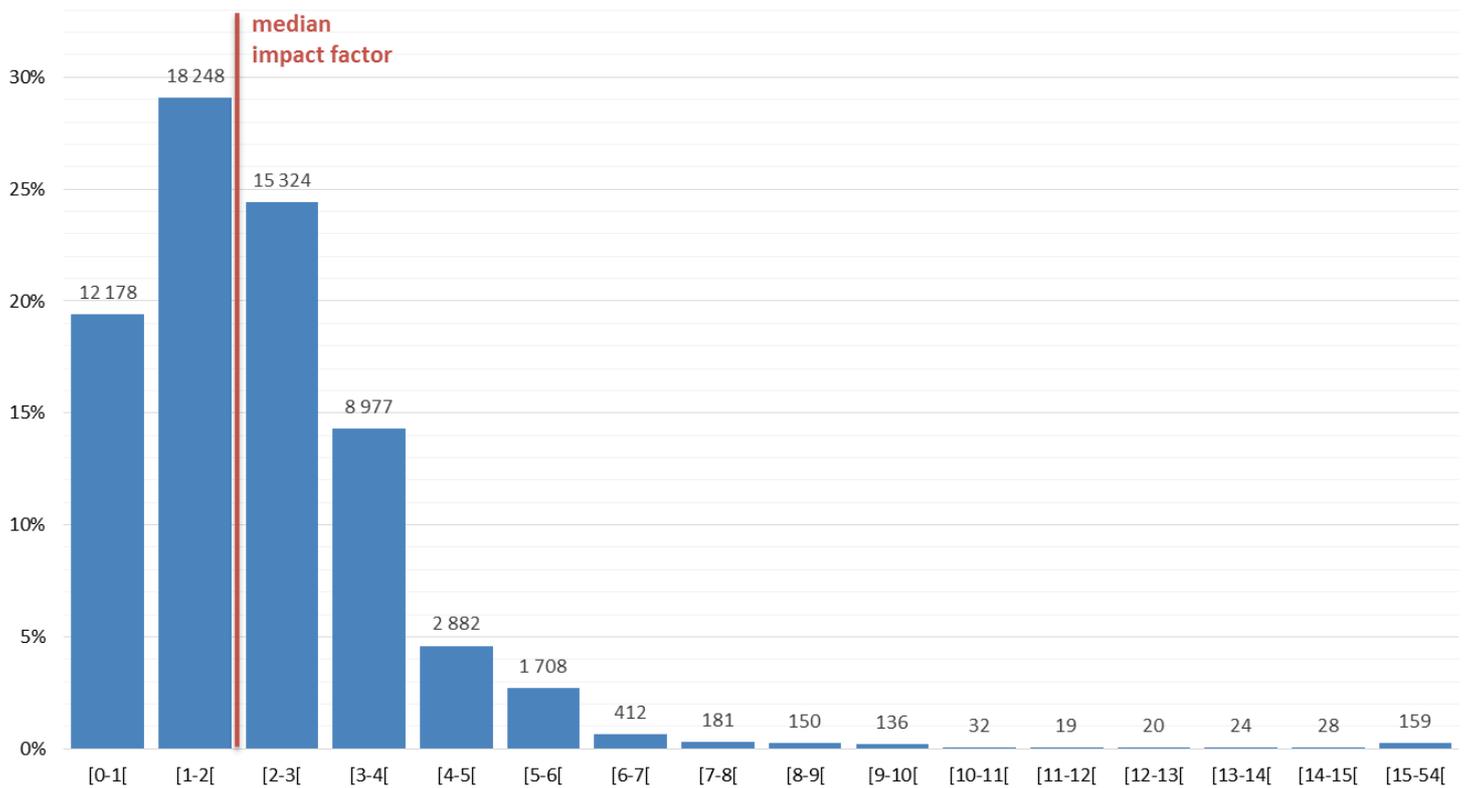


The graph shows a well established network of international collaborations with different levels of volumes and inter-regional collaborations. North America is collaborating with nearly every region, particularly Europe and Asia. European regions largely collaborate with each other as well as with North America.

## Publication medium: journals



**Figure 27:** Distribution of the number of articles by journal for the period 2006-2013 (threshold = 200 articles, 2013 impact factors and in brackets, significant average annual growth rate, for the period 2006-2013).



**Figure 28:** Distribution of the number of articles by journal impact factor class for the period 2006-2013 (figures, number of articles).

The scientific literature on infectious diseases in production animals is published in a huge number of different journals; from 2006 through 2013, 2 304 different journals were used to publish this material. The journal in which the highest number of papers was published is Veterinary Microbiology, which represents only 3.3% (2 059 / 62 754) of the papers.

The median impact factor of the journal in which the papers were published is 2. Twenty seven percent of the papers were published in journals with an impact factor above 3, 4.6 % with an impact factor above 5, and 0.4% above 10 (maximum IF=53.486).

## SYNTHESIS AND CONCLUSION

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Based on an updated publication database, including papers from all over the world published during an eight-year period (2006-2013), the objectives of this bibliometric analysis were to describe the research subjects and the international collaborations in the field of research on infectious diseases in production animals at the country level.

After reviewing the studies already completed under ERA-Net EMIDA and ERA-Net ANIHWA, the database on animal infectious diseases was designed using the bibliographic source, the Web of Science®. In accordance with the scope of the study, queries were built that combined 130 descriptors related to animal species, 800 descriptors related to thematics, the period of publication (2006-2013), the language in which documents were written (English) and the type of document (primary articles or reviews). To refine and assess the accuracy of the extracted database, supplementary filters were applied to discard non-specific terms and neighbouring topics, and numerous tests were carried out on samples. Additional fields for species groups, pathogens and geographical regions were incorporated for each publication. For pathogens, annotation was done using a thematic terminology established to link each disease with its corresponding pathogen, which was in turn classified according to its family.

A total of 62 754 articles on infectious diseases in production animals were published around the world between 2006 and 2013. The average annual growth rate of the number of papers was 5%, meaning that each year, 5% more papers were produced compared to the previous year. When analyzing increases in the number of papers published in thematic sub-categories, it is important to compare their average annual growth rates against this overall figure of 5%.

Over the entire study period, 23 200 articles, or 37% of the total, were dedicated to ruminant diseases. Poultry, Pigs and Fishes were covered by respectively 21%, 13% and 14% of the total. Enterobacteriaceae was the bacteria family receiving the most coverage with 10 217 publications, or 36% of the total number of articles devoted to bacteria. In terms of viruses, the Orthomyxoviridae and Flaviviridae families figured prominently with each the subject of over 4 000 publications, they represented respectively 19% and 16% of the total number of publications on viruses. During the 8 year study period, the trend in parasitology was dominated by high average annual growth rates for Babesiidae (10%), Plasmodidae (10%) and Taeniidae (7%).

The average annual growth rate for Asia was 10%, which is high compared to 3% for Europe and 2% for the Americas. Over the entire study period, Asia thus had a growth rate of 122%, indicating that the continent will have a leading role in coming years.

There is a well established network of international collaborations. In 75% of the papers the co-authors were from the same country, in 10% from different countries on the same continent, and in 15% from different continents. The number of papers representing international collaborations generally is increasing more quickly than the overall average annual growth rate (average annual growth rate of inter-continental co-authorship is 7% in Europe, 8% in the Americas, 13% in Asia and 16% in Africa).

The scientific literature on infectious diseases in production animals is published in a huge number of different journals (over 2 300); the journal in which the highest number of papers were published representing only 3.3% of the papers. The median impact factor of the papers is 2; 27% of the papers have an impact factor above 3, 4.6 % above 5 and 0.4% above 10.

# APPENDIX

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**Table 1:** Number of publications by publication year for the period 2006-2013.

	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Number of publications	6 164	6 833	7 050	7 556	7 982	8 656	9 329	9 184	62 754	49%	5%

**Table 2:** Number of publications by animal species group for the period 2006-2013.

Animal species group	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Ruminants	2 418	2 680	2 689	2 815	2 824	3 061	3 360	3 353	23 200	37%	39%	4%
Poultry	1 264	1 418	1 528	1 693	1 730	1 797	1 972	1 976	13 378	21%	56%	6%
Pigs	755	839	798	1 006	1 129	1 254	1 375	1 258	8 414	13%	67%	7%
Fishes	823	940	993	1 029	1 134	1 277	1 327	1 283	8 806	14%	56%	6%
Horses	311	318	360	323	398	443	444	471	3 068	5%	51%	5%
Rabbits	279	265	293	274	287	347	304	314	2 363	4%	13%	1%
Bees	45	52	48	50	79	78	120	98	570	1%	118%	10%
Multispecies	269	321	341	366	401	399	427	431	2 955	5%	60%	6%
<b>All species</b>	<b>6 164</b>	<b>6 833</b>	<b>7 050</b>	<b>7 556</b>	<b>7 982</b>	<b>8 656</b>	<b>9 329</b>	<b>9 184</b>	<b>62 754</b>	<b>100%</b>	<b>49%</b>	<b>5%</b>

**Table 3:** Number of publications by pathogen for the period 2006-2013.

Pathogen	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Bacteria	2 336	2 539	2 629	2 798	2 903	3 157	3 445	3 292	23 099	37%	41%	4%
Viruses	1 837	2 156	2 230	2 492	2 741	2 896	3 096	3 164	20 612	33%	72%	7%
Parasites	1 192	1 294	1 390	1 391	1 442	1 586	1 737	1 728	11 760	19%	45%	5%
Prions	180	209	180	186	133	174	140	115	1 317	2%	-36%	-5%
Multi-pathogens	619	635	621	689	763	843	911	885	5 966	10%	43%	5%
<b>All pathogens</b>	<b>6 164</b>	<b>6 833</b>	<b>7 050</b>	<b>7 556</b>	<b>7 982</b>	<b>8 656</b>	<b>9 329</b>	<b>9 184</b>	<b>62 754</b>	<b>100%</b>	<b>49%</b>	<b>5%</b>

**Table 4:** Number of publications by species and pathogen for the period 2006-2013.

Pathogen	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Species share	Growth rate 2006-2013	Average annual growth rate
<b>Ruminants</b>												
Bacteria	996	1 102	1 120	1 188	1 203	1 314	1 472	1 425	9 820	42%	43%	+ 5%
Viruses	502	562	593	610	639	656	725	781	5 068	22%	56%	+ 6%
Parasites	504	566	572	571	585	641	694	681	4 814	21%	35%	+ 4%
Prions	160	182	161	162	115	154	124	104	1 162	5%	-35%	- 5%
Multi-pathogens	256	268	243	284	282	296	345	362	2 336	10%	41%	+ 4%
<b>All pathogens</b>	<b>2 418</b>	<b>2 680</b>	<b>2 689</b>	<b>2 815</b>	<b>2 824</b>	<b>3 061</b>	<b>3 360</b>	<b>3 353</b>	<b>23 200</b>	<b>100%</b>	<b>39%</b>	<b>+ 4%</b>
<b>Poultry</b>												
Bacteria	407	438	462	506	491	533	593	569	3 999	30%	40%	+ 4%
Viruses	578	711	724	846	887	879	959	987	6 571	49%	71%	+ 7%
Parasites	181	162	225	213	223	262	279	291	1 836	14%	61%	+ 6%
Prions	8	6	1	13	6	3	3		40	0%	ns	ns
Multi-pathogens	90	101	116	115	123	120	138	129	932	7%	43%	+ 5%
<b>All pathogens</b>	<b>1 264</b>	<b>1 418</b>	<b>1 528</b>	<b>1 693</b>	<b>1 730</b>	<b>1 797</b>	<b>1 972</b>	<b>1 976</b>	<b>13 378</b>	<b>100%</b>	<b>56%</b>	<b>+ 6%</b>
<b>Pigs</b>												
Bacteria	265	297	269	342	345	387	428	369	2 702	32%	39%	+ 4%
Viruses	306	353	352	465	553	607	668	645	3 949	47%	111%	+ 10%
Parasites	85	83	79	93	92	95	129	125	781	9%	47%	+ 5%
Prions	1	3		4		4	1		13	0%	ns	ns
Multi-pathogens	98	103	98	102	139	161	149	119	969	12%	21%	+ 2%
<b>All pathogens</b>	<b>755</b>	<b>839</b>	<b>798</b>	<b>1 006</b>	<b>1 129</b>	<b>1 254</b>	<b>1 375</b>	<b>1 258</b>	<b>8 414</b>	<b>100%</b>	<b>67%</b>	<b>+ 7%</b>
<b>Fishes</b>												
Bacteria	317	336	388	403	461	485	533	521	3 444	39%	64%	+ 6%
Viruses	155	198	187	199	218	262	246	246	1 711	19%	59%	+ 6%
Parasites	277	313	337	339	341	388	395	375	2 765	31%	35%	+ 4%
Prions	1	3	2	2	1	4	3	3	19	0%	ns	ns
Multi-pathogens	73	90	79	86	113	138	150	138	867	10%	89%	+ 8%
<b>All pathogens</b>	<b>823</b>	<b>940</b>	<b>993</b>	<b>1 029</b>	<b>1 134</b>	<b>1 277</b>	<b>1 327</b>	<b>1 283</b>	<b>8 806</b>	<b>100%</b>	<b>56%</b>	<b>+ 6%</b>
<b>Horses</b>												
Bacteria	107	111	138	128	130	140	141	141	1 036	34%	32%	+ 4%
Viruses	116	127	128	102	154	193	183	186	1 189	39%	60%	+ 6%
Parasites	50	64	62	58	74	65	75	84	532	17%	68%	+ 7%
Prions			2		4	2	3	1	12	0%	ns	ns
Multi-pathogens	38	16	30	35	36	43	42	59	299	10%	ns	ns
<b>All pathogens</b>	<b>311</b>	<b>318</b>	<b>360</b>	<b>323</b>	<b>398</b>	<b>443</b>	<b>444</b>	<b>471</b>	<b>3 068</b>	<b>100%</b>	<b>51%</b>	<b>+ 5%</b>
<b>Rabbits</b>												
Bacteria	121	111	103	91	106	127	99	107	865	37%	-12%	- 2%
Viruses	94	92	97	100	96	117	106	112	814	34%	19%	+ 2%
Parasites	37	39	62	45	52	55	61	63	414	18%	70%	+ 7%
Prions	2	2	3	1	4	5	2	3	22	1%	ns	ns
Multi-pathogens	25	21	28	37	29	43	36	29	248	10%	ns	ns
<b>All pathogens</b>	<b>279</b>	<b>265</b>	<b>293</b>	<b>274</b>	<b>287</b>	<b>347</b>	<b>304</b>	<b>314</b>	<b>2 363</b>	<b>100%</b>	<b>13%</b>	<b>+ 1%</b>

Pathogen	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Species share	Growth rate 2006-2013	Average annual growth rate
<b>Bees</b>												
Bacteria	13	19	16	20	30	21	25	28	172	30%	ns	ns
Viruses	11	11	9	7	16	9	34	13	110	19%	ns	ns
Parasites	14	16	16	16	23	34	44	41	204	36%	ns	ns
Prions						1			1	0%	ns	ns
Multi-pathogens	7	6	7	7	10	13	17	16	83	15%	ns	ns
<b>All pathogens</b>	<b>45</b>	<b>52</b>	<b>48</b>	<b>50</b>	<b>79</b>	<b>78</b>	<b>120</b>	<b>98</b>	<b>570</b>	<b>100%</b>	<b>118%</b>	<b>+ 10%</b>
<b>Multispecies</b>												
Bacteria	110	125	133	120	137	150	154	132	1 061	36%	20%	+ 2%
Viruses	75	102	140	163	178	173	175	194	1 200	41%	159%	+ 13%
Parasites	44	51	37	56	52	46	60	68	414	14%	55%	+ 6%
Prions	8	13	11	4	3	1	4	4	48	2%	ns	ns
Multi-pathogens	32	30	20	23	31	29	34	33	232	8%	ns	ns
<b>All pathogens</b>	<b>269</b>	<b>321</b>	<b>341</b>	<b>366</b>	<b>401</b>	<b>399</b>	<b>427</b>	<b>431</b>	<b>2 955</b>	<b>100%</b>	<b>60%</b>	<b>+ 6%</b>

**Table 5:** Number of publications by bacteria family for the period 2006-2013.

Bacteria family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Enterobacteriaceae	1018	1158	1232	1262	1249	1365	1541	1392	10 217	36%	37%	4%
Streptococcaceae	365	412	429	475	464	545	617	586	3 893	14%	61%	6%
Actinomycetaceae	320	361	362	406	427	455	539	501	3 371	12%	57%	6%
Staphylococcaceae	212	240	235	312	314	341	430	404	2 488	9%	91%	8%
Mycobacteriaceae	247	215	251	267	256	285	286	320	2 127	8%	30%	3%
Pasteurellaceae	168	191	186	204	197	275	238	206	1 665	6%	23%	3%
Vibrionaceae	129	137	139	158	158	195	213	217	1 346	5%	68%	7%
Clostridiaceae	119	147	140	160	180	142	177	216	1 281	5%	82%	8%
Mycoplasmataceae	121	123	137	141	159	182	206	162	1 231	4%	34%	4%
Bacillaceae	108	128	126	124	173	188	201	175	1 223	4%	62%	6%
Lactobacillaceae	71	113	110	113	138	172	154	164	1 035	4%	131%	11%
Campylobacteraceae	116	143	126	124	106	131	129	129	1 004	4%	11%	1%
Pseudomonadaceae	96	101	103	116	141	153	136	127	973	3%	32%	4%
Aeromonadaceae	78	73	80	94	124	119	127	135	830	3%	73%	7%
Brucellaceae	71	88	91	83	108	103	140	122	806	3%	72%	7%
Spirochaetae	77	86	72	92	86	118	117	115	763	3%	49%	5%
Flavobacteriaceae	67	85	80	67	92	97	93	87	668	2%	30%	3%
Enterococcaceae	78	63	49	71	87	86	80	95	609	2%	22%	2%
Ehrlichiaeae	60	47	69	61	66	66	83	75	527	2%	25%	3%
Chlamydiaceae	49	55	40	55	65	54	61	52	431	2%	6%	1%
Listeriaceae	53	62	50	41	46	45	61	58	416	1%	9%	1%
Rickettsiaceae	21	25	25	23	41	38	30	30	233	1%	ns	ns
Coxiellaceae	16	17	12	21	24	46	56	40	232	1%	ns	ns
Corynebacteriaceae	21	16	28	23	21	31	33	32	205	1%	ns	ns
Nocardiaceae	27	17	9	27	24	37	17	25	183	1%	ns	ns
Fusobacteriaceae	20	13	25	22	26	20	20	34	180	1%	ns	ns
Alcaligenaceae	17	19	11	19	19	29	24	20	158	1%	ns	ns
Moraxellaceae	12	13	22	16	29	16	29	19	156	1%	ns	ns
Desulfovibrionales	18	10	15	21	22	19	24	20	149	1%	ns	ns
Cardiobacteriaceae	14	8	15	20	22	19	15	27	140	0%	ns	ns
Francisellaceae	8	10	7	15	17	22	18	14	111	0%	ns	ns
Paenibacillaceae	11	11	13	10	12	12	15	23	107	0%	ns	ns
Burkholderiaceae	5	10	4	9	8	11	14	13	74	0%	ns	ns
Erysipelotrichidae	8	7	3	12	10	10	12	10	72	0%	ns	ns
Leuconostocaceae	10	12	8	7	9	6	10	10	72	0%	ns	ns
Neisseriaceae	7	7	6	6	9	14	12	10	71	0%	ns	ns
Micrococcaceae	10	9	12	5	8	4	5	8	61	0%	ns	ns
Bartonellaceae	5	7	6	2	3	11	8	9	51	0%	ns	ns
Anaplasmataceae	5	2	4	6	3	3	7	10	40	0%	ns	ns
Lachnospiraceae			1	2	9	6	6	6	30	0%	ns	ns
Dermatophilaceae	4	4	3	3	4	3	1	4	26	0%	ns	ns
Piscirickettsiaceae	4	2	4	1	3	6	3	3	26	0%	ns	ns
Moritellaceae	4	3	3	4	3	3	4		24	0%	ns	ns

Bacteria family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Spiroplasmataceae	1	1	1	3	5	3	2	4	20	0%	ns	ns
Other bacteria			1	2			1		4	0%	ns	ns
<b>All bacteria</b>	<b>2 854</b>	<b>3 061</b>	<b>3 138</b>	<b>3 370</b>	<b>3 558</b>	<b>3 884</b>	<b>4 234</b>	<b>4 043</b>	<b>28 142</b>	-	<b>42%</b>	<b>4%</b>

**Table 6:** Number of publications by parasite family for the period 2006-2013.

Parasite family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Miscellaneous helminths	192	234	236	230	232	246	300	249	1 919	14%	30%	3%
Sarcocystidae	127	119	109	116	139	173	170	194	1 147	8%	53%	5%
Eimeriidae	90	93	106	104	104	127	144	130	898	6%	44%	5%
Trichostrongylidae	67	77	82	90	92	99	113	106	726	5%	58%	6%
Nectriaceae	74	57	94	72	70	88	82	91	628	4%	23%	3%
Taeniidae	64	52	62	74	78	73	86	107	596	4%	67%	7%
Trichocomaceae	47	72	73	73	73	73	84	86	581	4%	83%	8%
Babesiidae	50	64	67	53	84	51	83	105	557	4%	110%	10%
Cryptosporidiidae	69	69	74	67	56	69	70	81	555	4%	17%	2%
Plasmodiidae	48	53	75	59	58	78	79	103	553	4%	115%	10%
Trypanosomatidae	47	44	62	60	69	66	49	67	464	3%	43%	5%
Fasciolidae	40	46	47	60	51	70	59	62	435	3%	55%	6%
Miscellaneous ectoparasites	38	42	49	52	54	65	65	64	429	3%	68%	7%
Saccharomycetaceae	38	46	47	38	45	70	45	72	401	3%	89%	8%
Theileriidae	30	28	34	25	37	31	49	47	281	2%	ns	ns
Caligidae	24	28	23	31	24	45	39	46	260	2%	ns	ns
Anisakidae	13	21	21	25	25	34	31	39	209	1%	ns	ns
Davaineidae	24	18	20	21	30	22	31	38	204	1%	ns	ns
Schistosomatidae	27	26	24	25	19	25	33	22	201	1%	ns	ns
Calliphoridae	24	15	14	35	29	26	31	25	199	1%	ns	ns
Hexamitidae	23	30	26	18	23	24	34	18	196	1%	ns	ns
Hymenolepididae	24	17	20	21	25	22	27	36	192	1%	ns	ns
Varroidae	10	13	16	14	22	30	35	32	172	1%	ns	ns
Myxobolidae	19	21	23	17	30	25	19	15	169	1%	ns	ns
Hymenostomatida	16	10	18	24	16	31	25	24	164	1%	ns	ns
Gyrodactylidae	16	29	17	21	19	25	18	14	159	1%	ns	ns
Psoroptidae	17	16	20	12	25	13	20	20	143	1%	ns	ns
Dactylogyridae	10	13	14	16	20	25	20	18	136	1%	ns	ns
Trichinellidae	10	10	5	30	16	18	22	25	136	1%	ns	ns
Lernaeopodidae	9	18	14	17	21	22	16	11	128	1%	ns	ns
Trichomonadidae	12	12	14	9	14	19	22	21	123	1%	ns	ns
Ascarididae	9	15	7	17	13	17	22	18	118	1%	ns	ns
Dictyocaulidae	12	15	9	12	14	19	18	14	113	1%	ns	ns
Leptolegniellaceae	11	7	6	18	9	20	18	18	107	1%	ns	ns
Paramoebidae	13	21	17	9	15	9	12	4	100	1%	ns	ns
Haemoproteidae	10	7	14	10	13	1	16	25	96	1%	ns	ns
Oestridae	11	6	8	9	14	11	15	15	89	1%	ns	ns
Trichuridae	11	9	10	11	10	7	19	12	89	1%	ns	ns
Anoplocephalidae	11	10	9	7	13	8	13	17	88	1%	ns	ns
Sarcophagidae	13	6	6	16	10	7	18	10	86	1%	ns	ns
Strongyloididae	4	12	12	5	14	8	20	11	86	1%	ns	ns

Parasite family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Arthrodermataceae	7	11	11	12	9	13	13	8	84	1%	ns	ns
Diplostomatidae	8	9	8	10	15	8	11	12	81	1%	ns	ns
Monocercomonadidae	14	5	9	13	13	11	6	10	81	1%	ns	ns
Ascospaeraceae	5	11	9	11	8	13	10	12	79	1%	ns	ns
Argulidae	5	6	12	9	13	9	12	9	75	1%	ns	ns
Trichodinidae	3	7	6	8	11	15	12	10	72	1%	ns	ns
Saprolegniaceae	7	8	5	9	11	6	13	11	70	0%	ns	ns
Metastrongylidae	9	9	9	6	8	6	10	7	64	0%	ns	ns
Heterophyidae	3	8	9	6	7	7	9	13	62	0%	ns	ns
Ichthyophthiriidae	8	2	4	11	5	13	6	11	60	0%	ns	ns
Unikaryonidae	9	6	8	12	7	4	5	9	60	0%	ns	ns
Capillariidae	7	10	7	12	10	3	5	5	59	0%	ns	ns
Leucocytozoidae	5	3	13	6	9		6	17	59	0%	ns	ns
Philometridae	7	5	12	8	7	7	5	6	57	0%	ns	ns
Dicrocoeliidae	9	12	4	5	5	5	8	7	55	0%	ns	ns
Diphyllobothriidae	6	3	6	8	7	4	11	7	52	0%	ns	ns
Filariidae	8	8	3	6	6	6	7	4	48	0%	ns	ns
Protostrongylidae	9	7	6	3	8	5	7	3	48	0%	ns	ns
Herpotrichiellaceae	2	5	8	6	4	10	4	5	44	0%	ns	ns
Dracunculidae	8	7	12	8	2		1	4	42	0%	ns	ns
Ergasilidae		9	7	4	4	3	6	9	42	0%	ns	ns
Other parasites	6	5	4	6	8	5	7	1	42	0%	ns	ns
Paramphistomatidae		3	9	6	6	6	7	4	41	0%	ns	ns
Piscicolidae	10	4	3	5	4	7	4	4	41	0%	ns	ns
Saccosporidae	4	9	5	4	7	2	5	5	41	0%	ns	ns
Sarcoptidae	3	6	8	1	4	6	4	8	40	0%	ns	ns
Proteocephalidae	3	3	6	4	6	6	5	4	37	0%	ns	ns
Echinorhynchidae	3	10	6	2	2	3	8	2	36	0%	ns	ns
Hippoboscidae	2	1	2	3	7	8	9	3	35	0%	ns	ns
Lernaeidae	3		7	3	4	4	12	2	35	0%	ns	ns
Bothriocephalidae	4	9	4	6	4	1	5	1	34	0%	ns	ns
Kudoidae	4	3	5	2	6	4	6	4	34	0%	ns	ns
Ichthyophonidae	4	2	7	3	5	3	1	4	29	0%	ns	ns
Schistocephalidae	4	2	2	3	5	4	6	3	29	0%	ns	ns
Tetrahymenidae	4	5	1	6	5	4	4		29	0%	ns	ns
Capsalidae		8	4	4	4	3	1	4	28	0%	ns	ns
Syngamidae	3	1	3	5	2	4	2	8	28	0%	ns	ns
Bucephalidae	4	3	2	5	3	4	1	3	25	0%	ns	ns
Clavicipitaceae	4	3	1	3	1	7	4	2	25	0%	ns	ns
Haematopinidae	3	2	3	4	2		2	9	25	0%	ns	ns
Heterakidae	2	1	3	3	4	6	2	4	25	0%	ns	ns
Onygenaceae	4	1	1	3	2	3	4	6	24	0%	ns	ns
Cystidicolidae		6	2	3	5	3	3	1	23	0%	ns	ns
Oodiniaceae	1	2	4		7	4	2	3	23	0%	ns	ns

Parasite family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Glugeidae		4	4	5	2	3	3		21	0%	ns	ns
Habronematidae	1	4		4	1	4	1	3	18	0%	ns	ns
Spiruroidea	2	5	2	3	1	1	2	2	18	0%	ns	ns
Bodonidae	1	2	3	4	2	1	1	3	17	0%	ns	ns
Dioctophmatidae	1	2	1	3	1	2	2	5	17	0%	ns	ns
Acuariidae	1	1	2	4	1	3	1	2	15	0%	ns	ns
Chilodonellidae	2	1		3	2	4	2	1	15	0%	ns	ns
Sphaerosporidae	3	2	1	1		4	1	3	15	0%	ns	ns
Cryptobiidae	1	3	3	2	2	1		2	14	0%	ns	ns
Onchocercidae	1	1	1	1	2	1	5	1	13	0%	ns	ns
Pneumocystidaceae	2	2			2	4	1	2	13	0%	ns	ns
Trichodectidae	2		4		1	1	3	2	13	0%	ns	ns
Thelaziidae	2	6	1	1		1		1	12	0%	ns	ns
Triaenophoridae	3	1	3	2	1	2			12	0%	ns	ns
Linognathidae	2	1	3	1			2	2	11	0%	ns	ns
Diplozoidae		4			1	2	2		9	0%	ns	ns
Gongylonematidae	1		3	1	1			3	9	0%	ns	ns
Haplosporidiidae	1		3	2		1	1	1	9	0%	ns	ns
Pleistophorae	1		1	2		1	4		9	0%	ns	ns
Rhinosporideaceae				2		3	3	1	9	0%	ns	ns
Haemogregarinidae	3		1				2	2	8	0%	ns	ns
Listrophoridae			3	1		1		2	7	0%	ns	ns
Oxyruidae	1	1		1	2			2	7	0%	ns	ns
Ancylostomatidae					1	2	3		6	0%	ns	ns
Cheyletidae	1		3					2	6	0%	ns	ns
Demodicidae		2	1	1		1		1	6	0%	ns	ns
Laelapidae				1		2	3		6	0%	ns	ns
Scuticociliatidae		1	2	1	1	1			6	0%	ns	ns
Tarsonemidae					1	3	1	1	6	0%	ns	ns
Dermocystidiaceae	2		2	1					5	0%	ns	ns
Clinostomidae	1			2				1	4	0%	ns	ns
Pyalidae		1		1	1		1		4	0%	ns	ns
Trombiculidae		1	1	1	1				4	0%	ns	ns
Amidostomatidae	1					2			3	0%	ns	ns
Cochlosmatidae	2			1					3	0%	ns	ns
Glossiphonidae						1	2		3	0%	ns	ns
Tetrameridae				1		1			2	0%	ns	ns
Triactinomyxidae				1				1	2	0%	ns	ns
Atoxoplasmatidae							1		1	0%	ns	ns
Diaporthaceae							1		1	0%	ns	ns
Hexabothriidae							1		1	0%	ns	ns
<b>All parasites</b>	<b>1 451</b>	<b>1 547</b>	<b>1 646</b>	<b>1 656</b>	<b>1 733</b>	<b>1 883</b>	<b>2 048</b>	<b>2 091</b>	<b>14 055</b>	<b>-</b>	<b>44%</b>	<b>5%</b>

**Table 7:** Number of publications by prions for the period 2006-2013.

Prions	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Prions	222	254	211	223	160	223	176	154	1 623	-	-31%	-4%

**Table 8:** Number of publications by virus family for the period 2006-2013.

Virus family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Orthomyxoviridae	278	426	470	628	713	775	702	750	4 742	19%	170%	13%
Flaviviridae	442	488	451	489	497	559	628	606	4 160	16%	37%	4%
Herpesviridae	238	258	261	279	300	309	333	311	2 289	9%	31%	3%
Retroviridae	158	204	183	172	195	184	234	246	1 576	6%	56%	6%
Other viruses	145	162	184	172	169	214	237	225	1 508	6%	55%	6%
Paramyxoviridae	159	160	171	170	195	198	230	199	1 482	6%	25%	3%
Reoviridae	105	106	155	164	195	176	195	221	1 317	5%	110%	10%
Coronaviridae	140	134	134	172	184	164	176	179	1 283	5%	28%	3%
Picornaviridae	114	134	167	130	139	180	174	164	1 202	5%	44%	5%
Arteriviridae	85	76	89	120	142	149	217	204	1 082	4%	140%	12%
Poxviridae	95	117	112	126	146	141	172	148	1 057	4%	56%	6%
Alloherpesviridae	108	102	99	121	144	138	134	133	979	4%	23%	3%
Circoviridae	87	101	107	112	104	147	139	130	927	4%	49%	5%
Rhabdoviridae	74	85	97	79	91	139	114	114	793	3%	54%	6%
Adenoviridae	66	70	81	71	97	77	89	96	647	3%	45%	5%
Birnaviridae	71	79	62	75	67	77	78	78	587	2%	10%	1%
Togaviridae	31	39	33	45	52	55	57	60	372	1%	ns	ns
Papillomaviridae	30	43	40	48	44	44	34	66	349	1%	ns	ns
Bunyaviridae	15	20	21	23	36	39	79	99	332	1%	ns	ns
Nodaviridae	39	51	33	41	53	44	37	29	327	1%	ns	ns
Caliciviridae	27	29	41	41	44	38	49	34	303	1%	ns	ns
Iridoviridae	22	21	27	23	36	52	47	44	272	1%	ns	ns
Parvoviridae	19	20	20	38	41	44	44	43	269	1%	ns	ns
Asfaviridae	25	27	23	28	30	39	31	65	268	1%	ns	ns
Hepeviridae	13	24	26	32	28	47	39	36	245	1%	ns	ns
Nimaviridae	17	16	8	15	18	19	28	29	150	1%	ns	ns
Astroviridae	5	7	5	7	9	22	22	15	92	0%	ns	ns
Iflaviridae	9	4	8	7	9	11	24	10	82	0%	ns	ns
Polyomaviridae	11	4	4	6	8	10	12	14	69	0%	ns	ns
Dicistroviridae	7	7	7	7	11	4	13	7	63	0%	ns	ns
Bornaviridae	6	5	4	7	8	5	9	7	51	0%	ns	ns
<b>All viruses</b>	<b>2 290</b>	<b>2 644</b>	<b>2 708</b>	<b>3 033</b>	<b>3 339</b>	<b>3 553</b>	<b>3 830</b>	<b>3 833</b>	<b>25 230</b>	<b>-</b>	<b>67%</b>	<b>7%</b>

**Table 9:** Number of publications by geographical continent for the period 2006-2013.

Continent	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Share	Growth rate 2006-2013	Average annual growth rate
Europe	2 092	2 277	2 210	2 325	2 359	2 365	2 627	2 588	18 843	30%	24%	3%
Americas	1 818	1 801	1 871	1 950	1 942	1 990	2 076	2 071	15 519	25%	14%	2%
Asia	1 127	1 464	1 620	1 805	2 029	2 415	2 722	2 504	15 686	25%	122%	10%
Oceania	217	230	198	216	246	278	226	229	1 840	3%	6%	1%
Africa	88	136	156	194	213	213	197	151	1 348	2%	72%	7%
Inter continents	811	911	981	1 044	1 182	1 381	1 470	1 631	9 411	15%	101%	9%
Without information on continents	11	14	14	22	11	14	11	10	107	0%	ns	ns
<b>All publications</b>	<b>6 164</b>	<b>6 833</b>	<b>7 050</b>	<b>7 556</b>	<b>7 982</b>	<b>8 656</b>	<b>9 329</b>	<b>9 184</b>	<b>62 754</b>	<b>100%</b>	<b>49%</b>	<b>5%</b>

**Table 10:** Number of publications by geographical continent and partnerships for the period 2006-2013.

Partnership	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Continental share	Growth rate 2006-2013	Average annual growth rate
<b>Europe</b>												
National partnership	1 694	1 821	1 786	1 860	1 906	1 884	2 076	2 041	15 068	59%	20%	+ 2%
Intra continental partnership	398	456	424	465	453	481	551	547	3 775	15%	37%	+ 4%
Inter continental partnership	608	664	714	753	798	942	996	1 072	6 547	26%	76%	+ 7%
<b>All partnerships</b>	<b>2 700</b>	<b>2 941</b>	<b>2 924</b>	<b>3 078</b>	<b>3 157</b>	<b>3 307</b>	<b>3 623</b>	<b>3 660</b>	<b>25 390</b>	<b>100%</b>	<b>36%</b>	<b>+ 4%</b>
<b>Americas</b>												
National partnership	1 704	1 674	1 741	1 820	1 799	1 808	1 897	1 908	14 351	67%	12%	+ 1%
Intra continental partnership	114	127	130	130	143	182	179	163	1 168	5%	43%	+ 5%
Inter continental partnership	543	573	637	669	743	863	923	1 032	5 983	28%	90%	+ 8%
<b>All partnerships</b>	<b>2 361</b>	<b>2 374</b>	<b>2 508</b>	<b>2 619</b>	<b>2 685</b>	<b>2 853</b>	<b>2 999</b>	<b>3 103</b>	<b>21 502</b>	<b>100%</b>	<b>31%</b>	<b>+ 3%</b>
<b>Asia</b>												
National partnership	1 081	1 405	1 565	1 755	1 939	2 301	2 597	2 373	15 016	76%	120%	+ 10%
Intra continental partnership	46	59	55	50	90	114	125	131	670	3%	185%	+ 14%
Inter continental partnership	295	362	389	408	497	632	680	758	4 021	20%	157%	+ 13%
<b>All partnerships</b>	<b>1 422</b>	<b>1 826</b>	<b>2 009</b>	<b>2 213</b>	<b>2 526</b>	<b>3 047</b>	<b>3 402</b>	<b>3 262</b>	<b>19 707</b>	<b>100%</b>	<b>129%</b>	<b>+ 11%</b>
<b>Oceania</b>												
National partnership	208	223	196	211	237	269	218	224	1 786	54%	8%	+ 1%
Intra continental partnership	9	7	2	5	9	9	8	5	54	2%	ns	ns
Inter continental partnership	137	156	161	153	191	206	203	235	1 442	44%	72%	+ 7%
<b>All partnerships</b>	<b>354</b>	<b>386</b>	<b>359</b>	<b>369</b>	<b>437</b>	<b>484</b>	<b>429</b>	<b>464</b>	<b>3 282</b>	<b>100%</b>	<b>31%</b>	<b>+ 3%</b>
<b>Africa</b>												
National partnership	83	124	147	184	207	202	183	136	1 266	40%	64%	+ 6%
Intra continental partnership	5	12	9	10	6	11	14	15	82	3%	ns	ns
Inter continental partnership	113	144	156	194	237	293	299	373	1 809	57%	230%	+ 16%
<b>All partnerships</b>	<b>201</b>	<b>280</b>	<b>312</b>	<b>388</b>	<b>450</b>	<b>506</b>	<b>496</b>	<b>524</b>	<b>3 157</b>	<b>100%</b>	<b>161%</b>	<b>+ 13%</b>
<b>Global</b>												
National partnership	4 770	5 247	5 435	5 830	6 088	6 464	6 971	6 682	47 487	76%	40%	+ 4%
Intra continental partnership	572	661	620	660	701	797	877	861	5 749	9%	51%	+ 5%
Inter continental partnership	811	911	981	1 044	1 182	1 381	1 470	1 631	9 411	15%	101%	+ 9%
Without information about partnership	11	14	14	22	11	14	11	10	107	0%	ns	ns
<b>All partnerships</b>	<b>6 164</b>	<b>6 833</b>	<b>7 050</b>	<b>7 556</b>	<b>7 982</b>	<b>8 656</b>	<b>9 329</b>	<b>9 184</b>	<b>62 754</b>	<b>100%</b>	<b>49%</b>	<b>+ 5%</b>

**Table 11:** Number of publications by geographical region and partnerships for the period 2006-2013.

Partnership	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Regional share	Growth rate 2006-2013	Average annual growth rate
<b>Western Europe</b>												
National partnership	544	637	569	573	589	595	670	633	4 810	48%	16%	+ 2%
Intra continental partnership	259	274	261	288	286	306	343	336	2 353	23%	30%	+ 3%
Inter continental partnership	258	266	298	332	359	424	459	507	2 903	29%	97%	+ 9%
<b>All partnerships</b>	<b>1 061</b>	<b>1 177</b>	<b>1 128</b>	<b>1 193</b>	<b>1 234</b>	<b>1 325</b>	<b>1 472</b>	<b>1 476</b>	<b>10 066</b>	<b>100%</b>	<b>39%</b>	<b>+ 4%</b>
<b>Northern Europe</b>												
National partnership	584	616	588	644	592	581	602	596	4 803	50%	2%	+ 0%
Intra continental partnership	214	239	231	244	259	274	295	288	2 044	21%	35%	+ 4%
Inter continental partnership	273	324	298	330	326	385	421	414	2 771	29%	52%	+ 5%
<b>All partnerships</b>	<b>1 071</b>	<b>1 179</b>	<b>1 117</b>	<b>1 218</b>	<b>1 177</b>	<b>1 240</b>	<b>1 318</b>	<b>1 298</b>	<b>9 618</b>	<b>100%</b>	<b>21%</b>	<b>+ 2%</b>
<b>Southern Europe</b>												
National partnership	364	418	398	416	471	417	497	508	3 489	56%	40%	+ 4%
Intra continental partnership	137	188	159	183	137	177	201	199	1 381	22%	45%	+ 5%
Inter continental partnership	103	137	155	143	173	220	216	253	1 400	22%	146%	+ 12%
<b>All partnerships</b>	<b>604</b>	<b>743</b>	<b>712</b>	<b>742</b>	<b>781</b>	<b>814</b>	<b>914</b>	<b>960</b>	<b>6 270</b>	<b>100%</b>	<b>59%</b>	<b>+ 6%</b>
<b>Eastern Europe</b>												
National partnership	202	150	231	227	254	291	307	304	1 966	62%	50%	+ 5%
Intra continental partnership	59	75	80	81	81	77	109	102	664	21%	73%	+ 7%
Inter continental partnership	63	48	65	55	52	81	71	84	519	16%	33%	+ 4%
<b>All partnerships</b>	<b>324</b>	<b>273</b>	<b>376</b>	<b>363</b>	<b>387</b>	<b>449</b>	<b>487</b>	<b>490</b>	<b>3 149</b>	<b>100%</b>	<b>51%</b>	<b>+ 5%</b>
<b>North America</b>												
National partnership	1 466	1 409	1 403	1 420	1 393	1 349	1 358	1 364	11 162	64%	-7%	- 1%
Intra continental partnership	106	113	116	114	127	155	157	142	1 030	6%	34%	+ 4%
Inter continental partnership	471	511	549	580	655	730	796	869	5 161	30%	85%	+ 8%
<b>All partnerships</b>	<b>2 043</b>	<b>2 033</b>	<b>2 068</b>	<b>2 114</b>	<b>2 175</b>	<b>2 234</b>	<b>2 311</b>	<b>2 375</b>	<b>17 353</b>	<b>100%</b>	<b>16%</b>	<b>+ 2%</b>
<b>South America</b>												
National partnership	201	217	251	321	329	378	454	484	2 635	66%	141%	+ 12%
Intra continental partnership	48	56	57	48	73	100	85	91	558	14%	90%	+ 8%
Inter continental partnership	62	56	70	80	80	135	133	157	773	19%	153%	+ 12%
<b>All partnerships</b>	<b>311</b>	<b>329</b>	<b>378</b>	<b>449</b>	<b>482</b>	<b>613</b>	<b>672</b>	<b>732</b>	<b>3 966</b>	<b>100%</b>	<b>135%</b>	<b>+ 11%</b>
<b>Central America</b>												
National partnership	33	43	80	68	69	76	80	57	506	57%	73%	+ 7%
Intra continental partnership	17	19	19	18	23	26	25	16	163	18%	ns	ns
Inter continental partnership	17	24	25	19	32	36	25	39	217	24%	ns	ns
<b>All partnerships</b>	<b>67</b>	<b>86</b>	<b>124</b>	<b>105</b>	<b>124</b>	<b>138</b>	<b>130</b>	<b>112</b>	<b>886</b>	<b>100%</b>	<b>67%</b>	<b>+ 7%</b>
<b>Caribbean</b>												
National partnership	4	5	7	11	8	5	5	3	48	22%	ns	ns
Intra continental partnership	5	4	4	3	12	5	13	10	56	25%	ns	ns
Inter continental partnership	11	6	14	11	6	21	17	30	116	53%	ns	ns
<b>All partnerships</b>	<b>20</b>	<b>15</b>	<b>25</b>	<b>25</b>	<b>26</b>	<b>31</b>	<b>35</b>	<b>43</b>	<b>220</b>	<b>100%</b>	<b>ns</b>	<b>ns</b>

Partnership	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Regional share	Growth rate 2006-2013	Average annual growth rate
<b>Eastern Asia</b>												
National partnership	607	785	823	1 007	1 145	1 412	1 651	1 588	9 018	76%	162%	+ 13%
Intra continental partnership	41	52	48	43	83	96	102	118	583	5%	188%	+ 14%
Inter continental partnership	157	204	215	234	268	342	371	419	2 210	19%	167%	+ 13%
<b>All partnerships</b>	<b>805</b>	<b>1 041</b>	<b>1 086</b>	<b>1 284</b>	<b>1 496</b>	<b>1 850</b>	<b>2 124</b>	<b>2 125</b>	<b>11 811</b>	<b>100%</b>	<b>164%</b>	<b>+ 13%</b>
<b>Southern Asia</b>												
National partnership	293	381	471	410	474	570	605	506	3 710	81%	73%	+ 7%
Intra continental partnership	10	11	10	13	29	37	48	46	204	4%	ns	ns
Inter continental partnership	41	54	69	60	83	111	105	132	655	14%	222%	+ 16%
<b>All partnerships</b>	<b>344</b>	<b>446</b>	<b>550</b>	<b>483</b>	<b>586</b>	<b>718</b>	<b>758</b>	<b>684</b>	<b>4 569</b>	<b>100%</b>	<b>99%</b>	<b>+ 9%</b>
<b>Western Asia</b>												
National partnership	143	186	203	227	225	200	237	182	1 603	69%	27%	+ 3%
Intra continental partnership	1	4	7	4	4	10	14	4	48	2%	ns	ns
Inter continental partnership	53	59	62	55	78	112	120	127	666	29%	140%	+ 12%
<b>All partnerships</b>	<b>197</b>	<b>249</b>	<b>272</b>	<b>286</b>	<b>307</b>	<b>322</b>	<b>371</b>	<b>313</b>	<b>2 317</b>	<b>100%</b>	<b>59%</b>	<b>+ 6%</b>
<b>South-Eastern Asia</b>												
National partnership	38	50	67	110	95	117	103	96	676	41%	153%	+ 12%
Intra continental partnership	14	26	31	24	39	51	60	59	304	19%	ns	ns
Inter continental partnership	49	54	57	79	86	99	123	115	662	40%	135%	+ 11%
<b>All partnerships</b>	<b>101</b>	<b>130</b>	<b>155</b>	<b>213</b>	<b>220</b>	<b>267</b>	<b>286</b>	<b>270</b>	<b>1 642</b>	<b>100%</b>	<b>167%</b>	<b>+ 13%</b>
<b>Central Asia</b>												
National partnership	0	3	1	1	0	2	1	1	9	29%	ns	ns
Intra continental partnership	0	1	0	0	0	0	1	1	3	10%	ns	ns
Inter continental partnership	3	2	0	1	4	2	4	3	19	61%	ns	ns
<b>All partnerships</b>	<b>3</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>5</b>	<b>31</b>	<b>100%</b>	<b>ns</b>	<b>ns</b>
<b>Australia and New Zealand</b>												
National partnership	207	222	194	211	235	269	218	223	1 779	55%	8%	+ 1%
Intra continental partnership	9	7	2	5	9	9	8	5	54	2%	ns	ns
Inter continental partnership	133	155	159	149	184	204	201	232	1 417	44%	74%	+ 7%
<b>All partnerships</b>	<b>349</b>	<b>384</b>	<b>355</b>	<b>365</b>	<b>428</b>	<b>482</b>	<b>427</b>	<b>460</b>	<b>3 250</b>	<b>100%</b>	<b>32%</b>	<b>+ 4%</b>
<b>Melanesia</b>												
National partnership	1	1	2	0	2	0	0	1	7	18%	ns	ns
Intra continental partnership	0	1	0	1	0	1	0	0	3	8%	ns	ns
Inter continental partnership	5	1	1	4	10	2	4	2	29	74%	ns	ns
<b>All partnerships</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>12</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>39</b>	<b>100%</b>	<b>ns</b>	<b>ns</b>
<b>Polynesia</b>												
National partnership	0	0	0	0	0	0	0	0	0	0%	ns	ns
Intra continental partnership	0	0	0	0	0	0	0	0	0	0%	ns	ns
Inter continental partnership	0	0	1	2	2	1	1	2	9	100%	ns	ns
<b>All partnerships</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>9</b>	<b>100%</b>	<b>ns</b>	<b>ns</b>

Partnership	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Regional share	Growth rate 2006-2013	Average annual growth rate
<b>Northern Africa</b>												
National partnership	20	25	38	42	54	63	63	40	345	35%	ns	ns
Intra continental partnership	0	2	2	4	3	2	1	1	15	2%	ns	ns
Inter continental partnership	24	34	48	62	88	118	110	145	629	64%	504%	+ 25%
<b>All partnerships</b>	<b>44</b>	<b>61</b>	<b>88</b>	<b>108</b>	<b>145</b>	<b>183</b>	<b>174</b>	<b>186</b>	<b>989</b>	<b>100%</b>	<b>323%</b>	<b>+ 20%</b>
<b>Eastern Africa</b>												
National partnership	21	25	26	58	56	50	26	33	295	32%	ns	ns
Intra continental partnership	2	7	4	3		3	6	6	31	3%	ns	ns
Inter continental partnership	35	61	61	58	78	83	93	131	600	65%	274%	+ 18%
<b>All partnerships</b>	<b>58</b>	<b>93</b>	<b>91</b>	<b>119</b>	<b>134</b>	<b>136</b>	<b>125</b>	<b>170</b>	<b>926</b>	<b>100%</b>	<b>193%</b>	<b>+ 14%</b>
<b>Southern Africa</b>												
National partnership	24	33	42	44	44	57	60	46	350	44%	ns	ns
Intra continental partnership	1	5	8	5	4	9	9	8	49	6%	ns	ns
Inter continental partnership	29	38	22	52	43	62	71	88	405	50%	ns	ns
<b>All partnerships</b>	<b>54</b>	<b>76</b>	<b>72</b>	<b>101</b>	<b>91</b>	<b>128</b>	<b>140</b>	<b>142</b>	<b>804</b>	<b>100%</b>	<b>163%</b>	<b>+ 13%</b>
<b>Western Africa</b>												
National partnership	14	39	40	39	51	32	33	17	265	47%	ns	ns
Intra continental partnership	3	5	3	4	2	6	9	9	41	7%	ns	ns
Inter continental partnership	24	17	25	30	39	33	46	44	258	46%	ns	ns
<b>All partnerships</b>	<b>41</b>	<b>61</b>	<b>68</b>	<b>73</b>	<b>92</b>	<b>71</b>	<b>88</b>	<b>70</b>	<b>564</b>	<b>100%</b>	<b>71%</b>	<b>+ 7%</b>
<b>Middle Africa</b>												
National partnership	4	2	1	1	2	0	1	0	11	11%	ns	ns
Intra continental partnership	2	1	0	0	0	1	0	0	4	4%	ns	ns
Inter continental partnership	8	6	7	11	11	22	8	14	87	85%	ns	ns
<b>All partnerships</b>	<b>14</b>	<b>9</b>	<b>8</b>	<b>12</b>	<b>13</b>	<b>23</b>	<b>9</b>	<b>14</b>	<b>102</b>	<b>100%</b>	<b>ns</b>	<b>ns</b>

**Table 12:** Number of publications by geographical continent and species for the period 2006-2013.

Species	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Continental share	Growth rate 2006-2013	Average annual growth rate
<b>Europe</b>												
Ruminants	1 158	1 194	1 176	1 207	1 200	1 239	1 465	1 451	10 090	40%	25%	+ 3%
Poultry	448	535	550	552	569	611	612	660	4 537	18%	47%	+ 5%
Pigs	352	408	350	450	495	497	527	542	3 621	14%	54%	+ 6%
Fishes	346	418	412	426	431	473	479	454	3 439	14%	31%	+ 3%
Horses	131	120	147	138	166	163	205	213	1 283	5%	63%	+ 6%
Rabbits	118	100	110	125	94	120	93	96	856	3%	-19%	- 3%
Bees	27	18	24	16	31	34	52	47	249	1%	ns	ns
Multispecies	120	148	155	164	171	170	190	197	1 315	5%	64%	+ 6%
<b>All species</b>	<b>2 700</b>	<b>2 941</b>	<b>2 924</b>	<b>3 078</b>	<b>3 157</b>	<b>3 307</b>	<b>3 623</b>	<b>3 660</b>	<b>25 390</b>	<b>100%</b>	<b>36%</b>	<b>+ 4%</b>
<b>Americas</b>												
Ruminants	889	888	906	972	946	1 044	1 093	1 137	7 875	37%	28%	+ 3%
Poultry	538	568	620	642	646	624	641	701	4 980	23%	30%	+ 3%
Pigs	269	264	261	309	343	360	438	399	2 643	12%	48%	+ 5%
Fishes	262	273	302	295	311	362	357	377	2 539	12%	44%	+ 5%
Horses	159	162	183	153	170	182	189	199	1 397	6%	25%	+ 3%
Rabbits	107	88	100	95	99	100	90	102	781	4%	-5%	- 1%
Bees	21	18	19	22	29	28	47	39	223	1%	ns	ns
Multispecies	116	113	117	131	141	153	144	149	1 064	5%	28%	+ 3%
<b>All species</b>	<b>2 361</b>	<b>2 374</b>	<b>2 508</b>	<b>2 619</b>	<b>2 685</b>	<b>2 853</b>	<b>2 999</b>	<b>3 103</b>	<b>21 502</b>	<b>100%</b>	<b>31%</b>	<b>+ 3%</b>
<b>Asia</b>												
Ruminants	472	652	682	688	756	904	999	973	6 126	31%	106%	+ 9%
Poultry	341	391	494	602	609	731	880	833	4 881	25%	144%	+ 12%
Pigs	180	232	251	330	392	524	564	496	2 969	15%	176%	+ 14%
Fishes	256	301	335	359	448	525	588	559	3 371	17%	118%	+ 10%
Horses	34	55	42	36	70	71	73	79	460	2%	132%	+ 11%
Rabbits	82	98	98	84	104	145	130	144	885	4%	76%	+ 7%
Bees	6	19	8	14	24	24	35	26	156	1%	ns	ns
Multispecies	51	78	99	100	123	123	133	152	859	4%	198%	+ 15%
<b>All species</b>	<b>1 422</b>	<b>1 826</b>	<b>2 009</b>	<b>2 213</b>	<b>2 526</b>	<b>3 047</b>	<b>3 402</b>	<b>3 262</b>	<b>19 707</b>	<b>100%</b>	<b>129%</b>	<b>+ 11%</b>
<b>Oceania</b>												
Ruminants	163	173	184	195	210	199	179	209	1 512	46%	28%	+ 3%
Poultry	72	72	67	60	67	80	82	92	592	18%	28%	+ 3%
Pigs	30	32	25	29	31	32	46	34	259	8%	ns	ns
Fishes	36	53	37	43	61	56	51	56	393	12%	ns	ns
Horses	18	20	19	11	22	75	34	43	242	7%	ns	ns
Rabbits	12	14	8	8	19	11	13	12	97	3%	ns	ns
Bees	2	2		2	4	5	2	7	24	1%	ns	ns
Multispecies	21	20	19	21	23	26	22	11	163	5%	ns	ns
<b>All species</b>	<b>354</b>	<b>386</b>	<b>359</b>	<b>369</b>	<b>437</b>	<b>484</b>	<b>429</b>	<b>464</b>	<b>3 282</b>	<b>100%</b>	<b>31%</b>	<b>+ 3%</b>

Species	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Continental share	Growth rate 2006-2013	Average annual growth rate
<b>Africa</b>												
Ruminants	120	157	149	220	220	280	222	258	1 626	52%	115%	+ 10%
Poultry	27	49	57	67	83	89	120	108	600	19%	300%	+ 19%
Pigs	8	13	10	21	31	28	23	36	170	5%	ns	ns
Fishes	22	31	47	35	49	52	61	41	338	11%	ns	ns
Horses	10	12	18	20	26	21	29	38	174	6%	ns	ns
Rabbits	6	6	14	7	13	17	17	15	95	3%	ns	ns
Bees		1		3	4	5	7	4	24	1%	ns	ns
Multispecies	8	11	17	15	24	14	17	24	130	4%	ns	ns
<b>All species</b>	<b>201</b>	<b>280</b>	<b>312</b>	<b>388</b>	<b>450</b>	<b>506</b>	<b>496</b>	<b>524</b>	<b>3 157</b>	<b>100%</b>	<b>161%</b>	<b>+ 13%</b>

**Table 13:** Number of publications by pathogen in Africa for the period 2006-2013.

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Actinomycetaceae	5	15	12	14	25	20	16	22	129	ns	ns
Bacteria	Aeromonadaceae	1	4	3	3	6	7	4	5	33	ns	ns
Bacteria	Alcaligenaceae	2	1	1	1		4	1	1	11	ns	ns
Bacteria	Anaplasmataceae			1					1	2	ns	ns
Bacteria	Bacillaceae	4	15	9	8	14	22	13	14	99	ns	ns
Bacteria	Bartonellaceae						2		1	3	ns	ns
Bacteria	Brucellaceae	5	10	7	10	18	21	15	24	110	ns	ns
Bacteria	Burkholderiaceae	1					2	2	2	7	ns	ns
Bacteria	Campylobacteraceae	4	3	5	7	6	8	5	9	47	ns	ns
Bacteria	Cardiobacteriaceae								2	2	ns	ns
Bacteria	Chlamydiaceae	1			1	2	1	2	2	9	ns	ns
Bacteria	Clostridiaceae	2	5	4	6	3	1	4	7	32	ns	ns
Bacteria	Corynebacteriaceae		2		1		1	3	2	9	ns	ns
Bacteria	Coxiellaceae				1	1		2	2	6	ns	ns
Bacteria	Dermatophilaceae	1	3	1	3	2	2		2	14	ns	ns
Bacteria	Ehrlichiaeae	8	9	11	11	13	9	10	9	80	ns	ns
Bacteria	Enterobacteriaceae	13	31	31	48	50	49	54	49	325	ns	ns
Bacteria	Enterococcaceae	4	3	1	3	1	2	1	2	17	ns	ns
Bacteria	Flavobacteriaceae		1	3	1	1			1	7	ns	ns
Bacteria	Francisellaceae					1				1	ns	ns
Bacteria	Fusobacteriaceae			1		1			2	4	ns	ns
Bacteria	Lactobacillaceae	4	7	9	5	4	8	7	7	51	ns	ns
Bacteria	Leuconostocaceae						1		1	2	ns	ns
Bacteria	Listeriaceae	1	3	4	3	1	5	6	1	24	ns	ns
Bacteria	Micrococcaceae				1	1		1		3	ns	ns
Bacteria	Moraxellaceae			1	2			1		4	ns	ns
Bacteria	Mycobacteriaceae	8	7	10	28	27	31	29	31	171	ns	ns
Bacteria	Mycoplasmataceae	8	7	6	8	10	10	7	11	67	ns	ns
Bacteria	Neisseriaceae			1	1			1	3	6	ns	ns
Bacteria	Nocardiaceae				3		1			4	ns	ns
Bacteria	Paenibacillaceae						1		2	3	ns	ns
Bacteria	Pasteurellaceae	9	12	10	10	12	17	14	12	96	ns	ns
Bacteria	Pseudomonadaceae		6	4	6	3	9	8	3	39	ns	ns
Bacteria	Rickettsiaceae	1	5	7	7	11	6	9	7	53	ns	ns
Bacteria	Spirochaetae	1	1	1	2	3		6	7	21	ns	ns
Bacteria	Staphylococcaceae	6	9	7	15	15	20	19	18	109	ns	ns
Bacteria	Streptococcaceae	4	17	12	13	22	21	13	27	129	ns	ns
Bacteria	Vibrionaceae	2	3	6	5	3	12	9	7	47	ns	ns
Parasites	Ancylostomatidae						1			1	ns	ns
Parasites	Anisakidae	1		4	1	2	2	2	2	14	ns	ns
Parasites	Anoplocephalidae			2	1		1	1	1	6	ns	ns
Parasites	Argulidae					1		1		2	ns	ns
Parasites	Arthrodermataceae	1			1			1		3	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Ascarididae		2		1	2			1	6	ns	ns
Parasites	Ascospaeraceae		1		2	1	1			5	ns	ns
Parasites	Babesiidae	8	7	13	11	15	11	16	21	102	ns	ns
Parasites	Bodonidae								1	1	ns	ns
Parasites	Bothriocephalidae		1		1					2	ns	ns
Parasites	Caligidae		1			2	1	1	1	6	ns	ns
Parasites	Calliphoridae	1		1	3	1		3	2	11	ns	ns
Parasites	Capsalidae						1			1	ns	ns
Parasites	Clavicipitaceae							1		1	ns	ns
Parasites	Clinostomidae				1				1	2	ns	ns
Parasites	Cryptosporidiidae		3	4	1	4	5	7	9	33	ns	ns
Parasites	Cystidicolidae					2				2	ns	ns
Parasites	Dactylogyridae					2		1	2	5	ns	ns
Parasites	Davaineidae	2	2	2	1	5	2	1	4	19	ns	ns
Parasites	Demodicidae			1	1					2	ns	ns
Parasites	Diaporthaceae							1		1	ns	ns
Parasites	Dicrocoeliidae		1							1	ns	ns
Parasites	Dictyocaulidae	1				2	3			6	ns	ns
Parasites	Diectophymatidae	1								1	ns	ns
Parasites	Diphyllobothriidae			2				2	2	6	ns	ns
Parasites	Diplostomatidae			1		3		1	2	7	ns	ns
Parasites	Dracunculidae	1	1	1						3	ns	ns
Parasites	Eimeriidae		1	8	5	8	9	15	14	60	ns	ns
Parasites	Ergasilidae		1				2		2	5	ns	ns
Parasites	Fasciolidae	3	5	8	11	5	10	6	5	53	ns	ns
Parasites	Filariidae	1	2	1	1	1	3	1	1	11	ns	ns
Parasites	Gyrodactylidae		1			2	1	3		7	ns	ns
Parasites	Haematopinidae			1	1	1			1	4	ns	ns
Parasites	Haemogregarinidae	3						1	1	5	ns	ns
Parasites	Haemoproteidae			1	1	1		1	1	5	ns	ns
Parasites	Herpotrichiellaceae						1			1	ns	ns
Parasites	Heterakidae								2	2	ns	ns
Parasites	Heterophyidae			2		2				4	ns	ns
Parasites	Hexabothriidae							1		1	ns	ns
Parasites	Hexamitidae					1		2	1	4	ns	ns
Parasites	Hippoboscidae						3	1		4	ns	ns
Parasites	Hymenolepididae	2	2	2	1	4	2	1	4	18	ns	ns
Parasites	Hymenostomatida	1					1			2	ns	ns
Parasites	Kudoidea			1	1			2	1	5	ns	ns
Parasites	Leptolegniellaceae			1	1	1	1	2		6	ns	ns
Parasites	Lernaeidae			3	1			2	1	7	ns	ns
Parasites	Lernaeopodidae					3	1		1	5	ns	ns
Parasites	Leucocytozoidae		1	1	1				1	4	ns	ns
Parasites	Linognathidae			1				1	1	3	ns	ns
Parasites	Metastrongylidae	1				1	1			3	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Miscellaneous ectoparasites	3	3	4	4	5	3	4	5	31	ns	ns
Parasites	Miscellaneous helminths	20	26	22	21	23	23	26	21	182	ns	ns
Parasites	Monocercomonadidae			1	1	3				5	ns	ns
Parasites	Myxobolidae		2	2		4	1		1	10	ns	ns
Parasites	Nectriaceae		2	4	7	7	6	5	5	36	ns	ns
Parasites	Oestridae			2		2	1			5	ns	ns
Parasites	Onchocercidae							1		1	ns	ns
Parasites	Onygenaceae	3								3	ns	ns
Parasites	Oodiniaceae						1	1		2	ns	ns
Parasites	Other parasites		1	1		1	1	2		6	ns	ns
Parasites	Paramoebidae								1	1	ns	ns
Parasites	Paramphistomatidae			1		2	1			4	ns	ns
Parasites	Philometridae				1	1				2	ns	ns
Parasites	Piscicolidae						1		1	2	ns	ns
Parasites	Plasmodiidae	7	4	10	13	6	16	19	13	88	ns	ns
Parasites	Pleistophorae				1		1	3		5	ns	ns
Parasites	Proteocephalidae	1	1			3	1	2	1	9	ns	ns
Parasites	Protostrongylidae	1				1	1			3	ns	ns
Parasites	Psoroptidae	3	1		2	2	2	2		12	ns	ns
Parasites	Pyalidae					1				1	ns	ns
Parasites	Saccharomycetaceae	1	1	3	1	1	4	4	4	19	ns	ns
Parasites	Saprolegniaceae			1	1	2				4	ns	ns
Parasites	Sarcocystidae		5	4	7	4	7	5	11	43	ns	ns
Parasites	Sarcophagidae	1		1	3	1		3	1	10	ns	ns
Parasites	Sarcoptidae					1	1		1	3	ns	ns
Parasites	Schistocephalidae							1		1	ns	ns
Parasites	Schistosomatidae	5	6	4	1	1	1	3	1	22	ns	ns
Parasites	Strongyloididae		2	3				4		9	ns	ns
Parasites	Syngamidae						1		1	2	ns	ns
Parasites	Taeniidae	8	9	7	15	18	11	9	17	94	ns	ns
Parasites	Theileriidae	10	8	6	7	8	11	9	6	65	ns	ns
Parasites	Thelaziidae						1			1	ns	ns
Parasites	Trichinellidae				1	1			3	5	ns	ns
Parasites	Trichocomaceae	1	1	4	6	3	6	11	2	34	ns	ns
Parasites	Trichodectidae			1					1	2	ns	ns
Parasites	Trichodinidae						3	2	1	6	ns	ns
Parasites	Trichomonadidae		1				4		1	6	ns	ns
Parasites	Trichostrongylidae	4	11	7	11	4	7	14	9	67	ns	ns
Parasites	Trichuridae			2				2		4	ns	ns
Parasites	Trypanosomatidae	15	10	21	22	17	19	9	15	128	ns	ns
Parasites	Unikaryonidae		1				1			2	ns	ns
Parasites	Varroidae					1	2	3	1	7	ns	ns
Prions	Prions	1	2	3	3	1	2	4	4	20	ns	ns
Viruses	Adenoviridae		1	3		2		4	1	11	ns	ns
Viruses	Alloherpesviridae	1	1	2	1	1	3	7	4	20	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Viruses	Arteriviridae	1	1			2	1		1	6	ns	ns
Viruses	Asfaviridae	1	6	1	8	8	11	4	14	53	ns	ns
Viruses	Birnaviridae	1	2	2	1	1	3	3	3	16	ns	ns
Viruses	Bunyaviridae	2	6	5	6	9	17	13	17	75	ns	ns
Viruses	Caliciviridae			1		1	1	1	3	7	ns	ns
Viruses	Circoviridae	7	9	15	14	9	15	10	7	86	ns	ns
Viruses	Coronaviridae	4	1		9	8	7	7	5	41	ns	ns
Viruses	Dicistroviridae					1				1	ns	ns
Viruses	Flaviviridae	3	10	14	14	15	23	25	26	130	ns	ns
Viruses	Hepeviridae		1			1			1	3	ns	ns
Viruses	Herpesviridae	2	3	4	4	3	9	11	8	44	ns	ns
Viruses	Iflaviridae					2	2	2		6	ns	ns
Viruses	Iridoviridae								1	1	ns	ns
Viruses	Nimaviridae			1					1	2	ns	ns
Viruses	Nodaviridae			1	1	1	1	1	2	7	ns	ns
Viruses	Orthomyxoviridae	2	15	12	13	30	32	36	25	165	ns	ns
Viruses	Other viruses		2		4	4	2	8	4	24	ns	ns
Viruses	Papillomaviridae	1	1		1		4		2	9	ns	ns
Viruses	Paramyxoviridae	8	14	14	22	18	15	32	21	144	ns	ns
Viruses	Parvoviridae						2		2	4	ns	ns
Viruses	Picornaviridae	8	5	3	8	14	13	10	16	77	ns	ns
Viruses	Polyomaviridae								2	2	ns	ns
Viruses	Poxviridae	2	4	4	4	12	8	5	12	51	ns	ns
Viruses	Reoviridae	7	8	9	12	11	18	23	25	113	ns	ns
Viruses	Retroviridae	4	4	1	2	3	6	6	3	29	ns	ns
Viruses	Rhabdoviridae	1	3	3	1		2	2	6	18	ns	ns
Viruses	Togaviridae			1	2	2	1		2	8	ns	ns

**Table 14:** Number of publications by pathogen in the Americas for the period 2006-2013.

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Actinomycetaceae	113	107	129	124	134	174	180	164	1 125	45%	5%
Bacteria	Aeromonadaceae	22	10	15	13	25	22	25	38	170	ns	ns
Bacteria	Alcaligenaceae	6	6	4	8	8	11	10	5	58	ns	ns
Bacteria	Anaplasmataceae	3	1	3	4		2	4	5	22	ns	ns
Bacteria	Bacillaceae	37	48	42	43	58	46	57	50	381	ns	ns
Bacteria	Bartonellaceae	3	5	2	2	3	7	4	4	30	ns	ns
Bacteria	Brucellaceae	28	29	31	30	40	30	45	46	279	ns	ns
Bacteria	Burkholderiaceae	2	4	3	3	3	5	6	5	31	ns	ns
Bacteria	Campylobacteraceae	59	52	51	55	35	48	45	50	395	ns	ns
Bacteria	Cardiobacteriaceae	3	2	3	3	2	4		6	23	ns	ns
Bacteria	Chlamydiaceae	14	8	17	16	20	12	16	17	120	ns	ns
Bacteria	Clostridiaceae	44	52	53	60	62	47	73	84	475	91%	8%
Bacteria	Corynebacteriaceae	7	5	13	9	7	17	16	21	95	ns	ns
Bacteria	Coxiellaceae		3	5	4	3	4	11	9	39	ns	ns
Bacteria	Dermatophilaceae					3			1	4	ns	ns
Bacteria	Desulfovibrionales	8	4	7	8	7	4	8	9	55	ns	ns
Bacteria	Ehrlichiaeae	38	28	39	30	33	28	42	27	265	ns	ns
Bacteria	Enterobacteriaceae	412	420	463	443	399	432	481	445	3 495	8%	1%
Bacteria	Enterococcaceae	24	14	18	18	26	24	19	23	166	ns	ns
Bacteria	Erysipelotrichidae		1	1	2	5	4	4	4	21	ns	ns
Bacteria	Flavobacteriaceae	41	41	43	37	44	55	49	45	355	ns	ns
Bacteria	Francisellaceae	5	4	5	7	8	7	10	8	54	ns	ns
Bacteria	Fusobacteriaceae	6	2	10	5	5	6	6	9	49	ns	ns
Bacteria	Lachnospiraceae			1		1	2	2	2	8	ns	ns
Bacteria	Lactobacillaceae	13	34	26	17	30	31	38	38	227	ns	ns
Bacteria	Leuconostocaceae	1	1	1		2		2	4	11	ns	ns
Bacteria	Listeriaceae	19	21	20	12	16	14	19	22	143	ns	ns
Bacteria	Micrococcaceae	6	5	6	2	7	3	2	3	34	ns	ns
Bacteria	Moraxellaceae	5	3	9	3	13	8	8	9	58	ns	ns
Bacteria	Moritellaceae				1	1				2	ns	ns
Bacteria	Mycobacteriaceae	115	92	102	115	92	110	102	122	850	6%	1%
Bacteria	Mycoplasmataceae	47	47	56	50	52	63	72	62	449	32%	4%
Bacteria	Neisseriaceae	4	3	4	3	4	4	5	6	33	ns	ns
Bacteria	Nocardiaceae	12	11	7	12	15	22	8	17	104	ns	ns
Bacteria	Other bacteria			1				1		2	ns	ns
Bacteria	Paenibacillaceae	4	6	5	3	5	4	5	7	39	ns	ns
Bacteria	Pasteurellaceae	67	60	61	73	80	109	91	80	621	19%	2%
Bacteria	Piscirickettsiaceae	3	2	2	1	3	6	3	3	23	ns	ns
Bacteria	Pseudomonadaceae	27	28	30	27	41	43	45	48	289	ns	ns
Bacteria	Rickettsiaceae	9	12	11	9	25	21	14	16	117	ns	ns
Bacteria	Spirochaetae	35	35	33	43	33	56	55	46	336	ns	ns
Bacteria	Spiroplasmataceae	1	1		2		1		1	6	ns	ns
Bacteria	Staphylococcaceae	72	67	77	89	102	93	129	119	748	65%	6%
Bacteria	Streptococcaceae	119	114	130	137	134	159	176	154	1 123	29%	3%

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Vibrionaceae	42	31	46	51	37	56	52	68	383	ns	ns
Parasites	Acuariidae		1		1		2		1	5	ns	ns
Parasites	Ancylostomatidae						1			1	ns	ns
Parasites	Anisakidae	3	6	3	9	5	13	7	12	58	ns	ns
Parasites	Anoplocephalidae	6	4	3	2	3	3	2	3	26	ns	ns
Parasites	Argulidae		2	2	1		5	1	2	13	ns	ns
Parasites	Arthrodermataceae	3		4	2	1	2	1	2	15	ns	ns
Parasites	Ascarididae	1	6	1	8	2	4	3	2	27	ns	ns
Parasites	Ascospaeraceae	4	7	6	7	3	8	5	7	47	ns	ns
Parasites	Atoxoplasmatidae							1		1	ns	ns
Parasites	Babesiidae	22	22	27	19	22	18	28	32	190	ns	ns
Parasites	Bodonidae		1	2	2				1	6	ns	ns
Parasites	Bothriocephalidae	2	5	2	5	2	1	1		18	ns	ns
Parasites	Bucephalidae	2			1		2		1	6	ns	ns
Parasites	Caligidae	11	15	13	12	15	28	20	23	137	ns	ns
Parasites	Calliphoridae	6	6	2	14	11	7	9	8	63	ns	ns
Parasites	Capillariidae	3	3	3	5	1	1	2	1	19	ns	ns
Parasites	Capsalidae			2		1	1	1		5	ns	ns
Parasites	Cheyletidae	1		1					2	4	ns	ns
Parasites	Chilodonellidae						2		1	3	ns	ns
Parasites	Clavicipitaceae	3	1		2	1	5	3	1	16	ns	ns
Parasites	Clinostomidae	1								1	ns	ns
Parasites	Cochlosmatidae	1								1	ns	ns
Parasites	Cryptobiidae		3	2	1	1	1		2	10	ns	ns
Parasites	Cryptosporidiidae	26	23	25	22	26	24	32	30	208	ns	ns
Parasites	Cystidicolidae		3	1	1	4	1	2	1	13	ns	ns
Parasites	Dactylogyridae	2	4	8	6	6	7	4	7	44	ns	ns
Parasites	Davaineidae	15	11	10	14	12	12	12	17	103	ns	ns
Parasites	Demodicidae		2		1		1			4	ns	ns
Parasites	Dicrocoeliidae	3	1		1	2		3	1	11	ns	ns
Parasites	Dictyocaulidae	3	2	2	3	5	4	2	6	27	ns	ns
Parasites	Diectophymatidae				2			1	1	4	ns	ns
Parasites	Diphylobothriidae	1			1	1	1	2	2	8	ns	ns
Parasites	Diplostomatidae		1		1	2		2	1	7	ns	ns
Parasites	Dracunculidae	1		2	1	1				5	ns	ns
Parasites	Echinorhynchidae	2	5	2			1	2	1	13	ns	ns
Parasites	Eimeriidae	26	32	34	33	36	58	40	40	299	ns	ns
Parasites	Ergasilidae		3	4	2	1	1	1	2	14	ns	ns
Parasites	Fasciolidae	9	17	12	15	9	16	13	15	106	ns	ns
Parasites	Filariidae	1	3	1	1	1	1	2	1	11	ns	ns
Parasites	Glossiphonidae						1	1		2	ns	ns
Parasites	Glugeidae		2	1	2	1	2	1		9	ns	ns
Parasites	Gyrodactylidae	6	6	3	2	6	5	4	5	37	ns	ns
Parasites	Habronematidae						1		1	2	ns	ns
Parasites	Haematopinidae	2	1			1		1	1	6	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Haemogregarinidae			1					1	2	ns	ns
Parasites	Haemoproteidae	3	3	6	5	5		7	8	37	ns	ns
Parasites	Haplosporidiidae			2	2				1	5	ns	ns
Parasites	Herpotrichiellaceae	2	3	3	4	1	5	1	3	22	ns	ns
Parasites	Heterakidae	1		1		2	1		2	7	ns	ns
Parasites	Heterophyidae	2	2	1	1	3	3	5	5	22	ns	ns
Parasites	Hexamitidae	7	11	10	7	10	11	19	7	82	ns	ns
Parasites	Hippoboscidae	2		1	2	1	3	4	1	14	ns	ns
Parasites	Hymenolepididae	16	11	10	14	11	12	12	17	103	ns	ns
Parasites	Hymenostomatida	5	3	5	5	2	10	10	9	49	ns	ns
Parasites	Ichthyophonidae	4		5	2	4	1	1	4	21	ns	ns
Parasites	Ichthyophthiriidae						1		1	2	ns	ns
Parasites	Kudoidae	2	1	2	1	1		1		8	ns	ns
Parasites	Leptolegniellaceae		2		1		1		2	6	ns	ns
Parasites	Lernaeidae	2				1	1	2		6	ns	ns
Parasites	Lernaeopodidae	4	7	4	5	9	9	6	2	46	ns	ns
Parasites	Leucocytozoidae	5	1	4	2	3		2	5	22	ns	ns
Parasites	Linognathidae	2	1	1						4	ns	ns
Parasites	Listrophoridae			1	1		1		2	5	ns	ns
Parasites	Metastrongylidae	3	1	4	3	1				12	ns	ns
Parasites	Miscellaneous ectoparasites	20	12	21	20	24	27	29	34	187	ns	ns
Parasites	Miscellaneous helminths	78	79	72	83	91	91	112	103	709	32%	4%
Parasites	Monocercomonadidae	2		2	1	3	2	2	3	15	ns	ns
Parasites	Myxobolidae	11	6	15	8	13	13	9	11	86	ns	ns
Parasites	Nectriaceae	26	23	26	22	15	31	25	28	196	ns	ns
Parasites	Oestridae	2	4	2	4	1	6	7	6	32	ns	ns
Parasites	Onchocercidae	1	1			1		3		6	ns	ns
Parasites	Onygenaceae	1	1	1	1	2	3	4	6	19	ns	ns
Parasites	Oodiniaceae		2	4		5	1		3	15	ns	ns
Parasites	Other parasites	1	2		1	2	1	1		8	ns	ns
Parasites	Oxyruidae	1			1	1			1	4	ns	ns
Parasites	Paramoebidae	6	3	4	4	8	4	4	1	34	ns	ns
Parasites	Paramphistomatidae			1	1	1			1	4	ns	ns
Parasites	Philometridae	3	3	2	4	2	4			18	ns	ns
Parasites	Piscicolidae	5	1	1		2	2	2	1	14	ns	ns
Parasites	Plasmodiidae	24	21	32	29	27	27	24	55	239	ns	ns
Parasites	Pneumocystidaceae	1	1			2	3			7	ns	ns
Parasites	Proteocephalidae	2		1	2	2	4	1	1	13	ns	ns
Parasites	Protostrongylidae	3	1	2	3	3	1			13	ns	ns
Parasites	Psoroptidae	1	2	3	1	1	2	2	5	17	ns	ns
Parasites	Pyralidae		1		1					2	ns	ns
Parasites	Rhinosporideaceae				1					1	ns	ns
Parasites	Saccharomycetaceae	17	19	16	14	12	29	15	21	143	ns	ns
Parasites	Saccosporidae		1			1		1	2	5	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Saprolegniaceae	4	2	1	2	4	2	6	1	22	ns	ns
Parasites	Sarcocystidae	58	43	53	49	60	69	72	80	484	38%	4%
Parasites	Sarcophagidae	2	1	1	4	3		4	4	19	ns	ns
Parasites	Sarcoptidae		1		1	2	1		1	6	ns	ns
Parasites	Schistocephalidae			2		4	2	3		11	ns	ns
Parasites	Schistosomatidae	9	7	10	5	3	5	6	4	49	ns	ns
Parasites	Scuticociliatidae					1				1	ns	ns
Parasites	Sphaerosporidae	1					2		2	5	ns	ns
Parasites	Spiruroidae	1	2		2	1				6	ns	ns
Parasites	Strongyloididae	1	3	2	2	1	2	4	2	17	ns	ns
Parasites	Syngamidae	1	1	2	2		1		1	8	ns	ns
Parasites	Taeniidae	25	21	15	20	25	21	25	31	183	ns	ns
Parasites	Tarsonemidae						1			1	ns	ns
Parasites	Tetrahymenidae	1	2		1	2		2		8	ns	ns
Parasites	Theileriidae	3	5	5	4	7	8	13	13	58	ns	ns
Parasites	Thelaziidae	1		1	1		1			4	ns	ns
Parasites	Triaenophoridae	1					1			2	ns	ns
Parasites	Trichinellidae	1	2	1	5	3	4	5	5	26	ns	ns
Parasites	Trichocomaceae	16	25	24	23	22	28	16	31	185	ns	ns
Parasites	Trichodectidae	2					1			3	ns	ns
Parasites	Trichodinidae	1	2	4	3	4	3	5	3	25	ns	ns
Parasites	Trichomonadidae	8	9	12	7	8	10	8	13	75	ns	ns
Parasites	Trichostrongylidae	14	13	27	25	27	37	33	42	218	ns	ns
Parasites	Trichuridae	2	2	3	3	1	2	3	2	18	ns	ns
Parasites	Trombiculidae		1	1	1					3	ns	ns
Parasites	Trypanosomatidae	20	13	22	20	24	27	24	25	175	ns	ns
Parasites	Unikaryonidae	4	2	1	3			1	1	12	ns	ns
Parasites	Varroidae	4	2	4	8	7	9	17	13	64	ns	ns
Prions	Prions	66	64	66	68	43	86	49	53	495	-20%	-3%
Viruses	Adenoviridae	31	33	35	31	40	27	35	33	265	ns	ns
Viruses	Alloherpesviridae	52	49	48	51	65	64	52	58	439	12%	1%
Viruses	Arteriviridae	43	43	41	46	61	53	87	68	442	58%	6%
Viruses	Asfaviridae	6	7	7	6	7	8	5	13	59	ns	ns
Viruses	Astroviridae	1	3	4	2	4	7	10	7	38	ns	ns
Viruses	Birnaviridae	15	24	15	18	17	23	17	22	151	ns	ns
Viruses	Bornaviridae			1	5	3	3	2	3	17	ns	ns
Viruses	Bunyaviridae	6	5	9	7	10	12	21	22	92	ns	ns
Viruses	Caliciviridae	10	9	13	12	12	13	18	10	97	ns	ns
Viruses	Circoviridae	36	38	38	36	32	52	52	46	330	ns	ns
Viruses	Coronaviridae	52	39	34	45	58	42	37	50	357	ns	ns
Viruses	Dicistroviridae	2	2	2	4	3	1	3	2	19	ns	ns
Viruses	Flaviviridae	197	170	166	182	159	183	194	218	1 469	11%	1%
Viruses	Hepeviridae	4	7	6	6	3	16	14	10	66	ns	ns
Viruses	Herpesviridae	102	104	119	106	120	125	118	126	920	24%	3%
Viruses	Iflaviridae	4	1		3	4	2	11	4	29	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Viruses	Iridoviridae	7	6	4	1	6	8	12	5	49	ns	ns
Viruses	Nimaviridae	3	5	1	3	2	1	6	6	27	ns	ns
Viruses	Nodaviridae	12	13	8	6	13	9	8	1	70	ns	ns
Viruses	Orthomyxoviridae	122	161	188	251	275	255	250	298	1 800	144%	12%
Viruses	Other viruses	71	76	81	72	71	80	81	67	599	-6%	-1%
Viruses	Papillomaviridae	14	18	16	28	18	17	12	34	157	ns	ns
Viruses	Paramyxoviridae	56	37	51	35	53	57	59	53	401	-5%	-1%
Viruses	Parvoviridae	4	5	7	9	13	19	15	18	90	ns	ns
Viruses	Picornaviridae	39	34	41	37	46	53	42	47	339	ns	ns
Viruses	Polyomaviridae	3		1	3	1	4	7	8	27	ns	ns
Viruses	Poxviridae	29	35	35	37	37	30	41	41	285	ns	ns
Viruses	Reoviridae	42	37	40	50	58	38	46	65	376	ns	ns
Viruses	Retroviridae	65	71	68	65	68	55	75	82	549	26%	3%
Viruses	Rhabdoviridae	25	32	39	30	47	55	50	51	329	ns	ns
Viruses	Togaviridae	12	12	18	17	15	17	22	18	131	ns	ns

**Table 15:** Number of publications by pathogen in Asia for the period 2006-2013.

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Actinomycetaceae	59	84	92	96	119	134	156	129	869	119%	10%
Bacteria	Aeromonadaceae	33	33	29	45	65	65	71	72	413	118%	10%
Bacteria	Alcaligenaceae	6	5	3	6	4	7	6	6	43	ns	ns
Bacteria	Anaplasmataceae		1		1			1		3	ns	ns
Bacteria	Bacillaceae	39	37	46	54	75	95	108	91	545	133%	11%
Bacteria	Bartonellaceae		1				2	3	2	8	ns	ns
Bacteria	Brucellaceae	16	26	34	22	35	36	60	39	268	ns	ns
Bacteria	Burkholderiaceae	1	3	1	2	4	6	7	6	30	ns	ns
Bacteria	Campylobacteraceae	16	18	8	19	16	18	22	27	144	ns	ns
Bacteria	Cardiobacteriaceae	2	2	1	2	5	5	3	3	23	ns	ns
Bacteria	Chlamydiaceae	5	13	4	6	9	7	12	11	67	ns	ns
Bacteria	Clostridiaceae	23	35	36	36	51	39	55	66	341	ns	ns
Bacteria	Corynebacteriaceae	7	2	5	1	5	6	13	7	46	ns	ns
Bacteria	Coxiellaceae	5		4	3	9	9	9	8	47	ns	ns
Bacteria	Dermatophilaceae	1		1			1	1		4	ns	ns
Bacteria	Desulfovibrionales	1	1	4	1	2	1	3	4	17	ns	ns
Bacteria	Ehrlichiaeae	7	8	9	17	12	13	22	30	118	ns	ns
Bacteria	Enterobacteriaceae	232	290	335	392	414	504	605	527	3 299	127%	11%
Bacteria	Enterococcaceae	11	15	9	21	18	26	25	38	163	ns	ns
Bacteria	Erysipelotrichidae	1	1	2	6	2	6	5	4	27	ns	ns
Bacteria	Flavobacteriaceae	5	10	13	12	25	22	27	25	139	ns	ns
Bacteria	Francisellaceae	1			3			3	3	10	ns	ns
Bacteria	Fusobacteriaceae	3	4	4	2	6	4	3	7	33	ns	ns
Bacteria	Lachnospiraceae					2	1	2	3	8	ns	ns
Bacteria	Lactobacillaceae	15	36	43	56	63	93	73	83	462	453%	24%
Bacteria	Leuconostocaceae			1		1		4	1	7	ns	ns
Bacteria	Listeriaceae	14	17	4	9	14	12	13	20	103	ns	ns
Bacteria	Micrococcaceae	2	1	2	1	1		1	2	10	ns	ns
Bacteria	Moraxellaceae	3	5	5	6	9	5	13	8	54	ns	ns
Bacteria	Moritellaceae	1						1		2	ns	ns
Bacteria	Mycobacteriaceae	31	32	37	40	41	30	54	53	318	ns	ns
Bacteria	Mycoplasmataceae	24	17	26	29	39	54	46	46	281	ns	ns
Bacteria	Neisseriaceae	1		1		2	4	1		9	ns	ns
Bacteria	Nocardiaceae	6	2	1	5	6	7	3	5	35	ns	ns
Bacteria	Other bacteria				1					1	ns	ns
Bacteria	Paenibacillaceae	1	3	1	2	3	4	3	5	22	ns	ns
Bacteria	Pasteurellaceae	37	52	51	57	54	75	71	51	448	38%	4%
Bacteria	Piscirickettsiaceae	1		1			1			3	ns	ns
Bacteria	Pseudomonadaceae	29	28	27	43	59	52	50	39	327	ns	ns
Bacteria	Rickettsiaceae	2	4	6	3	3	6	7	10	41	ns	ns
Bacteria	Spirochaetae	7	18	13	16	18	21	19	27	139	ns	ns
Bacteria	Spiroplasmataceae			1	1	4	1	1	3	11	ns	ns
Bacteria	Staphylococcaceae	41	49	52	88	84	87	120	102	623	149%	12%
Bacteria	Streptococcaceae	74	83	123	126	158	192	225	192	1 173	159%	13%

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Vibrionaceae	38	60	60	66	72	85	111	102	594	168%	13%
Parasites	Acuariidae				1	1	1			3	ns	ns
Parasites	Amidostomatidae						1			1	ns	ns
Parasites	Ancylostomatidae					1		3		4	ns	ns
Parasites	Anisakidae	4	6	4	1	4	9	9	4	41	ns	ns
Parasites	Anoplocephalidae	3	3	1	1	3	1	6	7	25	ns	ns
Parasites	Argulidae	1		4	4	8	3	7	7	34	ns	ns
Parasites	Arthrodermataceae	3	4	3	5	4	7	8	2	36	ns	ns
Parasites	Ascarididae	5	3	4	3	2	5	10	3	35	ns	ns
Parasites	Ascospaeraceae	1		2	1	2	2	2	1	11	ns	ns
Parasites	Babesiidae	9	31	24	18	30	14	37	53	216	ns	ns
Parasites	Bodonidae	1		1	1					3	ns	ns
Parasites	Bothriocephalidae	1	1			1		3		6	ns	ns
Parasites	Bucephalidae	1	1	2	1		1	1		7	ns	ns
Parasites	Caligidae		4		4	2	4	7	3	24	ns	ns
Parasites	Calliphoridae	4	1	6	7	5	6	10	5	44	ns	ns
Parasites	Capillariidae	2	1	2	2	4	1	1	2	15	ns	ns
Parasites	Capsalidae		2		1		1		3	7	ns	ns
Parasites	Cheyletidae			2						2	ns	ns
Parasites	Chilodonellidae				1		1	2		4	ns	ns
Parasites	Clavicipitaceae						2		1	3	ns	ns
Parasites	Clinostomidae				1				1	2	ns	ns
Parasites	Cochlosmatidae				1					1	ns	ns
Parasites	Cryptobiidae	1			1	1				3	ns	ns
Parasites	Cryptosporidiidae	14	16	20	15	15	20	24	26	150	ns	ns
Parasites	Cystidicolidae						2			2	ns	ns
Parasites	Dactylogyridae	5	7	1	7	8	12	11	8	59	ns	ns
Parasites	Davaineidae	3	5	4	5	4	4	14	15	54	ns	ns
Parasites	Demodicidae								1	1	ns	ns
Parasites	Dicrocoeliidae	6	3	3	1	1	1	2	1	18	ns	ns
Parasites	Dictyocaulidae	1	2	2	2	1	6	3		17	ns	ns
Parasites	Diectophymatidae		1		1		1		2	5	ns	ns
Parasites	Diphyllobothriidae	1	2	2	2	3	1	3	2	16	ns	ns
Parasites	Diplostomatidae	1	1	2		2	3	2	2	13	ns	ns
Parasites	Diplozoidae		1			1		2		4	ns	ns
Parasites	Dracunculidae	1		2	3					6	ns	ns
Parasites	Echinorhynchidae	1	1			1	1	1		5	ns	ns
Parasites	Eimeriidae	23	22	35	28	36	43	62	56	305	ns	ns
Parasites	Ergasilidae		2	1	2			3	4	12	ns	ns
Parasites	Fasciolidae	21	14	19	14	15	29	24	19	155	ns	ns
Parasites	Filariidae		1	2	1	2	1	2	1	10	ns	ns
Parasites	Glugeidae			2	1		1			4	ns	ns
Parasites	Gongylonematidae			3	1	1			1	6	ns	ns
Parasites	Gyrodactylidae	3	5	3	3	2	5	4	3	28	ns	ns
Parasites	Habronematidae		3		1	1	3		2	10	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Haematopinidae			1	2				4	7	ns	ns
Parasites	Haemoproteidae	1	1	1	2	1		1	2	9	ns	ns
Parasites	Haplosporidiidae			1					1	2	ns	ns
Parasites	Herpotrichiellaceae			4	1	1	2	1	1	10	ns	ns
Parasites	Heterakidae		1		1	2	2	1	1	8	ns	ns
Parasites	Heterophyidae	1	5	5	4	3	3	3	8	32	ns	ns
Parasites	Hexamitidae	1	2	2	2	2	6	6	1	22	ns	ns
Parasites	Hippoboscidae		1		1	2		5	2	11	ns	ns
Parasites	Hymenolepididae	2	4	3	5	2	4	10	12	42	ns	ns
Parasites	Hymenostomatida	1		4	4	6	4	10	6	35	ns	ns
Parasites	Ichthyophonidae		1	2		1	1			5	ns	ns
Parasites	Ichthyophthiriidae			1	1	1		3		6	ns	ns
Parasites	Kudoidae	2		1	1	2	2	2	2	12	ns	ns
Parasites	Laelapidae				1		1	2		4	ns	ns
Parasites	Leptolegnellaceae		1	1	6	3	1	8	5	25	ns	ns
Parasites	Lernaeidae			4	2	1	1	10	1	19	ns	ns
Parasites	Lernaeopodidae	2	2	6	5	5	5	5	3	33	ns	ns
Parasites	Leucocytozoidae	1	1	2	2	2			4	12	ns	ns
Parasites	Linognathidae				1					1	ns	ns
Parasites	Listrophoridae			2						2	ns	ns
Parasites	Metastrongylidae	1	2	2	3	3	1	1	1	14	ns	ns
Parasites	Miscellaneous ectoparasites	1	9	6	9	8	10	9	6	58	ns	ns
Parasites	Miscellaneous helminths	23	56	61	41	35	52	67	51	386	ns	ns
Parasites	Monocercomonadidae	2		1	3	2				8	ns	ns
Parasites	Myxobolidae	4	4	3	4	9	10	8	4	46	ns	ns
Parasites	Nectriaceae	15	10	13	11	17	29	28	35	158	ns	ns
Parasites	Oestridae	4	1	3	4	2	4	3	5	26	ns	ns
Parasites	Onchocercidae			1		1	1	3	1	7	ns	ns
Parasites	Onygenaceae				2		1			3	ns	ns
Parasites	Oodiniaceae		1			1				2	ns	ns
Parasites	Other parasites	4		3	1	1	1	3		13	ns	ns
Parasites	Paramoebidae		2	1				1		4	ns	ns
Parasites	Paramphistomatidae		1	4	5	3	5	4	2	24	ns	ns
Parasites	Philometridae	1		3		2	1	2	4	13	ns	ns
Parasites	Piscicolidae	1	2	1	1		2			7	ns	ns
Parasites	Plasmodiidae	9	10	17	14	9	25	21	17	122	ns	ns
Parasites	Pleistophorae				1		1	3		5	ns	ns
Parasites	Pneumocystidaceae						1		1	2	ns	ns
Parasites	Proteocephalidae						1		1	2	ns	ns
Parasites	Protostrongylidae	1	1	1	1	2	2	1		9	ns	ns
Parasites	Psoroptidae	6	4	8	2	11		4	7	42	ns	ns
Parasites	Pylalidae		1			1		1		3	ns	ns
Parasites	Saccharomycetaceae	9	11	14	14	18	23	15	29	133	ns	ns
Parasites	Saccosporidae			1				1		2	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Saprolegniaceae	3		1	3	3	2	5	4	21	ns	ns
Parasites	Sarcocystidae	21	28	30	29	31	46	51	57	293	ns	ns
Parasites	Sarcophagidae	1	2	3	3	2	3	6	1	21	ns	ns
Parasites	Sarcoptidae		1	4		1		1	1	8	ns	ns
Parasites	Schistocephalidae		1					3		4	ns	ns
Parasites	Schistosomatidae	12	8	12	15	11	14	20	14	106	ns	ns
Parasites	Scuticociliatidae		1	1	1		1			4	ns	ns
Parasites	Sphaerosporidae			1			2			3	ns	ns
Parasites	Spiruroidae		2	1	1			2	1	7	ns	ns
Parasites	Strongyloididae	1	3	4	1	7	2	6	4	28	ns	ns
Parasites	Syngamidae				1		1	1	2	5	ns	ns
Parasites	Taeniidae	11	17	27	29	25	32	42	45	228	ns	ns
Parasites	Tarsonemidae						2		1	3	ns	ns
Parasites	Tetrahymenidae	1	3		4	3	3	1		15	ns	ns
Parasites	Tetrameridae						1			1	ns	ns
Parasites	Theileriidae	12	15	16	10	19	10	21	17	120	ns	ns
Parasites	Thelaziidae		3							3	ns	ns
Parasites	Triactinomyxidae								1	1	ns	ns
Parasites	Trichinellidae	5	2		3	2	8	3	10	33	ns	ns
Parasites	Trichocomaceae	16	30	25	29	30	26	30	32	218	ns	ns
Parasites	Trichodectidae					1		2		3	ns	ns
Parasites	Trichodinidae	1	4	2	1	5	6	4	5	28	ns	ns
Parasites	Trichomonadidae		1	1		3		5	3	13	ns	ns
Parasites	Trichostrongylidae	6	19	15	12	15	22	19	18	126	ns	ns
Parasites	Trichuridae	3	2	3	3	4	2	7	2	26	ns	ns
Parasites	Trypanosomatidae	5	17	11	13	19	18	10	22	115	ns	ns
Parasites	Unikaryonidae			1	1		1		2	5	ns	ns
Parasites	Varroidae	3	3	4	4	4	8	9	5	40	ns	ns
Prions	Prions	28	31	38	43	33	51	42	43	309	ns	ns
Viruses	Adenoviridae	15	19	26	24	29	28	30	35	206	ns	ns
Viruses	Alloherpesviridae	10	15	21	29	29	38	38	39	219	ns	ns
Viruses	Arteriviridae	18	21	25	49	62	76	112	115	478	539%	26%
Viruses	Asfaviridae	2	3	3	8	6	7	6	8	43	ns	ns
Viruses	Astroviridae	1		1	1		7	5	4	19	ns	ns
Viruses	Birnaviridae	31	35	26	29	31	35	38	33	258	ns	ns
Viruses	Bornaviridae	4	1	1	1		1	5	1	14	ns	ns
Viruses	Bunyaviridae	6	8	4	7	9	10	18	11	73	ns	ns
Viruses	Caliciviridae	3	5	8	5	6	8	5	6	46	ns	ns
Viruses	Circoviridae	19	23	30	26	31	55	55	45	284	ns	ns
Viruses	Coronaviridae	32	50	54	67	65	69	82	79	498	147%	12%
Viruses	Dicistroviridae	3	3	2	2	1	1	3	2	17	ns	ns
Viruses	Flaviviridae	108	125	132	143	173	227	253	222	1 383	106%	9%
Viruses	Hepeviridae	7	10	10	16	12	19	10	18	102	ns	ns
Viruses	Herpesviridae	50	66	67	88	88	108	112	98	677	96%	9%
Viruses	Iflaviridae	2	1		2		3	6	3	17	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Viruses	Iridoviridae	15	12	23	15	27	37	35	36	200	ns	ns
Viruses	Nimaviridae	15	10	4	10	14	16	18	23	110	ns	ns
Viruses	Nodaviridae	18	19	18	14	22	18	17	16	142	ns	ns
Viruses	Orthomyxoviridae	92	132	180	254	283	331	299	324	1 895	252%	17%
Viruses	Other viruses	46	51	64	64	56	95	106	108	590	135%	11%
Viruses	Papillomaviridae	1	9	3	4	8	8	10	13	56	ns	ns
Viruses	Paramyxoviridae	56	65	81	77	81	95	119	106	680	89%	8%
Viruses	Parvoviridae	7	4	9	16	22	22	19	19	118	ns	ns
Viruses	Picornaviridae	28	40	59	43	43	66	80	76	435	171%	13%
Viruses	Polyomaviridae	3		2	2	3	1	1		12	ns	ns
Viruses	Poxviridae	30	40	43	58	63	88	97	79	498	163%	13%
Viruses	Reoviridae	25	29	38	39	51	62	70	61	375	ns	ns
Viruses	Retroviridae	41	57	51	54	77	78	104	117	579	185%	14%
Viruses	Rhabdoviridae	23	32	36	21	30	58	46	41	287	ns	ns
Viruses	Togaviridae	10	13	9	16	13	28	23	25	137	ns	ns

**Table 16:** Number of publications by pathogen in Europe for the period 2006-2013.

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Actinomycetaceae	158	163	143	203	194	177	232	238	1 508	51%	5%
Bacteria	Aeromonadaceae	26	31	37	41	40	38	31	32	276	ns	ns
Bacteria	Alcaligenaceae	5	8	4	6	7	14	10	11	65	ns	ns
Bacteria	Anaplasmataceae	2		1	2	3	1	2	5	16	ns	ns
Bacteria	Bacillaceae	36	43	39	29	39	45	50	44	325	ns	ns
Bacteria	Bartonellaceae	3	3	4			4	2	4	20	ns	ns
Bacteria	Brucellaceae	30	30	25	34	39	39	44	50	291	ns	ns
Bacteria	Burkholderiaceae	2	3		5	1	6	7	7	31	ns	ns
Bacteria	Campylobacteraceae	50	79	64	55	54	65	70	61	498	22%	3%
Bacteria	Cardiobacteriaceae	6	4	9	11	12	10	12	11	75	ns	ns
Bacteria	Chlamydiaceae	33	35	24	39	41	35	33	28	268	ns	ns
Bacteria	Clostridiaceae	50	66	53	70	72	59	69	78	517	56%	6%
Bacteria	Corynebacteriaceae	8	5	10	12	10	17	10	10	82	ns	ns
Bacteria	Coxiellaceae	11	14	5	13	15	33	39	30	160	ns	ns
Bacteria	Dermatophilaceae	2	1			1			2	6	ns	ns
Bacteria	Desulfovibrionales	8	5	5	9	12	14	13	7	73	ns	ns
Bacteria	Ehrlichiaeae	25	22	33	26	32	31	36	34	239	ns	ns
Bacteria	Enterobacteriaceae	436	498	469	492	487	480	556	530	3 948	22%	2%
Bacteria	Enterococcaceae	44	35	22	35	49	42	39	47	313	ns	ns
Bacteria	Erysipelotrichidae	5	5		4	2	2	2	3	23	ns	ns
Bacteria	Flavobacteriaceae	24	24	18	13	29	24	25	29	186	ns	ns
Bacteria	Francisellaceae	4	6	2	5	11	16	7	6	57	ns	ns
Bacteria	Fusobacteriaceae	7	8	10	10	13	10	14	12	84	ns	ns
Bacteria	Lachnospiraceae				2	6	3	2	1	14	ns	ns
Bacteria	Lactobacillaceae	44	49	42	40	55	47	52	54	383	ns	ns
Bacteria	Leuconostocaceae	9	11	7	7	6	5	5	6	56	ns	ns
Bacteria	Listeriaceae	22	28	24	19	16	19	25	19	172	ns	ns
Bacteria	Micrococcaceae	3	4	6	3	1	1	2	3	23	ns	ns
Bacteria	Moraxellaceae	4	6	7	7	9	4	7	6	50	ns	ns
Bacteria	Moritellaceae	3	3	3	4	3	3	4		23	ns	ns
Bacteria	Mycobacteriaceae	120	89	132	127	128	152	153	157	1 058	31%	3%
Bacteria	Mycoplasmataceae	46	57	65	66	72	69	91	68	534	48%	5%
Bacteria	Neisseriaceae	3	5	3	3	5	9	5	5	38	ns	ns
Bacteria	Nocardiaceae	11	6	2	9	5	16	6	8	63	ns	ns
Bacteria	Other bacteria				1					1	ns	ns
Bacteria	Paenibacillaceae	7	2	7	5	5	4	7	13	50	ns	ns
Bacteria	Pasteurellaceae	66	78	75	80	79	104	85	81	648	23%	3%
Bacteria	Piscirickettsiaceae	1		3			3		1	8	ns	ns
Bacteria	Pseudomonadaceae	44	42	48	45	54	59	47	53	392	ns	ns
Bacteria	Rickettsiaceae	13	9	8	8	16	15	16	10	95	ns	ns
Bacteria	Spirochaetae	34	38	26	30	30	43	47	50	298	ns	ns
Bacteria	Spiroplasmataceae				1	1	1	1	1	5	ns	ns
Bacteria	Staphylococcaceae	106	124	110	141	150	170	212	213	1 226	101%	9%
Bacteria	Streptococcaceae	184	212	186	232	206	213	257	273	1 763	48%	5%

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Vibrionaceae	56	59	55	55	59	52	68	63	467	13%	1%
Parasites	Acuariidae	1		2	2			1	1	7	ns	ns
Parasites	Amidostomatidae	1					1			2	ns	ns
Parasites	Anisakidae	5	11	15	14	14	13	13	23	108	ns	ns
Parasites	Anoplocephalidae	3	4	6	4	9	5	5	10	46	ns	ns
Parasites	Argulidae	4	4	6	4	2	1	4	1	26	ns	ns
Parasites	Arthrodermataceae	2	7	7	3	4	4	4	4	35	ns	ns
Parasites	Ascarididae	4	8	2	9	8	10	12	13	66	ns	ns
Parasites	Ascosphaeraceae		6	2	3	3	2	6	6	28	ns	ns
Parasites	Babesiidae	19	19	24	16	36	21	25	31	191	ns	ns
Parasites	Bodonidae		1		1	2	1	1	3	9	ns	ns
Parasites	Bothriocephalidae	1	4	2	1	1		1	1	11	ns	ns
Parasites	Bucephalidae	2	2	1	3	3	2		2	15	ns	ns
Parasites	Caligidae	14	15	11	15	12	17	19	25	128	ns	ns
Parasites	Calliphoridae	10	7	7	7	11	10	11	10	73	ns	ns
Parasites	Capillariidae	3	6	4	5	5	1	2	3	29	ns	ns
Parasites	Capsalidae		3	1	1	1				6	ns	ns
Parasites	Cheyletidae	1		1					1	3	ns	ns
Parasites	Chilodonellidae	1	1		2	2	1			7	ns	ns
Parasites	Clavicipitaceae	2	2	1						5	ns	ns
Parasites	Clinostomidae	1								1	ns	ns
Parasites	Cochlosmatidae	1								1	ns	ns
Parasites	Cryptobiidae			1						1	ns	ns
Parasites	Cryptosporidiidae	31	39	34	30	18	19	19	30	220	ns	ns
Parasites	Cystidicolidae		3	1	3	2	1	1		11	ns	ns
Parasites	Dactylogyridae	4	3	6	5	5	7	4	3	37	ns	ns
Parasites	Davaineidae	4	6	14	10	14	8	10	14	80	ns	ns
Parasites	Dermocystidiaceae	1		2	1					4	ns	ns
Parasites	Dicrocoeliidae	1	7	1	3	3	5	4	5	29	ns	ns
Parasites	Dictyocaulidae	7	10	6	7	8	11	15	11	75	ns	ns
Parasites	Diectophymatidae	1	1	1		1	1	1	2	8	ns	ns
Parasites	Diphyllobothriidae	6	2	4	6	3	2	6	4	33	ns	ns
Parasites	Diplostomatidae	8	7	5	9	8	5	6	8	56	ns	ns
Parasites	Diplozoidae		3				2			5	ns	ns
Parasites	Dracunculidae	6	6	8	4	1		1	4	30	ns	ns
Parasites	Echinorhynchidae	1	4	4	2	2	1	4	1	19	ns	ns
Parasites	Eimeriidae	42	42	40	42	38	41	53	54	352	ns	ns
Parasites	Ergasilidae		4	2		3	1	2	3	15	ns	ns
Parasites	Fasciolidae	18	20	21	28	29	37	30	32	215	ns	ns
Parasites	Filariidae	5	6	3	5	5	6	4	2	36	ns	ns
Parasites	Glossiphonidae							1		1	ns	ns
Parasites	Glugeidae		2	3	3	1		3		12	ns	ns
Parasites	Gongylonematidae	1							2	3	ns	ns
Parasites	Gyrodactylidae	8	23	12	16	12	19	9	7	106	ns	ns
Parasites	Habronematidae	1	1		3	1	1	1	1	9	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Haematopinidae	2	1	1	1	1		1	4	11	ns	ns
Parasites	Haemogregarinidae	2		1				2	1	6	ns	ns
Parasites	Haemoproteidae	7	4	8	7	9	1	11	16	63	ns	ns
Parasites	Haplosporidiidae	1		1	1		1	1		5	ns	ns
Parasites	Herpotrichiellaceae		3	3	1	2	2	2	2	15	ns	ns
Parasites	Heterakidae	1		2	2		4	1	1	11	ns	ns
Parasites	Heterophyidae	1	4	3	2	2	1	3	6	22	ns	ns
Parasites	Hexamitidae	13	20	12	8	7	7	12	9	88	ns	ns
Parasites	Hippoboscidae			1		5	6	4		16	ns	ns
Parasites	Hymenolepididae	4	6	15	10	13	8	10	15	81	ns	ns
Parasites	Hymenostomatida	11	7	7	16	9	16	12	12	90	ns	ns
Parasites	Ichthyophonidae		1		1		1			3	ns	ns
Parasites	Ichthyophthiriidae	8	2	3	10	5	12	4	11	55	ns	ns
Parasites	Kudoidae			2	2		2	2		8	ns	ns
Parasites	Laelapidae						1			1	ns	ns
Parasites	Leptolegniellaceae	11	4	4	10	7	17	10	13	76	ns	ns
Parasites	Lernaeidae	1		2		2	2			7	ns	ns
Parasites	Lernaeopodidae	3	8	4	8	7	9	7	4	50	ns	ns
Parasites	Leucocytozoidae	1	1	7	4	4		5	9	31	ns	ns
Parasites	Linognathidae	1		1				2	1	5	ns	ns
Parasites	Listrophoridae			1			1		1	3	ns	ns
Parasites	Metastrongylidae	5	5	3	2	3	3	9	4	34	ns	ns
Parasites	Miscellaneous ectoparasites	15	16	27	24	21	32	29	30	194	ns	ns
Parasites	Miscellaneous helminths	89	96	102	90	94	110	125	99	805	11%	1%
Parasites	Monocercomonadidae	10	5	8	10	10	9	4	7	63	ns	ns
Parasites	Myxobolidae	5	12	5	12	11	6	6	3	60	ns	ns
Parasites	Nectriaceae	42	29	58	39	34	35	41	52	330	ns	ns
Parasites	Oestridae	7	3	4	3	9	3	7	8	44	ns	ns
Parasites	Onchocercidae	1			1	1		2		5	ns	ns
Parasites	Onygenaceae				1	1	1	1	3	7	ns	ns
Parasites	Oodiniaceae					1	2	1		4	ns	ns
Parasites	Other parasites	3	1	1	1	2	2			10	ns	ns
Parasites	Oxyruidae		1			1			2	4	ns	ns
Parasites	Paramoebidae	3	5	6	1	4	5	4	3	31	ns	ns
Parasites	Paramphistomatidae		2	5		3	1	3	2	16	ns	ns
Parasites	Philometridae	5	4	9	6	4	2	5	5	40	ns	ns
Parasites	Piscicolidae	5	3	1	4	3	2	2	2	22	ns	ns
Parasites	Plasmodiidae	21	18	32	30	20	35	36	50	242	ns	ns
Parasites	Pleistophorae	1		1	2		1	3		8	ns	ns
Parasites	Pneumocystidaceae	1	1				2	1	1	6	ns	ns
Parasites	Proteocephalidae	1	3	5	3	3	3	3	1	22	ns	ns
Parasites	Protostrongylidae	4	5	3		3	2	6	3	26	ns	ns
Parasites	Psoroptidae	10	10	9	9	13	10	14	9	84	ns	ns
Parasites	Pyralidae					1		1		2	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Rhinosporideaceae				2		3	3	1	9	ns	ns
Parasites	Saccharomycetaceae	13	19	16	11	17	21	17	25	139	ns	ns
Parasites	Saccosporidae	4	8	4	4	6	2	3	4	35	ns	ns
Parasites	Saprolegniaceae	3	6	1	3	3	2	5	7	30	ns	ns
Parasites	Sarcocystidae	60	54	41	50	60	71	61	83	480	38%	4%
Parasites	Sarcophagidae	9	3	3	5	4	3	5	5	37	ns	ns
Parasites	Sarcoptidae	2	6	4		2	4	2	5	25	ns	ns
Parasites	Schistocephalidae	4	2		3	1	3	3	3	19	ns	ns
Parasites	Schistosomatidae	11	12	6	9	9	9	8	7	71	ns	ns
Parasites	Scuticociliatidae			1						1	ns	ns
Parasites	Sphaerosporidae	2	2	1	1		3	1	3	13	ns	ns
Parasites	Spiruroidae	1	1	1	1		1		1	6	ns	ns
Parasites	Strongyloididae	2	7	7	2	4	3	9	4	38	ns	ns
Parasites	Syngamidae	2		1	1	2	1		5	12	ns	ns
Parasites	Taeniidae	32	23	31	26	25	19	26	43	225	ns	ns
Parasites	Tarsonemidae					1		1		2	ns	ns
Parasites	Tetrahymenidae	3	1	1	1	2	1	2		11	ns	ns
Parasites	Tetrameridae				1					1	ns	ns
Parasites	Theileriidae	15	7	12	9	10	9	18	14	94	ns	ns
Parasites	Thelaziidae	1	3				1		1	6	ns	ns
Parasites	Triactinomyxidae				1					1	ns	ns
Parasites	Triaenophoridae	2	1	3	2	1	1			10	ns	ns
Parasites	Trichinellidae	5	6	4	26	13	9	16	15	94	ns	ns
Parasites	Trichocomaceae	15	20	24	18	26	19	37	28	187	ns	ns
Parasites	Trichodectidae	1		1				1	1	4	ns	ns
Parasites	Trichodinidae	1	1		4	2	4	2	3	17	ns	ns
Parasites	Trichomonadidae	2	4	2	2	2	7	9	5	33	ns	ns
Parasites	Trichostrongylidae	32	34	33	35	40	36	49	44	303	ns	ns
Parasites	Trichuridae	6	5	3	6	4	3	11	8	46	ns	ns
Parasites	Trypanosomatidae	19	12	25	27	27	28	17	26	181	ns	ns
Parasites	Unikaryonidae	5	5	6	8	7	2	4	6	43	ns	ns
Parasites	Varroidae	5	8	10	3	12	17	17	21	93	ns	ns
Prions	Prions	145	172	123	133	99	104	93	80	949	-45%	-7%
Viruses	Adenoviridae	29	20	26	25	32	29	32	32	225	ns	ns
Viruses	Alloherpesviridae	49	45	35	49	65	54	58	54	409	10%	1%
Viruses	Arteriviridae	27	20	27	36	35	37	53	59	294	ns	ns
Viruses	Asfaviridae	19	15	17	14	19	27	21	49	181	ns	ns
Viruses	Astroviridae	3	5	1	5	4	11	10	6	45	ns	ns
Viruses	Birnaviridae	31	32	22	28	22	26	29	29	219	ns	ns
Viruses	Bornaviridae	5	5	3	4	5	2	5	4	33	ns	ns
Viruses	Bunyaviridae	5	5	6	9	19	15	40	68	167	ns	ns
Viruses	Caliciviridae	15	16	26	25	27	23	27	22	181	ns	ns
Viruses	Circoviridae	31	35	36	45	43	45	41	46	322	ns	ns
Viruses	Coronaviridae	60	53	48	64	63	67	59	63	477	5%	1%
Viruses	Dicistroviridae	3	3	3	2	7	3	8	4	33	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Viruses	Flaviviridae	171	212	176	185	189	182	232	216	1 563	26%	3%
Viruses	Hepeviridae	3	8	14	13	16	19	17	17	107	ns	ns
Viruses	Herpesviridae	94	109	91	107	118	102	126	112	859	19%	2%
Viruses	Iflaviridae	6	3	8	3	6	9	15	7	57	ns	ns
Viruses	Iridoviridae	1	3	1	7	6	9	5	4	36	ns	ns
Viruses	Nimaviridae	1	2	4	3	6	4	7	2	29	ns	ns
Viruses	Nodaviridae	12	22	9	21	19	19	15	12	129	ns	ns
Viruses	Orthomyxoviridae	107	185	169	194	239	260	236	259	1 649	142%	12%
Viruses	Other viruses	43	54	57	53	56	63	78	74	478	72%	7%
Viruses	Papillomaviridae	16	17	24	23	20	25	16	26	167	ns	ns
Viruses	Paramyxoviridae	45	62	47	48	62	54	65	54	437	20%	2%
Viruses	Parvoviridae	8	10	4	16	10	12	13	11	84	ns	ns
Viruses	Picornaviridae	54	62	88	62	53	72	68	64	523	19%	2%
Viruses	Polyomaviridae	5	4	1	4	4	7	5	4	34	ns	ns
Viruses	Poxviridae	36	43	37	39	43	34	48	35	315	ns	ns
Viruses	Reoviridae	46	47	79	86	102	87	98	119	664	159%	13%
Viruses	Retroviridae	65	91	76	69	63	67	82	93	606	43%	5%
Viruses	Rhabdoviridae	31	31	32	33	23	41	32	35	258	ns	ns
Viruses	Togaviridae	16	15	13	15	24	13	22	26	144	ns	ns

**Table 17:** Number of publications by pathogen in Oceania for the period 2006-2013.

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Bacteria	Actinomycetaceae	13	25	24	19	16	18	22	19	156	ns	ns
Bacteria	Aeromonadaceae	1	2	1			1	4	1	10	ns	ns
Bacteria	Alcaligenaceae	2				1		1		4	ns	ns
Bacteria	Bacillaceae	2	4	3		5	6	4	5	29	ns	ns
Bacteria	Bartonellaceae			1						1	ns	ns
Bacteria	Brucellaceae	1	3	1			4	3	3	15	ns	ns
Bacteria	Burkholderiaceae	1	2		1	1	3	1		9	ns	ns
Bacteria	Campylobacteraceae	4	6	15	9	7	11	13	7	72	ns	ns
Bacteria	Cardiobacteriaceae	5	2	3	7	7	4	1	9	38	ns	ns
Bacteria	Chlamydiaceae		4	1		3	2	3	4	17	ns	ns
Bacteria	Clostridiaceae	6	10	8	9	14	8	7	15	77	ns	ns
Bacteria	Corynebacteriaceae		2				3	1		6	ns	ns
Bacteria	Coxiellaceae	1	2		2	1	3	3		12	ns	ns
Bacteria	Dermatophilaceae	1		1						2	ns	ns
Bacteria	Desulfovibrionales	1	2		3	2	1	1	2	12	ns	ns
Bacteria	Ehrlichiaeae	3		2	2	2	1		1	11	ns	ns
Bacteria	Enterobacteriaceae	31	51	60	45	57	62	57	44	407	42%	4%
Bacteria	Enterococcaceae		2	2		3	2	2	1	12	ns	ns
Bacteria	Erysipelotrichidae	2			1	1		2	1	7	ns	ns
Bacteria	Flavobacteriaceae	7	17	10	6	9	8	8	1	66	ns	ns
Bacteria	Fusobacteriaceae	6	1	2	8	5	3	3	8	36	ns	ns
Bacteria	Lachnospiraceae					1	1	1	2	5	ns	ns
Bacteria	Lactobacillaceae	1	3	2	5	2	3	1	10	27	ns	ns
Bacteria	Listeriaceae	1	1	1	2	2	1	1	2	11	ns	ns
Bacteria	Micrococcaceae			1					1	2	ns	ns
Bacteria	Moraxellaceae		1				1	2	1	5	ns	ns
Bacteria	Mycobacteriaceae	30	25	25	22	28	41	19	31	221	ns	ns
Bacteria	Mycoplasmataceae	15	7	4	6	4	6	14	12	68	ns	ns
Bacteria	Neisseriaceae		1	1				1		3	ns	ns
Bacteria	Nocardiaceae	4	2	1	1	2	1	3	1	15	ns	ns
Bacteria	Paenibacillaceae	1						1	1	3	ns	ns
Bacteria	Pasteurellaceae	7	13	8	4	4	13	14	9	72	ns	ns
Bacteria	Pseudomonadaceae	3	2	3	3	4	5	2	2	24	ns	ns
Bacteria	Rickettsiaceae		2		1	3	1		1	8	ns	ns
Bacteria	Spirochaetae	6	4	7	13	12	10	11	7	70	ns	ns
Bacteria	Staphylococcaceae	6	15	9	16	11	13	10	11	91	ns	ns
Bacteria	Streptococcaceae	18	33	29	29	19	21	19	24	192	ns	ns
Bacteria	Vibrionaceae	5		2	2	8	5	5	9	36	ns	ns
Parasites	Acuariidae						1			1	ns	ns
Parasites	Amidostomatidae						1			1	ns	ns
Parasites	Anisakidae	1	1			2	3	2	6	15	ns	ns
Parasites	Anoplocephalidae		2	1					3	6	ns	ns
Parasites	Argulidae			1		1				2	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Arthrodermataceae				2					2	ns	ns
Parasites	Ascarididae	1	1		1					3	ns	ns
Parasites	Ascospaeraceae			1			2		1	4	ns	ns
Parasites	Babesiidae	3	3	3	3	2	1	3	7	25	ns	ns
Parasites	Bucephalidae	1					1			2	ns	ns
Parasites	Caligidae	1	1		4	3	5	3	7	24	ns	ns
Parasites	Calliphoridae	8	2	1	9	6	4	6	3	39	ns	ns
Parasites	Capillariidae	1				2	1			4	ns	ns
Parasites	Capsalidae		6	2	3	2	1		1	15	ns	ns
Parasites	Chilodonellidae	1								1	ns	ns
Parasites	Clavicipitaceae	1			1					2	ns	ns
Parasites	Clinostomidae								1	1	ns	ns
Parasites	Cryptosporidiidae	5	6	15	5	10	15	5	9	70	ns	ns
Parasites	Cystidicolidae		1		1	1				3	ns	ns
Parasites	Dactylogyridae						1			1	ns	ns
Parasites	Davaineidae	6	1	1	3	7	2	7	2	29	ns	ns
Parasites	Dermocystidiaceae	1								1	ns	ns
Parasites	Dictyocaulidae		3			1	2	1	1	8	ns	ns
Parasites	Diphyllobothriidae					1				1	ns	ns
Parasites	Dracunculidae			2						2	ns	ns
Parasites	Echinorhynchidae		2				1	1	1	5	ns	ns
Parasites	Eimeriidae	4	4	5	6	5	4	3	5	36	ns	ns
Parasites	Ergasilidae		1							1	ns	ns
Parasites	Fasciolidae	8	3	3	4	3	2	1	3	27	ns	ns
Parasites	Filariidae	2								2	ns	ns
Parasites	Gyrodactylidae	1	1				1			3	ns	ns
Parasites	Habronematidae				1					1	ns	ns
Parasites	Haematopinidae								1	1	ns	ns
Parasites	Haemogregarinidae								1	1	ns	ns
Parasites	Haemoproteidae							1	1	2	ns	ns
Parasites	Herpotrichiellaceae			1			1			2	ns	ns
Parasites	Heterakidae						1			1	ns	ns
Parasites	Heterophyidae				1					1	ns	ns
Parasites	Hexamitidae	3	3	7	3	6	6	3	3	34	ns	ns
Parasites	Hymenolepididae	6	1	1	3	7	2	7	2	29	ns	ns
Parasites	Hymenostomatida			2						2	ns	ns
Parasites	Kudoidae	1	2	1		3	1	1	2	11	ns	ns
Parasites	Laelapidae						1	1		2	ns	ns
Parasites	Leptolegniellaceae							2		2	ns	ns
Parasites	Lernaeidae					1				1	ns	ns
Parasites	Lernaeopodidae	1	6	2	1	2	3	1	1	17	ns	ns
Parasites	Leucocytozoidae			1		1		1	1	4	ns	ns
Parasites	Metastrongylidae		2				1	1	2	6	ns	ns
Parasites	Miscellaneous ectoparasites	4	5	3	5	6	5	5	2	35	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Parasites	Miscellaneous helminths	27	21	26	39	37	25	39	33	247	ns	ns
Parasites	Myxobolidae		1							1	ns	ns
Parasites	Nectriaceae	4		3	2	3	4		2	18	ns	ns
Parasites	Oestridae					1		1		2	ns	ns
Parasites	Oodiniaceae	1								1	ns	ns
Parasites	Other parasites	1	3		4	5		1	1	15	ns	ns
Parasites	Paramoebidae	7	14	9	4	7		4		45	ns	ns
Parasites	Philometridae			1	1		2			4	ns	ns
Parasites	Piscicolidae						1			1	ns	ns
Parasites	Plasmodiidae	1	4	2	2	8	9	9	5	40	ns	ns
Parasites	Protostrongylidae		1							1	ns	ns
Parasites	Psoroptidae	1					1	1	1	4	ns	ns
Parasites	Saccharomycetaceae	2	1	1		2	2	1	1	10	ns	ns
Parasites	Saprolegniaceae			1						1	ns	ns
Parasites	Sarcocystidae	6	3	3	3	6	9	8	8	46	ns	ns
Parasites	Sarcophagidae	4			4	2	1	2		13	ns	ns
Parasites	Sarcoptidae	1		1		1	1	2	2	8	ns	ns
Parasites	Schistosomatidae	3	3	3	2		2	3		16	ns	ns
Parasites	Spiruroidae	1								1	ns	ns
Parasites	Strongyloididae		1		1	2	1	2	1	8	ns	ns
Parasites	Syngamidae	1					1	1		3	ns	ns
Parasites	Taeniidae	11	5	6	8	11	4	14	10	69	ns	ns
Parasites	Theileriidae	1	1	1	1	1	4	2	8	19	ns	ns
Parasites	Trichinellidae		1					2	2	5	ns	ns
Parasites	Trichocomaceae	1	1	2		2	3	3	1	13	ns	ns
Parasites	Trichodectidae			2						2	ns	ns
Parasites	Trichomonadidae	2				1		2		5	ns	ns
Parasites	Trichostrongylidae	19	14	15	22	25	19	20	17	151	ns	ns
Parasites	Trichuridae					1	2	1	2	6	ns	ns
Parasites	Trombiculidae					1				1	ns	ns
Parasites	Trypanosomatidae	1	2		4	4	2	2		15	ns	ns
Parasites	Varroidae	1	2			1	3		1	8	ns	ns
Prions	Prions	1	12	10	5	7	6	5	4	50	ns	ns
Viruses	Adenoviridae	2	4	3	1	5	4	3	2	24	ns	ns
Viruses	Alloherpesviridae	7	8	8	6	4	6	5	6	50	ns	ns
Viruses	Arteriviridae		2	1			3	1	4	11	ns	ns
Viruses	Asfaviridae		1				1	1		3	ns	ns
Viruses	Astroviridae	1		1		1				3	ns	ns
Viruses	Birnaviridae	3	1		1	1	4	1	3	14	ns	ns
Viruses	Bornaviridae	1		1	1					3	ns	ns
Viruses	Bunyaviridae		2	1	2		1	1	2	9	ns	ns
Viruses	Caliciviridae	4	3	2	4	7	3	3	3	29	ns	ns
Viruses	Circoviridae	9	5	9	1	1	9	3	10	47	ns	ns
Viruses	Coronaviridae	5	7	6	6	8	4	11	13	60	ns	ns
Viruses	Flaviviridae	21	21	19	20	23	23	28	23	178	ns	ns

Pathogen	Family	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Viruses	Hepeviridae	1	2	1	1		4	3	2	14	ns	ns
Viruses	Herpesviridae	15	15	13	7	5	20	18	21	114	ns	ns
Viruses	Iflaviridae								1	1	ns	ns
Viruses	Iridoviridae	1	2		4	1	3	4	1	16	ns	ns
Viruses	Nimaviridae					1				1	ns	ns
Viruses	Nodaviridae		3		1	4	3		1	12	ns	ns
Viruses	Orthomyxoviridae	11	16	18	26	31	80	39	39	260	ns	ns
Viruses	Other viruses	4	3	5	5	5	11	9	6	48	ns	ns
Viruses	Papillomaviridae		2		1	4	3	1	5	16	ns	ns
Viruses	Paramyxoviridae	11	9	6	4	8	9	14	12	73	ns	ns
Viruses	Parvoviridae		1			1				2	ns	ns
Viruses	Picornaviridae	8	12	13	9	12	13	7	8	82	ns	ns
Viruses	Polyomaviridae						1		4	5	ns	ns
Viruses	Poxviridae	12	15	10	8	12	4	10	9	80	ns	ns
Viruses	Reoviridae	6	1	6	5	3	7	5	8	41	ns	ns
Viruses	Retroviridae	2	5	8	6	6	3	5	6	41	ns	ns
Viruses	Rhabdoviridae		1	3	3	2	8	2	6	25	ns	ns
Viruses	Togaviridae	1	1	1	1	1	3	5	2	15	ns	ns

**Table 18:** Number of publications by journal for the period 2006-2013.

Journal	FI 2013	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Veterinary Microbiology	2.726	165	205	222	272	276	295	299	325	2 059	97%	+ 9%
Veterinary Parasitology	2.545	220	201	173	231	226	217	305	259	1 832	18%	+ 2%
Plos One	3.534	2	22	51	91	135	259	431	525	1 516	26150%	+ 101%
Vaccine	3.485	141	159	141	165	160	168	126	116	1 176	-18%	- 2%
Journal of Virology	4.648	122	131	92	125	136	152	227	127	1 112	4%	+ 1%
Journal of Dairy Science	2.550	78	110	85	112	112	117	157	155	926	99%	+ 9%
Avian Diseases	1.107	87	133	95	82	150	93	111	107	858	23%	+ 3%
Parasitology Research	2.327	48	121	94	90	81	102	152	139	827	190%	+ 14%
Veterinary Immunology and Immunopathology	1.748	94	78	87	88	100	104	112	93	756	-1%	- 0%
Poultry Science	1.544	73	74	87	108	94	78	108	128	750	75%	+ 7%
Preventive Veterinary Medicine	2.506	61	81	86	104	100	84	103	128	747	110%	+ 10%
Fish & Shellfish Immunology	3.034	45	64	60	63	92	115	113	151	703	236%	+ 16%
Veterinary Record	1.633	93	111	101	95	95	67	74	59	695	-37%	- 6%
Applied and Environmental Microbiology	3.952	89	91	82	86	77	99	90	79	693	-11%	- 1%
Journal of Virological Methods	1.883	72	55	78	91	94	89	64	91	634	26%	+ 3%
Journal of Veterinary Diagnostic Investigation	1.232	61	67	70	71	74	94	93	69	599	13%	+ 2%
Journal of Food Protection	1.797	94	89	77	81	65	59	55	62	582	-34%	- 5%
Journal of General Virology	3.529	87	91	74	52	68	82	53	75	582	-14%	- 2%
Tropical Animal Health and Production	0.970	32	21	39	101	109	75	106	93	576	191%	+ 14%
Research In Veterinary Science	1.511	38	38	58	57	66	59	124	127	567	234%	+ 16%
Veterinary Journal	2.165	42	52	66	56	64	59	100	100	539	138%	+ 11%
Journal of Animal and Veterinary Advances	no IF	0	57	54	64	86	104	156	13	534	837%	+ 32%
Aquaculture	1.828	79	61	43	70	44	86	77	62	522	-22%	- 3%
Journal of Fish Diseases	1.507	56	53	76	75	74	55	64	65	518	16%	+ 2%
Virus Research	2.827	45	56	59	58	72	54	66	84	494	87%	+ 8%
Journal of Veterinary Medical Science	0.875	52	54	48	57	63	63	65	73	475	40%	+ 4%
Journal of Parasitology	1.258	64	61	49	63	61	63	55	56	472	-13%	- 2%
Archives of Virology	2.282	43	55	55	57	50	72	64	71	467	65%	+ 6%
Virology Journal	2.089	12	15	15	50	91	138	64	66	451	450%	+ 24%
Avian Pathology	2.041	55	51	66	57	49	54	54	60	446	9%	+ 1%
Veterinary Research	3.383	32	42	43	39	43	84	60	92	435	188%	+ 14%
Diseases of Aquatic Organisms	1.586	59	70	38	61	49	56	45	49	427	-17%	- 2%
Virology	3.278	54	48	59	70	48	48	51	42	420	-22%	- 3%
Infection and Immunity	4.156	88	61	52	31	43	37	27	45	384	ns	ns
Journal of Applied Microbiology	2.386	32	67	48	45	72	36	31	40	371	ns	ns
Small Ruminant Research	1.099	44	52	48	41	31	38	50	62	366	ns	ns
Journal of Animal Science	1.920	32	37	32	40	38	45	98	43	365	ns	ns
Clinical and Vaccine Immunology	2.370	40	39	29	45	51	51	48	61	364	ns	ns
Journal of Wildlife Diseases	1.305	49	35	43	47	50	40	48	36	348	ns	ns
Parasitology	2.350	44	53	36	32	39	38	39	59	340	ns	ns
Indian Journal of Animal Sciences	no IF	35	53	65	52	39	41	49		334	ns	ns

Journal	FI 2013	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013	Growth rate 2006-2013	Average annual growth rate
Journal of Clinical Microbiology	4.232	42	36	48	50	39	37	37	45	334	ns	ns
Emerging Infectious Diseases	7.327	37	47	45	42	36	47	38	39	331	ns	ns
Virus Genes	1.837	22	42	35	46	37	45	53	51	331	ns	ns
BMC Veterinary Research	1.743			30	25	34	38	98	94	319	ns	ns
Bulletin of the Veterinary Institute In Pulawy	0.365	41	37	39	43	39	44	37	35	315	ns	ns
International Journal of Food Microbiology	3.155	41	53	43	26	32	36	43	39	313	ns	ns
African Journal of Microbiology Research	no IF		1	5	17	51	103	106		283	ns	ns
Epidemiology and Infection	2.491	24	22	30	30	31	34	31	52	254	ns	ns
Transboundary and Emerging Diseases	3.116			30	27	37	44	47	63	248	ns	ns
Indian Veterinary Journal	no IF	89	76	76						241	ns	ns
Livestock Science	1.100	13	40	20	23	57	25	35	28	241	ns	ns
Journal of Bacteriology	2.688	22	21	23	22	13	59	58	12	230	ns	ns
Veterinary Research Communications	1.364	44	39	40	32	38	13	9	15	230	ns	ns
International Journal for Parasitology	3.404	26	24	39	35	33	25	23	24	229	ns	ns
Experimental Parasitology	1.859	7	16	27	24	28	46	34	43	225	ns	ns
Veterinary Pathology	2.038	32	26	23	29	28	29	21	31	219	ns	ns
Developmental and Comparative Immunology	3.705	15	19	25	23	24	25	42	42	215	ns	ns
Journal of Comparative Pathology	1.100	29	21	24	29	35	22	30	23	213	ns	ns
Theriogenology	1.845	26	23	20	27	22	24	37	34	213	ns	ns
Zoonoses and Public Health	2.065		35	32	22	44	29	30	20	212	ns	ns
Infection Genetics and Evolution	3.264	3	8	9	18	20	47	39	64	208	ns	ns
American Journal of Veterinary Research	no IF	41	28	36	18	16	25	23	20	207	ns	ns
Letters in Applied Microbiology	1.749	33	27	25	37	24	26	16	18	206	ns	ns
African Journal of Biotechnology	no IF	12	16	21	24	40	91			204	ns	ns
Vector-Borne and Zoonotic Diseases	2.531	16	16	11	24	25	47	34	31	204	ns	ns
Asian-Australasian Journal of Animal Sciences	0.563	30	18	18	15	34	31	33	23	202	ns	ns

**Table 19:** Number of publications by journal impact factor class for the period 2006-2013.

Impact factor class	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013
[0-1[	1 356	1 474	1 331	1 431	1 494	1 771	1 684	1 637	12 178
[1-2[	2 222	2 253	2 230	2 266	2 341	1 992	2 484	2 460	18 248
[2-3[	1 116	1 364	1 598	2 021	1 968	2 282	2 518	2 457	15 324
[3-4[	731	744	856	804	1 172	1 332	1 617	1 721	8 977
[4-5[	221	332	176	324	463	641	298	427	2 882
[5-6[	224	228	156	186	193	249	378	94	1 708
[6-7[	27	37	60	66	63	77	10	72	412
[7-8[	15	17	22	16	16	18	22	55	181
[8-9[	3	6	11	32	6	11	38	43	150
[9-10[	5	14	24	8	31	42	4	8	136
[10-11[	3	1	8	1	4	2	7	6	32
[11-12[	3	5	6		2	1	1	1	19
[12-13[	2	5	3	3	2	1	1	3	20
[13-14[	3	4	3	3	3	5	1	2	24
[14-15[	7	2	3	2	6		5	3	28
[15-16[	7	3		2			3	1	16
[16-17[		2	1	1	1	1		2	8
[17-18[				1		2	3		6
[18-19[		1							1
[19-20[		1					2	1	4
[20-21[	1				1				2
[21-22[			1			3			4
[22-23[	1	3	1		1			1	7
[23-24[									0
[24-25[								1	1
[25-26[	5	2			3			1	11
[26-27[	6	6		1		1			14
[27-28[	2								2
[28-29[	2	3	1						6
[29-30[				6			1	1	8
[30-31[	3								3
[31-32[			10	1	7	2	6	6	32
[32-33[							1		1
[33-34[									0
[34-35[				7					7
[35-36[									0
[36-37[					4	4			8
[37-38[									0
[38-39[						1	3		4
[39-40[									0
[40-41[									0
[41-42[									0
[42-43[								7	7
[43-44[									0

Impact factor class	2006	2007	2008	2009	2010	2011	2012	2013	2006-2013
[44-45[									0
[45-46[									0
[46-47[									0
[47-48[				3					3
[48-49[									0
[49-50[									0
[50-51[			2						2
[51-52[	1								1
[52-53[									0
[53-54[					1				1
No IF	198	326	547	371	200	218	242	174	2 276