



Ministry of Agriculture
Republic of Indonesia



World Organisation
for Animal Health
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Information, Education, and Communication Materials Awareness on Antimicrobial Resistance/ Antimicrobial Use

Multi-Partner Trust Fund on Antimicrobial Resistance



Directorate General of Livestock and
Animal Health Services, Ministry of Agriculture
Center for Indonesian Veterinary Analytical Studies
World Organisation for Animal Health

2023



Ministry of Agriculture
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**Directorate General of Livestock and Animal Health Services
Center for Indonesian Veterinary Analytical Studies (CIVAS)
World Organisation for Animal Health (WOAH)**

INFORMATION, EDUCATION, AND COMMUNICATION

Materials Awareness on Antimicrobial Resistance/ Antimicrobial Use

Multi-Partner Trust Fund on AMR

2023

INFORMATION, EDUCATION, AND COMMUNICATION AWARENESS ON ANTIMICROBIAL RESISTANCE/ ANTIMICROBIAL USE AWARENESS MATERIALS

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INTRODUCTION

Background

Antimicrobial resistance (AMR) is a global health problem caused by the misuse and overuse of antimicrobials. The inappropriate use of antimicrobials in the human, animal, agricultural, fishery, and food product sectors has led to an accelerated rate of AMR. Based on the 2022 global report with statistical simulation models and risk factor studies, it is known that 4.95 million world deaths related to AMR are the highest in the African-Asian Region in 2019. A Lancet study conducted in 2019 discovered 1.27 million fatalities, of which 860,000 were in Africa, caused by drug-resistant bacteria. As well, HIV was the cause of death for 640,000 individuals in Africa in the same year (Lancet 2022, Anderson 2023).

In Indonesia, AMR is also a serious problem in the human, animal, agricultural, fisheries, and environmental sectors because it is projected that by 2030 it will be included among the 5 countries with the highest consumption of antimicrobials if no action is taken. Insufficient knowledge and awareness about AMR and inappropriate and irresponsible use of antimicrobials are key factors driving the acceleration of the incidence rate of AMR.

The World Organisation for Animal Health (WOAH) has roles to develop the Information, Education, and Communication (IEC) materials on AMR/AMU in Indonesia to gaining comprehensive understanding of AMR/AMU can transform prevailing attitudes and behaviour. WOAH has appointed the Center for Indonesian Veterinary Analytical Studies (CIVAS) for a short-term consultancy, in November 2021 until June 2023, under the Multi-Partner Trust Fund (MPTF) project to collaborative with Quadripartite Alliance (WOAH, World Health Organization/WHO, Food and Agriculture Organization of the United Nations/FAO, and United Nations Environment Programme/UNEP) use One Health approach to combat AMR in Indonesia.

Objectives and Outputs

The objectives are to develop the content (script concept and layout) and design for IEC materials on AMR/AMU suitable in posters, leaflets, infographics/social media tools.

The outputs are to develop 17 awareness materials (7 posters, 6 leaflets, and 4 infographics social media) in English and Indonesian version languages to encourage the prudent and responsible use of antimicrobials in human, animal, and environmental sectors, as well as to encourage and promotion of good animal production practices and infection control prevention.

METHOD

The development content and design of IEC materials on AMR/AMU was gathered from the key messages based on the results of a consultation workshop on 18-19 August 2022 by 22 relevant stakeholders. Before developing a design, the inventory of published IEC materials on AMR/AMU was conducted to gather more information and insights for baseline on One Health awareness design.

The development contents process was discussed many times in internal meetings and other meeting with relevant stakeholders. The design and layout development were carried out on January until May 2023 in collaboration with an illustrator, layout designer, and translator, following the instructions in the Brand Manual WOAH version 2.0 (Decimal 2023). A number of 17 awareness materials were pre-tested on 16 March 2023 to 28 participants from human health workers such as midwives, nurses, and pharmacists; animal health workers like livestock/fisheries extension workers and technical service/TS from animal drug company, poultry farmers, fish farmers; and as well as members of the general public, to gather input and feedback from the target audience. The target outputs for IEC Materials on AMR/AMU can be seen at Tabel 1.

The IEC materials have different identify colours for the background in each sector. The background for the human sector material is soft blue, for the animal sector is soft red, and for the environment sector is soft green. The materials were created in two language versions, Bahasa Indonesia and English.

Table 1. Target Outputs for One Health IEC Materials on AMR/AMU

Themes of Key Messages Suggested by WOAH	Human Sector	Animal Sector	Environment Sector	Key Messages
1. Prudent and responsible use of antimicrobials in human, animal, and environmental sectors	- 1 poster - 1 leaflet - 1 social media infographic	- 1 poster - 1 leaflet - 1 social media infographic	- 1 Poster	Focus on AMU as an act with societal impact to human, animal, and environment
2. Promoting good animal production practices including biosecurity, vaccination, use of alternatives to antimicrobials	N/A	- 2 posters (animals and fish) - 1 leaflet - 1 social media infographic	- 1 leaflet	Focus on the process to ensure the quality and safety of animal food products
3. Promoting infection, prevention and control (IPC) and biosecurity in human and animal health sectors	- 1 poster - 1 leaflet	- 1 poster - 1 leaflet	- 1 social media infographic	Focus on the preventive measures to minimize the adverse impact of AMR to the people, planet, and prosperity

THE ONE HEALTH INFORMATION, EDUCATION, AND COMMUNICATION (IEC) AWARENESS MATERIALS ON AMR/AMU IN INDONESIA

The materials were refined and finalized, have been sent to WOAH on June 2023. The IEC materials can be seen in the figures below based on themes key messages from WOAH. The Indonesian (Bahasa) version of the material is on the left side, and the English version is on the right side. References used to develop IEC data and infographics can be found in the sources cited (References part of this report).

Theme 1: Promote Prudent and Responsible Use of Antimicrobials in Human, Animal, and Environmental Sectors

Posters

There are 3 posters made, intended for the human (Figure 1), animal (Figure 2) and environmental sector (Figure 3).

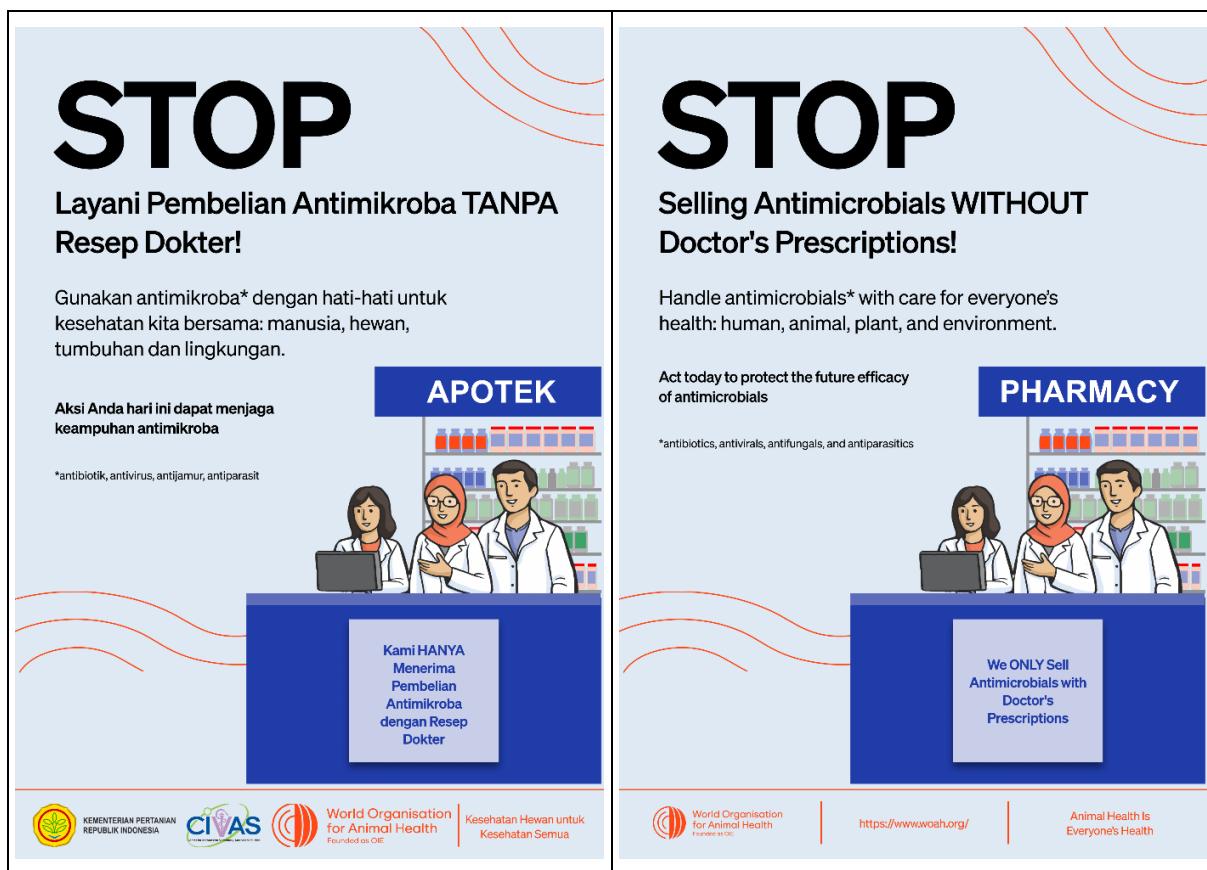


Figure 1. Human Posters of Theme 1

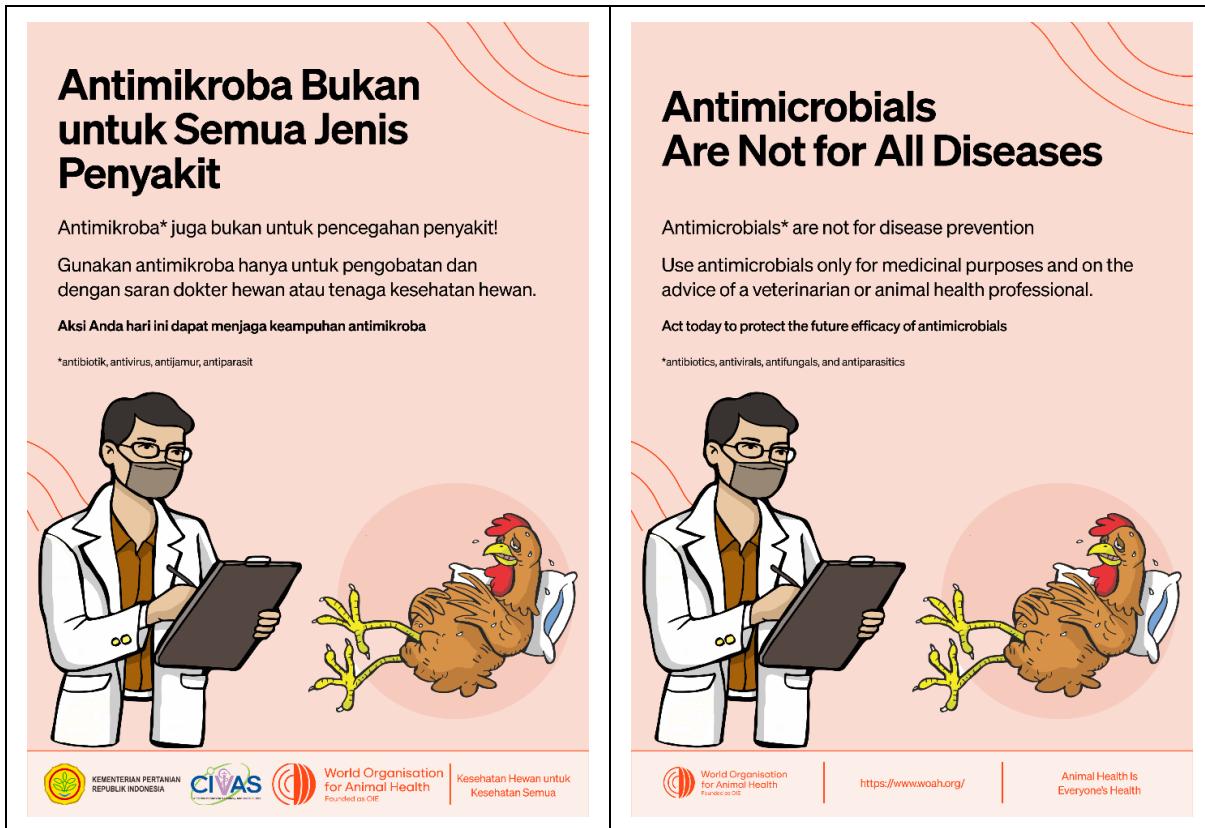


Figure 2. Animal Posters of Theme 1

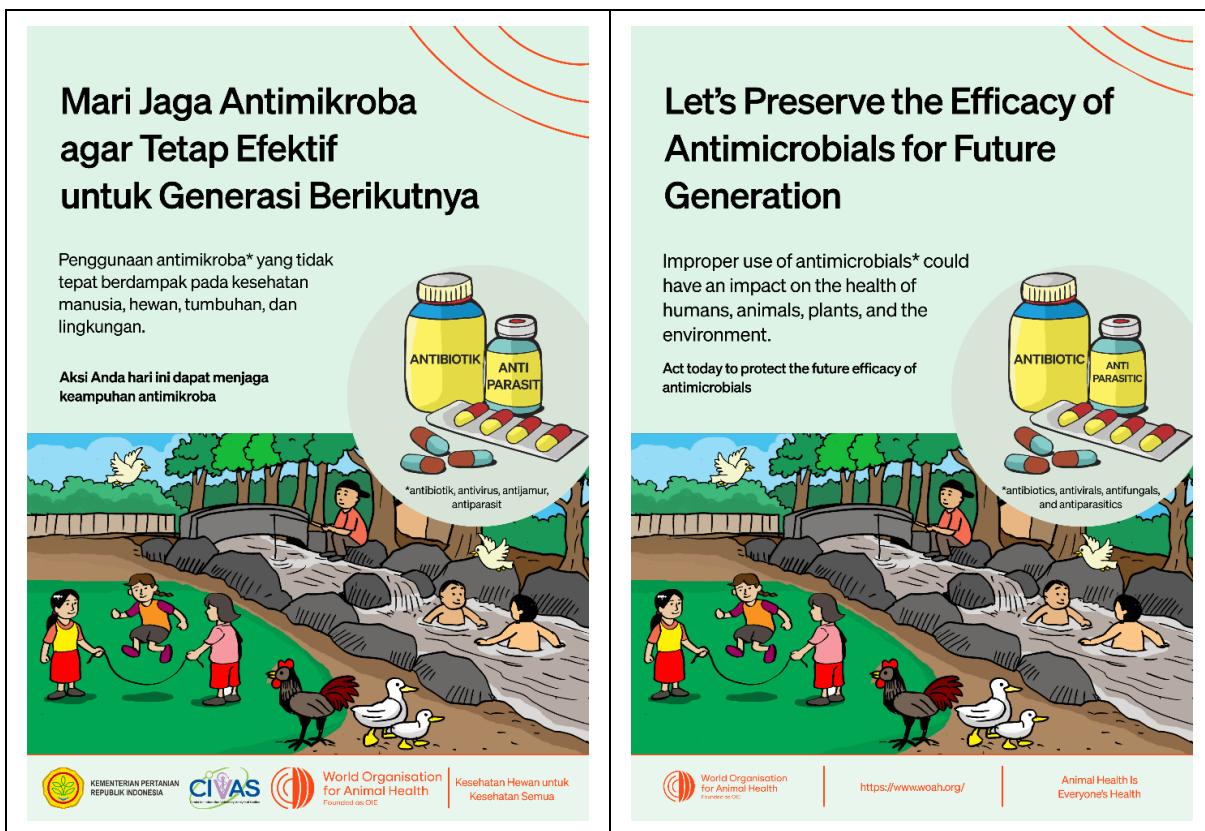
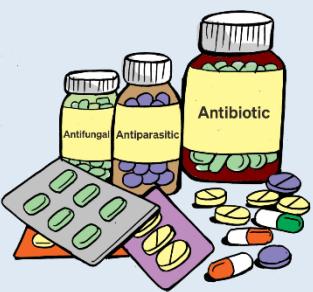


Figure 3. Environment Posters of Theme 1

Leaflets

There are 2 leaflets made, intended for the human (Figure 4) and animal sector (Figure 5).

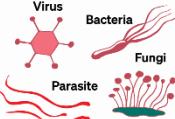


Using antimicrobials without a doctor's prescription is an irresponsible act and a form of antimicrobial misuse.

Misuse and overuse of antimicrobials increase resistance risk, endangering animal, human, and environmental health and welfare.

Antimicrobial resistance (AMR) is conditions in which bacteria, viruses, fungi, and the parasites no longer respond to the antimicrobial, therefore the antimicrobials become ineffective to treat disease anymore.

As a result, the infections become difficult or impossible to treat, the duration of treatment is longer, the cost of treatment becomes more expensive, and the diseases become more severe and may result in death, and the risk of spreading the diseases increases.



Impact Of AMR

5,000,000
Global deaths related to antimicrobial resistance
Source: Lancet 2022; 399: 629-55

558,000
New cases of antibiotic resistant Tuberculosis (TB)
Source: WHO 2018

200,000
Deaths of newborns
Source: WHO, 2016

Why Do We Have to Buy Antimicrobials* Only with Doctor's Prescriptions?

*antibiotics, antivirals, antifungals, antiparasitics

World Organisation for Animal Health

Drug-resistant microorganisms such as bacteria, viruses, fungi and parasites can spread between and within animal, human, plant populations, and migrate through the environment such as water and air.

Resistant Microbes Spreading Pathways



AMR is happening and has become one of the biggest threats to global health, food security and development today.

One Health's rapid response to antimicrobial resistance save lives and protect antimicrobial efficacy for several generation.



“ Animal Health is Everyone's Health **”**

<https://www.woah.org/>

Act today to protect the future efficacy of antimicrobials

World Organisation for Animal Health
Founded as OIE



Mengapa Membeli Antimikroba* harus dengan Resep Dokter?

*antibiotik, antivirus, antijamur, antiparasit



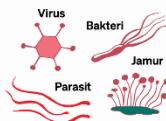
World Organisation
for Animal Health

Menggunakan antimikroba tanpa resep dokter merupakan tindakan tidak bertanggung jawab dan bentuk penyalahgunaan antimikroba.

Penyalahgunaan dan penggunaan antimikroba yang berlebihan dapat meningkatkan risiko resistensi, serta membahayakan kesehatan dan kesejahteraan manusia, hewan, dan lingkungan hidup.

Resistensi antimikroba (AMR) adalah kondisi dimana bakteri, virus, jamur, dan parasit tidak lagi merespon agen antimikroba, sehingga antimikroba tidak ampuh mengobati penyakit.

Akibatnya, infeksi sulit atau tidak mungkin diobati, durasi perawatan lebih lama, biaya pengobatan menjadi lebih mahal, penyakit semakin parah dan berakibat kematian, serta risiko penyebaran penyakit meningkat.



Dampak AMR

5,000,000

kematian global terkait resistensi antimikroba

Sumber: Lancet 2022; 399: 629-55

558,000

kasus baru
Tuberkulosis (TBC)
yang resisten
terhadap antibiotik

Sumber: WHO, 2018

200,000

kematian bayi baru
lahir

Sumber: WHO, 2016

Mikroorganisme yang resisten terhadap obat seperti bakteri, virus, jamur dan parasit dapat menyebar di antara dan di dalam populasi hewan, manusia, tumbuhan, dan berpindah melalui lingkungan, misalnya melalui air, kotoran, dan udara.

Alur Penyebaran Mikroba Resisten



Resistensi antimikroba sudah terjadi, dan menjadi ancaman serius bagi kesehatan global, ketahanan pangan, dan pembangunan.

Aksi cepat tanggap One Health terhadap resistensi antimikroba membantu menyelamatkan nyawa dan menjaga keampuhan antimikroba selama beberapa generasi.



Aksi Anda hari ini akan menjaga keampuhan antimikroba.

**Kesehatan Hewan
untuk
Kesehatan Semua**



KEMENTERIAN PERTANIAN
REPUBLIK INDONESIA



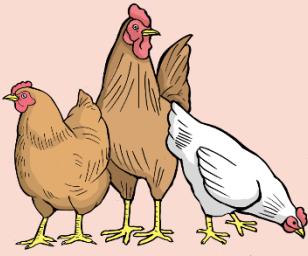
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4

5

Figure 4. Human Leaflets of Theme 1



Misuse of Antimicrobials* Leads to the Catastrophe

*antibiotics, antivirals, antifungals, antiparasitics



World Organisation
for Animal Health

Misuse and overuse of antimicrobials can increase the risk of resistance as well as threaten the health and welfare of humans, animals and the environment.

Antimicrobial resistance (AMR) is conditions in which bacteria, viruses, fungi, and the parasite no longer responds to the antimicrobial, therefore the antimicrobials become ineffective to treat disease anymore.

As a result, treatment duration getting longer, livestock production and farmer's income decrease, mortality rates increase, thus threatening health, food safety and security, as well as global sustainable development.

Antimicrobials are not for disease prevention!

Use antimicrobials only for treatment under the advice of a veterinarian or animal health professional.



Reduce antimicrobial use at your farm through the following steps:



Implement good farming management to maintain livestock health



Infection Prevention and Control (IPC) with biosecurity and vaccination

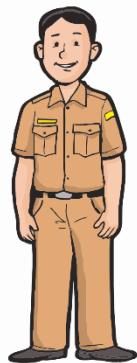
Biosecurity is a strategic and integrated approach to analyze and manage risks to human, animal, plant, and the environment life and health (FAO, 2007).

2

3

The Government of Indonesia has banned the use of antibiotics for growth promoters and disease prevention.

One example is the prohibition of the use of the antibiotic namely colistin in animals. Colistin belongs to an important class of antibiotics and is the last resort in human medicine.



4



The health of humans, animals, plants, and the environment are linked, mutually related, and affecting one another.

Act today to protect the future efficacy of antimicrobials

“ Animal Health
is
Everyone's Health 

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5

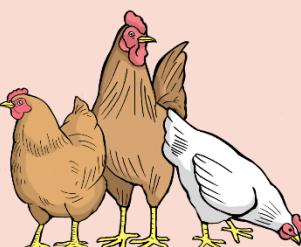
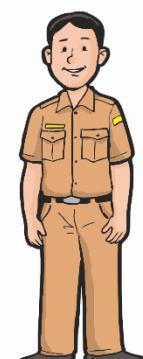
 <p>Antimikroba* Tidak Tepat Guna Dapat Berujung Bencana</p> <p>*antibiotik, antivirus, antijamur, antiparasit</p> <p> World Organisation for Animal Health</p>	<p>Penyalahgunaan dan penggunaan antimikroba yang berlebihan dapat meningkatkan risiko resistensi, serta membahayakan kesehatan dan kesejahteraan manusia, hewan, dan lingkungan.</p> <p>Resistensi antimikroba (AMR) adalah kondisi dimana bakteri, virus, jamur, dan parasit tidak lagi merespon agen antimikroba, sehingga antimikroba tidak ampuh mengobati penyakit.</p> <p>Akibatnya, pengobatan menjadi lebih lama, produksi ternak dan pendapatan peternak menurun, angka kematian meningkat, hingga mengancam kesehatan, keamanan dan ketahanan pangan, serta pembangunan berkelanjutan global.</p> <p>Antimikroba bukan untuk pencegahan penyakit!</p> <p>Gunakan antimikroba hanya untuk pengobatan dan dengan saran dokter hewan atau tenaga kesehatan hewan.</p>	 <p>Kurangi penggunaan antimikroba pada peternakan ayam dengan:</p> <ul style="list-style-type: none"> • Manajemen peternakan yang baik untuk menjaga kesehatan ternak • Pencegahan dan Pengendalian Infeksi (PPI) dengan biosecuriti dan vaksinasi <p>Biosecuriti adalah pendekatan strategis dan terintegrasi untuk menganalisis dan mengelola risiko terhadap kehidupan dan kesehatan manusia, hewan, dan tumbuhan serta lingkungan (FAO, 2007).</p>
<p>2</p> 	 <p>Kesehatan manusia, hewan, tumbuhan dan lingkungan tidak dapat dipisahkan, saling berkaitan dan memengaruhi satu sama lain.</p> <p>Aksi Anda hari ini akan menjaga keampuhan antimikroba.</p>	<p>“ Kesehatan Hewan untuk Kesehatan Semua ”</p> <p> KEMENTERIAN PERTANIAN REPUBLIK INDONESIA</p> <p> Center for Indonesian Veterinary Analytical Studies</p> <p> World Organisation for Animal Health Founded as OIE</p> <p>https://www.woah.org/</p>

Figure 5. Animal Leaflets of Theme 1

Infographics for Social Media

There are 2 infographics made, intended for the human (Figure 6) and animal sector (Figure 7).

<p>Apa yang Terjadi jika Konsumsi Antimikroba* Tidak Sesuai Saran Tenaga Kesehatan?</p> <p>* antibiotik, antivirus, antijamur, antiparasit</p> 	<p>Why We Have to Follow the Advice of Health Professionals When Using Antimicrobials*?</p> <p>*antibiotics, antivirals, antifungals, and antiparasitics</p> 
<p>Penyalahgunaan dan penggunaan antimikroba berlebihan dapat ...</p> <p>Menyebabkan resistensi antimikroba</p>  <p>dan membahayakan kesehatan serta kesejahteraan semua.</p>	<p>Misuse and overuse of antimicrobials can...</p> <p>Cause the antimicrobial resistance</p>  <p>and endanger the health and well-being of everyone.</p>

Dampak Resistensi Antimikroba

5.000.000

Kegiatan global resistensi antimikroba

Source: Lancet 2022; 399: 629-55

558.000

Kasus baru Tuberkulosis (TB) yang resistensi terhadap antibiotik

Source: WHO,2018

200.000

Kematian bayi baru lahir

Source: WHO, 2016

Impacts of Antimicrobial Resistance

5,000,000

Global deaths related to antimicrobial resistance

Source: Lancet 2022; 399: 629-55

558,000

New cases of antibiotic resistant Tuberculosis (TB)

Source: WHO,2018

200,000

Deaths of newborns

Source: WHO, 2016

Resistensi Antimikroba Dapat Menyebabkan Kemiskinan Global



Sumber: <https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/antimicrobial-resistance-global-threat>

Antimicrobial Resistance Can Cause Global Poverty



Sumber: <https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/antimicrobial-resistance-global-threat>

Aksi Bersama Demi Kesehatan Semua

Kesehatan Hewan untuk Kesehatan Semua

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Collaborative Actions For One Health

Animal Health is Everyone's Health

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Figure 6. Human Infographics of Theme 1

HANYA Gunakan Antimikroba* sebagai Pilihan Terakhir untuk Pengobatan

* antibiotik, antivirus, antijamur, antiparasit

ONLY Use Antimicrobials* as the Last Resort for Treatment

*antibiotics, antivirals, antifungals, and antiparasitics

MAKIN TINGGI
penggunaan
antimikroba

MAKIN CEPAT
laju resistensi antimikroba

The **MORE**
antimicrobials
are used

The **FASTER** bacterial resistance
incidence rate becomes

Tingkat Resistensi Bakteri terhadap Antibiotik

Korelasi $+$ antara bakteri resisten  dengan tingginya frekuensi penggunaan antibiotik 

Tingginya kekebalan bakteri terhadap:

93% Ciprofloxacin

88% Ampicillin

83% Tetrasiuklin



Sedangkan Ciprofoksasin dikategorikan sebagai antibiotik **SANGAT PENTING** bagi kesehatan manusia oleh WHO.

Studi pada 19 peternakan broiler di Kabupaten Bogor
Nurbiyanti et al., 2022

Antibiotic Resistance Level of Bacteria

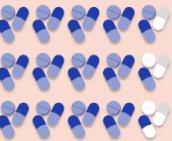
There is a $+$ correlation between resistant bacteria and the **high** frequency of antibiotic use 

Most bacteria are resistant to:

93% Ciprofloxacin

88% Ampicillin

83% Tetracycline



Meanwhile, Ciprofloxacin is categorized as a **CRITICALLY IMPORTANT** antibiotics for human health by WHO.

Study on 19 broiler farms in Bogor District
Nurbiyanti et al., 2022

Kita semua HARUS menjaga keampuhan antimikroba agar masih efektif ketika dibutuhkan untuk pengobatan manusia dan hewan



We all MUST protect the future efficacy of antimicrobials so that they will work effectively when needed for humans and animals



 **Aksi Bersama Demi Kesehatan Semua** 

Kesehatan Hewan untuk Kesehatan Semua

<https://www.woah.org/>

 **Collaborative Actions For One Health** 

Animal Health is Everyone's Health

<https://www.woah.org/>

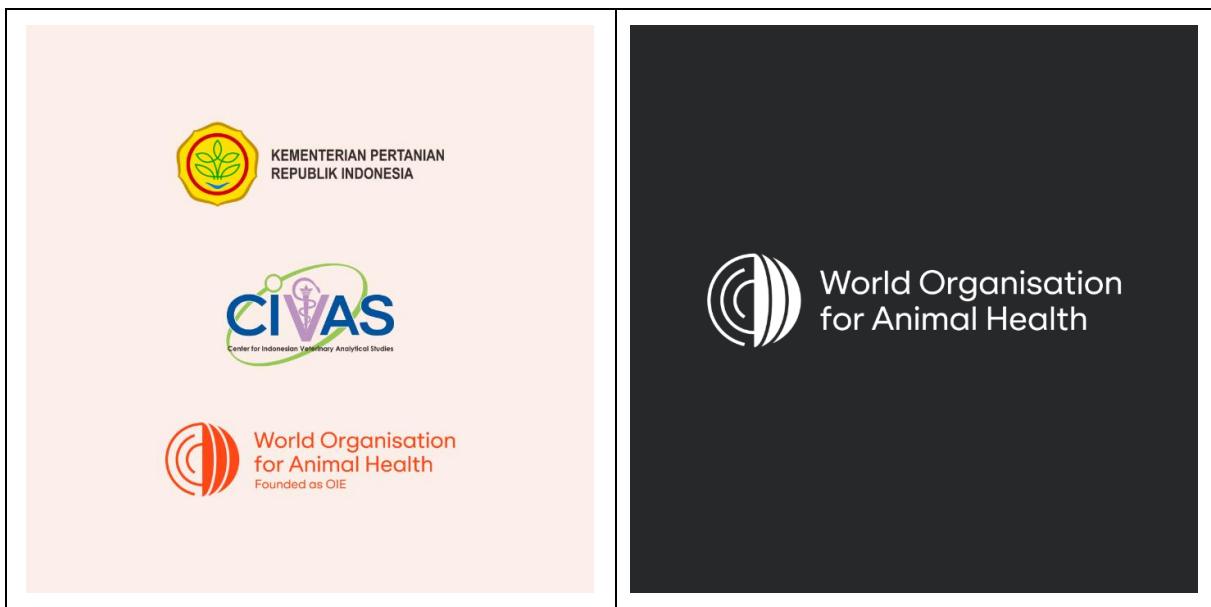


Figure 7. Animals Infographics of Theme 1

Theme 2: Promote Good Animal Production Practices Including Biosecurity, Vaccination, Use of Alternatives to Antimicrobials

Posters

There are 2 posters made, intended for the animal (Figure 8) and aquaculture sector (Figure 9).

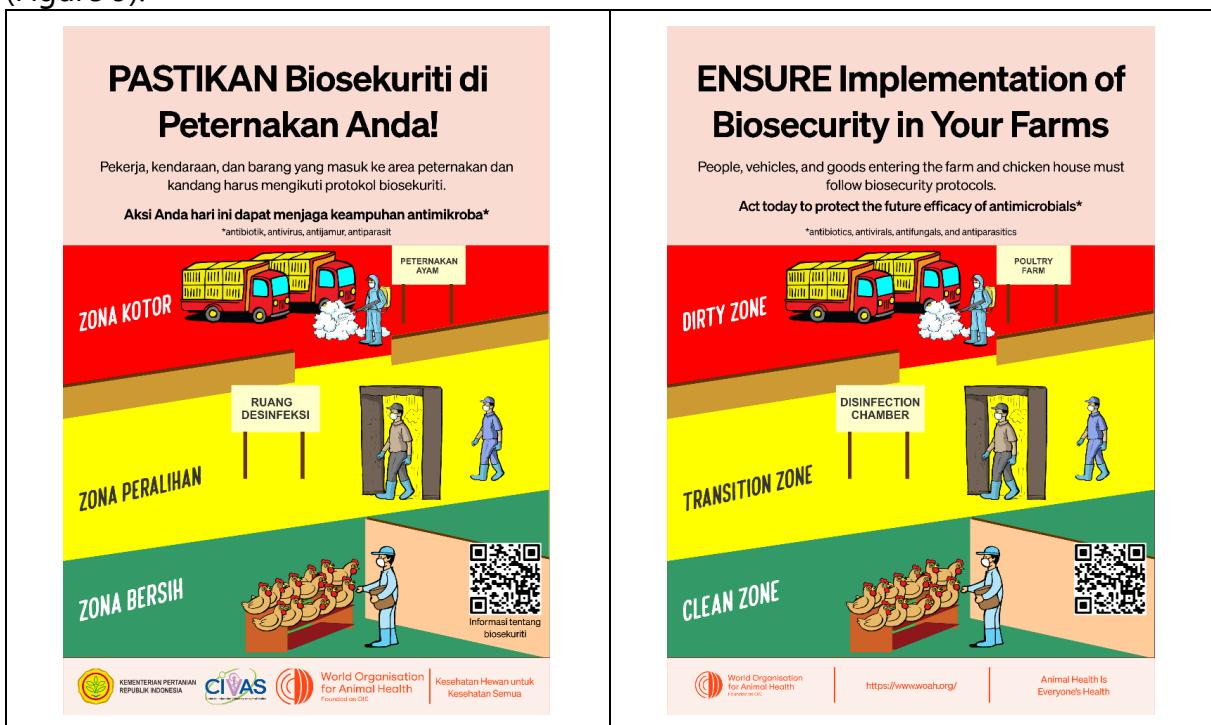


Figure 8. Animal Posters of Theme 2

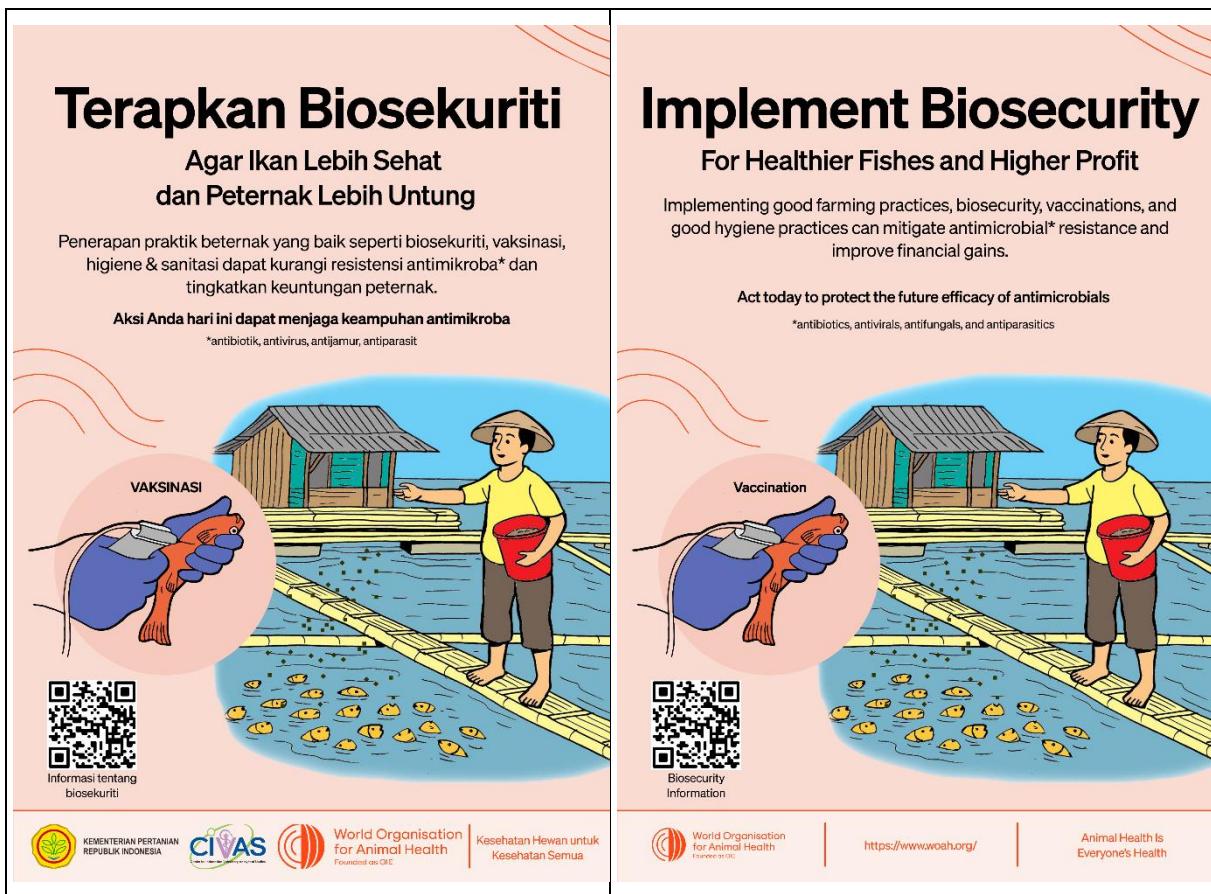
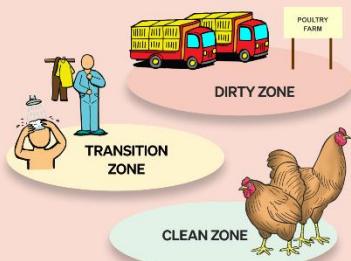


Figure 9. Fishery Posters of Theme 2

Leaflets

There are 2 leaflets made, intended for the animal (Figure 10) and environment sector (Figure 11).



Biosecurity for Optimum Production, Prosperous Farmers, Healthier Environment



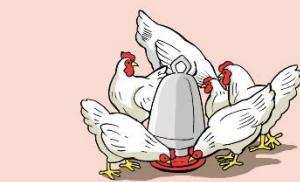
World Organisation
for Animal Health

Implement good farm practices, biosecurity, vaccination, hygiene, and sanitation so that the chickens are healthy, production is more optimal, and farmers' income increases.

Good biosecurity on the farm can prevent the spread of pathogens to humans, animal products, and the environment.



Biosecurity is a strategic and integrated approach to analyze and manage risks to human, animal, plant, and the environment life and health (FAO, 2007).



Good Biosecurity Practices

Implementation of three-zone biosecurity on farms; separate dirty (red), transition (yellow), and production (green) zones.

Implementation of disinfection at the entrance gate, on vehicles, equipment, poultry houses, and the surrounding environment.

Restrictions on the movement of livestock, humans, vehicles, and equipment to enter the farms.

Implementation of routine sanitation of house equipment such as drinking and feeder bowls, and other equipment.

2

3



Pest control inside the farm and the surrounding environment



Provide special locations and installations for managing waste from farming activities.



Manage farm waste by separating it from the public sewer and avoid throwing it into the river.



4

Have Your Farms Applied Biosecurity Measures?

Disease prevention is cheaper than treatment

Good biosecurity implementation can save the rearing cost per chicken per period

Source: FAO, 2016



Act today to protect the future efficacy of antimicrobials

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5

Biosecuriti untuk Produksi Prima, Peternak Sejahtera, dan Lingkungan Terjaga

World Organisation for Animal Health

2

Terapkan praktik manajemen peternakan yang baik, biosecuriti, vaksinasi, higiene dan sanitasi agar ayam sehat dan tidak mudah sakit, produksi lebih optimal, serta pendapatan peternak meningkat.

Biosecuriti yang baik di peternakan dapat mencegah penyebaran patogen ke manusia, produk hewan, dan lingkungan.

Biosecuriti adalah pendekatan strategis dan terintegrasi untuk menganalisis dan mengelola risiko terhadap kehidupan dan kesehatan manusia, hewan, dan tumbuhan serta lingkungan (FAO, 2007).

3

Penerapan Biosecuriti yang Baik

- Penerapan biosecuriti 3 zona di peternakan: pisahkan zona merah (kotor), kuning (transisi), dan hijau (produksi).
- Penerapan desinfeksi di pintu masuk, kendaraan, peralatan, area kandang, dan sekitarnya.
- Pembatasan pergerakan lalu lintas hewan, manusia, kendaraan, dan peralatan dari luar ke dalam.
- Penerapan sanitasi rutin pada peralatan kandang seperti tempat minum, pakan, dan peralatan lainnya.

4

Kontrol hama di dalam peternakan dan sekitarnya.

Sediakan lokasi dan instalasi tempat pembuangan sampah khusus peternakan.

Kelola limbah sebelum dibuang ke saluran pembuangan.

4

Sudahkah Anda Menerapkan Biosecuriti di Peternakan?

Pencegahan
penyakit lebih murah dibandingkan dengan pengobatan

Biosecuriti yang baik dapat menghemat biaya pemeliharaan ayam per siklus

Sumber: FAO, 2016

Aksi Anda hari ini akan menjaga keampuhan antimikroba.

5

“ Kesehatan Hewan untuk Kesehatan Semua ”

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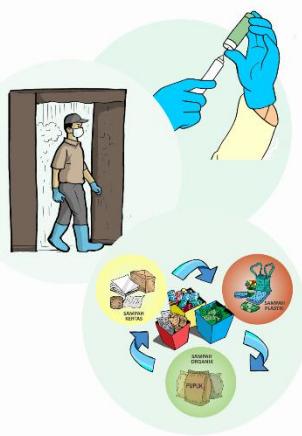
Figure 10. Animal Leaflets of Theme 2



Prevent Diseases with Biosecurity, Vaccination, and Good Waste Management



World Organisation for Animal Health



Biosecurity, vaccination, hygiene, and sanitation can prevent diseases and reduce morbidity and mortality.

Good waste management can reduce the risk of spreading pathogens into the environment.

Biosecurity is a strategic and integrated approach to analyze and manage risks to human, animal, plant, and the environment life and health (FAO, 2007).

2

Biosecurity For The Optimum Production



Separation of dirty, transition, and clean zones

Disinfection at the entrance gate



Restrictions on the traffic movement



Implementation of routine WASH (water, sanitation, hygiene)



Implementation of pest control

3

Protect Your Livestock From Diseases With Vaccinations



Align vaccination programs according to the disease mapping on the field.



Match the types and strains of the virus with the types and strains of the vaccines.



Conduct vaccination programs based on the age of the chickens.



Make sure vaccines are stored at the right temperature according to the label instructions.



Vaccines should be administered by trained personnel according to the procedures on the label.



Provide supplements and vitamins to boost immunity. Do not use antimicrobials before the program.

4

Farm Waste Management For Everyone's Health



Provide special location and installation for waste management from farming activities.



Collect antimicrobial waste in securely closed containers.



Burn antimicrobial waste in a special installation (incinerator) that is secured and closed, separated from other types of waste, and is not accessible to people in the surrounding areas.



Manage farm waste by separating it from the public sewer and avoid throwing it into the river.

Act today to protect the future efficacy of antimicrobials

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Cegah Penyakit dengan Biosekuriti, Vaksinasi, dan Pengelolaan Limbah yang Baik

 World Organisation for Animal Health

Vaksinasi Lindungi Ternak dari Penyakit

-  Menyelaraskan program vaksinasi sesuai pemetaan penyakit di lapangan.
-  Cocokkan jenis mikroorganisme dan strain lapang dengan jenis dan strain vaksin
-  Lakukan vaksinasi berkala sesuai dengan umur ayam.
-  Pastikan produk vaksin disimpan pada temperatur yang tepat sesuai petunjuk label/kemasan.
-  Vaksin diberikan pada hewan oleh tenaga yang sudah terlatih sesuai prosedur pada label/kemasan.
-  Berikan suplemen dan vitamin untuk meningkatkan kekebalan. Jangan gunakan antimikroba sebelum vaksinasi.

2



Pencegahan penyakit dapat dilakukan dengan biosekuriti, vaksinasi, higiene, dan sanitasi, sehingga menurunkan angka kesakitan dan kematian.

Pengelolaan limbah yang baik dapat mengurangi risiko penyebaran mikroba patogen ke lingkungan.

Biosekuriti adalah pendekatan strategis dan terintegrasi untuk menganalisis dan mengelola risiko terhadap kehidupan dan kesehatan manusia, hewan, dan tumbuhan serta lingkungan (FAO, 2007).

3

Pengelolaan Limbah Peternakan untuk Kesehatan Semua

-  Sediakan lokasi dan instalasi tempat pembuangan limbah khusus peternakan.
-  Kumpulkan sampah antimikroba di dalam wadah atau kemasan tertutup yang aman.
-  Bakar sampah antimikroba di tempat pembakaran khusus yang aman dan tertutup, serta terpisah dari sampah lain dan tidak mudah diakses oleh warga sekitar.
-  Kelola limbah peternakan yang terpisah dengan saluran pembuangan umum dan tidak langsung dibuang ke sungai.

4

Aksi Anda hari ini akan menjaga keampuhan antimikroba.

5

Kesehatan Hewan untuk Kesehatan Semua 

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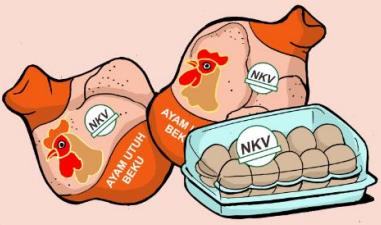
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Figure 11. Environment Leaflets of Theme 2

Infographics for Social Media

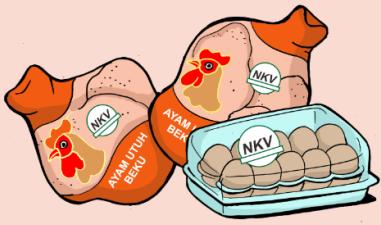
There are 1 infographic made, intended for the animal sector (Figure 12).

Mengapa Kita Perlu Pilih Produk Ayam dan Telur Berlogo ?



*Nomor Kontrol Veteriner

Why Do We Need to Choose Poultry Products with ?



*Nomor Kontrol Veteriner



Higiene 

Sanitasi 



Hygiene 

Sanitation 

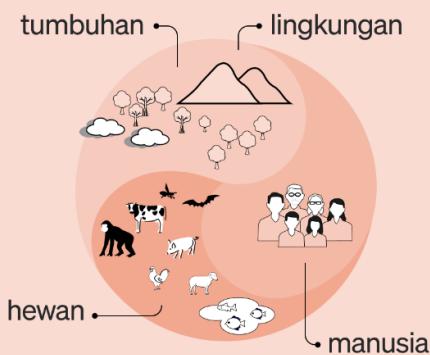
Konsumen PINTAR pilih produk hewan yang bertanda 



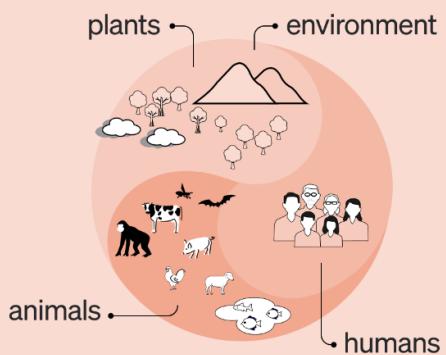
Engaged and healthy consumers choose food products with 



... sehingga membantu menjaga kesehatan



...thus help protecting the health of



 **Aksi Bersama
Demi
Kesehatan Semua** 

Kesehatan Hewan untuk Kesehatan Semua

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 **Collaborative Actions
For
One Health** 

Animal Health is Everyone's Health

<https://www.woah.org/>

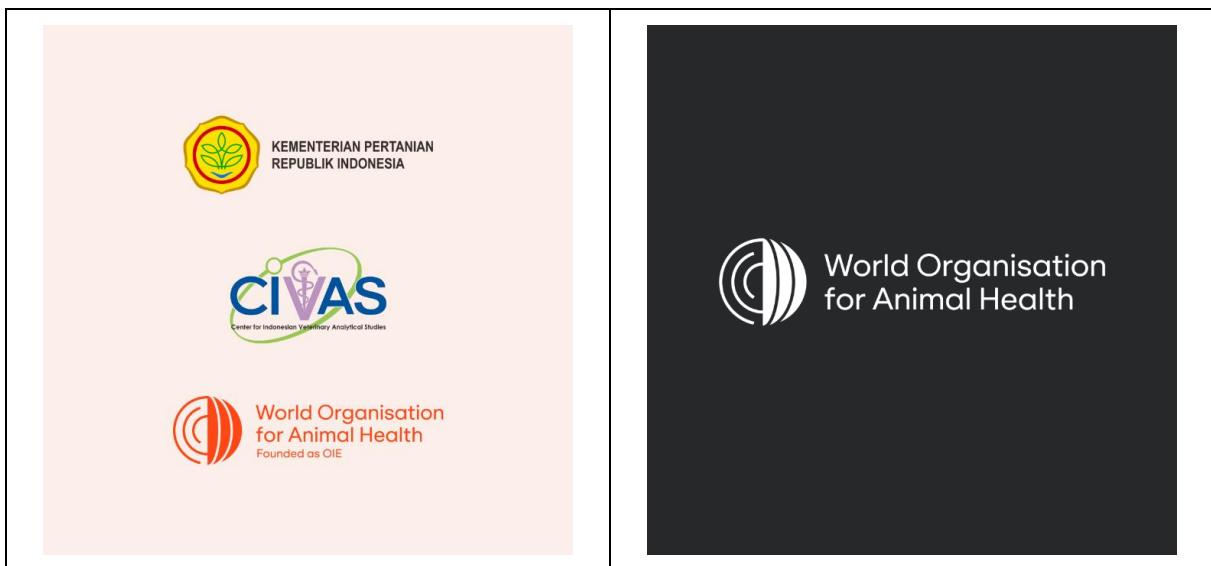


Figure 12. Animal Product Infographics of Theme 2

Theme 3: Promote IPC and Biosecurity in Human and Animal Health Sectors

Posters

There are 2 posters made, intended for the human (Figure 13) and animal sector (Figure 14).

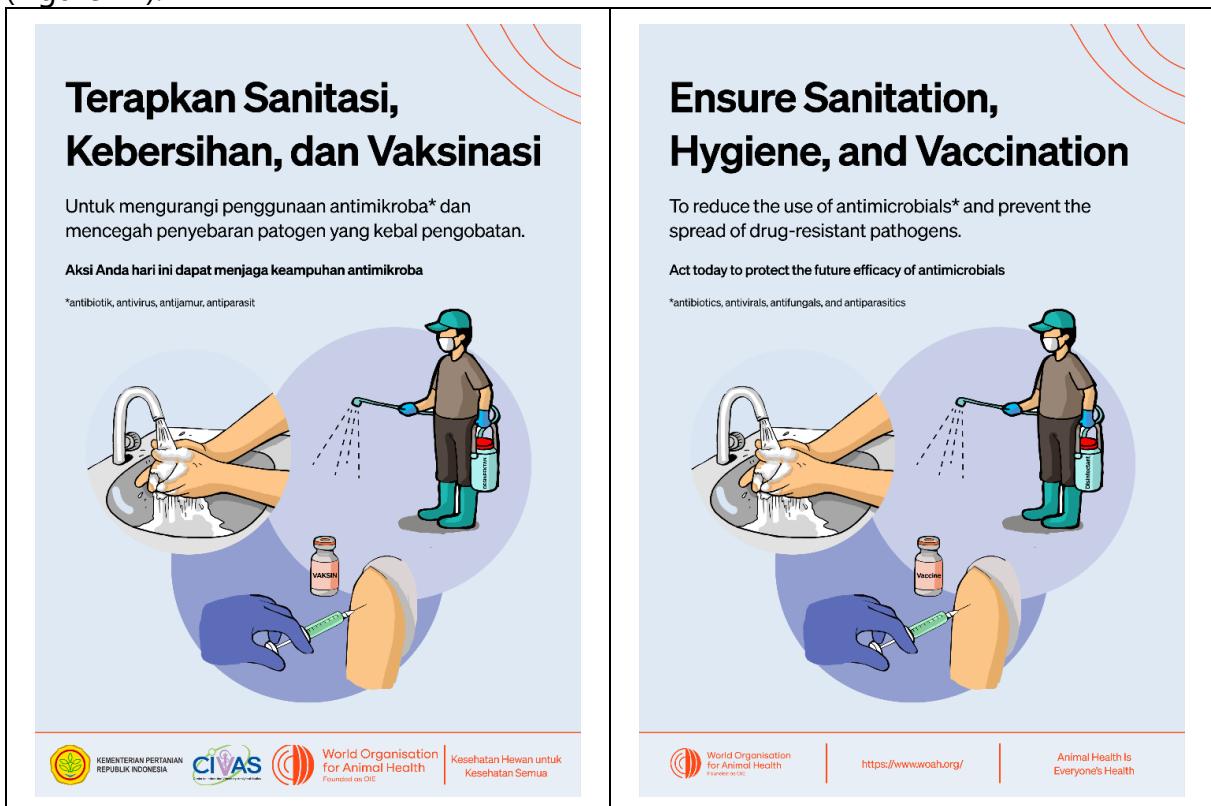


Figure 13. Human Posters of Theme 3

Terapkan Biosecuriti

Agar Ternak Lebih Sehat dan Peternak Lebih Untung

Penerapan praktik beternak yang baik seperti biosecuriti, vaksinasi, higiene & sanitasi dapat kurangi resistensi antimikroba* dan tingkatkan keuntungan peternak.

Aksi Anda hari ini dapat menjaga keampuhan antimikroba

ZONA BERSIH
Zona terbatas tempat ayam dipelihara. Hanya dapat dimasuki oleh pekerja dan peralatan penting yang telah didisinfeksi.

ZONA TRANSISI
The transition area between dirty and clean. Access is limited. The places for bathing, changing clothes and footwear, as well as disinfection.

ZONA KOTOR
Area di luar gerbang peternakan dan area parkir kendaraan.

ZONA PERALIHAN
Area peralihan antara kotor dan bersih. Akses terbatas dan tempat proses mandi, berganti pakaian dan alas kaki, serta desinfeksi.

PETERNAK AYAM

POULTRY FARM

DIRTY ZONE
Area outside the farm gate and parking area.

CLEAN ZONE
Restricted zone where chickens are kept. Limited access only to workers and essential equipment that has been disinfected.

***antibiotik, antivirus, antijamur, antiparasit**

Informasi tentang biosecuriti

Biosecurity Information

QR code

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Animal Health Is Everyone's Health

Implement Biosecurity

For Healthier Chickens and Higher Profit

Implementing good farming practices, biosecurity, vaccinations, and good hygiene practices can mitigate antimicrobial* resistance and improve financial gains.

Act today to protect the future efficacy of antimicrobials

CLEAN ZONE
Restricted zone where chickens are kept. Limited access only to workers and essential equipment that has been disinfected.

TRANSITION ZONE
The transition area between dirty and clean. Access is limited. The places for bathing, changing clothes and footwear, as well as disinfection.

DIRTY ZONE
Area outside the farm gate and parking area.

ZONA KOTOR
Area di luar gerbang peternakan dan area parkir kendaraan.

POULTRY FARM

***antibiotics, antivirals, antifungals, and antiparasitics**

QR code

Biosecurity Information

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Animal Health Is Everyone's Health

Figure 14. Animal Posters of Theme 3

Leaflets

There are 2 leaflets made, intended for the human (Figure 15) and animal sector (Figure 16).



Why Do We Need to Treat Antimicrobial Waste Carefully?

*antibiotics, antivirals, antifungals, antiparasitics

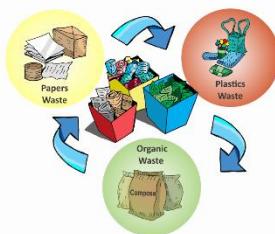


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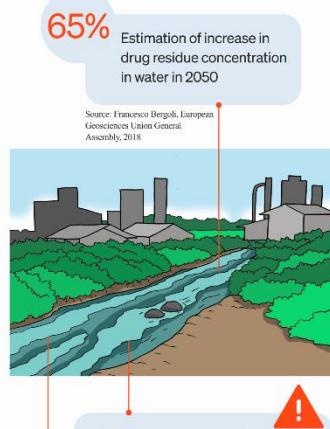
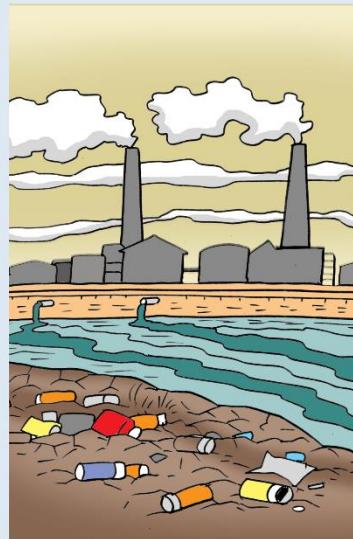
Antimicrobial resistance (AMR) is conditions in which bacteria, viruses, fungi, and the parasite no longer responds to the antimicrobial, therefore the antimicrobials become ineffective to treat disease anymore.

Improper disposal of antimicrobial waste can pollute the environment thereby contributing to accelerating the rate of occurrence of antimicrobial resistance.

Waste containing antimicrobials in the environment can come from residual antimicrobials in fertilizers, industrial waste (eg: from drug factories), and those excreted through urine or feces from human and animal bodies.



Human-induced water, air, and soil pollution of water can exacerbate antimicrobial resistance in the environment.



2/3

Rivers in the world have been polluted with antibiotics (300x above the environmental safety threshold)

Source: Carolyn Wilke, 2019



Management of municipal, agricultural and industrial waste is an important preventative measure.

Act today to protect the future efficacy of antimicrobials

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Mengapa Kita Perlu Berhati-Hati Membuang Sampah dan Limbah Antimikroba*?

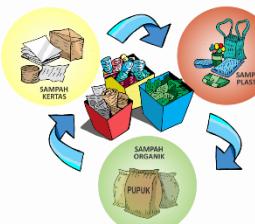
*antibiotik, antivirus, antijamur, antiparasit

 World Organisation for Animal Health

Resistensi antimikroba (AMR) adalah kondisi dimana bakteri, virus, jamur, dan parasit tidak lagi merespon agen antimikroba, sehingga tidak ampuh mengobati penyakit.

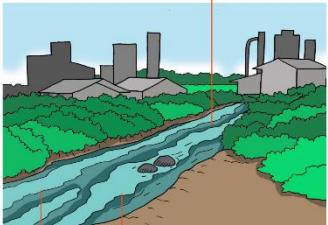
Pembuangan sampah dan limbah antimikroba yang tidak tepat dapat mencemari lingkungan sehingga berkontribusi mempercepat laju terjadinya resistensi antimikroba.

Contoh sampah dan limbah yang mengandung antimikroba di lingkungan, dapat berasal dari sisa antimikroba dalam pupuk, limbah industri (contoh: pabrik obat), dan yang dikeluarkan bersama urin atau kotoran dari tubuh manusia dan hewan.



65% Estimasi kenaikan koncentrasi residu obat dalam air di tahun 2050

Sumber: Unesco Bengal, European Geosciences Union General Assembly, 2018



Konsentrasi tinggi residu antibiotik ditemukan di beberapa saluran pembuangan limbah di India

Sumber: Onkar Gaonkar, 2022

2/3 Sungai di dunia telah tercemar antibiotik (300x di atas ambang batas keamanan lingkungan)

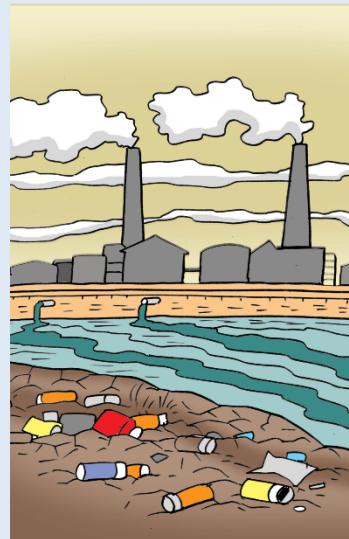
Sumber: Carolyn Wilke, 2019



Pengolahan limbah dari kota, pertanian dan industri menjadi tindakan pencegahan yang penting.

Aksi Anda hari ini akan menjaga keampuhan antimikroba.

Polusi air, udara, dan tanah akibat ulah manusia dapat memperburuk resistensi antimikroba di lingkungan.



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Figure 15. Human Leaflets of Theme 3



Why Does Antimicrobial* Waste Needs to be Managed?

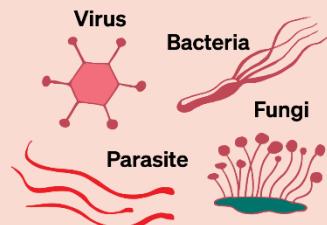
*antibiotics, antivirals, antifungals, antiparasitics



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for Animal Health

Not all of the antimicrobial products given to the chickens are absorbed fully. Residual antimicrobials can be excreted in feces and urine.

Untreated farm waste and leftover antimicrobial products can pollute the environment and have the potential to accelerate the rate of antimicrobial resistance.



Antimicrobial resistance is a condition where microbes are resistant to treatment.



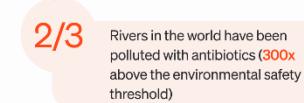
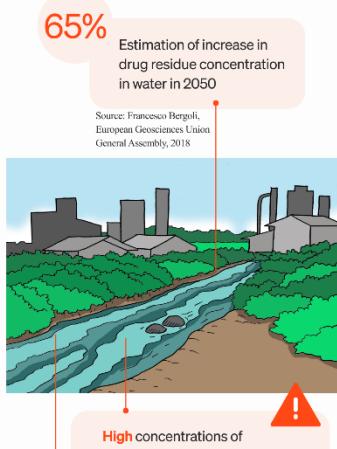
Resistant microbes have resistance genes. Resistance genes are found in several types of organic waste, livestock manure, sludge, and food scraps.

Resistance genes can contaminate animal products such as meat and eggs.

The spread of resistant genes to humans, animals, plants, and the environment threatens everyone's health.

2

3



Source: Omkar Gaonkar, 2022

Your Contribution To Everyone's Health

Collect antimicrobial waste in securely closed containers.

Burn antimicrobial waste in a special installation (incinerator) that is secured and closed, separated from other types of waste, and is not accessible to people in the surrounding areas.

Manage farm waste by separating it from the public sewer and avoid throwing it into the river.

Build good drainage installations to prevent wastewater flowing directly into the environment.

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4

5



Mengapa Limbah Antimikroba* Perlu Dikelola?

*antibiotik, antivirus, antijamur, antiparasit

 World Organisation for Animal Health

65% Estimasi kenaikan konsentrasi residu obat dalam air di tahun 2050
 Sumber: Francesco Bergoli, European Sciences Union General Assembly, 2018

2/3 Sungai di dunia telah tercemar antibiotik (30x di atas ambang batas keamanan lingkungan)
 Sumber: Carolyn Wilke, 2019

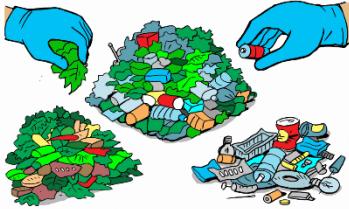
Konsentrasi tinggi residu antibiotik ditemukan di beberapa saluran pembuangan limbah di India

Sumber: Omkar Gaonkar, 2022

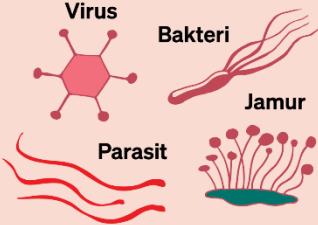
4

Produk antimikroba yang digunakan pada saat pemeliharaan ternak tidak seluruhnya diserap oleh tubuh unggas. Sisa antimikroba dapat dikeluarkan melalui kotoran dan urin.

Limbah peternakan dan sisa produk antimikroba yang tidak diolah dapat mencemari lingkungan dan berpotensi mempercepat laju resistensi antimikroba.



2



Resistensi antimikroba merupakan suatu keadaan dimana mikroba kebal terhadap pengobatan.

Mikroba kebal memiliki gen resisten. Gen resisten ditemukan di beberapa jenis sampah organik, limbah kotoran ternak, lumpur, dan sisa makanan.

Gen resisten dapat mencemari produk hewan seperti daging ayam dan telur.

Potensi penyebaran gen resisten ke manusia, hewan, tumbuhan, dan lingkungan mengancam kesehatan semua.

3

Kontribusi Anda untuk Kesehatan Semua

-  Kumpulkan sampah antimikroba di dalam wadah atau kemasan tertutup yang aman.
-  Bakar sampah antimikroba di tempat pembakaran khusus yang aman dan tertutup, serta terpisah dari sampah lain dan tidak mudah diakses oleh warga sekitar.
-  Kelola limbah peternakan yang terpisah dengan saluran pembuangan umum dan tidak langsung dibuang ke sungai.
-  Bangun instalasi drainase yang baik untuk mencegah air limbah mengalir langsung ke lingkungan.

Aksi Anda hari ini akan menjaga keampuhan antimikroba.

5

Kesehatan Hewan untuk Kesehatan Semua 

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Figure 16. Animal Leaflets of Theme 3

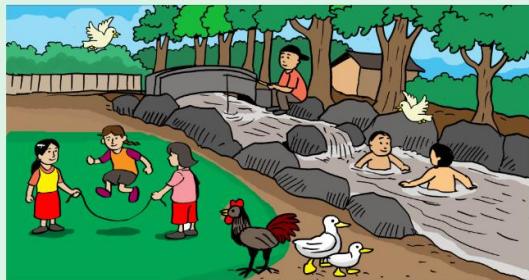
Infographics for Social Media

There are 1 infographic made, intended for environment sector (Figure 17).

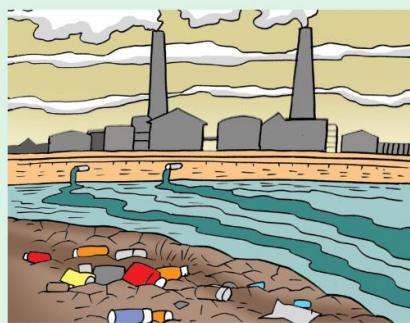
Cegah Pencemaran Mikroba Resisten di Lingkungan



Prevent Contamination of Resistant Microbes in the Environment

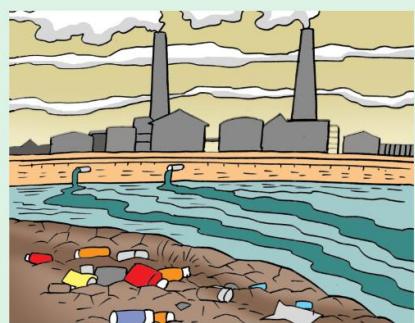


Mikroba yang mengandung gen resisten terhadap antimikroba* sudah banyak ditemukan di lingkungan.



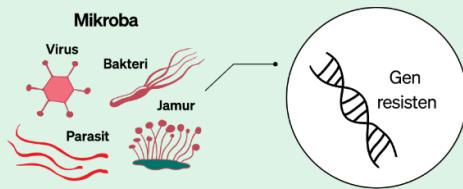
* antibiotik, antivirus, antijamur, antiparasit

Microbes containing antimicrobial* resistant genes have been found in the environment



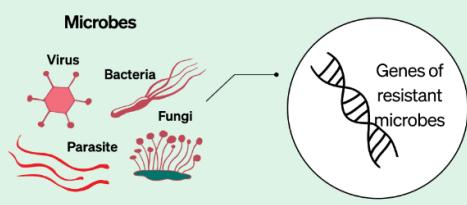
*antibiotics, antivirals, antifungals, and antiparasitics

Gen resisten dapat menyebar di antara dan di dalam populasi hewan, manusia, dan tumbuhan.



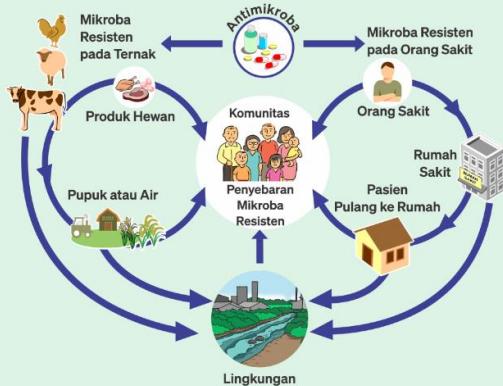
Gen resisten juga dapat berpindah lewat produk peternakan/pertanian, hewan, dan manusia melalui air, kotoran, dan udara.

Genes of resistant microbes can spread between and within animal, human, and plant populations

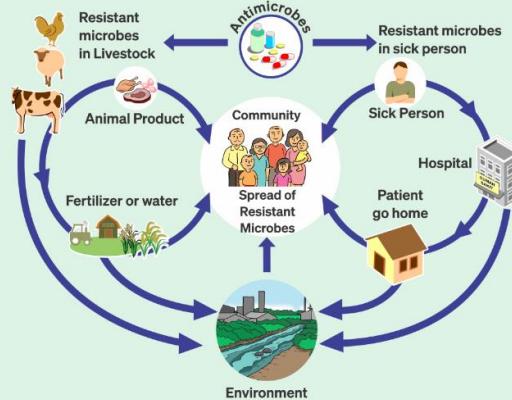


Genes of resistant microbes can also be transferred through water, soil, and air

Alur Penyebaran Mikroba Resisten



Resistant Microbes Spreading Pathways



65% Estimasi kenaikan konzentrasи residu obat dalam air di tahun 2050

Sumber: Francesco Bergoli, European Geriatrics Union General Assembly, 2018

Konentrasi tinggi residu antibiotik ditemukan di beberapa saluran pembuangan limbah di India



2/3 Sungai di dunia telah tercemar antibiotik (**300x** di atas ambang batas keamanan lingkungan)

Sumber: Carolyn Wilke, 2019

65% Estimation of increase in drug residue concentration in water in 2050

Sumber: Francesco Bergoli, European Geriatrics Union General Assembly, 2018

High concentrations of antibiotic residues have been found in several sewers in India



2/3 Rivers in the world have been polluted with antibiotics (**300x** above the environmental safety threshold)

Sumber: Carolyn Wilke, 2019

Kita harus bertindak **sekarang** untuk mencegah penyebaran resistensi antimikroba di lingkungan.



We must act **NOW** to prevent the spread of antimicrobial resistance in the environment.



Cegah Resistensi Antimikroba dengan:

Gunakan antimikroba hanya untuk pengobatan.



Habiskan antimikroba sesuai resep dan anjuran dokter.



Terapkan pola hidup bersih dan sehat.



Let's Prevent Antimicrobials Resistance by:

Using antimicrobials only for treatment.



finishing antimicrobials treatment according to the prescription and doctor's advice.



Applying a clean and healthy lifestyle.



Aksi Bersama Demi Kesehatan Semua



Kesehatan Hewan untuk Kesehatan Semua

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Collaborative Actions For One Health



Animal Health is Everyone's Health

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Figure 17. Environment Infographics of Theme 3

REFERENCES

- Anderson S. 2023. Antimicrobial Resistance Death Toll Could Catch Up to Cancer by 2050, and Pollution is Fuelling its Spread. Health Policy Watch Independent Global Health Reporting, Climate and Health (Published on 07/02/2023). <https://healthpolicy-watch.news/antimicrobial-resistance-deaths-cancer/>.
- Lancet. 2022. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. Antimicrobial Resistance Collaborators*, Lancet 2022 (399): 629–55. <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2821%2902724-0> (Downloaded on 20/06/2023).



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