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Volume 12, 2019, Pages 1333-1351

**Self-medication with antibiotics: Investigating practice among university students at the Malaysian national defence university** (Article) ([Open Access](#))

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**Abstract**

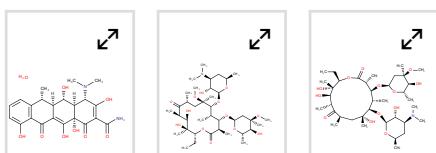
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**Background:** Self-medication of drugs to alleviate symptoms is a common global behavior, helping relieve burdens on health services, but many drugs eg, antibiotics are prescription-only. Self-medication of antibiotics (SMA) is an irrational use of drugs, contributing to microbial resistance increasing health care costs and higher mortality and morbidity. This study aimed to assess SMA among university students. **Methods:** This was a cross-sectional study conducted among medical and non-medical students of the National Defence University of Malaysia. A validated instrument was used to gather data. Ethics approval was obtained. Random and universal sampling was adopted, and SPSS 21 was used for data analysis. **Results:** A total of 649 students participated in the study: 48.5% male and 51.5% female, 39.3% reported self-medicating with antibiotics. Penicillin, doxycycline, clarithromycin were the antibiotics most used with the majority reporting no adverse drug reactions. Cost savings and convenience were the principal reasons for SMA which were mainly obtained from local retail pharmacies. Despite medical students (particularly the more senior) having better knowledge of antibiotic use than non-medical students, 89% of all research participants responded that practicing SMA was a good/acceptable practice. **Conclusion:** SMA is common amongst Malaysian students and, despite understanding why SMA is unwise, even medical students self-medicate. © 2019 Haque et al.

**SciVal Topic Prominence** ⓘ

Topic: Self Medication | Anti-Bacterial Agents | Community pharmacies

Prominence percentile: 93.131

**Chemistry database information** ⓘ**Substances****Author keywords**

[Antibiotic resistance](#) [Antibiotics](#) [Medical students](#) [Non-medical students](#) [Self-medication](#) [University students](#)

**Indexed keywords**EMTREE drug terms: [antibiotic agent](#) [clarithromycin](#) [doxycycline](#) [penicillin derivative](#)Metrics ⓘ [View all metrics](#) >**PlumX Metrics**

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The antibiotic resistance crisis:  
Part 1: causes and threats

Ventola, C.L.  
(2015) *P and T*

The antibiotic resistance crisis:  
Part 2: Management strategies  
and new agents

Lee Ventola, C.  
(2015) *P and T*

1,2,3-Triazole fused with  
pyridine/pyrimidine as new  
template for antimicrobial  
agents: Regioselective synthesis  
and identification of potent N-  
heteroarenes

Marepu, N. , Yeturu, S. , Pal, M.  
(2018) *Bioorganic and Medicinal  
Chemistry Letters*

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## Chemicals and CAS Registry Numbers:

clarithromycin, 81103-11-9; doxycycline, 10592-13-9, 17086-28-1, 564-25-0, 94088-85-4

ISSN: 11786973

Source Type: Journal

Original language: English

DOI: 10.2147/IDR.S203364

Document Type: Article

Publisher: Dove Medical Press Ltd.

## References (146)

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[View all 146 references](#)

- 1 WHO Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self-Medication

*Geneva: WHO/EDM/QSM/00.1 WHO; 2000*

Available from:, Accessed May 29, 2018

<http://apps.who.int/medicinedocs/pdf/s2218e/s2218e.pdf>

- 2 Alhomoud, F., Aljamea, Z., Almhasnah, R., Alkhalifah, K., Basalelah, L., Alhomoud, F.K.

Self-medication and self-prescription with antibiotics in the Middle East—do they really happen? A systematic review of the prevalence, possible reasons, and outcomes  
[\(Open Access\)](#)

(2017) *International Journal of Infectious Diseases*, 57, pp. 3-12. Cited 26 times.

doi: 10.1016/j.ijid.2017.01.014

[View at Publisher](#)

- 3 Togoobaatar, G., Ikeda, N., Ali, M., Sonomjamts, M., Dashdemberel, S., Mori, R., Shibuya, K.

A survey of non-prescribed use of antibiotics for children in an urban community in Mongolia

(2010) *Bulletin of the World Health Organization*, 88 (12), pp. 930-936. Cited 72 times.

<http://www.who.int/entity/bulletin/volumes/88/12/10-079004.pdf>

doi: 10.2471/BLT.10.079004

[View at Publisher](#)

- 4 Reardon, S.

Antibiotic resistance sweeping developing world

(2014) *Nature*, 509 (7499), pp. 141-142. Cited 96 times.

<http://www.nature.com/nature/index.html>

doi: 10.1038/509141a

[View at Publisher](#)

- 5 Wirtz, V.J., Herrera-Patino, J.J., Santa-Ana-Tellez, Y., Dreser, A., Elseviers, M., Vander Stichele, R.H.

Analysing policy interventions to prohibit over-the-counter antibiotic sales in four Latin American countries

(2013) *Tropical Medicine and International Health*, 18 (6), pp. 665-673. Cited 17 times.

doi: 10.1111/tmi.12096

[View at Publisher](#)

- 6 From the President's Desk  
*Pharmacists Pledge to Be Antibiotic Guardians*  
Press Release. 2017, Accessed June 19, 2018  
<http://www.mps.org.my/newsmaster.cfm?&mnuid=191&action=view&retrieveid=7508>
- 

- 7 (2016) *Medication Must Not Be Sold without Prescription*  
The Star Online, Available from, Accessed June 19, 2018  
<https://www.thestar.com.my/opinion/letters/2016/08/29/medication-must-not-be-sold-without-prescription/>
- 

- 8 (2015) *Superbugs on the Rise*. National Pharmacy News  
<http://www.mps.org.my/newsmaster.cfm?&mnuid=36&action=view&retrieveid=7183>
- 

- 9 Wolfe, C.M., Cohen, B., Larson, E.  
Prevalence and risk factors for antibiotic-resistant community-associated bloodstream infections ([Open Access](#))  
(2014) *Journal of Infection and Public Health*, 7 (3), pp. 224-232. Cited 15 times.  
[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/716388/description](http://www.elsevier.com/wps/find/journaldescription.cws_home/716388/description)  
doi: 10.1016/j.jiph.2014.01.001

[View at Publisher](#)

---

- 10 Unemo, M., Golparian, D., Shafer, W.M.  
Challenges with gonorrhea in the era of multi-drug and extensively drug resistance- are we on the right track?

(2014) *Expert Review of Anti-Infective Therapy*, 12 (6), pp. 653-656. Cited 19 times.  
<http://www.future-drugs.com/loi/eri>  
doi: 10.1586/14787210.2014.906902

[View at Publisher](#)

---

- 11 Falcone, M., Russo, A., Giannella, M., Cangemi, R., Scarpellini, M.G., Bertazzoni, G., Alarcón, J.M., (...), Venditti, M.  
Individualizing risk of multidrug-resistant pathogens in community-onset pneumonia ([Open Access](#))

(2015) *PLoS ONE*, 10 (4), art. no. e0119528. Cited 30 times.  
<http://www.plosone.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pone.0119528&representation=PDF>  
doi: 10.1371/journal.pone.0119528

[View at Publisher](#)

---

- 12 Antimicrobial resistance  
(2018) *Key Facts*  
Accessed June 19, 2018  
<http://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>
- 

- 13 *Multidrug-Resistant Neisseria Gonorrhoea*. 2016  
Accessed June 19, 2018  
<https://www.niaid.nih.gov/research/multidrug-resistant-neisseria-gonorrhoeae>
-

- 14 Birger, R.B., Kouyos, R.D., Cohen, T., Griffiths, E.C., Huijben, S., Mina, M., Volkova, V., (...), Metcalf, C.J.E. The potential impact of coinfection on antimicrobial chemotherapy and drug resistance  
(2015) *Trends in Microbiology*, 23 (9), pp. 537-544. Cited 16 times.  
[www.elsevier.com/locate/tim](http://www.elsevier.com/locate/tim)  
doi: 10.1016/j.tim.2015.05.002
- [View at Publisher](#)
- 

- 15 Ruiz, M.E. Risks of self-medication practices  
(2010) *Current Drug Safety*, 5 (4), pp. 315-323. Cited 75 times.  
doi: 10.2174/157488610792245966
- [View at Publisher](#)
- 

- 16 Kiyingi, K.S., Lauwo, J.A.K. Drugs in the home: Danger and waste  
(1993) *World Health Forum*, 14 (4), pp. 381-384. Cited 44 times.
- 

- 17 Rather, I.A., Kim, B.-C., Bajpai, V.K., Park, Y.-H. Self-medication and antibiotic resistance: Crisis, current challenges, and prevention  
(Open Access)  
(2017) *Saudi Journal of Biological Sciences*, 24 (4), pp. 808-812. Cited 29 times.  
<http://www.ksu.edu.sa/sites/Colleges/CollegeofSciences/BotanyDepartment/SJBS/Default.aspx>  
doi: 10.1016/j.sjbs.2017.01.004
- [View at Publisher](#)
- 

- 18 Bennadi, D. Self-medication: A current challenge  
(2013) *J Basic Clin Pharm*, 5 (1), pp. 19-23. Cited 71 times.
- 

- 19 Shah, S.J., Ahmad, H., Rehan, R.B., Najeeb, S., Mumtaz, M., Jilani, M.H., Rabbani, M.S., (...), Kadir, M.M. Self-medication with antibiotics among non-medical university students of Karachi: A cross-sectional study  
(Open Access)  
(2014) *BMC Pharmacology and Toxicology*, 15 (1), art. no. 74. Cited 34 times.  
<http://www.biomedcentral.com/bmcpharmacoltoxicol/>  
doi: 10.1186/2050-6511-15-74
- [View at Publisher](#)
- 

- 20 Ventola, C.L. The antibiotic resistance crisis: Part 1: causes and threats  
(2015) *P and T*, 40 (4), pp. 277-283. Cited 1020 times.  
<http://www.ptcommunity.com/system/files/pdf/ptj4004277.pdf>
- [View at Publisher](#)
- 

- 21 Littmann, J., Viens, A.M. The ethical significance of antimicrobial resistance  
(Open Access)  
(2015) *Public Health Ethics*, 8 (3), pp. 209-224. Cited 36 times.  
<http://phe.oxfordjournals.org/>  
doi: 10.1093/phe/phv025
- [View at Publisher](#)

- 22 *Antibiotic Resistance*; 2018. Available From Accessed June 20, 2018  
<http://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance>
- 
- 23 Reardon, S.  
(2014) WHO Warns against ‘post-antibiotic’ Era? Agency Recommends Global System to Monitor Spread of Resistant Microbes  
Available from: Accessed June 20, 2018  
<https://www.nature.com/news/who-warns-against-post-antibiotic-era-1.15135>
- 
- 24 Viens, A.M., Littmann, J.  
Is antimicrobial resistance a slowly emerging disaster? (Open Access)  
(2015) *Public Health Ethics*, 8 (3), pp. 255-265. Cited 26 times.  
<http://phe.oxfordjournals.org/>  
doi: 10.1093/phe/phv015  
View at Publisher
- 
- 25 WHO’s First Global Report on Antibiotic Resistance Reveals Serious, Worldwide Threat to Public Health. Cited 4 times.  
New WHO report provides the most comprehensive picture of antibiotic resistance to date, with data from 114 countries. News release; 2014, Accessed June 20, 2018  
<http://www.who.int/mediacentre/news/releases/2014/amr-report/en/>
- 
- 26 McCarthy, M.  
Chief medical officer dame sally davies: Resistance to antibiotics risks health “Catastrophe” to rank with terrorism and climate change  
(2013) *The Independent*. Cited 8 times.  
Available from:, Accessed June 22, 2018  
<https://www.independent.co.uk/news/science/chief-medical-officer-dame-sally-davies-resistance-to-antibiotics-risks-health-catastrophe-to-rank-8528442.html>
- 
- 27 Sample | Antibiotic-resistant diseases pose “Apocalyptic” threat, top expert says  
(2013) *The Guardian*  
Accessed June 22, 2018  
<https://www.theguardian.com/society/2013/jan/23/antibiotic-resistant-diseases-apocalyptic-threat>
- 
- 28 Hakanen, A., Kaartinen, J.J.J.L.  
*National Action Plan on Antimicrobial Resistance 2017–2021*  
[https://ec.europa.eu/health/amr/sites/amr/files/amr\\_nap\\_finland\\_en.pdf](https://ec.europa.eu/health/amr/sites/amr/files/amr_nap_finland_en.pdf)
- 
- 29 Fair, R.J., Tor, Y.  
Antibiotics and bacterial resistance in the 21st century  
(2014) *Perspectives in Medicinal Chemistry*, (6), pp. 25-64. Cited 396 times.  
[http://www.la-press.com/redirect\\_file.php?fileId=5821&filename=4357-PMC-Antibiotics-and-Bacterial-Resistance-in-the-21st-Century-pdf&fileType=pdf](http://www.la-press.com/redirect_file.php?fileId=5821&filename=4357-PMC-Antibiotics-and-Bacterial-Resistance-in-the-21st-Century-pdf&fileType=pdf)  
doi: 10.4137/PMC.S14459  
View at Publisher

30 Llor, C., Bjerrum, L.

Antimicrobial resistance: Risk associated with antibiotic overuse and initiatives to reduce the problem

(2014) *Therapeutic Advances in Drug Safety*, 5 (6), pp. 229-241. Cited 228 times.  
doi: 10.1177/2042098614554919

[View at Publisher](#)

---

31 Yadav, K., Prakas, S.

Antimicrobial Resistance (AMR): A global problem  
(2016) *Glob J Pub Health Epidemiol*, 3 (1), pp. 120-138.

32 Tomb, R.M., Maclean, M., Coia, J.E., MacGregor, S.J., Anderson, J.G.

Assessment of the potential for resistance to antimicrobial violet-blue light in *Staphylococcus aureus* [\(Open Access\)](#)

(2017) *Antimicrobial Resistance and Infection Control*, 6 (1), art. no. 100. Cited 10 times.  
<http://www.aricjournal.com/>  
doi: 10.1186/s13756-017-0261-5

[View at Publisher](#)

---

33 Ferry, T., Perpoint, T., Vandenesch, F., Etienne, J.

Virulence determinants in *Staphylococcus aureus* and their involvement in clinical syndromes

(2005) *Current Infectious Disease Reports*, 7 (6), pp. 420-428. Cited 52 times.  
<http://www.springerlink.com/content/1523-3847/>  
doi: 10.1007/s11908-005-0043-8

[View at Publisher](#)

---

34 Munita, J.M., Arias, C.A.

Mechanisms of antibiotic resistance

(2016) *Microbiology Spectrum*, 4 (2), art. no. VMBF-0016-2015. Cited 212 times.  
[http://www.asmscience.org/docserver/fulltext/microbiolspec/4/2/VMBF-0016-2015.pdf?  
Expires=1486108180&id=id&accname=45052&checksum=43A031364F99D87142C9C34E0F0E2DC9](http://www.asmscience.org/docserver/fulltext/microbiolspec/4/2/VMBF-0016-2015.pdf?Expires=1486108180&id=id&accname=45052&checksum=43A031364F99D87142C9C34E0F0E2DC9)  
doi: 10.1128/microbiolspec.VMBF-0016-2015

[View at Publisher](#)

---

35 Fymat, A.L.

Antibiotics and antibiotic resistance

(2017) *Biomed J Sci & Tech Res*, 1 (1), pp. 1-16. Cited 2 times.

36 Boswahi, S.S., Udo, E.E.

Methicillin-resistant *Staphylococcus aureus*: An update on the epidemiology, treatment options, and infection control

(2018) *Curr Med Res Pract*, 8 (1), pp. 18-24. Cited 21 times.

37 Chen, C.-J., Huang, Y.-C.

New epidemiology of *Staphylococcus aureus* infection in Asia [\(Open Access\)](#)

(2014) *Clinical Microbiology and Infection*, 20 (7), pp. 605-623. Cited 153 times.  
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1469-0691](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1469-0691)  
doi: 10.1111/1469-0691.12705

[View at Publisher](#)

38 Sowash, M.G., Uhlemann, A.-C.

### Community-associated methicillin-resistant staphylococcus aureus case studies

(2014) *Methods in Molecular Biology*, 1085, pp. 25-69. Cited 30 times.

<http://www.springer.com/series/7651>

ISBN: 978-162703663-4

doi: 10.1007/978-1-62703-664-1\_2

[View at Publisher](#)

---

39 Ray, P., Gautam, V., Singh, R.

Methicillin-resistant Staphylococcus aureus (MRSA) in developing and developed countries: Implications and solutions

(2011) *Regional Health Forum*, 15 (1), pp. 74-82. Cited 13 times.

---

40 Chouhan, K., Prasad, S.B.

Self-medication and their consequences: A challenge to health professional

(2016) *Asian Journal of Pharmaceutical and Clinical Research*, 9 (2), pp. 314-317. Cited 6 times.

<http://innovareacademics.in/journals/index.php/ajpcr/article/download/10675/4122>

---

41 *Biggest Threats*. Cited 9 times.

1600 Clifton Road Atlanta, GA 30329-4027 USA; 2018

[https://www.cdc.gov/drugresistance/biggest\\_threats.html](https://www.cdc.gov/drugresistance/biggest_threats.html)

---

42 (2015) *The Star Online. Antibiotic Resistance in M'sia Worrying*

<https://www.thestar.com.my/news/nation/2015/11/17/superbugs-on-the-rise-data-shows-pathogens-increasing-resistance-to-antibiotics/>

---

43 (2016)

The Borneo Post Online. Antibiotic-resistant bacteria now a serious global health threat

<http://www.theborneopost.com/2016/11/19/antibiotic-resistant-bacteria-now-a-serious-global-health-threat/>

---

44 Gelband, H., Miller-Petrie, M., Pant, S.

The state of the world's antibiotics

(2015) *The Center for Disease Dynamics, Economics & Policy (CDDEP)*

Accessed June 24, 2018

[https://www.cddep.org/publications/state\\_worlds\\_antibiotics\\_2015](https://www.cddep.org/publications/state_worlds_antibiotics_2015)

---

45 Malaysian Statistics on Medicines 2009 & 2010. Pharmaceutical Services Division and Clinical Research

Centre. Kuala Lumpur 2014

---

46 The pulse of IMU

(2017) *Antibiotics: Friend Or Foe?*

Available from:, Accessed June 24, 2018

<http://imunews imu.edu.my/health/antibiotics-friend-foe/>

---

47 *Newly Reported Gene, Mcr -1, Threatens Last-Resort Antibiotics*

1600 Clifton Road Atlanta, GA 30329-4027 USA; 2018, Accessed June 24, 2018

<https://www.cdc.gov/drugresistance/mcr1.html>

- 48 Zellweger, R.M., Carrique-Mas, J., Limmathurotsakul, D., Day, N.P.J., Thwaites, G.E., Baker, S., Ashley, E., (...), Yang, H.L.

A current perspective on antimicrobial resistance in Southeast Asia ([Open Access](#))

(2017) *Journal of Antimicrobial Chemotherapy*, 72 (11), pp. 2963-2972. Cited 29 times.  
<http://jac.oxfordjournals.org/>  
doi: 10.1093/jac/dkx260

[View at Publisher](#)

---

- 49 Premanandh, J., Samara, B.S., Mazen, A.N.

Race against antimicrobial resistance requires coordinated action – an overview  
(2015) *Front Microbiol*, 6, p. 1536. Cited 9 times.

- 50 (2014)

Department of Health and Social Care. Prime Minister warns of global threat of antibiotic resistance. Prime Minister's Office, 10 Downing Street  
<https://www.gov.uk/government/news/prime-minister-warns-of-global-threat-of-antibiotic-resistance>

- 51 Spellberg, B., Guidos, R., Gilbert, D., Bradley, J., Boucher, H.W., Scheld, W.M., Bartlett, J.G., (...), Edwards Jr., J.

The epidemic of antibiotic-resistant infections: A call to action for the medical community from the infectious diseases society of America ([Open Access](#))

(2008) *Clinical Infectious Diseases*, 46 (2), pp. 155-164. Cited 964 times.  
doi: 10.1086/524891

[View at Publisher](#)

---

- 52 Viswanathan, V.K.

Off-label abuse of antibiotics by bacteria ([Open Access](#))

(2014) *Gut Microbes*, 5 (1). Cited 32 times.  
<https://www.landesbioscience.com/journals/gutmicrobes/gmic.28027.pdf>  
doi: 10.4161/gmic.28027

[View at Publisher](#)

---

- 53 Read, A.F., Woods, R.J.

Antibiotic resistance management ([Open Access](#))

(2014) *Evolution, Medicine and Public Health*, 2014 (1), art. no. eou024, p. 147. Cited 37 times.  
[http://www.oxfordjournals.org/our\\_journals/emph/](http://www.oxfordjournals.org/our_journals/emph/)  
doi: 10.1093/emph/eou024

[View at Publisher](#)

---

- 54 The antibiotic alarm.

(2013) *Nature*, 495 (7440), p. 141. Cited 46 times.  
doi: 10.1038/495141a

[View at Publisher](#)

---

- 55 Lushniak, B.D.

Surgeon general's perspectives

(2014) *Public Health Reports*, 129 (4), pp. 314-316. Cited 56 times.  
<http://www.publichealthreports.org/issuetopen.cfm?articleID=3195>

[View at Publisher](#)

56 Gross, M.

Antibiotics in crisis ([Open Access](#))

(2013) *Current Biology*, 23 (24), pp. R1063-R1065. Cited 40 times.  
doi: 10.1016/j.cub.2013.11.057

[View at Publisher](#)

---

57 Piddock, L.J.V.

The crisis of no new antibiotics-what is the way forward?

(2012) *The Lancet Infectious Diseases*, 12 (3), pp. 249-253. Cited 193 times.  
doi: 10.1016/S1473-3099(11)70316-4

[View at Publisher](#)

---

58 Bartlett, J.G., Gilbert, D.N., Spellberg, B.

Seven ways to preserve the Miracle of antibiotics

(2013) *Clinical Infectious Diseases*, 56 (10), pp. 1445-1450. Cited 129 times.  
doi: 10.1093/cid/cit070

[View at Publisher](#)

---

59 Michael, C.A., Dominey-Howes, D., Labbate, M.

The antimicrobial resistance crisis: Causes, consequences, and management

([Open Access](#))

(2014) *Frontiers in Public Health*, 2 (SEP), art. no. 145. Cited 133 times.  
<http://journal.frontiersin.org/article/10.3389/fpubh.2014.00145/pdf>  
doi: 10.3389/fpubh.2014.00145

[View at Publisher](#)

---

60 Maragakis, L.L., Perencevich, E.N., Cosgrove, S.E.

Clinical and economic burden of antimicrobial resistance

(2008) *Expert Review of Anti-Infective Therapy*, 6 (5), pp. 751-763. Cited 188 times.  
<http://www.expert-reviews.com/doi/pdf/10.1586/14787210.6.5.751>  
doi: 10.1586/14787210.6.5.751

[View at Publisher](#)

---

61 Cosgrove, S.E.

The relationship between antimicrobial resistance and patient outcomes: Mortality, length of hospital stay, and health care costs ([Open Access](#))

(2006) *Clinical Infectious Diseases*, 42 (SUPPL. 2), pp. S82-S89. Cited 617 times.  
doi: 10.1086/499406

[View at Publisher](#)

---

62 Li, B., Webster, T.J.

Bacteria antibiotic resistance: New challenges and opportunities for implant-associated orthopedic infections

(2018) *Journal of Orthopaedic Research*, 36 (1), pp. 22-32. Cited 64 times.  
[http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1554-527X](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1554-527X)  
doi: 10.1002/jor.23656

[View at Publisher](#)

---

- 63 Schwaber, M.J., Navon-Venezia, S., Kaye, K.S., Ben-Ami, R., Schwartz, D., Carmeli, Y.  
Clinical and economic impact of bacteremia with extended-spectrum- $\beta$ - lactamase-producing Enterobacteriaceae  
(2006) *Antimicrobial Agents and Chemotherapy*, 50 (4), pp. 1257-1262. Cited 293 times.  
doi: 10.1128/AAC.50.4.1257-1262.2006  
[View at Publisher](#)
- 
- 64 Lautenbach, E., Patel, J.B., Bilker, W.B., Edelstein, P.H., Fishman, N.O.  
Extended-spectrum  $\beta$ -lactamase-producing *Escherichia coli* and *Klebsiella pneumoniae*: Risk factors for infection and impact of resistance on outcomes  
(Open Access)  
(2001) *Clinical Infectious Diseases*, 32 (8), pp. 1162-1171. Cited 581 times.  
doi: 10.1086/319757  
[View at Publisher](#)
- 
- 65 Lodise, T.P., McKinnon, P.S.  
Clinical and economic impact of methicillin resistance in patients with *Staphylococcus aureus* bacteremia  
(2005) *Diagnostic Microbiology and Infectious Disease*, 52 (2), pp. 113-122. Cited 157 times.  
doi: 10.1016/j.diagmicrobio.2005.02.007  
[View at Publisher](#)
- 
- 66 Cosgrove, S.E., Qi, Y., Kaye, K.S., Harbarth, S., Karchmer, A.W., Carmeli, Y.  
The impact of methicillin resistance in *Staphylococcus aureus* bacteremia on patient outcomes: Mortality, length of stay, and hospital charges  
(2005) *Infection Control and Hospital Epidemiology*, 26 (2), pp. 166-174. Cited 678 times.  
doi: 10.1086/502522  
[View at Publisher](#)
- 
- 67 Vergis, E.N., Hayden, M.K., Chow, J.W., Snydman, D.R., Zervos, M.J., Linden, P.K., Wagener, M.M., (...), Muder, R.R.  
Determinants of vancomycin resistance and mortality rates in enterococcal bacteremia. A prospective multicenter study  
(2001) *Annals of Internal Medicine*, 135 (7), pp. 484-492. Cited 256 times.  
<http://annals.org/issues.aspx>  
doi: 10.7326/0003-4819-135-7-200110020-00007  
[View at Publisher](#)
- 
- 68 Kwon, K.T., Oh, W.S., Song, J.-H., Chang, H.-H., Jung, S.-I., Kim, S.-W., Ryu, S.Y., (...), Lee, N.Y.  
Impact of imipenem resistance on mortality in patients with *Acinetobacter* bacteraemia  
(Open Access)  
(2007) *Journal of Antimicrobial Chemotherapy*, 59 (3), pp. 525-530. Cited 143 times.  
doi: 10.1093/jac/dkl499  
[View at Publisher](#)
- 
- 69 Young, L.S., Sabel, A.L., Price, C.S.  
Epidemiologic, clinical, and economic evaluation of an outbreak of clonal multidrug-resistant *Acinetobacter baumannii* infection in a surgical intensive care unit  
(2007) *Infection Control and Hospital Epidemiology*, 28 (11), pp. 1247-1254. Cited 86 times.  
doi: 10.1086/521660  
[View at Publisher](#)

- 70 Wilson, S.J., Knipe, C.J., Zieger, M.J., Gabehart, K.M., Goodman, J.E., Volk, H.M., Sood, R. Direct costs of multidrug-resistant *Acinetobacter baumannii* in the burn unit of a public teaching hospital  
(2004) *American Journal of Infection Control*, 32 (6), pp. 342-344. Cited 64 times.  
doi: 10.1016/j.ajic.2004.02.008  
[View at Publisher](#)
- 
- 71 Aloush, V., Navon-Venezia, S., Seigman-Igra, Y., Cabili, S., Carmeli, Y. Multidrug-resistant *Pseudomonas aeruginosa*: Risk factors and clinical impact (Open Access)  
(2006) *Antimicrobial Agents and Chemotherapy*, 50 (1), pp. 43-48. Cited 391 times.  
doi: 10.1128/AAC.50.1.43-48.2006  
[View at Publisher](#)
- 
- 72 Abasiubong, F., Bassey, E.A., Udobang, J.A., Akinbami, O.S., Udo, S.B., Idung, A.U. Self-medication: Potential risks and hazards among pregnant women in Uyo, Nigeria  
(2012) *Pan African Medical Journal*, 13. Cited 23 times.  
<http://www.panafrican-med-journal.com/content/article/13/15/abstract/>
- 
- 73 Al Rasheed, A., Yagoub, U., Alkhashan, H., Abdelhay, O., Alawwad, A., Al Aboud, A., Al Battal, S. Prevalence and Predictors of Self-Medication with Antibiotics in Al Wazarat Health Center, Riyadh City, KSA (Open Access)  
(2016) *BioMed Research International*, 2016, art. no. 3916874. Cited 15 times.  
<http://www.hindawi.com/journals/biomed/>  
doi: 10.1155/2016/3916874  
[View at Publisher](#)
- 
- 74 Aziz, M.M., Masood, I., Yousaf, M., Saleem, H., Ye, D., Fang, Y. Pattern of medication selling and self-medication practices: A study from Punjab, Pakistan (Open Access)  
(2018) *PLoS ONE*, 13 (3), art. no. e0194240. Cited 10 times.  
<http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0194240&type=printable>  
doi: 10.1371/journal.pone.0194240  
[View at Publisher](#)
- 
- 75 Arshad, M.S., Rasool, M.F., Ijaz, M., Hussain, A. Evaluation of antibiotic use behavior in cold and flu amongst the students of Bahauddin Zakariya University Multan Pakistan  
(2010) *Pak J Pharm*, 23 (2), pp. 15-22. Cited 4 times.
- 
- 76 Anwar, M., Green, J.A., Norris, P., Bukhari, N.I. Self-medication, home remedies, and spiritual healing: Common responses to everyday symptoms in Pakistan  
(2015) *Health Psychol Behav Med*, 3 (1), pp. 281-295. Cited 7 times.
- 
- 77 Saleem, Z., Saeed, H., Ahmad, M., Yousaf, M., Hassan, H.B., Javed, A., Anees, N., (...), Maharjan, S. Antibiotic self-prescribing trends, experiences and attitudes in upper respiratory tract infection among pharmacy and non-pharmacy students: A study from Lahore (Open Access)  
(2016) *PLoS ONE*, 11 (2), art. no. e0149929. Cited 16 times.  
<http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2f10.1371%2fjournal.pone.0149929&representation=PDF>  
doi: 10.1371/journal.pone.0149929  
[View at Publisher](#)

78 Guinovart, M.C., Figueras, A., Carles Llop, J., Llor, C.

Obtaining antibiotics without prescription in Spain in 2014: Even easier now than 6 years ago ([Open Access](#))

(2014) *Journal of Antimicrobial Chemotherapy*, 70 (4), pp. 1270-1271. Cited 14 times.  
<http://jac.oxfordjournals.org/>  
doi: 10.1093/jac/dku526

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---

79 Kalungia, A.C., Burger, J., Godman, B., Costa, J.D.O., Simuwelu, C.

Non-prescription sale and dispensing of antibiotics in community pharmacies in Zambia

(2016) *Expert Review of Anti-Infective Therapy*, 14 (12), pp. 1215-1223. Cited 24 times.  
doi: 10.1080/14787210.2016.1227702

[View at Publisher](#)

---

80 Widayati, A., Suryawati, S., De Crespigny, C., Hiller, J.E.

Self medication with antibiotics in Yogyakarta City Indonesia: A cross sectional population-based survey ([Open Access](#))

(2011) *BMC Research Notes*, 4, art. no. 491. Cited 37 times.  
doi: 10.1186/1756-0500-4-491

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