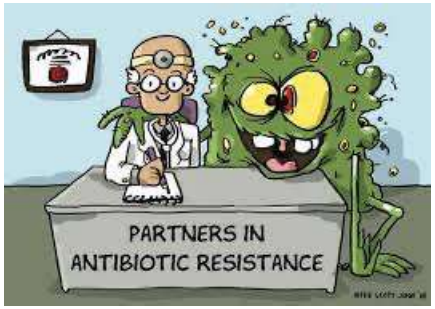
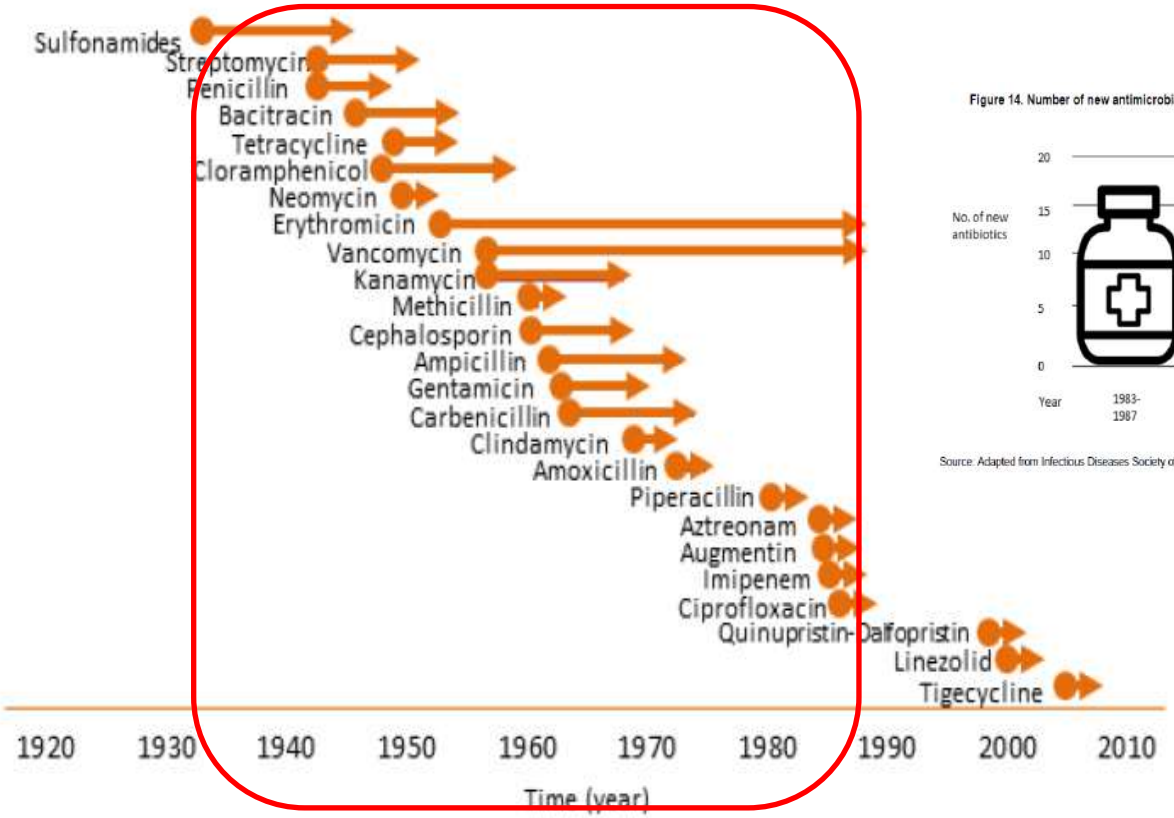


COVID-19 Hastalarında Nozokomiyal İnfeksiyon Sorunu: Antimikrobiyal Yönetim

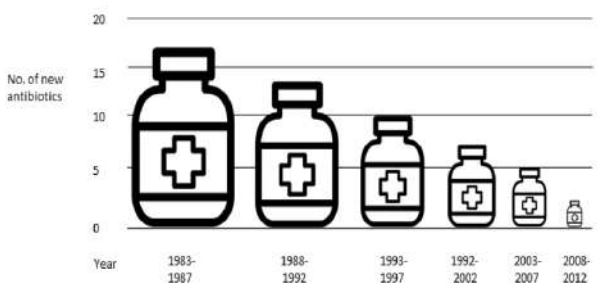
Dr Emel YILMAZ
BUÜTF-Enf Hast ve Kl Mik AD
KLİMİK 2022
11.03.2022

Figure 13. Timeline: antimicrobial discovery to first resistance identified



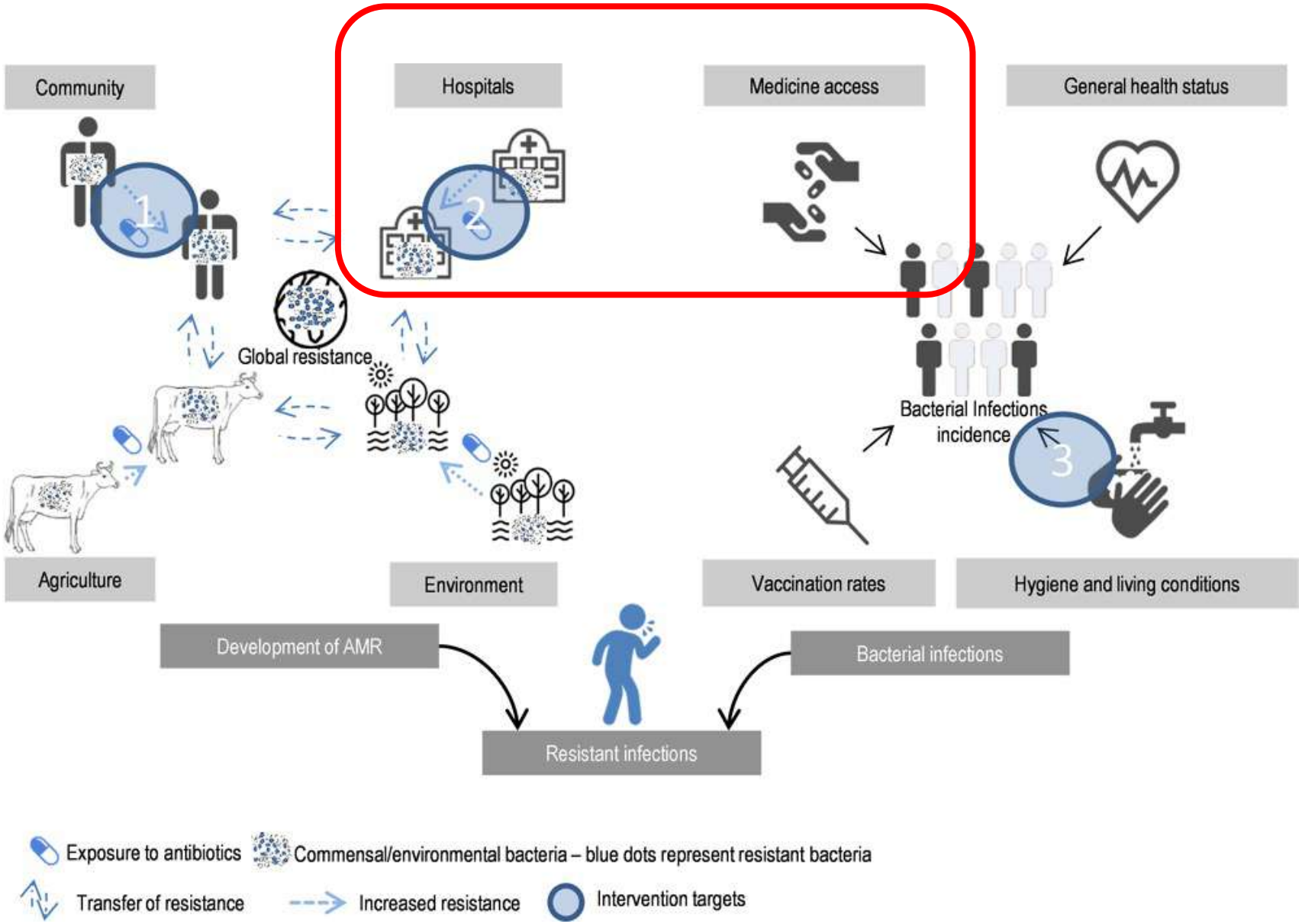
Source: Adapted from Pray L, 2008

Figure 14. Number of new antimicrobials approved by the Food and Drug Administration since 1983



Source: Adapted from Infectious Diseases Society of America, 2011

Altın çağ


Community
Hospitals
Medicine access
General health status
1
2
3
Global resistance
Bacterial Infections incidence
Agriculture
Environment
Vaccination rates
Hygiene and living conditions
Development of AMR
Bacterial infections
Resistant infections
Exposure to antibiotics
Commensal/environmental bacteria – blue dots represent resistant bacteria
Transfer of resistance
Increased resistance
Intervention targets

Available online at www.sciencedirect.com
ScienceDirect
Diagnostic Microbiology and Infectious Disease 61 (2008) 110–128
DIAGNOSTIC MICROBIOLOGY AND INFECTIOUS DISEASE
www.elsevier.com/locate/diagmicrobio

Susceptible organism

Resistant organism

Antimicrobial stewardship: concepts and strategies in the 21st century

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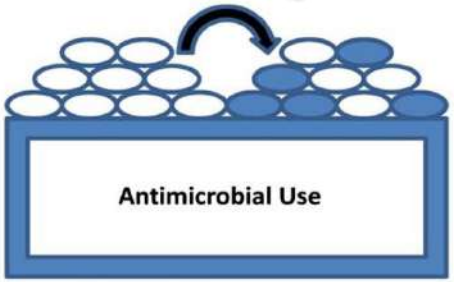
Received 22 February 2008; accepted 25 February 2008

Sorun

Abstract

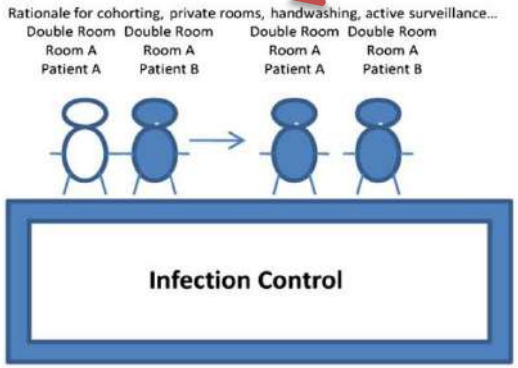
Large worldwide surveillance studies report that resistance to nearly all classes of antimicrobial is increasing, as is the emergence of what have been termed *pan-drug–resistant* and *extremely drug-resistant* pathogens. Concomitantly, bacterial binding sites have been exploited by available antimicrobials, and there has been a decline in the development of antimicrobials using novel mechanisms of action. These trends have prompted healthcare facilities to adopt antimicrobial stewardship programs (ASPs) and infection control programs (ICPs) to monitor antimicrobial use while simultaneously optimizing treatment, outcome, and cost. This article outlines the development of an effective ASP and the key components and operating principles, and also provides insight into the production of materials that will facilitate the execution of these programs at healthcare facilities. In this discussion, education of healthcare providers is emphasized, and a rationale is provided with

Antimicrobial exposure (dose, duration, type of antibiotic*)



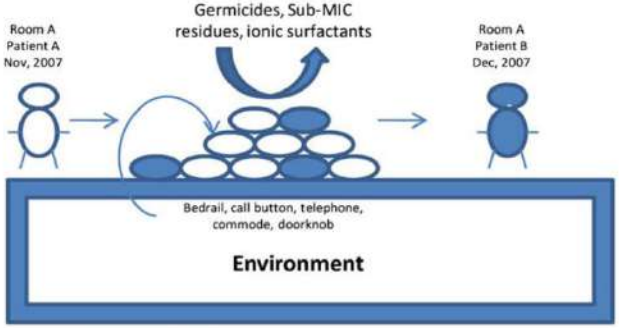
INFLUENCERS:
- Human antimicrobial consumption
- Agriculture antimicrobial consumption

Rationale for cohorting, private rooms, handwashing, active surveillance...



INFLUENCERS:
- Hand hygiene
- Epidemiology
- Outbreak investigations
- Cohorting
- Active surveillance

Germicides, Sub-MIC residues, ionic surfactants



INFLUENCERS:
- Germicides
- 10% hypochlorite (sporicidal) for *C. difficile*
- Policy & Practice
  - What surfaces?
  - How often?
  - Is terminal enough? (NO!)

sm

- Antibiyotik:
  - Mikroorganizmaları öldüren ya da çoğalmasını durduran ilaçlar

Antibiyotik Direnci: Antimikrobiyallerin aşırı ve bilinçsizce kullanımları sonucunda patojen ve kommensal mo kendilerini yeni ortama adapte edebilmeleri ve yaşam mücadelesinde en büyük, doğal güçleri olan genetik yapılarını süratle değiştirebilmeleridir

- Yönetim:
  - Bir şey ya da bir faaliyetten sorumlu olma ya da onu koruma için yapılan müdahaleler

Shown at http://www.sportbikes.dhs.org

KLİMİK TÜRK KLİNİK MİKROBİYOLOJİ VE İNFEKSİYON HASTALIKLARI DERNEĞİ

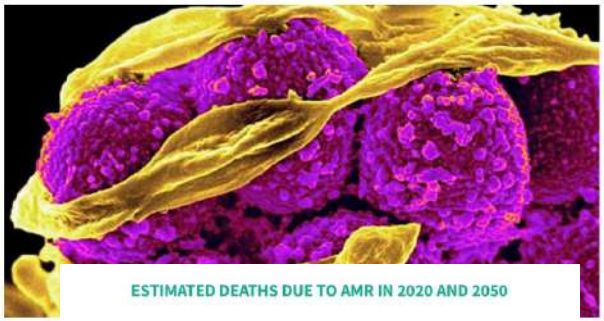
Bilimle Sağlıkla 35 Yıl

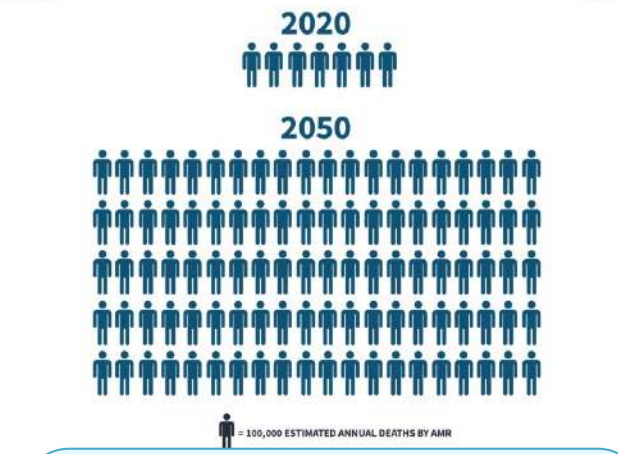
İLETİŞİM ÜYE GİRİŞİ YENİ ÜYE SİTE HARİTASI

DERNEK | YETERLİK KURULU | ÇALIŞMA GRUPLARI | TOPLANTILAR | DERGİLER | KLİMİK BÜLTENİ

HABERLER »

ARAŞTIRMA: ANTİBİYOTİK DİRENCİ KAYNAKLI ÖLÜMLER ARTIYOR





DSÖ 2050'de AMR nedeniyle ölümlerin 10 milyon/yıl olduğunu açıkladı

Etkinlikler

20 Ocak 2022

Dünyada koronavirusla mücadele sürerken bilim insanları antibiyotik direnci nedeniyle kaydedilen ölümlerin giderek arttığı uyarısında bulunuyor.

Tıp dünyasının saygın yayınlarından *Lancet* dergisinde yayımlanan bir araştırma sonucuna göre 2019 yılında dünya çapında 1.2 milyondan fazla insan antibiyotik direnci nedeniyle yaşamını yitirdi. 204 ülke ve bölgeden verilere dayandırılan araştırmada antibiyotik direnciyle bağlantılı nedenlerden ölenlerin sayısının ise 4.95 milyonu bulduğu belirtildi.

Bilim insanları ve sağlık yetkilileri antibiyotiğin yanlış ve gereksiz kullanımı nedeniyle antibiyotik tedavisine yanıt vermeyen bakteri ve mikrop türlerinin arttığı uyarısında bulunuyor.

Yılda 10 milyon ölüm bekleniyor

Araştırmada yer alan Washington Üniversitesinden Prof. Dr. Chris Murray, açıklanan yeni verilerin dünya çapında antibiyotik direncinin gerçek boyutunu gözler önüne serdiğini belirterek, "Önceki tahminler 2050 yılına kadar antibiyotik direnci kaynaklı yılda 10 milyon ölüme işaret ediyordu. Ancak şu an bu rakama tahmin edildiğinden çok daha yakın olduğumuzu kesin olarak biliyoruz" dedi.

Tehdide karşı acilen harekete geçilmesi gerektiğini vurgulayan Murray, "Antibiyotik direncine karşı yarışta önde olmak istiyorsak bu verileri, rotayı düzeltecek önlemler almak, inovasyonu geliştirmek için kullanmalıyız" dedi.

Antibiyotikler direnci kıramıyor

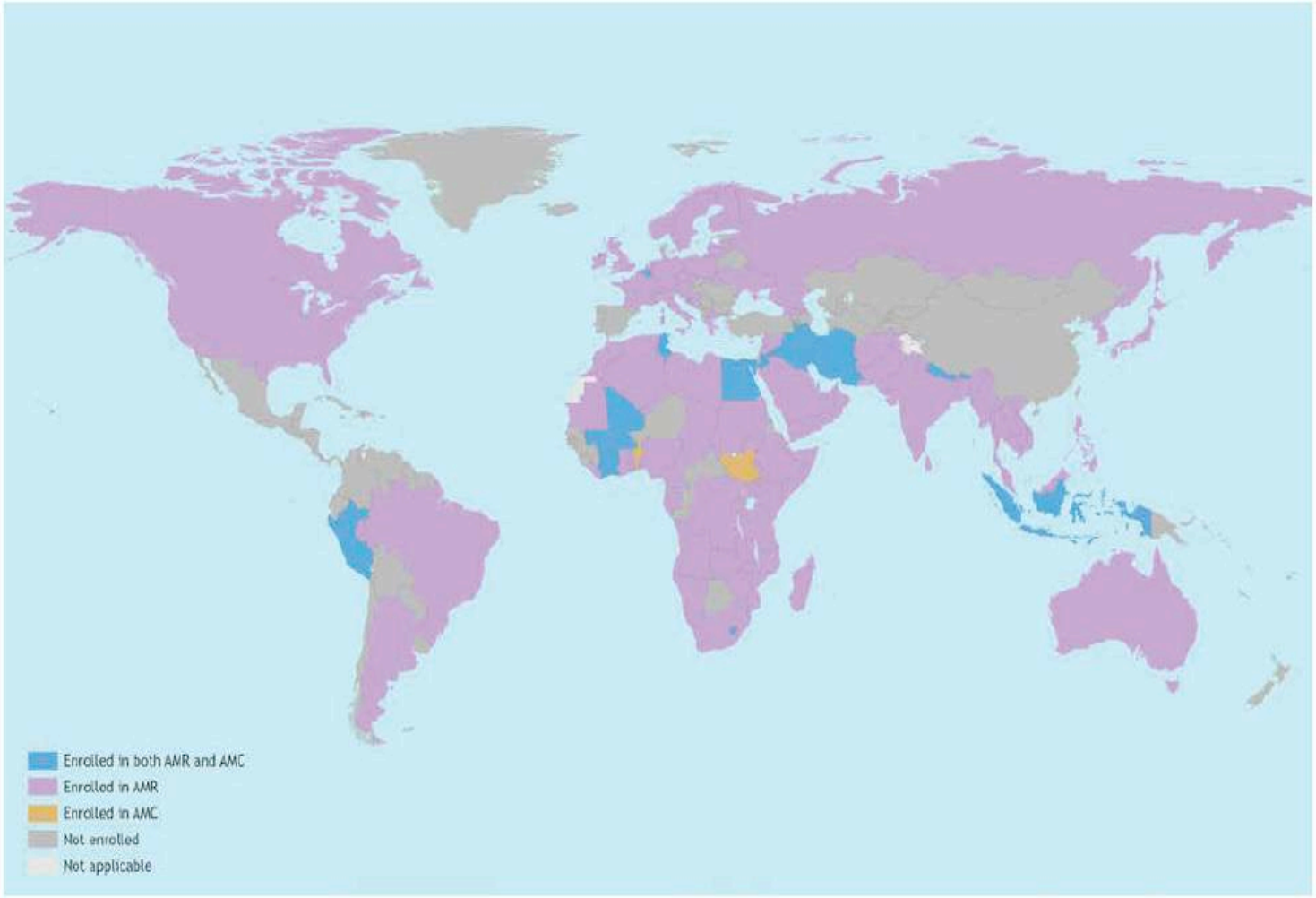
Dünya Sağlık Örgütü geçen yıl antibiyotik direnci konusunda uyarıda bulunarak son dönemde ruhsat alan ya da geliştirme aşamasındaki 43 antibiyotiğin hiçbirinin antibiyotik direnciyle mücadele için yeterli olmadığına dikkat çekmişti.

Pittsburgh Üniversitesi Tıp Fakültesinden Prof. Dr. Cornelius Clancy de antibiyotik direncine karşı mücadelede yeni tedavi yöntemlerine odaklanılması gerektiğini belirterek, "Penisilinden bu yana on yıllardır sahip olduğumuz geleneksel antibiyotik modelinin iflas ettiğini düşünüyorum" dedi.

Clancy, son iki yılda dünyanın koronavirus pandemisine odaklandığını, ancak antibiyotik direncinin "uzun vadeli bir sınama" olduğunu vurguladı.

Araştırmada 2019 yılında antibiyotik direnci nedeniyle kaydedilen ölümlerin büyük bölümünün, zatürre gibi alt solunum yolu hastalıklarından kaynaklandığı, ardından kan dolaşımı ve intraabdominal (karın içi) infeksiyonlarının geldiği bildirildi.

Fig. 1.1. GLASS enrolment map at the 30 April 2021



The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: WHO, Global Antimicrobial Resistance and Use Surveillance System (GLASS)
Map Production: WHO GIS Centre for Health, DNA/DDI

World Health Organization

Global Antimicrobial Resistance and Use Surveillance System (GLASS) Report

2021

1940'larda akılcı ilaç kullanımı gündeme geldi
Son 10 yılda AMR'nin büyük boyutta olduğu fark edildi

Original research

BMJ Global Health

Waves of attention: patterns and themes of international antimicrobial resistance reports, 1945–2020

Kristen Overton,[1,2] Nicolas Fortané,[3] Alex Broom,[4] Stephanie Raymond,[4]

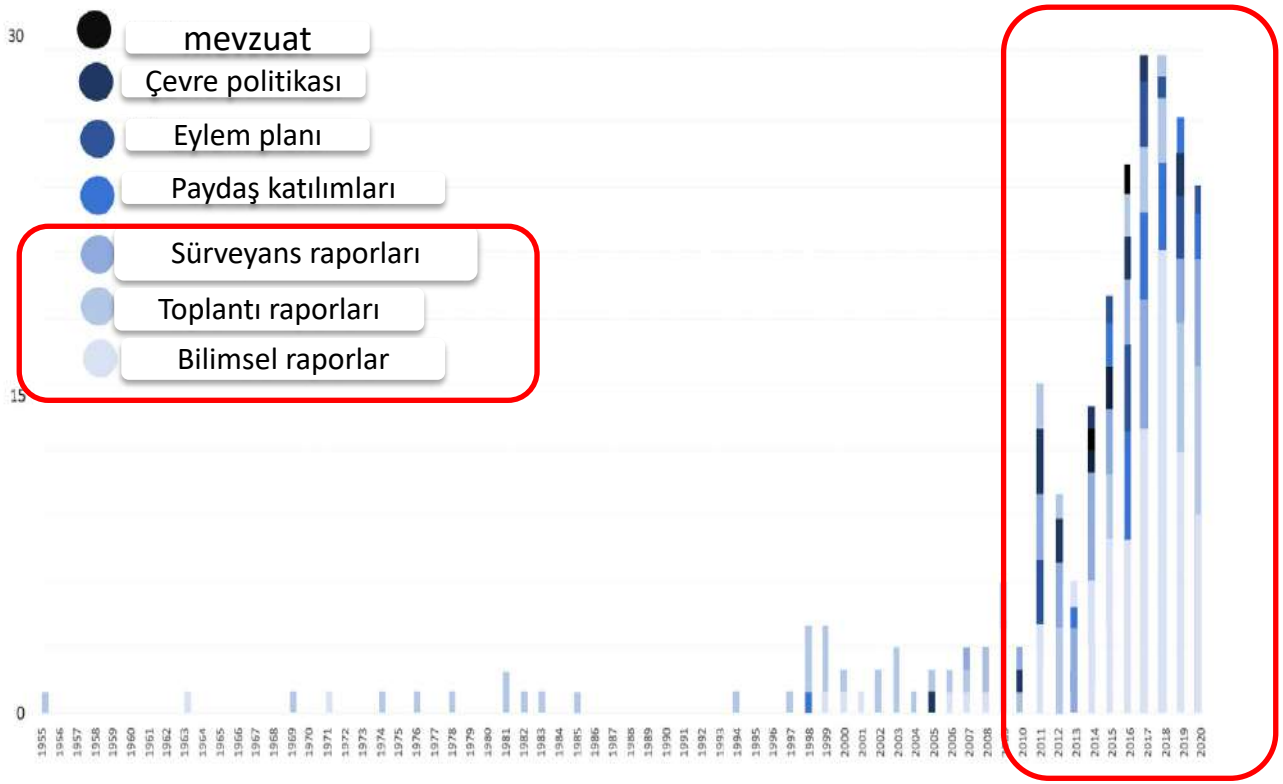


Figure 4 Types of AMR reports by year (1955–2020).

Overton K, *et al. BMJ Global Health* 2021;**6**:e006909.

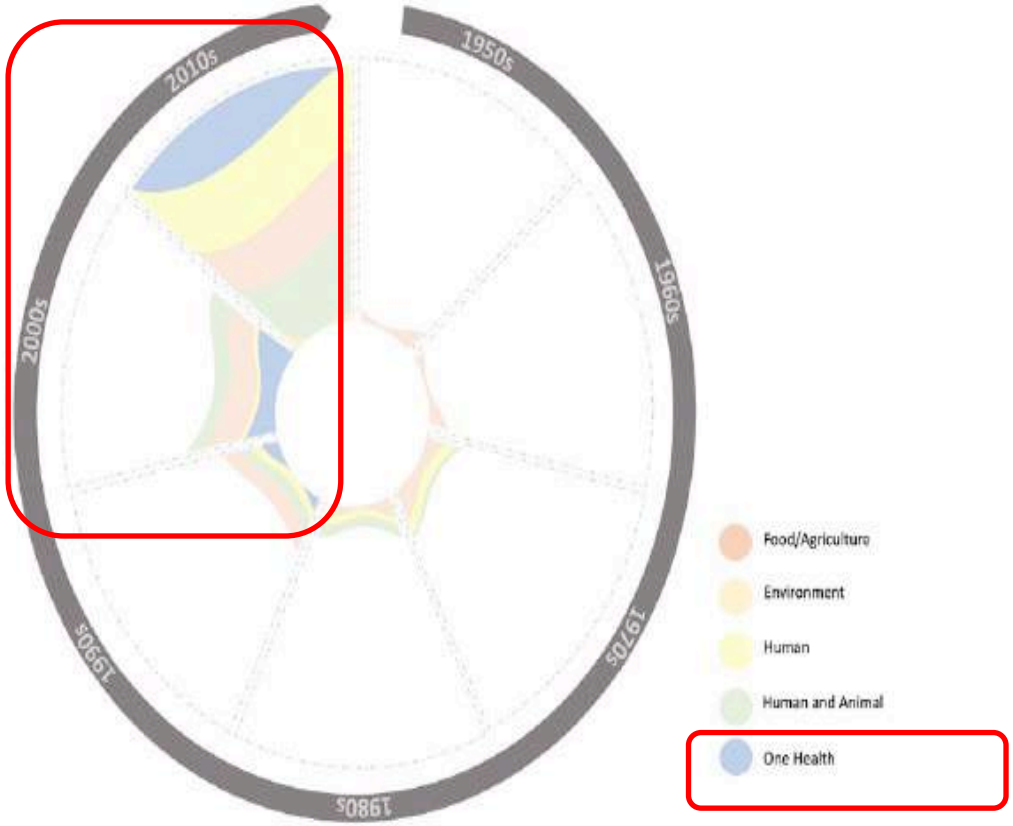


Figure 7 Orientation of AMR reports by decade (1950s–2010s).

BUNLARI BİLİYOR MUYDUNUZ?

1970 G(-)'lerde MDR
1990 VRE
1999 VISA-VRSA
2008 NDM-1
2015 mcr-1

Aslında 1980'lerde Çin'de Brezilya'da (belki Afrika'da ??) hayvan yemlerinde polimiksin kullanımı ile suş koleksiyonu incelendiğinde mcr-1 taşıyan enterik bakteriler mevcut

MacDougall C. Antimicrobial stewardship. In: Bennett JE, et al. eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 8th ed. Philadelphia: Elsevier Saunders, 2015: 605-11.

Figure 5 Total AMR reports by target locale* (1955–200
*Excluding 112 worldwide reports.

Sorun küresel

Ancak 2015’den sonra adımlar atıldı

Güney yarım kürenin de dünyanın bir parçası olduğu akla geldi

Figure 6 Total AMR reports by target locale* (2010s**–2020). *Excluding 112 worldwide reports. **Noting emergence of the Global South.

Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis

*Antimicrobial Resistance Collaborators**

Summary

Background Antimicrobial resistance (AMR) poses a major threat to human health around the world. Previous publications have estimated the effect of AMR on incidence, deaths, hospital length of stay, and health-care costs for specific pathogen–drug combinations in select locations. To our knowledge, this study presents the most comprehensive estimates of AMR burden to date.

Lancet 2022; 399: 629–55
Published Online
January 20, 2022
https://doi.org/10.1016/
S0140-6736(21)02724-0

Antimikrobiyal direnç Dünya çapında sorun ve acilen ele alınması gereken küresel bir tehdit

Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55

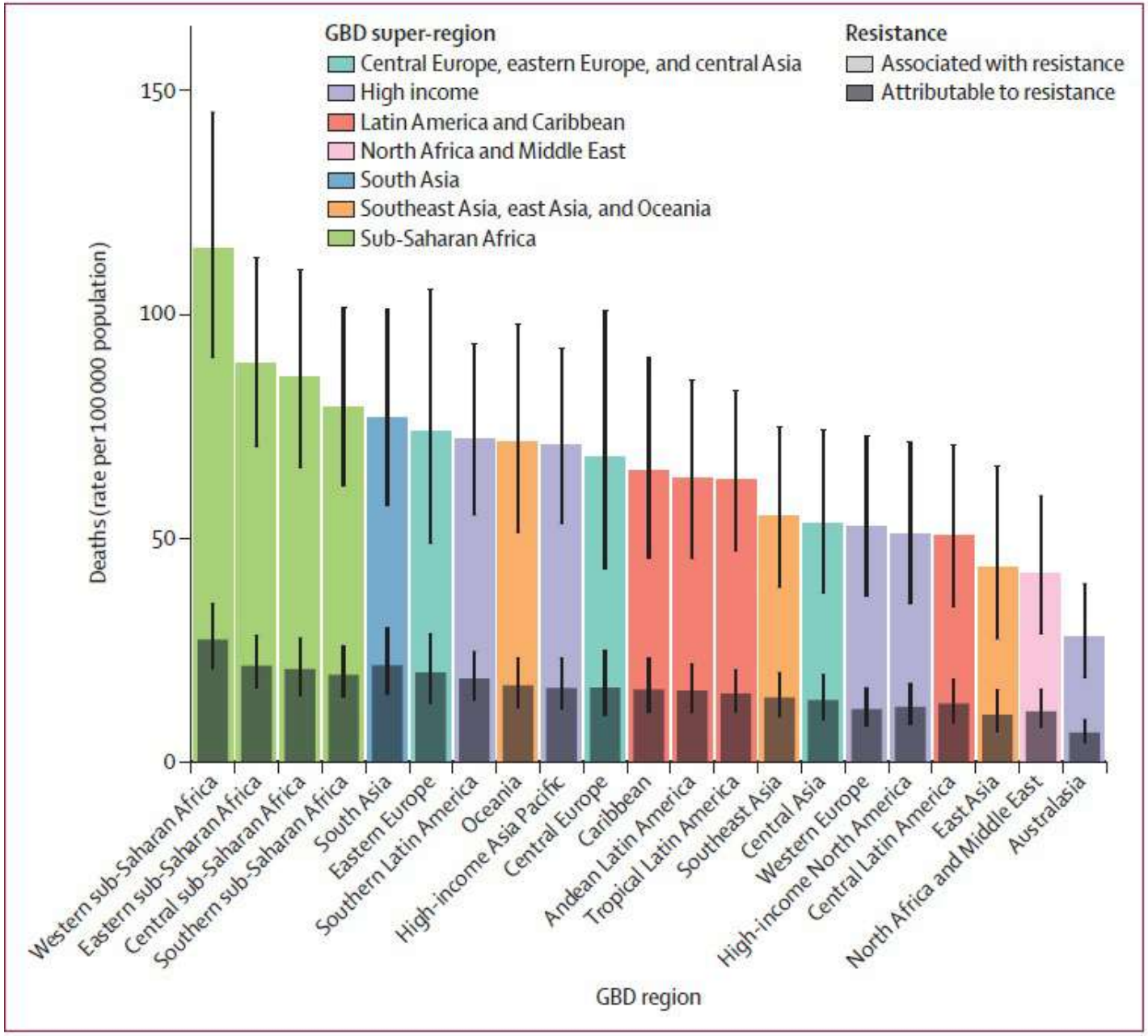


Figure 2: **All-age rate of deaths attributable to and associated with bacterial antimicrobial resistance by GBD region, 2019**

Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55

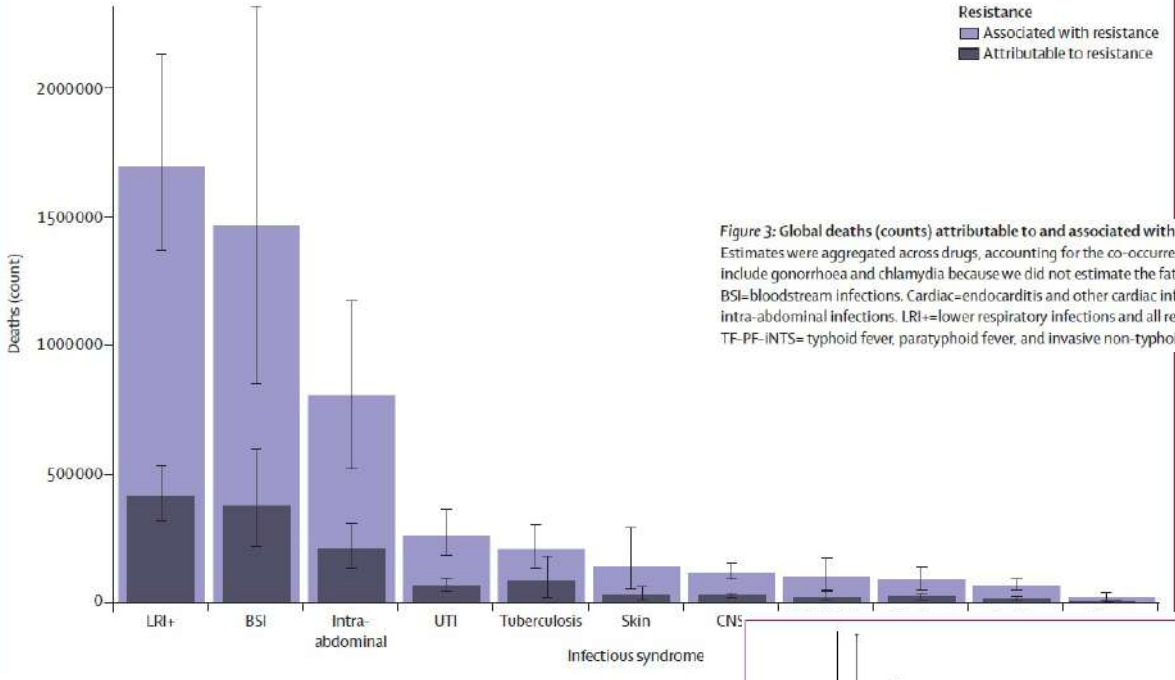
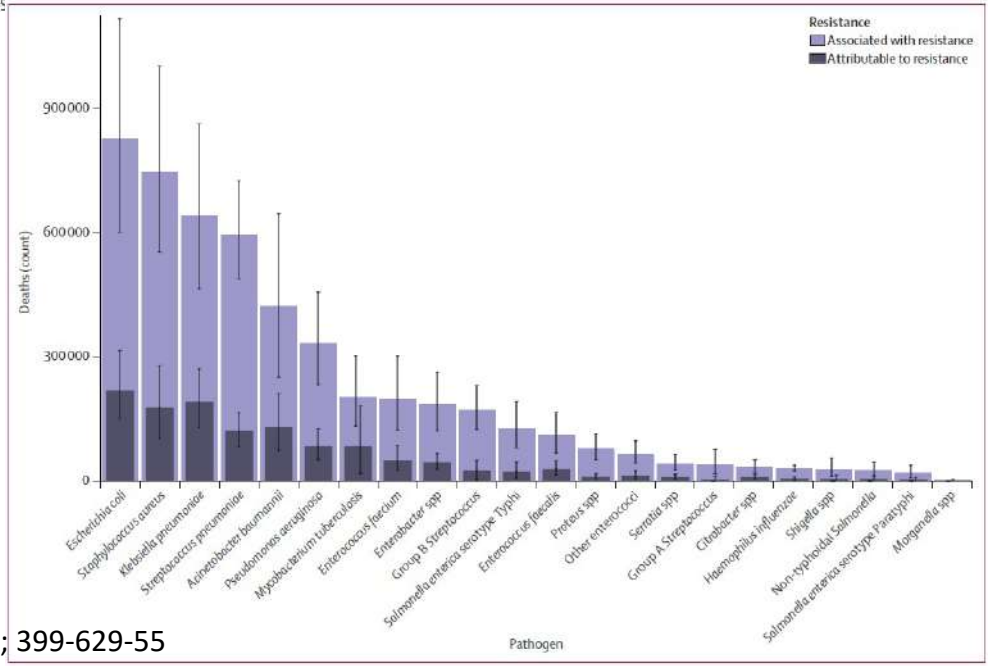
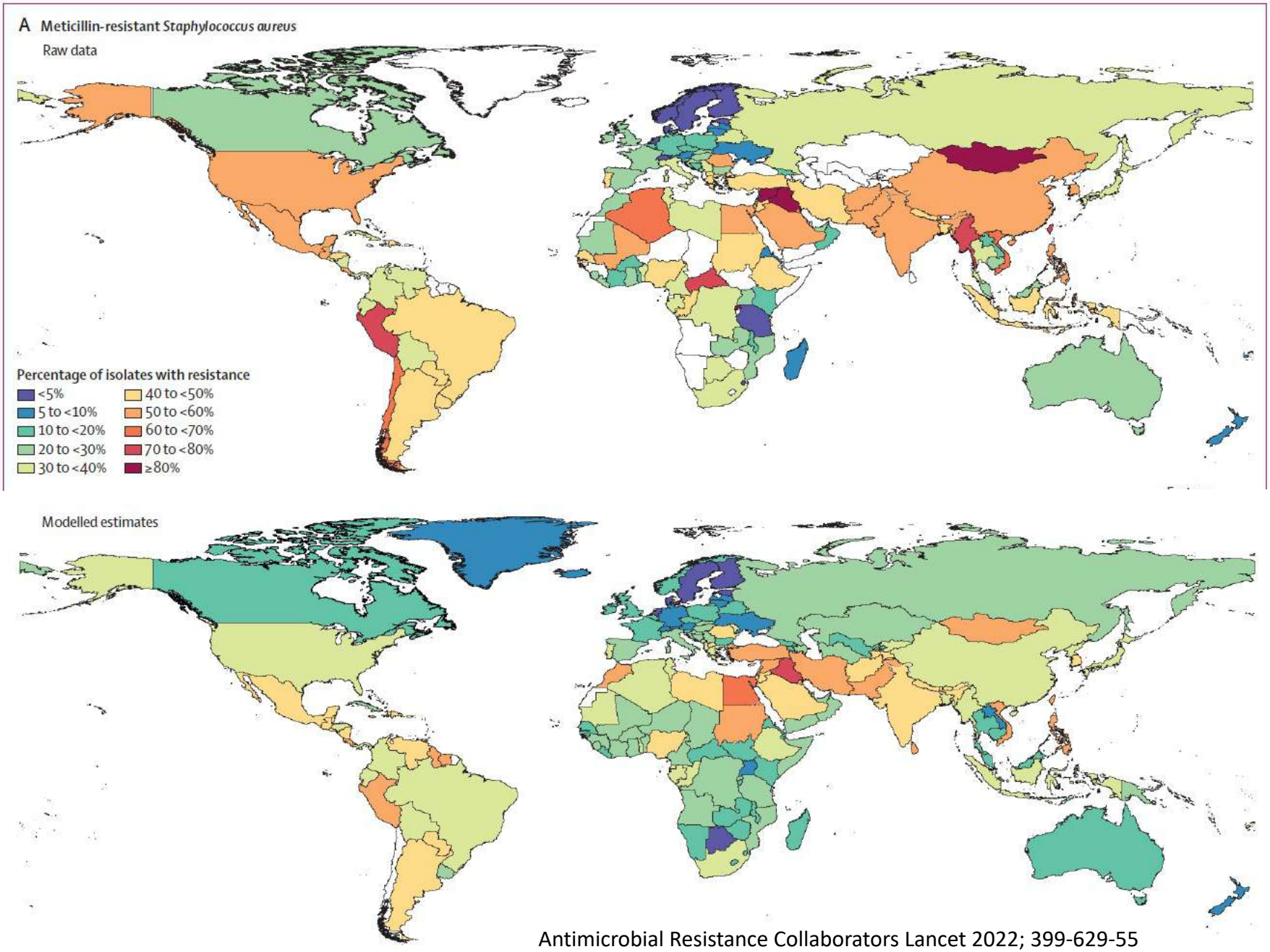


Figure 3: **Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by infectious syndrome, 2019**
Estimates were aggregated across drugs, accounting for the co-occurrence of resistance to multiple drugs. Error bars show 95% uncertainty intervals. Does not include gonorrhoea and chlamydia because we did not estimate the fatal burden of this infectious syndrome. Bone+=infections of bones, joints, and related organs. BSI=bloodstream infections. Cardiac=endocarditis and other cardiac infections. CNS=meningitis and other bacterial CNS infections. Intra-abdominal=peritoneal and intra-abdominal infections. LRI+=lower respiratory infections and all related infections in the thorax. Skin=bacterial infections of the skin and subcutaneous systems. TF-PF-iNTS= typhoid fever, paratyphoid fever, and invasive non-typhoidal *Salmonella* spp. UTI=urinary tract infections and pyelonephritis.

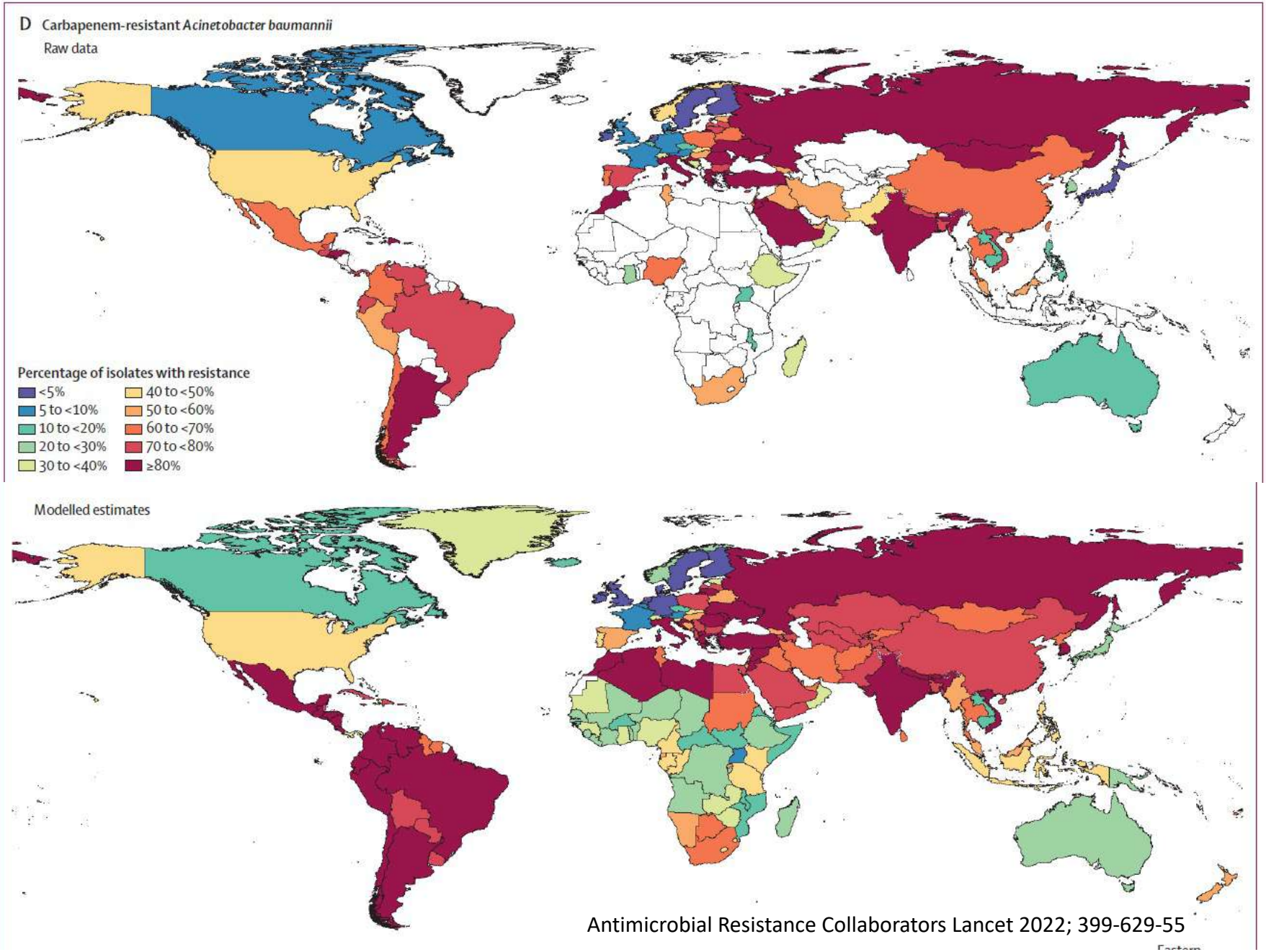


Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55

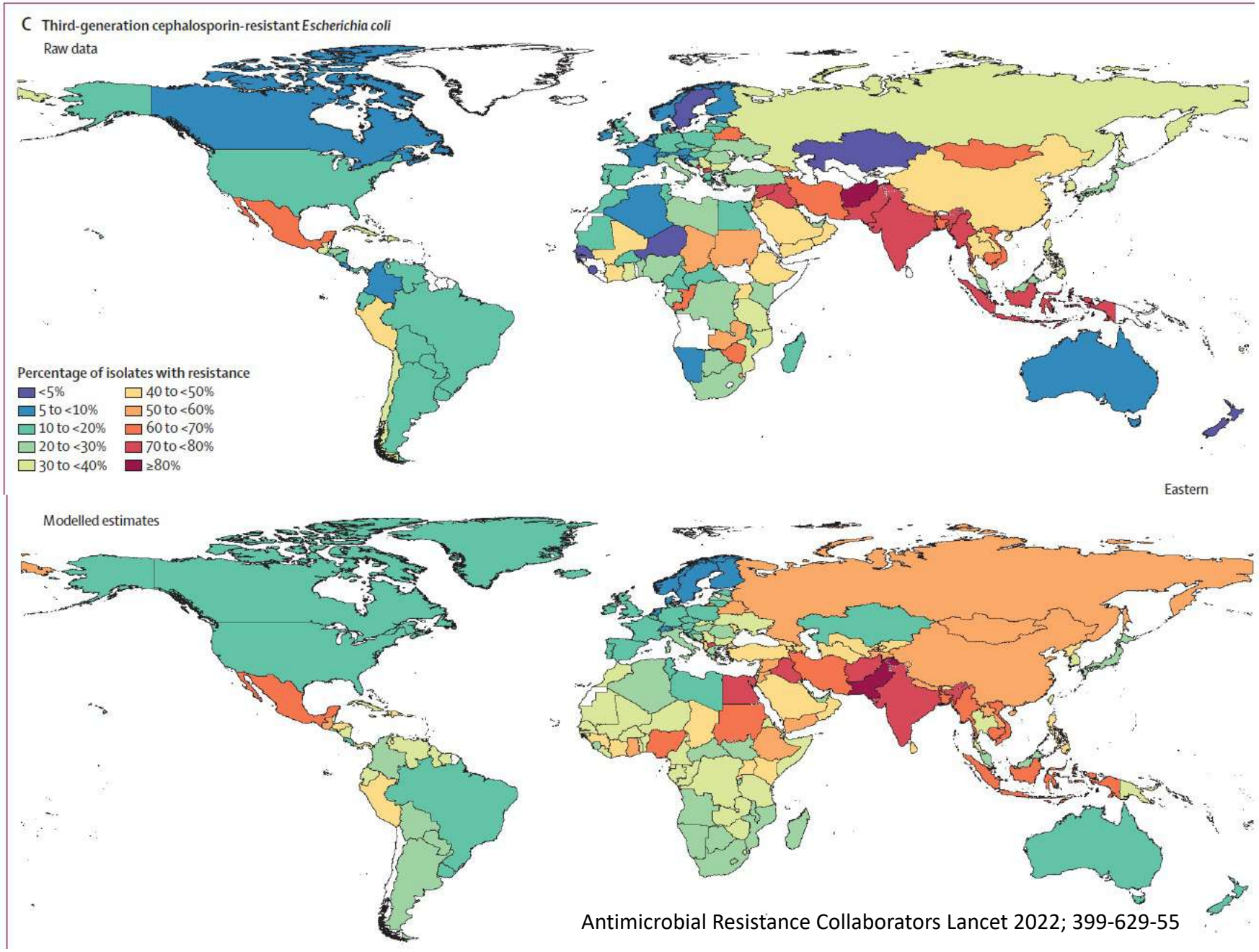
Figure 4: **Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by pathogen, 2019**
Estimates were aggregated across drugs, accounting for the co-occurrence of resistance to multiple drugs. Error bars show 95% uncertainty intervals.



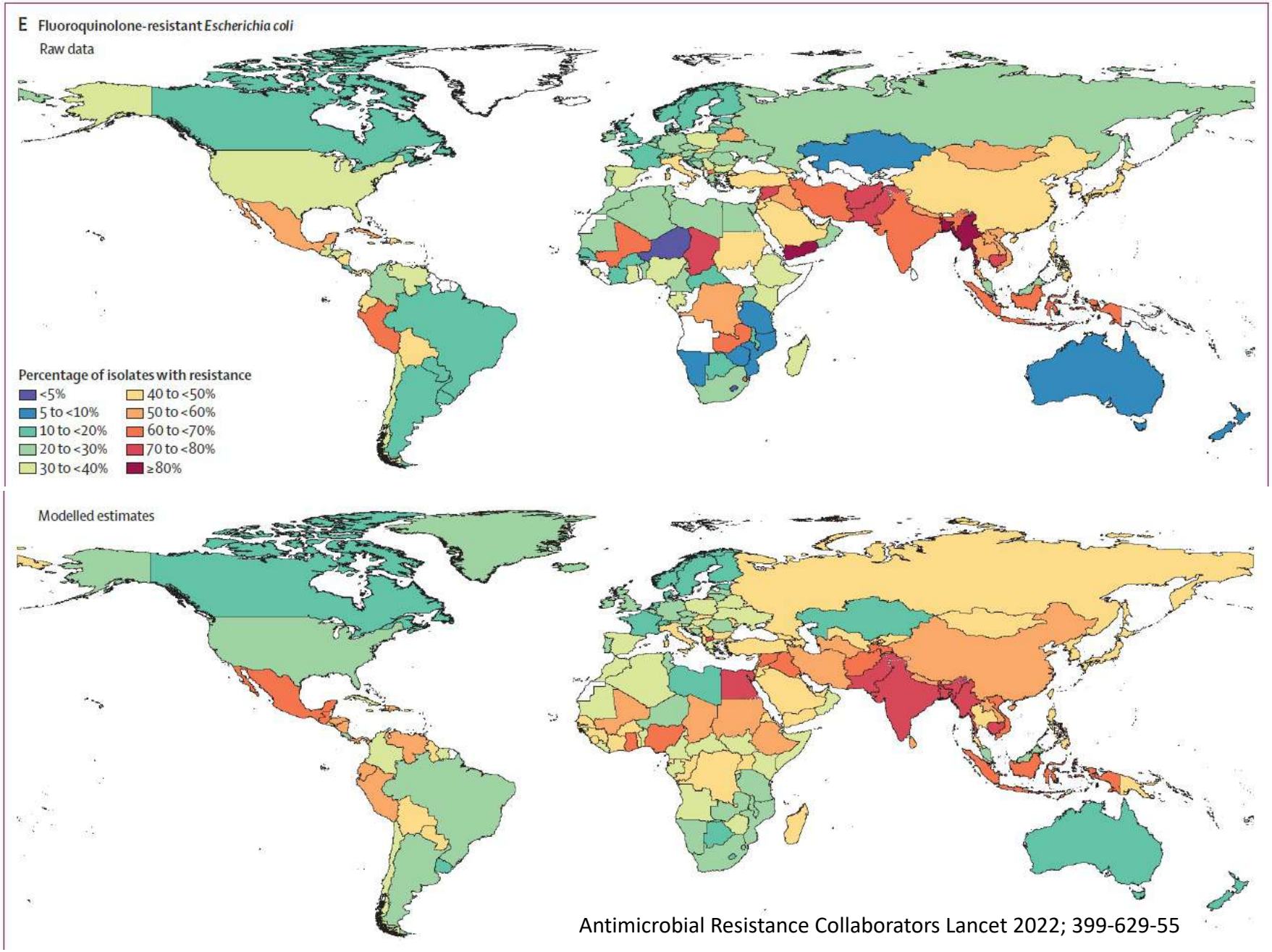
Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55



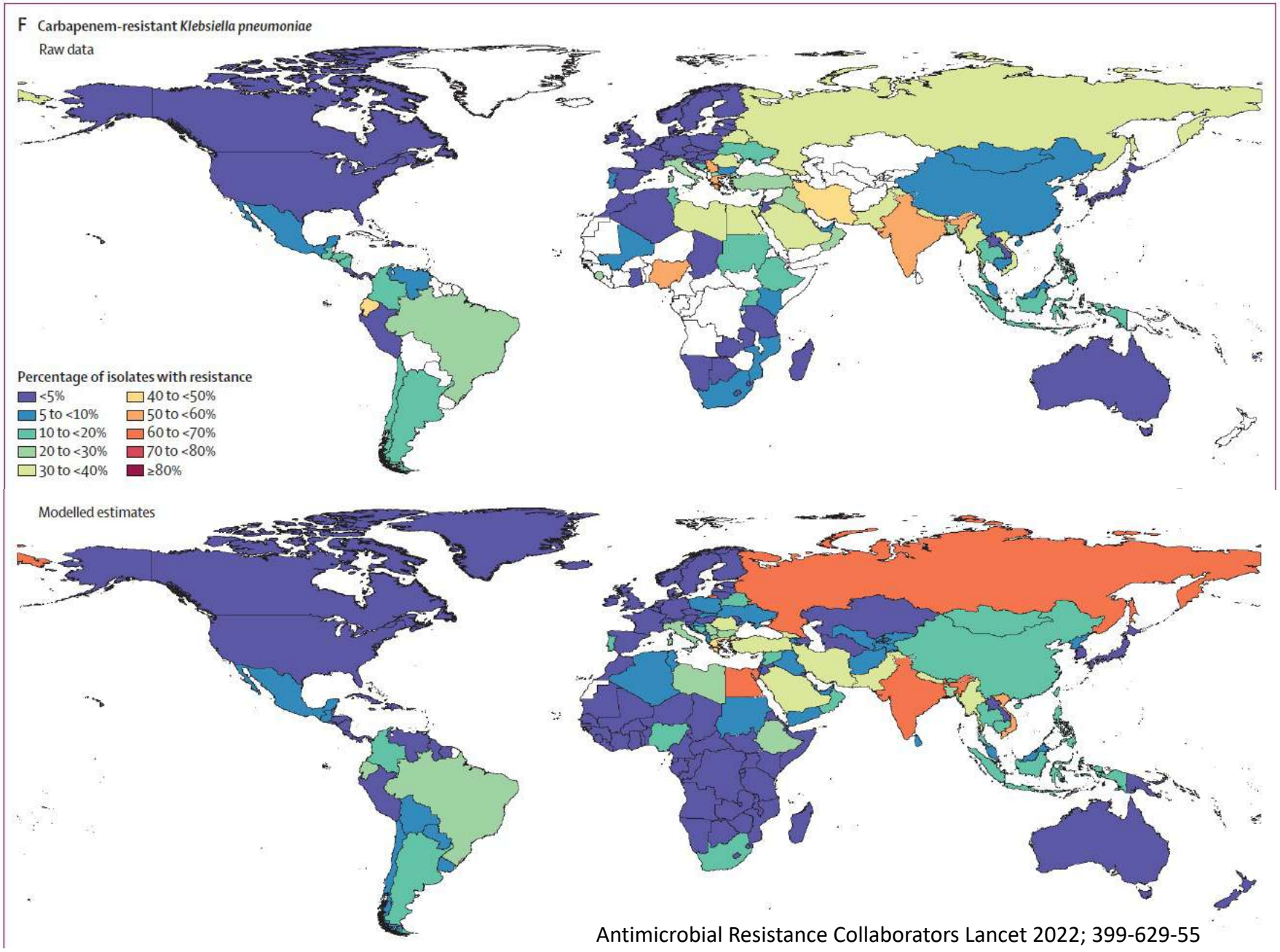
Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55



Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55

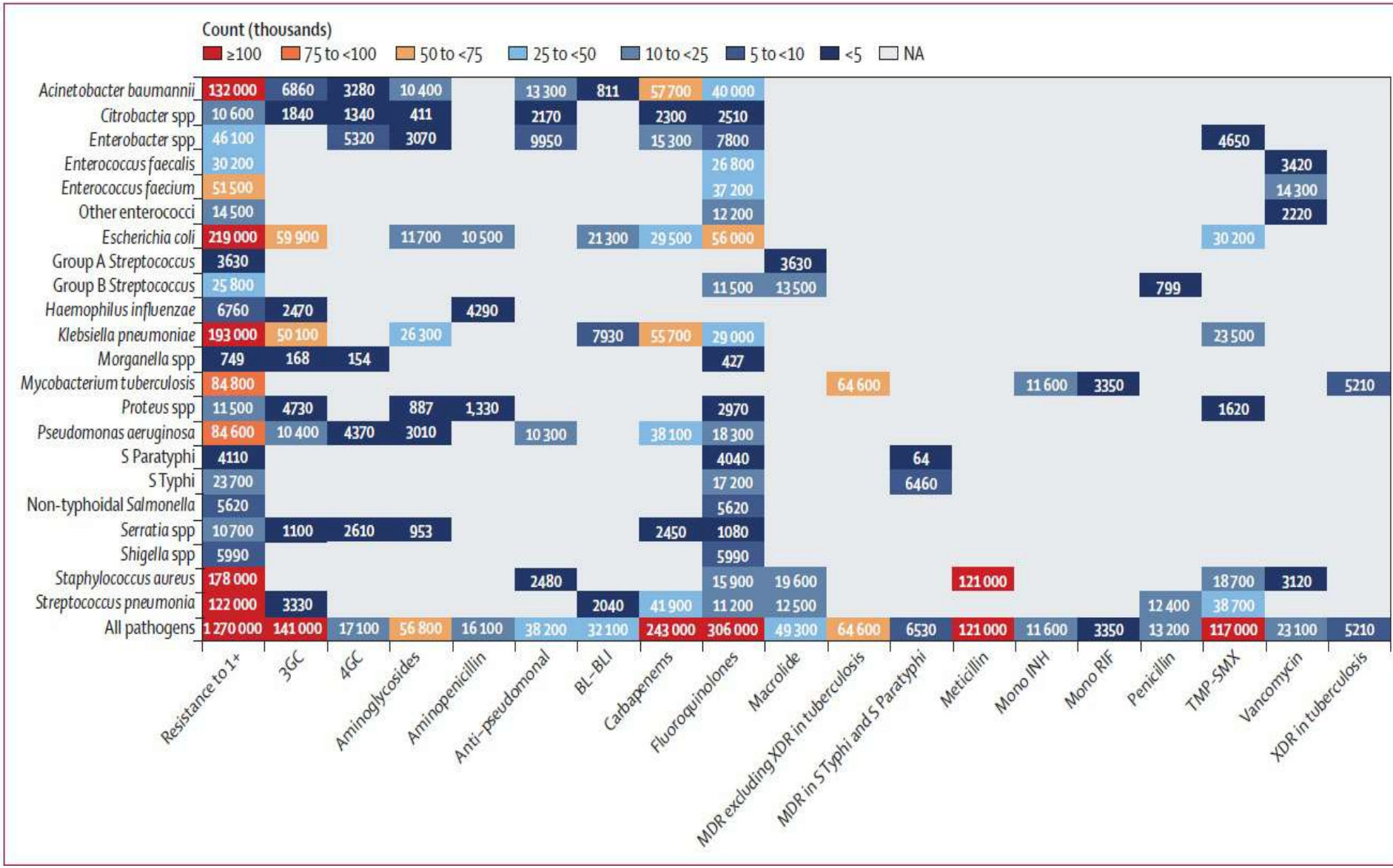


Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55



Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55

Figure 6: Global deaths (counts) attributable to bacterial antimicrobial resistance by pathogen–drug combination, 2019



Antimicrobial Resistance Collaborators Lancet 2022; 399-629-55

2021 ~ 4,9 milyon/yıl

2050 KAÇ MİLYON/yıl

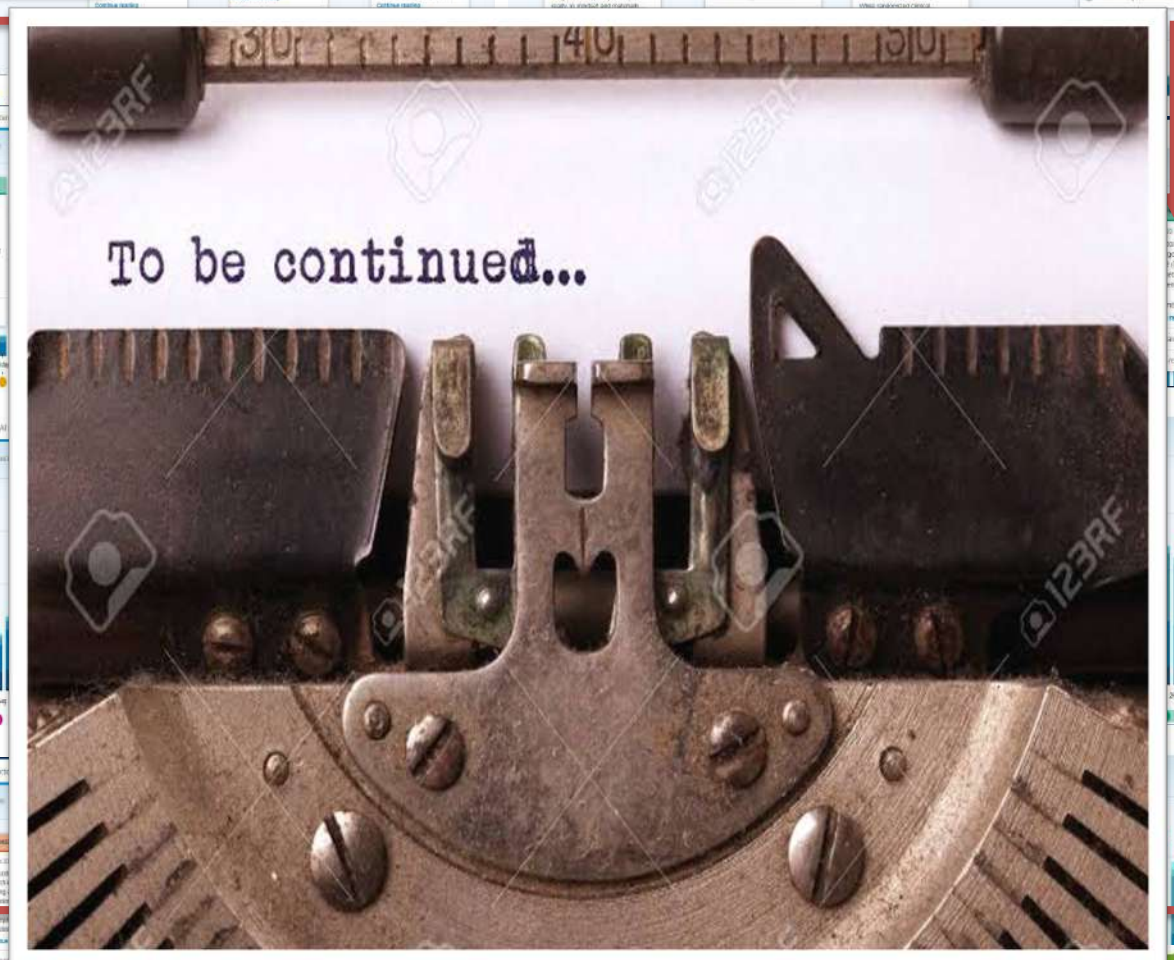
AMR nedeniyle ölüm10 milyon/yıl

2019 AMR nedeniyle ölüm bildirilen 1,27 milyon
Tahmin edilen 4,95 milyon/yıl

COVID-19 Pandemi Dönemi ve Antimikrobiyal Direnç Etkileri

- 1. El hijyenindeki değişiklik
- 2.COVID-19 ve diğer hastalıklara karşı aşılanma/aşılanmama
- 3. Yoğun antibiyotik kullanımı
- 4.Sağlık hizmetlerindeki değişiklikler (yorgunluk, tükenmişlik)

17 Kasım 2019



0?. ??. 2021

0?. ??. 202?

COVID-19'da antibiyotik vermeye eğilim

Kanıtlanmış ya da yüksek olasılık

- Kan, idrar Ag, balgam kültürü
- Sepsis, septik şok
- PCT >0,5 ng/mL
- Nötrofilik lökositoz

Kanıt yok ancak klinik ağır

- Yeni doğan, ileri yaş, akut fazları yüksek
- ARDS
- CRP >30 mg/dL
- Mekanik ventilasyon ihtiyacı
- Çoklu komorbiditesi mevcut

Antiviral etkinik ve profilaksi dışında

Antibiyotik başlamaya eyilim devam ediyor

COVID-19 pnömonisi

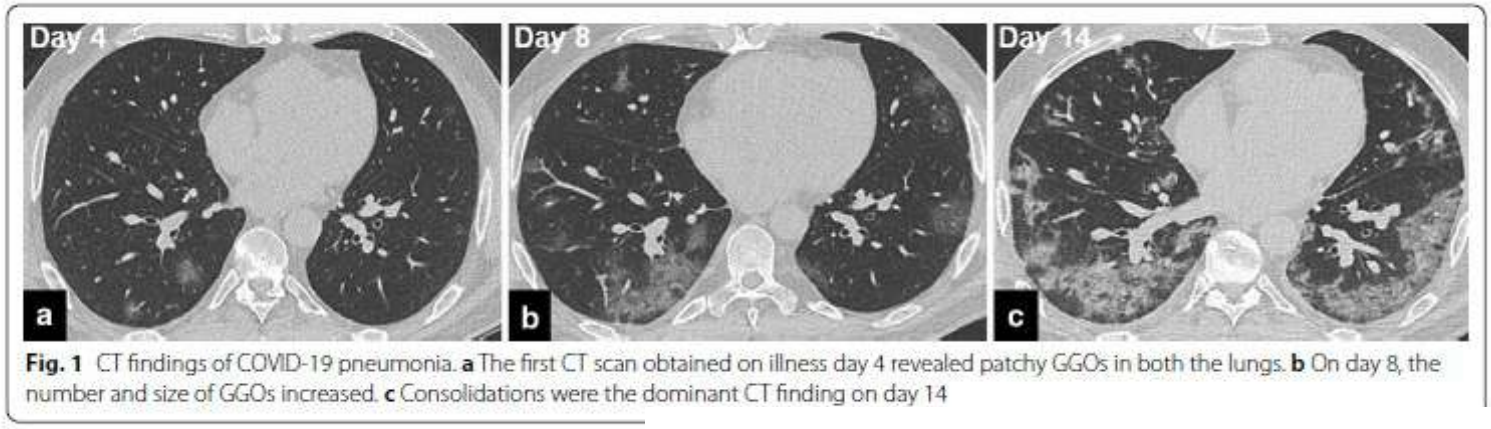


Fig. 1 CT findings of COVID-19 pneumonia. **a** The first CT scan obtained on illness day 4 revealed patchy GGOs in both the lungs. **b** On day 8, the number and size of GGOs increased. **c** Consolidations were the dominant CT finding on day 14

Tablo 1. COVID-19 enfeksiyonunda görülen radyolojik bulgular

Tipik bulgular	Atipik bulgular
Buzlu cam opasitesi	Plevral sıvı
Konsolidasyon	Lenfadenopati
Kaldırım taşı	Perikardiyal sıvı
Hava bronkogramı	Kavitasyon
Hava yolu değişiklikleri, hava kisti	
Retiküler görünüm	
Nodüller (halo ve ters halo işareti ile birlikte)	

Table 1 CT findings of COVID-19 pneumonia and other infectious diseases

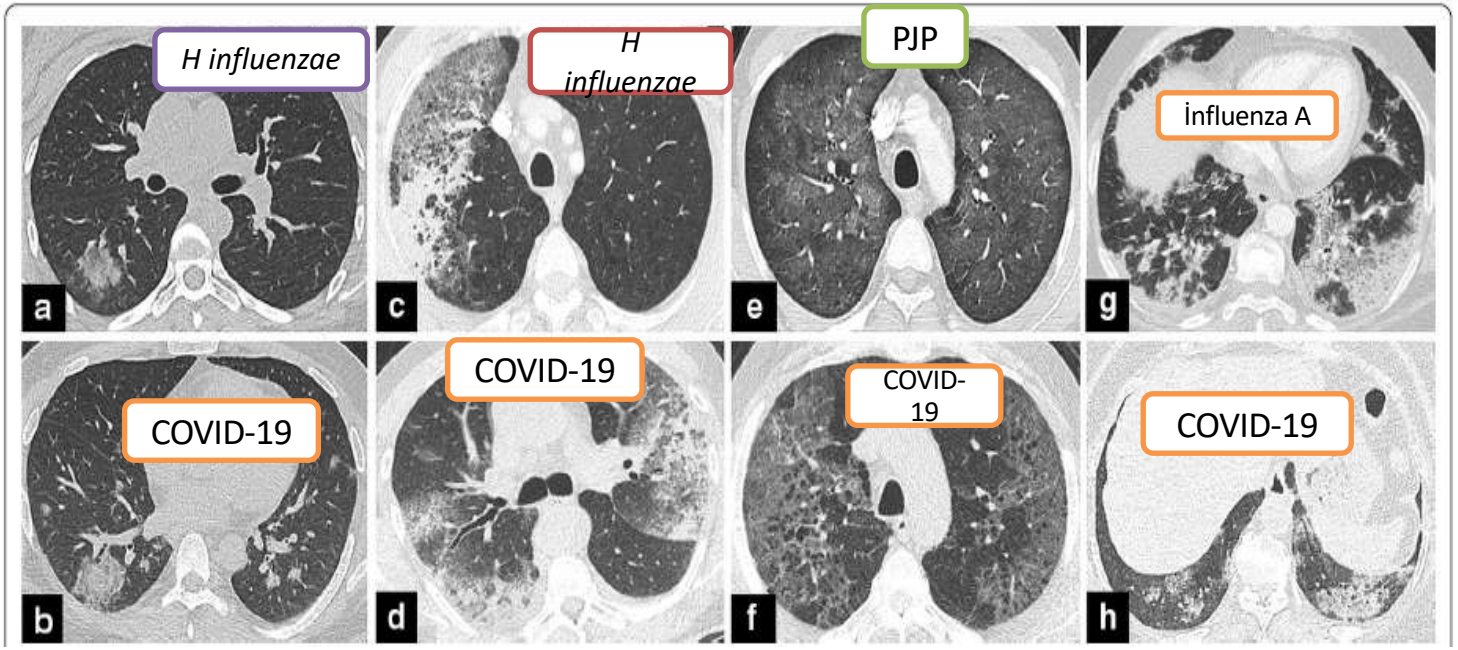
CT finding	COVID-19 pneumonia	Non-COVID viral pneumonia	Bacterial pneumonia	PJP	Fungal pneumonia
GGO	+++	++	+	+++	+
Consolidation	++	++	+++	0	+
Centrilobular nodular opacities	−−−	++	++	−	+
Crazy-paving	++	++	+	++	−
Lesion distribution					
Peripheral	+++	++	+	+	0
Lower zone	+++	++	+	+	0
Rounded morphology	+++	+	+	−−	++
Cavitation	−−−	−	+	−	++
Pleural effusion	−−	+	++	0	+
Lymphadenopathy	−−	+	++	0	+

The most common findings of aforementioned disease groups are presented. Signs indicate the strength of relation between the CT finding and diagnosis; in a range of (+++) and (−−−); (+++) indicating the strongest association

Ardali Düzgün S et al. Insights Imaging 2020; 11: 118

Sekonder infeksiyon??
Yeni ateş, PA Akc kaviter lezyon ya da lober konsolidasyon
Hızlı tanı testleri

Salgının ilk dönemlerinde tek merkezden PCR sonuçları gecikmelere neden oluyordu



Ardali Düzgün S et al. Insights Imaging 2020; 11: 118

Meta analiz
118 yayın incelenmiş (Birleşik Krallık)

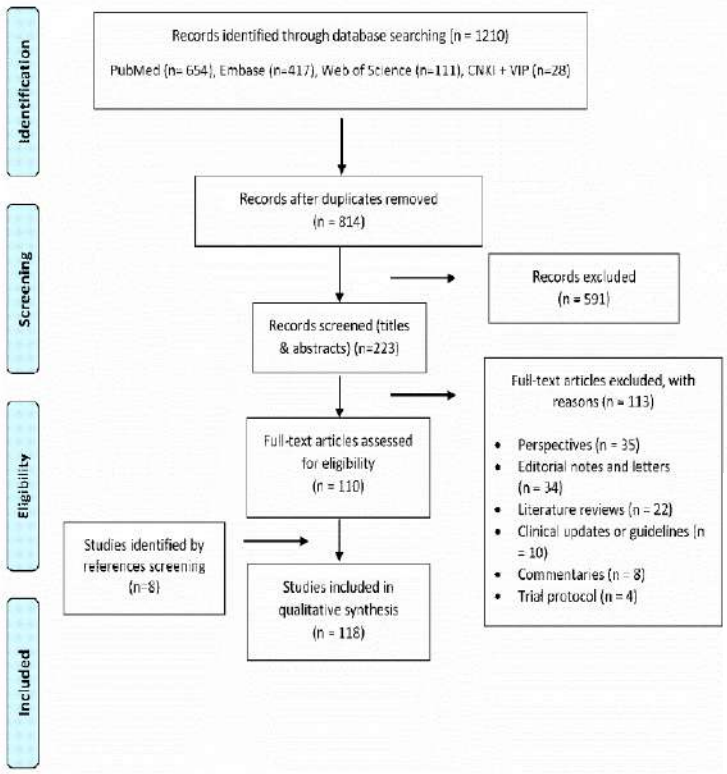


Figure 1. Prisma chart.

antibiotics
MDPI

Review

Antimicrobial Use in COVID-19 Patients in the First Phase of the SARS-CoV-2 Pandemic: A Scoping Review

Wenjuan Cong [1,*], Ak Narayan Poudel [2], Nour Alhusein [1], Hexing Wang [3], Guiqing Yao [2] and Helen Lambert [1]

Table 1. Severity of illness and antibiotic prescribing.

Illness Severity of COVID-19 Patients	Patient Size *n* (%)	Mean Antibiotic Prescribing (%)
Severe and critical patients	2630 (41.9)	75.4
Mild and moderate	3649 (58.1)	75.1
Total	6279 (100.0)	75.2

Table 2. Antibiotic prescribing categories and outcomes.

SN	Category of Antibiotic Prescribing	LOS (Mean Days)	Discharge (Mean%)	Mortality (Mean%)
1	All given abs (58 studies)	12.5	76.2	26.5
2	Majority are given abs (37 studies)	14.3	57.9	13.1
3	Majority not given abs (11 studies)	10.3	73.2	2.3

Cong W et al. Antibiotics 2021; 10: 1-14

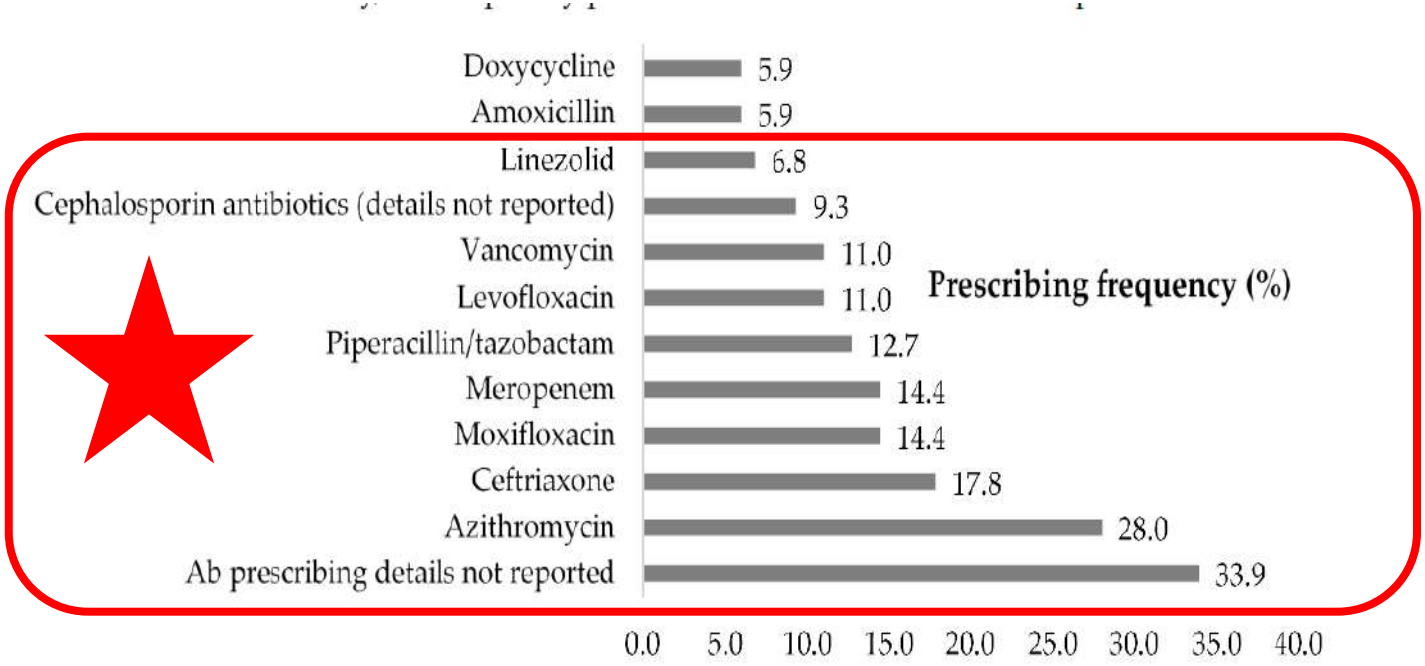


Figure 2. Frequently prescribed antibiotics for hospitalized COVID-19 patients.

Cong W et al. Antibiotics 2021; 10: 1-14

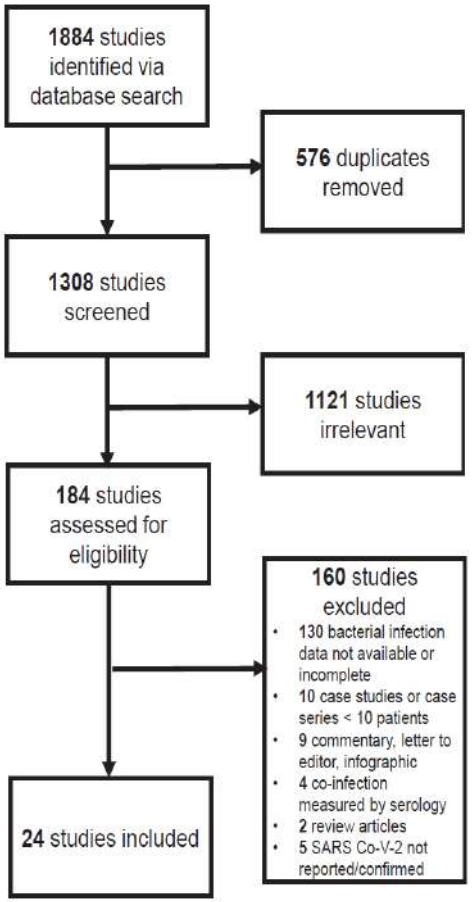


Fig. 1. Study flow diagram.

Clinical Microbiology and Infection 26 (2020) 1622–1629

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journal homepage: www.clinicalmicrobiologyandinfection.com

Systematic review

Bacterial co-infection and secondary infection in patients with COVID-19: a living rapid review and meta-analysis

Bradley J. Langford [1, 2, *], Miranda So [3, 4, 5], Sumit Raybardhan [6], Valerie Leung [1, 7], Duncan Westwood [8], Derek R. MacFadden [9], Jean-Paul R. Soucy [10], Nick Daneman [1, 4, 8, 11]

Lanford BJ et al. CMI 2020; 26: 1622-9

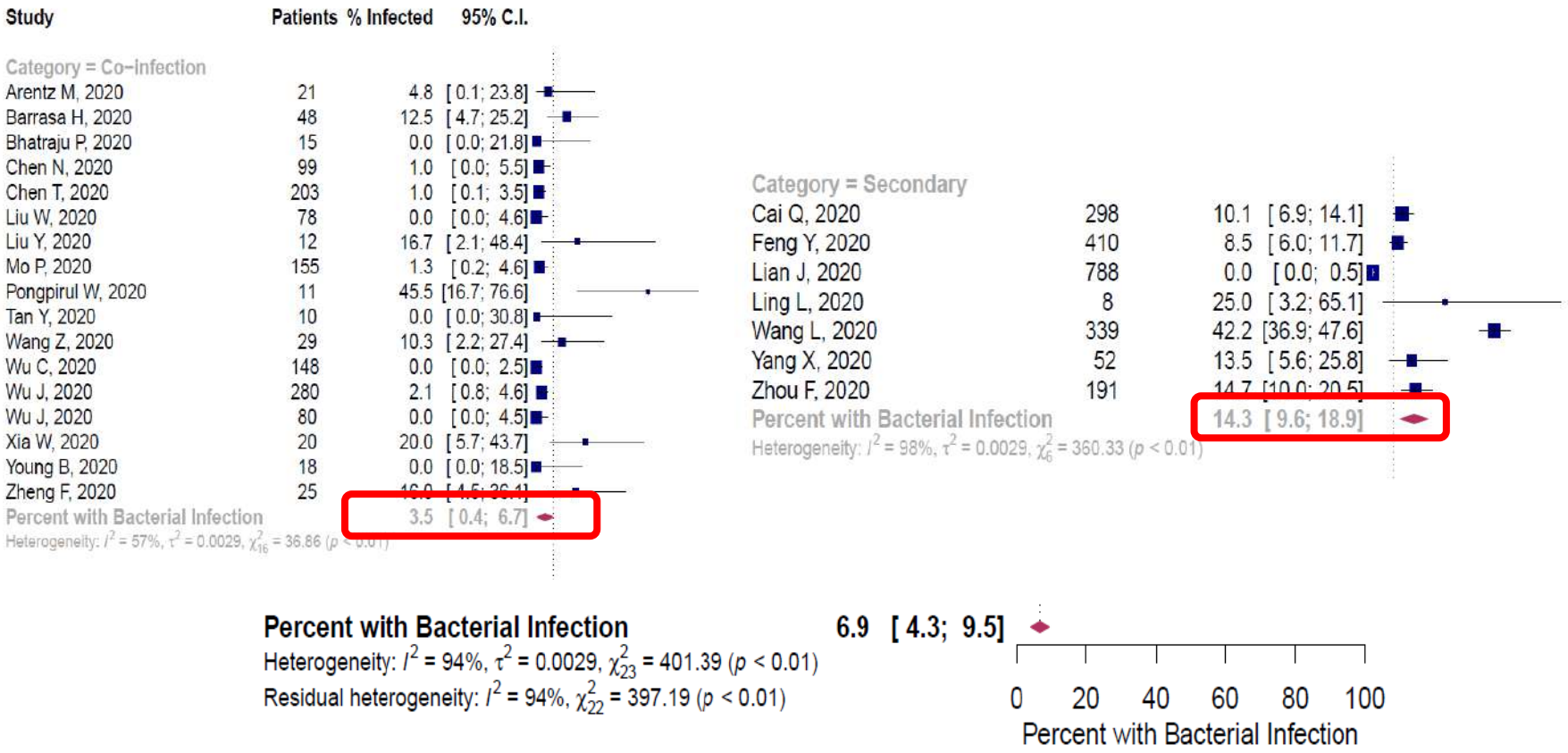


Fig. 2. Percentage of patients with COVID-19 and bacterial co-infection or secondary infection.

Lanford BJ et al. CMI 2020; 26: 1622-9

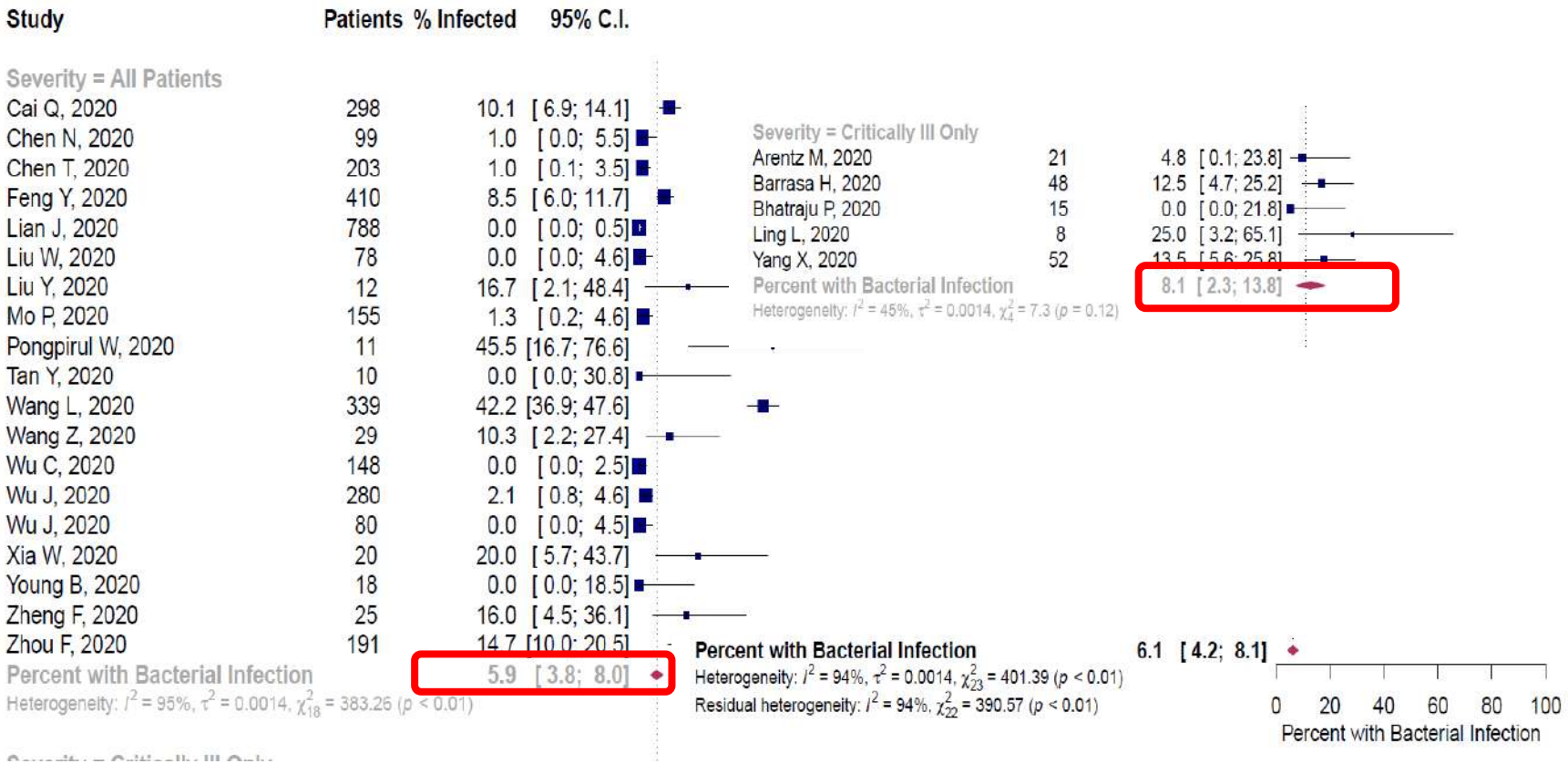


Fig. 3. Percentage of patients with COVID-19 and bacterial infection stratified by estimated severity of illness.

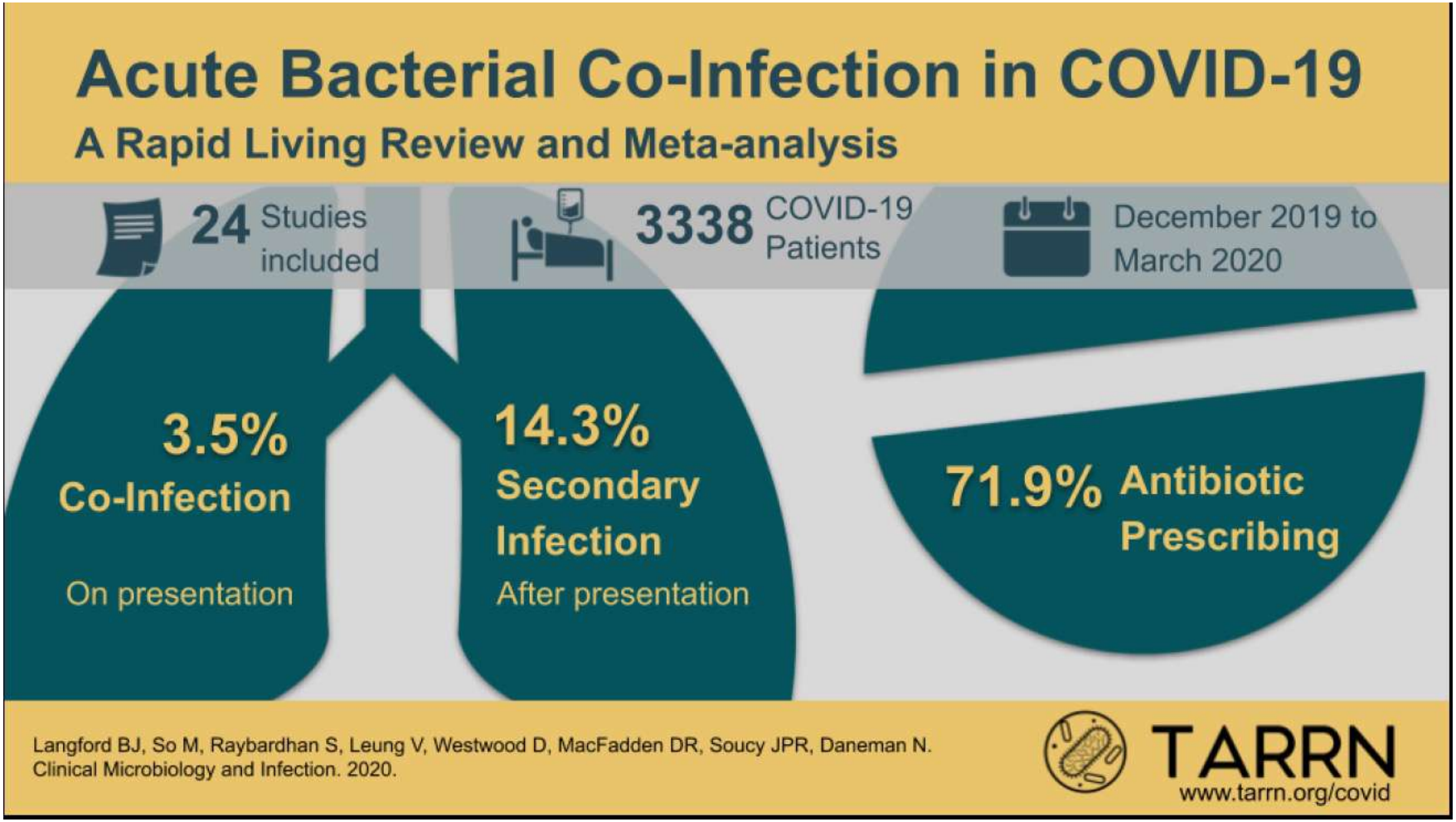
Lanford BJ et al. CMI 2020; 26: 1622-9

Table 1
Study, patient, and infection characteristics

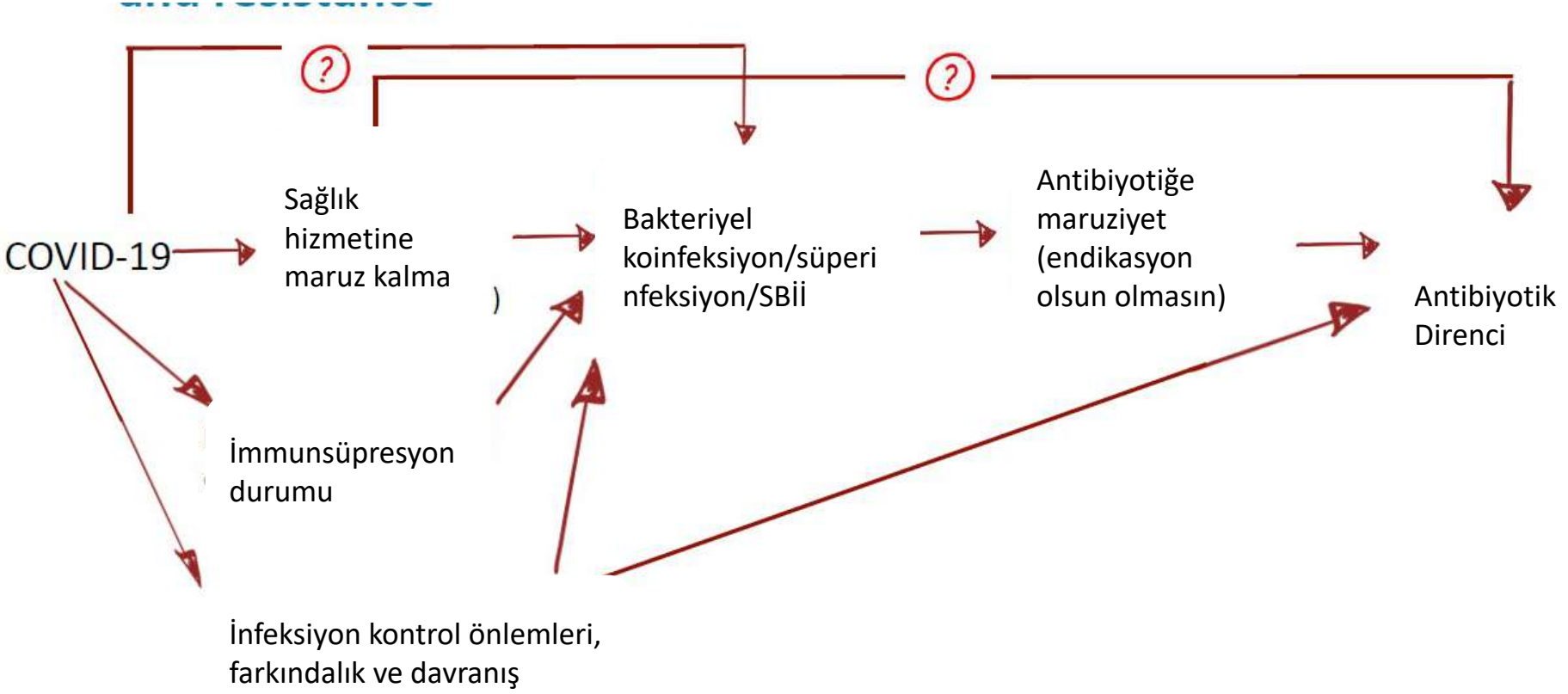
Author, year	Country	Setting	Sample size	Age	Female (n, %)	Bacteria diagnostic method	Infection type	Bacterial infection (n, %)	Antibiotic use (%)
Arentz M, 2020	USA	ICU (critically Ill)	21	70 (mean)	10 (47.6)	Unspecified	Co-infection	1 (4.8)	Unspecified
Barrasa H, 2020	Spain	ICU (critically ill)	48	63 (median)	21 (43.8)	Unspecified	Co-infection	6 (12.5)	87.5
Bhatraju P, 2020	USA	ICU (critically ill)	15	64 (mean)	9 (37.5)	Respiratory, blood culture	Co-infection	0 (0.0)	Unspecified
Cai Q, 2020	China	Hospital	298	48 (median)	153 (51.3)	Unspecified	Secondary	30 (10.1)	12.4
Chen N, 2020	China	Hospital	99	56 (mean)	32 (32.3)	Respiratory culture	Co-infection	1 (1.0)	70.7
Chen T, 2020	China	Hospital	203	54 (median)	95 (46.8)	Unspecified	Co-infection	2 (1.0)	Unspecified
Feng Y, 2020	China	Hospital	410	53 (median)	205 (43.1)	Respiratory culture	Secondary	35 (8.5)	67.0
Lian J, 2020	China	Hospital	788	46 (mean)	381 (48.4)	Unspecified	Secondary	0 (0.0)	Unspecified
Ling L, 2020	China	ICU (critically ill)	8	64.5 (mean)	4 (50.0)	Unspecified culture	Co-infection Secondary	0 (0.0) 2 (25.0)	100.0
Liu W, 2020	China	Hospital	78	38 (median)	39 (50.0)	Respiratory NAAT	Co-infection	0 (0.0)	Unspecified
Liu Y, 2020	China	Hospital	12	54 (mean)	4 (33.3)	Unspecified	Co-infection	2 (16.7)	Unspecified
Mo P, 2020	China	Hospital	155	54 (median)	69 (44.5)	Unspecified	Co-infection	2 (1.3)	Unspecified
Pongpirul W, 2020	Thailand	Hospital	11	56 (mean)	5 (45.5)	Respiratory NAAT	Co-infection	5 (45.4)	55.5
Tan Y, 2020	China	Hospital (children)	10	7 (mean)	7 (70.0)	Respiratory culture	Co-infection	0 (0.0)	10.0
Wang L, 2020	China	Hospital (adults >60)	339	71 (mean)	173 (51.0)	Unspecified	Secondary	143 (42.2)	Unspecified
Wang Z, 2020	China	Hospital	29	42 (median)	37 (53.6)	Respiratory culture	Co-infection	3 (10.3)	98.6
Wu C, 2020	China	Hospital	148	51 (median)	73 (36.3)	Respiratory culture	Co-infection	0 (0.0)	97.5
Wu J, 2020	China	Hospital	280	43 (median)	129 (46.1)	Respiratory culture	Co-infection	6 (2.1)	67.1
Wu J, 2020	China	Hospital	80	46 (mean)	41 (51.3)	Respiratory culture	Co-infection	0 (0.0)	91.3
Xia W, 2020	China	Hospital (children)	20	2 (median)	7 (35.0)	Unspecified	Co-infection	4 (20.0)	Unspecified
Yang X, 2020	China	ICU (critically Ill)	52	60 (mean)	17 (32.7)	Respiratory, blood culture	Secondary	7 (13.5)	94.2
Young B, 2020	Singapore	Hospital	18	47 (median)	9 (50.0)	Unspecified	Co-infection	0 (0)	Unspecified
Zheng F, 2020	China	Hospital (children)	25	3 (median)	11 (44.0)	Unspecified	Co-infection	4 (16.0)	52.0
Zhou F, 2020	China	Hospital	191	56 (median)	72 (37.7)	Respiratory, blood culture	Secondary	28 (14.7)	94.8

NAAT, nucleic acid amplification.

Lanford BJ et al. CMI 2020; 26: 1622-9



Bakteriyel infeksiyon riski
Mekanik ventilasyon varlığında X 1,4
YB'da yatış durumunda X 18,8


?
?
COVID-19
Sağlık hizmetine maruz kalma
Bakteriyel koinfeksiyon/süperi nfeksiyon/SBİİ
Antibiyotiğe maruziyet (endikasyon olsun olmasın)
Antibiyotik Direnci
İmmunsüpresyon durumu
İnfeksiyon kontrol önlemleri, farkındalık ve davranış

COVID-19 - antimikrobiyal kullanım ve direnç üzerindeki etkisi?

JAC Antimicrob Resist
doi:10.1093/jacamr/dlaa049

JAC-Antimicrobial Resistance

PRO: The COVID-19 pandemic will result in increased antimicrobial resistance rates

JAC-Antimicrobial Resistance

JAC Antimicrob Resist
doi:10.1093/jacamr/dlaa051

CON: COVID-19 will not result in increased antimicrobial resistance prevalence

Peter Collignon [1,2]* and John J. Beggs[3]

JAC Antimicrob Resist
doi:10.1093/jacamr/dlaa051

JAC-Antimicrobial Resistance

CON: COVID-19 will not result in increased antimicrobial resistance prevalence

Peter Collignon [1,2]* and John J. Beggs[3]

- Düzelen İnfeksiyon kontrol önlemleri
  - El hijyeni önemi
  - İnfluenzaya maruziyet azalması (aşı, ve diğer önlemler)
  - Seyahat kısıtlamsı
  - Sosyal izolasyon, sosyal mesafe
  - Diğer solunum yolu infeksiyonlarında azalma
    - Dolayısıyla ikincil infeksiyonlarda azalma
    - Antibiyotik maruziyetinde azalma

JAC Antimicrob Resist
doi:10.1093/jacamr/dlaa049

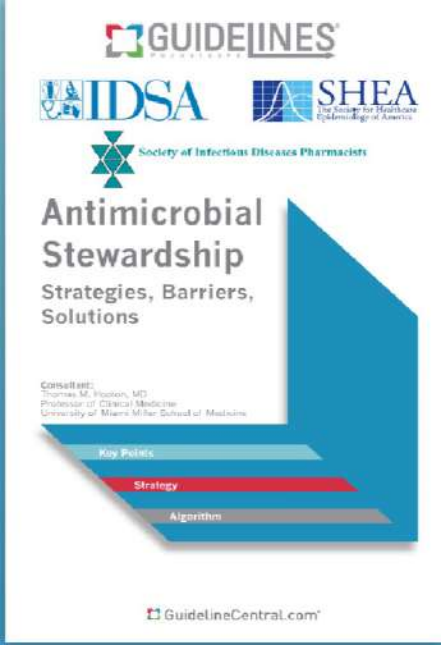
JAC-Antimicrobial Resistance

AMR'yi COVID-19 dönemi daha karmaşık hale getirdi

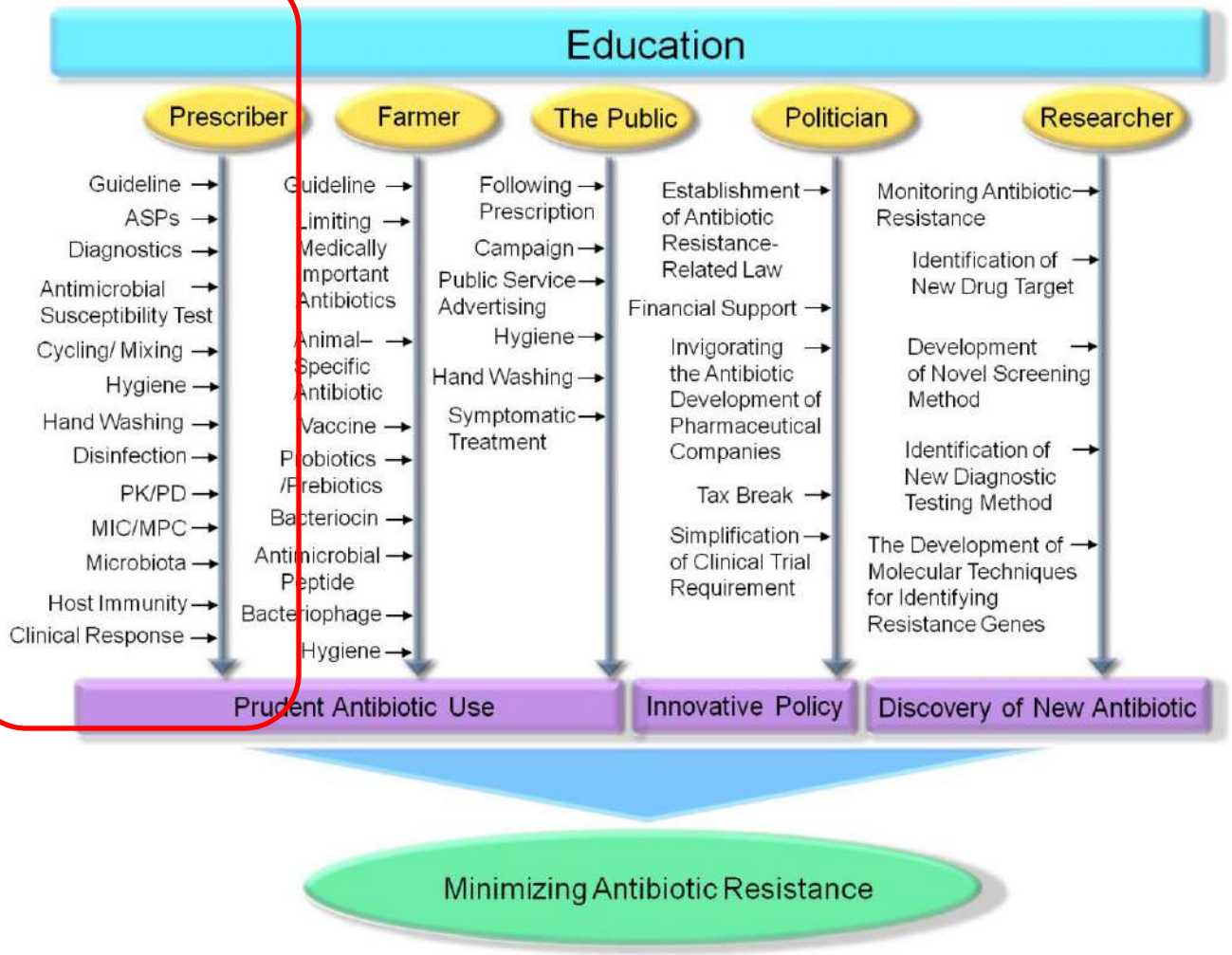
PRO: The COVID-19 pandemic will result in increased antimicrobial resistance rates

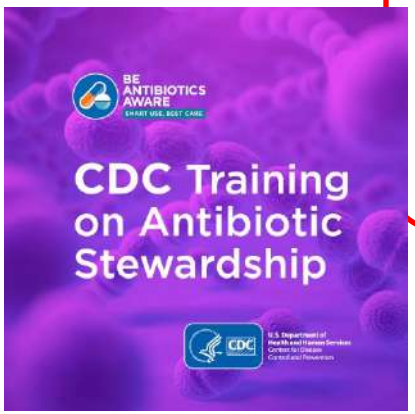
Cornelius J. Clancy[1,2]*, Deanna J. Buehrle[2] and M. Hong Nguyen[1]

- Erken verilerde koinfeksiyon ≈%10-35 (!!), ampirik antibiyotik kullanımı %70-100
  - Yatan hastaların demografik özelliklerinde ki farklılıklar
  - Ampirik antibiyotik kullanımının yoğun olması
  - COVID-19 ve bakteriyel infeksiyon tanılarında zorluklar ve farklı ülkelerde farklı olanaklar



İlk 2014'te Antimikrobiyal Yönetimden bahsedildi





Akılcı Antibiyotik Kullanımı

Doğru hasta????!!!!!

Doğru Tanı
Doğru Antibiyotik
Doğru Doz
Doğru Süre

Prof. Dr. Halis AKALIN

Tablo 1. Antibiyotik direncinin ortaya çıkması ve yayılmasını önleyici stratejiler

I. Antibiyotik kullanımındaki stratejiler (Antibiyotik kullanımının yönetimi)
1. Antibiyotik kullanımının kısıtlanması
2. Antibiyotik kullanımı ve direnç profiline dayanarak hastane formülerinde sınırlama veya kısıtlama
3. Antibiyotik kullanımının kılavuz ve protokoller kullanılarak yapılması (optimal hale getirilmesi)
4. Gereksiz antibiyotik kullanımından kaçınmak (endikasyon varlığında antibiyotik kullanımı)
5. Uygun tanı yöntemlerinin kullanılması
6. Uygun ampirik antibiyotik kullanımı (lokal epidemiyolojik bulgulara dayanarak uygun antibiyotik seçimi)
7. Antibiyotik tedavisinde de-eskalasyon
8. Antibiyotik tedavi sürelerinin kısaltılması
9. Farmakokinetik/farmakodinamik parametrelerin dikkate alınması
10. Rotasyon şeklinde antibiyotik kullanımı ve programlı antibiyotik değişimi (heterojen antibiyotik kullanım politikaları)
II. Enfeksiyon kontrolü stratejileri

Akalın H. TC Saglık Bakanlığı Türkiye akılcı İlaç Kullanımı Bült2016; 3: 1-10

PENICILLIN'S FINDER ASSAYS ITS FUTURE

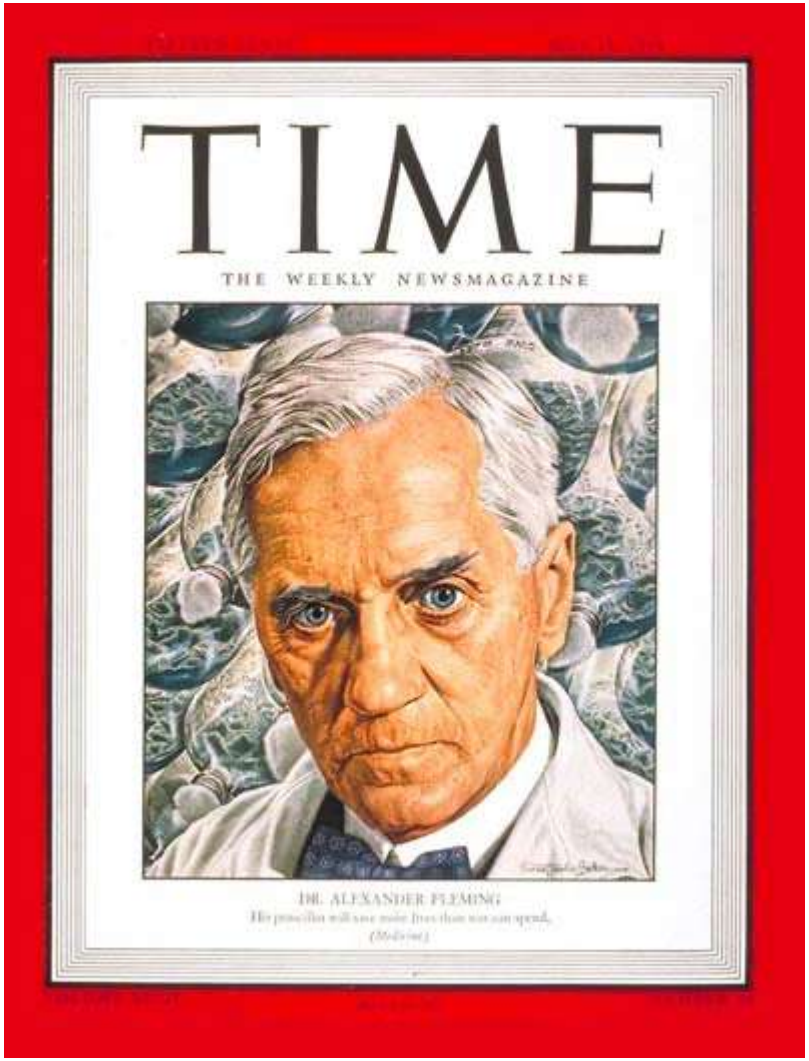
Sir Alexander Fleming Says Improved Dosage Method Is Needed to Extend Use

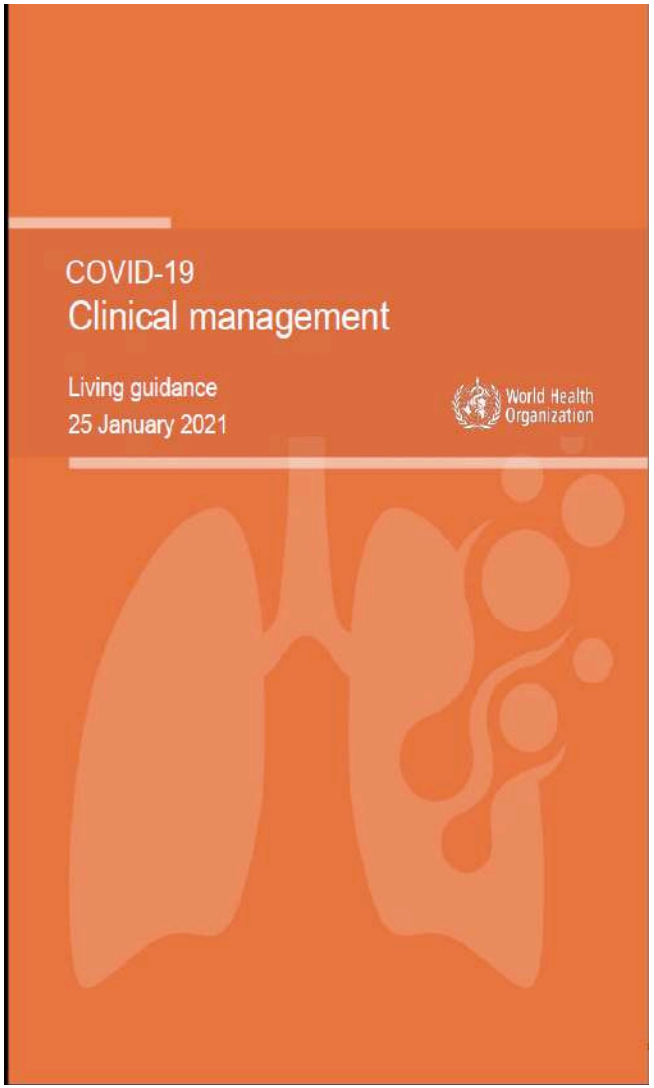
Sir Alexander Fleming, discoverer of penicillin, said last night that a better method of administering the drug than by injection every two or three hours as at present was needed to extend its use. The British scientist warned, however, in speaking at a dinner in his honor in the Hotel Waldorf-Astoria, that administration by mouth would lead to "self-medication and all its abuses."

He gave full credit to the American Pharmaceutical Manufacturers Association for the "phenomenal increase in production" of penicillin to the point where it was

Sir Alexander Fleming (New York Times-1945)

Laboratuvarda penisilini mikropları öldürmeye yetmeyecek kadar maruz bırakırsak, antibiyotiğe direnç geliştirmesi hiç te zor değil, bu durum sıklıkla vücutta da meydana gelebilir)





15. Therapeutics and COVID-19

For the most up to date clinical practice guideline on therapeutics and COVID-19 see WHO website and BMJ website and MAGICapp.

By 17 December 2020 this guideline contains the following recommendations:

- Strong recommendations against the use of hydroxychloroquine and lopinavir/ritonavir in patients with COVID-19, regardless of disease severity.
- A strong recommendation for systemic corticosteroids in patients with severe and critical COVID-19.
- A conditional recommendation against systemic corticosteroids in patients with non-severe COVID-19.
- A conditional recommendation against remdesivir in hospitalized patients with COVID-19.

Acute coinfections with bacteria

We recommend for patients with suspected or confirmed mild COVID-19, against the use of antibiotic therapy or prophylaxis.

We recommend for patients with suspected or confirmed moderate COVID-19, that antibiotics should not be prescribed unless there is clinical suspicion of a bacterial infection.

We recommend for patients with suspected or confirmed severe COVID-19, the use of empiric antimicrobials to treat all likely pathogens, based on clinical judgment, patient host factors and local epidemiology, and this should be done as soon as possible (within 1 hour of initial assessment if possible), ideally with blood cultures obtained first. Antimicrobial therapy should be assessed daily for de-escalation.

Kılavuz	Antimikrobiyal önerisi
Ulusal Sağlık Enstitüleri (NIH)	-Ciddi/kritik COVID-19 hastalarında, bkanıt yoksa ampirik geniş spektrumlu antimikrobiyal tedavi önermek için yeterli veri yok (BIII) Başlanma durumunda olumsuz sonuçları en aza indirmek için hastalar günlük olarak yeniden değerlendirilmelidir (AIII)
Dünya Sağlık Örgütü (DSÖ)	Hafif COVID-19: öneri yok Orta derecede COVID-19: Bakteriyel enfeksiyona dair klinik şüphe yoksa öneri yok Şiddetli COVID-19: Olası tüm patojenlere yönelik ampirik başlanır (hasta, yaş, epidemiyolojik veriere) ve hasta günlük olarak değerlendirilmelidir
Sepsis ve Septik Şok Yönetimi Kampanyası: COVID-19'lu kritik hasta yetişkinlerin yönetimine ilişkin yönergeler	Mekanik ventilasyon uygulanan hastalara ampirik antimikrobiyallerin/antibakteriyel ajanların kullanılması önerisi var(zayıf görüş, düşük kanıt) Her gün yeniden değerlendirilmeli

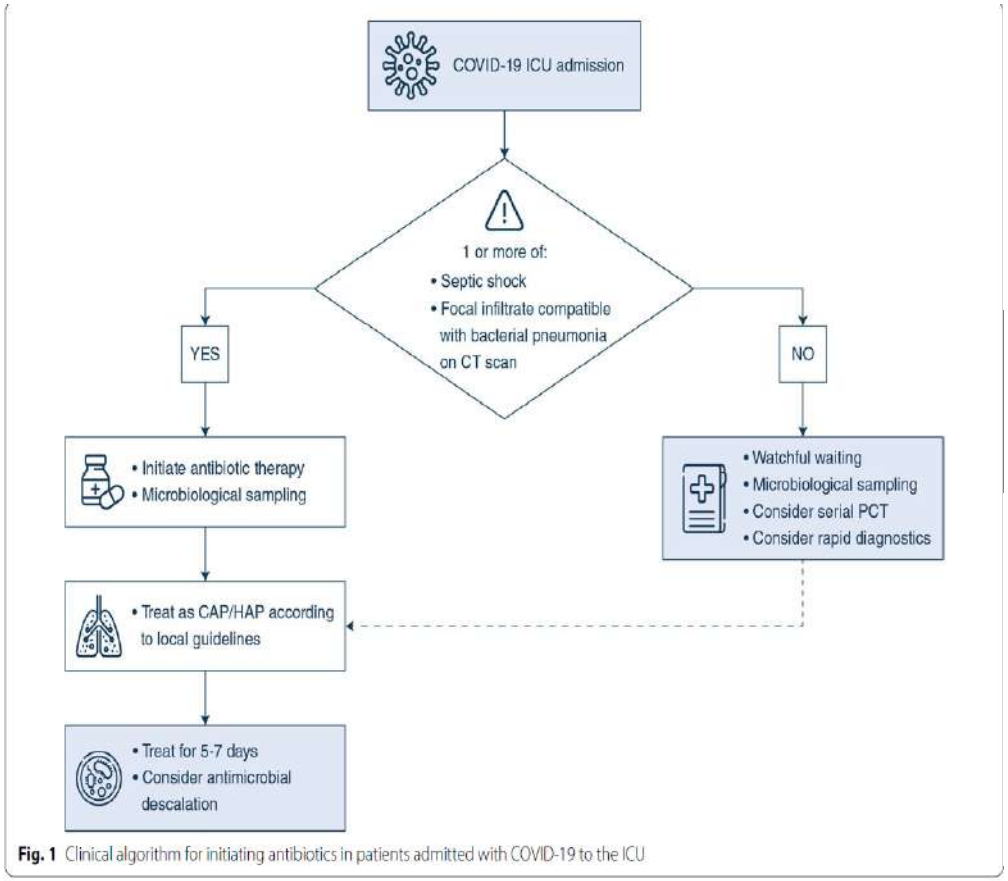


Fig. 1 Clinical algorithm for initiating antibiotics in patients admitted with COVID-19 to the ICU

Intensive Care Med (2021) 47:104–106
https://doi.org/10.1007/s00134-020-06278-x

WHAT'S NEW IN INTENSIVE CARE

Antimicrobial stewardship in ICUs during the COVID-19 pandemic: back to the 90s?

Jan J. De Waele[1*], Lennie Derde[2,3] and Matteo Bassetti[4]

SARS-CoV-2 infection has arguably been one of the most ... develops, this is typically later in the clinical course, pro...

antibiotics

MDPI

Perspective

The Need for Ongoing Antimicrobial Stewardship during the COVID-19 Pandemic and Actionable Recommendations

Wei Ping Khor [1], Omotayo Olaoye [1], Nikki D'Arcy [1], Eva M. Krockow [2], Rasha Abdelsalam Elshenawy [3], Victoria Rutter [1] and Diane Ashiru-Oredope [1,*]

[1] Commonwealth Pharmacists Association, London E1W 1AW, UK; weiping.khor@commonwealthpharmacy.org (W.P.K.); omotayo.olaoye@commonwealthpharmacy.org (O.O.);

Pandemi Döneminde AMY

Fırsatlar

- İş birliği
- Tanı
- Tedavi (kılavuz geliştirme

Engeller

- Tanı zorluğu
  - Örnek solunum örneklerinin alımında zorluk
- Koinfeksiyon olasılığı net değil
  - Beklendiği kadar mı? Daha az mı?
- Personel azlığı/yoğunluğu

- Solunum örneklerinde viral panel

- Balgam kültürü
- Bronkoskopi

AMY Temel Faaliyetleri-(COVID-19'a uyarlanmış)

- Liderlik (İnfeksiyon hastalıkları uzmanları)
- Eğitim
- Prospektif denetim ve Geri bildirim
- Kısıtlı formül ve ön yetkilendirme
- Tedavide daraltma (de-eskalasyon), ''zaman aşımı''
- IV'den PO'e geçiş
- Mikrobiyoloji laboratuvar desteği
- İnfeksiyon kontrol ve önleme programları
- Tedavi ve klinik kılavuzlar

MazdeyasnaH, et al. CurrInfect Dis Rep. 2020;22(9):23.

Liderlik

- Daha çok infeksiyon hastalıkları uzmanı olmalı
- Organizasyonu yapabilmeli
- Gerekli müdahaleleri yapabilmeli

Eğitim

- Gerçek zamanlı eğitimler
- Aplikasyon
- Elektronik posta
  - Kılavuzlara uyumu hatırlatma
- Kılavuzlar

Sürekli yenilenmeye açık olmalı

Eğitim-Hemşire

- Tedaviye başlamadan uygun zamanda kültür alma konusunda eğitilmeli
- Tedavi süresi, endikasyonu açısından bilgi sahibi olmalı
- Yan etki, ilaç alerjiyi iyi değerlendirmeli

Eğitim-Eczacı

- Klinik eczacı (özel eğitimli)
- Klinik farmakolog olmalı
- Liderin yardımcısı olması

IV'den oral'e geçiş için uyarı

Uzamış tedavide uyarı sistemi

İlaç ilaç etkileşimleri konusunda uyarıda bulunma

Antibiyotik endikasyonu belgelenmeli

Cerrahi profilaksiyi otomatik kesme

Özellikle çoklu tedavilerde uyarıda bulunma

KC, böbrek fonksiyonlarına göre doz ayarlama

İntravenözden Oral Forma Geçiş

- Yatış süresini kısaltma
- IV ilişkili infeksiyonlarda ve SBİİ ‘ları azaltma
- Personel iş yükünü azaltma

- Otomatik IV-PO geçiş protokolleri oluşturmak
- Hemşire/eczane tarafından uyarılma

Prospektif denetim ve Geri bildirim-İzleme

- Uzamış antibiyotikler için hemşire/eczane/otomatik sistem temelli uyarı (Alarm sistemi)

- Antibiyotik reçeteleme
  - DDD ya da DOT (hastane kendisine uygun olanı seçmeli)
  - *Cl difficile* takibi
  - Antimikrobiyal yan etkiler

- Sürveyans (AMR)
  - Sürveyans verileri reçete yazan, eczacı, yönetim ile periyodik paylaşılmalı

Prospektif denetim ve Geri bildirim-İzleme

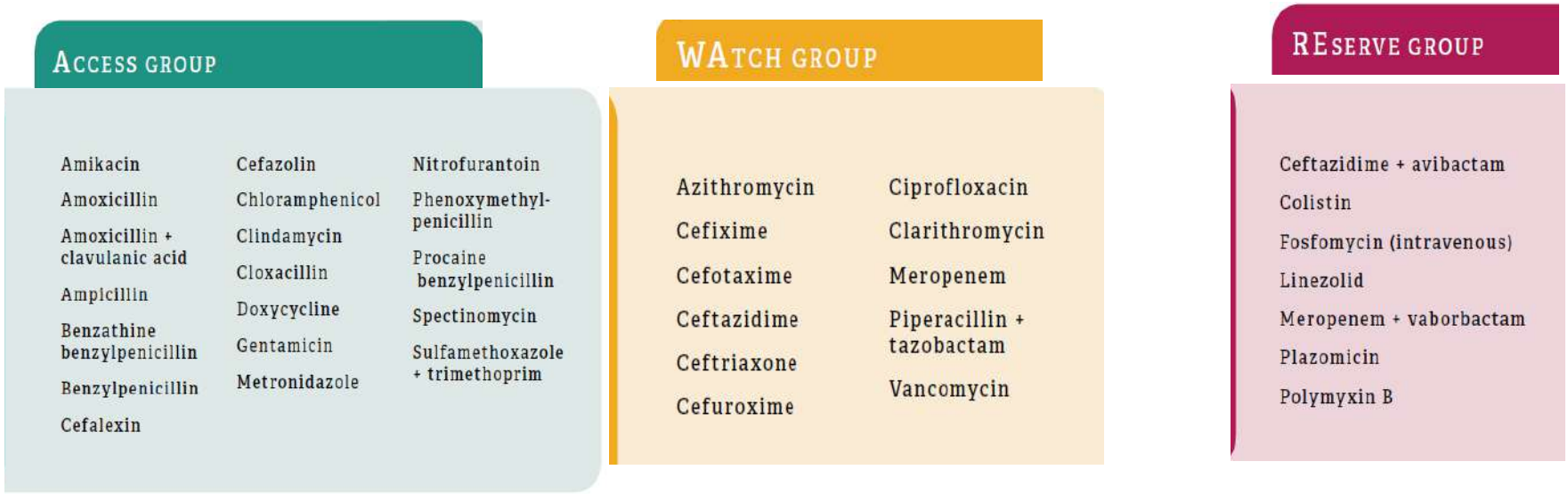
- IV-oral geçiş
- De-eskalasyon

Kaçırılan fırsat var mı???

- Hastaların prognozu
- Taburculuk sırasında antibiyotik (gerekli/gereksiz) reçete edilme

Kısıtlama ve Ön yetkilendirme

- Antibiyotik onayı (EHU)
  - Ciddi infeksiyonlarda tedavi geciktirmeyecek şekilde düzenlenmeli
  - Kılavuzların yol gösterici olması



Doz Optimizasyonu - Optimal Tedavi Süresi –De-eskalasyon

- Antibiyotik dozu bireyselleştirilmeli, ilaç-ilaç etkileşimi, renal-kc fonksiyonları
- PK/PD ‘ye göre dozların ayarlanması
- 5. günde antibiyotik gerekli mi? Sorusunun sorulması
- Tedavi süresi: ayaktan/yatan hasta, mikrobiyolojik veriler, tanı, MDR varlığı belirler
- Zaman aşımı (time out) uyarı sistemi (hemşire/eczacı/otomatik sistem..)

Düşük doz R’i seçer
Yüksek doz yan etki artar

Mikrobiyoloji Laboratuvarı

- Yeterli donanımda olması
  - Hızlı tanı testleri (Sendromik testler)
  - COVID-19 tanı testlerinin erken sonuçlanması
  - Serolojik testler
- Sonuçların elektronik ortamda ve hızlı paylaşılması

1,5 saat içinde sonuç

European Journal of Clinical Microbiology & Infectious Diseases
https://doi.org/10.1007/s10096-021-04213-6

BRIEF REPORT

Impact of rapid multiplex PCR on management of antibiotic therapy in COVID-19-positive patients hospitalized in intensive care unit

Naouale Maataoui[1,2] · Lotfi Chemali[2] · Juliette Patrier[3] · Alexy Tran Dinh[4,5] · Lucie Le Fèvre[3] · Brice Lortat-Jacob[4] · Mehdi Marzouk[3] · Camille d'Humières[1,2] · Emilie Rondinaud[1,2] · Etienne Ruppé[1,2] · Philippe Montravers[4,5] · Jean-François Timsit[1,3] · Laurence Armand-Lefèvre[1,2]

Received: 30 November 2020 / Accepted: 25 February 2021

Table 2 (continued)

	Organisms	True positive (culture = mPCR)	False positive (mPCR +/culture −)	False negative (culture +/mPCR −)	True negative (culture +/mPCR −)	Se (%) [95% CI]	Sp (%) [95% CI]	PPV (%) [95% CI]	NPV (%) [95% CI]
Total		8	1	1	438	88.9	99.8	88.9	99.8
Atypical	*Chlamydia pneumoniae*	0	0	0	112	-	100.0	-	100.0
	Legionella pneumophila	0	0	0	112	-	100.0	-	100.0
	Mycoplasma pneumoniae	0	0	0	112	-	100.0	-	100.0
Total		0	0	0	336	-	100.0	-	100.0
Total		43	5	9	1959	82.7 [71.4-94.0]	99.7 [99.5-100.0]	89.6 [80.9-98.2]	99.5 [99.2-99.8]

Viral PPV %85,6; NPV %99,5

Bakteriyel
Kültür PPV %98,4; NPV %97
PCR PPV %90; NPV %96

M morganii ve *St maltophilia* ; R genleri açısından yanılma payı var
Kolonizasyonu ayırt edemeyebilir

European Journal of Clinical Microbiology & Infectious Diseases
https://doi.org/10.1007/s10096-021-04213-6

BRIEF REPORT

Impact of rapid multiplex PCR on management of antibiotic therapy in COVID-19-positive patients hospitalized in intensive care unit

Naouale Maataoui[1,2] · Lotfi Chemali[2] · Juliette Patrier[3] · Alexy Tran Dinh[4,5] · Lucie Le Fèvre[3] · Brice Lortat-Jacob[4] · Etienne Ruppé[1,2] · Philippe Montravers[4,5] ·

Table 2 Analytical performance of BioFire® FilmArray® Pneumonia plus Panel compared to culture, taking into account microbiological thresholds (A) and irrespective of thresholds (B). *Se*, sensitivity; *Sp*, specificity; *PPV*, positive predictive value; *NPV*, negative predictive value

	Organisms	True positive (culture = mPCR)	False positive (mPCR +/culture −)	False negative (culture +/mPCR −)	True negative (culture +/mPCR −)	Se (%) [95% CI]	Sp (%) [95% CI]	PPV (%) [95% CI]	NPV (%) [95% CI]
A									
Gram −	*Escherichia coli*	4	3	0	105	100.0	97.2	57.1	100.0
	Enterobacter cloacae complex	2	0	0	110	100.0	100.0	100.0	100.0
	Klebsiella aerogenes	4	2	0	106	100.0	98.1	66.7	100.0
	Klebsiella oxytoca	0	0	0	112	-	100.0	-	100.0
	Klebsiella pneumoniae group	2	4	0	106	100.0	96.4	33.3	100.0
	Proteus spp.	0	0	0	112	-	100.0	-	100.0
	Serratia marcescens	0	2	0	110	-	98.2	0.0	100.0
	Acinetobacter calcoaceticus-baumannii complex	1	2	0	109	100.0	98.2	33.3	100.0
	Pseudomonas aeruginosa	6	5	0	101	100.0	95.3	54.5	100.0
	Haemophilus influenzae	1	1	0	110	100.0	99.1	50.0	100.0
	Moraxella catarrhalis	0	0	0	112	-	100.0	-	100.0
Total		20	19	0	1193	100.0	98.4	51.3	100.0
Gram +	*Staphylococcus aureus*	5	4	0	103	100.0	96.3	55.6	100.0
	Streptococcus pneumoniae	0	0	0	112	-	100.0	-	100.0
	Streptococcus agalactiae	0	0	0	112	-	100.0	-	100.0
	Streptococcus pyogenes	0	0	0	112	-	100.0	-	100.0
Total		5	4	0	439	100.0	99.1	55.6	100.0
Atypical	*Chlamydia pneumoniae*	0	0	0	112	-	100.0	-	100.0
	Legionella pneumophila	0	0	0	112	-	100.0	-	100.0
	Mycoplasma pneumoniae	0	0	0	112	-	100.0	-	100.0
Total		0	0	0	336	-	100.0	-	100.0
Total		25	23	0	1968	100.0 [100.0-100.0]	98.8 [98.4-99.3]	52.1 [38.0-66.2]	100.0 [100.0-100.0]
B									
Gram −	*Escherichia coli*	7	0	2	103	77.8	100.0	100.0	98.1
	Enterobacter cloacae complex	2	0	0	110	100.0	100.0	100.0	100.0
	Klebsiella aerogenes	5	1	1	105	83.3	99.1	83.3	99.1
	Klebsiella oxytoca	0	0	0	112	-	100.0	-	100.0
	Klebsiella pneumoniae group	4	2	1	105	80.0	98.1	66.7	99.1
	Proteus spp.	0	0	2	110	0.0	100.0	-	98.2
	Serratia marcescens	2	0	0	110	100.0	100.0	100.0	100.0
	Acinetobacter calcoaceticus-baumannii complex	3	0	1	108	75.0	100.0	100.0	99.1
	Pseudomonas aeruginosa	11	0	1	100	91.7	100.0	100.0	99.0
	Haemophilus influenzae	1	1	0	110	100.0	99.1	50.0	100.0
	Moraxella catarrhalis	0	0	0	112	-	100.0	-	100.0
Total		35	4	8	1185	81.4	99.7	89.7	99.3
Gram +	*Staphylococcus aureus*	8	1	1	102	88.9	99.0	88.9	99.0
	Streptococcus pneumoniae	0	0	0	112	-	100.0	-	100.0
	Streptococcus agalactiae	0	0	0	112	-	100.0	-	100.0
	Streptococcus pyogenes	0	0	0	112	-	100.0	-	100.0

NPV yüksek
Antibiyotik kullanımını azaltabilir
Deeskalasyona erken dönemde olanak sağlar

Mikrobiyoloji Laboratuvarı

- Rehberlere uygun ve seçici antibiyotik duyarlılık testi bildirilmeli

- Raporda kolonizasyon, kontaminasyon uyarılarında bulunmalı

Antimicrobial agent[a] (n° of strains)	CLSI susceptibility breakpoint (mg/L)	EUCAST susceptibility breakpoint (mg/L)	CLSI %S	EUCAST %S	Type of discrepancy [b]
Penicillin (934)	≤0.12	≤0.25	99.9	100	-
Azithromycin (22.884)	≤0.5	≤0.25	91.7	91.2	-
Clindamycin (10.994)	≤0.25	≤0.5	96.6	96.7	-
Levofloxacin (26.775)	≤2	≤1	99.0	93.1	minor
Vancomycin (10.728)	≤1	≤2	100	100	-
Tetracycline (2.413)	≤2	≤1	83.9	83.7	-

§ CLSI [11] and EUCAST [13].
[a] For Erythromycin, Clarithromycin, Linezolid and Daptomycin CLSI and EUCAST suggested the same susceptibility breakpoints.
[b] Discrepancy as defined in the materials and methods section.

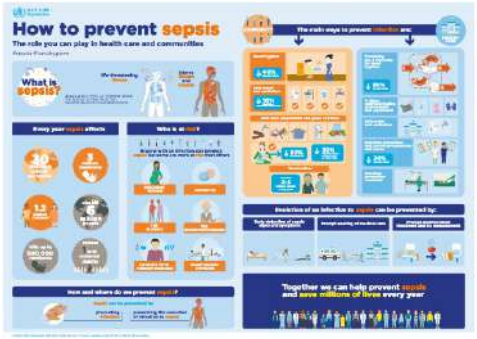
Kılavuzlar

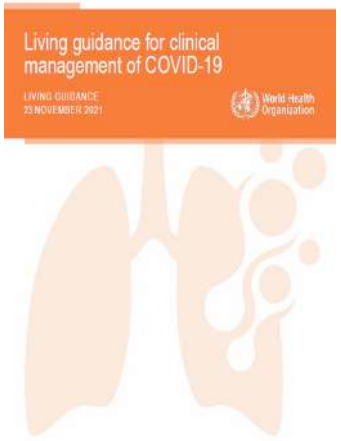
- Pandeminin fırsata çevrilmesi açısından önemli
- Tedavi kılavuzları
  - Hastanenin özellikleri (gelen hasta potansiyeli, bölgesel direnç…)
  - Antibiyotik seçimi, süresi, dozu
- Cerrahi profilaksi kılavuzu

TK pnömoni,
İYE,
DYD,
İE,
TK menenjit

Kılavuzlar

- AMY + Sepsis tanı ve tedavi yönetimi + COVID tanı ve tedavi kılavuzları entegre edilmeli

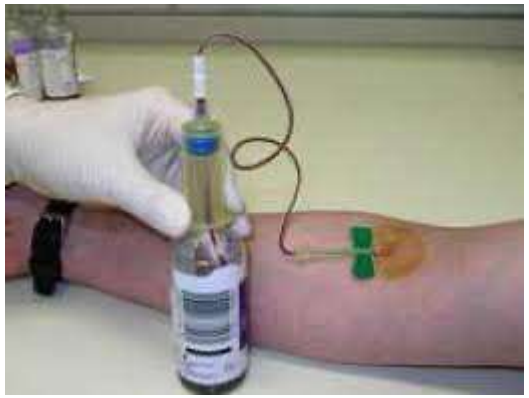




Kılavuzlar

- Tanı için uygun örnek alma, zamanlama, PCT, görüntüleme konusunda da madde olmalı

- Kılavuzlar mobil/elektronik ortama adapte edilmeli



Kılavuzlar

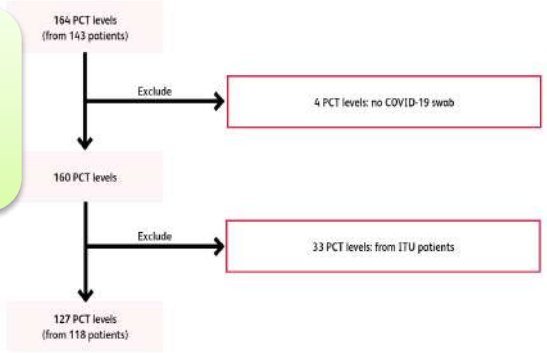
- Prokalsitonin bakteriyel-viral ayırımında önemli
- Ancak eşik değer net değil
  - PCT <0,25 ng/mL eşik olarak almak bile antibiyotik kullanımını 2 kat azaltmış
  - Ferritin/PCT oranı ≥877 (duyarlılık %85; özgüllük %56)
- Bazal önemli
- Tedavi kesme, deeskalasyon için önemli

Pierce J et al. Int J Infect Dis 2021; 113: 103-8

Use of procalcitonin for antibiotic stewardship in patients with COVID-19: A quality improvement project in a district general hospital

Authors: Christina Peters,[A] Kelly Williams,[A] Elena A Un,[A] Louisa Little,[B] Abeer Saad,[C] Katherine Lendrum,[D] Naomi Thompson,[E] Nicholas D Weatherley[F] and Amanda Pegden[G]

PCT+Solunum paneli (hızlı test)+balgam kx+ BT yol gösterici



Kanada

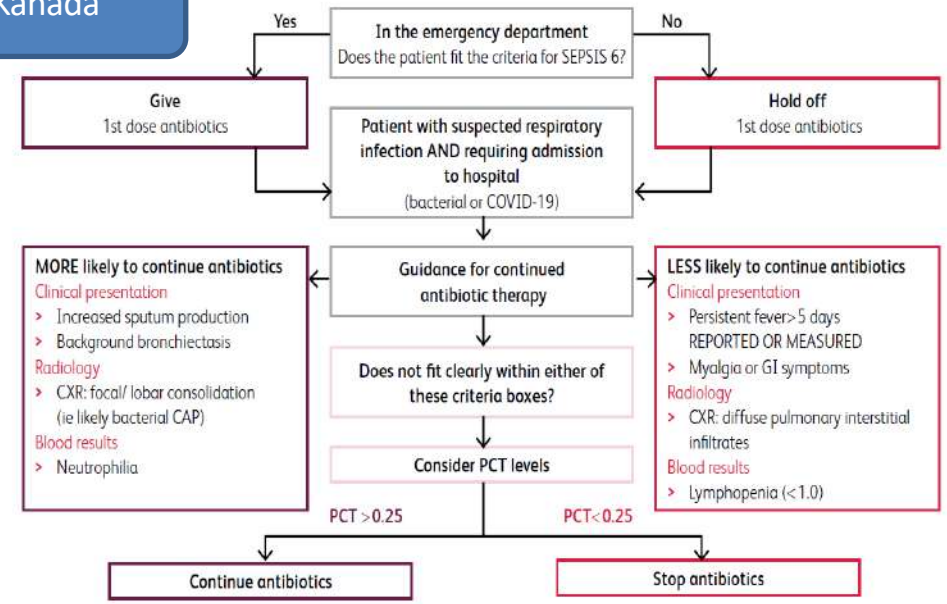


Fig 1. Guideline for rationalising antibiotics in patients with suspected or confirmed COVID-19.

Table 1. Recommendation of antibiotic use based on procalcitonin result

Procalcitonin <0.1 µg/L	Antibiotics strongly discouraged
Procalcitonin 0.1–0.24 µg/L	Antibiotics discouraged
Procalcitonin 0.25–0.49 µg/L	Antibiotics encouraged
Procalcitonin ≥0.5 µg/L	Antibiotics strongly encouraged

2. Kez tekrar

Peters C et al. Clin Med 2021; 21: 71-6

Balkan Med J 2021;38

Coronavirus disease 2019 and antibiotic stewardship—antibiotic usage in adult patients: is it necessary? when should it be concerned?

Uğur Önal, Halis Akalın

Department of Infectious Diseases and Clinical Microbiology, Uludağ University School of Medicine, Bursa, Turkey

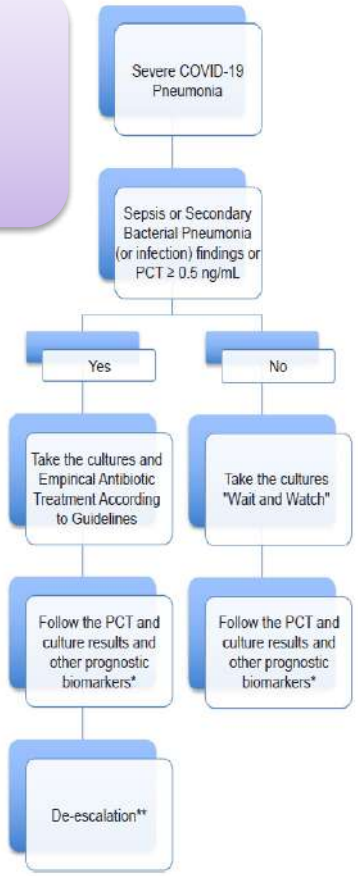
TABLE 1. Incidence of bacterial community-acquired coinfections or bacterial coinfections detected within the first 5 days and the overall incidence of empirical antibiotic use

Study (reference number)	The overall incidence of empirical antibiotic use (%)	Incidence of bacterial community-acquired infections or bacterial coinfections detected within the first 5 days (%)	Diagnostic methods for bacterial infection	Total number of patients with COVID-19
Karami et al.[13]	60.1	1.2	Cultures and urinary antigen tests	925
Hughes et al.[14]	ND	3.2	Cultures	836
Garcia-Vidal et al.[15]	ND	3.1	Cultures	925
Vaughn et al.[16]	56.6	3.5	Cultures	1,705

COVID-19, coronavirus disease 2019; ND, not determined.

1. evre erken faz
2. evre inflamasyon fazı (Akc)

3. evre hiperinflamasyon fazı



Malik et al; PCT ≥ 0,8 ng/mL (NPD %91,9)

Zeng et al; LDH, CRP, hs CRP/lenfosit,

Yeni oç ateş (steroid alanlarda dikkat)

Balgam karakterinin değişmesi

Nötrofilik lökositoz (steroid dikkat!!)

PCT azalmışken, artması (özellikle 7-10. gün)

Önal U, Akalın H. Balkan Med J 2021; 38

International Journal of Infectious Diseases 113 (2021) 103–108

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journal homepage: www.elsevier.com/locate/ijid

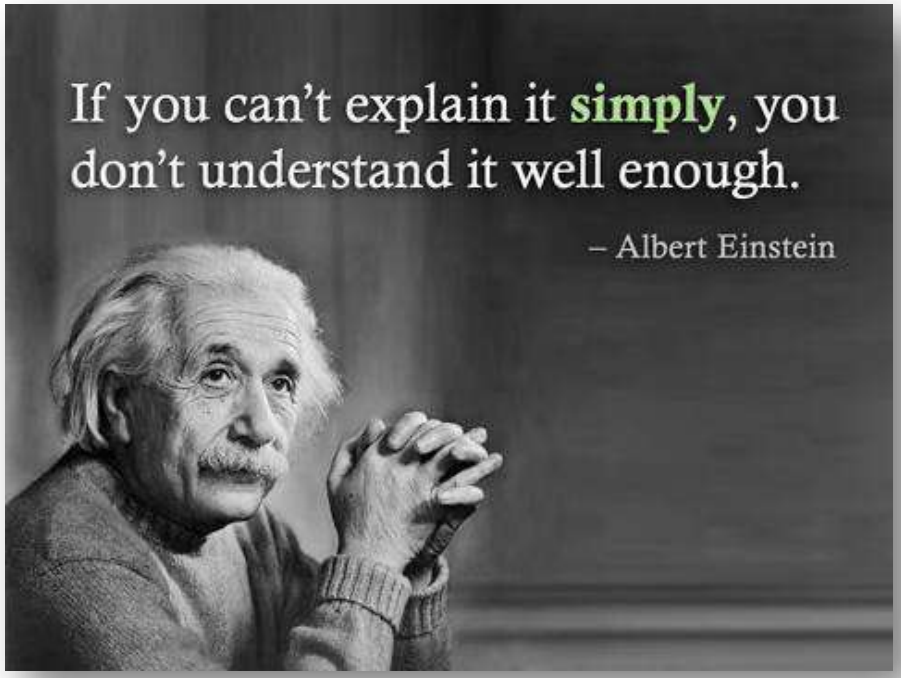
COVID-19 and antimicrobial stewardship: lessons learned, best practices, and future implications

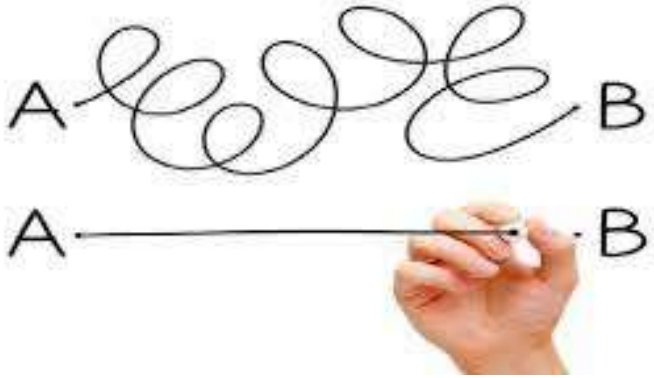
Jacob Pierce*, Michael P. Stevens

Department of Internal Medicine, Division of Infectious Diseases, Virginia Commonwealth University School of Medicine, 1009 E Marshall St., Richmond, VA 23298, USA

- Pandemi AMY için bir fırsat mı? Yoksa engel mi?
- Yapılan anketlerde pandemi döneminde AMY programlarında aksama olduğu belirtilmiş
  - AMY ‘nin pandemi döneminde uygulama zorluğu
  - Denetim, eğitim, komite toplantılarında aksamalar
  - Kilit faaliyetlerde aksamalar olmuş

Pierce J et al. Int J Infect Dis 2021; 113: 103-8

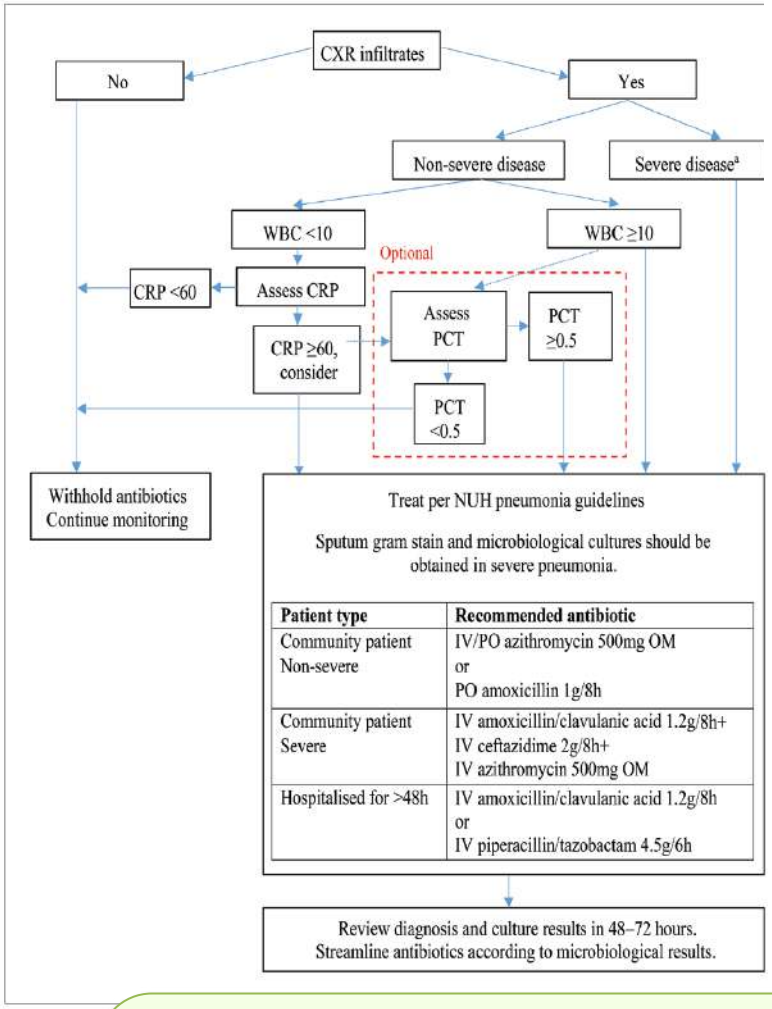

If you can't explain it simply, you don't understand it well enough.
– Albert Einstein


A
B
A
B


KEEP IT SIMPLE
SURF MORE

COVID-19 Döneminde Antibiyotik Yönetimi (AMY)

- AMY Nedir?
- “Optimal doz, tedavi süresi ve uygulama yolu dahil olmak üzere uygun antimikrobiyallerin seçimini teşvik ederek, antimikrobiyallerin kullanımını iyileştirmek ve ölçmek için **tasarlanmış koordineli müdahaleler**”- IDSA/SHEA 2012



LETTER TO THE EDITOR

Ann Acad Med Singap 2021;50:366-8
https://doi.org/10.47102/annals-acadmedsg.2020493

Antibiotic stewardship algorithm to rationalise antibiotic use among hospitalised COVID-19 patients

TK?
HK?
İmmünsüprese hasta

Singapur'da AMY
CRP >60 mg/L
BK>10.000/mm3
BT bulgusu

Singapurda ise:

AMY programına devam edilmiş
Geniş spektrumlu antibiyotiklerin kullanımında ve sürelerinde azalma olduğu gösterilmiş

Chen HH et al. Ann Acad Med Singap 20121; 50: 366-8.

AMY program oluşturulmuş
506 COVID-19 tanısı alan hasta
Müdahale öncesi 102 hasta, müdahale sonrası 404 hasta (ABD'de)

Pettit et al. BMC Infectious Diseases (2021) 21:516
https://doi.org/10.1186/s12879-021-06219-z

BMC Infectious Diseases

RESEARCH ARTICLE Open Access

Reducing the use of empiric antibiotic therapy in COVID-19 on hospital admission

Natasha N. Pettit[1*], Cynthia T. Nguyen[1], Alison K. Lew[1], Palak H. Bhagat[1], Allison Nelson[1], Gregory Olson[2], Jessica P. Ridgway[2], Mai T. Pho[3] and Jade Pagkas-Bather[2]

Table 2 Antibiotic duration and clinical outcomes

	Pre-Intervention (N = 76)	Post-Intervention (N = 170)	p-value
All antibiotics duration, median days (IQR)	2.3 (1, 3.9)	1 (0.5, 2.1)	< 0.001
Atypical coverage duration, median days (IQR)	3.8 (3, 4.1)	1 (0.4, 1.6)	< 0.001
Clostridioides difficile infection	1 (1)	2 (1)	> 0.99
Antibiotics re-initiated			
Any-indication	6 (8)	24 (14)	0.2
Bacterial pneumonia[a]	2 (2.6)	16 (9)	0.07
Readmission within 30 days			
All-cause	5 (7)	23 (13.5)	0.2
Bacterial pneumonia	1 (1.3)	3 (1.8)	> 0.99
Mortality (all-cause)	13 (17)	21 (12)	0.42
Length of stay, median (IQR)	7 (4, 13.2)	7 (4, 12)	0.5

[a] Two and 15 patients respectively were reinitiated on antibiotics for the indication of hospital acquired pneumonia or ventilator associated pneumonia, 1 patient in the post-intervention group was reinitiated on antibiotics for suspected CABP

İlk 48 saat içinde bakteriyel infeksiyon bulgusu yok, idrar Legionella Ag (-) ise antibiyotikler kesilmiş

%32,5 antibiyotik alan hasta azalmış
Tedavi süresi 1,3 gün kısalmış

Pettit NN et al. BMC Infect Dis 2021; 21: 516

PLOS ONE

Japonya'da bir merkez
1 Nisan 2018-31 mart 2021
Faz 1- Enfeksiyon ekibi tarafından izlenmiş (22.202 hasta)
Faz 2 AMY ve Enfeksiyon takımı tarafından müdahalenin olduğu dönem (10.106 hasta)

PLoS ONE 17(1): e0263095.

RESEARCH ARTICLE

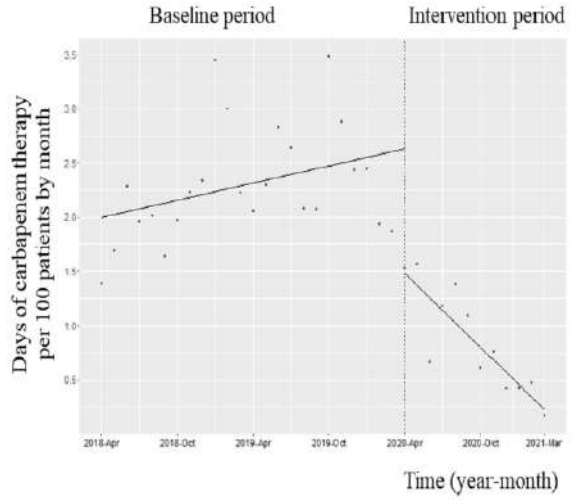
Effects of infectious disease consultation and antimicrobial stewardship program at a Japanese cancer center: An interrupted time-series analysis

Table 1. Assessment sheet used by the AST.

	Category		
Appropriate therapy	A	Appropriate	Antimicrobial selection and dosage are appropriate at the time of evaluation.
	B	Better choice	There are no major problems with antimicrobials selection, although there are suggestions for some modifications and changes.
Inappropriate therapy	C	Culture	Absence or inadequacy of submission of bacterial cultures; requires additional investigation (or, therefore, is difficult to evaluate)
	D	De-escalation	Broad-spectrum antimicrobials were used based on the clinical characteristics, culture results, and local factors, and these can be changed to a narrow-spectrum antimicrobial.
	E	Escalation	The antimicrobials do not provide adequate coverage of the target microorganisms; therefore, the spectrum needs to be broadened or the antimicrobial should be changed.
	F	Fitting dose	The dose and method of administering the antimicrobials are inappropriate due to the renal function or other factors; thus, adjustments are necessary.
	H	Halt	Discontinuation is necessary because the purpose of antimicrobial administration has been achieved, further use is unnecessary, or there is a risk of allergy.
	I	Indication document	The purpose of use and the target microorganisms of the antimicrobials are not described in the medical record and, therefore, cannot be evaluated; additional descriptions are needed.
Time out	T	Time out	Notify physician that culture results are available (3–5 days after initiation of the antimicrobial therapy) or that it is time to reconsider the termination of antimicrobial therapy (10–14 days after initiation of the antimicrobial therapy).

Abbreviation: AST, Antimicrobial Stewardship Team.

Itoh N et al. PLoS ONE 2022; 17(1): e0263095



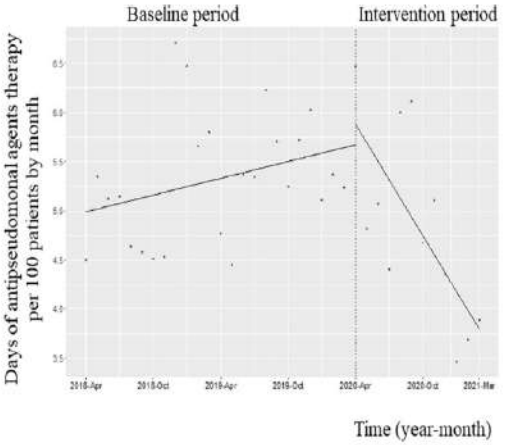
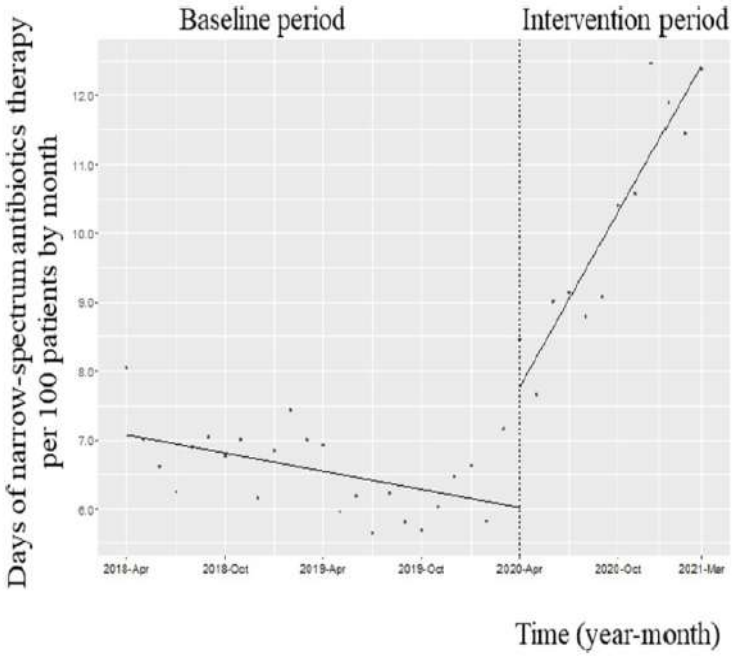
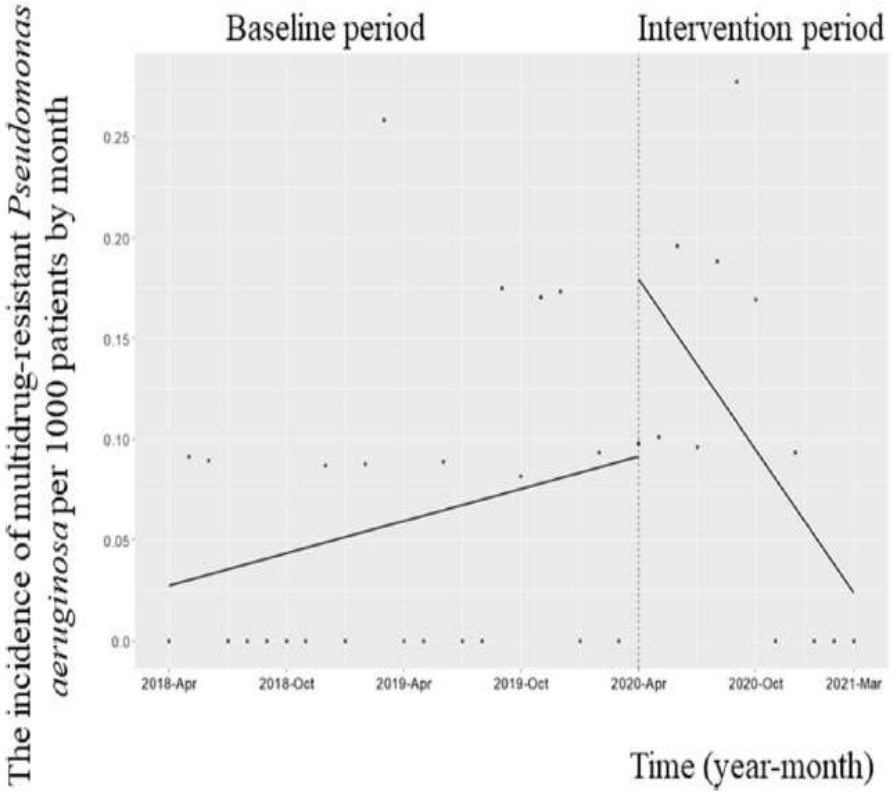
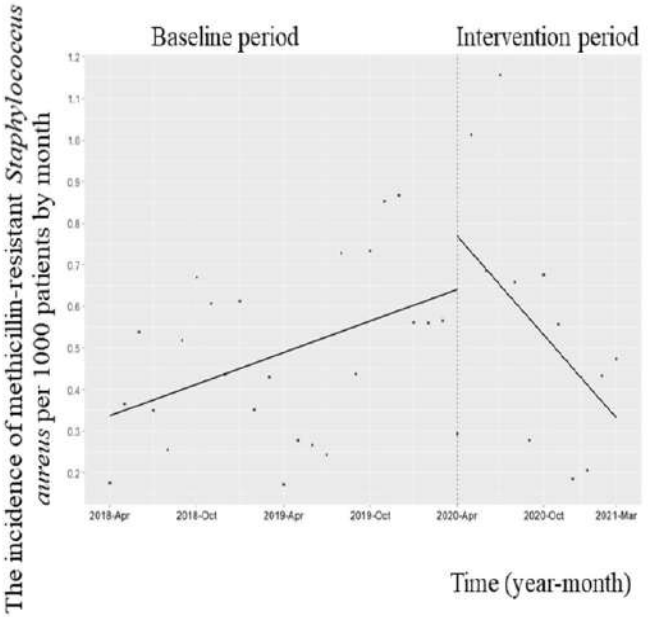


Fig 2. **Trends in the days of antipseudomonal agent (piperacillin–tazobactam, cefepime, and cefozopran) therapy per 100 patients, by month, during Phase 2 of the intervention period.** Each dot refers to the days of antipseudomonal agent therapy per 100 patients in each month, and the slope is based on linear regression in the two phases. The explanation of each phase is as follows: Phase 1 (antimicrobial notification by the infection control team from April 1, 2018, to March 31, 2020); Phase 2 (establishing an infectious disease [ID] consultation service and implementation of the Antimicrobial Stewardship Program [ASP] from April 1, 2020, to March 31, 2021). The level of the monthly DOT of the three antipseudomonal agents did not decrease (coefficient: 0.20; 95% confidence interval [CI]: −0.67 to 1.09, p = 0.65), although the trend decreased (coefficient: −2.22; 95% CI: −0.33 to −0.10, p<0.001).



Itoh N et al. PLoS ONE 2022; 17(1): e0263095



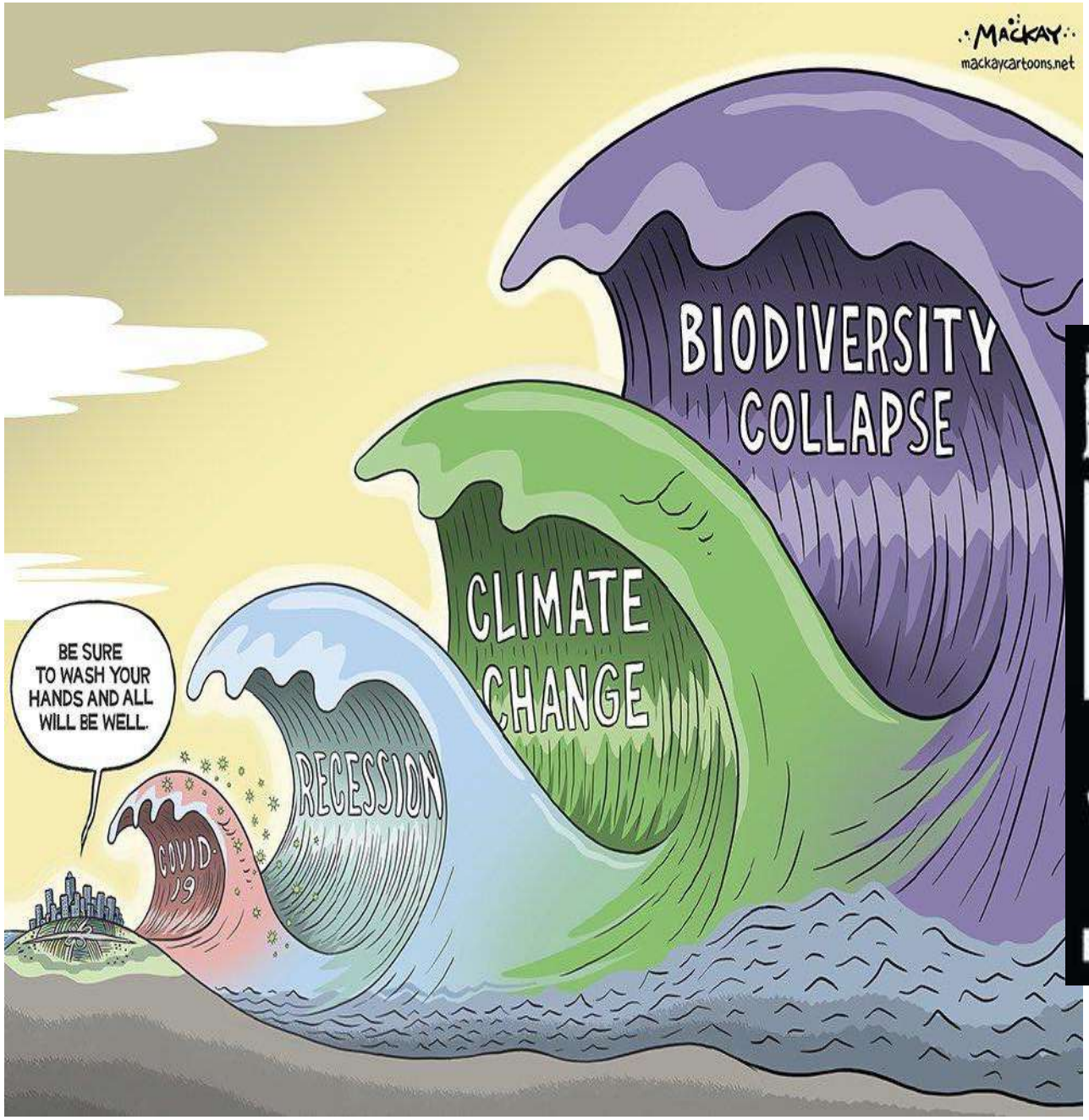


Itoh N et al. PLoS ONE 2022; 17(1): e0263095

Enfeksiyon Kontrolü

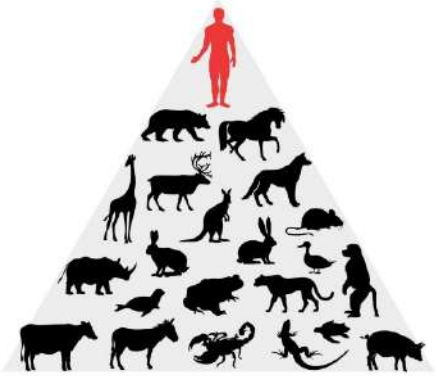
COVID-19

- ‘’Fuel to fire’’ for AMR


MACKAY
mackaycartoons.net
BIODIVERSITY COLLAPSE
CLIMATE CHANGE
RECESSION
COVID-19
BE SURE TO WASH YOUR HANDS AND ALL WILL BE WELL.


THE ENEMY
WITHIN
END · OF · AN · ERROR

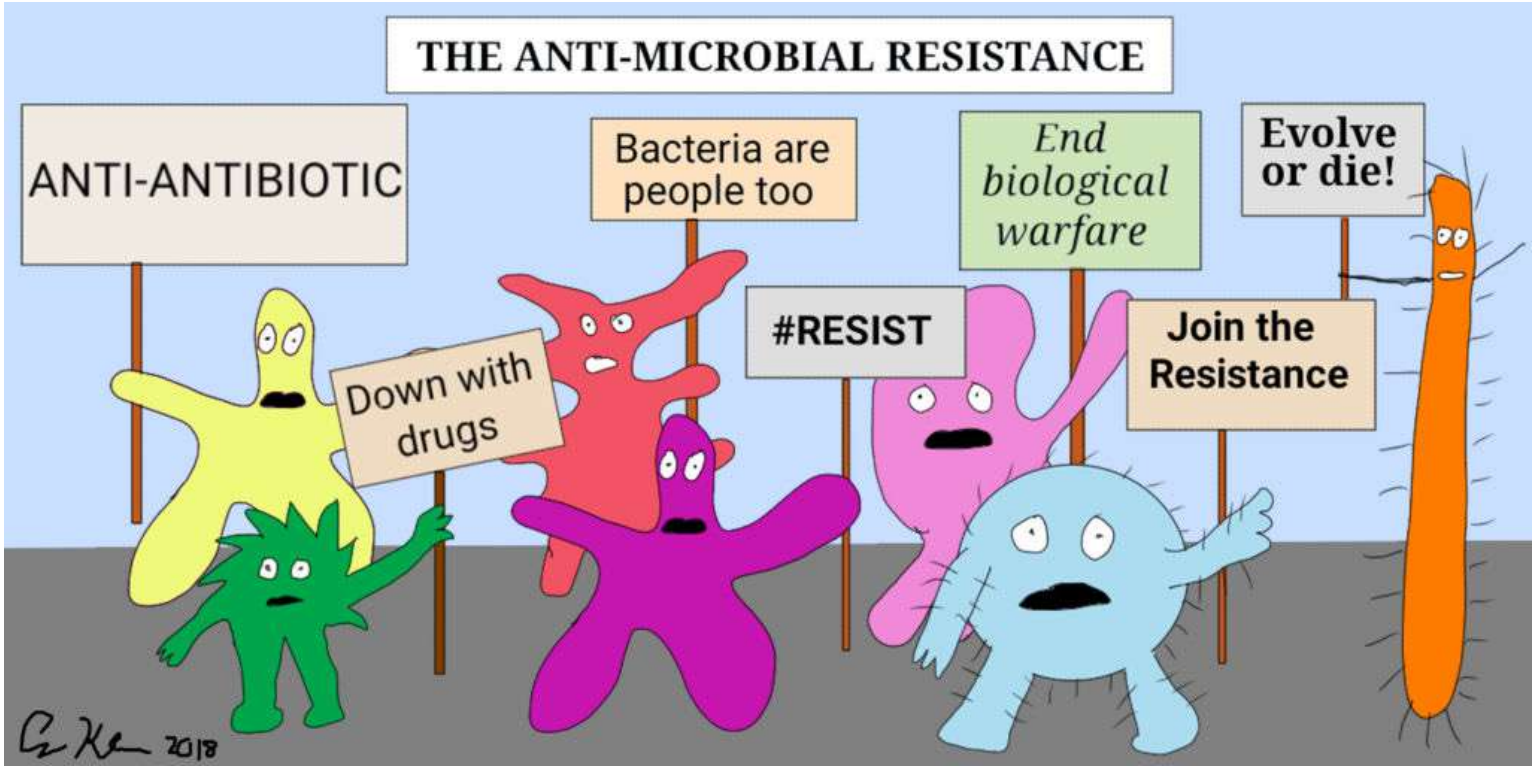
EGO

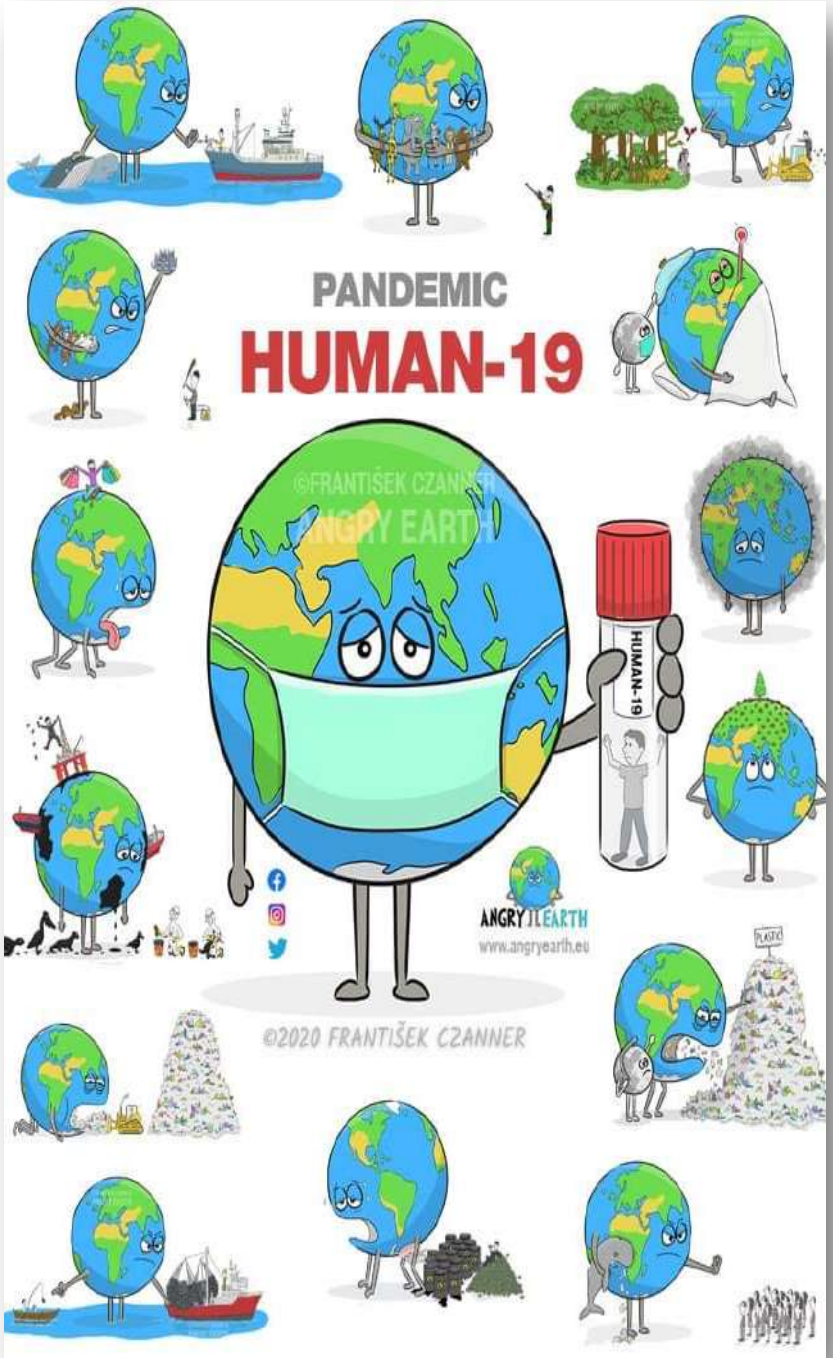


ECO

Egosystem (Distribution)

Ecosystem (Attention)





Teşekkürler...

**"Eğer basit bir şekilde anlatamıyorsan,
o konuyu iyi anlamamışsın demektir."**

Albert Einstein