Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2013-004201
Article Type:	Research
Date Submitted by the Author:	09-Oct-2013
Complete List of Authors:	Ye, Bo; Changhai hospital, Internal medicine Du, Ting-Ting; Changhai hospital, Internal medicine Xie, Ting; Zhongda hospital, Internal mdicine Ji, Jun-Tao; Changhai hospital, Internal medicine Zheng, Zhao-Hong; Changhai hospital, Internal medicine Liao, Zhuan; Changhai hospital, Internal medicine Hu, Liang-Hao; Changhai hospital, Internal medicine Li, Zhao-Shen; Changhai Hospital, Second Military Medical University, Digestive Endoscopy Center
Primary Subject Heading:	Respiratory medicine
Secondary Subject Heading:	Respiratory medicine
Keywords:	INTERNAL MEDICINE, MEDICAL HISTORY, RESPIRATORY MEDICINE (see Thoracic Medicine)

Title Page

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Bo Ye[1]*, M.D., Ting-Ting Du[1]*, M.D., Ting Xie[2]*, M.D., Jun-Tao Ji[1], M.D., Zhao-Hong Zheng[1], M.D., Zhuan Liao[1], M.D., Liang-Hao Hu[1], M.D., Zhao-Shen Li[1], M.D.

[1] Department of internal medicine, Changhai Hospital, the Second Military Medical University, Shanghai, China; [2] Department of internal medicine, Zhongda Hospital, the Southeast University, Nanjing,China

Running title: Scientific Publications in respirology from Chinese authors.

**Dr. Ye., Dr. Du and Dr. Xie contributed equally to this work.*

No conflicts of interest exist. No current external funding sources for this study.

Correspondence:

Prof. Zhao-Shen Li, OR Liang-Hao Hu

Department of Gastroenterology, Digestive Endoscopy Center

Changhai Hospital

The Second Military Medical University

168 Changhai Road

Shanghai 200433, China

Tel: +86-21-31161344

Fax: +86-21-55621735

E-mail: zhaoshen-li@hotmail.com OR lianghao-hu@hotmail.com

Article summary

Article focus

1) How many articles in respiratory journals were published from the three major regions of China from 2000 to 2009? 2) What is the trend? 3) How is the quality of these articles?

Key messages

1) 2208 articles in respiratory journals were published from the three major regions of China from 2000 to 2009, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008.

2) The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312).

3) HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Strengths and limitations of this study

A few journals covered resources beyond respiratory even selected from the respiratory systems of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles are published in general journals, rather than in the specialized ones. Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation.

Abstract

Background: Respiratory disease remains one of the leading causes of morbidity and mortality in China. However, little is known about the research status of respirology in the three major regions of China—Mainland (ML), Hong Kong (HK) and Taiwan (TW).A 10-year survey of literature was conducted to compare the three regions' outputs in the research of respirology.

Methods: We searched PubMed database to identify the related articles from 2000 to 2009. The number of total articles, randomized controlled trials, case reports, meta-analysis, impact factors (IF), citations, and articles published in top general medicine journals were conducted for quantity and quality comparisons.

Results: 2208 articles were collected, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008. The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312). HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Conclusion: The total number of published articles from the three major regions of China has increased notably from 2000 to 2009. The annual number of publications by ML researchers exceeded those from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

Keywords: impact factor (IF); science citation index expanded (SCIE); journal citation reports (JCR); respirology

Abbreviation List

ACCP	American College of Chest Physicians
BMJ	British Medical Journal
ChiCTR	Chinese Clinical Trial Register
HK	Hong Kong
ICMJE	International Committee of Medical Journal Editors
ICTPR	International Clinical Trials Registry Platform
IF	impact factors
ISI	Institute for Scientific Information
JAMA	Journal of the American Medical Association
JCR	journal citation reports
ML	Mainland
NCBI	National Center for Biotechnology Information
NEJM	The New England Journal of Medicine
RCT	randomized controlled trials
SCIE	science citation index expanded
TW	Taiwan
WHO	World Health Organization

Introduction:

Pulmonary diseases are matters of concern for all the countries. Lung disease accounts for 15% of disability-adjusted life-years [1] and may be the first cause of mortality in the world [2, 3].

In China, under the influence of the dramatic economic evolution and urbanization progress, the levels and patterns of outdoor and indoor air pollutants have greatly changed. Hundreds of cities suffer the substandard air quality according to the World Health Organization (WHO) guidelines [4].Besides, with a population of 1.3 billion, China has become a major contributor to the worldwide respiratory disease burden [5].

In terms of the fatality rate, respiratory disease comes first in rural areas and the fourth in urban areas in China. However, little is known about the research status of respirology in the three major regions of China — Mainland (ML), Hong Kong (HK) and Taiwan (TW) [6]. We therefore conducted a 10-year survey of literature and compared these three regions' outputs in the research of respirology.

Methods and Materials:

A total of 46 journals related to respirology were selected from the "respiratory systems" category of Science Citation Index Expanded (SCIE) subject categories by the Institute for Scientific Information(ISI) [7].The category covers resources dealing with the diagnosis and treatment of respiratory disease and focuses on prevention, pharmacology, surgery, transplantation, and research. *Annals of Thoracic Medicine*, *COPD* and *Portuguese Journal of Pulmonology (Revista Portuguesa de Pneumologia*) were not indexed by PubMed, so they were excluded. A computerized literature search was conducted in the PubMed database on 10 September 2012[8].

Articles from ML, TW and HK from January 2000 to December 2009 in these journals were elicited respectively. We used the ISSN to perform searches in PubMed. The search terms used were: (1040-0605 OR 1073-449X OR 1044-1549 OR 1817-1737 OR 0003-4975 OR 0300-2896 OR 1198-2241 OR 0012-3692 OR 1752-6981 OR 0272-5231 OR 1541-2555 OR 1070-5287 OR 1010-7940 OR 0903-1936 OR 0190-2148 OR 0147-9563 OR 1027-3719 OR 1806-3713 OR 1941-2711 OR 0277-0903 OR 1053-0770 OR 1569-1993 OR 1053-2498 OR 0022-5223 OR 1556-0864 OR 0341-2040 OR 0169-5002 OR 1828-695X OR 1526-0542 OR 8755-6863 OR 1094-5539 OR 0025-7931 OR 0020-1324 OR 0954-6111 OR 1569-9048 OR 1465-9921 OR 1323-7799 OR 0873-2159 OR 0761-8417 OR 0761-8425 OR 1124-0490 OR 1069-3424 OR 1520-9512 OR 0171-6425 OR 0040-6376 OR 1472-9792 AND TAIWAN[AD] AND 2000[DP])AND “Hong Kong[AD]”, “ Taiwan[AD]”,and “China[AD] NOT Hong Kong[AD] NOT Taiwan[AD]”. Articles that showed the first author's affiliation (AD) with these three regions were considered as research outputs from the regions. Articles in the fields of randomized controlled trials (RCT), review, meta-analysis and case reports were generated respectively, according to the

publication types by PubMed.

To compare the quality of the research articles, three methods were used: (1) the accumulated impact factors (IF) and the average IF were generated according to Journal Citation Reports (JCR) 2010 established by the ISI [9]; (2) citation reports of articles showing an affiliation with a Chinese institution were conducted; (3) articles published in top general medicine journals [*The New England Journal of Medicine (NEJM)*, *Journal of the American Medical Association (JAMA)*, *The Lancet*, and *British Medical Journal (BMJ)*] were also generated. Articles related to respirology were first extracted independently by two reviewers (Hao J.F. and Hu L.H.), and any disagreement between the reviewers was resolved by viewing the titles, abstracts, and full text if necessary. The number of articles published by each region in the top 10 high-impact respiratory journals was also compared. We determined the 10 most popular respiratory journals containing articles from the three regions of China according to the number of such articles published by each journal.

Statistical analysis

Statistical analyses were performed using STATA 11.0 [10].The nonparametric test for trend was performed to confirm any significant change of the total numbers over the period of time. Kruskal-Wallis test was used for detecting the difference among the three regions, and rank-sum test between two if necessary. The test for significance was two-tailed and the value of $P<0.05$ was considered significant.

Results:

Total number of articles

A total number of 83787 articles were published in the selected 46 journals within the period 2000 to 2009 worldwide. There were 2208 articles (2208/83787, 2.64%) from ML (814/2208, 36.9%), TW (909/2208 41.1%) and HK (485/2208, 22.0%).The numbers increased significantly from 2001 to 2010 in the three regions (from 13 to 273, P=0.004 for trend, 39 to 151, P=0.003, 36 to 62, P=0.047, respectively, Fig. 1). From 2005 onwards, the number of articles from ML has exceeded that from HK and in 2008 ML exceeded TW. The share of articles was on the rise for ML (P=0.001) and TW (P=0.040), but not in HK (P=0.813, Fig. 2).

Randomized controlled trial, review, meta-analysis and case report

In respect to randomized controlled trial (Fig. 3), it shows no difference among the three regions (ML vs. TW vs. HK, P=0.3662). In respect to review, ML and TW (ML vs.TW P=0.7591) showed no significant difference, while less than HK (ML vs. HK P=0.0331; TW vs. HK P=0.0038). Besides, there was a number of meta-analysis from ML since 2006, but few from TW and HK. However, showed for case report, ML and HK (ML vs. HK P=0.6215) were equal to each other, while less than TW (TW vs. HK P=0.0006; TW vs.ML P=0.0064).

Impact factors

According to the JCR, 43 journals in the "respiratory systems" had IF in 2010[11]. 3 journals in our study had no IF. Excluding them, the accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312, P=0.038). However, HK took the highest average IF of 3.914, followed by TW of

3.512, ML of 2.961 (P=0.003, Table 1).

Citation reports of articles published in the respiratory journals.

According to our analysis, TW got the highest total citations of 6320 (1064 articles), followed by HK with 5232 total citations in 700 articles, and ML with 5232 citations in 1122 articles. These differences among the three regions were not significant (P=0.772; Fig. 4).

High-impact respiratory journals and top general medicine journals.

1014 articles from these three regions were published in the 10 top-ranking respiratory journals, 40.33% (409/1014) were in *American Journal of Respiratory and Critical Care Medicine, Thorax, Chest,* and *European Respiratory Journal*. TW published 456 articles in the high IF respiratory journals, while ML and HK had 336 and 222 articles, respectively, in the top 10 journals (Table 2). A total number of 271 articles (ML 81, TW 71, and HK 119) were published in the 4 top general medicine journals (*NEJM*, *Lancet*, *JAMA and BMJ*). 55 articles in the field of respirology were selected by the two reviewers. HK owned the most articles of 31(original articles 23 including 1 RCT and 1 guideline, review 1, case report 2, others 5; *NEJM* 6, *JAMA* 1, *Lancet* 16, *BMJ* 8), ML had 16 articles (original articles 12 including 3 RCTs, case report 1, others 3; *NEJM* 3, *JAMA* 1, *Lancet* 10, *BMJ* 2), and TW had 8 articles (original articles 3, case report 5; *NEJM* 5, *JAMA* 1, *Lancet* 2).

Popular respiratory journals

The most popular journals in the three regions are shown in Table 3. *Chest* ranked 1st in HK and TW, while *Annals of Thoracic Surgery* ranked 1st in ML. *Annals of*

Thoracic Surgery, European Journal of Cardio-Thoracic Surgery, Respirology, The *International Journal of Tuberculosis and Lung Disease, Chest* are all ranked top 10.

Discussion:

To the best of our knowledge, this is the first report that showed clearly the contributions of Chinese authors in major regions of China—ML, HK and TW—to the worldwide research in the field of respirology. Our study results showed that the number of published articles from Mainland China had increased significantly in the past ten years, and surpassed HK in 2005 and TW in 2008. However, when impact factors (IF), citation reports, and articles published in top general medicine journals were taken into quality comparisons, the gap among the three regions appeared wide. HK had the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961, mainly because the readers worldwide preferred English, which was an advantage of HK while a challenge for the other two regions. The number of articles from China in the "respiratory systems" category ranked 11 worldwide in total (2.20% for share), although a substantial number of high-quality articles were in Chinese. In addition, the increased articles in the field of respirology suggested similar academic levels as in other fields such as Cardiology, Cardiovasology and Gastroenterology [12, 13].

The three regions kept equal to each other in terms of randomized controlled trial for the past decades. However, ML has gradually come to the fore since 2007. In 2008, ML released more reports than TW and HK, suggesting its obvious superiority of large population and relatively low research cost [14].

However, the published essays, in fact, are just a small part of randomized controlled trials achievements. The reasons are as follows: The records were dispersed not only in the Chinese Clinical Trial Register (ChiCTR), but also in other WHO International Clinical Trials Registry Platform (ICTPR) primary registries or International Committee of Medical Journal Editors (ICMJE) approved registries [15]. Besides, part of the results were released in Chinese or in the journals not indexed by PubMed.

Moreover, the randomized controlled trials in China showed a lower publication rate to average [16, 17, 18].

The great advances in China have also further promoted relevant research. More and more new Chinese journals are listed in the ISI database, many of which are in English and thus more accessible for the vast majority of researchers all around the world. These journals, though with lower impact factors, are necessary for every research in this area [19].

The data in our study mainly came from two sources: the PubMed search system and the JCR. The PubMed search system is a comprehensive database run by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in Bethesda, Maryland, containing articles from high-quality medical journals. The JCR, published by the Institute for Scientific Information in 1975, represents the most comprehensive citation index to the scientific literature, and covers more than 7000 journals at 2010. Although IF is not the optimal parameter for determining the quality of articles, it is at present the best available parameter for judging the quality of studies.

Our study has its limitations, however. A few journals covered resources beyond respiratory even selected from the respiratory systems of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles are published in general journals, rather than in the specialized ones [20].

Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation. (1 in Heart Lung. 2007 and 1 in Respirology. 2009)

In conclusion, the number of articles published from ML, TW, and HK has increased

significantly during the past ten years. There has also been an appreciable increase in the total number of articles from the three major regions of China from 2000 to 2009.The number of articles published per year from ML has exceeded that from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

References

[1] Guntupalli KK, Gutterman D, Raoof S et al. 2010: the year of the lung. Chest 2010; 138:1287-8.

[2] Sandoval-Gutierrez JL, Reyes ES, Bautista EB. Pulmonary Diseases: First Cause of Mortality in the World. Chest 2011; 139:1550.

[3] Mathers CD, Boerma T, Ma Fat D. Global and regional causes of death. Br Med Bull. 2009; 92:7-32.

[4] Chinese Academy of Engineering, Chinese Academy of Sciences, National Academy of Engineering, National Research Council. Introduction of urbanization, energy and air pollution in China: the Challenges Ahead, Proceedings of a symposium. The National Academies Press. Washington, D.C. (2003), pp. 1-3.

[5]Fang X, Wang X, Bai C.COPD in China: the burden and importance of proper management.Chest 2011; 139:920-9.

[6] Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health. BMC Public Health 2006; 15:301.

[7] Journal search: Science citation index expanded subject categories. Cited 10 September 2012. http://scientific.thomsonreuters.com/cgibin/jrnlst/jlresults.cgi

[8] PubMed. Cited 10 September 2012. Available from URL:http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed.

[9] ISI Journal Citation Reports, Institute for Scientific Information, 2011.Cited 10 September 2012. Available from URL: http://isiknowledge.com.

[10] STATA statistical software (version 11.0, Stata. Corp, College Station, TX, U.S.A.)

[11] ISI Journal Citation Reports, Institute for Scientific Information, 2011.Cited 10 September 2012. Available from URL: http://isiknowledge.com.

[12] Goh KL, Farrell GC. Publications from China: The sleeping giant awakens. J Gastroenterol Hepatol 2008; 23:341-3.

[13] Hu LH, Liao Z, Gao R et al. Scientific publications in cardiology and cardiovasology journals from Chinese authors in various parts of North Asia: 10-year survey of literature. Int J Cardiol 2010; 30; 140:304-8.

[14] Mervis J. China's unique environment favors large intervention trials. Science 1995; 270:1149-51.

[15] Liu XM, Li YP, Yu XT et al. Assessment of registration quality of trials sponsored by China. Journal of Evidence-Based Medicine 2009; 2:8–18.

[16] Song FJ, Parekh-Bhurke S, Hooper L et al. Extent of publication bias in different categories of research cohorts: a meta-analysis of empirical studies. BMC Medical research methodology 2009;9:79

[17] Xuemei L, Youping L, Shangqi S et al. Ethical review reporting of Chinese trials records in WHO primary registries.J Med Ethics 2011; 37:144-8.

[18] Michalopoulos A, Falagas ME. A Bibliometric Analysis of Global Research Production in Respiratory Medicine. Chest 2005; 128:3993-8.

[19] Makris GC, Spanos A, Rafailidis PI et al. Increasing contribution of China in modern biomedical research. Statistical data from ISI Web of Knowledge. Med Sci Monit 2009; 15:SR15-21.

[20] Partridge MR, Lewison G. Respiratory research output. Chest 2006; 130:1283.

Figure Legends

Fig.1. The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 2. The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 3. Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.

Fig. 4. Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.

Tables

Table 1. The accumulated and average impact factor of articles from Mainland (ML), Taiwan (TW), and Hong Kong (HK)

Year	Accumulated impact factor			Average impact factor		
	ML	HK	TW	ML	HK	TW
2000	54.895	167.831	171.309	4.223	4.662	4.393
2001	66.619	78.862	149.393	2.896	3.286	3.557
2002	38.238	133.937	248.554	2.941	3.827	3.452
2003	50.552	194.997	328.783	2.808	3.482	3.961
2004	109.898	244.190	331.810	3.330	4.003	4.200
2005	218.684	162.832	355.665	3.364	3.877	3.824
2006	242.293	308.506	318.215	3.106	4.007	3.350
2007	292.890	193.632	379.165	2.615	4.503	3.108
2008	533.500	172.982	463.555	2.868	3.530	3.485
2009	802.387	240.543	445.968	2.939	3.880	2.953
TOTAL	2409.956	1898.312	3192.417	2.961	3.914	3.512

Table 2. Articles published on the 10 most influential journals from Mainland (ML), Taiwan (TW) and Hong Kong (HK)

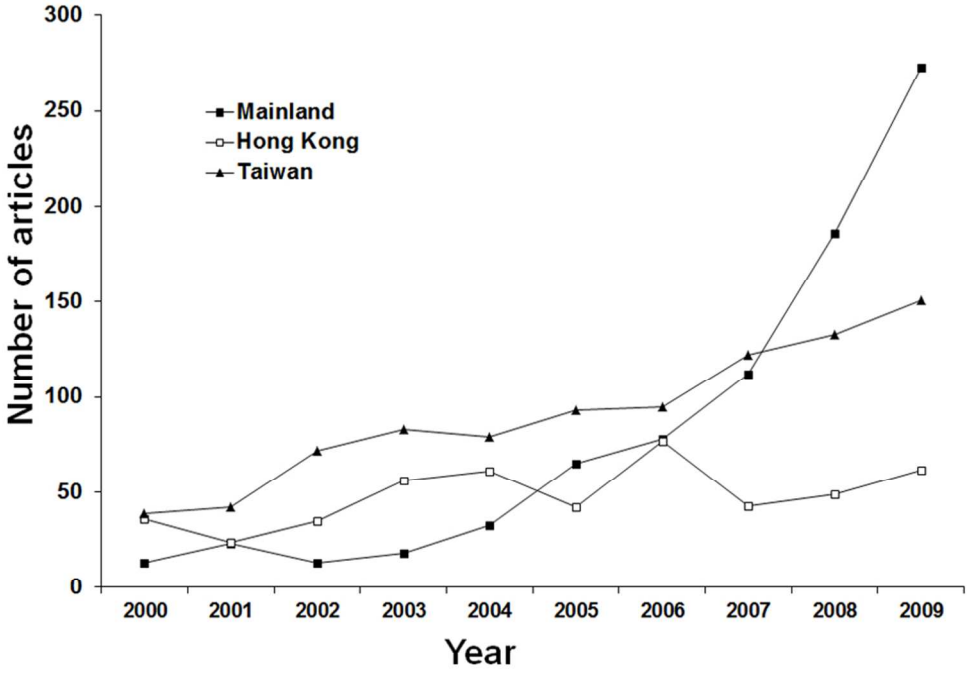
Rank	Journal	2009 IF	ML	(%)	TW	(%)	HK	(%)	Total
1	Am J Resp Crit Care	10.689	8	15	20	38	24	46	52
2	Thorax	7.041	9	15	18	30	33	55	60
3	Chest	6.360	28	13	127	58	65	30	220
4	Eur Respir J	5.527	17	22	24	31	36	47	77
5	J Thorac Oncol	4.547	19	59	9	28	4	13	32
6	Am J Resp Cell Mol	4.319	12	29	21	51	8	20	41
7	Am J Physiol Lung C	4.043	7	29	16	67	1	4.2	24
8	Ann Thorac Surg	3.644	115	44	109	42	37	14	261
9	J Heart Lung Transpl	3.541	9	32	15	54	4	14	28
10	Lung Cancer	3.140	112	51	97	44	10	5	219

Am J Resp Crit Care: American Journal of Respiratory and Critical Care Medicine. IF2009=10.689; Thorax: IF= 7.041; Chest: IF= 6.36;Eur Respir J: European Respiratory Journal. IF=5.527; J Thorac Oncol: Journal of Thoracic Oncology. IF= 4.547 ; Am J Resp Cell Mol: American Journal of Respiratory Cell and Molecular Biology. IF=4.319; Am J Physiol Lung C: American Journal of Physiology - Lung Cellular and Molecular Physiology. IF= 4.043; Ann Thorac Surg: Annals of Thoracic Surgery. IF=3.644; J Heart Lung Transpl: The Journal of Heart and Lung Transplantation. IF= 3.541; Lung Cancer: IF=3.140.

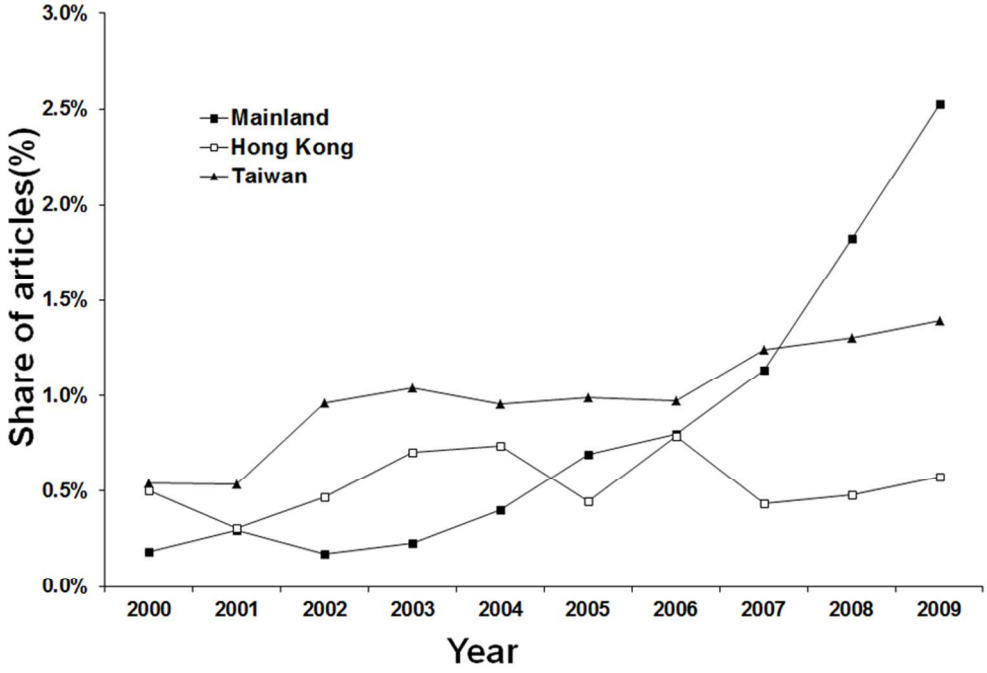
Table 3.The 10 most popular respiratory journals in Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	ML(n=814)	N	TW(n=909)	N	HK(n=485)	N
1	ATS	115	Chest	127	Chest	65
2	LC	112	ATS	109	Respirology	62
3	EJCT	68	LC	97	IJTLD	42
4	JTCS	68	JTCS	93	ATS	37
5	Respirology	57	EJCT	59	ERJ	36
6	Respiration	41	Respirology	42	Thorax	33
7	IJTLD	34	IJTLD	39	RM	30
8	Chest	28	PP	36	PP	25
9	RR	23	TCS	36	AJRCC	24
10	PPT	22	JA	29	EJCT	19

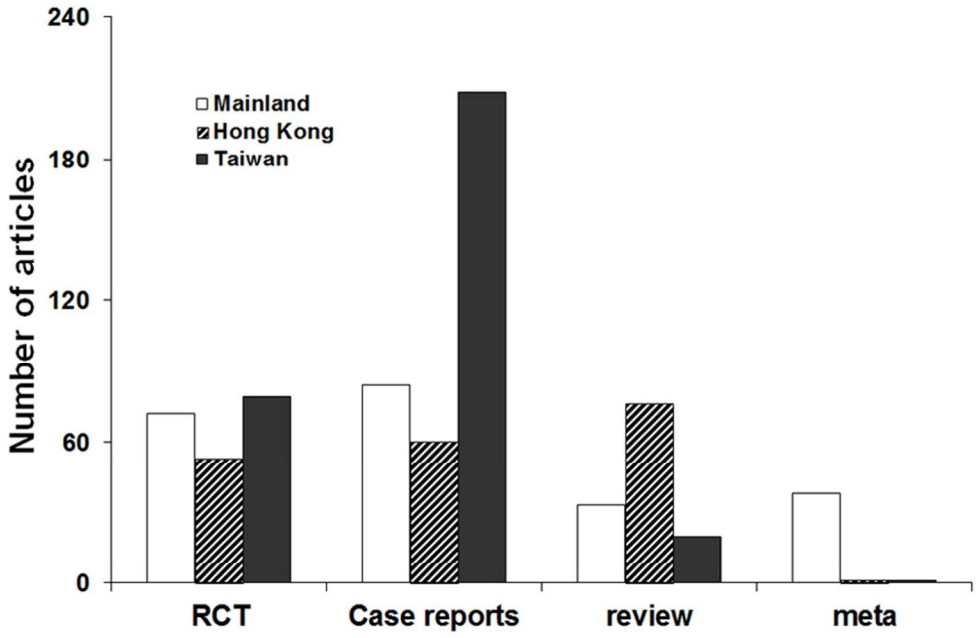
ATS: Annals of Thoracic Surgery. IF=3.644; LC: Lung Cancer. IF=3.140; EJCT: European Journal of Cardio-Thoracic Surgery. IF=2.397; JTCS：Journal of Thoracic and Cardiovascular Surgery. IF= 3.063; Respirology: IF=1.853; Respiration: IF=1.935; IJTLD: The International Journal of Tuberculosis and Lung Disease. IF= 2.548; Chest: IF= 6.36; RR: Respiratory Research. IF= 3.127; PPT: Pulmonary Pharmacology and Therapeutics. IF= 2.024; PP: Pediatric Pulmonology. IF=1.816; TCS: Thoracic and Cardiovascular Surgeon. IF=0.745; JA: Journal of Asthma. IF=1.372; ERJ: European Respiratory Journal. IF=5.527; Thorax: IF= 7.041; RM: Respiratory Medicine. IF=2.331; AJRCC: American Journal of Respiratory and Critical Care Medicine. IF=10.689.



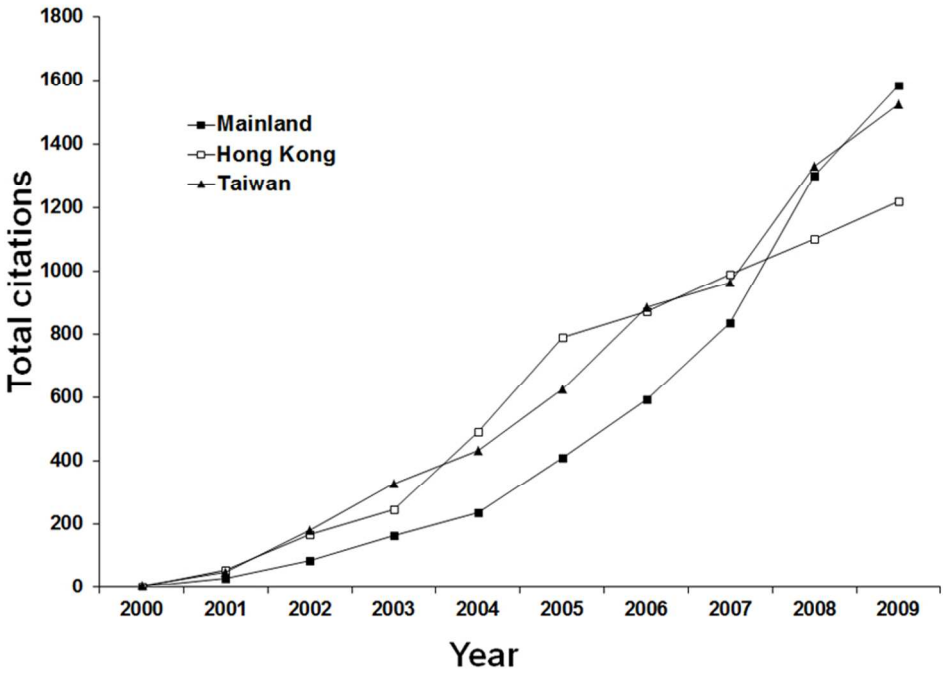
333x233mm (72 x 72 DPI)



333x233mm (72 x 72 DPI)



333x233mm (72 x 72 DPI)



333x233mm (72 x 72 DPI)

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	5
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	N/A
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	6
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N/A
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	6
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	7
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	7
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	N/A
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	7-9
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	8-9
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	10
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	11
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	12
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	N/A

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2013-004201.R1
Article Type:	Research
Date Submitted by the Author:	14-Jan-2014
Complete List of Authors:	Ye, Bo; Changhai hospital, Internal medicine Du, Ting-Ting; Changhai hospital, Internal medicine Xie, Ting; Zhongda hospital, Internal mdicine Ji, Jun-Tao; Changhai hospital, Internal medicine Zheng, Zhao-Hong; Changhai hospital, Internal medicine Liao, Zhuan; Changhai hospital, Internal medicine Hu, Liang-Hao; Changhai hospital, Internal medicine Li, Zhao-Shen; Changhai Hospital, Second Military Medical University, Internal medicine
Primary Subject Heading:	Respiratory medicine
Secondary Subject Heading:	Respiratory medicine
Keywords:	INTERNAL MEDICINE, MEDICAL HISTORY, RESPIRATORY MEDICINE (see Thoracic Medicine)

Title Page

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Bo Ye[1]*, M.D., Ting-Ting Du[1]*, M.D., Ting Xie[2]*, M.D., Jun-Tao Ji[1], M.D., Zhao-Hong Zheng[1], M.D., Zhuan Liao[1], M.D., Liang-Hao Hu[1], M.D., Zhao-Shen Li[1], M.D.

[1] Department of internal medicine, Changhai Hospital, the Second Military Medical University, Shanghai, China; [2] Department of internal medicine, Zhongda Hospital, the Southeast University, Nanjing,China

Running title: Scientific Publications in respirology from Chinese authors.

**Dr. Ye., Dr. Du and Dr. Xie contributed equally to this work.*

Correspondence:

Prof. Zhao-Shen Li, OR Liang-Hao Hu

Department of internal medicine

Changhai Hospital

The Second Military Medical University

168 Changhai Road

Shanghai 200433, China

Tel: +86-21-31161344

Fax: +86-21-55621735

E-mail: zhaoshen-li@hotmail.com OR lianghao-hu@hotmail.com

Keywords: impact factor (IF); science citation index expanded (SCIE); journal citation reports (JCR); respirology

Abstract

Background: Respiratory disease remains one of the leading causes of morbidity and mortality in China. However, little is known about the research status of respirology in the three major regions of China—Mainland (ML), Hong Kong (HK) and Taiwan (TW).A 10-year survey of literature was conducted to compare the three regions' outputs in the research of respirology.

Methods: We searched PubMed database to identify the related articles from 2000 to 2009. The number of total articles, randomized controlled trials, case reports, meta-analysis, impact factors (IF), citations, and articles published in top general medicine journals were conducted for quantity and quality comparisons.

Results: 2208 articles were collected, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008. The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312). HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Conclusion: The total number of published articles from the three major regions of China has increased notably from 2000 to 2009. The annual number of publications by ML researchers exceeded those from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

Article summary

Article focus

1) How many articles in respiratory journals were published from the three major regions of China from 2000 to 2009? 2) What is the trend? 3) How is the quality of these articles?

Key messages

1) 2208 articles in respiratory journals were published from the three major regions of China from 2000 to 2009, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008.

2) The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312).

3) HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Strengths and limitations of this study

A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles were published in general journals, rather than in the specialized ones. Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation.

Abbreviation List

ACCP	American College of Chest Physicians
BMJ	British Medical Journal
ChiCTR	Chinese Clinical Trial Register
HK	Hong Kong
ICMJE	International Committee of Medical Journal Editors
ICTPR	International Clinical Trials Registry Platform
IF	impact factors
ISI	Institute for Scientific Information
JAMA	Journal of the American Medical Association
JCR	journal citation reports
ML	Mainland
NCBI	National Center for Biotechnology Information
NEJM	The New England Journal of Medicine
RCT	randomized controlled trials
SCIE	science citation index expanded
TW	Taiwan
WHO	World Health Organization

Introduction:

Pulmonary diseases are matters of concern for all the countries. Lung disease accounts for 15% of disability-adjusted life-years [1] and may be the first cause of mortality in the world [2, 3].

In China, under the influence of the dramatic economic evolution and urbanization progress, the levels and patterns of outdoor and indoor air pollutants have greatly changed. Hundreds of cities suffer the substandard air quality according to the World Health Organization (WHO) guidelines [4].Besides, with a population of 1.3 billion, China has become a major contributor to the worldwide respiratory disease burden [5, 6].In terms of the fatality rate, respiratory disease comes the first in rural areas and the fourth in urban areas in China. However, little is known about the research status of respirology in the three major regions of China — Mainland (ML), Hong Kong (HK) and Taiwan (TW) [7]. We therefore conducted a 10-year survey of literature and compared these three regions' outputs in the research of respirology.

Methods and Materials:

A total of 46 journals related to respirology were selected from the "respiratory system" category of Science Citation Index Expanded (SCIE) subject categories by the Institute for Scientific Information(ISI) [8].The category covers resources dealing with the diagnosis and treatment of respiratory disease and focuses on prevention, pharmacology, surgery, transplantation, and research. *Annals of Thoracic Medicine*, *COPD* and *Portuguese Journal of Pulmonology (Revista Portuguesa de Pneumologia*) were not indexed by PubMed, so they were excluded. A computerized literature search was conducted in the PubMed database on 10 September 2012 (URL: http://www.ncbi.nlm.nih.gov/pubmed/).

Articles from ML, TW and HK from January 2000 to December 2009 in these journals were elicited respectively. We used the ISSN to perform searches in PubMed. The search terms used were: (1040-0605 OR 1073-449X OR 1044-1549 OR 1817-1737 OR 0003-4975 OR 0300-2896 OR 1198-2241 OR 0012-3692 OR 1752-6981 OR 0272-5231 OR 1541-2555 OR 1070-5287 OR 1010-7940 OR 0903-1936 OR 0190-2148 OR 0147-9563 OR 1027-3719 OR 1806-3713 OR 1941-2711 OR 0277-0903 OR 1053-0770 OR 1569-1993 OR 1053-2498 OR 0022-5223 OR 1556-0864 OR 0341-2040 OR 0169-5002 OR 1828-695X OR 1526-0542 OR 8755-6863 OR 1094-5539 OR 0025-7931 OR 0020-1324 OR 0954-6111 OR 1569-9048 OR 1465-9921 OR 1323-7799 OR 0873-2159 OR 0761-8417 OR 0761-8425 OR 1124-0490 OR 1069-3424 OR 1520-9512 OR 0171-6425 OR 0040-6376 OR 1472-9792 AND TAIWAN[AD] AND 2000[DP])AND “Hong Kong[AD]”, “ Taiwan[AD]”,and “China[AD] NOT Hong Kong[AD] NOT Taiwan[AD]”. Articles that showed the first author's affiliation (AD) with these three regions were considered as research outputs from the regions. Articles in the fields of randomized controlled trials (RCT), review,

meta-analysis and case reports were generated respectively, according to the publication types by PubMed.

To compare the quality of the research articles, three methods were used: (1) the accumulated impact factors (IF) and the average IF were generated according to Journal Citation Reports (JCR) 2010 established by the ISI (URL: http://isiknowledge.com); (2) citation reports of articles showing an affiliation with a Chinese institution were conducted; (3) articles published in top general medicine journals [*The New England Journal of Medicine (NEJM)*, *Journal of the American Medical Association (JAMA)*, *The Lancet*, and *British Medical Journal (BMJ)*] were also generated. Articles related to respirology were first extracted independently by two reviewers (Du T.T and Hu L.H.), and any disagreement between the reviewers was resolved by viewing the titles, abstracts, and full text if necessary. The number of articles published by each region in the top 10 high-impact respiratory journals was also compared. We determined the 10 most popular respiratory journals containing articles from the three regions of China according to the number of such articles published by each journal.

Statistical analysis

Statistical analyses were performed using STATA 11.0 [9].The nonparametric test for trend was performed to confirm any significant change of the total numbers over the period of time. Kruskal-Wallis test was used for detecting the difference among the three regions, and rank-sum test between two if necessary. The test for significance was two-tailed and the value of $P<0.05$ was considered significant.

Results:

Total number of articles

A total number of 83787 articles were published in the selected 46 journals within the period 2000 to 2009 worldwide. There were 2208 articles (2208/83787, 2.64%) from ML (814/2208, 36.9%), TW (909/2208 41.1%) and HK (485/2208, 22.0%).The numbers increased significantly from 2001 to 2010 in the three regions (from 13 to 273, P=0.004 for trend, 39 to 151, P=0.003, 36 to 62, P=0.047, respectively, Fig. 1). From 2005 onwards, the number of articles from ML has exceeded that from HK and in 2008 ML exceeded TW. The share of articles was on the rise in ML (P=0.001) and TW (P=0.040), but not in HK (P=0.813, Fig. 2).

Randomized controlled trial, review, meta-analysis and case report

In respect of randomized controlled trial (Fig. 3), it shows no difference among the three regions (ML vs. TW vs. HK, P=0.3662). In respect of review, ML and TW (ML vs.TW P=0.7591) showed no significant difference, while less than HK (ML vs. HK P=0.0331; TW vs. HK P=0.0038). Besides, we found a number of meta-analysis from ML since 2006, but few from TW and HK. However, showed for case report, ML and HK (ML vs. HK P=0.6215) were equal to each other, while less than TW (TW vs. HK P=0.0006; TW vs.ML P=0.0064).

Impact factors

According to the JCR, 43 journals in the "respiratory system" had IF in 2010 (URL: http://isiknowledge.com). 3 journals in our study had no IF. Excluding them, the accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312, P=0.038). However, HK took the highest average IF

of 3.914, followed by TW of 3.512, ML of 2.961 (P=0.003, Table 1).

Citation reports of articles published in the respiratory journals.

The ISI has not set up a function for finding a citation report of articles by limiting the department of the corresponding author, so in this citation reports the articles included were affiliated with a Chinese institution, more than the previous search results in PubMed [10]. According to our analysis, TW got the highest total citations of 6320 (1064 articles), followed by HK with 5232 total citations in 700 articles, and ML with 5232 citations in 1122 articles. These differences among the three regions were not significant (P=0.772; Fig. 4).

High-impact respiratory journals and top general medicine journals.

1014 articles from these three regions were published in the 10 top-ranking respiratory journals, 40.33% (409/1014) were in *American Journal of Respiratory and Critical Care Medicine, Thorax, Chest,* and *European Respiratory Journal*. TW published 456 articles in the high IF respiratory journals, while ML and HK had 336 and 222 articles, respectively, in the top 10 journals (Table 2). A total number of 271 articles (ML 81, TW 71, and HK 119) were published in the 4 top general medicine journals *(NEJM, Lancet, JAMA and BMJ*). 55 articles in the field of respirology were selected by the two reviewers. HK owned the most articles of 31(original articles 23 including 1 RCT and 1 guideline, review 1, case report 2, others 5; *NEJM* 6, *JAMA* 1, *Lancet* 16, *BMJ* 8), ML had 16 articles (original articles 12 including 3 RCTs, case report 1, others 3; *NEJM* 3, *JAMA* 1, *Lancet* 10, *BMJ* 2), and TW had 8 articles (original articles 3, case report 5; *NEJM* 5, *JAMA* 1, *Lancet* 2).

Popular respiratory journals

The most popular journals in the three regions are shown in Table 3. *Chest* ranked the first in HK and TW, while *Annals of Thoracic Surgery* ranked the first in ML. *Annals of Thoracic Surgery, European Journal of Cardio-Thoracic Surgery, Respirology,* The *International Journal of Tuberculosis and Lung Disease, Chest* are all ranked top 10.

Discussion:

To the best of our knowledge, this is the first report that showed clearly the contributions of Chinese authors in major regions of China—ML, HK and TW—to the worldwide research in the field of respirology. Our study results showed that the number of published articles from Mainland China had increased significantly in the past ten years, and surpassed HK in 2005 and TW in 2008. However, when impact factors (IF), citation reports, and articles published in top general medicine journals were taken into quality comparisons, the gap among the three regions appeared wide. HK had the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961, mainly because the readers worldwide preferred English, which gave HK an advantage over the other two regions. The number of articles from China in the "respiratory system" category ranked 11 worldwide in total (2.64% for share), although a substantial number of high-quality articles were in Chinese. In addition, the situation that the articles increased in the field of respirology was also found in other fields, such as Cardiology, Cardiovasology and Gastroenterology [11, 12].

The three regions kept equal to each other in terms of randomized controlled trial for the past decades. However, ML has gradually come to the fore since 2007. In 2008, ML released more reports than TW and HK, indicating its obvious superiority of large population and relatively low research cost [13].

However, the published essays, in fact, are just a small part of randomized controlled trials achievements. The reasons are as follows: The records were dispersed not only in the Chinese Clinical Trial Register (ChiCTR), but also in other WHO International Clinical Trials Registry Platform (ICTPR) primary registries or International Committee of Medical Journal Editors (ICMJE) approved registries [14]. Besides, part of the results were released in Chinese or in the journals not indexed by PubMed.

Moreover, the randomized controlled trials in China showed a lower publication rate to average [15-17].

China in recent years is prospering rapidly economically to become the second-largest economy in the world after the United States. However, air pollution, especially hazes, followed this prosperity. The Global Burden of Disease Study 2010 found that particulate matter with an aerodynamic diameter of less than 2.5 μm (PM2.5) has become the fourth biggest threat to the health of the Chinese people [18]. Although smoking has fallen in China, the prevalence of lung cancer has increased, most probably due to air pollution[19].Now China is faced with an arduous task in addressing the challenges of environmental pollution[20].Today, the pace of life is increasing with technological advancements, this leads to hyper-tension, decreased exercise in people's daily life. All of these risk factors obviously will increase the morbidity of respiratory diseases. There is a price that developing countries must pay for modernization. However, let the price the Chinese pay not exceed the benefits from modernization. Therefore, government, scientific association and doctors pay more attention to the study about respiratory diseases [21, 22].

The data in our study mainly came from two sources: the PubMed search system and the JCR. The PubMed search system is a comprehensive database run by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in Bethesda, Maryland, containing articles from high-quality medical journals. The JCR, published by the Institute for Scientific Information in 1975, represents the most comprehensive citation index to the scientific literature, and covers more than 7000 journals at 2010. Although IF is not the optimal parameter for determining the quality of articles, it is at present the best available parameter for judging the quality of studies.

Our study has its limitations, however. A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles are published in general journals, rather than in the specialized ones [23].

Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation. (1 in Heart Lung. 2007 and 1 in Respirology. 2009)

In conclusion, the number of articles published from ML, TW, and HK has increased significantly during the past ten years. There has also been an appreciable increase in the total number of articles from the three major regions of China from 2000 to 2009.The number of articles published per year from ML has exceeded that from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

No conflicts of interest exist.

No current external funding sources for this study.

Contributorship Statement:

Bo Ye: searched and selected the data; analyzed the data; wrote the manuscript;
Ting-Ting Du: searched and selected the data; analyzed the data;
Ting Xie: wrote the manuscript;
Jun-Tao Ji:searched and selected the data;
Zhao-Hong Zheng:searched and selected the data;
Zhuan Liao:searched and selected the data;
Zhao-Shen Li: analyzed the data; contributed analysis tools;
Liang-Hao Hung: conceived and designed the study

Data Sharing Statement

No additional data

References

[1] Guntupalli KK, Gutterman D, Raoof S et al. 2010: the year of the lung. Chest 2010; 138:1287-8.

[2] Sandoval-Gutierrez JL, Reyes ES, Bautista EB. Pulmonary Diseases: First Cause of Mortality in the World. Chest 2011; 139:1550.

[3] Mathers CD, Boerma T, Ma Fat D. Global and regional causes of death. Br Med Bull. 2009; 92:7-32.

[4] Chinese Academy of Engineering, Chinese Academy of Sciences, National Academy of Engineering, National Research Council. Introduction of urbanization, energy and air pollution in China: the Challenges Ahead, Proceedings of a symposium. The National Academies Press. Washington, D.C. (2003), pp. 1-3.

[5]Fang X, Wang X, Bai C.COPD in China: the burden and importance of proper management.Chest 2011; 139:920-9.

[6]Sun YC.Taking ACTion for better control of asthma.Chin Med J (Engl). 2007 ;120(12):1035-6.

[7] Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health. BMC Public Health 2006; 15:301.

[8] Journal search: Science citation index expanded subject categories. Cited 10 September 2012. http://scientific.thomsonreuters.com/cgibin/jrnlst/jlresults.cgi

[9] STATA statistical software (version 11.0, Stata. Corp, College Station, TX, U.S.A.)

[10] Hu LH, Liao Z et al. Scientific publications in cardiology and cardiovasology journals fromChinese authors in various parts of North Asia: 10-year survey of literature.Int J Cardiol. 2010;140(3):304-8.

[11]Goh KL, Farrell GC. Publications from China: The sleeping giant awakens. J Gastroenterol Hepatol 2008; 23:341-3.

[12] Hu LH, Liao Z, Gao R et al. Scientific publications in cardiology and cardiovasology journals from Chinese authors in various parts of North Asia: 10-year survey of literature. Int J Cardiol 2010; 30; 140:304-8.

[13] Mervis J. China's unique environment favors large intervention trials. Science 1995; 270:1149-51.

[14] Liu XM, Li YP, Yu XT et al. Assessment of registration quality of trials sponsored by China. Journal of Evidence-Based Medicine 2009; 2:8-18.

[15] Song FJ, Parekh-Bhurke S, Hooper L et al. Extent of publication bias in different categories of research cohorts: a meta-analysis of empirical studies. BMC Medical research methodology 2009;9:79

[16] Xuemei L, Youping L, Shangqi S et al. Ethical review reporting of Chinese trials records in WHO primary registries.J Med Ethics 2011; 37:144-8.

[17] Michalopoulos A, Falagas ME. A Bibliometric Analysis of Global Research Production in Respiratory Medicine. Chest 2005; 128:3993-8.

[18] Cancer death report in China: the third national retrospective sampling death survey People's Medical Publishing House, Beijing (2008).National Office for Cancer Prevention and Control National Center for Cancer Registries Bureau of Disease Prevention and Control Ministry of Health

[19] Xu P. Haze, air pollution, and health in China. Lancet. 2013; 382(9910):2067.

[20] Chen Z, Wang JN, Ma GX et al. China tackles the health effects of air pollution. Lancet. 2013; 382(9909):1959-60.

[21]Yao X, Sun Y. The sounds of small airways: emerging role in pathogenesis and clinical expression of asthma. Chin Med J (Engl). 2014; 127(1):173-9

[22]Sun YC. Advances in respiratory medicine in the mainland of China: a historical perspective. Chin Med J (Engl). 2010; 123(1):6-17.

[23] Partridge MR, Lewison G. Respiratory research output. Chest 2006; 130:1283.

Figure Legends

Fig.1. The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 2. The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 3. Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.

Fig. 4. Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.

Tables

Table 1. The accumulated and average impact factor of articles from Mainland (ML), Taiwan (TW), and Hong Kong (HK)

Year	Accumulated impact factor			Average impact factor		
	ML	HK	TW	ML	HK	TW
2000	54.895	167.831	171.309	4.223	4.662	4.393
2001	66.619	78.862	149.393	2.896	3.286	3.557
2002	38.238	133.937	248.554	2.941	3.827	3.452
2003	50.552	194.997	328.783	2.808	3.482	3.961
2004	109.898	244.190	331.810	3.330	4.003	4.200
2005	218.684	162.832	355.665	3.364	3.877	3.824
2006	242.293	308.506	318.215	3.106	4.007	3.350
2007	292.890	193.632	379.165	2.615	4.503	3.108
2008	533.500	172.982	463.555	2.868	3.530	3.485
2009	802.387	240.543	445.968	2.939	3.880	2.953
TOTAL	2409.956	1898.312	3192.417	2.961	3.914	3.512

Table 2. Articles published on the 10 most influential journals from Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	Journal	2009 IF	ML	(%)	TW	(%)	HK	(%)	Total
1	Am J Resp Crit Care	10.689	8	15	20	38	24	46	52
2	Thorax	7.041	9	15	18	30	33	55	60
3	Chest	6.360	28	13	127	58	65	30	220
4	Eur Respir J	5.527	17	22	24	31	36	47	77
5	J Thorac Oncol	4.547	19	59	9	28	4	13	32
6	Am J Resp Cell Mol	4.319	12	29	21	51	8	20	41
7	Am J Physiol Lung C	4.043	7	29	16	67	1	4.2	24
8	Ann Thorac Surg	3.644	115	44	109	42	37	14	261
9	J Heart Lung Transpl	3.541	9	32	15	54	4	14	28
10	Lung Cancer	3.140	112	51	97	44	10	5	219

Am J Resp Crit Care: American Journal of Respiratory and Critical Care Medicine; Eur Respir J: European Respiratory Journal; J Thorac Oncol: Journal of Thoracic Oncology; Am J Resp Cell Mol: American Journal of Respiratory Cell and Molecular Biology; Am J Physiol Lung C: American Journal of Physiology - Lung Cellular and Molecular Physiology; Ann Thorac Surg: Annals of Thoracic Surgery; J Heart Lung Transpl: The Journal of Heart and Lung Transplantation.

Table 3.The 10 most popular respiratory journals in Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	ML(n=814)	N	TW(n=909)	N	HK(n=485)	N
1	ATS	115	Chest	127	Chest	65
2	LC	112	ATS	109	Respirology	62
3	EJCT	68	LC	97	IJTLD	42
4	JTCS	68	JTCS	93	ATS	37
5	Respirology	57	EJCT	59	ERJ	36
6	Respiration	41	Respirology	42	Thorax	33
7	IJTLD	34	IJTLD	39	RM	30
8	Chest	28	PP	36	PP	25
9	RR	23	TCS	36	AJRCC	24
10	PPT	22	JA	29	EJCT	19

ATS: Annals of Thoracic Surgery. IF=3.644; LC: Lung Cancer. IF=3.140; EJCT: European Journal of Cardio-Thoracic Surgery. IF=2.397; JTCS：Journal of Thoracic and Cardiovascular Surgery. IF= 3.063; Respirology: IF=1.853; Respiration: IF=1.935; IJTLD: The International Journal of Tuberculosis and Lung Disease. IF= 2.548; Chest: IF= 6.36; RR: Respiratory Research. IF= 3.127; PPT: Pulmonary Pharmacology and Therapeutics. IF= 2.024; PP: Pediatric Pulmonology. IF=1.816; TCS: Thoracic and Cardiovascular Surgeon. IF=0.745; JA: Journal of Asthma. IF=1.372; ERJ: European Respiratory Journal. IF=5.527; Thorax: IF= 7.041; RM: Respiratory Medicine. IF=2.331; AJRCC: American Journal of Respiratory and Critical Care Medicine. IF=10.689.

Title Page

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Bo Ye[1]*, M.D., Ting-Ting Du[1]*, M.D., Ting Xie[2]*, M.D., Jun-Tao Ji[1], M.D., Zhao-Hong Zheng[1], M.D., Zhuan Liao[1], M.D., Liang-Hao Hu[1], M.D., Zhao-Shen Li[1], M.D.

[1] Department of internal medicine, Changhai Hospital, the Second Military Medical University, Shanghai, China; [2] Department of internal medicine, Zhongda Hospital, the Southeast University, Nanjing,China

Running title: Scientific Publications in respirology from Chinese authors.

*Dr. Ye., Dr. Du and Dr. Xie contributed equally to this work.

No conflicts of interest exist. No current external funding sources for this study.

Correspondence:

Prof. Zhao-Shen Li, OR Liang-Hao Hu

Department of internal medicine

Changhai Hospital

The Second Military Medical University

168 Changhai Road

Shanghai 200433, China

Tel: +86-21-31161344

Fax: +86-21-55621735

E-mail: zhaoshen-li@hotmail.com OR lianghao-hu@hotmail.com

Article summary

Article focus

1) How many articles in respiratory journals were published from the three major regions of China from 2000 to 2009? 2) What is the trend? 3) How is the quality of these articles?

Key messages

1) 2208 articles in respiratory journals were published from the three major regions of China from 2000 to 2009, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008.

2) The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312).

3) HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Strengths and limitations of this study

A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles were published in general journals, rather than in the specialized ones. Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation.

Abstract

Background: Respiratory disease remains one of the leading causes of morbidity and mortality in China. However, little is known about the research status of respirology in the three major regions of China—Mainland (ML), Hong Kong (HK) and Taiwan (TW).A 10-year survey of literature was conducted to compare the three regions' outputs in the research of respirology.

Methods: We searched PubMed database to identify the related articles from 2000 to 2009. The number of total articles, randomized controlled trials, case reports, meta-analysis, impact factors (IF), citations, and articles published in top general medicine journals were conducted for quantity and quality comparisons.

Results: 2208 articles were collected, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008. The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312). HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Conclusion: The total number of published articles from the three major regions of China has increased notably from 2000 to 2009. The annual number of publications by ML researchers exceeded those from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

Keywords: impact factor (IF); science citation index expanded (SCIE); journal citation reports (JCR); respirology

Abbreviation List

ACCP	American College of Chest Physicians
BMJ	British Medical Journal
ChiCTR	Chinese Clinical Trial Register
HK	Hong Kong
ICMJE	International Committee of Medical Journal Editors
ICTPR	International Clinical Trials Registry Platform
IF	impact factors
ISI	Institute for Scientific Information
JAMA	Journal of the American Medical Association
JCR	journal citation reports
ML	Mainland
NCBI	National Center for Biotechnology Information
NEJM	The New England Journal of Medicine
RCT	randomized controlled trials
SCIE	science citation index expanded
TW	Taiwan
WHO	World Health Organization

Introduction:

Pulmonary diseases are matters of concern for all the countries. Lung disease accounts for 15% of disability-adjusted life-years [1] and may be the first cause of mortality in the world [2, 3].

In China, under the influence of the dramatic economic evolution and urbanization progress, the levels and patterns of outdoor and indoor air pollutants have greatly changed. Hundreds of cities suffer the substandard air quality according to the World Health Organization (WHO) guidelines [4].Besides, with a population of 1.3 billion, China has become a major contributor to the worldwide respiratory disease burden [5, 6].In terms of the fatality rate, respiratory disease comes the first in rural areas and the fourth in urban areas in China. However, little is known about the research status of respirology in the three major regions of China — Mainland (ML), Hong Kong (HK) and Taiwan (TW) [7]. We therefore conducted a 10-year survey of literature and compared these three regions' outputs in the research of respirology.

Methods and Materials:

A total of 46 journals related to respirology were selected from the "respiratory system" category of Science Citation Index Expanded (SCIE) subject categories by the Institute for Scientific Information(ISI) [8].The category covers resources dealing with the diagnosis and treatment of respiratory disease and focuses on prevention, pharmacology, surgery, transplantation, and research. *Annals of Thoracic Medicine*, *COPD* and *Portuguese Journal of Pulmonology (Revista Portuguesa de Pneumologia)* were not indexed by PubMed, so they were excluded. A computerized literature search was conducted in the PubMed database on 10 September 2012 (URL: http://www.ncbi.nlm.nih.gov/pubmed/).

Articles from ML, TW and HK from January 2000 to December 2009 in these journals were elicited respectively. We used the ISSN to perform searches in PubMed. The search terms used were: (1040-0605 OR 1073-449X OR 1044-1549 OR 1817-1737 OR 0003-4975 OR 0300-2896 OR 1198-2241 OR 0012-3692 OR 1752-6981 OR 0272-5231 OR 1541-2555 OR 1070-5287 OR 1010-7940 OR 0903-1936 OR 0190-2148 OR 0147-9563 OR 1027-3719 OR 1806-3713 OR 1941-2711 OR 0277-0903 OR 1053-0770 OR 1569-1993 OR 1053-2498 OR 0022-5223 OR 1556-0864 OR 0341-2040 OR 0169-5002 OR 1828-695X OR 1526-0542 OR 8755-6863 OR 1094-5539 OR 0025-7931 OR 0020-1324 OR 0954-6111 OR 1569-9048 OR 1465-9921 OR 1323-7799 OR 0873-2159 OR 0761-8417 OR 0761-8425 OR 1124-0490 OR 1069-3424 OR 1520-9512 OR 0171-6425 OR 0040-6376 OR 1472-9792 AND TAIWAN[AD] AND 2000[DP])AND “Hong Kong[AD]”, “ Taiwan[AD]”,and “China[AD] NOT Hong Kong[AD] NOT Taiwan[AD]”. Articles that showed the first author's affiliation (AD) with these three regions were considered as research outputs

from the regions. Articles in the fields of randomized controlled trials (RCT), review, meta-analysis and case reports were generated respectively, according to the publication types by PubMed.

To compare the quality of the research articles, three methods were used: (1) the accumulated impact factors (IF) and the average IF were generated according to Journal Citation Reports (JCR) 2010 established by the ISI (URL: http://isiknowledge.com); (2) citation reports of articles showing an affiliation with a Chinese institution were conducted; (3) articles published in top general medicine journals [*The New England Journal of Medicine (NEJM)*, *Journal of the American Medical Association (JAMA)*, *The Lancet*, and *British Medical Journal (BMJ)*] were also generated. Articles related to respirology were first extracted independently by two reviewers (Du T.T and Hu L.H.), and any disagreement between the reviewers was resolved by viewing the titles, abstracts, and full text if necessary. The number of articles published by each region in the top 10 high-impact respiratory journals was also compared. We determined the 10 most popular respiratory journals containing articles from the three regions of China according to the number of such articles published by each journal.

Statistical analysis

Statistical analyses were performed using STATA 11.0 [9].The nonparametric test for trend was performed to confirm any significant change of the total numbers over the period of time. Kruskal-Wallis test was used for detecting the difference among the three regions, and rank-sum test between two if necessary. The test for significance was two-tailed and the value of $P<0.05$ was considered significant.

Results:

Total number of articles

A total number of 83787 articles were published in the selected 46 journals within the period 2000 to 2009 worldwide. There were 2208 articles (2208/83787, 2.64%) from ML (814/2208, 36.9%), TW (909/2208 41.1%) and HK (485/2208, 22.0%).The numbers increased significantly from 2001 to 2010 in the three regions (from 13 to 273, P=0.004 for trend, 39 to 151, P=0.003, 36 to 62, P=0.047, respectively, Fig. 1). From 2005 onwards, the number of articles from ML has exceeded that from HK and in 2008 ML exceeded TW. The share of articles was on the rise in ML (P=0.001) and TW (P=0.040), but not in HK (P=0.813, Fig. 2).

Randomized controlled trial, review, meta-analysis and case report

In respect of randomized controlled trial (Fig. 3), it shows no difference among the three regions (ML vs. TW vs. HK, P=0.3662). In respect of review, ML and TW (ML vs.TW P=0.7591) showed no significant difference, while less than HK (ML vs. HK P=0.0331; TW vs. HK P=0.0038). Besides, we found a number of meta-analysis from ML since 2006, but few from TW and HK. However, showed for case report, ML and HK (ML vs. HK P=0.6215) were equal to each other, while less than TW (TW vs. HK P=0.0006; TW vs.ML P=0.0064).

Impact factors

According to the JCR, 43 journals in the "respiratory system" had IF in 2010 (URL: http://isiknowledge.com). 3 journals in our study had no IF. Excluding them, the accumulated IF of articles from TW (3192.417) was much higher than that from ML

(2409.956) and HK (1898.312, P=0.038). However, HK took the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961 (P=0.003, Table 1).

Citation reports of articles published in the respiratory journals.

The ISI has not set up a function for finding a citation report of articles by limiting the department of the corresponding author, so in this citation reports the articles included were affiliated with a Chinese institution, more than the previous search results in PubMed [10]. According to our analysis, TW got the highest total citations of 6320 (1064 articles), followed by HK with 5232 total citations in 700 articles, and ML with 5232 citations in 1122 articles. These differences among the three regions were not significant (P=0.772; Fig. 4).

High-impact respiratory journals and top general medicine journals.

1014 articles from these three regions were published in the 10 top-ranking respiratory journals, 40.33% (409/1014) were in *American Journal of Respiratory and Critical Care Medicine, Thorax, Chest,* and *European Respiratory Journal*. TW published 456 articles in the high IF respiratory journals, while ML and HK had 336 and 222 articles, respectively, in the top 10 journals (Table 2). A total number of 271 articles (ML 81, TW 71, and HK 119) were published in the 4 top general medicine journals *(NEJM, Lancet, JAMA and BMJ*). 55 articles in the field of respirology were selected by the two reviewers. HK owned the most articles of 31(original articles 23 including 1 RCT and 1 guideline, review 1, case report 2, others 5; *NEJM* 6, *JAMA* 1, *Lancet* 16, *BMJ* 8), ML had 16 articles (original articles 12 including 3 RCTs, case report 1, others 3; *NEJM* 3, *JAMA* 1, *Lancet* 10, *BMJ* 2), and TW had 8 articles (original articles 3, case report 5; *NEJM* 5, *JAMA* 1, *Lancet* 2).

Popular respiratory journals

The most popular journals in the three regions are shown in Table 3. *Chest* ranked the first in HK and TW, while *Annals of Thoracic Surgery* ranked the first in ML. *Annals of Thoracic Surgery, European Journal of Cardio-Thoracic Surgery, Respirology,* The *International Journal of Tuberculosis and Lung Disease, Chest* are all ranked top 10.

Discussion:

To the best of our knowledge, this is the first report that showed clearly the contributions of Chinese authors in major regions of China—ML, HK and TW—to the worldwide research in the field of respirology. Our study results showed that the number of published articles from Mainland China had increased significantly in the past ten years, and surpassed HK in 2005 and TW in 2008. However, when impact factors (IF), citation reports, and articles published in top general medicine journals were taken into quality comparisons, the gap among the three regions appeared wide. HK had the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961, mainly because the readers worldwide preferred English, which gave HK an advantage over the other two regions. The number of articles from China in the "respiratory system" category ranked 11 worldwide in total (2.64% for share), although a substantial number of high-quality articles were in Chinese. In addition, the situation that the articles increased in the field of respirology was also found in other fields, such as Cardiology, Cardiovasology and Gastroenterology [11, 12].

The three regions kept equal to each other in terms of randomized controlled trial for the past decades. However, ML has gradually come to the fore since 2007. In 2008, ML released more reports than TW and HK, indicating its obvious superiority of large population and relatively low research cost [13].

However, the published essays, in fact, are just a small part of randomized controlled trials achievements. The reasons are as follows: The records were dispersed not only in the Chinese Clinical Trial Register (ChiCTR), but also in other WHO International Clinical Trials Registry Platform (ICTPR) primary registries or International Committee of Medical Journal Editors (ICMJE) approved registries [14]. Besides, part

of the results were released in Chinese or in the journals not indexed by PubMed. Moreover, the randomized controlled trials in China showed a lower publication rate to average [15-17].

China in recent years is prospering rapidly economically to become the second-largest economy in the world after the United States. However, air pollution, especially hazes, followed this prosperity. The Global Burden of Disease Study 2010 found that particulate matter with an aerodynamic diameter of less than 2.5 μm (PM2.5) has become the fourth biggest threat to the health of the Chinese people [18]. Although smoking has fallen in China, the prevalence of lung cancer has increased, most probably due to air pollution[19].Now China is faced with an arduous task in addressing the challenges of environmental pollution[20].Today, the pace of life is increasing with technological advancements, this leads to hyper-tension, decreased exercise in people's daily life. All of these risk factors obviously will increase the morbidity of respiratory diseases. There is a price that developing countries must pay for modernization. However, let the price the Chinese pay not exceed the benefits from modernization. Therefore, government, scientific association and doctors pay more attention to the study about respiratory diseases [21, 22].

The data in our study mainly came from two sources: the PubMed search system and the JCR. The PubMed search system is a comprehensive database run by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in Bethesda, Maryland, containing articles from high-quality medical journals. The JCR, published by the Institute for Scientific Information in 1975, represents the most comprehensive citation index to the scientific literature, and covers more than 7000 journals at 2010. Although IF is not the optimal parameter for determining the quality of articles, it is at present the best available parameter for judging the quality of

studies.

Our study has its limitations, however. A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles are published in general journals, rather than in the specialized ones [23].

Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation. (1 in Heart Lung. 2007 and 1 in Respirology. 2009)

In conclusion, the number of articles published from ML, TW, and HK has increased significantly during the past ten years. There has also been an appreciable increase in the total number of articles from the three major regions of China from 2000 to 2009.The number of articles published per year from ML has exceeded that from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

References

[1] Guntupalli KK, Gutterman D, Raoof S et al. 2010: the year of the lung. Chest 2010; 138:1287-8.

[2] Sandoval-Gutierrez JL, Reyes ES, Bautista EB. Pulmonary Diseases: First Cause of Mortality in the World. Chest 2011; 139:1550.

[3] Mathers CD, Boerma T, Ma Fat D. Global and regional causes of death. Br Med Bull. 2009; 92:7-32.

[4] Chinese Academy of Engineering, Chinese Academy of Sciences, National Academy of Engineering, National Research Council. Introduction of urbanization, energy and air pollution in China: the Challenges Ahead, Proceedings of a symposium. The National Academies Press. Washington, D.C. (2003), pp. 1-3.

[5]Fang X, Wang X, Bai C.COPD in China: the burden and importance of proper management.Chest 2011; 139:920-9.

[6]Sun YC.Taking ACTion for better control of asthma.Chin Med J (Engl). 2007 ;120(12):1035-6.

[7] Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health. BMC Public Health 2006; 15:301.

[8] Journal search: Science citation index expanded subject categories. Cited 10 September 2012. http://scientific.thomsonreuters.com/cgibin/jrnlst/jlresults.cgi

[9] STATA statistical software (version 11.0, Stata. Corp, College Station, TX, U.S.A.)

[10] Hu LH, Liao Z et al. Scientific publications in cardiology and cardiovasology journals fromChinese authors in various parts of North Asia: 10-year survey of literature.Int J Cardiol. 2010;140(3):304-8.

[11]Goh KL, Farrell GC. Publications from China: The sleeping giant awakens. J Gastroenterol Hepatol 2008; 23:341-3.

[12] Hu LH, Liao Z, Gao R et al. Scientific publications in cardiology and cardiovasology journals from Chinese authors in various parts of North Asia: 10-year survey of literature. Int J Cardiol 2010; 30; 140:304-8.

[13] Mervis J. China's unique environment favors large intervention trials. Science 1995; 270:1149-51.

[14] Liu XM, Li YP, Yu XT et al. Assessment of registration quality of trials sponsored by China. Journal of Evidence-Based Medicine 2009; 2:8-18.

[15] Song FJ, Parekh-Bhurke S, Hooper L et al. Extent of publication bias in different categories of research cohorts: a meta-analysis of empirical studies. BMC Medical research methodology 2009;9:79

[16] Xuemei L, Youping L, Shangqi S et al. Ethical review reporting of Chinese trials records in WHO primary registries.J Med Ethics 2011; 37:144-8.

[17] Michalopoulos A, Falagas ME. A Bibliometric Analysis of Global Research Production in Respiratory Medicine. Chest 2005; 128:3993-8.

[18] Cancer death report in China: the third national retrospective sampling death survey People's Medical Publishing House, Beijing (2008).National Office for Cancer Prevention and Control National Center for Cancer Registries Bureau of Disease Prevention and Control Ministry of Health

[19] Xu P. Haze, air pollution, and health in China. Lancet. 2013; 382(9910):2067.

[20] Chen Z, Wang JN, Ma GX et al. China tackles the health effects of air pollution. Lancet. 2013; 382(9909):1959-60.

[21]Yao X, Sun Y. The sounds of small airways: emerging role in pathogenesis and clinical expression of asthma. Chin Med J (Engl). 2014; 127(1):173-9

[22]Sun YC. Advances in respiratory medicine in the mainland of China: a historical perspective. Chin Med J (Engl). 2010; 123(1):6-17.

[23] Partridge MR, Lewison G. Respiratory research output. Chest 2006; 130:1283.

Figure Legends

Fig.1. The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 2. The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 3. Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.

Fig. 4. Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.

Tables

Table 1. The accumulated and average impact factor of articles from Mainland (ML), Taiwan (TW), and Hong Kong (HK)

Year	Accumulated impact factor			Average impact factor		
	ML	HK	TW	ML	HK	TW
2000	54.895	167.831	171.309	4.223	4.662	4.393
2001	66.619	78.862	149.393	2.896	3.286	3.557
2002	38.238	133.937	248.554	2.941	3.827	3.452
2003	50.552	194.997	328.783	2.808	3.482	3.961
2004	109.898	244.190	331.810	3.330	4.003	4.200
2005	218.684	162.832	355.665	3.364	3.877	3.824
2006	242.293	308.506	318.215	3.106	4.007	3.350
2007	292.890	193.632	379.165	2.615	4.503	3.108
2008	533.500	172.982	463.555	2.868	3.530	3.485
2009	802.387	240.543	445.968	2.939	3.880	2.953
TOTAL	2409.956	1898.312	3192.417	2.961	3.914	3.512

Table 2. Articles published on the 10 most influential journals from Mainland (ML), Taiwan (TW) and Hong Kong (HK)

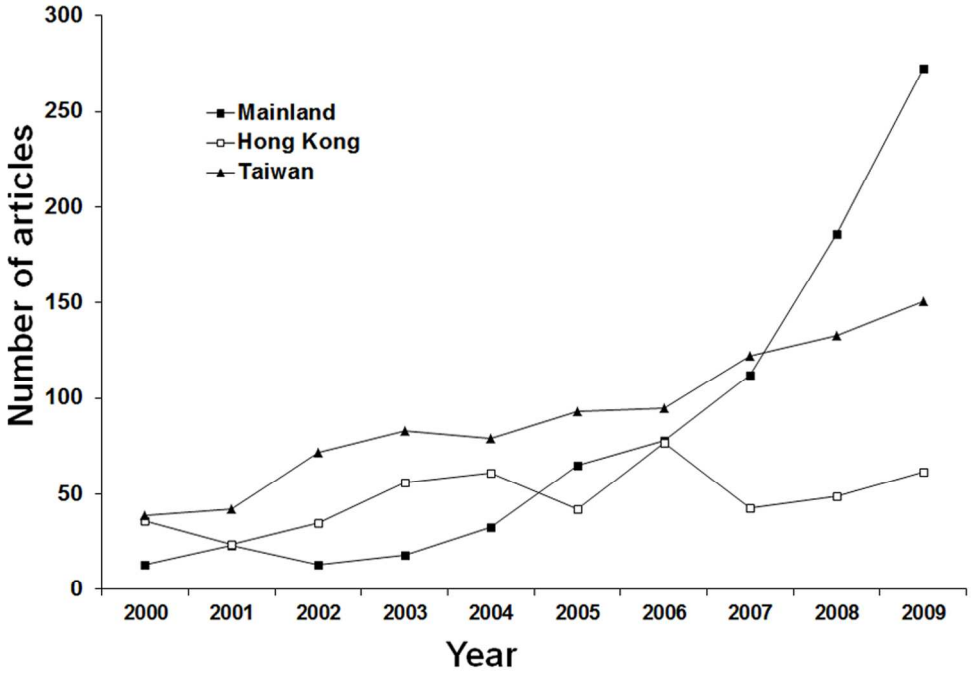
Rank	Journal	2009 IF	ML	(%)	TW	(%)	HK	(%)	Total
1	Am J Resp Crit Care	10.689	8	15	20	38	24	46	52
2	Thorax	7.041	9	15	18	30	33	55	60
3	Chest	6.360	28	13	127	58	65	30	220
4	Eur Respir J	5.527	17	22	24	31	36	47	77
5	J Thorac Oncol	4.547	19	59	9	28	4	13	32
6	Am J Resp Cell Mol	4.319	12	29	21	51	8	20	41
7	Am J Physiol Lung C	4.043	7	29	16	67	1	4.2	24
8	Ann Thorac Surg	3.644	115	44	109	42	37	14	261
9	J Heart Lung Transpl	3.541	9	32	15	54	4	14	28
10	Lung Cancer	3.140	112	51	97	44	10	5	219

Am J Resp Crit Care: American Journal of Respiratory and Critical Care Medicine; Eur Respir J: European Respiratory Journal; J Thorac Oncol: Journal of Thoracic Oncology; Am J Resp Cell Mol: American Journal of Respiratory Cell and Molecular Biology; Am J Physiol Lung C: American Journal of Physiology - Lung Cellular and Molecular Physiology; Ann Thorac Surg: Annals of Thoracic Surgery; J Heart Lung Transpl: The Journal of Heart and Lung Transplantation.

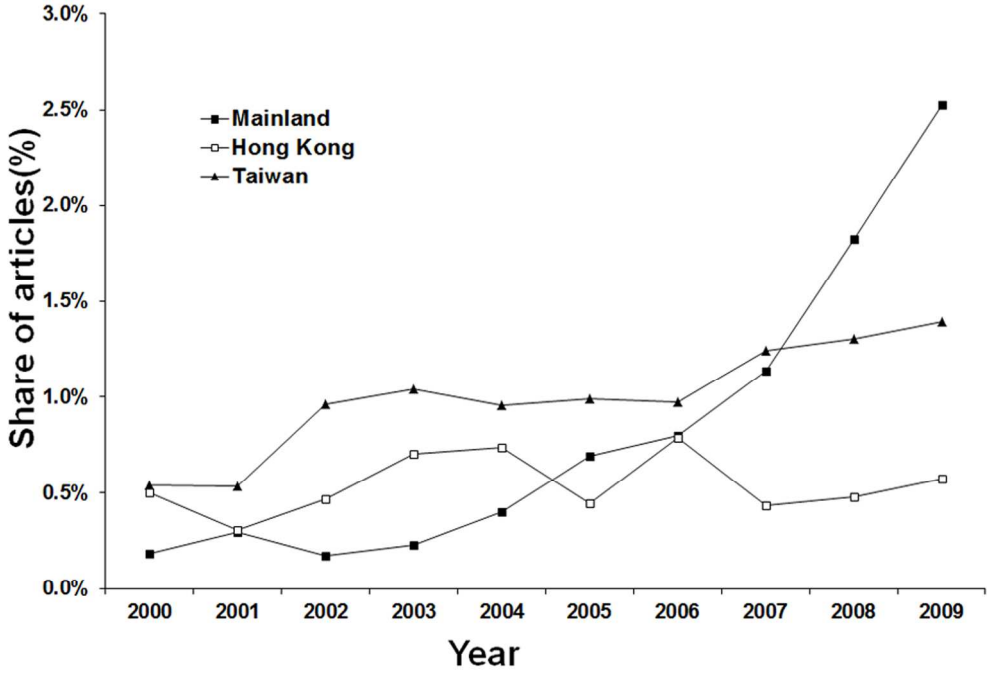
Table 3.The 10 most popular respiratory journals in Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	ML(n=814)	N	TW(n=909)	N	HK(n=485)	N
1	ATS	115	Chest	127	Chest	65
2	LC	112	ATS	109	Respirology	62
3	EJCT	68	LC	97	IJTLD	42
4	JTCS	68	JTCS	93	ATS	37
5	Respirology	57	EJCT	59	ERJ	36
6	Respiration	41	Respirology	42	Thorax	33
7	IJTLD	34	IJTLD	39	RM	30
8	Chest	28	PP	36	PP	25
9	RR	23	TCS	36	AJRCC	24
10	PPT	22	JA	29	EJCT	19

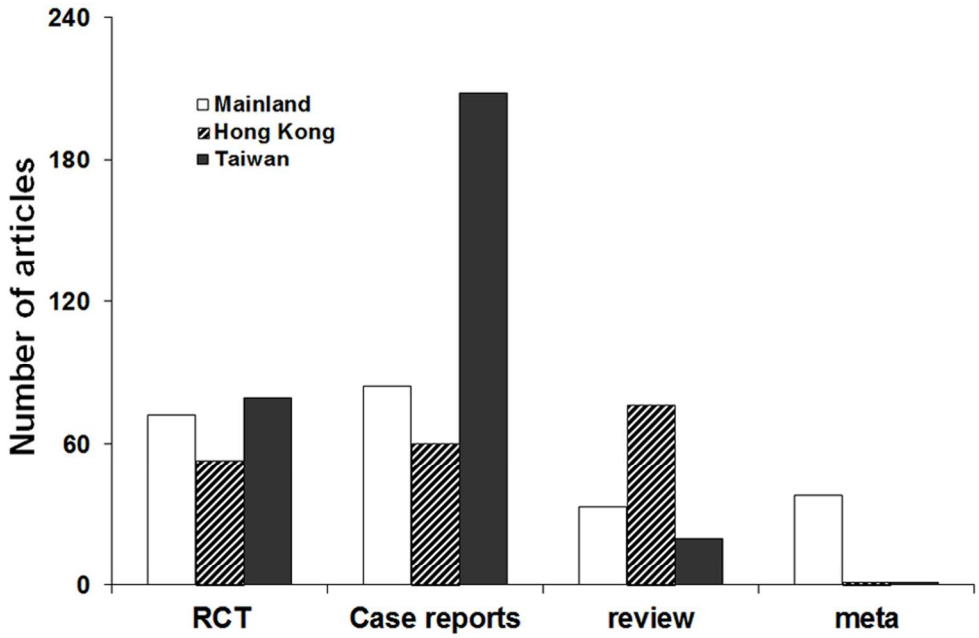
ATS: Annals of Thoracic Surgery. IF=3.644; LC: Lung Cancer. IF=3.140; EJCT: European Journal of Cardio-Thoracic Surgery. IF=2.397; JTCS：Journal of Thoracic and Cardiovascular Surgery. IF= 3.063; Respirology: IF=1.853; Respiration: IF=1.935; IJTLD: The International Journal of Tuberculosis and Lung Disease. IF= 2.548; Chest: IF= 6.36; RR: Respiratory Research. IF= 3.127; PPT: Pulmonary Pharmacology and Therapeutics. IF= 2.024; PP: Pediatric Pulmonology. IF=1.816; TCS: Thoracic and Cardiovascular Surgeon. IF=0.745; JA: Journal of Asthma. IF=1.372; ERJ: European Respiratory Journal. IF=5.527; Thorax: IF= 7.041; RM: Respiratory Medicine. IF=2.331; AJRCC: American Journal of Respiratory and Critical Care Medicine. IF=10.689.



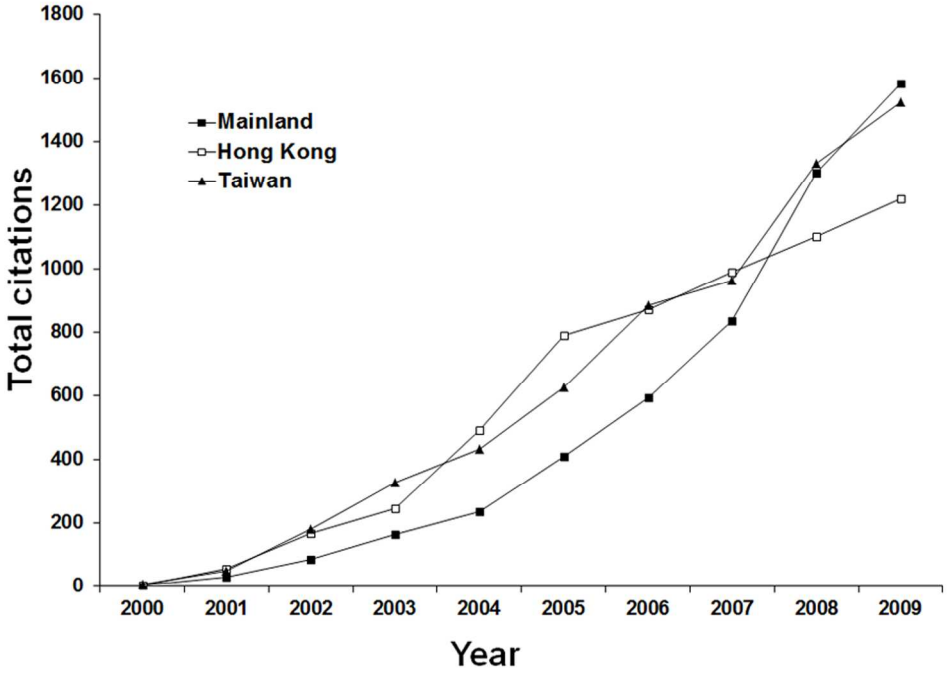
The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.
173x121mm (300 x 300 DPI)



The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.
173x121mm (300 x 300 DPI)



Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.
173x121mm (300 x 300 DPI)



Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.
173x121mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract **[Within the title page 1 and method section of the abstract page 3]**
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found **[See results section of abstract page 3]**
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported **[Page 5]**
Objectives	3	State specific objectives, including any prespecified hypotheses **[Page 5]**
Methods		
Study design	4	Present key elements of study design early in the paper **[Page 6]**
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection **[Page 5]**
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants **[Page 6-7]**
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable **[Page 6-7]**
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group **[Page 6-7]**
Bias	9	Describe any efforts to address potential sources of bias **[Page 6-7]**
Study size	10	Explain how the study size was arrived at **[Page 6-7]**
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why **[Page 6-7]**
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding **[Page 7]**
		(*b*) Describe any methods used to examine subgroups and interactions
		(*c*) Explain how missing data were addressed
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy **[Page 7]**
		(*e*) Describe any sensitivity analyses

Continued on next page

Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed **[Page 8-10]**
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders **[Page 8-10]**
		(b) Indicate number of participants with missing data for each variable of interest
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time
		Case-control study—Report numbers in each exposure category, or summary measures of exposure
		Cross-sectional study—Report numbers of outcome events or summary measures **[Page 8-10]**
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included **[Page 8-10]**
		(*b*) Report category boundaries when continuous variables were categorized
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses **[Page 8-10]**
Discussion		
Key results	18	Summarise key results with reference to study objectives **[Page13]**
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias **[Page13]**
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence **[Page11-13]**
Generalisability	21	Discuss the generalisability (external validity) of the study results **[Page11-13]**
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based **[N/A]**

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2013-004201.R2
Article Type:	Research
Date Submitted by the Author:	03-Feb-2014
Complete List of Authors:	Ye, Bo; Changhai hospital, Internal medicine Du, Ting-Ting; Changhai hospital, Internal medicine Xie, Ting; Zhongda hospital, Internal mdicine Ji, Jun-Tao; Changhai hospital, Internal medicine Zheng, Zhao-Hong; Changhai hospital, Internal medicine Liao, Zhuan; Changhai hospital, Internal medicine Hu, Liang-Hao; Changhai hospital, Internal medicine Li, Zhao-Shen; Changhai Hospital, Second Military Medical University, Internal medicine
Primary Subject Heading:	Respiratory medicine
Secondary Subject Heading:	Respiratory medicine
Keywords:	INTERNAL MEDICINE, MEDICAL HISTORY, RESPIRATORY MEDICINE (see Thoracic Medicine)

Title Page

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Bo Ye[1]*, M.D., Ting-Ting Du[1]*, M.D., Ting Xie[2]*, M.D., Jun-Tao Ji[1], M.D., Zhao-Hong Zheng[1], M.D., Zhuan Liao[1], M.D., Liang-Hao Hu[1], M.D., Zhao-Shen Li[1], M.D.

[1] Department of internal medicine, Changhai Hospital, the Second Military Medical University, Shanghai, China; [2] Department of internal medicine, Zhongda Hospital, the Southeast University, Nanjing,China

Running title: Scientific Publications in respirology from Chinese authors.

**Dr. Ye., Dr. Du and Dr. Xie contributed equally to this work.*

Correspondence:

Prof. Zhao-Shen Li, OR Liang-Hao Hu

Department of internal medicine

Changhai Hospital

The Second Military Medical University

168 Changhai Road

Shanghai 200433, China

Tel: +86-21-31161344

Fax: +86-21-55621735

E-mail: zhaoshen-li@hotmail.com OR lianghao-hu@hotmail.com

Keywords: impact factor (IF); science citation index expanded (SCIE); journal citation reports (JCR); respirology

Abstract

Background: Respiratory disease remains one of the leading causes of morbidity and mortality in China. However, little is known about the research status of respirology in the three major regions of China—Mainland (ML), Hong Kong (HK) and Taiwan (TW).A 10-year survey of literature was conducted to compare the three regions' outputs in the research of respirology.

Methods: We searched PubMed database to identify the related articles from 2000 to 2009. The number of total articles, randomized controlled trials, case reports, meta-analysis, impact factors (IF), citations, and articles published in top general medicine journals were conducted for quantity and quality comparisons.

Results: 2208 articles were collected, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008. The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312). HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Conclusion: The total number of published articles from the three major regions of China has increased notably from 2000 to 2009. The annual number of publications by ML researchers exceeded those from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

Article summary

Article focus

1) How many articles in respiratory journals were published from the three major regions of China from 2000 to 2009? 2) What is the trend? 3) How is the quality of these articles?

Key messages

1) 2208 articles in respiratory journals were published from the three major regions of China from 2000 to 2009, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008.

2) The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312).

3) HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Strengths and limitations of this study

A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles were published in general journals, rather than in the specialized ones. Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation.

Abbreviation List

ACCP	American College of Chest Physicians
BMJ	British Medical Journal
ChiCTR	Chinese Clinical Trial Register
HK	Hong Kong
ICMJE	International Committee of Medical Journal Editors
ICTPR	International Clinical Trials Registry Platform
IF	impact factors
ISI	Institute for Scientific Information
JAMA	Journal of the American Medical Association
JCR	journal citation reports
ML	Mainland
NCBI	National Center for Biotechnology Information
NEJM	The New England Journal of Medicine
RCT	randomized controlled trials
SCIE	science citation index expanded
TW	Taiwan
WHO	World Health Organization

Introduction:

Pulmonary diseases are matters of concern for all the countries. Lung disease accounts for 15% of disability-adjusted life-years [1] and may be the first cause of mortality in the world [2, 3].

In China, under the influence of the dramatic economic evolution and urbanization progress, the levels and patterns of outdoor and indoor air pollutants have greatly changed. Hundreds of cities suffer the substandard air quality according to the World Health Organization (WHO) guidelines [4].Besides, with a population of 1.3 billion, China has become a major contributor to the worldwide respiratory disease burden [5, 6].In terms of the fatality rate, respiratory disease comes the first in rural areas and the fourth in urban areas in China. However, little is known about the research status of respirology in the three major regions of China — Mainland (ML), Hong Kong (HK) and Taiwan (TW) [7]. We therefore conducted a 10-year survey of literature and compared these three regions' outputs in the research of respirology.

Methods and Materials:

A total of 46 journals related to respirology were selected from the "respiratory system" category of Science Citation Index Expanded (SCIE) subject categories by the Institute for Scientific Information(ISI) [8].The category covers resources dealing with the diagnosis and treatment of respiratory disease and focuses on prevention, pharmacology, surgery, transplantation, and research. *Annals of Thoracic Medicine*, *COPD* and *Portuguese Journal of Pulmonology (Revista Portuguesa de Pneumologia*) were not indexed by PubMed, so they were excluded. A computerized literature search was conducted in the PubMed database on 10 September 2012 (URL: http://www.ncbi.nlm.nih.gov/pubmed/).

Articles from ML, TW and HK from January 2000 to December 2009 in these journals were elicited respectively. We used the ISSN to perform searches in PubMed. The search terms used were: (1040-0605 OR 1073-449X OR 1044-1549 OR 1817-1737 OR 0003-4975 OR 0300-2896 OR 1198-2241 OR 0012-3692 OR 1752-6981 OR 0272-5231 OR 1541-2555 OR 1070-5287 OR 1010-7940 OR 0903-1936 OR 0190-2148 OR 0147-9563 OR 1027-3719 OR 1806-3713 OR 1941-2711 OR 0277-0903 OR 1053-0770 OR 1569-1993 OR 1053-2498 OR 0022-5223 OR 1556-0864 OR 0341-2040 OR 0169-5002 OR 1828-695X OR 1526-0542 OR 8755-6863 OR 1094-5539 OR 0025-7931 OR 0020-1324 OR 0954-6111 OR 1569-9048 OR 1465-9921 OR 1323-7799 OR 0873-2159 OR 0761-8417 OR 0761-8425 OR 1124-0490 OR 1069-3424 OR 1520-9512 OR 0171-6425 OR 0040-6376 OR 1472-9792 AND TAIWAN[AD] AND 2000[DP])AND “Hong Kong[AD]”, “ Taiwan[AD]”,and “China[AD] NOT Hong Kong[AD] NOT Taiwan[AD]”. Articles that showed the first author's affiliation (AD) with these three regions were considered as research outputs from the regions. Articles in the fields of randomized controlled trials (RCT), review,

meta-analysis and case reports were generated respectively, according to the publication types by PubMed.

To compare the quality of the research articles, three methods were used: (1) the accumulated impact factors (IF) and the average IF were generated according to Journal Citation Reports (JCR) 2010 established by the ISI (URL: http://isiknowledge.com); (2) citation reports of articles showing an affiliation with a Chinese institution were conducted; (3) articles published in top general medicine journals [*The New England Journal of Medicine (NEJM)*, *Journal of the American Medical Association (JAMA)*, *The Lancet*, and *British Medical Journal (BMJ)*] were also generated. Articles related to respirology were first extracted independently by two reviewers (Du T.T and Hu L.H.), and any disagreement between the reviewers was resolved by viewing the titles, abstracts, and full text if necessary. The number of articles published by each region in the top 10 high-impact respiratory journals was also compared. We determined the 10 most popular respiratory journals containing articles from the three regions of China according to the number of such articles published by each journal.

Statistical analysis

Statistical analyses were performed using STATA 11.0 [9]. The nonparametric test for trend and time series analysis was performed to established change of the total numbers over the period of time. Kruskal-Wallis test was used for detecting the difference among the three regions, and rank-sum test between two if necessary. The test for significance was two-tailed and the value of $P<0.05$ was considered significant.

Results:

Total number of articles

A total number of 83787 articles were published in the selected 46 journals within the period 2000 to 2009 worldwide. There were 2208 articles (2208/83787, 2.64%) from ML (814/2208, 36.9%), TW (909/2208 41.1%) and HK (485/2208, 22.0%).The numbers increased significantly from 2001 to 2010 in the three regions (from 13 to 273, P=0.004 for trend, 39 to 151, P=0.003, 36 to 62, P=0.047, respectively, Fig. 1). From 2005 onwards, the number of articles from ML has exceeded that from HK and in 2008 ML exceeded TW. The share of articles was on the rise in ML (P=0.001) and TW (P=0.040), but not in HK (P=0.813, Fig. 2).

Randomized controlled trial, review, meta-analysis and case report

In respect of randomized controlled trial (Fig. 3), it shows no difference among the three regions (ML vs. TW vs. HK, P=0.3662). In respect of review, ML and TW (ML vs.TW P=0.7591) showed no significant difference, while less than HK (ML vs. HK P=0.0331; TW vs. HK P=0.0038). Besides, we found a number of meta-analysis from ML since 2006, but few from TW and HK. However, showed for case report, ML and HK (ML vs. HK P=0.6215) were equal to each other, while less than TW (TW vs. HK P=0.0006; TW vs.ML P=0.0064).

Impact factors

According to the JCR, 43 journals in the "respiratory system" had IF in 2010 (URL: http://isiknowledge.com). 3 journals in our study had no IF. Excluding them, the accumulated IF of articles from TW (3192.417) was much higher than that from ML

(2409.956) and HK (1898.312, P=0.038). However, HK took the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961 (P=0.003, Table 1).

Citation reports of articles published in the respiratory journals.

The ISI has not set up a function for finding a citation report of articles by limiting the department of the corresponding author, so in this citation reports the articles included were affiliated with a Chinese institution, more than the previous search results in PubMed [10]. According to our analysis, TW got the highest total citations of 6320 (1064 articles), followed by HK with 5232 total citations in 700 articles, and ML with 5232 citations in 1122 articles. These differences among the three regions were not significant (P=0.772; Fig. 4).

High-impact respiratory journals and top general medicine journals.

1014 articles from these three regions were published in the 10 top-ranking respiratory journals, 40.33% (409/1014) were in *American Journal of Respiratory and Critical Care Medicine, Thorax, Chest,* and *European Respiratory Journal*. TW published 456 articles in the high IF respiratory journals, while ML and HK had 336 and 222 articles, respectively, in the top 10 journals (Table 2). A total number of 271 articles (ML 81, TW 71, and HK 119) were published in the 4 top general medicine journals *(NEJM, Lancet, JAMA and BMJ*). 55 articles in the field of respirology were selected by the two reviewers. HK owned the most articles of 31(original articles 23 including 1 RCT and 1 guideline, review 1, case report 2, others 5; *NEJM* 6, *JAMA* 1, *Lancet* 16, *BMJ* 8), ML had 16 articles (original articles 12 including 3 RCTs, case report 1, others 3; *NEJM* 3, *JAMA* 1, *Lancet* 10, *BMJ* 2), and TW had 8 articles (original articles 3, case report 5; *NEJM* 5, *JAMA* 1, *Lancet* 2).

Popular respiratory journals

The most popular journals in the three regions are shown in Table 3. *Chest* ranked the first in HK and TW, while *Annals of Thoracic Surgery* ranked the first in ML. *Annals of Thoracic Surgery, European Journal of Cardio-Thoracic Surgery, Respirology,* The *International Journal of Tuberculosis and Lung Disease, Chest* are all ranked top 10.

Discussion:

To the best of our knowledge, this is the first report that showed clearly the contributions of Chinese authors in major regions of China—ML, HK and TW—to the worldwide research in the field of respirology. Our study results showed that the number of published articles from Mainland China had increased significantly in the past ten years, and surpassed HK in 2005 and TW in 2008. However, when impact factors (IF), citation reports, and articles published in top general medicine journals were taken into quality comparisons, the gap among the three regions appeared wide. HK had the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961, mainly because the readers worldwide preferred English, which gave HK an advantage over the other two regions. The number of articles from China in the "respiratory system" category ranked 11 worldwide in total (2.64% for share), although a substantial number of high-quality articles were in Chinese. In addition, the situation that the articles increased in the field of respirology was also found in other fields, such as Cardiology, Cardiovasology and Gastroenterology [11, 12].

The three regions kept equal to each other in terms of randomized controlled trial for the past decades. However, ML has gradually come to the fore since 2007. In 2008, ML released more reports than TW and HK, indicating its obvious superiority of large population and relatively low research cost [13].

However, the published essays, in fact, are just a small part of randomized controlled trials achievements. The reasons are as follows: The records were dispersed not only in the Chinese Clinical Trial Register (ChiCTR), but also in other WHO International Clinical Trials Registry Platform (ICTPR) primary registries or International Committee of Medical Journal Editors (ICMJE) approved registries [14]. Besides, part

of the results were released in Chinese or in the journals not indexed by PubMed. Moreover, the randomized controlled trials in China showed a lower publication rate to average [15-17].

China in recent years is prospering rapidly economically to become the second-largest economy in the world after the United States. However, air pollution, especially hazes, followed this prosperity. The Global Burden of Disease Study 2010 found that particulate matter with an aerodynamic diameter of less than 2.5 μm (PM2.5) has become the fourth biggest threat to the health of the Chinese people [18]. Although smoking has fallen in China, the prevalence of lung cancer has increased, most probably due to air pollution[19].Now China is faced with an arduous task in addressing the challenges of environmental pollution[20].Today, the pace of life is increasing with technological advancements, this leads to hyper-tension, decreased exercise in people's daily life. All of these risk factors obviously will increase the morbidity of respiratory diseases. There is a price that developing countries must pay for modernization. However, let the price the Chinese pay not exceed the benefits from modernization. Therefore, government, scientific association and doctors pay more attention to the study about respiratory diseases [21, 22].

The data in our study mainly came from two sources: the PubMed search system and the JCR. The PubMed search system is a comprehensive database run by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in Bethesda, Maryland, containing articles from high-quality medical journals. The JCR, published by the Institute for Scientific Information in 1975, represents the most comprehensive citation index to the scientific literature, and covers more than 7000 journals at 2010. Although IF is not the optimal parameter for determining the quality of articles, it is at present the best available parameter for judging the quality of

studies.

Our study has its limitations, however. A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles are published in general journals, rather than in the specialized ones [23].

Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation. (1 in Heart Lung. 2007 and 1 in Respirology. 2009)

In conclusion, the number of articles published from ML, TW, and HK has increased significantly during the past ten years. There has also been an appreciable increase in the total number of articles from the three major regions of China from 2000 to 2009.The number of articles published per year from ML has exceeded that from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

No conflicts of interest exist.

No current external funding sources for this study.

Contributorship Statement:

Bo Ye: searched and selected the data; analyzed the data; wrote the manuscript;
Ting-Ting Du: searched and selected the data; analyzed the data;
Ting Xie: wrote the manuscript;
Jun-Tao Ji:searched and selected the data;
Zhao-Hong Zheng:searched and selected the data;
Zhuan Liao:searched and selected the data;
Zhao-Shen Li: analyzed the data; contributed analysis tools;
Liang-Hao Hung: conceived and designed the study

Data Sharing Statement

No additional data

References

[1] Guntupalli KK, Gutterman D, Raoof S et al. 2010: the year of the lung. Chest 2010; 138:1287-8.

[2] Sandoval-Gutierrez JL, Reyes ES, Bautista EB. Pulmonary Diseases: First Cause of Mortality in the World. Chest 2011; 139:1550.

[3] Mathers CD, Boerma T, Ma Fat D. Global and regional causes of death. Br Med Bull. 2009; 92:7-32.

[4] Chinese Academy of Engineering, Chinese Academy of Sciences, National Academy of Engineering, National Research Council. Introduction of urbanization, energy and air pollution in China: the Challenges Ahead, Proceedings of a symposium. The National Academies Press. Washington, D.C. (2003), pp. 1-3.

[5]Fang X, Wang X, Bai C.COPD in China: the burden and importance of proper management.Chest 2011; 139:920-9.

[6]Sun YC.Taking ACTion for better control of asthma.Chin Med J (Engl). 2007 ;120(12):1035-6.

[7] Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health. BMC Public Health 2006; 15:301.

[8] Journal search: Science citation index expanded subject categories. Cited 10 September 2012. http://scientific.thomsonreuters.com/cgibin/jrnlst/jlresults.cgi

[9] STATA statistical software (version 11.0, Stata. Corp, College Station, TX, U.S.A.)

[10] Hu LH, Liao Z et al. Scientific publications in cardiology and cardiovasology journals fromChinese authors in various parts of North Asia: 10-year survey of literature.Int J Cardiol. 2010;140(3):304-8.

[11]Goh KL, Farrell GC. Publications from China: The sleeping giant awakens. J Gastroenterol Hepatol 2008; 23:341-3.

[12] Hu LH, Liao Z, Gao R et al. Scientific publications in cardiology and cardiovasology journals from Chinese authors in various parts of North Asia: 10-year survey of literature. Int J Cardiol 2010; 30; 140:304-8.

[13] Mervis J. China's unique environment favors large intervention trials. Science 1995; 270:1149-51.

[14] Liu XM, Li YP, Yu XT et al. Assessment of registration quality of trials sponsored by China. Journal of Evidence-Based Medicine 2009; 2:8-18.

[15] Song FJ, Parekh-Bhurke S, Hooper L et al. Extent of publication bias in different categories of research cohorts: a meta-analysis of empirical studies. BMC Medical research methodology 2009;9:79

[16] Xuemei L, Youping L, Shangqi S et al. Ethical review reporting of Chinese trials records in WHO primary registries.J Med Ethics 2011; 37:144-8.

[17] Michalopoulos A, Falagas ME. A Bibliometric Analysis of Global Research Production in Respiratory Medicine. Chest 2005; 128:3993-8.

[18] Cancer death report in China: the third national retrospective sampling death survey People's Medical Publishing House, Beijing (2008).National Office for Cancer Prevention and Control National Center for Cancer Registries Bureau of Disease Prevention and Control Ministry of Health

[19] Xu P. Haze, air pollution, and health in China. Lancet. 2013; 382(9910):2067.

[20] Chen Z, Wang JN, Ma GX et al. China tackles the health effects of air pollution. Lancet. 2013; 382(9909):1959-60.

[21]Yao X, Sun Y. The sounds of small airways: emerging role in pathogenesis and clinical expression of asthma. Chin Med J (Engl). 2014; 127(1):173-9

[22]Sun YC. Advances in respiratory medicine in the mainland of China: a historical perspective. Chin Med J (Engl). 2010; 123(1):6-17.

[23] Partridge MR, Lewison G. Respiratory research output. Chest 2006; 130:1283.

Figure Legends

Fig.1. The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 2. The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 3. Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.

Fig. 4. Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.

Tables

Table 1. The accumulated and average impact factor of articles from Mainland (ML), Taiwan (TW), and Hong Kong (HK)

Year	Accumulated impact factor			Average impact factor		
	ML	HK	TW	ML	HK	TW
2000	54.895	167.831	171.309	4.223	4.662	4.393
2001	66.619	78.862	149.393	2.896	3.286	3.557
2002	38.238	133.937	248.554	2.941	3.827	3.452
2003	50.552	194.997	328.783	2.808	3.482	3.961
2004	109.898	244.190	331.810	3.330	4.003	4.200
2005	218.684	162.832	355.665	3.364	3.877	3.824
2006	242.293	308.506	318.215	3.106	4.007	3.350
2007	292.890	193.632	379.165	2.615	4.503	3.108
2008	533.500	172.982	463.555	2.868	3.530	3.485
2009	802.387	240.543	445.968	2.939	3.880	2.953
TOTAL	2409.956	1898.312	3192.417	2.961	3.914	3.512

Table 2. Articles published on the 10 most influential journals from Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	Journal	2009 IF	ML	(%)	TW	(%)	HK	(%)	Total
1	Am J Resp Crit Care	10.689	8	15	20	38	24	46	52
2	Thorax	7.041	9	15	18	30	33	55	60
3	Chest	6.360	28	13	127	58	65	30	220
4	Eur Respir J	5.527	17	22	24	31	36	47	77
5	J Thorac Oncol	4.547	19	59	9	28	4	13	32
6	Am J Resp Cell Mol	4.319	12	29	21	51	8	20	41
7	Am J Physiol Lung C	4.043	7	29	16	67	1	4.2	24
8	Ann Thorac Surg	3.644	115	44	109	42	37	14	261
9	J Heart Lung Transpl	3.541	9	32	15	54	4	14	28
10	Lung Cancer	3.140	112	51	97	44	10	5	219

Am J Resp Crit Care: American Journal of Respiratory and Critical Care Medicine; Eur Respir J: European Respiratory Journal; J Thorac Oncol: Journal of Thoracic Oncology; Am J Resp Cell Mol: American Journal of Respiratory Cell and Molecular Biology; Am J Physiol Lung C: American Journal of Physiology - Lung Cellular and Molecular Physiology; Ann Thorac Surg: Annals of Thoracic Surgery; J Heart Lung Transpl: The Journal of Heart and Lung Transplantation.

Table 3.The 10 most popular respiratory journals in Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	ML(n=814)	N	TW(n=909)	N	HK(n=485)	N
1	ATS	115	Chest	127	Chest	65
2	LC	112	ATS	109	Respirology	62
3	EJCT	68	LC	97	IJTLD	42
4	JTCS	68	JTCS	93	ATS	37
5	Respirology	57	EJCT	59	ERJ	36
6	Respiration	41	Respirology	42	Thorax	33
7	IJTLD	34	IJTLD	39	RM	30
8	Chest	28	PP	36	PP	25
9	RR	23	TCS	36	AJRCC	24
10	PPT	22	JA	29	EJCT	19

ATS: Annals of Thoracic Surgery. IF=3.644; LC: Lung Cancer. IF=3.140; EJCT: European Journal of Cardio-Thoracic Surgery. IF=2.397; JTCS：Journal of Thoracic and Cardiovascular Surgery. IF= 3.063; Respirology: IF=1.853; Respiration: IF=1.935; IJTLD: The International Journal of Tuberculosis and Lung Disease. IF= 2.548; Chest: IF= 6.36; RR: Respiratory Research. IF= 3.127; PPT: Pulmonary Pharmacology and Therapeutics. IF= 2.024; PP: Pediatric Pulmonology. IF=1.816; TCS: Thoracic and Cardiovascular Surgeon. IF=0.745; JA: Journal of Asthma. IF=1.372; ERJ: European Respiratory Journal. IF=5.527; Thorax: IF= 7.041; RM: Respiratory Medicine. IF=2.331; AJRCC: American Journal of Respiratory and Critical Care Medicine. IF=10.689.

Title Page

Scientific publications in respiratory journals from Chinese authors in various parts of North Asia: 10-year survey of literature

Bo Ye[1]*, M.D., Ting-Ting Du[1]*, M.D., Ting Xie[2]*, M.D., Jun-Tao Ji[1], M.D., Zhao-Hong Zheng[1], M.D., Zhuan Liao[1], M.D., Liang-Hao Hu[1], M.D., Zhao-Shen Li[1], M.D.

[1] Department of internal medicine, Changhai Hospital, the Second Military Medical University, Shanghai, China; [2] Department of internal medicine, Zhongda Hospital, the Southeast University, Nanjing, China

Running title: Scientific Publications in respirology from Chinese authors.

**Dr. Ye., Dr. Du and Dr. Xie contributed equally to this work.*

Correspondence:

Prof. Zhao-Shen Li, OR Liang-Hao Hu

Department of internal medicine

Changhai Hospital

The Second Military Medical University

168 Changhai Road

Shanghai 200433, China

Tel: +86-21-31161344

Fax: +86-21-55621735

E-mail: zhaoshen-li@hotmail.com OR lianghao-hu@hotmail.com

Keywords: impact factor (IF); science citation index expanded (SCIE); journal citation reports (JCR); respirology

Abstract

Background: Respiratory disease remains one of the leading causes of morbidity and mortality in China. However, little is known about the research status of respirology in the three major regions of China—Mainland (ML), Hong Kong (HK) and Taiwan (TW).A 10-year survey of literature was conducted to compare the three regions' outputs in the research of respirology.

Methods: We searched PubMed database to identify the related articles from 2000 to 2009. The number of total articles, randomized controlled trials, case reports, meta-analysis, impact factors (IF), citations, and articles published in top general medicine journals were conducted for quantity and quality comparisons.

Results: 2208 articles were collected, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008. The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312). HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Conclusion: The total number of published articles from the three major regions of China has increased notably from 2000 to 2009. The annual number of publications by ML researchers exceeded those from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

Article summary

Article focus

1) How many articles in respiratory journals were published from the three major regions of China from 2000 to 2009? 2) What is the trend? 3) How is the quality of these articles?

Key messages

1) 2208 articles in respiratory journals were published from the three major regions of China from 2000 to 2009, 814 from ML, 909 from TW and 485 from HK. The total number of articles from the three regions has increased significantly from 2000 and 2009.The number of articles published per year from ML has exceeded that from HK in 2005 and TW in 2008.

2) The accumulated IF of articles from TW (3192.417) was much higher than that from ML (2409.956) and HK (1898.312).

3) HK got the highest average IF of respirology articles and the majority of articles were published in top general medicine journals.

Strengths and limitations of this study

A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles were published in general journals, rather than in the specialized ones. Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation.

Abbreviation List

ACCP	American College of Chest Physicians
BMJ	British Medical Journal
ChiCTR	Chinese Clinical Trial Register
HK	Hong Kong
ICMJE	International Committee of Medical Journal Editors
ICTPR	International Clinical Trials Registry Platform
IF	impact factors
ISI	Institute for Scientific Information
JAMA	Journal of the American Medical Association
JCR	journal citation reports
ML	Mainland
NCBI	National Center for Biotechnology Information
NEJM	The New England Journal of Medicine
RCT	randomized controlled trials
SCIE	science citation index expanded
TW	Taiwan
WHO	World Health Organization

Introduction:

Pulmonary diseases are matters of concern for all the countries. Lung disease accounts for 15% of disability-adjusted life-years [1] and may be the first cause of mortality in the world [2, 3].

In China, under the influence of the dramatic economic evolution and urbanization progress, the levels and patterns of outdoor and indoor air pollutants have greatly changed. Hundreds of cities suffer the substandard air quality according to the World Health Organization (WHO) guidelines [4].Besides, with a population of 1.3 billion, China has become a major contributor to the worldwide respiratory disease burden [5, 6].In terms of the fatality rate, respiratory disease comes the first in rural areas and the fourth in urban areas in China. However, little is known about the research status of respirology in the three major regions of China — Mainland (ML), Hong Kong (HK) and Taiwan (TW) [7]. We therefore conducted a 10-year survey of literature and compared these three regions' outputs in the research of respirology.

Methods and Materials:

A total of 46 journals related to respirology were selected from the "respiratory system" category of Science Citation Index Expanded (SCIE) subject categories by the Institute for Scientific Information(ISI) [8].The category covers resources dealing with the diagnosis and treatment of respiratory disease and focuses on prevention, pharmacology, surgery, transplantation, and research. *Annals of Thoracic Medicine*, *COPD* and *Portuguese Journal of Pulmonology (Revista Portuguesa de Pneumologia*) were not indexed by PubMed, so they were excluded. A computerized literature search was conducted in the PubMed database on 10 September 2012 (URL: http://www.ncbi.nlm.nih.gov/pubmed/).

Articles from ML, TW and HK from January 2000 to December 2009 in these journals were elicited respectively. We used the ISSN to perform searches in PubMed. The search terms used were: (1040-0605 OR 1073-449X OR 1044-1549 OR 1817-1737 OR 0003-4975 OR 0300-2896 OR 1198-2241 OR 0012-3692 OR 1752-6981 OR 0272-5231 OR 1541-2555 OR 1070-5287 OR 1010-7940 OR 0903-1936 OR 0190-2148 OR 0147-9563 OR 1027-3719 OR 1806-3713 OR 1941-2711 OR 0277-0903 OR 1053-0770 OR 1569-1993 OR 1053-2498 OR 0022-5223 OR 1556-0864 OR 0341-2040 OR 0169-5002 OR 1828-695X OR 1526-0542 OR 8755-6863 OR 1094-5539 OR 0025-7931 OR 0020-1324 OR 0954-6111 OR 1569-9048 OR 1465-9921 OR 1323-7799 OR 0873-2159 OR 0761-8417 OR 0761-8425 OR 1124-0490 OR 1069-3424 OR 1520-9512 OR 0171-6425 OR 0040-6376 OR 1472-9792 AND TAIWAN[AD] AND 2000[DP])AND “Hong Kong[AD]”, “ Taiwan[AD]”,and “China[AD] NOT Hong Kong[AD] NOT Taiwan[AD]”. Articles that showed the first author's affiliation (AD) with these three regions were considered as research outputs from the regions. Articles in the fields of randomized controlled trials (RCT), review,

meta-analysis and case reports were generated respectively, according to the publication types by PubMed.

To compare the quality of the research articles, three methods were used: (1) the accumulated impact factors (IF) and the average IF were generated according to Journal Citation Reports (JCR) 2010 established by the ISI (URL: http://isiknowledge.com); (2) citation reports of articles showing an affiliation with a Chinese institution were conducted; (3) articles published in top general medicine journals [*The New England Journal of Medicine (NEJM)*, *Journal of the American Medical Association (JAMA)*, *The Lancet*, and *British Medical Journal (BMJ)*] were also generated. Articles related to respirology were first extracted independently by two reviewers (Du T.T and Hu L.H.), and any disagreement between the reviewers was resolved by viewing the titles, abstracts, and full text if necessary. The number of articles published by each region in the top 10 high-impact respiratory journals was also compared. We determined the 10 most popular respiratory journals containing articles from the three regions of China according to the number of such articles published by each journal.

Statistical analysis

Statistical analyses were performed using STATA 11.0 [9]. The nonparametric test for trend and time series analysis was performed to established change of the total numbers over the period of time. Kruskal-Wallis test was used for detecting the difference among the three regions, and rank-sum test between two if necessary. The test for significance was two-tailed and the value of $P<0.05$ was considered significant.

Results:

Total number of articles

A total number of 83787 articles were published in the selected 46 journals within the period 2000 to 2009 worldwide. There were 2208 articles (2208/83787, 2.64%) from ML (814/2208, 36.9%), TW (909/2208 41.1%) and HK (485/2208, 22.0%).The numbers increased significantly from 2001 to 2010 in the three regions (from 13 to 273, P=0.004 for trend, 39 to 151, P=0.003, 36 to 62, P=0.047, respectively, Fig. 1). From 2005 onwards, the number of articles from ML has exceeded that from HK and in 2008 ML exceeded TW. The share of articles was on the rise in ML (P=0.001) and TW (P=0.040), but not in HK (P=0.813, Fig. 2).

Randomized controlled trial, review, meta-analysis and case report

In respect of randomized controlled trial (Fig. 3), it shows no difference among the three regions (ML vs. TW vs. HK, P=0.3662). In respect of review, ML and TW (ML vs.TW P=0.7591) showed no significant difference, while less than HK (ML vs. HK P=0.0331; TW vs. HK P=0.0038). Besides, we found a number of meta-analysis from ML since 2006, but few from TW and HK. However, showed for case report, ML and HK (ML vs. HK P=0.6215) were equal to each other, while less than TW (TW vs. HK P=0.0006; TW vs.ML P=0.0064).

Impact factors

According to the JCR, 43 journals in the "respiratory system" had IF in 2010 (URL: http://isiknowledge.com). 3 journals in our study had no IF. Excluding them, the accumulated IF of articles from TW (3192.417) was much higher than that from ML

(2409.956) and HK (1898.312, P=0.038). However, HK took the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961 (P=0.003, Table 1).

Citation reports of articles published in the respiratory journals.

The ISI has not set up a function for finding a citation report of articles by limiting the department of the corresponding author, so in this citation reports the articles included were affiliated with a Chinese institution, more than the previous search results in PubMed [10]. According to our analysis, TW got the highest total citations of 6320 (1064 articles), followed by HK with 5232 total citations in 700 articles, and ML with 5232 citations in 1122 articles. These differences among the three regions were not significant (P=0.772; Fig. 4).

High-impact respiratory journals and top general medicine journals.

1014 articles from these three regions were published in the 10 top-ranking respiratory journals, 40.33% (409/1014) were in *American Journal of Respiratory and Critical Care Medicine, Thorax, Chest,* and *European Respiratory Journal*. TW published 456 articles in the high IF respiratory journals, while ML and HK had 336 and 222 articles, respectively, in the top 10 journals (Table 2). A total number of 271 articles (ML 81, TW 71, and HK 119) were published in the 4 top general medicine journals *(NEJM, Lancet, JAMA and BMJ*). 55 articles in the field of respirology were selected by the two reviewers. HK owned the most articles of 31(original articles 23 including 1 RCT and 1 guideline, review 1, case report 2, others 5; *NEJM* 6, *JAMA* 1, *Lancet* 16, *BMJ* 8), ML had 16 articles (original articles 12 including 3 RCTs, case report 1, others 3; *NEJM* 3, *JAMA* 1, *Lancet* 10, *BMJ* 2), and TW had 8 articles (original articles 3, case report 5; *NEJM* 5, *JAMA* 1, *Lancet* 2).

Popular respiratory journals

The most popular journals in the three regions are shown in Table 3. *Chest* ranked the first in HK and TW, while *Annals of Thoracic Surgery* ranked the first in ML. *Annals of Thoracic Surgery, European Journal of Cardio-Thoracic Surgery, Respirology,* The *International Journal of Tuberculosis and Lung Disease, Chest* are all ranked top 10.

Discussion:

To the best of our knowledge, this is the first report that showed clearly the contributions of Chinese authors in major regions of China—ML, HK and TW—to the worldwide research in the field of respirology. Our study results showed that the number of published articles from Mainland China had increased significantly in the past ten years, and surpassed HK in 2005 and TW in 2008. However, when impact factors (IF), citation reports, and articles published in top general medicine journals were taken into quality comparisons, the gap among the three regions appeared wide. HK had the highest average IF of 3.914, followed by TW of 3.512, ML of 2.961, mainly because the readers worldwide preferred English, which gave HK an advantage over the other two regions. The number of articles from China in the "respiratory system" category ranked 11 worldwide in total (2.64% for share), although a substantial number of high-quality articles were in Chinese. In addition, the situation that the articles increased in the field of respirology was also found in other fields, such as Cardiology, Cardiovasology and Gastroenterology [11, 12].

The three regions kept equal to each other in terms of randomized controlled trial for the past decades. However, ML has gradually come to the fore since 2007. In 2008, ML released more reports than TW and HK, indicating its obvious superiority of large population and relatively low research cost [13].

However, the published essays, in fact, are just a small part of randomized controlled trials achievements. The reasons are as follows: The records were dispersed not only in the Chinese Clinical Trial Register (ChiCTR), but also in other WHO International Clinical Trials Registry Platform (ICTPR) primary registries or International Committee of Medical Journal Editors (ICMJE) approved registries [14]. Besides, part

of the results were released in Chinese or in the journals not indexed by PubMed. Moreover, the randomized controlled trials in China showed a lower publication rate to average [15-17].

China in recent years is prospering rapidly economically to become the second-largest economy in the world after the United States. However, air pollution, especially hazes, followed this prosperity. The Global Burden of Disease Study 2010 found that particulate matter with an aerodynamic diameter of less than 2.5 μm (PM2.5) has become the fourth biggest threat to the health of the Chinese people [18]. Although smoking has fallen in China, the prevalence of lung cancer has increased, most probably due to air pollution[19].Now China is faced with an arduous task in addressing the challenges of environmental pollution[20].Today, the pace of life is increasing with technological advancements, this leads to hyper-tension, decreased exercise in people's daily life. All of these risk factors obviously will increase the morbidity of respiratory diseases. There is a price that developing countries must pay for modernization. However, let the price the Chinese pay not exceed the benefits from modernization. Therefore, government, scientific association and doctors pay more attention to the study about respiratory diseases [21, 22].

The data in our study mainly came from two sources: the PubMed search system and the JCR. The PubMed search system is a comprehensive database run by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in Bethesda, Maryland, containing articles from high-quality medical journals. The JCR, published by the Institute for Scientific Information in 1975, represents the most comprehensive citation index to the scientific literature, and covers more than 7000 journals at 2010. Although IF is not the optimal parameter for determining the quality of articles, it is at present the best available parameter for judging the quality of

studies.

Our study has its limitations, however. A few journals covered resources beyond respiratory even selected from the respiratory system of SCIE. Besides, some related journals not shown in SCIE were not collected. Some respiratory medicine research articles are published in general journals, rather than in the specialized ones [23].

Searching by the author's address (China, HK or TW) led to another problem that the articles addressed other cities or provinces were not included. Actually, our previous design had taken Macau into consideration, but later we excluded it for its small amount and low correlation. (1 in Heart Lung. 2007 and 1 in Respirology. 2009)

In conclusion, the number of articles published from ML, TW, and HK has increased significantly during the past ten years. There has also been an appreciable increase in the total number of articles from the three major regions of China from 2000 to 2009.The number of articles published per year from ML has exceeded that from TW and HK. However, the quality of articles from TW and HK is better than that from ML.

No conflicts of interest exist.

No current external funding sources for this study.

Contributorship Statement:

Bo Ye: searched and selected the data; analyzed the data; wrote the manuscript;
Ting-Ting Du: searched and selected the data; analyzed the data;
Ting Xie: wrote the manuscript;
Jun-Tao Ji:searched and selected the data;
Zhao-Hong Zheng:searched and selected the data;
Zhuan Liao:searched and selected the data;
Zhao-Shen Li: analyzed the data; contributed analysis tools;
Liang-Hao Hung: conceived and designed the study

Data Sharing Statement

No additional data

References

[1] Guntupalli KK, Gutterman D, Raoof S et al. 2010: the year of the lung. Chest 2010; 138:1287-8.

[2] Sandoval-Gutierrez JL, Reyes ES, Bautista EB. Pulmonary Diseases: First Cause of Mortality in the World. Chest 2011; 139:1550.

[3] Mathers CD, Boerma T, Ma Fat D. Global and regional causes of death. Br Med Bull. 2009; 92:7-32.

[4] Chinese Academy of Engineering, Chinese Academy of Sciences, National Academy of Engineering, National Research Council. Introduction of urbanization, energy and air pollution in China: the Challenges Ahead, Proceedings of a symposium. The National Academies Press. Washington, D.C. (2003), pp. 1-3.

[5]Fang X, Wang X, Bai C.COPD in China: the burden and importance of proper management.Chest 2011; 139:920-9.

[6]Sun YC.Taking ACTion for better control of asthma.Chin Med J (Engl). 2007 ;120(12):1035-6.

[7] Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health. BMC Public Health 2006; 15:301.

[8] Journal search: Science citation index expanded subject categories. Cited 10 September 2012. http://scientific.thomsonreuters.com/cgibin/jrnlst/jlresults.cgi

[9] STATA statistical software (version 11.0, Stata. Corp, College Station, TX, U.S.A.)

[10] Hu LH, Liao Z et al. Scientific publications in cardiology and cardiovasology journals fromChinese authors in various parts of North Asia: 10-year survey of literature.Int J Cardiol. 2010;140(3):304-8.

[11]Goh KL, Farrell GC. Publications from China: The sleeping giant awakens. J Gastroenterol Hepatol 2008; 23:341-3.

[12] Hu LH, Liao Z, Gao R et al. Scientific publications in cardiology and cardiovasology journals from Chinese authors in various parts of North Asia: 10-year survey of literature. Int J Cardiol 2010; 30; 140:304-8.

[13] Mervis J. China's unique environment favors large intervention trials. Science 1995; 270:1149-51.

[14] Liu XM, Li YP, Yu XT et al. Assessment of registration quality of trials sponsored by China. Journal of Evidence-Based Medicine 2009; 2:8-18.

[15] Song FJ, Parekh-Bhurke S, Hooper L et al. Extent of publication bias in different categories of research cohorts: a meta-analysis of empirical studies. BMC Medical research methodology 2009;9:79

[16] Xuemei L, Youping L, Shangqi S et al. Ethical review reporting of Chinese trials records in WHO primary registries.J Med Ethics 2011; 37:144-8.

[17] Michalopoulos A, Falagas ME. A Bibliometric Analysis of Global Research Production in Respiratory Medicine. Chest 2005; 128:3993-8.

[18] Cancer death report in China: the third national retrospective sampling death survey People's Medical Publishing House, Beijing (2008).National Office for Cancer Prevention and Control National Center for Cancer Registries Bureau of Disease Prevention and Control Ministry of Health

[19] Xu P. Haze, air pollution, and health in China. Lancet. 2013; 382(9910):2067.

[20] Chen Z, Wang JN, Ma GX et al. China tackles the health effects of air pollution. Lancet. 2013; 382(9909):1959-60.

[21]Yao X, Sun Y. The sounds of small airways: emerging role in pathogenesis and clinical expression of asthma. Chin Med J (Engl). 2014; 127(1):173-9

[22]Sun YC. Advances in respiratory medicine in the mainland of China: a historical perspective. Chin Med J (Engl). 2010; 123(1):6-17.

[23] Partridge MR, Lewison G. Respiratory research output. Chest 2006; 130:1283.

Figure Legends

Fig.1. The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 2. The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.

Fig. 3. Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.

Fig. 4. Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.

Tables

Table 1. The accumulated and average impact factor of articles from Mainland (ML), Taiwan (TW), and Hong Kong (HK)

Year	Accumulated impact factor			Average impact factor		
	ML	HK	TW	ML	HK	TW
2000	54.895	167.831	171.309	4.223	4.662	4.393
2001	66.619	78.862	149.393	2.896	3.286	3.557
2002	38.238	133.937	248.554	2.941	3.827	3.452
2003	50.552	194.997	328.783	2.808	3.482	3.961
2004	109.898	244.190	331.810	3.330	4.003	4.200
2005	218.684	162.832	355.665	3.364	3.877	3.824
2006	242.293	308.506	318.215	3.106	4.007	3.350
2007	292.890	193.632	379.165	2.615	4.503	3.108
2008	533.500	172.982	463.555	2.868	3.530	3.485
2009	802.387	240.543	445.968	2.939	3.880	2.953
TOTAL	2409.956	1898.312	3192.417	2.961	3.914	3.512

Table 2. Articles published on the 10 most influential journals from Mainland (ML), Taiwan (TW) and Hong Kong (HK)

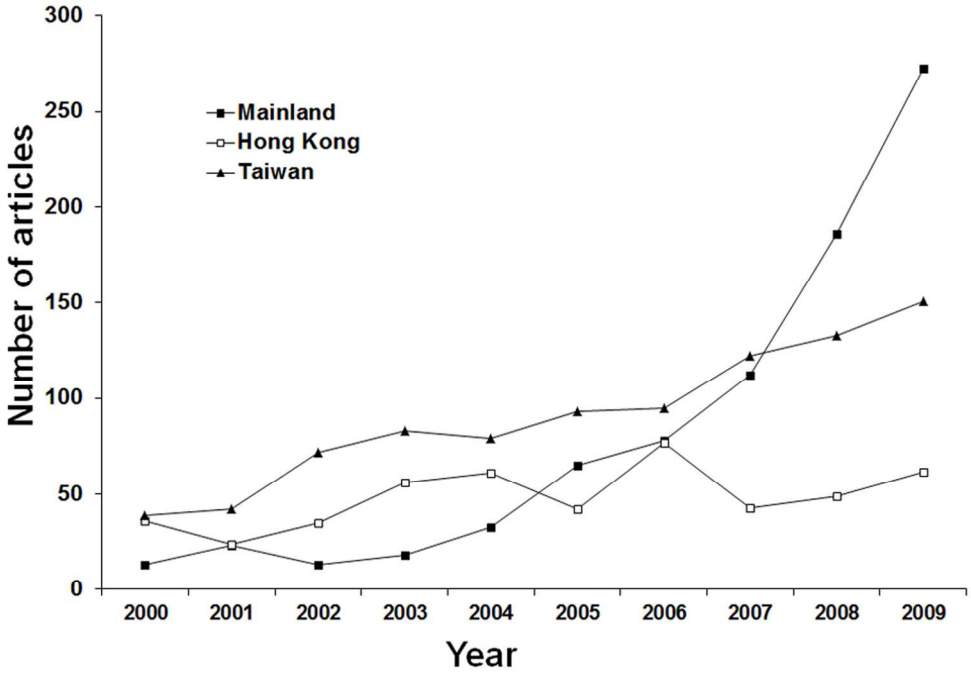
Rank	Journal	2009 IF	ML	(%)	TW	(%)	HK	(%)	Total
1	Am J Resp Crit Care	10.689	8	15	20	38	24	46	52
2	Thorax	7.041	9	15	18	30	33	55	60
3	Chest	6.360	28	13	127	58	65	30	220
4	Eur Respir J	5.527	17	22	24	31	36	47	77
5	J Thorac Oncol	4.547	19	59	9	28	4	13	32
6	Am J Resp Cell Mol	4.319	12	29	21	51	8	20	41
7	Am J Physiol Lung C	4.043	7	29	16	67	1	4.2	24
8	Ann Thorac Surg	3.644	115	44	109	42	37	14	261
9	J Heart Lung Transpl	3.541	9	32	15	54	4	14	28
10	Lung Cancer	3.140	112	51	97	44	10	5	219

Am J Resp Crit Care: American Journal of Respiratory and Critical Care Medicine; Eur Respir J: European Respiratory Journal; J Thorac Oncol: Journal of Thoracic Oncology; Am J Resp Cell Mol: American Journal of Respiratory Cell and Molecular Biology; Am J Physiol Lung C: American Journal of Physiology - Lung Cellular and Molecular Physiology; Ann Thorac Surg: Annals of Thoracic Surgery; J Heart Lung Transpl: The Journal of Heart and Lung Transplantation.

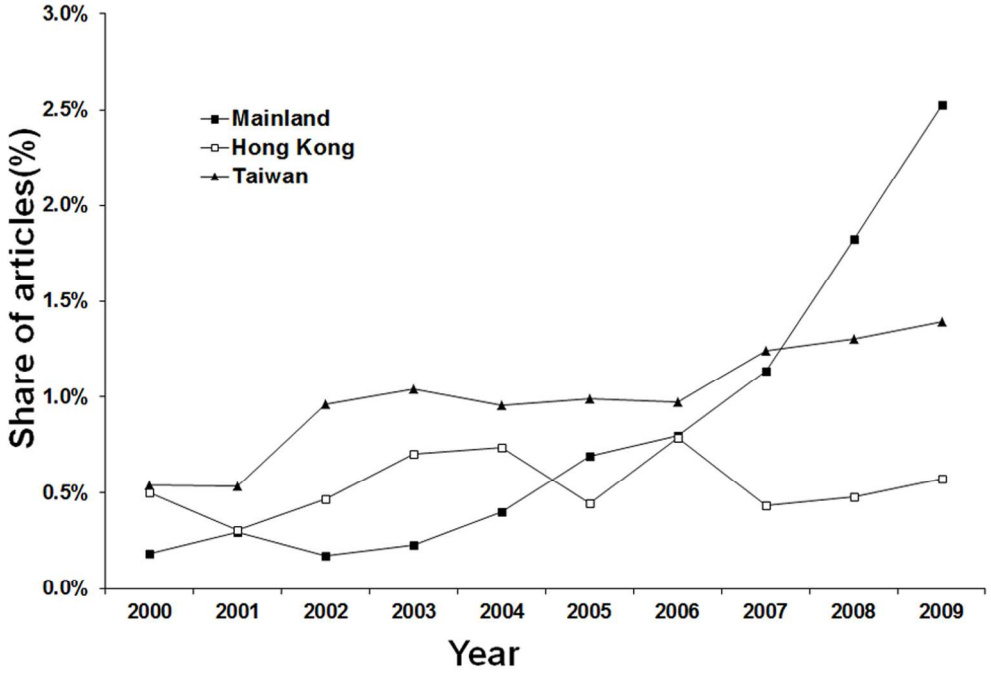
Table 3.The 10 most popular respiratory journals in Mainland (ML), Taiwan (TW) and Hong Kong (HK)

Rank	ML(n=814)	N	TW(n=909)	N	HK(n=485)	N
1	ATS	115	Chest	127	Chest	65
2	LC	112	ATS	109	Respirology	62
3	EJCT	68	LC	97	IJTLD	42
4	JTCS	68	JTCS	93	ATS	37
5	Respirology	57	EJCT	59	ERJ	36
6	Respiration	41	Respirology	42	Thorax	33
7	IJTLD	34	IJTLD	39	RM	30
8	Chest	28	PP	36	PP	25
9	RR	23	TCS	36	AJRCC	24
10	PPT	22	JA	29	EJCT	19

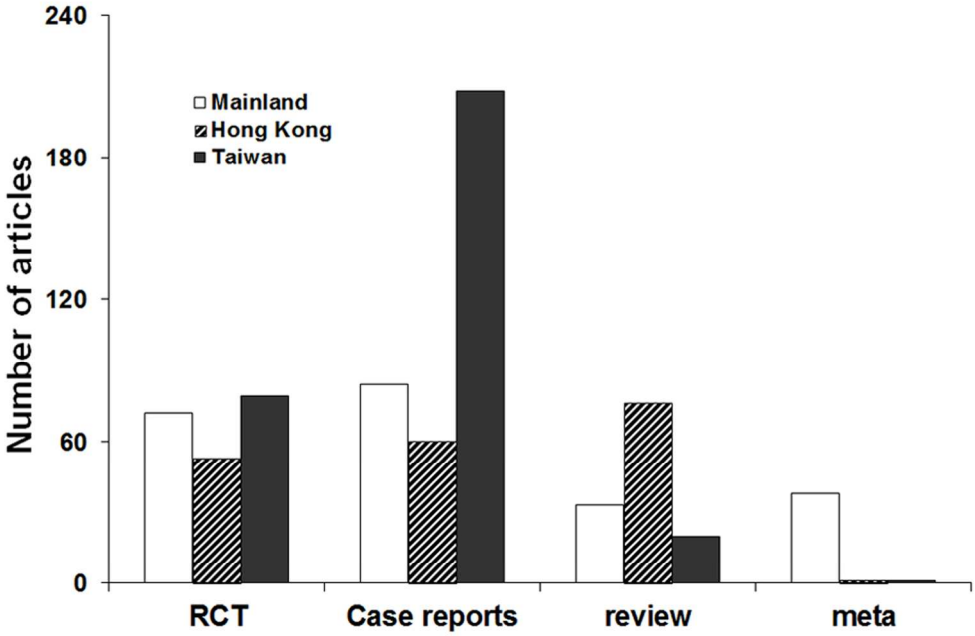
ATS: Annals of Thoracic Surgery. IF=3.644; LC: Lung Cancer. IF=3.140; EJCT: European Journal of Cardio-Thoracic Surgery. IF=2.397; JTCS：Journal of Thoracic and Cardiovascular Surgery. IF= 3.063; Respirology: IF=1.853; Respiration: IF=1.935; IJTLD: The International Journal of Tuberculosis and Lung Disease. IF= 2.548; Chest: IF= 6.36; RR: Respiratory Research. IF= 3.127; PPT: Pulmonary Pharmacology and Therapeutics. IF= 2.024; PP: Pediatric Pulmonology. IF=1.816; TCS: Thoracic and Cardiovascular Surgeon. IF=0.745; JA: Journal of Asthma. IF=1.372; ERJ: European Respiratory Journal. IF=5.527; Thorax: IF= 7.041; RM: Respiratory Medicine. IF=2.331; AJRCC: American Journal of Respiratory and Critical Care Medicine. IF=10.689.



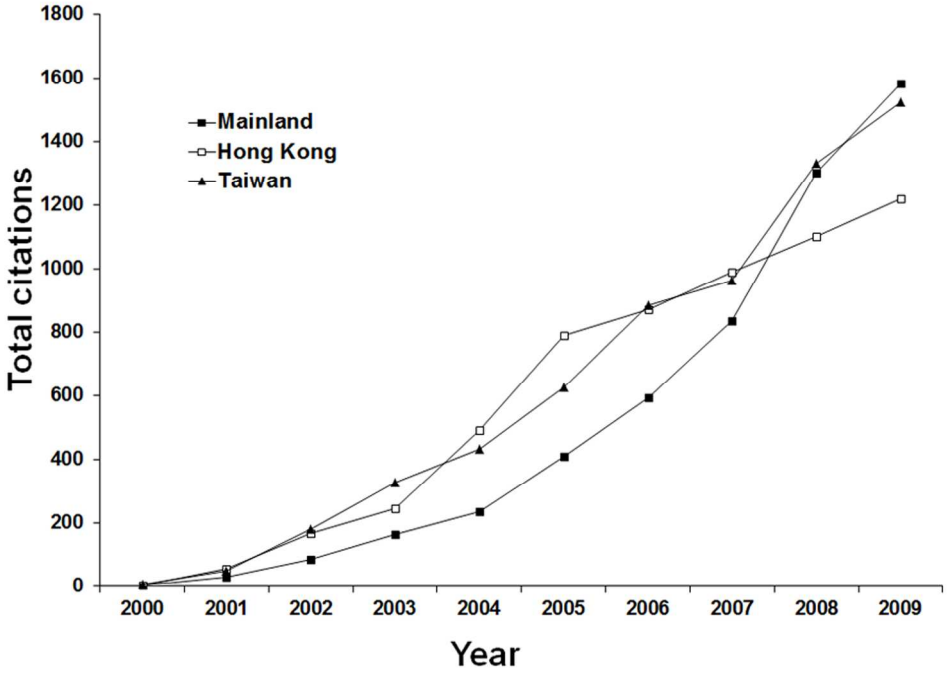
The trend of the number of articles from Mainland, Taiwan, and Hong Kong during the past ten years.
173x121mm (300 x 300 DPI)



The share of articles from Mainland, Taiwan, and Hong Kong during the past ten years.
173x121mm (300 x 300 DPI)



Number of articles on randomized controlled trial, case report, review and meta-analysis from Mainland, Taiwan and Hong Kong.
173x121mm (300 x 300 DPI)



Total citations of articles from Mainland, Taiwan, and Hong Kong published on respiratory journals from 2000 to 2009.
173x121mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract **[Within the title page 1 and method section of the abstract page 3]**
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found **[See results section of abstract page 3]**
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported **[Page 5]**
Objectives	3	State specific objectives, including any prespecified hypotheses **[Page 5]**
Methods		
Study design	4	Present key elements of study design early in the paper **[Page 6]**
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection **[Page 5]**
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants **[Page 6-7]**
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable **[Page 6-7]**
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group **[Page 6-7]**
Bias	9	Describe any efforts to address potential sources of bias **[Page 6-7]**
Study size	10	Explain how the study size was arrived at **[Page 6-7]**
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why **[Page 6-7]**
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding **[Page 7]**
		(*b*) Describe any methods used to examine subgroups and interactions
		(*c*) Explain how missing data were addressed
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy **[Page 7]**
		(*e*) Describe any sensitivity analyses

Continued on next page

Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed **[Page 8-10]**
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders **[Page 8-10]**
		(b) Indicate number of participants with missing data for each variable of interest
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time
		Case-control study—Report numbers in each exposure category, or summary measures of exposure
		Cross-sectional study—Report numbers of outcome events or summary measures **[Page 8-10]**
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included **[Page 8-10]**
		(*b*) Report category boundaries when continuous variables were categorized
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses **[Page 8-10]**
Discussion		
Key results	18	Summarise key results with reference to study objectives **[Page13]**
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias **[Page13]**
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence **[Page11-13]**
Generalisability	21	Discuss the generalisability (external validity) of the study results **[Page11-13]**
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based **[N/A]**

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.