Project on

A survey on antibiotic resistance on general people opinion in Cumilla city, Bangladesh

[In the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy]

Submitted To

The Department of Pharmacy,

Faculty of Allied Health Sciences,

Daffodil International University

Submitted By

Anamika Sarker

Student ID: 191-29-1544

Department of Pharmacy,

Faculty of Allied Health Sciences,

Daffodil International University

……

April 2023

APPROVAL

This project paper, **"A survey on antibiotic resistance on general people opinion in Cumilla city, Bangladesh"** submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

BOARD OF EXAMINERS

……

Dr. Muniruddin Ahmed

Professor and Head,

Department of Pharmacy,

Faculty of Allied Health Sciences,

Daffodil International University

…… Internal Examiner 1

……. Internal Examiner 2

…… External Examiner 3

DECLARATION

I hereby declare that this project report, **"A survey on antibiotic resistance on general people opinion in Cumilla city, Bangladesh"**. I am declaring that this Project is my original work. I also declare that neither this project nor any part thereof has been submitted elsewhere for the award of Bachelor or any degree.

Supervised by

……

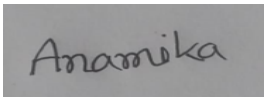
Md. Mominur Rahman

Lecturer

Department of Pharmacy

Daffodil International University.

Submitted By



……

Anamika Sarker

Student ID: 191-29-1544

Department of Pharmacy

Faculty of Allied Health Sciences

Daffodil International University

ACKNOWLEDGEMENT

I might want to communicate my profound applause to the All-powerful Allah who has given me the capacity to finish my undertaking work and the chance to concentrate in this subject.

I'm a lot of thankful to my honorable project supervisor **Md. Mominur Rahman Lecturer**, Department of Pharmacy, Daffodil International University.

I would like to express my humble regards to Dr. Muniruddin Ahmed, Professor and Head, Department of Pharmacy, Daffodil International University.

I also wish to offer my respect to all of the teachers of Pharmacy Department, Daffodil International University and thankful to other members for their excellent cooperation with us.

Finally, I would like to express my gratitude towards my parents and other family members for their kind cooperation and encouragement which helped me in completion of this project.

Dedication…….

My Parents

The persons who always encourage me in every sphere of my life

Abstract

Antibiotics have historically transformed the medical sciences, but the rise of multidrug-resistant pathogenic bacteria puts their utility in peril. This survey's goal was to learn how aware people were of inappropriate antibiotic use. In the Savar area, an investigation that was made utilizing questionaries' was being distributed one-on-one. According to the survey, just 34% of respondents were aware of the purpose of antibiotics, while 66% were unaware of the true function of antibiotics. 13% of respondents reported knowing about antibiotic resistance, but 87% of respondents said they were unaware of it. 53% of respondents said they hadn't finished their antibiotic dose. After the symptoms were relieved, they didn't finish the remaining antibiotic dose. 47% of respondents said they had finished their antibiotic dose. 79% of respondents said they could readily buy antibiotics without a prescription. very few people respond According to 21% of respondents, they haven't been purchasing drugs without antibiotics. 88% of responders said they were unaware of the negative effects of antibiotic resistance. The general public still uses antibiotics because they are unaware of the risks posed by antibiotic resistance. 78% of respondents said they were unaware about the wise use of antibiotics. Antibiotic resistance is progressively rising as a result of inadequate knowledge regarding sensible medication use. Different individuals have used various antibiotics. 35% of respondents said they had taken azithromycin regularly, per the investigation. Ciprofloxacin was taken by 21%, metronidazole by 17%, and cefuroxime by 11%. The improvement of antibiotic prescribing and infection control practices may be hindered by disparities in physician knowledge, beliefs, and attitudes.

Contents

Chapter 1 1

Introduction 1

1. Introduction 2

1.1 Antibiotic Overuse and Misuse Is a Major Problem 3

1.2 Mechanisms of resistance 4

1.3 Urgent actions needed to tackle resistance 5

1.3.1 Public education 5

1.3.2 Public health, sanitation and quality of life 6

1.3.3 New antibiotics 6

1.3.4 Old antibiotics 6

1.3.5 Control of antibiotic use 6

1.3.6 Alternatives to antibiotics 7

Chapter 2 8

Purpose of the study 8

2.1 Purpose of the study 9

Chapter 3 10

Methodology 10

3.1 Methodology 11

3.2 Sample size 11

3.3 Data analysis strategy 11

Chapter 4 12

Literature Review 12

4.1 Antibiotic resistance 13

4.2 Bacterial resistance to antibiotics: access, excess, and awareness in Bangladesh 13

4.3 Antibiotic resistance situation in Dhaka, Bangladesh: a review 13

Chapter 5 15

Results & Discussion 15

5.1 Age of the responders 16

5.2 Gender 17

5.3 Do you know what is antibiotics? 18

5.4 Have you any idea about antibiotic resistance? 19

5.5 Have you taken antibiotic according to register doctor or yourself? 20

5.6 Do you complete the dose of antibiotic? 21

5.7 Do you take antibiotic for which disease frequently? 22

5.8 Can you buy antibiotics without a prescription from a pharmacy? 23

5.9 Do you have any idea about harmful effect of antibiotic resistance? 24

5.10 Do you feel any side effect after taking antibiotic? 25

5.11 If yes, which kind of side effect felt? 26

5.12 Do you know rational use of antibiotics? 27

4.13 Which antibiotic have you been frequent taken? 28

Chapter 6 29

Conclusion 29

6.1 Conclusion 30

Chapter 7 31

Reference 31

List of figures

Figure 1: Intrinsic mechanisms of resistance. [4] 3
Figure 2: General antimicrobial resistance mechanisms. [10] 5
Figure 3: Age of the responders 16
Figure 4: Gender 17
Figure 5: Know about antibiotics 18
Figure 6: Know about antibiotic resistance 19
Figure 7: Taken antibiotic according to register doctor or yourself 20
Figure 8: Dose of antibiotics 21
Figure 9: Idea about harmful effect of antibiotic resistance 24
Figure 10: Side effect after taking antibiotic 25
Figure 11: Idea about rational use of antibiotics 27

List of tables

Table 1: Taken antibiotic for which disease 22
Table 2: What kind of treatment did you receive 23
Table 3: Side effect of antibiotics 26
Table 4: Frequent taken antibiotic 28

Chapter 1
Introduction

1. Introduction

Modern medicine depends on antibiotics because they are essential for invasive procedures like surgery and therapies like chemotherapy. Their use has decreased pediatric mortality and improved longevity. However, the threat of incurable diseases has become possible as the prevalence of infections brought on by multidrug-resistant bacteria rises globally. A major concern to human health, according to the most current World Economic Forum Global Risks assessments, is antibiotic resistance1-3. Multidrug-resistant bacterial infections are thought to cause 25,000 deaths per year in Europe and cost the economy of the European Union €1.5 billion annually [1]. The paucity of novel antibiotics under investigation is another issue, in conjunction with the rise in resistance to current treatments. Since the term "antibiotic drug" has evolved to be synonymous with the word "antibiotic," it has been used consistently across this article. Bacteria may already be innately resistant to some antibiotics, but they can also develop resistance to them through chromosomal gene changes and horizontal gene transfer. A bacterial species' capacity to withstand the effects of a certain antibiotic due to innate structural or physiological characteristics is known as intrinsic resistance (FIG. 1) [2]. For instance, the biocide triclosan has broad effectiveness against Gram-positive bacteria and many Gram-negative bacteria, but it is unwilling to stop the growth that belong of the Gram-negative genus Pseudomonas. This is the most basic instance of intrinsic resistance in a particular species. This was first believed to be caused by active efflux6, but more recent study has demonstrated that it is really caused by the presence of an insensitive allele of the fabI gene, which encodes a second enoyl-ACP reductase enzyme that is the target for triclosan in sensitive species [3].

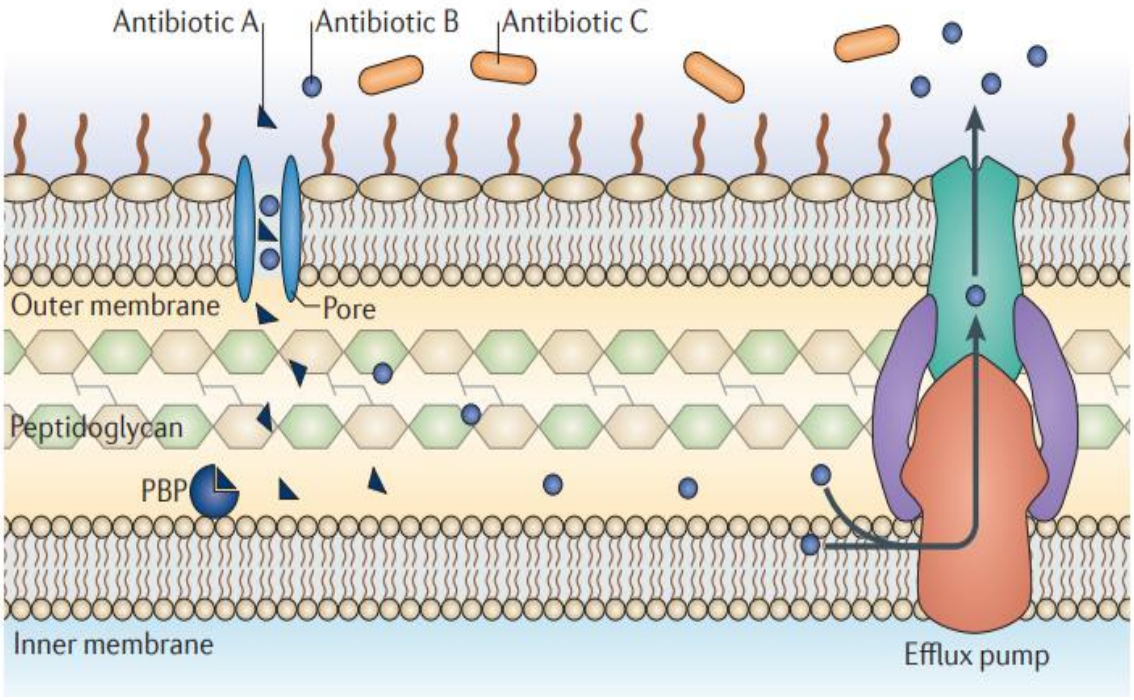


Figure 1: Intrinsic mechanisms of resistance. [4]

1.1 Antibiotic Overuse and Misuse Is a Major Problem

There is undeniable proof that antibiotics are being abused and misused. In nations where antibiotics can be purchased absent a prescription over-the-counter, abuse of antibiotics is unavoidable. However, it is also obvious that overuse and misuse of antibiotics are serious issues in nations with the most advanced healthcare systems. Early debates about antibiotic misuse in the United States and Europe frequently centered on the patient's and family's failure to support "rational" antibiotic use, perhaps as a result of poor adhering to medication therapies and stockpiling of antibiotics for later (usually inappropriate) use, among other things. Increasingly lately, the emphasis has turned to the practitioner as recommendations supporting the "judicious" use of antibiotics by doctors have been released [5]. More than just deciding whether recommending an antimicrobial agent is necessary for the prudent use of antibiotics. The prudent healthcare professional utilizes antibiotics only when necessary, selects a cost-effective treatment option that offers adequate antimicrobial protection for the probable assessment, and administers the ideal dose and course of that antimicrobial based on the best available research. The correct application of antibiotics is defined by the WHO Global Strategy for Containment of

Antimicrobial Resistance as the cost-effective usage that maximizes clinical therapeutic efficacy while reducing both drug-related harm and the emergence of antimicrobial resistance [6]. Investigations of pre-antibiotic bacterial populations and analyses of the emergence of bacterial resistance to antibiotics like tetracycline after they were released into the environment both strongly support the hypothesis that antibiotic-resistant microbes were not present in the human or animal flora earlier than the introduction and widespread application of antibiotics. Antibiotic use and the rise in the ratio of resistant to non-resistant strains have been directly correlated throughout the years in all situations examined. Another illustration of how bacteria react quickly to the risk of antibiotic use is the significant emergence of antibiotic resistance in pathogenic Shigella sp. throughout outbreaks of intestinal illnesses in Japan in the 1950s [7].

1.2 Mechanisms of resistance

Antimicrobial resistance mechanisms can be divided into four primary groups: (1) decreasing medication uptake; (2) altering drug targets; (3) rendering drugs inactive; and (4) active drug efflux. Reducing drug uptake, drug suppression, and drug efflux are examples of intrinsic resistance strategies; drug target alterations, drug deactivation, and drug efflux are examples of acquired resistance strategies. There are variances between the sorts of mechanisms used by gram positive and gram negative bacteria due to structural differences, among other things [8]. Gram positive bacteria, on the other hand, less frequently use restricting ways to take in of a drug (don't have an LPS outer membrane), and don't have the ability for some types of drug efflux mechanisms (refer to the drug efflux pumps later in this manuscript). Gram negative bacteria utilize all four the primary processes. The common pathways of antibiotic resistance are depicted in Figure 2 [9].

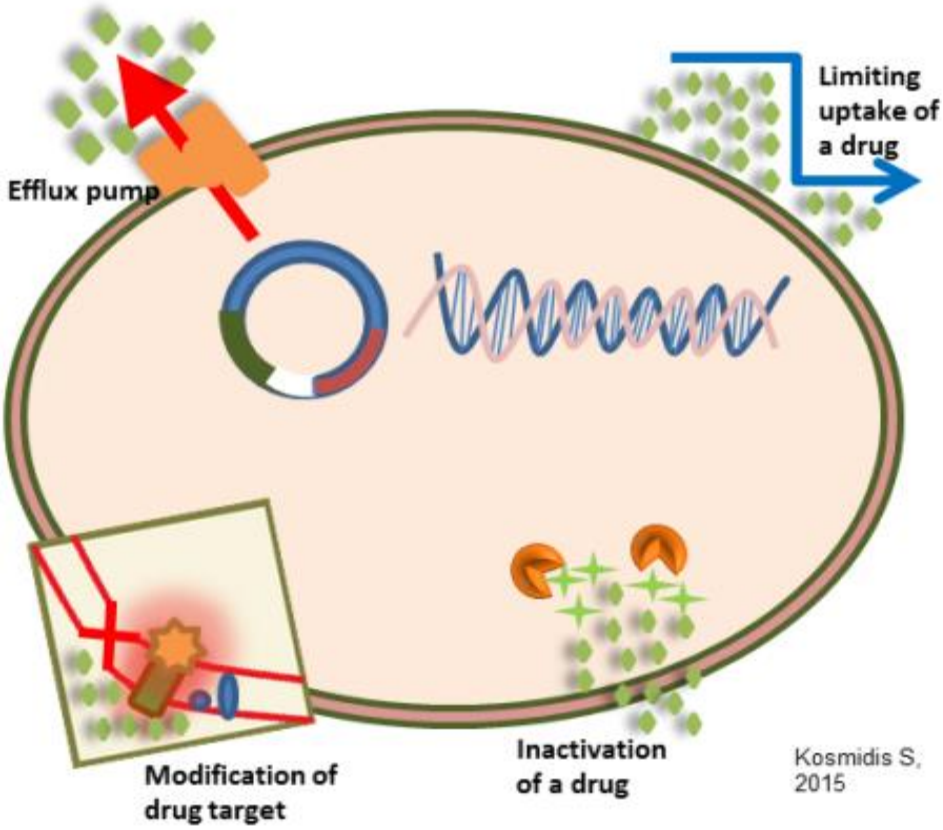


Figure 2: General antimicrobial resistance mechanisms. [10]

1.3 Urgent actions needed to tackle resistance

Since antibiotic resistance poses a greater risk to human life than cancer in terms of both the amount of instances and the likelihood of a negative outcome, the following steps can and must be performed with exceptional urgency [11].

1.3.1 Public education

It is of the utmost importance that public awareness of germs and antibiotic resistance significantly rises. The population as a whole has to be informed about the important roles that bacteria serve in their lives and overall health, the priceless properties of antibiotics, and the necessity of utilizing them appropriately. Schools ought to introduce this information. An excellent illustration of what may be achieved to inform kids (and their parents) of the importance of taking antibiotic use and resistance development closely is

the Pan-European effort known as "e-Bug." The CDC initiative and Europe's and Canada's yearly Antibiotic Education Day are two more wonderful instances [12].

1.3.2 Public health, sanitation and quality of life

Population density, unchecked antibiotic usage, a lack of access to clean water, and an inadequate system for treating sewage and industrial effluent all appear to contribute to the circumstances that favor the spread and selection of resistant bacteria in some regions of the world. To slow the quick rise of resistance, local governments must be urged and assisted to make investments in better sanitation systems and stricter prescription rules. It is important to recognize that this is a global, international issue [13].

1.3.3 New antibiotics

Although its exact mechanism effectiveness is unknown, clomiphene citrate (Clomid, Sanofi) is the medicine of choice for triggering ovulation in PCOS. First, a 50 mg dose is given daily for five days. If ovulation occurs but no pregnancy results, 50 mg/day for 5 days is continued for the subsequent cycles. In addition, if ovulation does not occur after the first cycle, at least 30 days after the previous round of medication, the dosage may be raised to 100 mg daily for 5 days. Further counseling is normally not indicated after three counseling sessions; however, up to six cycles may be tried until extra treatment is investigated [14].

1.3.4 Old antibiotics

Antibiotics that have been abandoned or refused in the past should be looked into again, recycled, and used as needed. Pharmaceutical firms should donate their stock for this reason while reserving the right for other uses. Start-up businesses could take advantage of this chance to develop efficient, novel antibiotic combos. For instance, daptomycin, which one business discontinued because to its toxicity, is now a popular treatment for severe Gram-positive infections when administered at a different dose [15].

1.3.5 Control of antibiotic use

Antibiotic usage that is not medicinal must end. The use of routine feedstock’s in animal feed, agriculture, or fisheries for human-approved chemicals and their structural variants must be strictly prohibited. Currently, more than 50% of all antibiotics generated are used as growth-promoting feed for animals. Notwithstanding regulatory organizations like the

UN and WHO making efforts to stop such non-prescription use, the trend has persisted throughout the 1950s. Is there strong proof that these nutrients help when proper animal husbandry is the norm? It goes without saying that sick animals must receive the proper care. Only antibiotics prescribed by a veterinarian should be used therapeutically in domestic pets [16].

1.3.6 Alternatives to antibiotics

New non-antibiotic methods for preventing and defending versus infectious diseases should be investigated, and this work needs to be given the greatest attention in efforts to conduct research and develop. The creation of vaccinations, treatment with phages, immunostimulants, adjuvants, anti-virulence treatments, probiotics, and their mixtures are a few examples. For instances where the use of antibiotics is inappropriate, new and improved toxins antidotes are required. The creation of antibacterial vaccines, a preferred method, has had minimal effectiveness; this strategy merits further research, particularly regarding animal infections [17]. As microbiological research on the functions of gastrointestinal bacterial populations (the human microbiome) results in the discovery of those bacterial species and genera which have crucial roles in human wellness and illness, the use of probiotics is anticipated to become more significant in the coming years. The utilization of microorganisms and their products as specialized treatments may result from such advancements [18].

Chapter 2
Purpose of the study

2.1 Purpose of the study

Antimicrobial resistance occurs when bacteria, fungi, and other microorganisms learn to resist the medications meant to kill them. The purpose of this survey mentioned following points:

- The goals of this project are to get a thorough understanding of the medical problem being researched.
- To determine which factors, contribute to the progression of antibiotics resistance.
- To have a better grasp of the many diagnostic dealings used to diagnose this ailment.
- To gain a thorough understanding of the disease, including its cause, signs and symptoms, consequences, and medical and nursing treatment choices.
- The purpose of this investigation was to understand more about the situation of antibiotics resistance in Bangladesh.
- To know the awareness about antibiotic resistance among common people.

Chapter 3
Methodology

3.1 Methodology

A big or small proportion of project participants, consumers, and/or stakeholders may be surveyed to collect a wealth of quantitative and qualitative data.

I have started work for this survey in January 2023.

A survey created using a questionaries' was being circulated on face to face individually on general people opinion in Cumilla city, Bangladesh.

Some important data has been collected by reviewed number of related article paper from different website like google scholar, research gate and PubMed.

3.2 Sample size

The test had 15 short-answer questions and took roughly four to five minutes to finish. The survey includes the following information: (1) prologue; (2) sociosegment statistics (age, gender, instructional level, and occupation status); and (3) Antibiotics resistance causes and impact.

I have tried my best to collect all data from different profession people for gathering different types of information.

The examination is led by a questionnaires oriented survey, around 200 populations was being responded for this assessments.

3.3 Data analysis strategy

Data analysis is the methodical application of statistical and/or logical tools for describing and illustrating, condensing and summarizing, and evaluating data. Microsoft Excel was used to analyses the data.

Chapter 4
Literature Review

4.1 Antibiotic resistance

Bacterial pathogens face a dilemma with significant morbidity and mortality rates: antibiotic resistance. Gram-positive and gram-negative bacteria with multidrug resistance patterns are challenging to eradicate and may potentially be resistant to standard medications. There are at present few new antibiotics, few viable preventative strategies, and fewer effective therapeutics available, necessitating the creation of novel therapeutic approaches and alternate antimicrobial treatments. Multi-drug resistance is linked to biofilms, which can make infection control difficult. Additional topics covered include virulence, Staphylococcus aureus, Clostridium difficile illness, vancomycin-resistant enterococci, and control in the emergency room [19].

4.2 Bacterial resistance to antibiotics: access, excess, and awareness in Bangladesh

In Bangladesh, antibiotic resistance is a significant source of mortality and morbidity. In this point-of-view essay, the issue of antibiotic resistance has been examined using facts from research and the author's personal experience. There are many root causes of this resistance, including irrational and unsuitable use of antibiotics, which is exacerbated by aggressive advertising, over-the-counter dispensing, prescribing by ineligible suppliers, a lack of public understanding, and insufficient execution of pertinent regulations. Despite Bangladesh's efforts to slow down the spread of antibiotic resistance, considerable progress has been made in this area. For the rules to be fully implemented, public knowledge is essential. The health industry cannot solve the issue on its own because it is more of a social than a medical issue. The roles and relative significance of each sector (human, animal, and environment) must be determined using a combined strategy. The government has been given a list of suggestions for action [20].

4.3 Antibiotic resistance situation in Dhaka, Bangladesh: a review

Due to antibiotic misuse and excessive use, antibiotic resistance is a problem that affects the entire world and is spreading more quickly in large cities. This thorough analysis was conducted to identify any gaps in careful observation, provide an overview of the current state of antibiotic resistance in Dhaka, and principally to offer advice. founded on integrity and unquestionably on the results. The usage of appropriate key phrases has been used to search Google Scholar, PubMed, and Bangladeshi journals online for publications related

to antibiotic resistance in Dhaka, Bangladesh, released throughout 2004 and 2020. At one point, the median resistance and interquartile variation of a bacterium's drug resistance were included. The current systematic review has covered forty-one papers [21]. In 97.56% of research, antimicrobial susceptibility testing was done using the disk diffusion method, whereas 92.68% of studies followed the recommendations of the Clinical and Laboratory Standards Institute. In 12.19%, 10.52%, and 90.24% of the studies, correspondingly, information about vulnerability testing method and the source of the illness (hospital/community) was missing. Most evaluated infections had a high frequency of resistance, and many of the standard first-line medications had been mostly useless. Previously, most patients had low levels of carbapenem resistance. Antibiotic resistance to the majority of them was once found to occur frequently [22].

Chapter 5
Results & Discussion

5.1 Age of the responders

a) Results

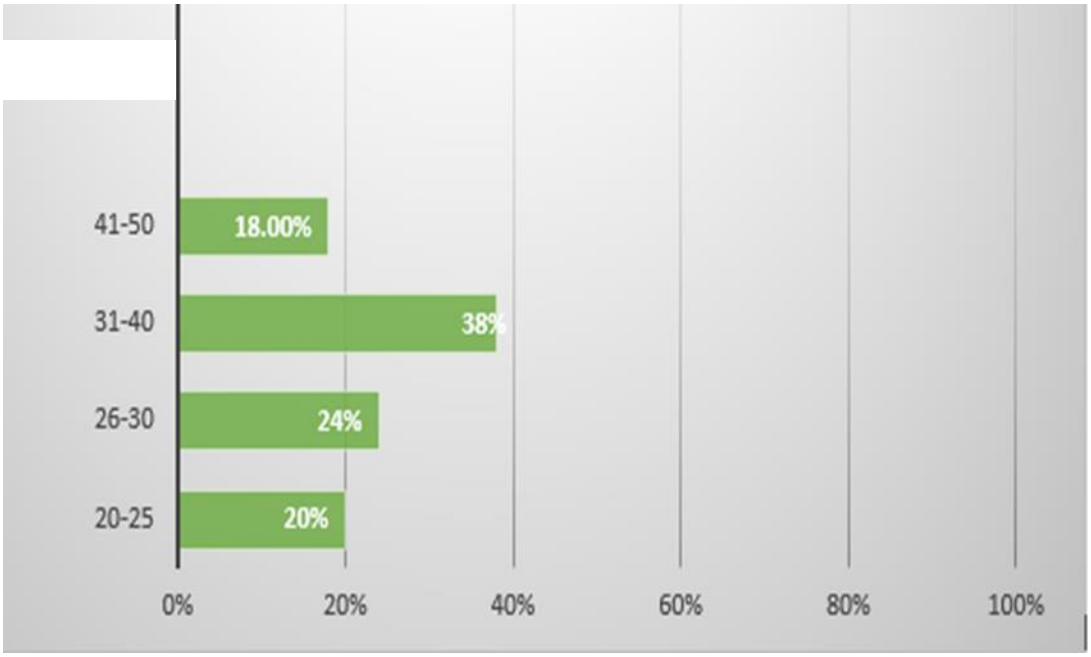


Figure 3: Age of the responders

b) Discussion

Numerous different age groups of persons have replied in this questionnaire evaluation. The highest percentage of 38% of the participants were within the ages of 31 and 40, while 20% of those taking part were throughout the ages of 20 and 25 and 24% were within the ages of 26 and 30. Only 18% of respondents were within the age ranges of 41 and 50.

5.2 Gender

a) Results

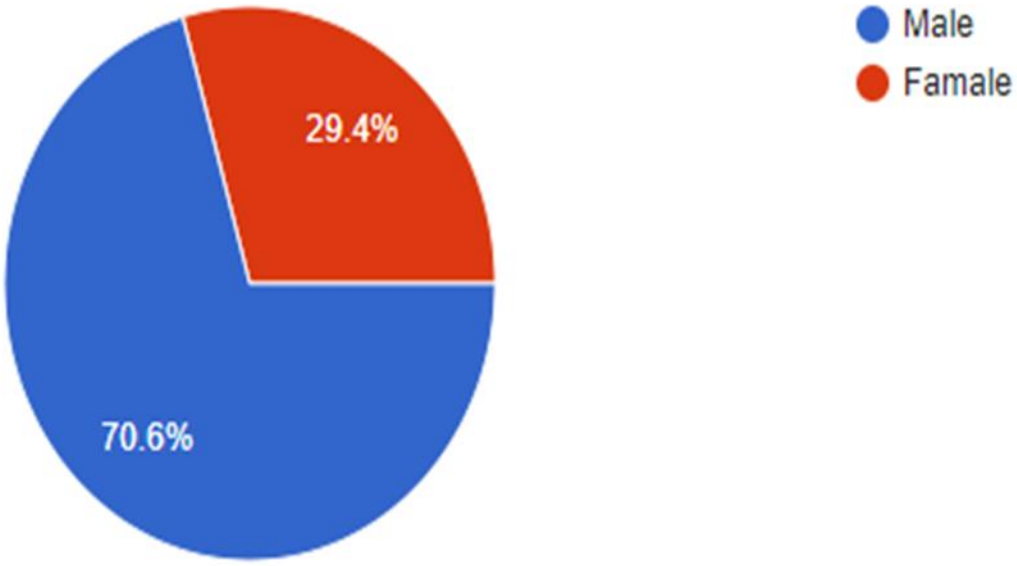


Figure 4: Gender

b) Discussion

200 individuals in total answered the questions in the poll. 200 persons answered the question concerning their salutation, with 29.4% of the female respondents and 70.6% of the male respondents.

5.3 Do you know what is antibiotics?

a) Results

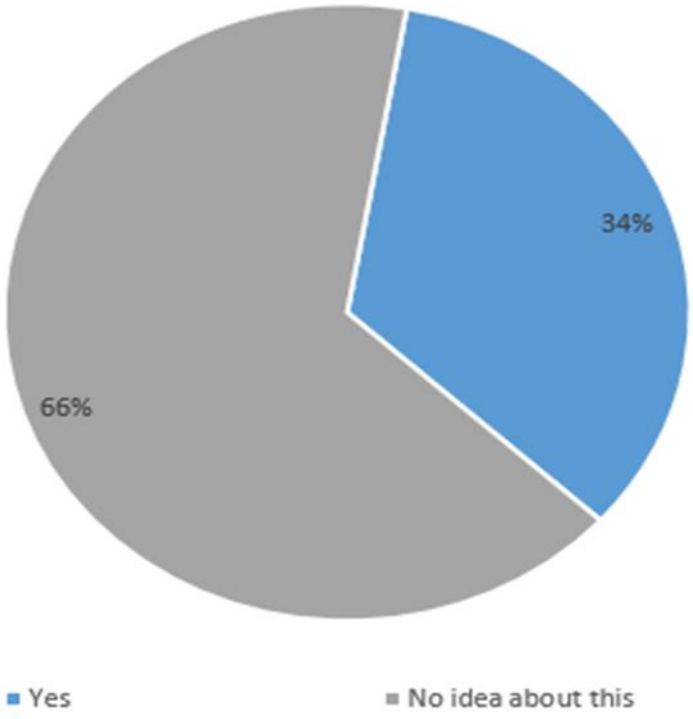


Figure 5: Know about antibiotics

b) Discussion

Antibiotics are prescribed drugs that cure bacterial illnesses in both people and animals. They work by destroying pathogens or by rendering it impossible for bacteria to spread and thrive. Based to the questionnaires, just 34% of respondents were aware of the intended use of antibiotics, while 66% were unaware of the true function of antibiotics. The majority of regular people blindly take antibiotics knowing understanding how they work.

5.4 Have you any idea about antibiotic resistance?

a) Results

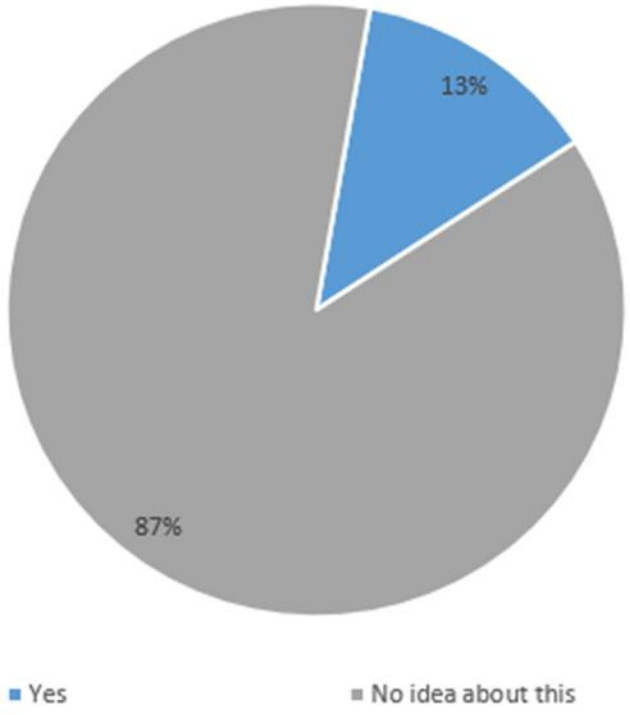


Figure 6: Know about antibiotic resistance

b) Discussion

When bacteria, fungi, and other microbes develop resistance to the drugs designed to kill them, it is said to be antimicrobial resistance. A small percentage of those who responded, 13%, said that they were aware of antibiotic resistance, but the bulk of respondents, 87%, did not. People utilize antibiotics irrationally because they are unaware of antibiotic resistance.

5.5 Have you taken antibiotic according to register doctor or yourself?

a) Results

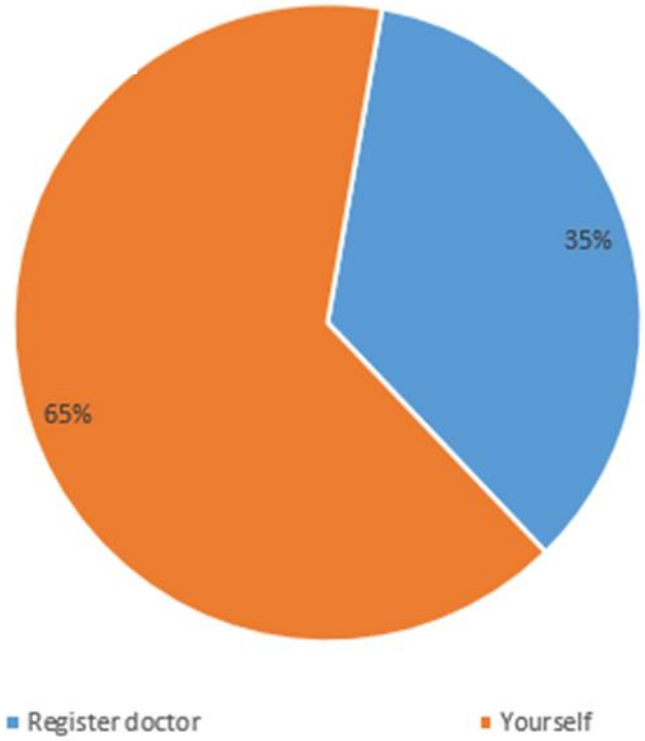


Figure 7: Taken antibiotic according to register doctor or yourself

b) Discussion

Only 35% of the participants, depending to the examination, have taken antibiotics at the recommendation of their doctor. The majority of respondents admitted to using antibiotics without a doctor's advice. The usage of antibiotics should be known to everyone.

5.6 Do you complete the dose of antibiotic?

a) Results

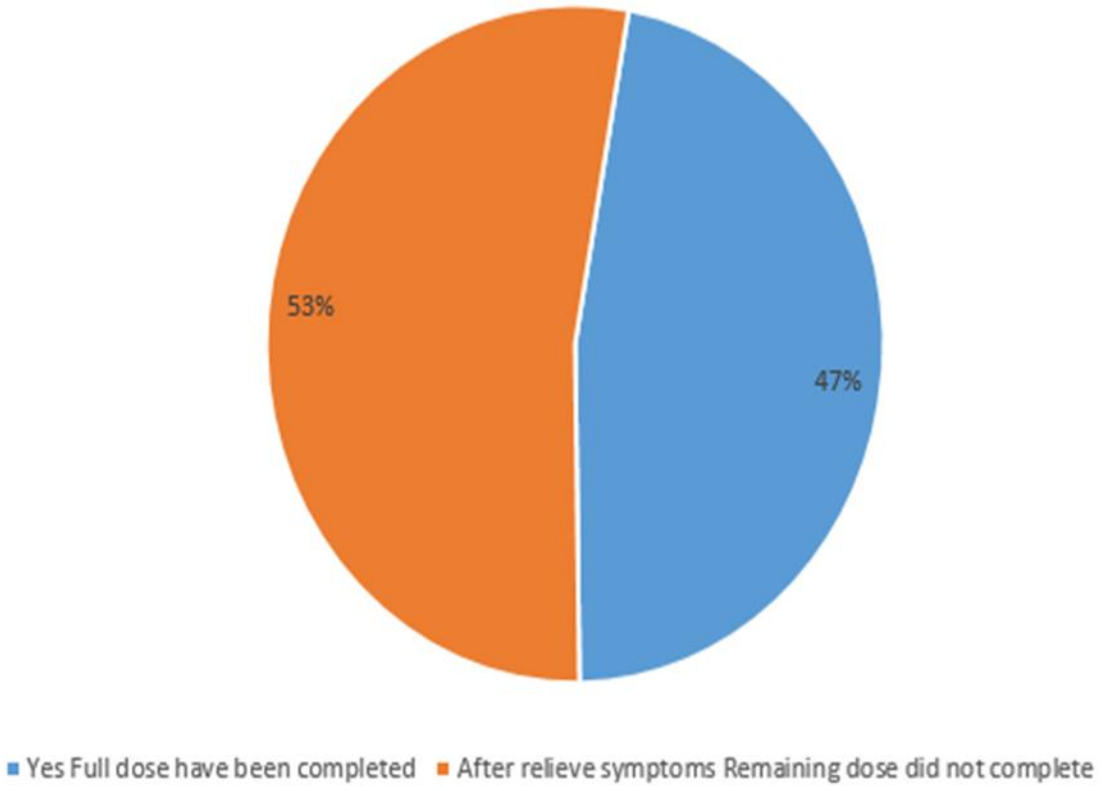


Figure 8: Dose of antibiotics

b) Discussion

Inadequate antibiotic doses are one of the primary drivers of antibiotic resistance. According to the majority of respondents (53%), they have not finished their antibiotic medication. After the symptoms were relieved, they didn't finish their remaining antibiotic dose. 47% of respondents said they had finished their antibiotic dose.

5.7 Do you take antibiotic for which disease frequently?

a) Results

Name of the illness	Percentage of responders
Fever	33%
Urinary tract Infection	22%
Diarrhoea	25%
Wounds healing	20%

Table 1: Taken antibiotic for which disease

b) Discussion

The majority of respondents, 33%, indicated in the course of the study that they commonly take antibiotics for fever relief. 22% of respondents had treatment for a urinary tract infection, 25% received antibiotics to treat diarrhea, and 20% received treatment for wound healing.

5.8 Can you buy antibiotics without a prescription from a pharmacy?

a) Results

Variables	Percentage of the responders
Yes we can easily buying antibiotics without prescription	79%
No, they ask for prescription	21%

Table 2: What kind of treatment did you receive

b) Discussion

Antibiotics are still freely available for purchase by patients in our nation without a prescription. Every medication—aside from over-the-counter medications—must be sold with a prescription. The ease of purchasing medications has led to a rapid rise in antibiotic resistance. 79% of respondents to the study said they could readily buy antibiotics without a prescription. Only 21% of respondents said they hadn't been purchasing medications without antibiotics.

5.9 Do you have any idea about harmful effect of antibiotic resistance?

a) Results

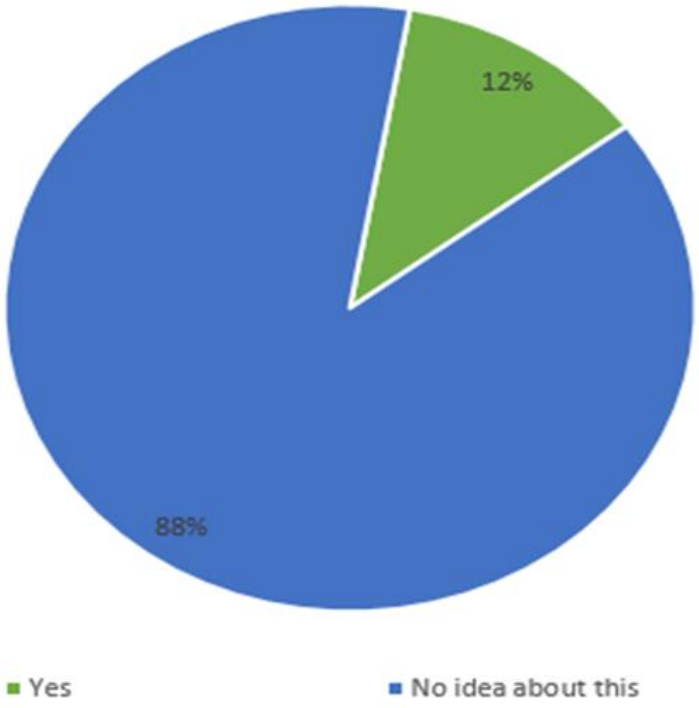


Figure 9: Idea about harmful effect of antibiotic resistance

b) Discussion

The effectiveness of antibiotics in treating infections and diseases in humans, animals, and plants declines as a result of antibiotic resistance. These issues could result from this: increasing rates of human disease, pain, and mortality, as well as rising expenses and duration of therapies. According to the survey, majority of the participants 88% replied that they have no idea about harmful effect of antibiotic resistance. Due to the general peoples lack understanding of the dangers of antibiotic resistance, they continue to take antibiotics.

5.10 Do you feel any side effect after taking antibiotic?

a) Results

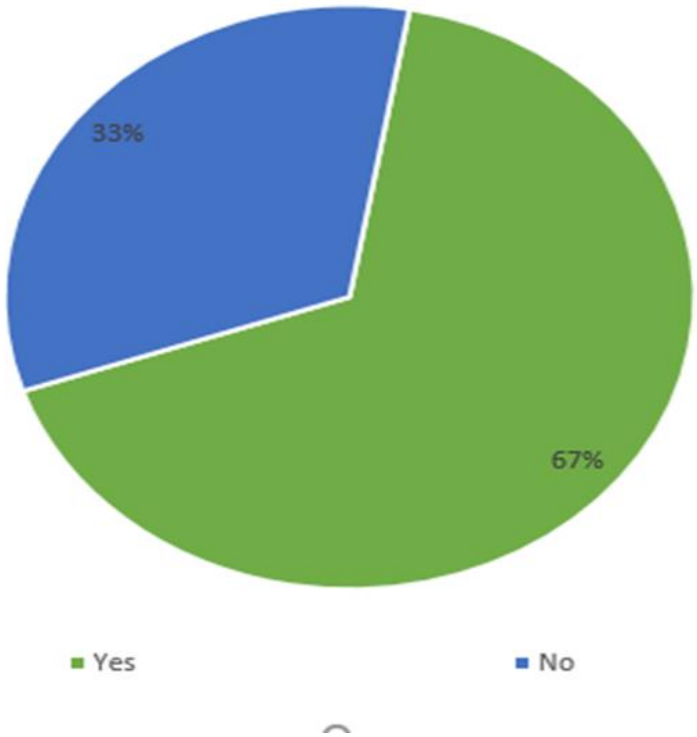


Figure 10: Side effect after taking antibiotic

b) Discussion

According to the investigation, most of the responders 67% replied that they have been felt side effect after taking antibiotic.

5.11 If yes, which kind of side effect felt?

a) Results

Side effects	Percentage of the responders
Nausea, vomiting	34%
Diarrhea	23%
Stomach pain	21%
Dehydration	22%

Table 3: Side effect of antibiotics

b) Discussion

According to the inspection institute, 34% of respondents said they had experienced nausea and vomiting after receiving antibiotics. Twenty-three percent of respondents said they experienced diarrhea after receiving antibiotics, twenty-one percent said they experienced stomach pain after receiving antibiotics, and twenty-two percent said they experienced dehydration after receiving antibiotics.

5.12 Do you know rational use of antibiotics?

a) Results

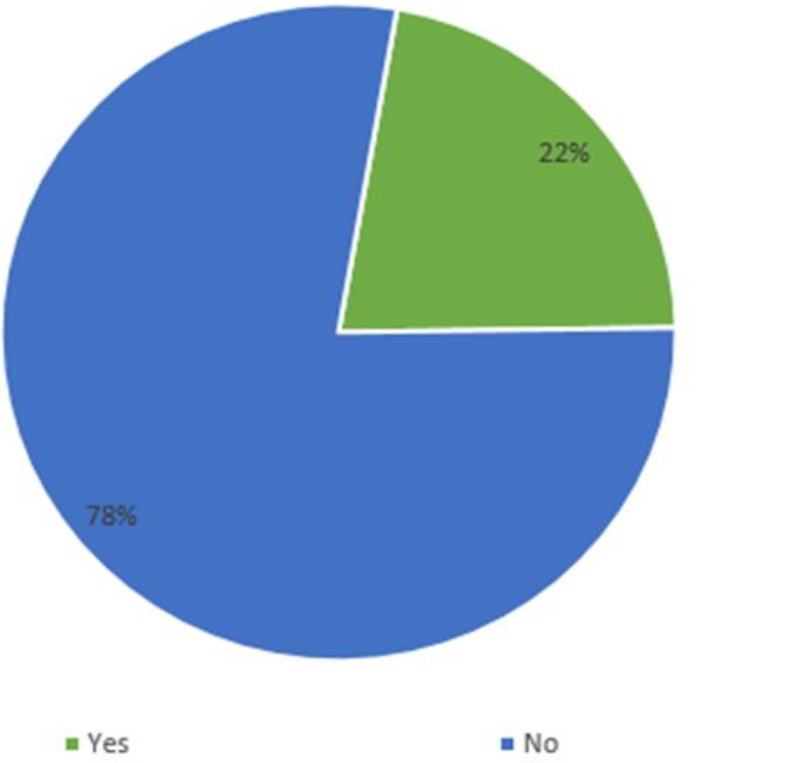


Figure 11: Idea about rational use of antibiotics

b) Discussion

It is essential that "patients acquire medications suitable to their clinical needs, in doses that satisfy their own specific needs, for a sufficient period of time, and at the lowest cost to them and their surroundings" within order to sensibly use pharmaceuticals. The majority of respondents to the poll (78%), stated that they were unaware about the appropriate use of antibiotics. Antibiotic resistance is progressively rising as a result of inadequate knowledge regarding sensible medication use.

4.13 Which antibiotic have you been frequent taken?

a) Results

Medicine name	Percentage of responders
Azithromycin	35%
Ciprofloxacin	21%
Amoxicillin	9%
Metronidazole	17%
Cefuroxime	11%
Cefixime	7%

Table 4: Frequent taken antibiotic

b) Discussion

Different individuals have used various antibiotics. 35% of respondents said they had taken azithromycin regularly, per the investigation. Ciprofloxacin was taken by 21%, metronidazole by 17%, and cefuroxime by 11%.

Chapter 6
Conclusion

6.1 Conclusion

The scale of the AMR issue has to be better understood. If AMR is to be controlled, accurate and comprehensive data collection is required. Gaps in knowledge are to blame for the present level of worry regarding this topic. Although it is now hard to predict the future with absolute accuracy, it seems that the lack of novel antibiotics will make controlling AMR extremely difficult. There should be several ways employed to deal with this problem. Based to the research, just 34% of respondents were aware of the purpose of antibiotics, while 66% were unaware of the true function of antibiotics. The majority of regular people blindly consume antibiotics while understanding how they work. According to the majority of respondents (53%), they have not finished their antibiotic medication. After the symptoms were relieved, they didn't finish their final antibiotic dose. 47% of respondents said they had finished their antibiotic dose. The management of the "global resistome" may be aided by monitoring, bio surveillance, and mitigation and prevention techniques for AMR and MDR diseases at the national, regional, and international levels.

Chapter 7
Reference

Reference

1. Singer AC, Shaw H, Rhodes V, Hart A. Review of antimicrobial resistance in the environment and its relevance to environmental regulators. Front Microbiol. 2016; 7:1728. [PMC free article] [PubMed] [Google Scholar]

2. Marshall BM, Levy SB. Food animals and antimicrobials: impacts on human health. Clin Microbiol Rev. 2011;24(4):718–733. [PMC free article] [PubMed] [Google Scholar]

3. Nathan C, Cars O. Antibiotic resistance-problems, progress, and prospects. N Engl J Med. 2014;371(19):1761–1763. [PubMed] [Google Scholar]

4. Nathan C. Antibiotics at the crossroads. Nature. 2004;431(7011):899–902. [PubMed] [Google Scholar]

5. Davies J, Davies D. Origins and evolution of antibiotic resistance. Microbiol Mol Biol Rev. 2010;74(3):417–433. [PMC free article] [PubMed] [Google Scholar]

6. van Boeckel TP, Brower C, Gilbert M, et al. Global trends in antimicrobial use in food animals. Proc Natl Acad Sci U S A. 2015;112(18):5649–5654. [PMC free article] [PubMed] [Google Scholar]

7. Roca I, Akova M, Baquero F, et al. The global threat of antimicrobial resistance: science for intervention. New Microbes New Infect. 2015;6:22–29. [PMC free article] [PubMed] [Google Scholar]

8. Rossolini GM, Arena F, Pecile P, Pollini S. Update on the antibiotic resistance crisis. Curr Opin Pharmacol. 2014;18:56–60. [PubMed] [Google Scholar]

9. Michael CA, Dominey-Howes D, Labbate M. The antimicrobial resistance crisis: causes, consequences, and management. Front Public Health. 2014;2:145. [PMC free article] [PubMed] [Google Scholar]

10. Spellberg B, Srinivasan A, Chambers HF. New societal approaches to empowering antibiotic stewardship. JAMA. 2016;315(12):1229–1230. [PMC free article] [PubMed] [Google Scholar]

11. Hoffman SJ, Caleo GM, Daulaire N, et al. Strategies for achieving global collective action on antimicrobial resistance. Bull World Health Organ. 2015;93(12):867–876. [PMC free article] [PubMed] [Google Scholar]

12. Payne DJ, Miller LF, Findlay D, Anderson J, Marks L. Time for a change: addressing R&D and commercialization challenges for antibacterials. Philos Trans R Soc Lond B Biol Sci. 2015;370(1670):20140086. [PMC free article] [PubMed] [Google Scholar]

13. Luepke KH, Mohr JF. The antibiotic pipeline: reviving research and development and speeding drugs to market. Expert Rev Anti Infect Ther. 2017;15(5):425–433. [PubMed] [Google Scholar]

14. Landers T, Kavanagh KT. Is the Presidential Advisory Council on Combating Antibiotic Resistance missing opportunities? Am J Infect Control. 2016;44(11):1356–1359. [PubMed] [Google Scholar]

15. Ventola CL. The antibiotic resistance crisis: part 1: causes and threats. P T. 2015;40(4):277–283. [PMC free article] [PubMed] [Google Scholar]

16. Prestinaci F, Pezzotti P, Pantosti A. Antimicrobial resistance: a global multifaceted phenomenon. Pathog Glob Health. 2015;109(7):309–318. [PMC free article] [PubMed] [Google Scholar]

17. Laxminarayan R, Duse A, Wattal C, et al. Antibiotic resistance-the need for global solutions. Lancet Infect Dis. 2013;13(12):1057–1098. [PubMed] [Google Scholar]

18. Guidos RJ. Combating antimicrobial resistance: policy recommendations to save lives. Clin Infect Dis. 2011;52(Suppl 5):S397–S428. [PMC free article] [PubMed] [Google Scholar]

19. Gould IM, Bal AM. New antibiotic agents in the pipeline and how they can help overcome microbial resistance. Virulence. 2013;4(2):185–191. [PMC free article] [PubMed] [Google Scholar]

20. Bartlett JG, Gilbert DN, Spellberg B. Seven ways to preserve the miracle of antibiotics. Clin Infect Dis. 2013;56(10):1445–1450. [PubMed] [Google Scholar]

21. Economou V, Gousia P. Agriculture and food animals as a source of antimicrobial-resistant bacteria. Infect Drug Resist. 2015;8:49–61. [PMC free article] [PubMed] [Google Scholar]

22. Maron DF, Smith TJ, Nachman KE. Restrictions on antimicrobial use in food animal production: an international regulatory and economic survey. Global Health. 2013; 9:48. [PMC free article] [PubMed] [Google Scholar]