

## AVIAN INFLUENZA VIRUS: A SCIENTOMETRIC STUDY USING CAB DIRECT ONLINE DATABASE FOR THE PERIOD FROM 1961-2016

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### ABSTRACT

*This paper analyses publication output in the field of Avian Influenza virus as indexed in CAB Direct Online database covering the period 1961 – 2016. It is observed that a total of 11,628 publications were published during the year 1961 to 2016 as per CAB Direct Online. The average number of publications published per year was 207 papers. The highest number of papers i.e. 1084 was published in the year 2010. The spurt in literature output was reported during 1998-2013. China is the top producing country with 1618 papers (13.91%) followed by the USA with 738 papers (6.34%). The top five most preferred journals by the scientists were: Avian Diseases with 688 papers (5.91%) followed by PLoS ONE with 406 papers (3.49%), Journal of Virology with 371 papers (3.19%), Vaccines with 251 papers (2.15%) and Emerging Infectious Diseases with 248 papers (2.13%). The top medium of communication is a journal article with 10,503 papers (90.32%) followed by conference papers with 1174 papers (10.09%). English was the most predominant language used by the scientists for communication with 9419 papers (81%). The prolific author is Swayne, D.E who contributed 349 papers (3%) followed by Suarez, D.L with 318 papers (2.73%).*

**KEYWORDS:** Avian Influenza, Scientometrics, CAB Direct, China, Communication, Language, Avian Influenza Virus

### INTRODUCTION

Avian influenza (AI) viruses, commonly known as bird flu, infect a wide range of hosts, including humans and swine. The natural reservoir lies in populations of wild aquatic birds such as ducks and shorebirds. AI viruses are members of the family Orthomyxoviridae, Type A which is subdivided into categories (strains) depending on the outer proteins H (Haemagglutinin) and N (Neuraminidase). These outer proteins can be combined to create different strains, for example, H5N1, H9N2. Influenza viruses have a single-stranded RNA genome that is split into eight different segments, which are surrounded by a capsid and an envelope.

A bird flu protection zone has been extended across the whole of England after the Department of Environment, Food and Rural Affairs confirmed Bird flu was detected in 17 wild birds in Dorset.

AI strains can be categorized into 2 types;

Highly pathogenic avian influenza (HPAI) is the more serious of the two, often being fatal in birds. Clinical signs include:

- Swollen head
- Blue discoloration of neck and throat
- Loss of appetite
- Respiratory distress such as the gaping beak, coughing, sneezing, gurgling, rattling
- Diarrhoea
- Fewer eggs laid
- Increased mortality

Low pathogenic avian influenza (LPAI) is less serious, with the severity depending on the species of bird and whether it has other infections. Clinical signs include mild breathing problems, but affected birds will not always display these signs (for example, ducks and geese can often be asymptomatic).

**Disease Transmission:** The disease spreads by direct contact or through contaminated faeces and bodily fluids. New AI virus strains are created frequently which means that there is a constant risk that one of the new strains may spread easily among people. Thankfully no recent strains of AI have been proven to spread between people, only from birds to people.

**Disease Prevalence:** HPAI is spread across the globe, featuring mainly in North America, Asia, Europe and West Africa. LPAI is endemic in the Middle East and South East Asia, with poultry populations being infected with strains such as H9N2. Due to the different migratory patterns of each species, it is difficult to predict where each strain will spread.

## OBJECTIVES OF THE STUDY

The main objective of this study is to analyze the research output in Avian Influenza research as reflected in its publications output during 1961-2016 in CAB Direct Online database. In particular, the study focuses on the following objectives:

- To study the total number of publications output on Avian Influenza research based on CAB Direct Online database for the period 1961 – 2016.
- To study the top 10 languages in Avian Influenza research.
- To study the top 10 countries in Avian Influenza research
- To study the top 20 prolific authors in the field of Avian Influenza research
- To study the top 20 journals publishing more research papers on Avian Influenza research

## METHODOLOGY

The CAB Direct Online has been used to retrieve the data for 56 years (1961 – 2016) by searching the keyword 'Avian Influenza' in the Title field. The total number of records retrieved by CAB Direct Online database is **11,628**.

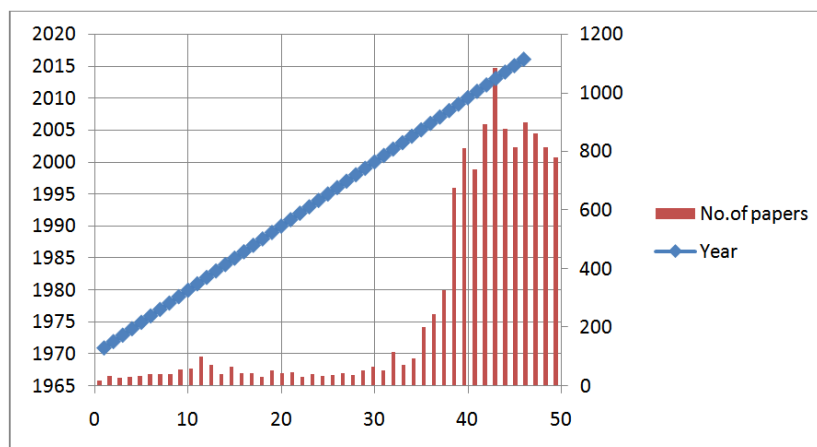
## RESULTS AND DISCUSSIONS

### Growth of Publication on Avian Influenza Literature

The study revealed that during the period 1961-2016, a total of 11628 publications were published on Avian Influenza research. The highest number of publications is 1084 papers in 2010. The lowest publication is 20 in 1971. It is very interesting to note that there was not even a single publication listed during the years 1961 to 1970. The average number of publications published per year was 207 and the spurt in literature output was reported during 2003-2016. The year-wise publication growth is furnished in Table-1.

**Table 1: Growth of Publication on Avian Influenza Research**

S. No	Year	No. of	S. No.	Year	No. of Papers
1	1971	20	24	1994	37
2	1972	36	25	1995	44
3	1973	28	26	1996	37
4	1974	31	27	1997	52
5	1975	36	28	1998	66
6	1976	42	29	1999	54
7	1977	40	30	2000	115
8	1978	40	31	2001	72
9	1979	57	32	2002	94
10	1980	60	33	2003	202
11	1981	100	34	2004	246
12	1982	71	35	2005	<b>326</b>
13	1983	41	36	2006	675
14	1984	65	37	2007	812
15	1985	43	38	2008	737
16	1986	44	39	2009	893
17	1987	30	40	<b>2010</b>	1084
18	1988	54	41	2011	877
19	1989	45	42	2012	814
20	1990	47	43	2013	897
21	1991	32	44	2014	861
22	1992	41	45	2015	814
23	1993	34	46	2016	780
<b>Total</b>					<b>11628</b>



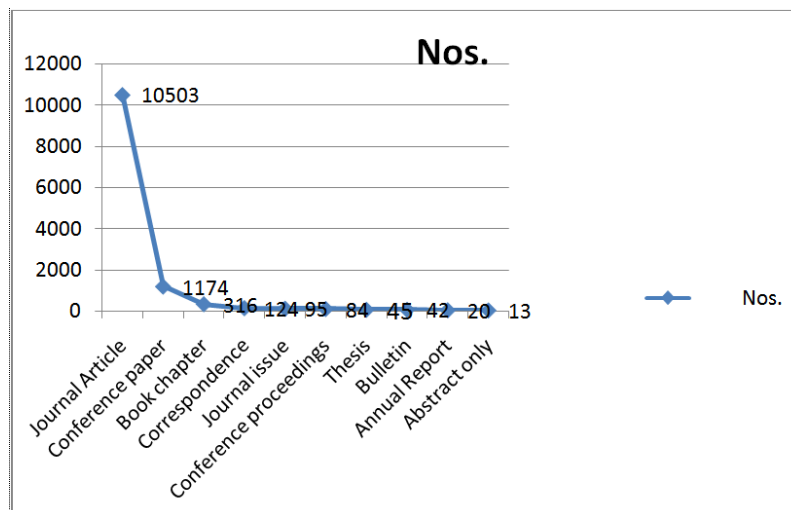
**Figure 1: Growth of Publication on Avian Influenza Research**

## PREFERRED TYPES OF PUBLICATIONS

The study reveals that the major source of publications covered by CAB Direct Online database on Avian Influenza research is journal articles with 10,503 papers (90.32%) followed by Conference papers with 1174 papers (10.09%). Book chapter ranks the third position with 316 (2.71%) and Correspondence and Journal issue are in the fourth and fifth places with 124 (1.06%) and 95 (0.81%) respective. The top 10 types of publications are furnished in Table-2

**Table 2: Top 10 Types of Publications**

Sl. No.	Document Type	Nos.
1.	Journal Article	10503
2.	Conference paper	1174
3.	Book chapter	316
4.	Correspondence	124
5.	Journal issue	95
6.	Conference proceedings	84
7.	Thesis	45
8.	Bulletin	42
9.	Annual Report	20
10.	Abstract only	13



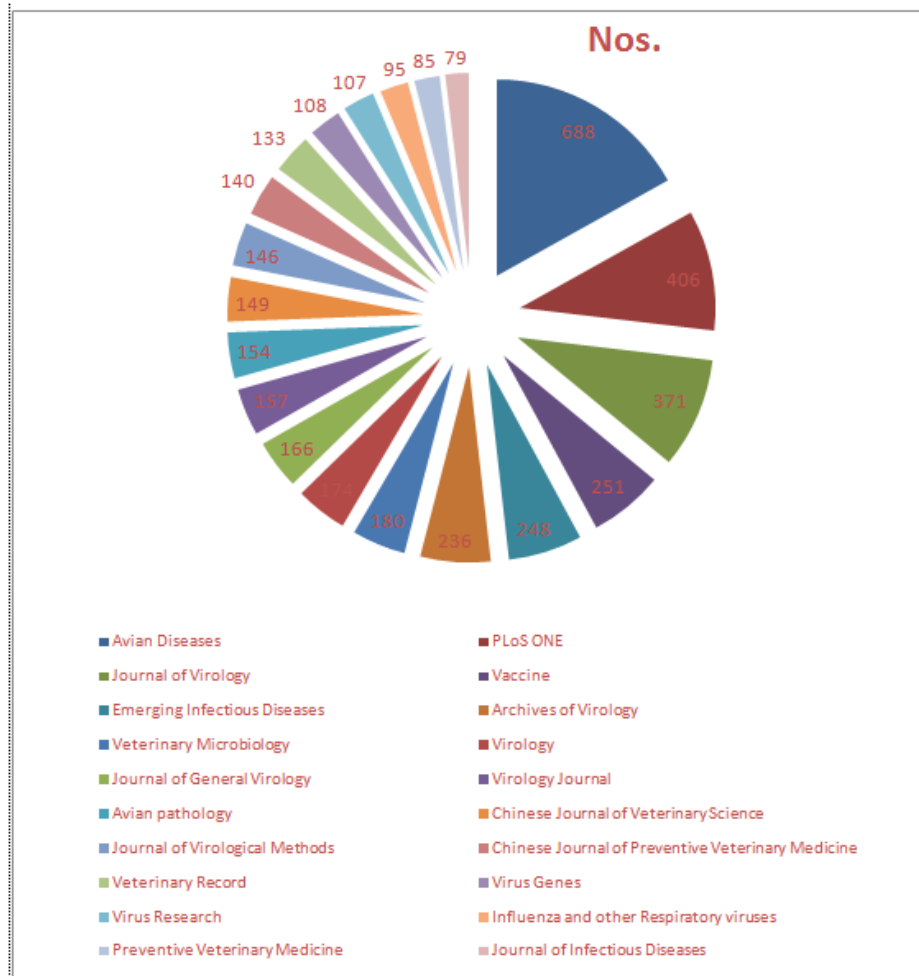
**Figure 2: Top 10 Types of Publications**

## MOST PREFERRED JOURNALS

The top five most preferred journals by the scientists were: Avian Influenza research with 688 papers (5.91%) followed by PLoS ONE with 406 papers (3.49%), Journal of Virology with 371 papers (3.19%), Vaccines with 251 papers (2.15%) and Emerging Infectious Diseases with 248 papers (2.13%). The top 20 most preferred journals are listed in Table-3 with the number of papers published.

**Table 3: Top 20 Preferred Journals by Scientists**

Sl. No.	Journal Title	Nos.
1.	Avian Diseases	688
2.	PLoS ONE	406
3.	Journal of Virology	371
4.	Vaccine	251
5.	Emerging Infectious Diseases	248
6.	Archives of Virology	236
7.	Veterinary Microbiology	180
8.	Virology	174
9.	Journal of General Virology	166
10.	Virology Journal	157
11.	Avian pathology	154
12.	Chinese Journal of Veterinary	149
13.	Journal of Virological Methods	146
14.	Chinese Journal of Preventive Veterinary Medicine	140
15.	Veterinary Record	133
16.	Virus Genes	108
17.	Virus Research	107
18.	Influenza and other Respiratory	95
19.	Preventive Veterinary Medicine	85
20.	Journal of Infectious Diseases	79



**Figure 3: Top 20 Preferred Journals by Scientists**

## PROLIFIC AUTHORS

The study reveals that Swayne, D.E is the most prolific author in Avian Influenza research who published 349 papers (3%) followed by Suarez, D.L 318 papers.(2.73%). Table-4 lists the top 10 prolific authors in the field of Avian Diseases research.

**Table 4: Most Prolific Authors**

Sl. No.	Author Name	No. of Papers
1.	Swayne, D.E	349
2.	Suarez, D.L	318
3.	Webster, R.G	290
4.	Chen, H.L	258
5.	Chen HuaLan	201
6.	Capua, I	169
7.	Kawaoka, Y	153
8.	Liu, X.F	120
9.	Liu XiuFan	118
10.	Kida, H	116

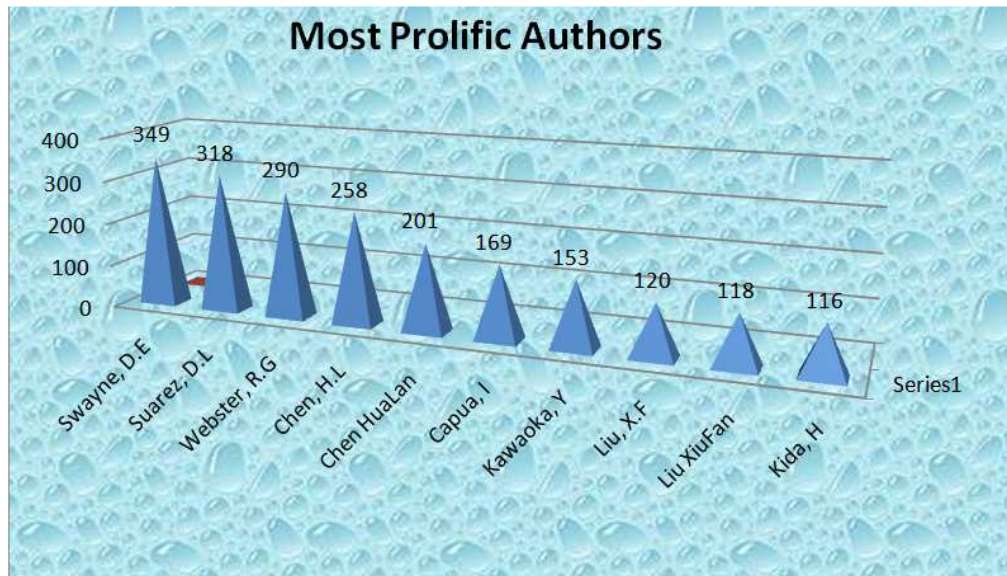


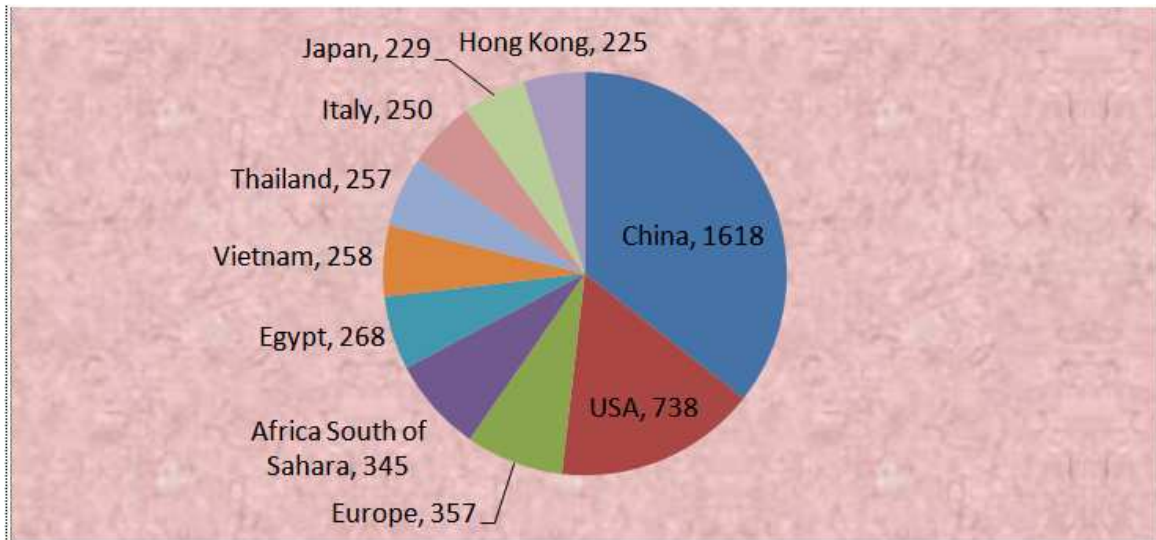
Figure 4

### COUNTRY-WISE DISTRIBUTION OF PUBLICATIONS

The study reveals that China is the top country in Avian Influenza research with its contribution of 1618 papers which is nearly 14% of the global research output on Avian Disease research followed by the USA with 738 papers (6.35%). Europe ranks third position with 357 papers (3.07%). The top 10 countries based on number of publications are furnished in Table-5.

Table 5: Top 10 Countries

Sl. No.	Country	No. of Publications
1.	China	1618
2.	USA	738
3.	Europe	357
4.	Africa South of Sahara	345
5.	Egypt	268
6.	Vietnam	258
7.	Thailand	257
8.	Italy	250
9.	Japan	229
10.	Hong Kong	225



**Figure 5: Top 10 Countries**

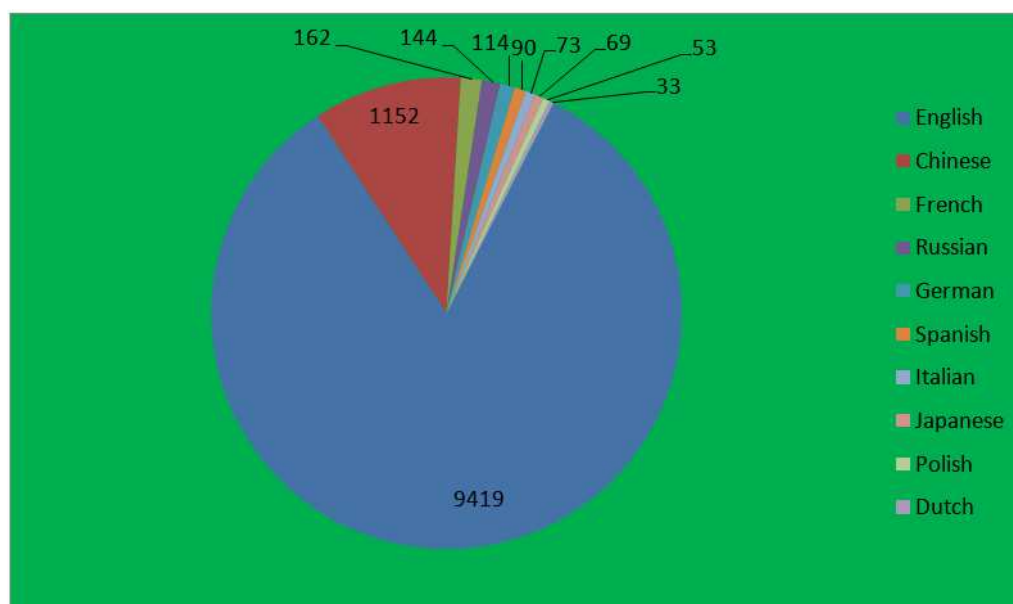
## PREDOMINANT LANGUAGES

It is observed that English is the most predominant language used by the scientists for communication of Avian Influenza research with 9,419 papers (81.00%) followed by Chinese with 1152 papers (9.90%). The top 10 predominant languages are furnished in Table-6.

**Table 6: Predominant Languages**

Sl. No.	Language	No. of Publications
1.	English	9419
2.	Chinese	1152
3.	French	162
4.	Russian	144
5.	German	114
6.	Spanish	90
7.	Italian	73
8.	Japanese	69
9.	Polish	53
10.	Dutch	33





**Figure 6: Predominant Languages**

## CONCLUSIONS

The scientometric study on research based on CAB Direct Online database reveals that China is the major producer of scientific research output with 1618 publications which is around 14% of the global research output on Avian Influenza virus research. The other interesting fact is that the most prolific author in this field is Swayne, D.E is the most prolific author in Avian Influenza research who published 349 papers (3%). The study revealed that English is the most predominant language used by the scientists for communication of Avian Influenza research 9,419 papers (81.00%) and China is leading in research on Avian Influenza.

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