Supplementary information

Supplementary Figure 1: Study Flow Diagram

All surveyed prescriptions at primary healthcare institutions in China in 2017

(9 provinces, 41 cities, 283 institutions; 388,361 prescriptions)

Excluded prescriptions without diagnosis of acute bronchitis

(369,924 prescriptions)

All prescriptions diagnosed with acute bronchitis at primary healthcare institutions in China in 2017

(8 provinces, 37 cities, 217 institutions; 18,437 prescriptions)

Excluded prescriptions also diagnosed with other infections

(7759 prescriptions)

Final sample of prescriptions

(8 provinces, 37 cities, 214 institutions; 10,678 prescriptions)
**Supplementary Table 1**: Inclusion and exclusion of prescriptions by diagnostic category with corresponding International Classification of Diseases, Tenth Revision (ICD-10) diagnosis codes.

| Diagnosis                               | Corresponding ICD-10 Codes¹ | Prescription Number |
|-----------------------------------------|-------------------------------|---------------------|
| **Inclusion**                           |                               |                     |
| 1. Acute bronchitis                     | Acute bronchitis (J20); Bronchitis, not specified as acute or chronic (J40) | 18,437 included     |
|                                         | *Excluding* simple and mucopurulent chronic bronchitis (J41); Unspecified chronic bronchitis (J42) |                     |
| **Exclusion**                           |                               |                     |
| 2. Nervous system infections            | Bacterial meningoencephalitis and meningomyelitis, not elsewhere classified (G04.2); Bacterial meningitis, not elsewhere classified (G00) | 0 excluded          |
| 3. Eye and adnexa infections            | Conjunctivitis (H10); Keratitis (H16); Purulent endophthalmitis (H44.0) | 408 excluded        |
| 4. Ear and mastoid process infections   | Otitis externa (H60.0-H60.5); Otitis media (H65-H66) | 16 excluded         |
| 5. Circulatory system infections        | Acute and subacute infective endocarditis (I33) | 0 excluded          |
| 6. Other respiratory system infections  | Acute upper respiratory infections (J00-J06); Influenza and pneumonia (J09-J18); Other diseases of upper respiratory tract (J30-J39); Emphysema (J43); Other chronic obstructive pulmonary disease (J44) | 6,986 excluded      |
| 7. Digestive system infections          | Peritoneal adhesions (K66.0); Diseases of pulp and periapical tissues (K04); Gingivitis and periodontal diseases (K05) | 97 excluded         |
| 8. Skin and subcutaneous tissue infections | Infections of the skin and subcutaneous tissue (L00-L08) | 155 excluded        |
| 9. Musculoskeletal system infections    | Arthritis (M01.3); Bursitis (M73.0); Osteomyelitis (M90.2*); Synovitis (M68.0); Tenosynovitis (M68.0) | 22 excluded         |
| 10. Genitourinary system infections     | Tubulo-interstitial nephritis (N10-N12); Cystitis (N30); Urinary tract infection, site not specified (N39.0); Inflammatory diseases of female pelvic organs (N70-N77) | 32 excluded         |
| 11. Sexually transmitted infections    | Infections with a predominantly sexual mode of transmission (A50-A64) | 1 excluded          |
| 12. Other bacterial infections          | Other and unspecified gastroenteritis and colitis of infectious origin (A09.0); Other bacterial diseases (A30-A49) | 42 excluded         |
| **Final sample**                       |                               | 10,678              |
**Supplementary Table 2: Pharmaceutical treatment recommendations for adult acute bronchitis according to the guidelines in China, U.S. and U.K.**

| Pharmaceutical Treatment | China<sup>3</sup> | U.S.<sup>3,4</sup> | U.K.<sup>*5</sup> |
|--------------------------|------------------|------------------|------------------|
| Antibiotics              | Routine treatment of uncomplicated acute bronchitis with antibiotics is not recommended. | Routine treatment of uncomplicated acute bronchitis with antibiotics is not recommended. | No routine antibiotic for acute cough associated with uncomplicated acute bronchitis. |
|                          | Antibiotics may be benefit for some specific population after carefully evaluating potential benefit and adverse reaction, including people over 65 with 2 or more of, or over 80 with 1 or more of: hospitalization in previous year, type 1 or 2 diabetes, history of congestive heart failure, current use of oral corticosteroids. Options for antibiotics includes **penicillins, cephalosporins, macrolides or fluoroquinolones.** | When pertussis is suspected as the etiology of cough, initiation of a macrolide antibiotic is recommended as soon as possible to reduce transmission. | For people who are identified as systemically very unwell, offer an immediate antibiotic prescription. For people who are identified as at higher risk of complications, consider an immediate antibiotic prescription or a back-up antibiotic prescription. Higher risk of complications includes people with pre-existing comorbidity; people over 65 with 2 or more of, or over 80 with 1 or more of: hospitalization in previous year, type 1 or 2 diabetes, history of congestive heart failure, current use of oral corticosteroids.  
- **First choice antibiotic:** doxycycline, 200 mg on first day, then 100 mg once a day for 4 days (5-day course in total).  
- **Alternative first choices:** amoxicillin 500 mg three times a day/ clarithromycin 250 mg to 500 mg twice a day/ erythromycin 250 mg to 500 mg four times a day or 500 mg to 1,000 mg twice a day for 5 days. |
| Symptom management        | 1. Options for symptomatic therapy include:  
  • Cough suppressants (eg. dextromethorphan, pentoxverine, benproperine)  
  • Expectorants (eg. bromhexine, ambroxol, N-acetylcysteine)  
  • Antispasmodic and Antihistamines (eg. salbutamol, aminophylline, chlorpheniramine)  
  2. Inhaled or systemic corticosteroids for cough management are not recommended. | 1. Options for symptomatic therapy include:  
  • Cough suppressants (codeine, dextromethorphan);  
  • First-generation antihistamines (diphenhydramine);  
  • Decongestants (phenylephrine). Evidence supporting specific symptomatic therapies is limited. | 1. Some people may wish to try the following self-care treatments, which have limited evidence of some benefit for the relief of cough symptoms:  
  • Pelargonium (a herbal medicine)  
  • Over-the-counter cough medicines containing the expectorant guaifenesin  
  • Over-the-counter cough medicines containing cough suppressants, except codeine, (in people who do not have a
2. Expectorants and inhaled adrenergics are not recommended for routine use.

| 2. Ocular/inhaled bronchodilators (eg. salbutamol) or oral/inhaled corticosteroids should not be used to treat people with symptoms of an acute cough associated with acute bronchitis unless the person has an underlying airways disease, such as asthma. |
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| 3. Mucolytic (eg. acetylcysteine or carbocisteine) should not be used to treat people with symptoms of an acute cough associated with acute bronchitis |

* This is in the NICE treatment guideline for acute cough.
**Supplementary Table 3:** Study definition of guideline compliance according to the guidelines in China, U.S. and U.K.

| Compliance with guidelines | China | U.S. | U.K. |
|---------------------------|-------|------|------|
| **Antibiotics**           | 1. Not prescribed with antibiotics | 1. Not prescribed with antibiotics | 1. Not prescribed with antibiotics |
|                           | 2. Prescribed penicillins, cephalosporins, macrolides or fluoroquinolones for people over 65 with 2 or more of, or over 80 with 1 or more of: diagnosed also with type 1 or 2 diabetes, congestive heart failure, current use of oral corticosteroids. | 2. Prescribed doxycycline, amoxicillin, clarithromycin, erythromycin for people over 65 with 2 or more of, or over 80 with 1 or more of: diagnosed also with type 1 or 2 diabetes, congestive heart failure, current use of oral corticosteroids. | |
| **Symptom management**    | Prescribed: 1. Cough suppressants; 2. Expectorants; 3. Antihistamines; 4. Combination of the 3 categories above. | Prescribed: 1. Cough suppressants (codeine, dextromethorphan); 2. First-generation antihistamines (diphenhydramine); 3. Decongestants (phenylephrine). | Prescribed: 1. Over-the-counter cough medicines containing the expectorant guaifenesin; 2. Over-the-counter cough medicines containing cough suppressants, except codeine. |
Supplementary References

[1] World Health Organization. ICD-10 online version 2019. https://icd.who.int/browse10/2019/en. Accessed on April 2 2020.
[2] Chinese Medical Association. Guidelines for the Diagnosis and Treatment of Acute Bronchitis at the Primary Level (2018). Chin J Pract. 2019;18(4):314-317.
[3] Centers for Disease Control and Prevention. Adult Treatment Recommendations. https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/adult-treatment-rec.html. Accessed April 14, 2020.
[4] Albert RH. Diagnosis and treatment of acute bronchitis. Am Fam Physician. 2010;82(11):1345-50.
[5] National Institute for Health and Care Excellence. Cough (acute): antimicrobial prescribing. https://www.nice.org.uk/guidance/ng120. Accessed April 14, 2020.