

**A systematic review of antibiotic prescription associated with upper respiratory tract infections in China (Jing Li, MS<sup>1§</sup>)**

**Supplemental Digital Content-Table 1. Quality assessment of included studies**

Study ID	Define drug to be regarded as antibiotics	Define the meaning of URTI	Adequate research time for prescribing data	Reported data collection method	Adequate sample size	Appropriate statistical methods	Score	Quality assessment
Yunlan Lu(1990)	Yes	No	No	Unreported	Yes	Yes	3	Moderate
Yinguang Kan(1996)	Yes	Yes	No	Unreported	Yes	No	3	Moderate
Lanjin Lin(1991)	Unreported	Yes	Yes	Unreported	Yes	Yes	4	Moderate
Zhongkai Luo(2007)	Yes	Yes	No	Retrospective	Yes	Yes	5	High
Peiyi Zheng(2006)	Yes	Yes	No	Retrospective	Yes	Yes	5	High
Ruishan Chen(2008)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High
Jiayin Ding(2009)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Shihong Jin(2008)	Yes	Yes	No	Retrospective	Yes	Yes	5	High
Lihui Meng(2007)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Guolong Zhang(2009)	Yes	Yes	No	Retrospective	Yes	Yes	5	High
Xiaoping Li(2009)	Yes	No	Yes	Retrospective	Yes	Yes	5	High
Yueqin Li(2002-2006)	Yes	Yes	Yes	Retrospective	Yes	No	5	High
Jiameng Ma(2010)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Yu Huang(2009)	Yes	No	Yes	Retrospective	Yes	No	4	Moderate
Xia Li(2010)	Yes	No	Yes	Retrospective	Yes	Yes	5	High
Maoxiang Liao(2009)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Jinying Liu(2009)	Unreported	No	Unclear	Retrospective	Yes	No	2	Low
Wenji Luo(2009-2010)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Heng Wang(2008)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High
Jinglun Zhu(2010)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High

Youyun Wu(2009)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High
Caixia Yan(2010)	Unreported	No	Yes	Unreported	No	Yes	2	Low
Xiaoling Ren(2011)	Unreported	No	Yes	Retrospective	Yes	Yes	4	Moderate
Yanping Jiang(2011)	Yes	No	Yes	Unreported	Yes	Yes	4	Moderate
Hongjuan Zhao(2010)	Yes	No	No	Unreported	Yes	Yes	3	Moderate
Wei Tian(2011)	Yes	No	No	Unreported	Yes	Yes	3	Moderate
Yuzhen Li(2009)	Yes	No	Yes	Retrospective	No	Yes	4	Moderate
Guojun Wang(2010)	Yes	No	No	Unreported	Yes	No	2	Low
Liying Chen(2011)	Yes	Yes	Unclear	Unreported	Yes	Yes	4	Moderate
Jianrong He(2012)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Lingnan Li(2011)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Chengmi Yang(2012)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Shanchao Xu(2010)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Yumei Song(2012)	Yes	No	Yes	Retrospective	Yes	No	4	Moderate
Jianwu Wang(2013)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Jintao Dong(2012)	Unreported	No	No	Retrospective	Yes	Yes	3	Moderate
Guilan Shen(2011)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Jun Shi(2008-2013)	Yes	No	Yes	Retrospective	Yes	Yes	5	High
Liping Wang(2013)	Yes	No	No	Retrospective	Yes	Yes	4	Moderate
Manqing Gui(2010-2012)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High
Fengqiong Ma(2013)	Yes	No	Yes	Retrospective	Yes	Yes	5	High
Bo He(2012)	Yes	No	Yes	Retrospective	Yes	Yes	5	High
Chaowu Yuan(2012)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High
Jinghua He(2012)	Yes	Yes	Yes	Retrospective	Yes	Yes	6	High
Haijun Xu(2013)	Yes	No	Yes	Retrospective	Yes	Yes	5	High

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**Supplemental Digital Content-Table 2. Included articles after full text evaluation**

Code	Article Information
a001	Lu Y, Zai F. A Survey of the drug used for emergency treatment of the upper respiratory tract infections. <i>Chinese Pharmaceutical Affairs</i> 1993; 45-7.
a002	Kan Y, Xing G. Analysis of the prescription of antimicrobial drug in 758 cases. <i>Journal of Huaihai Medicine</i> 1997; 54.
a004	Lin L, Fu Y. Analysis of antibiotics usage for children with acute upper respiratory infections in 1230 cases on subtropical regions <i>China Journal of Modern Medicine</i> 2001; 58-9.
a012	Luo Z. Analysis of antibiotics application for pediatric patients with acute upper respiratory tract infection <i>China Practical Medicine</i> 2007; 35-6.
a017	Zheng P, Chen T, Liu L. Utilization of drugs for treatment upper respiratory tract infection in pediatrics□analysis of 300 cases. <i>Evaluation and Analysis of Drug-use in Hospitals of China</i> 2008; 188-90.
a018	Chen R, Wang Y, Liu F et al. Analysis of treatment situation for children with upper respiratory tract infection outside the hospital <i>Clinical Medicine of China</i> 2009; 25: 1111□2.
a019	Ding J, Wang J, Li X et al. Analysis of the use of antimicrobial drug for pediatric patients with upper respiratory tract infection in emergency department in our hospital. <i>Strait Pharmaceutical Journal</i> 2009; 194-6.
a020	Jin S, Zhou Z. Medication prescription for acute upper respiratory tract infection in community health service in Haikou. <i>Chinese General Practice</i> 2009; 2048-50.
a022	Meng L, Dong B. Rational analysis of antibiotics usage in children patients with acute upper respiratory tract infection in pediatric outpatient department. <i>Chinese Journal of Drug Application and Monitoring</i> 2009; 24-6.
a023	Zhang G. Medication prescription practices for acute upper respiratory infection in community health service facilities <i>Chinese Journal of Medicinal Guide</i> 2009; 2069-70
a025	Li X. Rational analysis of antibiotics usage for pediatric patients with acute upper respiratory tract infection <i>Medical Information</i> 2010; 2104-5.
a026	Li Y. Analysis of antibiotic use situation of upper respiratory tract infection in 461 cases in grassroots pediatric department <i>Chinese Journal of Clinical Rational Drug Use</i> 2010; 133.
a027	Ma J, Song Q. Investigation and analysis of the prescription of upper respiratory tract infection in outpatient and emergency department in our hospital. <i>Chinese Medicine Modern Distance Education of China</i> 2010; 148-9.
a029	Huang Y. Rational analysis of antibiotics usage in children patients with acute upper respiratory tract infection in pediatric outpatient department. <i>Contemporary Medicine</i> 2010; 144..
a031	Li X. The application situation analysis of antibiotic usage in outpatient department with acute upper respiratory infections in our hospital. <i>China Modern Medicine</i> 2011; 150-1.
a032	Liao M, Dai F. Analysis of clinical medicine on the emergency treatment of upper respiratory tract infections. <i>Guide of China Medicine</i> 2011; 231-2..
a033	Liu J, Que W. The medication errors of acute upper respiratory tract infection <i>Guide of China Medicine</i> 2011; 160-1.
a034	Luo W, Lin Z, Huang H. Analysis of drug usage in children patients with acute upper respiratory tract infection in outpatient and emergency department in our hospital. <i>Pharmacy Today</i> 2011; 194-6.
a035	Wang H. Analysis of the application of antimicrobial agents for pediatric patients with acute upper respiratory tract infections <i>Medical Information</i> 2011; 2371

- a038 Zhu J. Analysis of the use of antibacterial agents in children with acute upper respiratory tract infections. *China Medecine and Pharmacy* 2011; 89+97.
- a039 Wu Y, Chen S, Shi M. Analysis of antibiotic use and the spectrum of disease of prescription in pediatric outpatient department in a hospital *Pharmacy Today* 2011; 187-90.
- a041 Yan C. Analysis of antibiotics application in children with acute upper respiratory tract infections in 60 cases *Modern Diagnosis and Treatment* 2012; 1007.
- a043 Ren X. Analysis of antibiotics use situation in patients with cold in 160 cases *Seek Medical and Ask the Medicine* 2012; 819.
- a047 Jiang Y, Feng J, Hu Y. A retrospective study of antibiotic use for patients with acute upper respiratory tract infections *World Health Digest Medical Periodieal* 2012; 440-
- a048 Zhao H. Analysis of the application of antimicrobial agents for patients with acute upper respiratory tract infections *Yiyao Qianyan* 2012; 02: 363-4.
- Tian W, Ding N. Analysis of the antibiotics rational usage in patients with acute upper respiratory tract infections in emergency department. *Journal of Clinical Emergency Call(China)* 2012; a049 89-90+3.
- a055 Li Y, Li X. Analysis of antibiotics application for patients with acute upper respiratory tract infections in our hospital. *Chinese Journal of Modern Drug Application* 2012; 83-4.
- a057 Wang G, Luo H, Ceng M. Investigation and analysis on antimicrobial drug use for upper respiratory tract infection in pediatric outpatients of a 3A hospital. *China Pharmaceuticals* 2012; 64-5.
- a059 Chen L, He X, Wang Z et al. How to reasonable use of antibiotics for upper respiratory tract infection. *Seek Medical and Ask the Medicine* 2012; 387-8.
- a060 He J. Analysis of the prescriptions of upper respiratory tract infections in pediatric department *The Medical Forum* 2013; 520-1.
- a061 Li L, Feng L. Analysis of drugs application for upper respiratory tract infection in pediatric outpatient. *China Medical Herald* 2013; 114-6.
- a064 Yang C, Wu X, Lan Z et al. Analysis of antibacterial drugs in 400 patients with acute upper respiratory tract infection. *Chinese Journal of Modern Drug Application* 2013; 8-9.
- a069 Xu S, Gao Y. Application of antibiotics for upper respiratory tract infections in emergency medicine department. *Chinese Journal of Nosocomiology* 2013; 169-71.
- a074 Song Y. Investigation and analysis of the situation of antibiotic use for pediatric patients with upper respiratory tract infection *Road to Health* 2013; 12: 353-.
- a075 Wang J. The comprehensive analysis of rational use of antimicrobial agents of acute upper respiratory tract infection. *Yiyao Qianyan* 2013; 54-5.
- Dong J, Liang L, Gao Y et al. Rational analysis of antibiotics usage in children patients with acute upper respiratory tract infection in pediatric outpatient department. *Guide of China Medicine* a078 2014; 242-3.
- a080 Shen G, Zhang P. Analysis of antibiotics application for pediatric patients with acute upper respiratory tract infection *Medicine & People* 2014; 252.
- Shi J. Investigation and analysis of antibiotics usage of upper respiratory tract infection in the department of emergency medicine. *Shenzhen Journal of Integrated Traditional Chinese and a081 Western Medicine* 2014; 59-60.
- a082 Wang L. Investigation of the prescription of upper respiratory tract infection in outpatient and emergency department. *China Practical Medicine* 2014; 199-201.
- a083 Gui M, Wang J. To analyze the service condition of antibacterial agents of upper respiratory tract infection prescription in pediatric outpatient department. *Chinese Community Doctors* 2014; 5+7.
- a084 Ma F. Analysis of the irrational use of medicine in cold treatment. *Journal of North Pharmacy* 2014; 110-1.
- a085 He B. Analysis and countermeasures for the irrational use of drugs in the Western medicine prescription *China Journal of Pharmaceutical Economics* 2014; 32-3.
- a087 Yuan C. Investigation and analysis of the situation of antibiotic use for patients with upper respiratory tract infection in 100 cases. *Road to Health* 2014; 368-.

- a088 He J, Chen M, Liang C et al. Analysis of the use of antimicrobial drug for pediatric patients with upper respiratory tract infection in 2400 cases. *International Medicine and Health Guidance News* 2014; 20: 3007-9.
- a091 Xu H, Yu J, Li B et al. Analysis of antibiotics application for pediatric patients with upper respiratory tract infection in outpatient department. *China Rural Health* 2014: 480-1.
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**Supplemental Digital Content-Table 3. Detailed information of included studies**

Code	First author	Published time	Enrollment time	Region	Urban/Rural	Hospital Level
a001	Yunlan Lu(1990)	1993	1990	Eastern China	Urban	Level 3
a002	Yinguang Kan(1996)	1997	1996	Central China	Urban	Level 2
a004	Lanjin Lin(1991)	2001	1991	Eastern China	Urban	Level 2
a012	Zhongkai Luo(2007)	2007	2007	Central China	Urban	Level 2
a017	Peiyi Zheng(2006)	2008	2006	Eastern China	Urban	Level 3
a018	Ruishan Chen(2008)	2009	2008	Eastern China	Urban	Level 3
a019	Jiayin Ding(2009)	2009	2009	Eastern China	Urban	Level 2
a020	Shihong Jin(2008)	2009	2008	Eastern China	Urban	Level 1
a022	Lihui Meng(2007)	2009	2007	Eastern China	Urban	Level 3
a023	Guolong Zhang(2009)	2009	2009	Eastern China	Urban	Level 1
a025	Xiaoping Li(2009)	2010	2009	Eastern China	Urban	Level 2
a026	Yueqin Li(2002-2006)	2010	2002-2006	Eastern China	Urban	Level 2
a027	Jiameng Ma(2010)	2010	2010	Central China	Urban	Level 2
a029	Yu Huang(2009)	2010	2009	Central China	Urban	Level 2
a031	Xia Li(2010)	2011	2010	Central China	Urban	level 2
a032	Maoxiang Liao(2009)	2011	2009	Eastern China	Urban	Level 3
a033	Jinying Liu(2009)	2011	2009	Eastern China	Urban	Level 2
a034-1§	Wenji Luo(2009)	2011	2009	Eastern China	Urban	Level 3
a034-2§	Wenji Luo(2010)	2011	2010	Eastern China	Urban	Level 3
a035	Heng Wang(2008)	2011	2008	Eastern China	Urban	Level 3
a038	Jinglun Zhu(2010)	2011	2010	Western China	Urban	Level 2

a039	Youyun Wu(2009)	2011	2009	Eastern China	Urban	Level 2
a041	Caixia Yan(2010)	2012	2010	Eastern China	Urban	Level 1
a043	Xiaoling Ren(2011)	2012	2011	Eastern China	Rural	Level 1
a047	Yanping Jiang(2011)	2012	2011	Western China	Urban	Level 1
a048	Hongjuan Zhao(2010)	2012	2010	Eastern China	Rural	Level 1
a049	Wei Tian(2011)	2012	2011	Eastern China	Urban	Level 3
a055	Yuzhen Li(2009)	2012	2009	Western China	Urban	Level 2
a057	Guojun Wang(2010)	2012	2010	Western China	Urban	Level 3
a059	Liying Chen(2011)	2012	2011	Eastern China	Urban	Level 3
a060	Jianrong He(2012)	2013	2012	Central China	Urban	Level 3
a061	Lingnan Li(2011)	2013	2011	Western China	Urban	Level 2
a064	Chengmi Yang(2012)	2013	2012	Eastern China	Urban	Level 3
a069	Shanchao Xu(2010)	2013	2010	Eastern China	Urban	Level 3
a074	Yumei Song(2012)	2013	2012	Central China	Urban	Level 2
a075	Jianwu Wang(2013)	2013	2013	Central China	Urban	Level 2
a078	Jintao Dong(2012)	2014	2012	Eastern China	Urban	Level 2
a080	Guilan Shen(2011)	2014	2011	Western China	Urban	Level 2
a081	Jun Shi(2008-2013)	2014	2008-2013	Central China	Urban	Level 2
a082	Liping Wang(2013)	2014	2013	Eastern China	Urban	Level 2
a083-1*	Manqing Gui(2010)	2014	2010	Central China	Urban	Level 2
a083-2*	Manqing Gui(2011)	2014	2011	Central China	Urban	Level 2
a083-3*	Manqing Gui(2012)	2014	2012	Central China	Urban	Level 2
a084	Fengqiong Ma(2013)	2014	2013	Western China	Urban	Level 2
a085	Bo He(2012)	2014	2012	Eastern China	Urban	Level 2
a087	Chaowu Yuan(2012)	2014	2012	Western China	Urban	Level 2
a088	Jinghua He(2012)	2014	2012	Eastern China	Urban	Level 3
a091	Haijun Xu(2013)	2014	2013	Eastern China	Urban	Level 3



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**Supplemental Digital Content-Table 4. Test of heterogeneity**

	<b>Number of study</b>	<b>Percentage use of antibiotics (95% CI)</b>	<b>Q</b>	<b>P</b>	<b>I<sup>2</sup>(95% CI)</b>	<b>tau<sup>2</sup></b>
Overall region	48 <sup>a</sup>	83.7(80.6, 86.4)	4248.95	<0.001	98.9%(98.8%, 99.0%)	
Eastern China	28	82.3(77.9,86.0)	2175.27	<0.001	98.8%	0.5039
Central China	12	86.6(79.8, 91.4)	1767.14	<0.001	99.4%	0.655
Western China	8	83.9(79.4, 87.6)	61.99	<0.001	88.7%	0.1437
Hospital level						
Level 3 hospitals	16	76.7(68.7, 83.2)	2068.02	<0.001	99.3%	0.6476
Level 2 hospitals	26	84.8(81.8, 87.4)	1183.55	<0.001	97.9%	0.2709
Level 1 hospitals	6	91.1(84.3, 95.2)	54.62	<0.001	90.8%	0.5544
Year of study						
Before 2008	10	91.6(86.0, 95.1)	395.76	<0.001	97.7%	0.8132
2009	9	84.3(75.5, 90.3)	383.10	<0.001	97.9%	0.6121
2010	10	78.3(70.1, 84.8)	353.91	<0.001	97.5%	0.4111
2011	6	86.9(80.1, 91.5)	266.41	<0.001	98.1%	0.3501
2012	9	78.2(68.0,85.7)	1542.92	<0.001	99.5%	0.5665
2013	4	72.9(68.5, 76.9)	17.53	<0.001	82.9%	0.0372

<sup>a</sup> Two included studies were conducted in different study time: one (a034-Wenji Luo) was divided into two different subgroups in groupwise analysis, and the other one (a083-Manqing Gui) was divided into three different subgroups in groupwise analysis.