Ülkemizde kısıtlı Antimikrobiyal tedavi

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5 KASIM 2019

Antimikrobiyal Yönetimi - AMY (Stewardshıp)

- ‘ The optimal selection, dosage, and duration of antimicrobial treatment that results in the best clinical outcome’ OR
- ‘Treatment and prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance’
- İlk defa 1980’li yıllarda Dr. Dale Gerding tarafından ortaya atılmış bir kavram

Dellit TH Et al. IDSA and SHEA guidelines Clin Infect Dis 2007

Antimikrobiyal Yönetimi (Stewardship)

Appropriate initial antibiotic (usually empirical) while improving patient outcomes and healthcare

Unnecessay antibiotics (broad spectrum) and increased resistance and cost

A Balancing Act

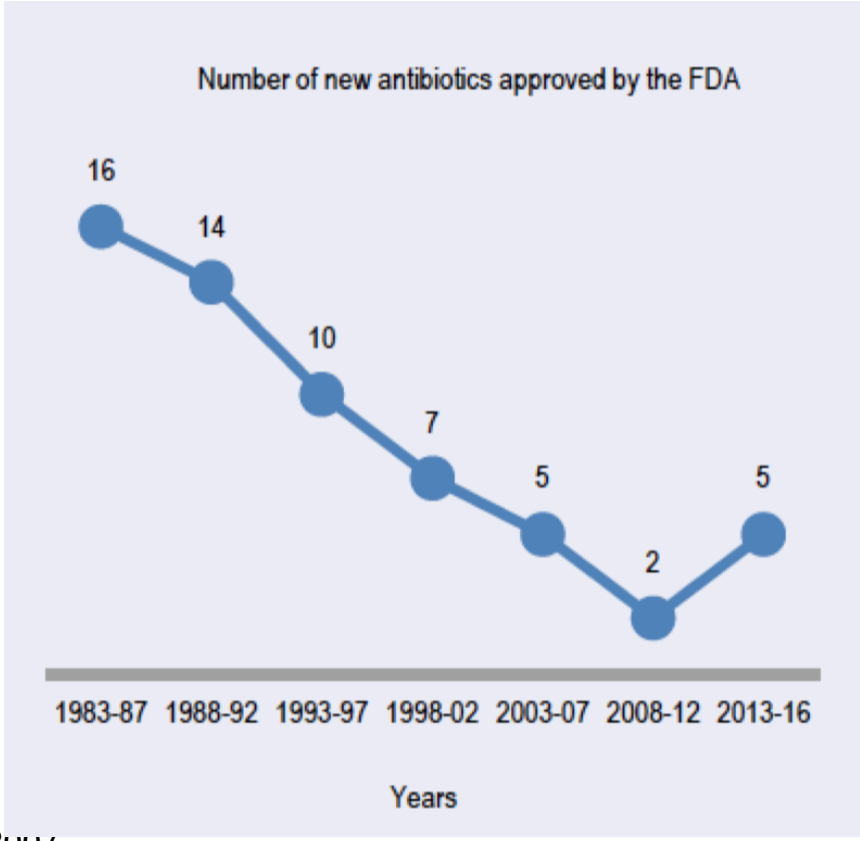
Yanlış kullanım?

- Gereksiz antibiyotik reçetelenmesi
- Kritik hastalarda antibiyotik tedavisinin gecikmesi
- Geniş yada dar spektrumlu antibiyotiklerin yanlış endikasyonlarda kullanımı
- Antibiyotik dozlarının spesifik tedavilere göre yüksek yada düşük dozda verilmesi
- Tedavi süresinin gereğinden uzun yada kısa olması
- Antibiyotik tedavisinin kültür sonuçlarına göre revize edilmemesi

Tedavi başarısızlığı, direnç riski
Mortalite ve morbidite ⬆
Hastane yatış riski ⬆
Yatış süresi ⬆
Geniş spektrumlu, pahalı antibiyotik gerekliliği

AMY Neden gerekli?

- >%50 antibiyotik uygunsuz reçetelenmekte
- Antimikrobiyal kullanımı & direnç gelişimi
- Yeni ilaç gelişimindeki sıkıntılar



Dellit TH Et al. IDSA and SHEA guidelines Clin Infect Dis 2007

FDA raporları :Yeni antibiyotik gelişimi son 20 yılda %56 ⬇
(1983 to 1987 vs 1998 to 2002)

2019 AWaRe Clasification

Overview of the WHO AWaRe groups and essential antibiotics on the WHO EML[50]

Access group

This group includes antibiotics and antibiotic classes that have activity against a wide range of commonly encountered susceptible pathogens while showing lower resistance potential than antibiotics in Watch and Reserve groups. Access antibiotics should be widely available, affordable and quality-assured to improve access and promote appropriate use.

Selected Access group antibiotics (shown here) are included on the WHO EML as essential first-choice or second-choice empirical treatment options for specific infectious syndromes.

- Amikacin
- Amoxicillin
- Amoxicillin + clavulanic acid
- Ampicillin
- Benzathine benzylpenicillin
- Benzylpenicillin
- Cefalexin

Watch group

This group includes antibiotics and antibiotic classes that have higher resistance potential and includes most of the highest priority agents among the Critically Important Antimicrobials (CIA) for Human Medicine and/or antibiotics that are at relatively high risk of selection of bacterial resistance. Watch group antibiotics should be prioritized as key targets of national and local stewardship programmes and monitoring.

Selected Watch group antibiotics (shown here) are included on the WHO EML as essential first-choice or second-choice empirical treatment options for a limited number of specific infectious syndromes.

Reserve group

This group includes antibiotics and antibiotic classes that should be reserved for treatment of confirmed or suspected infections due to multi drug-resistant organisms, and treated as "last-resort" options. Their use should be tailored to highly specific patients and settings, when all alternatives have failed or are not suitable. They could be protected and prioritized as key targets of national and international stewardship programmes, involving monitoring and utilization reporting, to preserve their effectiveness.

Selected Reserve group antibiotics (shown here) are included on the WHO EML when they have a favourable risk-benefit profile and proven activity against "Critical Priority" or "High Priority" pathogens identified by the WHO Priority Pathogens List, notably carbapenem-resistant Enterobacteriaceae.

ACCESS

WATCH

Anti-pseudomonal penicillins with beta-lactamase inhibitor (e.g. piperacillin + tazobactam)

Carbapenems / Penems (e.g. faropenem, imipenem + cilastatin, meropenem)

Cephalosporins, 3rd Generation (with or without beta-lactamase inhibitor, e.g. cefixime,

Quinolon … n)

RESERVE

Aztreonam

Cephalosporins, 4th Generation (e.g. cefepime)

Cephalosporins, 5th Generation (e.g. ceftaroline)

Daptomycin

Fosfomycin (IV)

Oxazolidinones (e.g. linezolid)

Polymyxins (e.g. colistin, polymyxin B)

Tigecycline

Antibiyotikler

- 1940'lar : Antibiyotikler kullanıma girdi
- 1950'ler: Yeni ajanlar geliştirilmeye başlandı
- 1956 Jawetz: Antibiyotik kullanımına bağlı sorunlar

New Horiz. 1996 Aug;4(3):370-6.

Does antibiotic restriction prevent resistance?

McGowan JE Jr[1], Gerding DN.

Author information

1 Emory University School of Medicine, Atlanta, GA, USA.

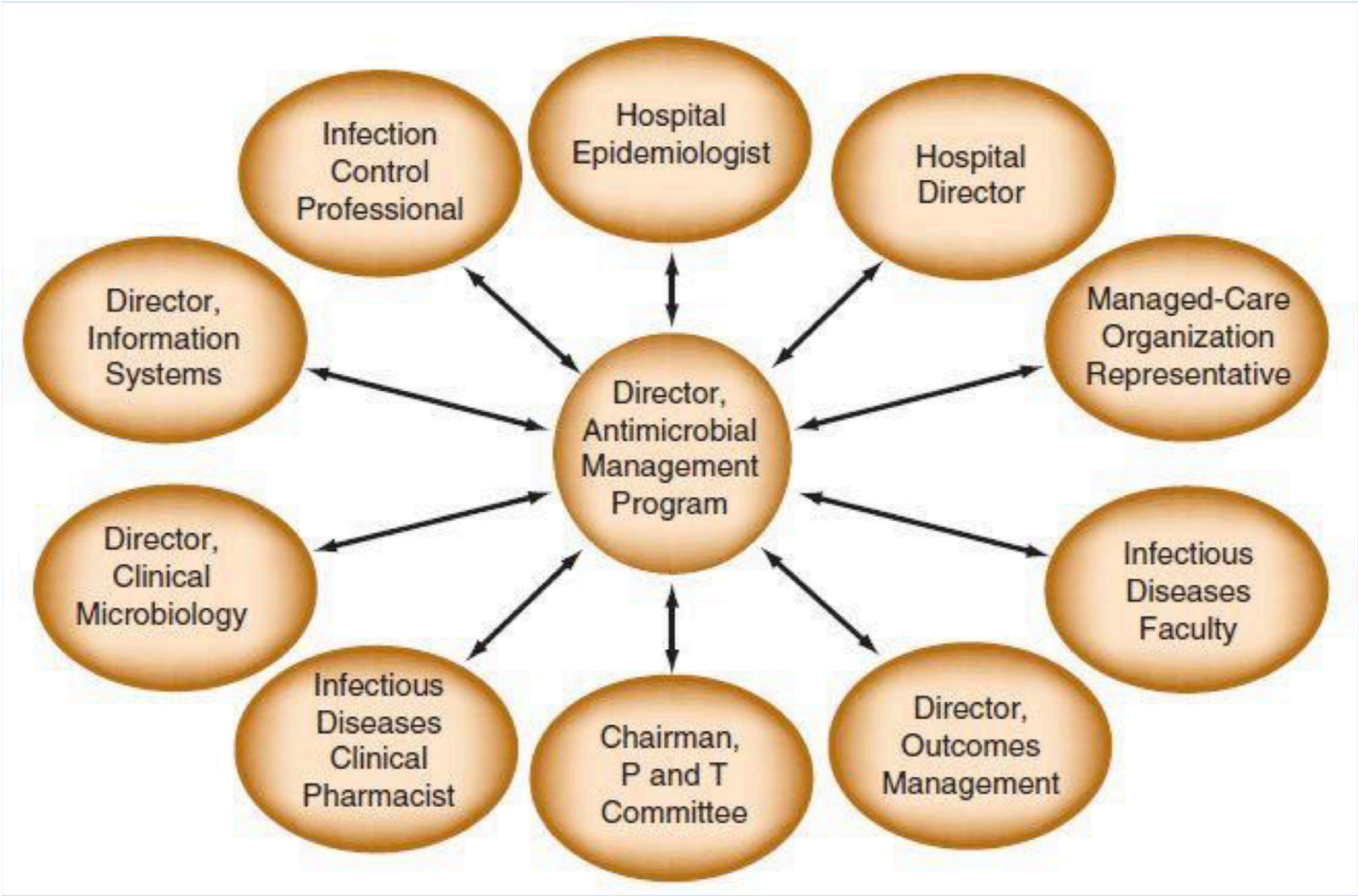
Abstract

Antimicrobial resistance among some hospital organisms has increased to a stage where it can no longer be tolerated. The need for preventive and corrective measures is urgent. There is an association between the use of antimicrobial agents and res have been shown to affect antimicrobial resistance rate antimicrobial use through educational efforts alone hav anagement or clinical guideline aspects. Thus, furt crobial-use controls. Additional large-scale, well controlled trials of antimicrobial-use regulation employing sophisticated epidemiologic methods, molecular biological organism typing, and precise resistance mechanism analysis will be required to determine the best methods to prevent and control this problem and ensure our optimal antimicrobial-use "stewardship." Consideration of the long-term effects of antimicrobial selection, dosage, and duration of treatment on resistance development should be a part of every antimicrobial treatment decision.

Stewardshi

p

Takım



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.

- Koordinasyon olmadan sıkı kuralları olan rehberler daha büyük başarısızlıklara neden olur

- Her ülke, her hastane koşullarına uygun politikalar benimsemeli

Burke AC. Med Clin North Amerika, 2006

AMY STRATEJİLERİ

- Formuler oluşturma AII
- Pre-authorization – **EHU onayı** - AII
- Reçeteleme sonrası müdahale AII
- Prospektif kontrol ve geri bildirim AI

Dellit TH Et al. IDSA and SHEA guidelines Clin Infect Dis 2007
Hand K et al. Hospital Pharmacist 2004

KISITLI ANTİMİKROBİYAL KULLANIMI

- Sürekli enfeksiyon hastalıkları konsültasyonlarının;
  - Dirençli bakteri enfeksiyonları
  - Antibiyotik kullanım miktarı ve süresinde önemli azalmaya neden olduğu olduğu gösterilmiş

Lemmen SW, et al. Infection 2000
Erbay A, et al. Int J Antmicrobial Agents 2003
Rattanaumpawan P, et al. AJIC 2010

ELSEVIER

International Journal of Antimicrobial Agents 21 (2003) 308–312

INTERNATIONAL JOURNAL OF Antimicrobial Agents

www.ischemo.org

Evaluation of antibiotic use in a hospital with an antibiotic restriction policy

Ayşe Erbay [a,*], Aylin Çolpan [a], Hürrem Bodur [a], Mustafa A. Çevik [a], Matthew H. Samore [b], Önder Ergönül [b]

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[b] *University of Utah, School of Medicine, Department of Internal Medicine, Division of Clinical Epidemiology, Salt Lake, UT, USA*

Received 14 May 2002; accepted 29 August 2002

- 2 aşamalı sınırlarlama

- Antibiyotik kontrol komitesi yıllık direnç oranları ve maliyete göre eczaneye hangi ilaçların alınacağına karar verir

- Belli ilaçlar uzman konsultasyonu onayı gerektirir (seftazidim, sefepim, imipenem, meropenem, piperasislin tazobactam ve vankomisin, siprofloksasin ve teikoplaninin IV formları)

1) Agree with choice of antibiotic, but dosage was inappropriate per literature
2) Disagree with choice of antibiotics because the spectrum of the antibiotics were overlapped
3) Disagree with choice of antibiotic because the spectrum was not broad enough
4) Disagree with choice of antibiotic because the spectrum was overly broad
5) Disagree with choice of antibiotic because an equally effective drug was available at a lower cost
6) Disagree with need for an antibiotic.

- Uygun kullanım duyarlılık testi sonuçlarına göre, empirik tedaviden daha fazla (p 0.017)
- Kısıtlı olmayan antibiyotiklerin uygunsuz kullanımı daha fazla (p <0.001)
- EHU konsultasyonu ile uyum daha fazla (p 0.001)

J Hosp Infect. 2005 Jan;59(1):53-61.

Evaluation of antibiotic use in intensive care units c
Turkey.

Erbay A[1], Bodur H, Akinci E, Colpan A.

Author information

1 Department of Infectious Diseases and Clinical Microbiology, Ankara Nu
Turkey. aerbay@kangurum.net

Abstract

The object of this study was to evaluate the appropriateness of antibioti
bacteriological findings in the intensive care units (ICUs) of a 1100-bed
antibiotic restriction policy in Turkey. Between June and December 200
medical and surgical ICUs were evaluated prospectively. Two infectious
antibiotics ordered daily. Of the 368 patients admitted to the ICUs, 223
frequently prescribed antibiotics were first-generation cephalosporins (1
(15.2%), aminoglycosides (12.1%), carbapenems (10.7%) and ampicilli
inappropriate in 47.3% of antibiotics. ID specialists recommended the u
without an ID consultation was more likely to be inappropriate [odds rati
(CI)=4.4-39.5]. Antibiotics ordered empirically were found to be less app
culture and susceptibility results (OR=3.8, P=0.038, CI=1.1-13.1). Inapp
in patients who had surgical interventions (OR=3.6, P=0.025, CI=1.2-10
unrestricted antibiotics. In particular, antibiotic use was inappropriate in
as postgraduate training programmes and elaboration of local guideline

(1) agree with choice of antibiotic, but dosage was inappropriate according to the literature;
(2) agree with choice of antibiotic, but loading dose was not administered;
(3) agree with choice of antibiotic, but dosage was not altered for the patient's current renal or hepatic functions;
(4) agree with choice of antibiotic, but disagree with the duration (extended surgical prophylaxis);
(5) disagree with choice of antibiotic because it was ineffective against the isolated pathogen based on culture and sensitivity tests;
(6) disagree with choice of antibiotic because of toxicity or allergy;
(7) disagree with choice of antibiotic because of the deteriorating clinical status of the patient;
(8) disagree with choice of antibiotic because the spectrum of the antibiotics were overlapped;
(9) disagree with choice of antibiotic because the spectrum was not broad enough;
(10) disagree with choice of antibiotic because the spectrum was too broad;
(11) disagree with choice of antibiotic because an equally suitable drug was available at a lower cost; and
(12) disagree with the need for an antibiotic.

- Ocak 1999 da antibiyotik kısıtlama politikası
- Belli ilaçlar uzman konsultasyonu onayı gerektirir (seftazidim, sefepim, imipenem, meropenem, piperasislin tazobactam ve vankomisin, siprofloksasin ve teikoplaninin IV formları)
- Haziran-Aralık 2002 Yoğun bakım hastaları
- EHU konsültasyonu olmaması durumunda uygunsuzluk 13x daha fazla (p <0.001)
- EHU onayı gerekmeyen antibiyotiklerin uygunsuz kullanımı fazla

PREAUTHORIZATION- EHU ONAYI 2003

AVANTAJLARI

- Gereksiz ve uygunsuz antibiyotik kullanımını azaltır
- Empirik seçimleri optimize eder
- Tedaviye başlarken kültür alınmasını ve kliniğin gözden geçirilmesini sağlar
- Antibiyotik maliyetleri düşer
- Antibiyotik eksikliklerine hızlı çözüm olanakları sunar
- Aşırı antibiyotik kullanımını direk olarak önler

DEZAVANTAJLARI

- Sadece kısıtlı antibiyotiklere uygulanabilir
- Daha geniş empirik kapsama neden olabilir
- Reçeteleme otonomisinin kaybı
- Tedavi gecikmesi
- EHU'na göre efektivitesi değişmesi
- Sistemin manipülasyona izin vermesi
- Başka antibiyotiklere kolayca geçilip farklı direnç paternleri görülmesi

Clin Infect Dis, 2016

Jpn. J. Infect. Dis., 58, 338-343, 2005

Original Article

Changes in Antibiotic Use, Cost and Consumption after an Antibiotic Restriction Policy Applied by Infectious Disease Specialists

Zulal Ozkurt*, Serpil Erol, Ayten Kadanali, Mustafa Ertek,

Table 2. The profiles of antibiotic use before and after the restriction policy

Antibiotic use	2001 no. (%)			2004 no. (%)			P
	Medical ward (n = 393)	Surgical ward (n = 324)	Total (n = 717)	Medical ward (n = 529)	Surgical ward (n = 338)	Total (n = 867)	
Total use of antibiotics	169 (43.0)	209 (64.5)	378 (52.7)	157 (29.7)	161 (47.6)	318 (36.7)	<0.001
Prophylactic	23 (13.6)	130 (62.2)	153 (40.5)	5 (3.0)	113 (70.2)	118 (37.1)	>0.05
Treatment	146 (86.3)	79 (46.7)	225 (59.5)	152 (96.8)	48 (29.8)	200 (62.9)	>0.05
Empiric	111 (76.0)	61 (77.2)	172 (76.4)	96 (63.2)	33 (68.7)	129 (64.5)	<0.05
Culture-based	35 (23.9)	18 (22.7)	53 (23.5)	56 (36.8)	15 (31.3)	71 (35.5)	<0.05

Table 3. Antibiotic use with respect to restricted antibiotics and infection consultation after antibiotic policy (in 2004)

Usage	ID consultation no. of patients (%)		P	no. of antibiotics (%)		P
	Yes	No		Restricted	Unrestricted	
Appropriate use	79 (97.5)	132 (55.7)	<0.001	130 (88.4)	167 (58.2)	<0.001
Inappropriate use	2 (2.5)	105 (44.3)	<0.001	17 (11.6)	120 (41.8)	<0.001
Total	81	237		147	287	

Yıllık maliyet ve tüketim izlendi

- Kısıtlama sonrası;
  - Antibiyotik kullanımı 52.7 → 36.7 (p<0.001)
  - Uygun kullanım 55.5 → 66.4 (p <0.05)

Kısıtlı aby %88.4 〉 p<0.001

Kısıtlı olmayan aby %58.2

EHU konst varlığında %97.5 〉 p<0.001

EHU konst yokluğunda %55.7

- Kısıtlama sonrasında kısıtlı aby kullanım oranı %44 ↓

ik maliyeti %18.5 ↓

J Infect. 2007 Jul;55(1):41-8. Epub 2007 May 18.

Short-term effect of antibiotic control policy on the usage patterns and cost of antimicrobials, mortality, nosocomial infection rates and antibacterial resistance.

Arda B[1], Sipahi OR, Yamazhan T, Tasbakan M, Pullukcu H, Tunger A, Buke C, Ulusoy S.

Author information

1 Ege University Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, Bornova, Izmir, Turkey.

Abstract

OBJECTIVES: In 2003 Turkish government released a new budget application instruction for regulating the usage of parenteral antibiotics inside and outside of the hospitals. In this study it was aimed to evaluate the effect of this instruction on the overall usage of restricted antibiotics, their cost, overall mortality, bacterial resistance patterns and nosocomial infection rates in intensive care units (ICUs) of our setting for March-October 2002 and March-October 2003 periods.

METHODS AND RESULTS: Overall daily defined dose/1000 patients/day of restricted drugs decreased, whereas unrestricted drugs increased significantly after the instruction. The cost of all analysed drugs in 2003 period was 540,303USD (-19.6%) less than 2002 period. Nosocomial infection rates in ICUs decreased significantly ($p<0.05$). When all microbiologically confirmed nosocomial bacteremia cases during the study period were analysed, amoxycilline/clavulanate, ciprofloxacin, cefuroxime, cefotaxime, piperacilline/tazobactam resistance and ESBL rate in Klebsiella pneumoniae decreased significantly ($p<0.05$). Amikacin resistance in Escherichia coli and Acinetobacter baumannii increased significantly ($p<0.05$).

CONCLUSION: Antibiotic control is one of the most important and significant ways to save money, and to prevent antibacterial resistance.

Kısıtlı antibiyotiklerin kullanımı azalırken, kısıtlama olmayanlar ↑

Maliyet %20 ↓

Review Article

Rational antibiotic use

Ozlem Tunger[1], Yeliz Karakaya[2], C. Banu Cetin[1], Gonul Dinc[3], Hakan Borand[4]

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[2] *Department of Infectious Diseases and Clinical Microbiology, Nevsehir State Hospital, Nevsehir, Turkey*
[3] *Department of Public Health, Faculty of Medicine, Celal Bayar University, Manisa, Turkey*
[4] *Department of Infectious Diseases and Clinical Microbiology, Turgutlu State Hospital, Manisa, Turkey*

Abstract

Background: Development of resistance to antimicrobial agents and increase of cost as the result of unnecessary and inappropriate use of antibiotics has become a global health problem. Therefore many strategies, which are aimed at optimizing antibiotic therapy, have been developed until now. In Turkey, an antibiotic restriction policy as a governmental solution was applied to decrease the antibiotic use and especially costs by Ministry of Health in 2003. The aim of this study is to evaluate the rational antibiotic use and the impact of the implementation of new restriction policy, with their reinforcement by infectious disease specialist, on the hospital wide use of antibiotics.

Methodology: The data of the inpatients received antibiotics (n=495) during January-June 2006 were compared with our previous study performed by the same methodology before the restriction policy in 1998. In both studies, prospective active daily surveillance of patients was performed by three infectious disease specialists. The appropriateness of antibiotic therapy was determined using the criteria described by Kunin and Jones. The data were analyzed by using SPSS for Windows.

Results: While the rate of antibiotic use decreased from 16.6% to 11.3%, rational use increased after the restriction policy ($p<0.001$). Besides the specific antibiotic use increasing, prophylactic antibiotic use was found decreased ($p<0.001$). Mostly determined irrationality was the prophylactic uses in both studies. As expected, infectious disease specialist examinations resulted in an increase in the appropriate antibiotic use.

Conclusions: The restriction policy was effective in decreasing the antibiotic consumption and increasing the rational antibiotic prescription in our hospital.

Key Words: Antibiotic, antibiotic usage, rational use, restriction policy

J Infect Developing Countries 2009; 3(2):88-93.

Received 15 July 2008 Accepted - 25 November 2008

- 1998 ve 2006 yıllarında EHU onayının antibiyotik kullanım uygunluğuna etkisi
- Antibiyotik kullanım oranı % 16.6 →%11.3 ($p < 0.001$)
- Spesifik antibiyotik kullanımı ↑ / profilaktik tedavi ↓ ($p < 0.001$)

IVYSPRING INTERNATIONAL PUBLISHER

International Journal of Medical Sciences

2011; 8(4):339-344

Research Paper

The Impact of a Nationwide Antibiotic Restriction Program on Antibiotic Usage and Resistance against Nosocomial Pathogens in Turkey

Adalet Altunsoy[1], Cenk Aypak[2]✉, Alpay Azap[1], Önder Ergönül[3], İsmail Balık[1]

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2. Department of Family Medicine, Ankara University, School of Medicine, Ibni Sina Hospital 06100, Ankara, Turkey
3. Department of Clinical Microbiology and Infectious Disease, Marmara University, School of Medicine, 34662, Istanbul, Turkey

Abstract

Purpose: Antimicrobial resistance among microorganisms is a global concern. In 2003, a nationwide antibiotic restriction program (NARP) was released in Turkey. In this study we evaluated the effect of NARP on antibiotic consumption, antimicrobial resistance, and cost.

Materials and Methods: The data obtained from all of the four university hospitals, and one referral tertiary-care educational state hospital in Ankara. Antimicrobial resistance profiles of 14,233 selected microorganisms all grown in blood cultures and antibiotic consumption from 2001 to 2005 were analyzed retrospectively.

Results: A negative correlation was observed between the ceftriaxone consumption and the prevalence of ceftriaxone resistant *E.coli* and *Klebsiella* spp. (rho:-0.395, *p*:0.332 and rho:-0.627, *p*:0.037, respectively). The decreased usage of carbapenems was correlated with decreased carbapenems-resistant *Pseudomonas* spp. and *Acinetobacter* spp (rho:0.155, *p*:0.712 and rho:0.180, *p*:0.668, respectively for imipenem). Methicillin resistance rates of *S.aureus* were decreased from 44% to 41%. After two years of NARP 5,389,155.82 USD saving occurred.

Conclusion: NARP is effective in lowering the costs and antibiotic resistance.

IVYSPRING INTERNATIONAL PUBLISHER

International Journal of Medical Sciences

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Research Paper

The Impact of a Nationwide Antibiotic Restriction Program on Antibiotic Usage and Resistance against Nosocomial Pathogens in Turkey

Adalet Altunsoy[1], Cenk Aypak[2]✉, Alpay Azap[1], Önder Ergönül[3], İsmail Balık[1]

1. Department of Clinical Microbiology and Infectious Disease, Ankara University, School of Medicine, Ibni Sina Hospital 06100, Ankara, Turkey
2. Department of Family Medicine, Ankara University, School of Medicine, Ibni Sina Hospital 06100, Ankara, Turkey
3. Department of Clinical Microbiology and Infectious Disease, Marmara University, School of Medicine, 34662, Istanbul, Turkey

Table 1. Impact of NARP* on bacterial resistance rates for the selected antibiotics

	Resistance rate (%)			
	Before NARP 2001 and 2002	After NARP 2003 and 2004	% Difference	*p* Value
E.coli /ceftriaxone	22	34.8	+12.8	NS
E.coli / PIP-TAZO**	16.8	24.3	+7.5	NS
Klebsiella/ceftriaxone	29.3	39.3	+10	NS
Klebsiella/ PIP-TAZO**	25.5	33.8	+8.3	NS
Acinetobacter/imipenem	51.3	45	-6.3	NS
Pseudomonas/ceftazidim	48.5	42.8	-5.7	NS
Staph. Aureus/methicillin	44	41	-3.0	NS

*nationwide antibiotic restriction program, **piperacillin-tazobactam

NS:not significant, p>0.05.

Table 2: Comparison of antibiotic consumption two years before and after the initiation of NARP*

Restricted Antibiotics	Antibiotic consumption (grams)		% difference
	2001+2002	2003+2004	
Meropenem	113362	85236	-24.8
Imipenem	50532	45935.2	-9.1
Ceftazidim	60074	38129	-36.5
Ceftriaxone	300955	190281	-36.8
PIP-TAZO*	270594	417114	+54.1
Cefepime	100588	121799	+21.1
Vancomycin	113362	85236	-17.8
Teicoplanin	50532	45935.2	-1.4
Total	60074	38129	**-11.3**

*nationwide antibiotic restriction program, **piperacillin-tazobactam

Journal of Antimicrobial Chemotherapy (2008) **61**, 1169–1171
doi:10.1093/jac/dkn055
Advance Access publication 13 February 2008

JAC

Increased antimicrobial consumption following reimbursement reform in Turkey

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Received 9 August 2007; returned 28 October 2007; revised 22 January 2008; accepted 23 January 2008

Objectives: **This study examined antibiotic utilization patterns in Turkey between 2001 and 2006.**

Methods: **A comprehensive collection and analysis of Turkish antibiotic data from 2001 to 2006 was conducted. The anatomical therapeutic chemical (ATC) classification and the defined daily dose (DDD) methodology were used to calculate antibiotic consumption. Data were presented as DDD/1000 inhabitant-days, and the relation between antimicrobial consumption and governmental reimbursement policy was evaluated.**

Results: **Total utilization of antibiotics increased from 14.62 to 31.36 DDD/1000 inhabitant-days between 2001 and 2006. The largest increase took place after the implementation of social insurance reform (SIR) in 2005, as evidenced by the DDD ratio increasing 1.87-fold after SIR went into effect. The largest increase occurred in the prescription of penicillins, from 7.13 in 2001 to 14.09 in 2006.**

Conclusions: **In Turkey, antibiotic consumption increased markedly in recent years, in a close relationship, to a new reimbursement policy following the implementation of the SIR, which facilitated the prescription and consumption of drugs compared with the earlier SIR conditions.**

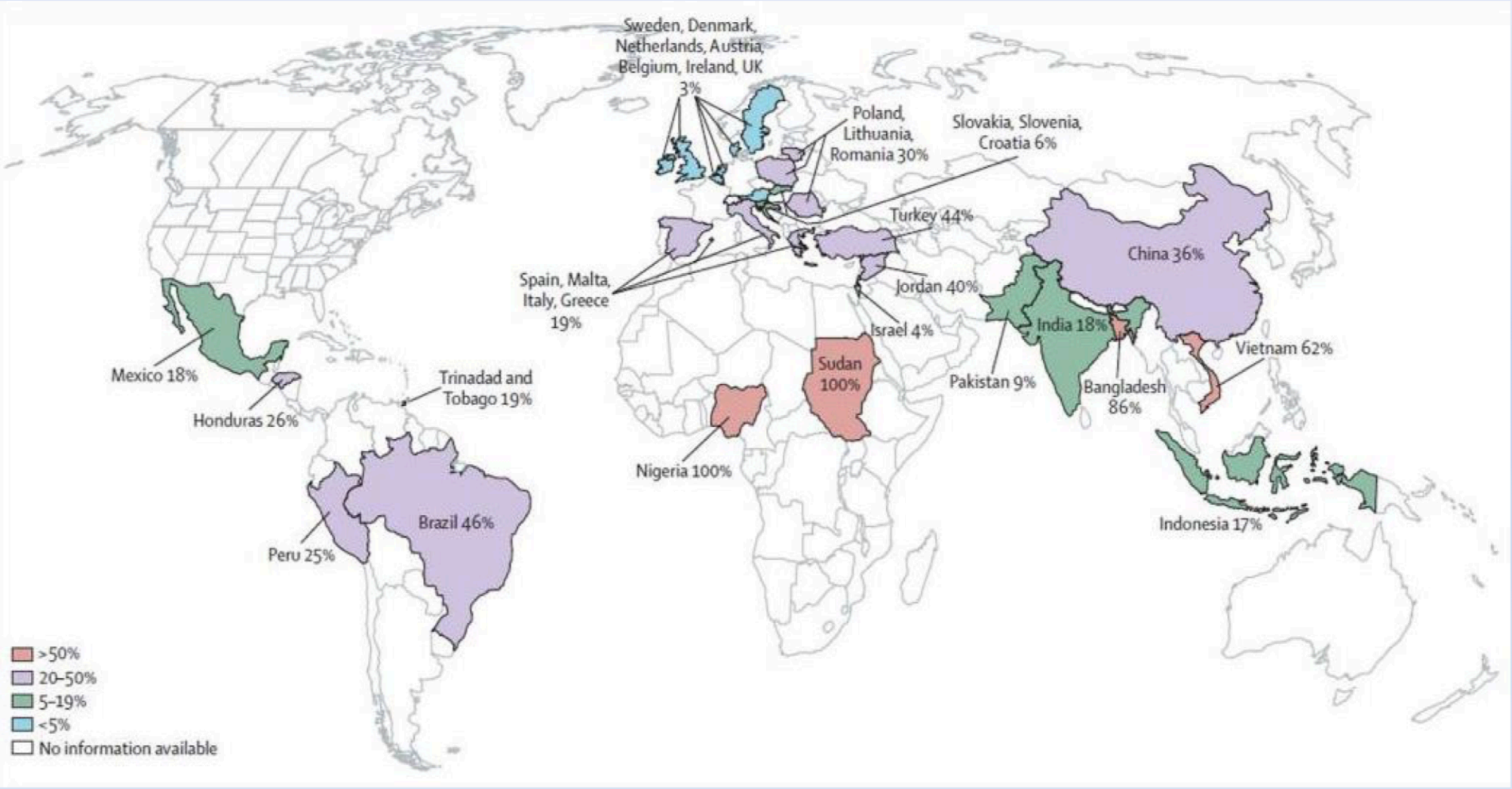
Table 2. Effects of SIR on antibiotic consumption in Turkey

Antibiotic class	Mean consumption (DDD)		Ratio (after/before SIR)	Difference in DDD
	before SIR (2001–04)	after SIR (2005–06)		
Aminoglycosides (J01G)	0.156	0.164	1.051	0.008
Amphenicols (J01B)	0.012	0.009	0.766	−0.003
Cephalosporins (J01DA)	2.530	5.927	2.343	3.397
Macrolides and lincosamides (J01F)	2.945	5.682	1.929	2.735
Penicillins (J01C)	8.160	14.065	1.724	5.905
Quinolones (J01M)	1.802	3.616	2.007	1.814
Tetracyclines (J01)	0.902	1.232	1.366	0.330
Antibacterials for systemic use (total) (J01)	16.598	30.960	1.865	14.363

Table 1. Antibacterial consumption in Turkey between 2001 and 2006

Antibacterial class	DDD/1000 inhabitant-days					
	2001	2002	2003	2004	2005	2006
Tetracyclines (J01)	0.850	0.911	0.929	0.917	1.261	1.203
Amphenicols (J01B)	0.015	0.012	0.011	0.009	0.010	0.008
Penicillins (J01C)	7.126	7.666	8.115	9.734	14.043	14.087
Cephalosporins (J01DA)	1.984	2.402	2.510	3.223	5.640	6.213
Carbapenems (J01DH)	0.003	0.003	0.003	0.003	0.006	0.007
Macrolides and lincosamides (J01F)	2.833	2.587	2.914	3.446	5.848	5.515
Aminoglycosides (J01G)	0.176	0.155	0.155	0.138	0.171	0.157
Quinolones (J01M)	1.543	1.682	1.809	2.173	3.409	3.823
Glycopeptides (J01XA)	0.003	0.003	0.003	0.003	0.006	0.007
Antibacterials for systemic use (total) (J01)	14.620	15.500	16.530	19.740	30.560	31.360

Reçetesiz antibiyotik kullanım sıklığı



Morgan DJ et al. Non-prescrition antimicrobial use woldwide:a systematic review.Lancet Infect Dis. 2011

Reçete bilgi sistemi

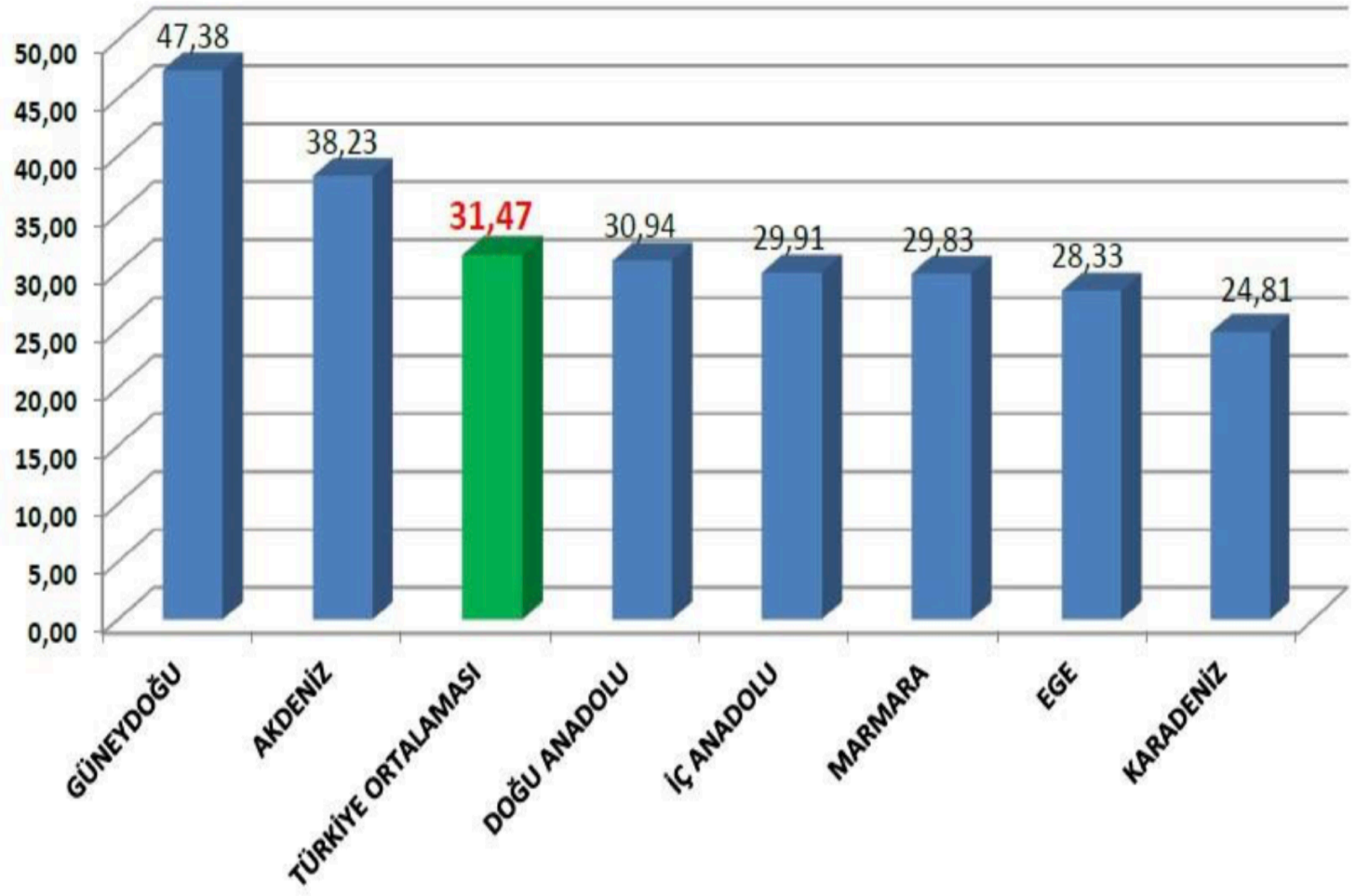
- E-reçetelerin izlenip değerlendirildiği ve hekimlere kendi reçeteleri ile ilgili bilgilendirmenin yapıldığı bir sistem

- 26 Ekim 2010 – Akılcı ilaç kullanımının yaygınlaştırılması amacıyla Reçete değerlendirme Projesi (RDP) adıyla başlatılmıştır.

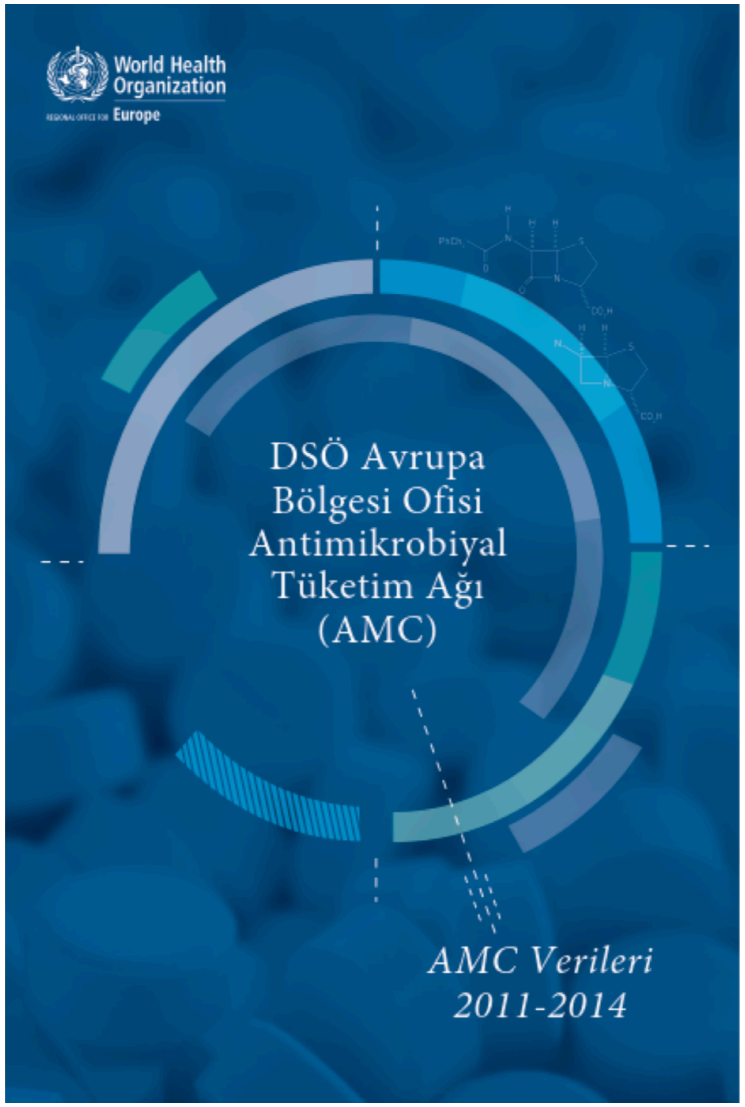
- 15 Ocak 2013 –Tüm sağlık kurumlarında e-reçete uygulamasına geçilmesiyle tüm reçeteler için izleme, değerlendirme ve geri bildirim yapılabilmektedir.

- Kasım 2013'den itibaren aile hekimlerine aylık bilgilendirme yapılmaktadır.

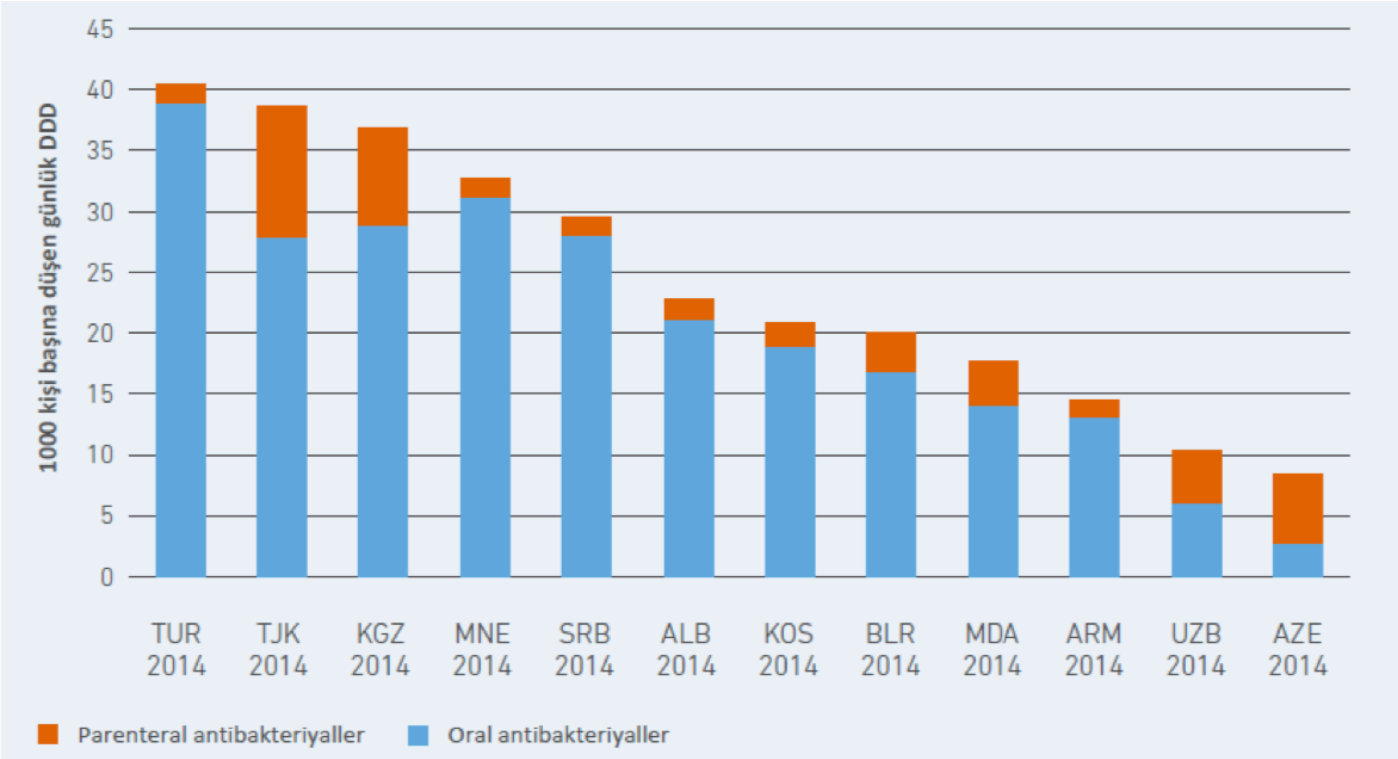
TÜRKİYE GENELİ BÖLGELER KARŞILAŞTIRMASIREÇETE BİLGİ SİSTEMİ 2014 "ANTİBİYOTİK BULUNAN REÇETE YÜZDESİ"



2015 VERİLERİ aile hekimleri tarafından oluşturulan e-reçetelerin %31.07 Sinde antibiyotik yer almaktadır.

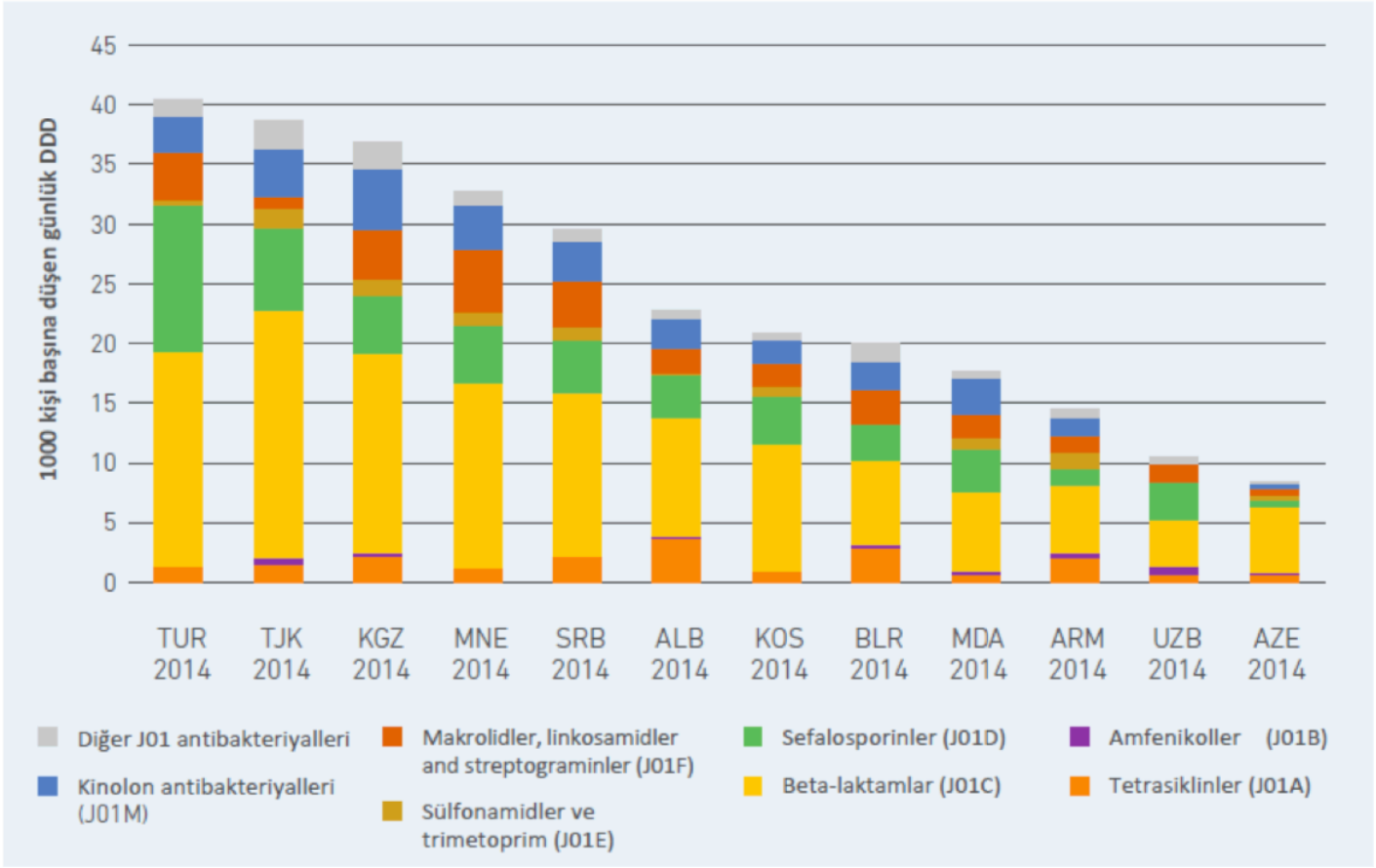


AB üyesi olmayan Avrupa ülkeleri arasındaki Antimikrobiyal tüketim eğilimleri

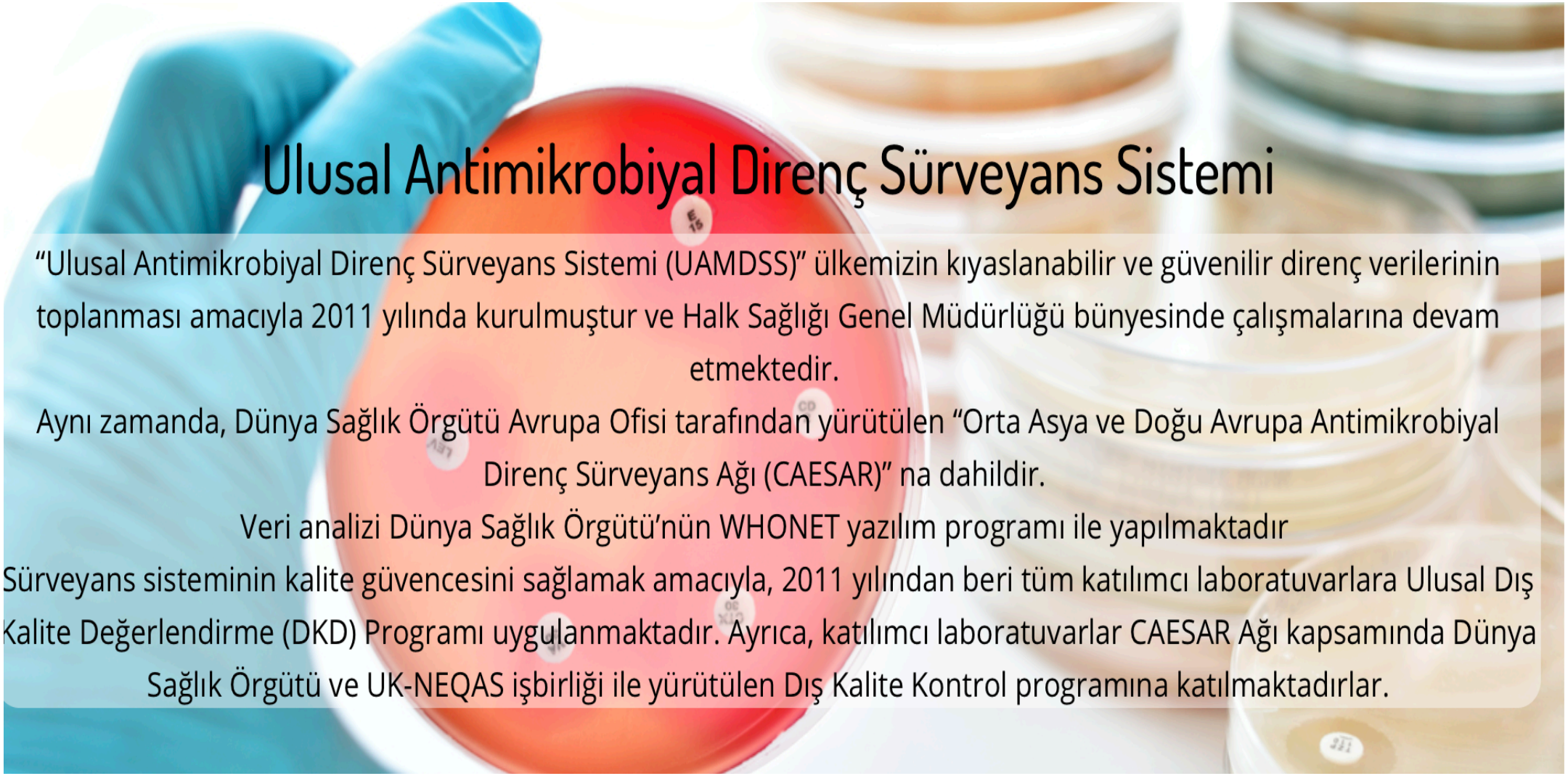


Şekil 1: J01 Antibakteriyellerinin Uygulama Yoluna Göre Toplam Tüketimi (2014)

2014
TUR 40,4 DDD
AZE 8,5 DDD



J01 grubu Antibakteriyellerin farmakolojik alt gruplara göre toplam tüketimi 2014



Ulusal Antimikrobiyal Direnç Sürveyans Sistemi

"Ulusal Antimikrobiyal Direnç Sürveyans Sistemi (UAMDSS)" ülkemizin kıyaslanabilir ve güvenilir direnç verilerinin toplanması amacıyla 2011 yılında kurulmuştur ve Halk Sağlığı Genel Müdürlüğü bünyesinde çalışmalarına devam etmektedir.

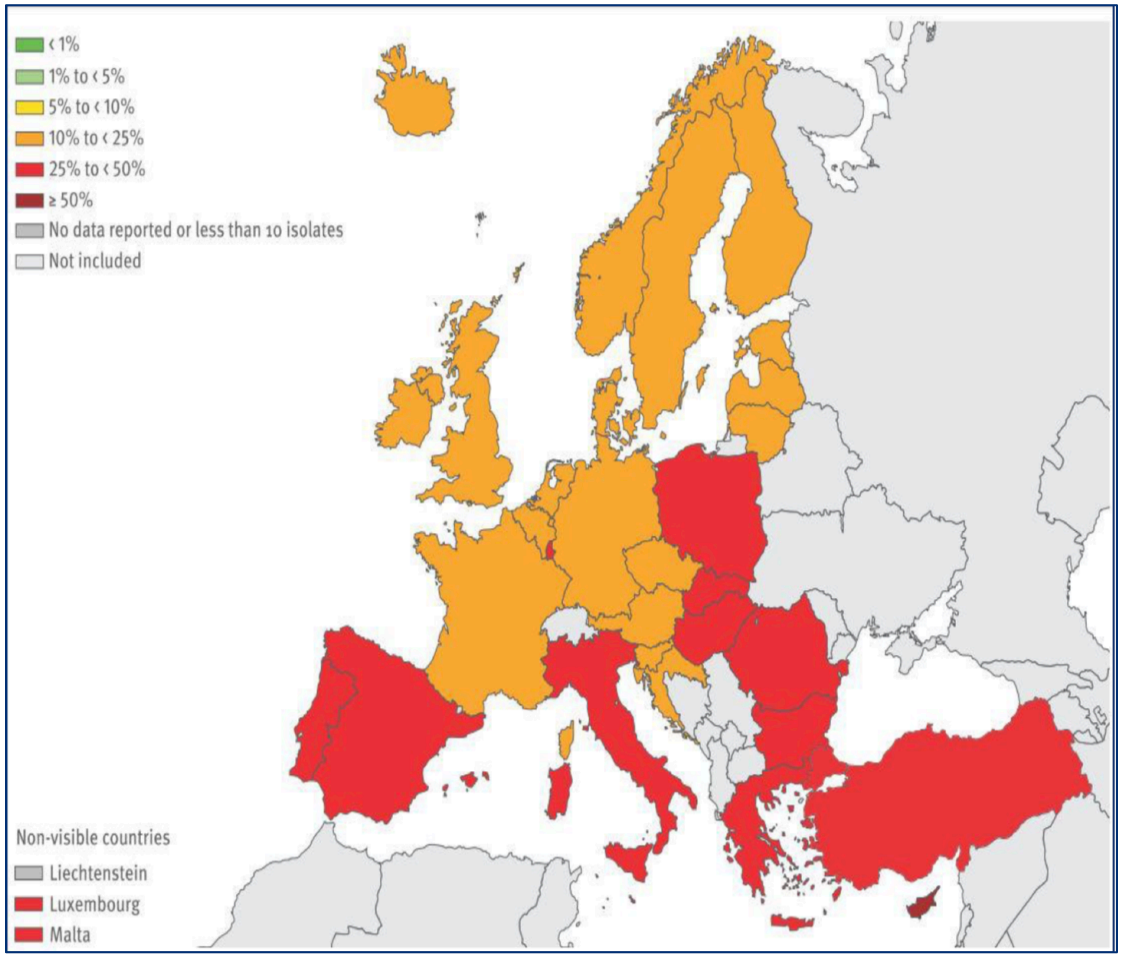
Aynı zamanda, Dünya Sağlık Örgütü Avrupa Ofisi tarafından yürütülen "Orta Asya ve Doğu Avrupa Antimikrobiyal Direnç Sürveyans Ağı (CAESAR)" na dahildir.

Veri analizi Dünya Sağlık Örgütü'nün WHONET yazılım programı ile yapılmaktadır

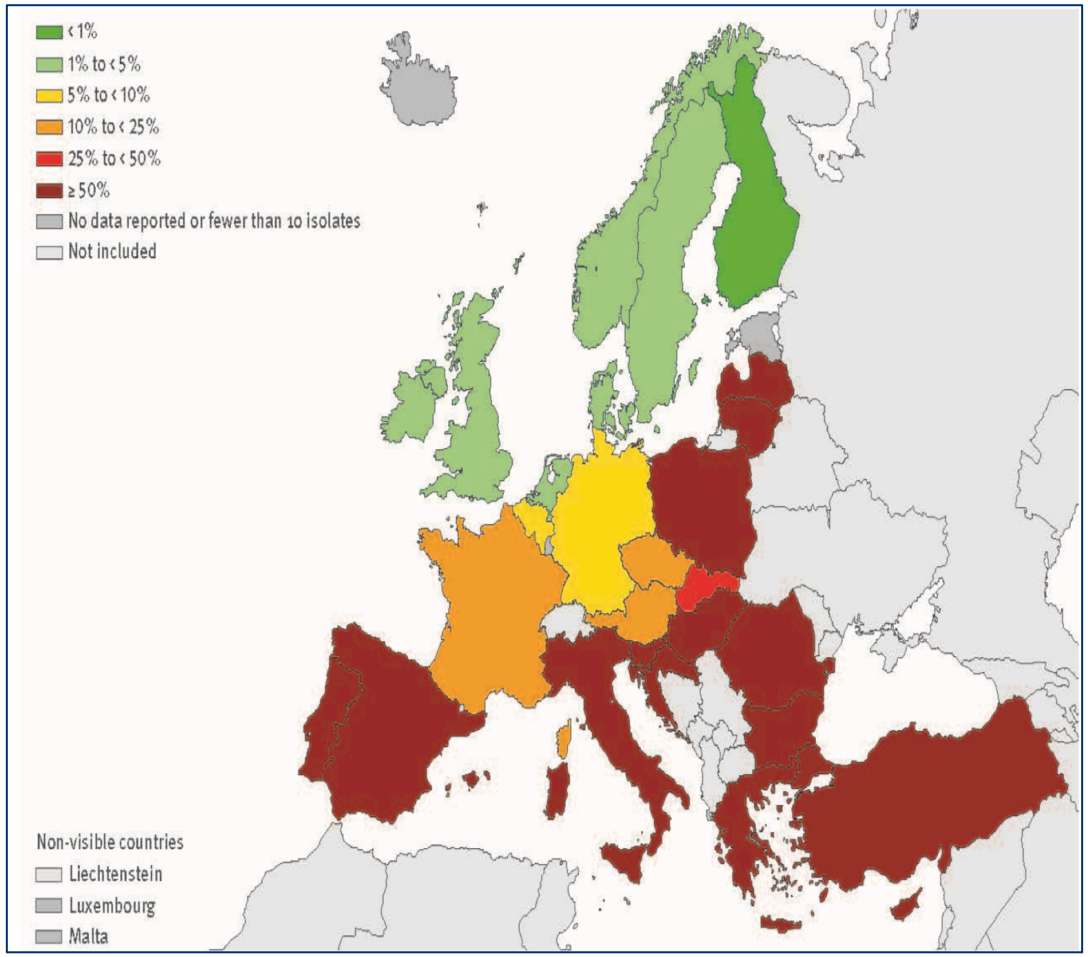
Sürveyans sisteminin kalite güvencesini sağlamak amacıyla, 2011 yılından beri tüm katılımcı laboratuvarlara Ulusal Dış Kalite Değerlendirme (DKD) Programı uygulanmaktadır. Ayrıca, katılımcı laboratuvarlar CAESAR Ağı kapsamında Dünya Sağlık Örgütü ve UK-NEQAS işbirliği ile yürütülen Dış Kalite Kontrol programına katılmaktadırlar.

İnvaziv E.coli İzolatlarında Fx direnç oranı

2013



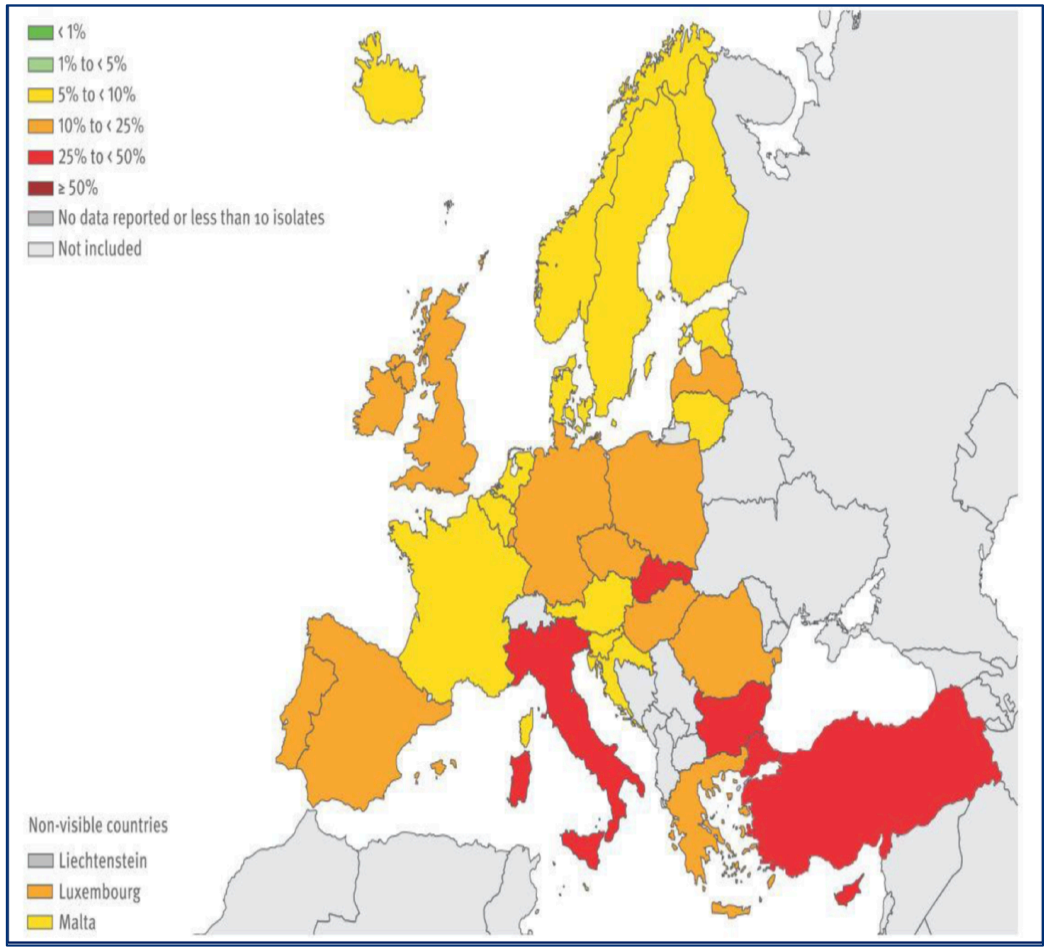
2016



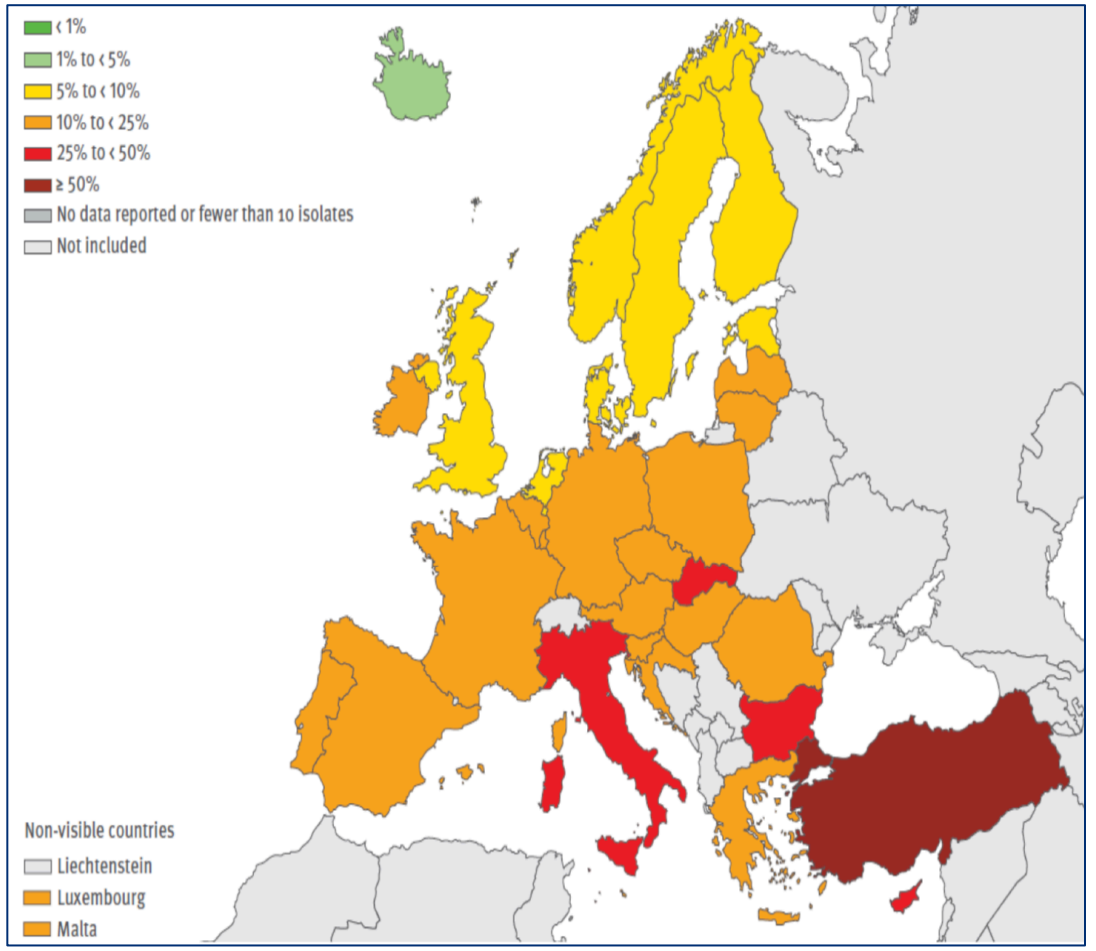
2013 ve 2016 EARSS-Net Raporundaki yer alan direnç haritaları üzerine Türkiye sonuçları eklenerek hazırlanmıştır

İnvaziv E.coli İzolatlarında 3.kuş Sefalosporin Direnç oranı

2013



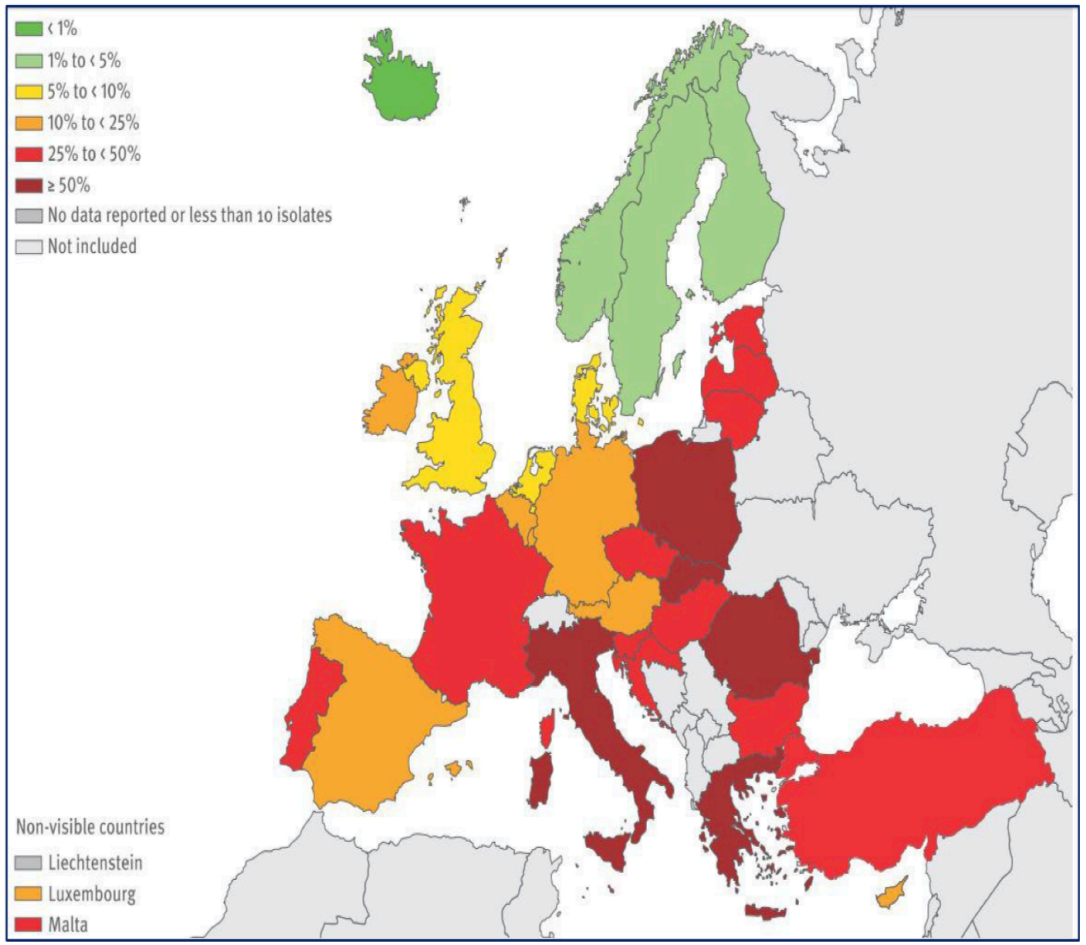
2016



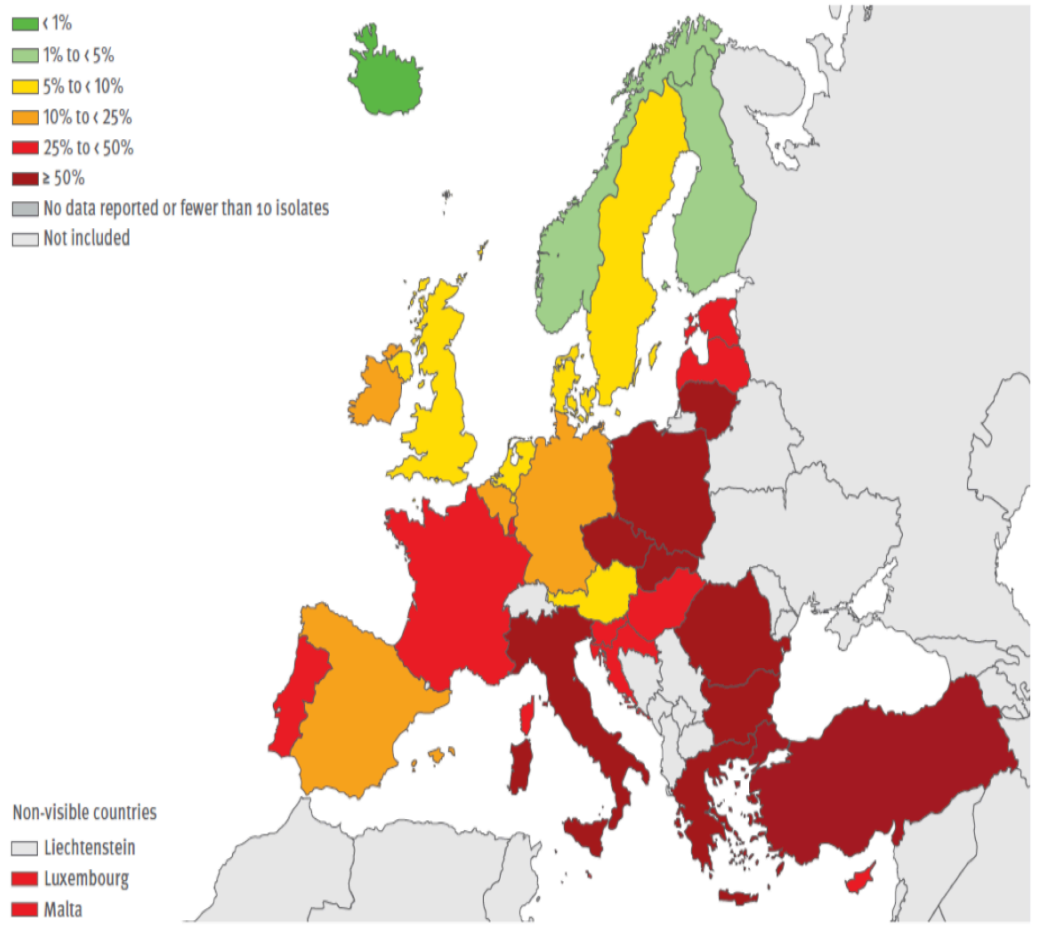
2013 ve 2016 EARSS-Net Raporundaki yer alan direnç haritaları üzerine Türkiye sonuçları eklenerek hazırlanmıştır

İnvaziv K.pneumoniae İzolatlarında Fx direnç oranı

2013



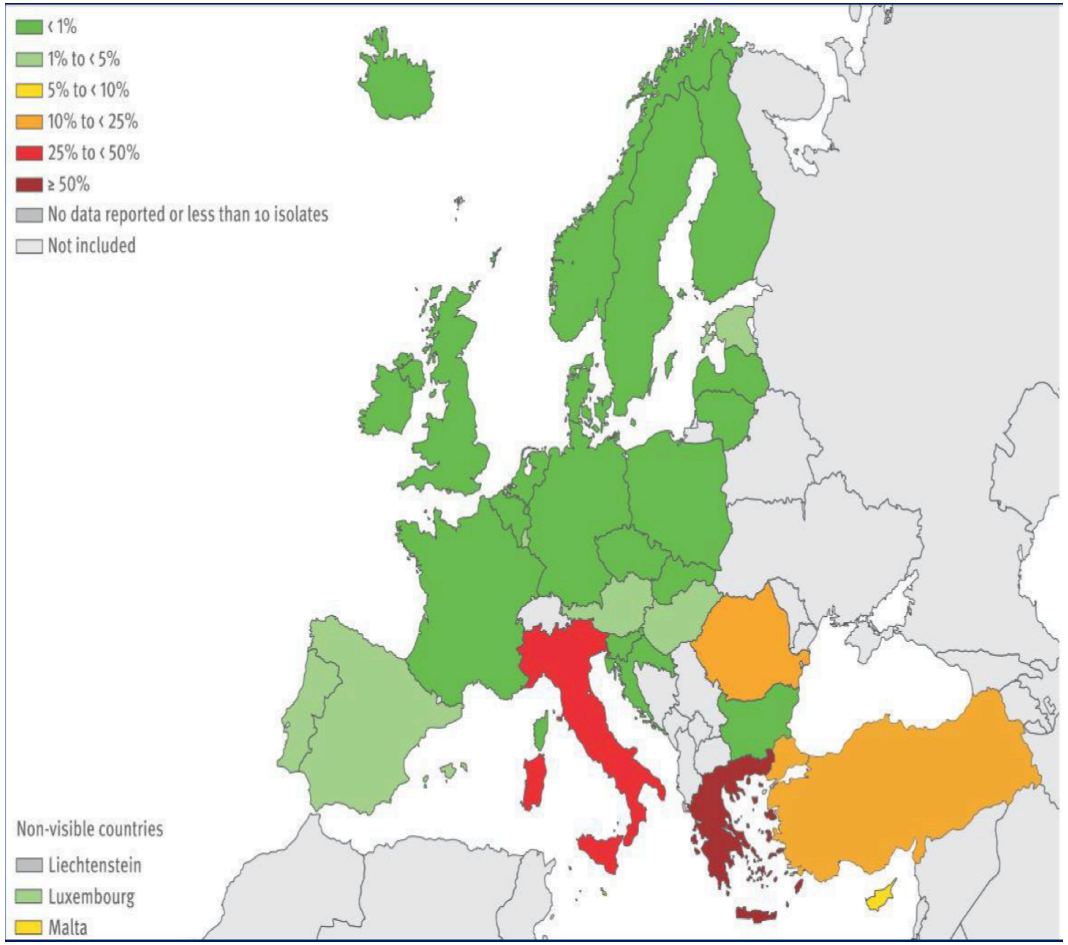
2016



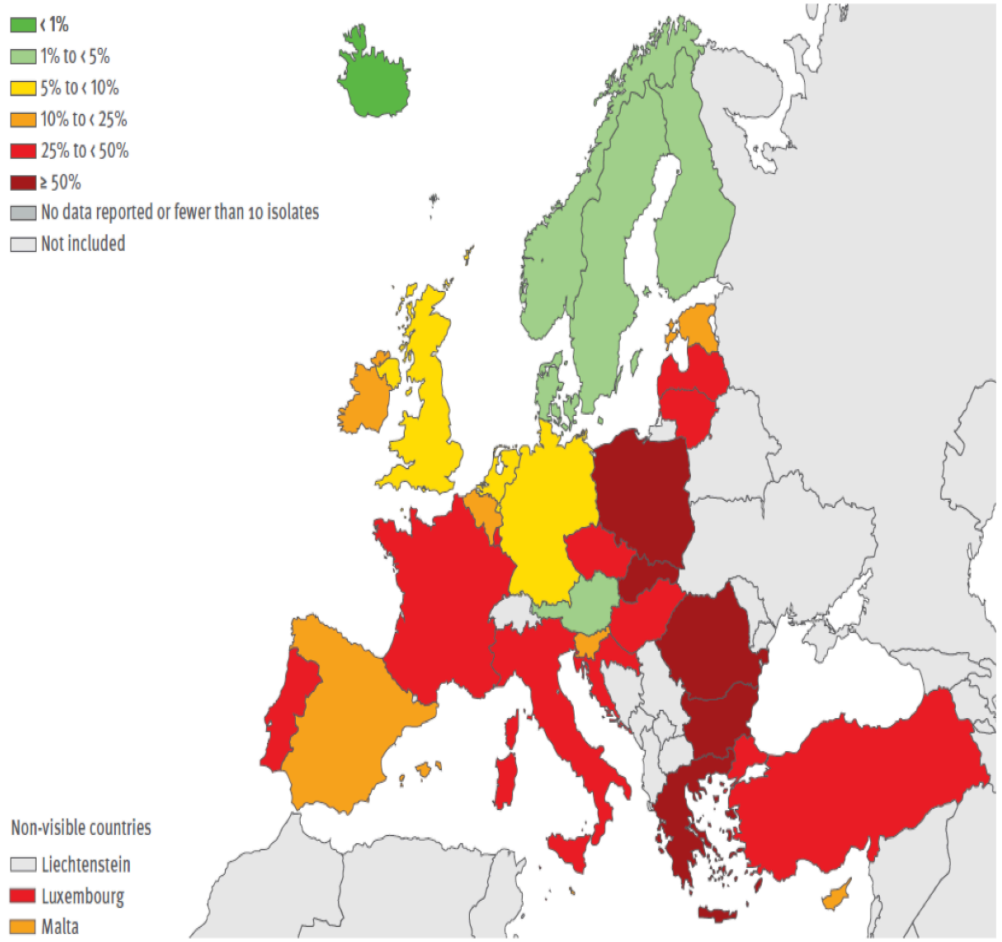
2013 ve 2016 EARSS-Net Raporundaki yer alan direnç haritaları üzerine Türkiye sonuçları eklenerek hazırlanmıştır

İnvaziv K.pneumoniae İzolatlarında Karbapenem direnç oranı

2013



2016

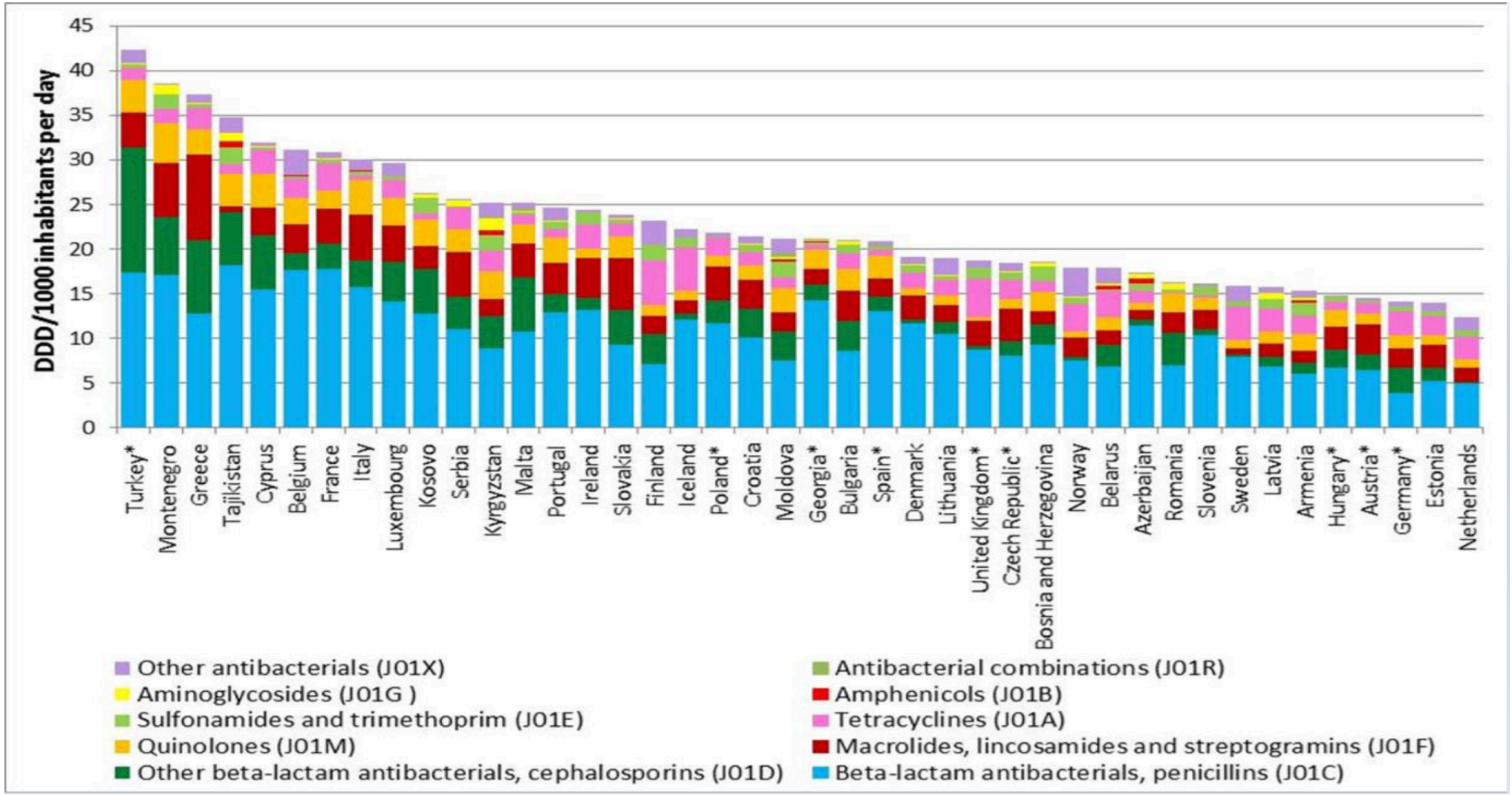


2013 ve 2016 EARSS-Net Raporundaki yer alan direnç haritaları üzerine Türkiye sonuçları eklenerek hazırlanmıştır

Table 5.46 Percentages of resistance for *E. coli* and *K. pneumoniae* among blood and CSF isolates in Turkey, 2017

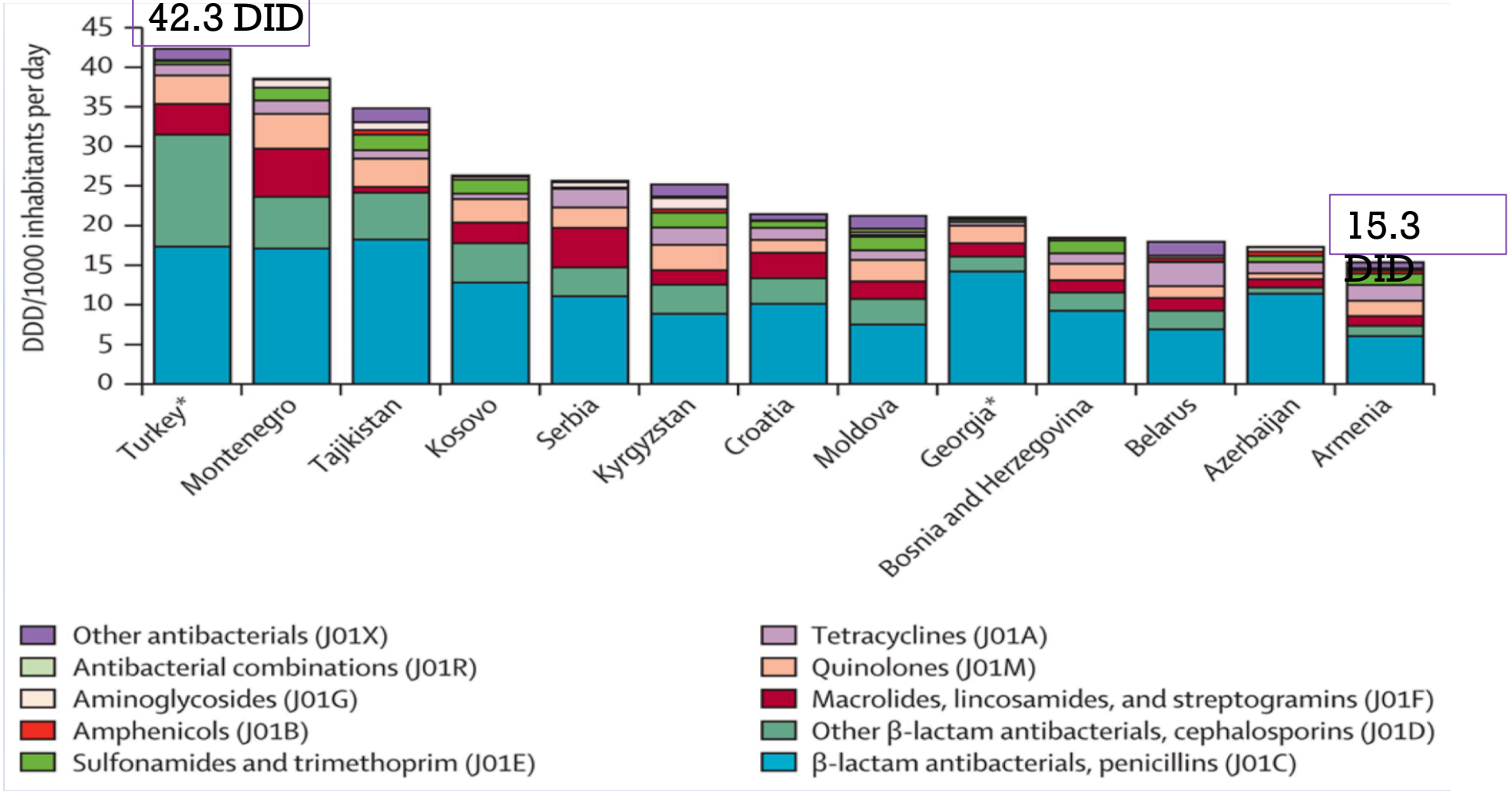
Antibiotic (group)	*E. coli*		*K. pneumoniae*	
	N	Resistance (%)	N	Resistance (%)
Amoxicillin/ampicillin (R)[a]	3652	78	NA	NA
Amoxicillin-clavulanic acid (R)	3110	59	1980	72
Piperacillin-tazobactam (R)	4022	22	2998	58
Cefotaxime/ceftriaxone (R)[b]	4059	52	2880	71
Cefotaxime/ceftriaxone (I+R)[b]	4059	53	2880	72
Ceftazidime (R)	3701	44	2803	69
Ertapenem (R)	3818	6	2815	43
Imipenem/meropenem (R)[c]	4321	3	3165	32
Imipenem/meropenem (I+R)[c]	4321	4	3165	38
Gentamicin/tobramycin (R)[d]	4083	27	2991	45
Amikacin (R)	4218	2	3060	19
Ciprofloxacin/levofloxacin/ofloxacin (R)[e]	4022	52	3009	61
Ciprofloxacin/levofloxacin/ofloxacin (I+R)[e]	4022	60	3009	66
Multidrug resistance (R)[f]	3755	19	2821	39

Avrupa Ülkelerinde antibiyotik tüketimi



Antibiotic use in Western Europe: a cross-national database study in coordination with the WHO Regional Office for Europe. Lancet Infect Dis. 2014 May;14(5):381-7 /Supplementary

Doğu Avrupa ülkelerinde antibiyotik tüketimi



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The need for an antibiotic stewardship program in a hospital using a computerized pre-authorization system

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ABSTRACT

Objectives: Antimicrobial stewardship programs (ASPs) have an important role in the appropriate utilization of antibiotics. Some of the core strategies recommended for ASPs are pre-authorization and prospective audit and feedback. In Turkey, a unique nationwide antibiotic restriction program (NARP) has been in place since 2003. The aim of this study was to measure the effect of a prospective audit and feedback strategy system along with the NARP.

Methods: A prospective quasi-experimental study was designed and implemented between March and June 2017. A computerized pre-authorization system was used as an ASP strategy to approve the antibiotics. During the baseline period, patients with intravenous (IV) antibiotic use ≥72 h were monitored without intervention. In the second period, feedback and treatment recommendations were given to attending physicians in the case of IV antibiotic use ≥72 h. The modified criteria of Kunin et al. and Gyssens et al. were followed for appropriateness of prescribing. Days of therapy (DOT) and length of stay (LOS) were calculated and compared between the two study periods.

Results: A total of 866 antibiotic episodes among 519 patients were observed. A significant reduction in systemic antibiotic consumption was observed in the intervention period (575 vs. 349 DOT per 1000 patient-days; $p < 0.001$). On multivariate analysis, prospective audit and feedback (odds ratio 1.5, 95% confidence interval 1.09–2.04; $p = 0.011$) and pre-authorization of restricted antibiotics (odds ratio 1.7; 95% confidence interval 1.2–2.31; $p = 0.002$) were the predictors of appropriate antimicrobial use. Mean LOS was decreased by 2.9 days ($p = 0.095$).

Conclusions: This study showed that the antimicrobial restriction program alone was effective, but the system should be supported by a tailored ASP, such as prospective audit and feedback.

EHU ONAYı TEK BAŞıNA EFEKTIF ANCAK AMY PROGRAMI İLE DESTEKLENMELİ

Univariate and multivariate analyses for the predictors of appropriate antibiotic use.

	Univariate analysis			Multivariate analysis		
	OR	95% CI	*p*-Value	OR	95% CI	*p*-Value
Prospective audit and feedback	1.4	1.02–1.84	0.036	1.5	1.09–2.04	0.011
Antibiotics restricted by NARP	2	1.51–2.82	<0.001	1.7	1.2–2.31	0.002
Medical vs. surgical wards (excluding ICU)	3.2	2.34–4.28	<0.001	3	2.2–4.11	<0.001

OR, odds ratio; CI, confidence interval; NARP, nationwide antibiotic restriction program; ICU, intensive care unit.

Comparison of DOTs for the effects of the intervention.

	RR	95% CI	*p*-Value
Internal medicine	0.74	0.70–0.77	<0.001
Thoracic surgery	0.74	0.65–0.84	<0.001
Gynecology/obstetrics	0.91	0.81–1.01	0.10
Urology	0.64	0.53–0.76	<0.001
Neurosurgery	0.29	0.24–0.34	<0.001
General surgery	0.93	0.82–1.07	0.36
Neurology	0.43	0.31–0.59	<0.001
Medical ICU	0.89	0.80–0.98	0.02
Surgical ICU	0.85	0.78–0.93	0.001

DOT, days of therapy; RR, risk ratio; CI, confidence interval; ICU, intensive care unit.

- EHU onayı tek başına efektif ancak antimikrobiyal yönetim program ile desteklenmeli

TEŞEKKÜR EDERİM