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### Background

Antibiotic use leads to antibiotic resistance and antibiotic misuse is high in China and other developing countries. This may arise from beliefs and behaviours of doctors and the pressure they receive from patients. This study aims to understand antibiotic use behaviour for self-limited illness among medical students - the future healthcare professionals.

### Methods

This is part of a large cross-sectional study of Chinese university students of science, social science and humanities, and medicine. An electronic survey health belief model (HBM) questionnaire was distributed at six universities in China from September to November 2015. The score assessment was based on the constructs of HBM theory. Chi-squared and multivariable logistic regression and adjusted odd ratios (aOR) were used to assess the relationship between demographic characteristics, antibiotic use knowledge and behavior.

### Results

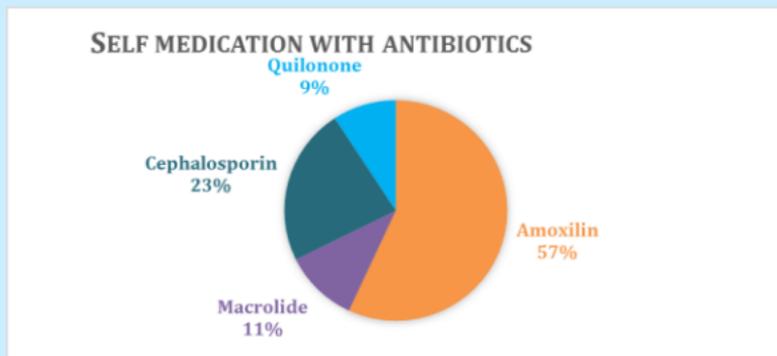
In total, 11455 students were asked to participate and 11192 (97.5%) completed the questionnaires. 1819 medical students completed the survey. In the past month 529 (29%) medical students reported at least one self-limited illness. Of those, 285 (54%) self-medicated and 77 (27%) of them used antibiotics. 111 (21%) saw a doctor among whom 64 (58%) received antibiotics. 133 (25%) did nothing. In the past year, 279 (15%) of students used antibiotics for prophylaxis, 273 (15%) ever demanded an antibiotic from a doctor, 1166 (64%) kept a personal stock of antibiotics, 1034 (57%) bought antibiotics at a pharmacy, 97% of these without a prescription. Students with high HBM scores about antibiotics were significantly less likely to self-medicate with antibiotics (aOR 0.37, 95% CI 0.15-0.91, p=0.031), to use antibiotics for prophylaxis (aOR 0.35, 95% CI 0.21-0.60, p<0.0001) or demand an antibiotic (aOR 0.46, 95% CI 0.26-0.81, p=0.007). Students whose father has a higher education level, whose mother is a doctor or who are from urban areas were more likely to stock antibiotics and self-medicate.

Table 1. Antibiotic use behaviour for self-limited illness symptoms.

Symptoms	Cases(n)	SM	SMA	See doctor	Antibiotic prescribed	Injectable antibiotics	No treatment
Cold	363	215(59%)	66(31%)	61(17%)	40(66%)	14(35%)	87(24%)
Fever	72	33(46%)	11(33%)	25(35%)	20(80%)	8(40%)	14(19%)
Sore throat	182	104(57%)	36(35%)	36(20%)	27(75%)	11(41%)	42(23%)
Ear pain	29	9(31%)	5(56%)	15(52%)	11(73%)	4(36%)	5(17%)
Headache	81	47(58%)	12(26%)	18(22%)	14(78%)	6(42%)	16(20%)
Flu like illness	23	9(39%)	5(56%)	15(65%)	8(53%)	4(50%)	5(22%)
Diarrhoea	95	50(53%)	16(32%)	17(18%)	10(59%)	2(20%)	28(29%)
Pneumonia-suspected	8	2(25%)	1(50%)	6(75%)	4(67%)	1(25%)	0(0%)
Abdominal pain	47	25(53%)	4(16%)	7(15%)	5(71%)	1(20%)	15(32%)

Note: Students might have overlap symptoms, the total students who reported having illness in the past month was 529.

Figure 1 Antibiotics used for reported illness in the past month illness by medical students



### Conclusion

High rates of antibiotic self-medication (54%) and stocking (64%) were found among medical students. Along with the high rates of unnecessarily prescribed antibiotics by doctors (58%), there is clearly a need for effective antibiotic stewardship and training programs in Chinese healthcare institutions and medical schools.