Kecenderungan infeksi MDR di Indonesia

Kajian data surveilans multi RS 2018-2022

Andaru Dahesihdewi

Pokja Infeksi PP PDS PatKLiN

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- Ketua Komite Medik RSUP Dr Sardjito Yogyakarta, Juli 2023 - 2026
- Anggota Bidang Surveilans Komite Nasional Pengendalian Resistansi Antimikroba 2019-2024
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- Anggota Bidang Ilmiah PDS PatKLIn Yogya
- Koordinator Bidang Diklat PERDALIN Cabang DIY
- Konsultan Laboratorium Infeksi RS PKU Muhammadiyah Yogyakarta
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Outline

- **Epidemiologi infeksi MDR global & regional**
- **Faktor risiko dan impak infeksi MDR**
- **Surveilans MDR di Indonesia**
- **Surveilans MDR di RS**

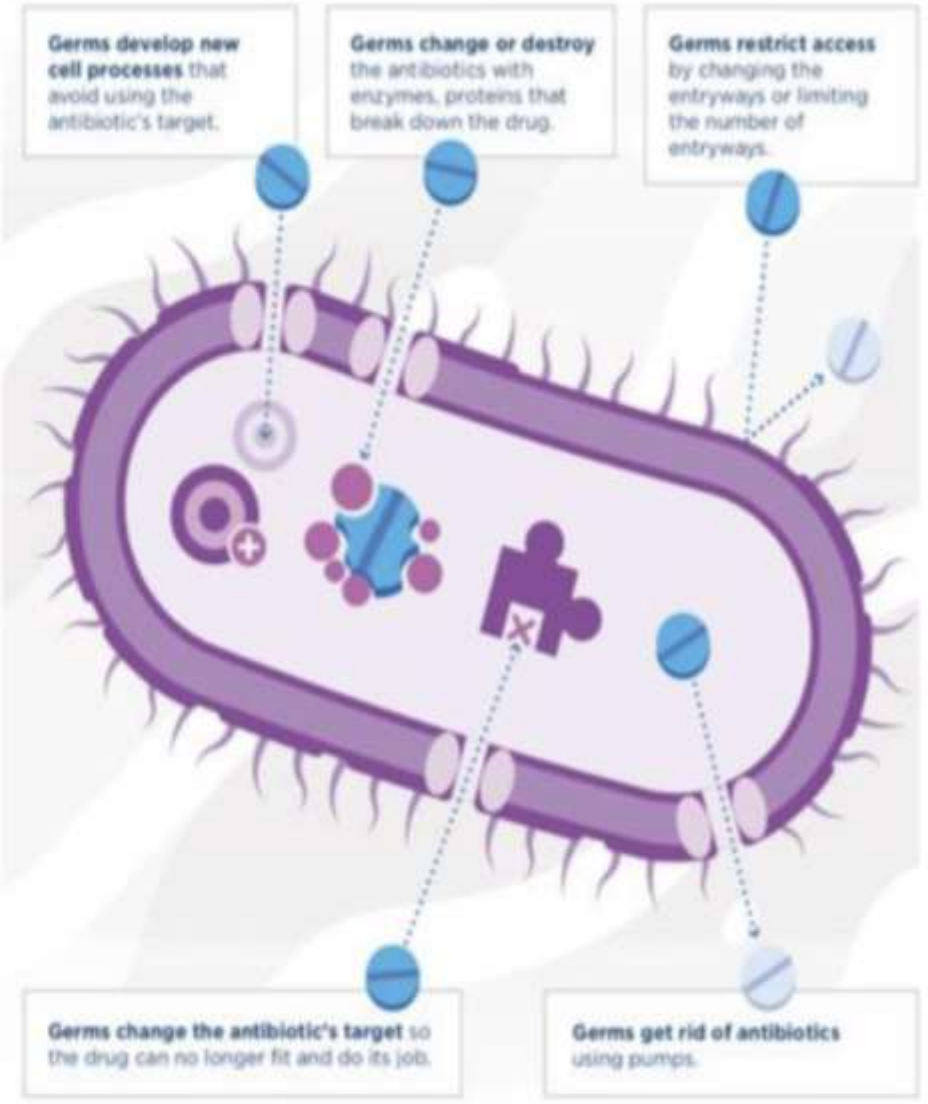
What is antimicrobial resistance?

Antimicrobial Resistance (AMR) occurs when bacteria change over time and no longer respond to antibiotic making infections harder to treat and increasing the risk of disease spread, severe illness and death. (WHO, 2021)

What are MDROs?

Multidrug-resistant organisms (MDROs) are organisms that are resistant to multiple antibiotics. MDROs can be difficult to treat, and therefore, can cause serious illness or even death (CDC, 2022)

- **Carbapenem resistant Enterobacteriaceae (CRE)**
- **Extended spectrum β-lactamase (ESBLs) producing bacteria.**
- **Methicillin Resistant Staphylococcus aureus (MRSA)**
- **Vancomycin resistant enterococci (VRE)**



Consequences of antimicrobial resistance

Increased mortality

- Patients with risk factors
- Therapeutic failure

Increased economic costs

- Higher length of hospital stay
- Higher antimicrobial use

Daikos GL, et al. Expert Rev Anti Infect Ther 2012;10:1393–404; Navarro-San Francisco C, et al. CMI 2013;19:E72–9; Smith R, Coast J. BMJ 2013;346:f1493; Marston HD, et al. JAMA 2016;316:1193–204.

AMR MERUPAKAN 1 DARI 10 ANCAMAN KESEHATAN GLOBAL

Pada Tahun 2050 diperkirakan Pandemi AMR dengan kematian 10 juta orang/tahun

[1] Review on AMR, 2014
[2] Global Burden Disease, 2019
[3] World Bank, 2017

silent pandemic

700.000 kematian per tahun [1]

1.27 juta kematian per tahun [2]

Proyeksi : 10 juta kematian per tahun [2]

DAMPAK EKONOMI TAHUN 2050

Penurunan GDP **3.8%** [3]

Beban ekonomi dunia **US$ 100 triliun**

Pembiayaan JKN meningkat

Beban pembanguanan global dan keuangan negara

Early warning system

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

*Antimicrobial Resistance Collaborators**

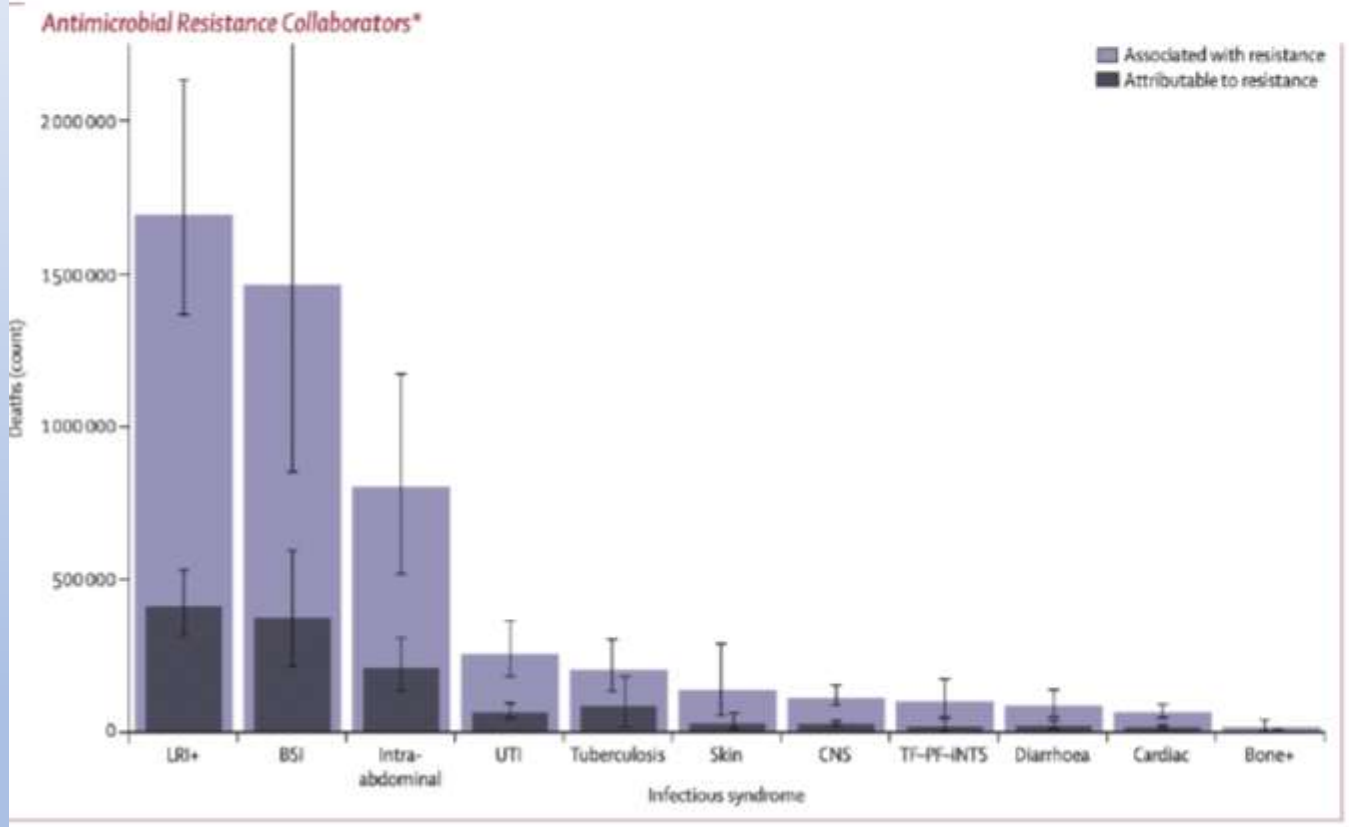
Legend	Regions	Death rate per 100000 associated with ABR
	Australasia	28
	North Africa and Middle East	42
	East Asia	43.3
	Central Latin America	50.6
	North America	51
	Western Europe	52.5
	Central Asia	53.3
	South East Asia	54.8
	Tropical Latin America	63
	Andean Latin America	63.2
	Caribbean	65.1
	Central Europe	68
	High Income Asia Pacific	70.7
	Southern Latin America	72.3
	Eastern Europe	74
	South Asia	76.8
	Southern Sub Saharan Africa	79.4
	Central Sub Saharan Africa	86
	Eastern Sub Saharan Africa	89
	Western Sub Saharan Africa	114.8

Data source: Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis- Supplementary material

Murray et al. Lancet, 2023;399(10325):629-655

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

*Antimicrobial Resistance Collaborators**



ure 3: Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by infectious syndrome, 2019

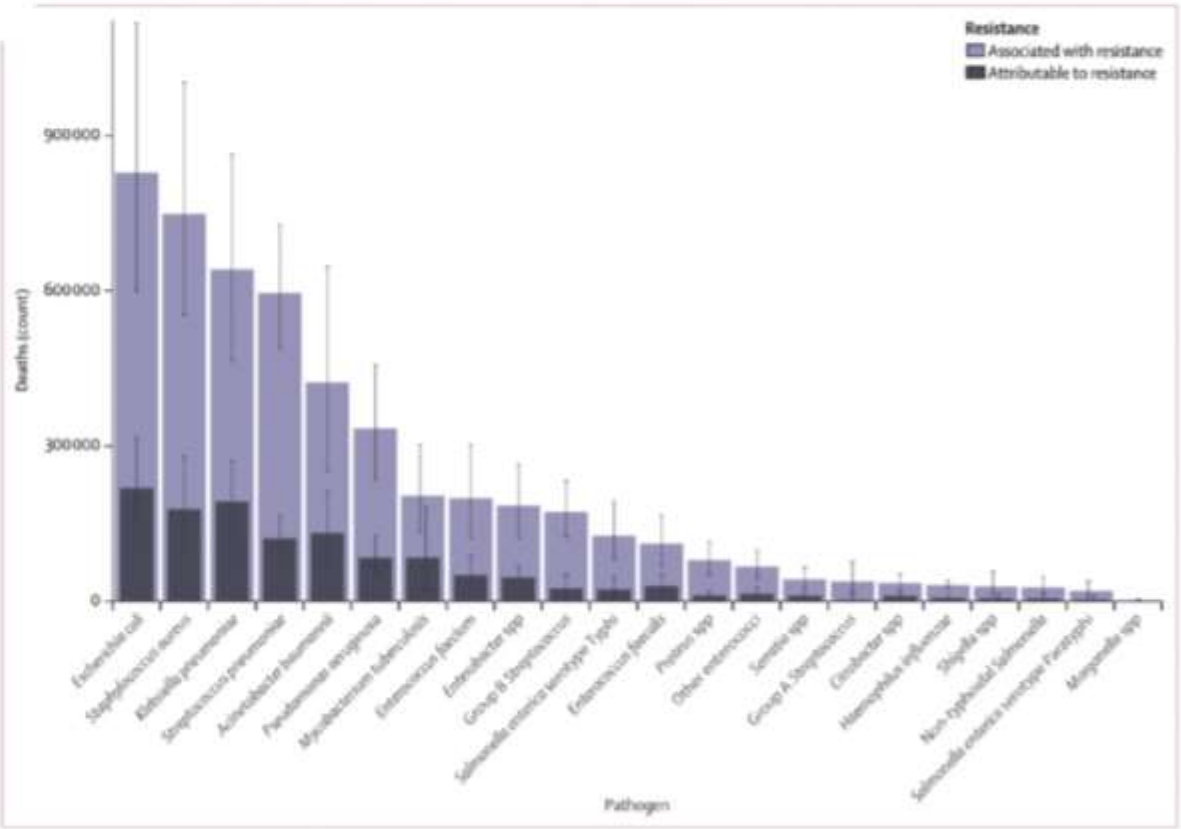


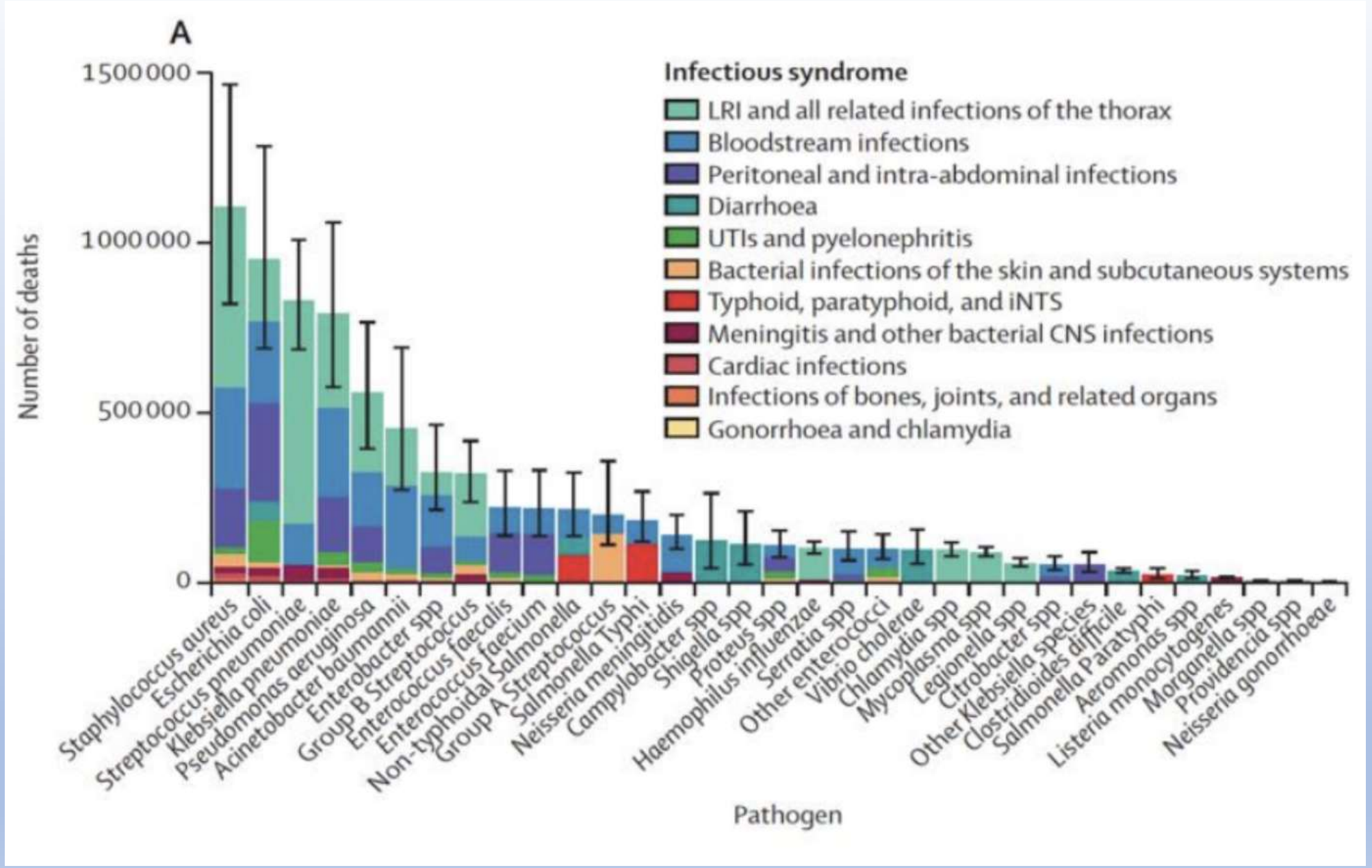
Figure 4: Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by pathogen, 2019

By infectious syndrome

By pathogen

Global mortality associated with 33 bacterial pathogens in 2019:

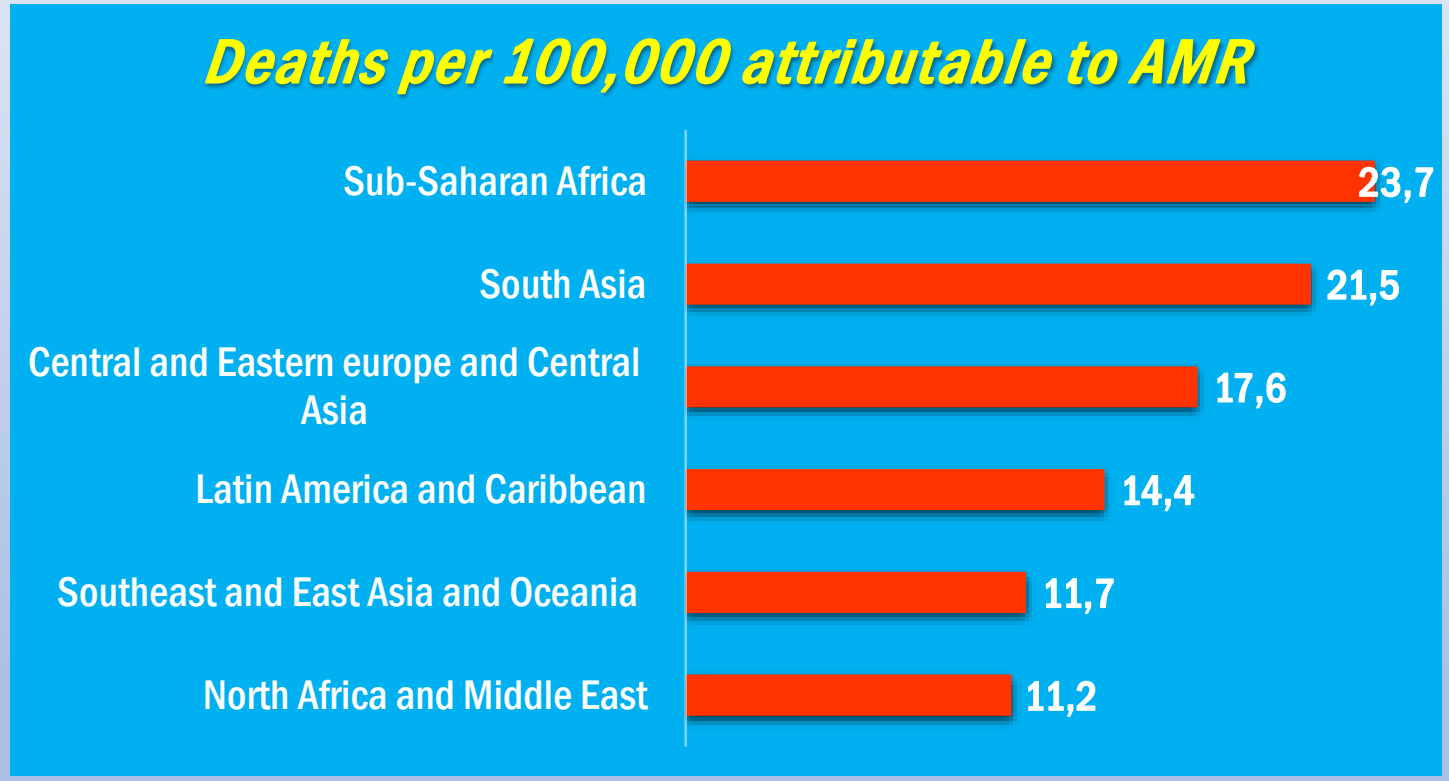
a systematic analysis for the Global Burden of Disease Study 2019



From an estimated 13.7 million (95%CI 10.9-17.1) infection related deaths in 2019, there were 7.7 million deaths (5.7-10.2) associated with the 33 bacterial parhogens (2019)

Estimated global burden

4.95 mil deaths/year



Global burden on bacterial antimicrobial resistance in 2019:
a systematic analysis, The Lancet 2022, IHME Institute for Health Metrics and Evaluation

Estimated regional burden

SOUTH ASIA

Total estimated deaths attributable to resistance
389,000

Leading pathogens are Klebsiella pneumoniae and E. coli

SOUTH EAST ASIA

Total estimated deaths attributable to resistance
97,000

Leading pathogens are A. baumannii and E. coli

Associated with resistance = those who died suffering from a drug-resistant infection, for which AMR may or may not have been causal

Attributable to resistance = AMR was judged to be a direct cause of death

Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis,
The Lancet, Jan 2022, IHME Institute for Health Metrics and Evaluation

Surveilans Nasional & RAN

3 GOOD HEALTH AND WELL-BEING

% R	2019	2020	2021	2022	Target Nasional 2024
E.coli - ESBL	62,2	66,7	59,2	68,1 ↑	52
S. aureus -MRSA	37,5	27,8	14,4	36,7	

Data Surveilans AMR Nasional yang disubmit ke platform *Global Antimicrobial Resistance Surveillance System* (GLASS) WHO

No	Indikator Nasional	Baseline	2024
1	**RPJMN 2020-2024 (Perpres 18/2020)** Persentase RS Kelas A dan B pendidikan melakukan surveilans sesuai standar	20%	100%
2	**RAN PRA 2020-2024 (Permenko PMK 7/2021)**		
	a. Penurunan persentase ESBL (extended spectrum beta-lactamase)	**62%**	**Turun 10%**
	b. Persentase penggunaan antimikroba di FKTP		
	1) ISPA non pneumonia	21.28%	≤20%
	2) Diare non spesifik	18.27%	≤8%
	c. Surveilans AMU (Antimicrobial Use)		
	1) data tahunan mutu antimikroba utk manusia yang beredar	-	1 paket
	2) Data penggunaan antimikroba rasional di FKTP	-	1 paket
	3) Data tahunan penggunaan antimikroba di RS	-	1 paket
	d. Surveilans AMR (Antimicrobial Resistance) Data tahunan ESBL	-	1 paket
	e. PPI di fasyankes		
	1) FKTP menerapkan PPI	-	100%
	2) FKRTL menerapkan PPI	-	100%

Contents lists available at ScienceDirect

One Health

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

Extended spectrum beta-lactamase-producing *Escherichia coli* surveillance in the human, food chain, and environment sectors: Tricycle project (pilot) in Indonesia

Nelly Puspandari [a,*], Sunarno Sunarno [a], Tati Febrianti [a], Dwi Febriyana [a], Ratih Dian Saraswati [a], Indri Rooslamiati [a], Novi Amalia [a], Sundari Nursofiah [a], Yudi Hartoyo [a], Herna Herna [a], Mursinah Mursinah [a], Fauzul Muna [a], Nurul Aini [a], Yenni Risniati [b], Pandji Wibawa Dhewantara [c], Puttik Allamanda [d], Dwi Nawang Wicaksana [d], Rinto Sukoco [d], Efadeswarni [e], Erni Juwita Nelwan [f], Cahyarini [g], Budi Haryanto [g], Benyamin Sihombing [h], Ricardo J. Soares Magalhães [i], Manish Kakkar [j], Vivi Setiawaty [a], Jorge Matheu [k]

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ESBL producing E. coli across sector

Table 1
Characteristics of the samples and ESBL-producing *E. coli* identification across sectors.

Variable	Human sector		Animal sector/food chain	Environment sector
	Pregnant women	Bloodstream infection patient		
Sample	rectal swab	blood culture	broiler cecum	river surface water
Number of samples	100	116	240	119
Sampling sites	1 Primary Health Care (PHC) Facility	2 hospitals	6 markets/ slaughterhouses	3 up/midstream sites, 6 markets/ slaughter houses, and 3 downstream sites
Sampling time	10 months	14 months	10 months	10 months
Epidemiology data	yes	yes	yes	no
Laboratory	NIHRD*	Hospital Lab and NIHRD	DIC**	CRDEQL***
Primary culture	MacConkey and MacConkey+CTX	Bactec	MacConkey+CTX	TBX and TBX + CTX
E. coli identification	indole test	Vitek-2	indole test	indole test
ESBL identification+ confirmatory	DDST****	Vitek-2	DDST****	DDST****

*The Research Laboratory for Infectious Diseases, NIHRD, Jakarta **Disease Investigation Center Subang West Java, ***the Centre for Research and Development of Environment Quality Laboratory, Banten ****Double Disk Sinergy Test.

ESBL producing E.coli	40%	57,7%	67,1%	12,8%

Average E.coli 2,0x10^8 CFU/100ml

PLOS GLOBAL PUBLIC HEALTH

RESEARCH ARTICLE

Excess mortality attributable to antimicrobial-resistant bacterial bloodstream infection at a tertiary-care hospital in Indonesia

Patricia M. Tauran*, Irawaty Djaharuddin[2,3], Uleng Bahrun[2,4], Asvin Nurulita[2,4], Sudirman Katu[2,5], Faisal Muchtar[2,6], Ninny Meutia Pelupessy[2,7], Raph L. Hamers[8,9,10], Niholas P. J. Day[1,9], Mansyur Arif[2,4], Direk Limmathurotsakul[1,9,11]

1 Mahidol Oxford Tropical Medicine Research Unit, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand, **2** Dr. Wahidin Sudirohusodo Hospital, Makassar, South Sulawesi, Indonesia, **3** Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Hasanuddin University, Makassar, South Sulawesi, Indonesia, **4** Department of Clinical Pathology, Faculty of Medicine, Hasanuddin University, Makassar, South Sulawesi, Indonesia, **5** Department of Internal Medicine, Faculty of Medicine, Hasanuddin University, Makassar, South Sulawesi, Indonesia, **6** Department of Anesthesiology, Faculty of Medicine, Hasanuddin University, Makassar, South Sulawesi, Indonesia, **7** Department of Pediatrics, Faculty of Medicine, Hasanuddin University, Makassar, South Sulawesi, Indonesia, **8** Eijkman-Oxford Clinical Research Unit, Jakarta, Indonesia, **9** Centre for Tropical Medicine and Global Health, Nuffield Department of Medicine, University of Oxford, Oxford, United Kingdom, **10** Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia, **11** Department of Tropical Hygiene, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand

Table 3. Factors associated with in-hospital mortality in patients with AMR BSI compared with patients without a BSI with a target pathogen.

Factors	In-hospital mortality in Cohort 1 (n = 443 patients)	In-hospital mortality in Cohort 3 (n = 76,987 patients)	Crude cORs* (95%CI)	P value	Adjusted cORs* (95%CI)	P value
Sex						
Female	53.6% (105/196)	12.0% (4,360/36,217)	1.0		1.0	
Male	46.6% (115/247)	13.7% (5,565/40,769)			0.85 (0.78–0.93)	<0.001
		14.9% (847/5,705)			0.95 (0.61–1.47)	
		9.3% (270/2,912)			0.48 (0.31–0.74)	
		8.3% (436/5,239)			0.51 (0.34–0.77)	
		8.6% (746/8,704)			0.64 (0.50–0.83)	
		9.8% (850/8,642)			0.73 (0.59–0.90)	
		11.5% (1,185/10,296)			0.90 (0.75–1.07)	
		14.4% (1,907/13,278)			1.0	<0.001
		15.3% (1,847/12,110)	0.85 (0.73–1.00)		0.76 (0.65–0.90)	
		18.2% (1,837/10,100)	0.99 (0.84–1.17)		0.81 (0.68–0.96)	
		21.0% (2,671/12,725)	1.49 (1.33–1.66)	<0.001	1.53 (1.36–1.72)	<0.001
		8.5% (3,032/35,899)	1.0	<0.001	1.0	<0.001
		13.2% (2,528/19,135)	1.42 (1.23–1.64)		1.41 (1.20–1.66)	
		17.6% (2,168/12,288)	1.77 (1.52–2.06)		1.82 (1.52–2.17)	
		22.7% (2,197/9,664)	2.26 (1.98–2.59)		2.33 (2.01–2.71)	
		12.9% (9,925/76,986)	1.0	<0.001	1.0	<0.001
		-	5.30 (4.36–6.45)		4.91 (4.02–6.00)	

CCI = Charlson Comorbidity Index

estimated from a conditional logistic regression and a match case-control data. Matched controls (1:32) Cohort 1 having AMR infection. This means that Cohort 1 who had later infection can be a control of ed based on duration of hospital stay prior to the infection, age group (neonatal, pediatric, adult), and individual level.

Gender,
Usia,
ICU admission,
Severitas
AMR

INTERNATIONAL JOURNAL OF UROLOGY
International Journal of Urology (2018) doi: 10.1111/iju.13787

Original Article

Occurrence and characterization of carbapenem-resistant Gram-negative bacilli: A collaborative study of antibiotic-resistant bacteria between Indonesia and Japan

Kuntaman Kuntaman,[1,2] Katsumi Shigemura,[3,5] Kayo Osawa,[4] Koichi Kitagawa,[6] Koharu Sato,[3] Naoki Yamada,[3] Kento Nishimoto,[3] Fukashi Yamamichi,[4] Dadik Rahardjo,[2] Usman Hadi,[1,7] Ni Made Mertaniasih,[1,2] Shohiro Kinoshita,[5] Masato Fujisawa[5] and Toshiro Shirakawa[5,6,8]

- 4861 Urine specimens→ 700 GNB resistant to 3rd gen Cephalosporin and/or IPM or MEM

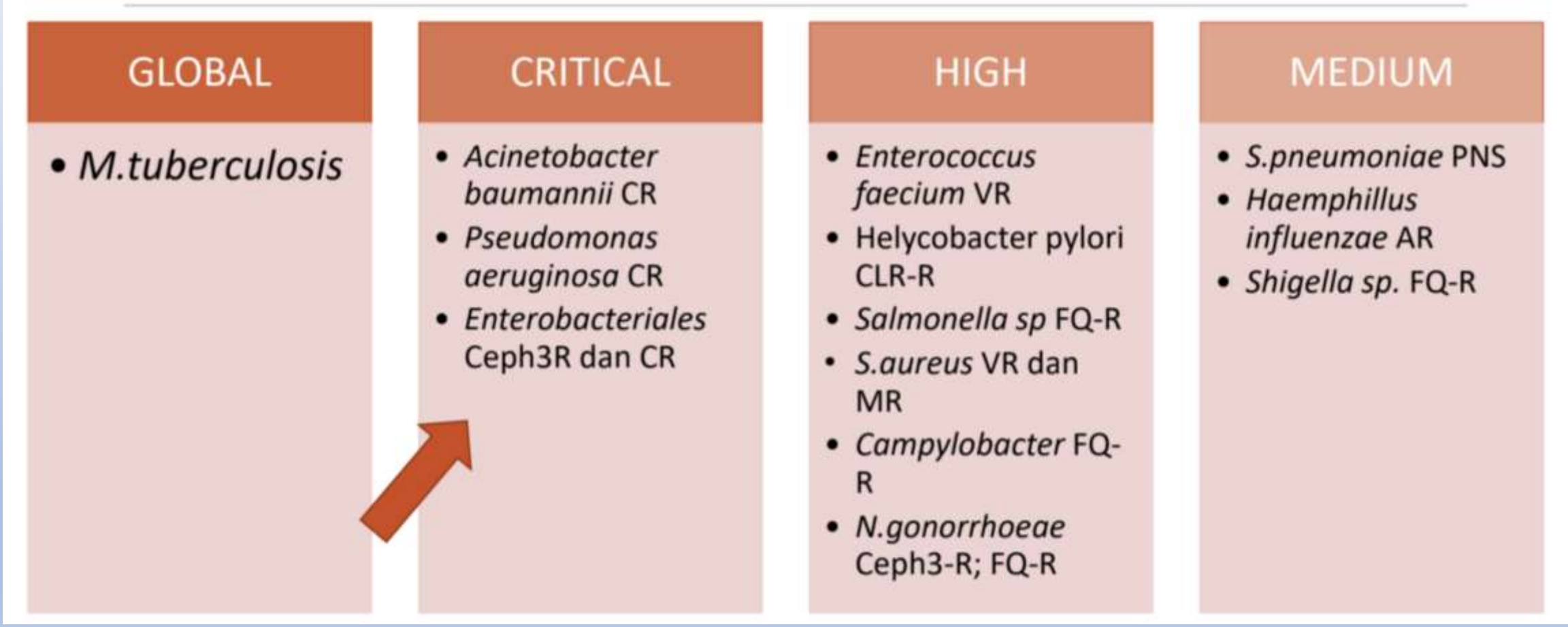
- From 700 GNB:
  - 116: Non-susceptible to IPM or MEM
  - 22 among 116 are CR-GNB → 4 strains produced ESBL

Table 1 Carbapenemase, extended-spectrum β-lactamase and AmpC genotypes in isolated carbapenem-resistant Gram-negative bacteria with MLST

Stock no.	Bacteria	Carbapenemase genes	ESBL-types†	AmpC-types	MLST
1	*Acinetobacter baumannii*	NDM-1			ST1000
2	*A. baumannii*	NDM-1			ST1000
3	*A. baumannii*	NDM-1			ST1089
4	*A. baumannii*	NDM-1			Non-type‡
5	*A. baylyi*	NDM-1			Non-data§
6	*A. junii*	NDM-1			Non-data
7	*Cedecea lapagei*	NDM-1			Non-data
8	*Enterobacter cloacae*	NDM-1			ST78
9	*E. cloacae*	NDM-1, OXA-181	TEM-1	ACT	ST121
10	*Klebsiella pneumoniae*	NDM-1			ST147
11	*K. pneumoniae*	NDM-1	SHV-12, TEM-1		ST273
12	*K. pneumoniae*	NDM-1	CTX-M-15, TEM-1		ST307
13	*K. pneumoniae*	NDM-1			ST307
14	*K. pneumoniae*	NDM-1			ST1473
15	*Providencia rettgeri*	NDM-1	CTX-M-15	DHA	Non-data
16	*P. rettgeri*	NDM-1			Non-data
17	*P. rettgeri*	NDM-1			Non-data
18	*P. rettgeri*	NDM-1			Non-data
19	*Pseudomonas aeruginosa*	IMP-7			ST622
20	*P. aeruginosa*	IMP-7			ST622
21	*P. aeruginosa*	IMP-7			ST622
22	*P. aeruginosa*	IMP-7			ST622

†Extended-spectrum β-lactamase. ‡"Non-type" was not typed by MLST. *A. baumannii*: *gltA-gyrB-gdhB-recA-cpn60-gpi-rpoD* = 28-38-45-1-16-100-2. §"Non-data" means no database for the bacteria.

Patogen prioritas untuk pengembangan obat



The Journal of Antibiotics (2020) 73: 329-364

Epidemiologi MDR di Indonesia

INASS
OP : PDS PatKLiN, PAMKI
Institusional RS : antibiogram lokal RS, RS Tipe A & Tipe B Pendidikan

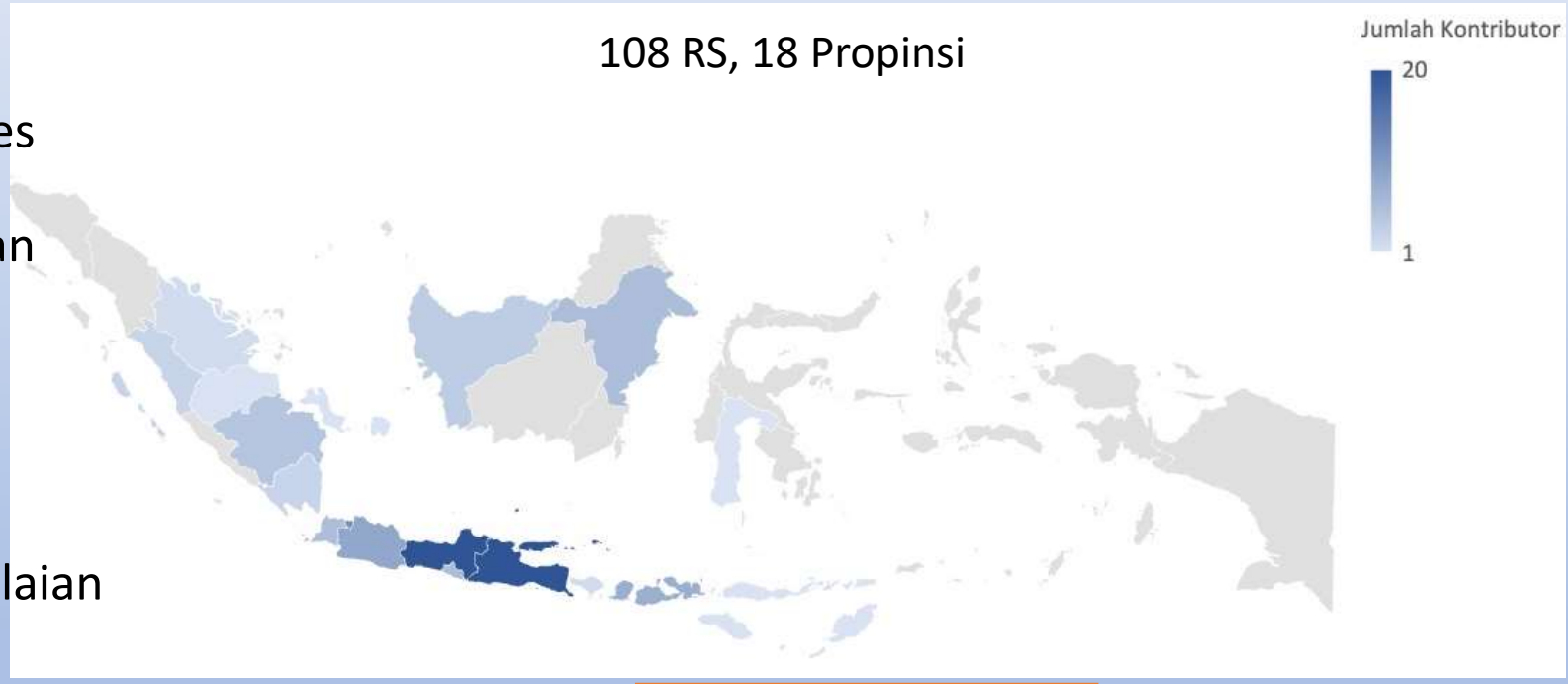
Surveilans mikroba dan kepekaannya terhadap antibiotik berdasarkan tipe RS, Studi multi RS di Indonesia 2022 *(interim result)*

Andaru, dkk, PDS PatKLiN

Kriteria inklusi Laboratorium RS

- Melaksanakan pemeriksaan kultur dan tes kepekaan antibiotik secara mandiri atau merujuk dengan standar pemeriksaan dan rujukan sesuai panduan,
- Laboratorium Mikrobiologi Klinik telah memenuhi standar kualitas melalui pelaksanaan pemantapan mutu,
- Memiliki sistem pendampingan dan penilaian validitas bahan oleh profesional yang kompeten,
- Dilakukan ekspertise pada hasil pemeriksaan mikrobiologi yang memberikan interpretasi patogen oleh ahli yang kompeten.

108 RS, 18 Propinsi



Kriteria eksklusi

- Penanggung Jawab Laboratorium tidak setuju berpartisipasi
- Pimpinan RS tidak memberikan ijin

Epidemiologi MDR di Indonesia

Surveilans mikroba dan kepekaannya terhadap antibiotik berdasarkan tipe RS
Studi multi RS di Indonesia 2022 *(interim result)* Andaru, dkk, PDS PatKLiN

- Periode surveilans : 1 Januari sd 31 Desember 2022
- Kriteria inklusi (data pemeriksaan) :
  - Hasil kultur & TKA dari pasien dengan klinis infeksi, bahan valid, hasil diverifikasi dokter sebagai patogen
  - Isolat pertama
  - Metode pemeriksaan terstandar (difusi cakram atau kaldu dilusi), dengan probabillitas ID >=80%, dan TKA konsisten
  - Jenis bahan pemeriksaan : darah, sputum, urine, feses, pus/abses, swab dasar luka, cairan serebrospinal dan cairan tubuh lain.
- Analisis data : WHOnet versi 2023, CLSI M100-Ed 32, GLASS/WHO 2015 dengan modifikasi

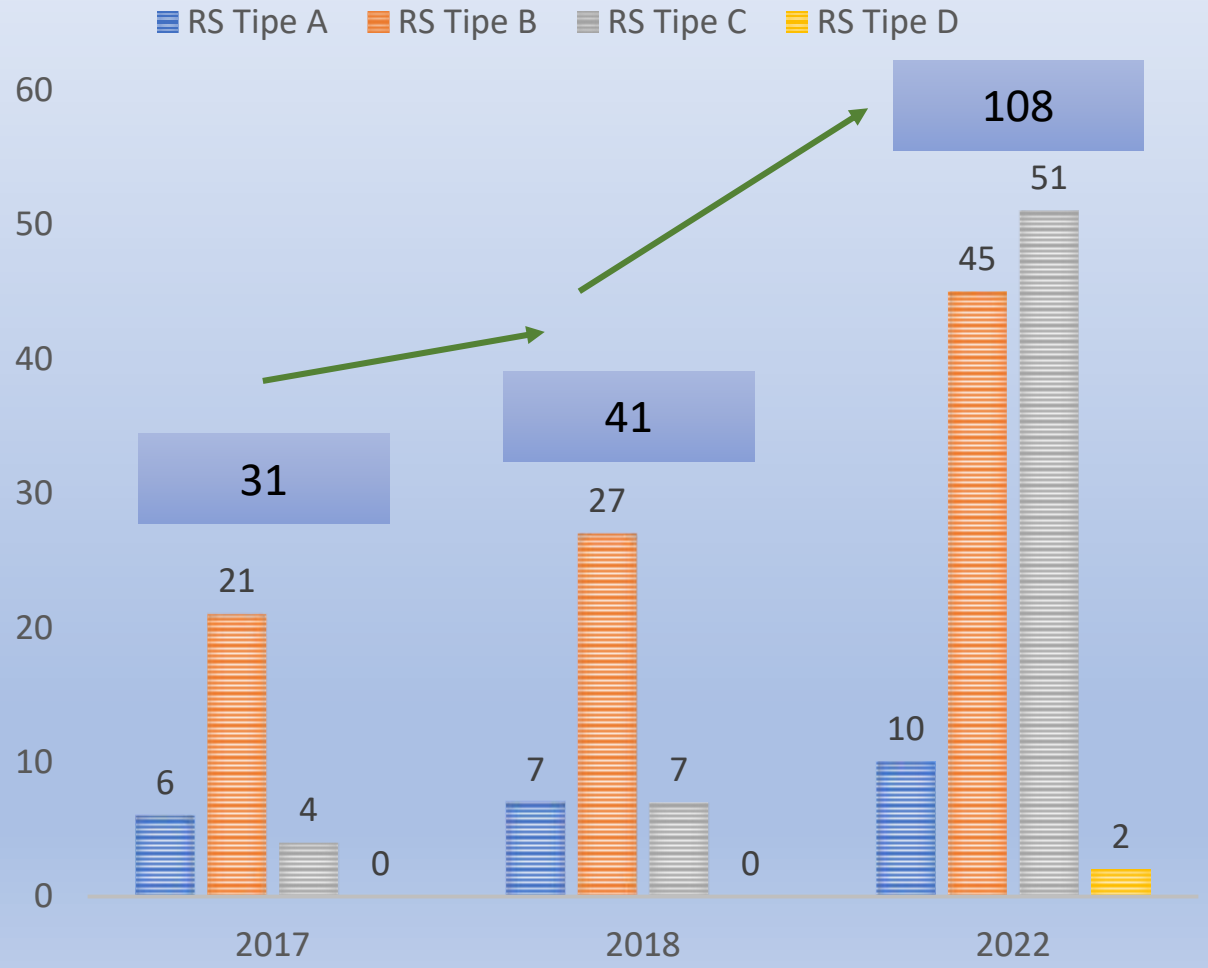
Studi multi RS di Indonesia (*interim result*)

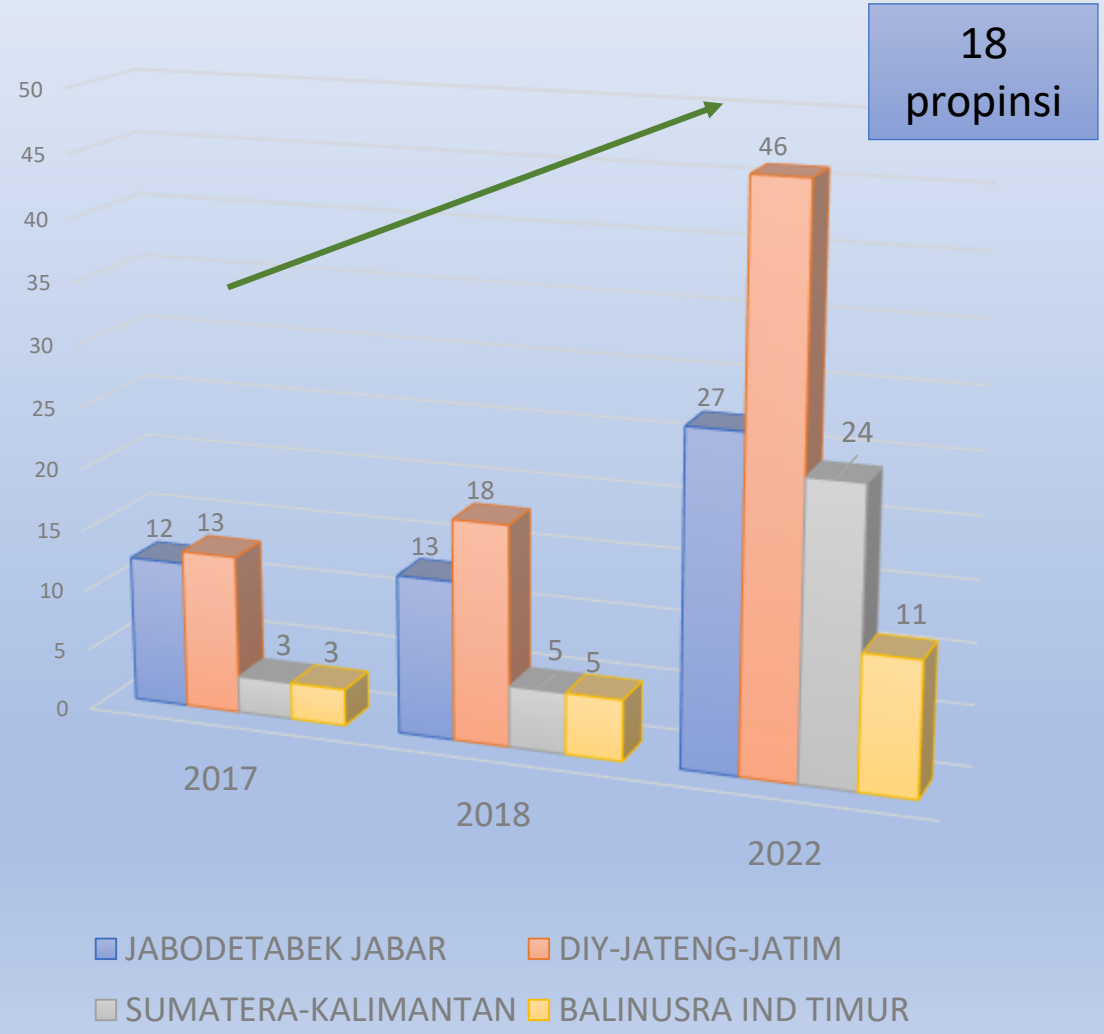
Andaru, dkk

	∑ RS								∑ TOTAL RS		∑ ISOLAT	
	TIPE A (n=10)		TIPE B (n=45)		TIPE C (n=51)	TIPE D (n=2)	PM	SW	n	%	n	%
	P	NP	P	NP								
JABODETABEK JABAR	4	1	3	13	5	1	17	10	27	25,0	43.512	54,9
DIY – JATENG - JATIM	3	0	14	4	24	1	33	13	46	42,6	28.698	36,2
SUMATERA - KALIMANTAN	1	1	4	3	15	0	15	9	24	22,2	1.174	1,5
BALI– NUSA – INA TIMUR	0	0	2	2	7	0	6	5	11	10,2	5.892	7,4
TOTAL	8	2	23	22	51	2	71	37	**108**	100,0	**79.276**	100,0
%	7,4	1,9	21,3	20,4	47,2	1,9	65,7	34,3		100,0		

Perkembangan RS kontributor :

RS melakukan surveilans/ menyusun antibiogram RS





Sebaran MDR prioritas terbanyak yang diisolasi dari bahan klinis pada semua RS Tahun 2022

Interim result,
Andaru, dkk

No	Darah		Sputum		Urin	
	MDR	%	MDR	%	MDR	%
1	*K. pn chep3R*	63,1	*E.Coli ceph3R*	65,6	*K. pn ceph3R*	62,1
2	*E.coli ceph3R*	53,3	*A. baumannii CR*	56	*E.coli ceph3R*	50,7
3	*A. baumannii CR*	46	*K. pn Chep3R*	49,5	*A. baumannii CR*	43,5

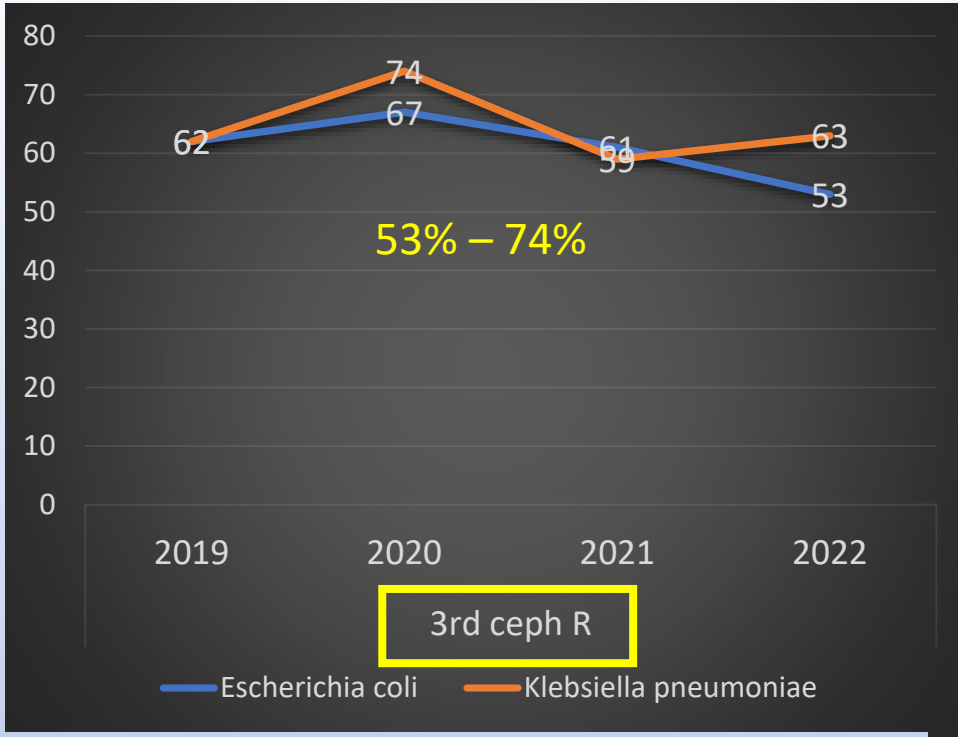
3 MDR prioritas terbanyak : 43,5% - 65,6%

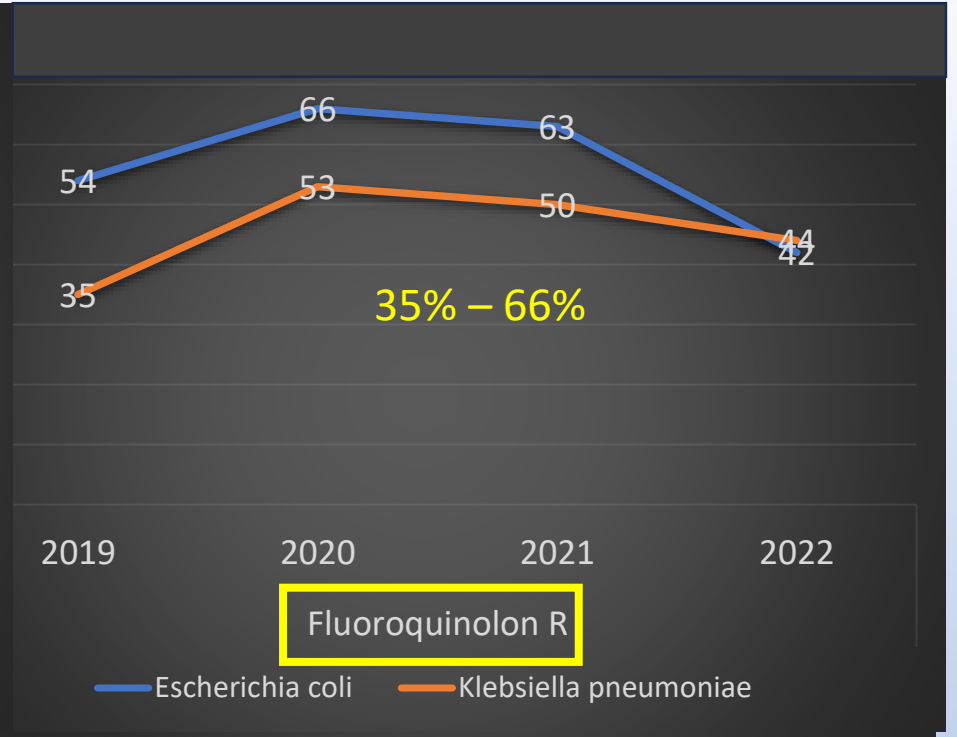
1. *K. pn chep3R*
2. *E.coli ceph3R*
3. *A. baumannii CR*

Resistance of top 3 pathogens (isolated from blood secimen)

National data

- *Trend fluktuatif*
- *FQR :*
- *CR :*



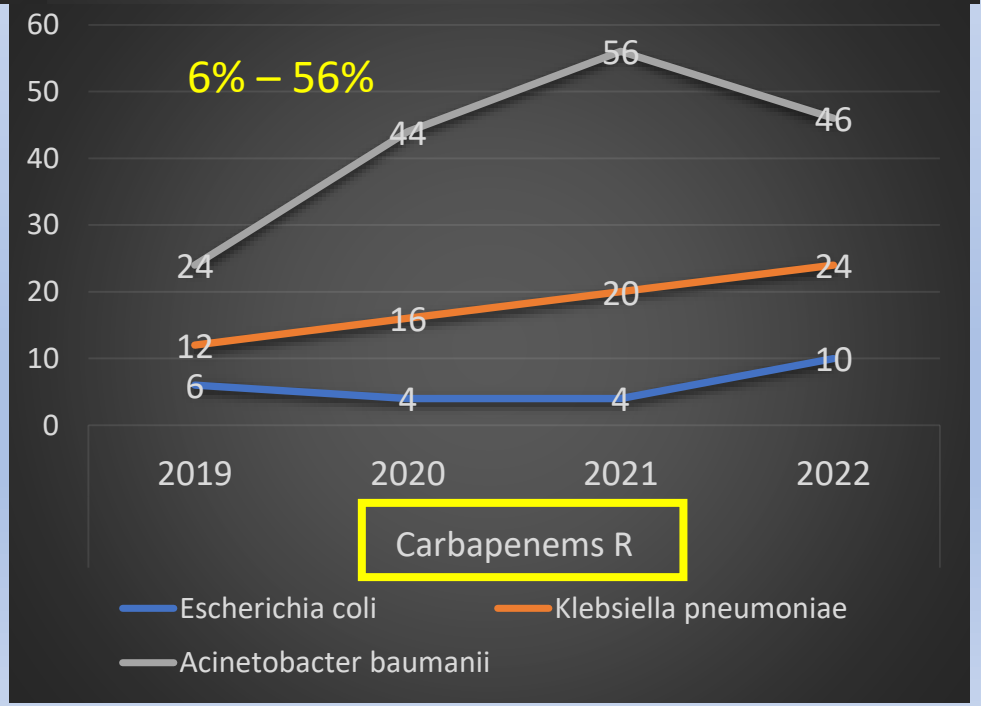


Dr Sardjito Hospital (institusional) 2022

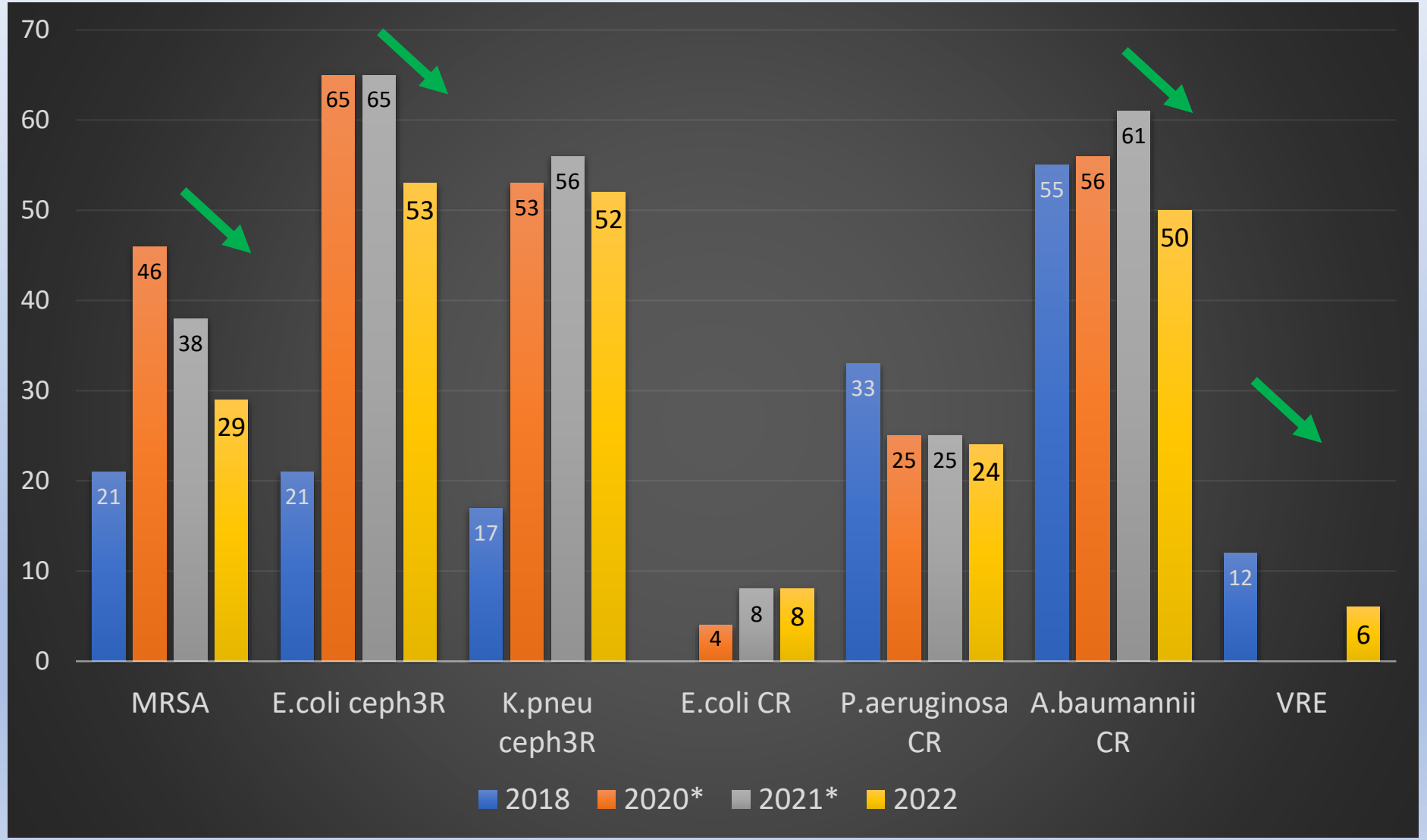
E.coli
R 3rd Cephalosporine 58% ;
R Fluoroquinolon 72% ;
R Carbapenem 2%

K.pneumoniae
R 3rd Cephalosporine 67%
R Fluoroquinolon 58%
R Carbapenem 9%

A baumannii.
R Carbapenem 68%



Kecenderungan sebaran MDR prioritas diisolasi pada semua RS : 2018 -2022



Ket sumber data :
OP PDS PatKLIn
* PAMKI

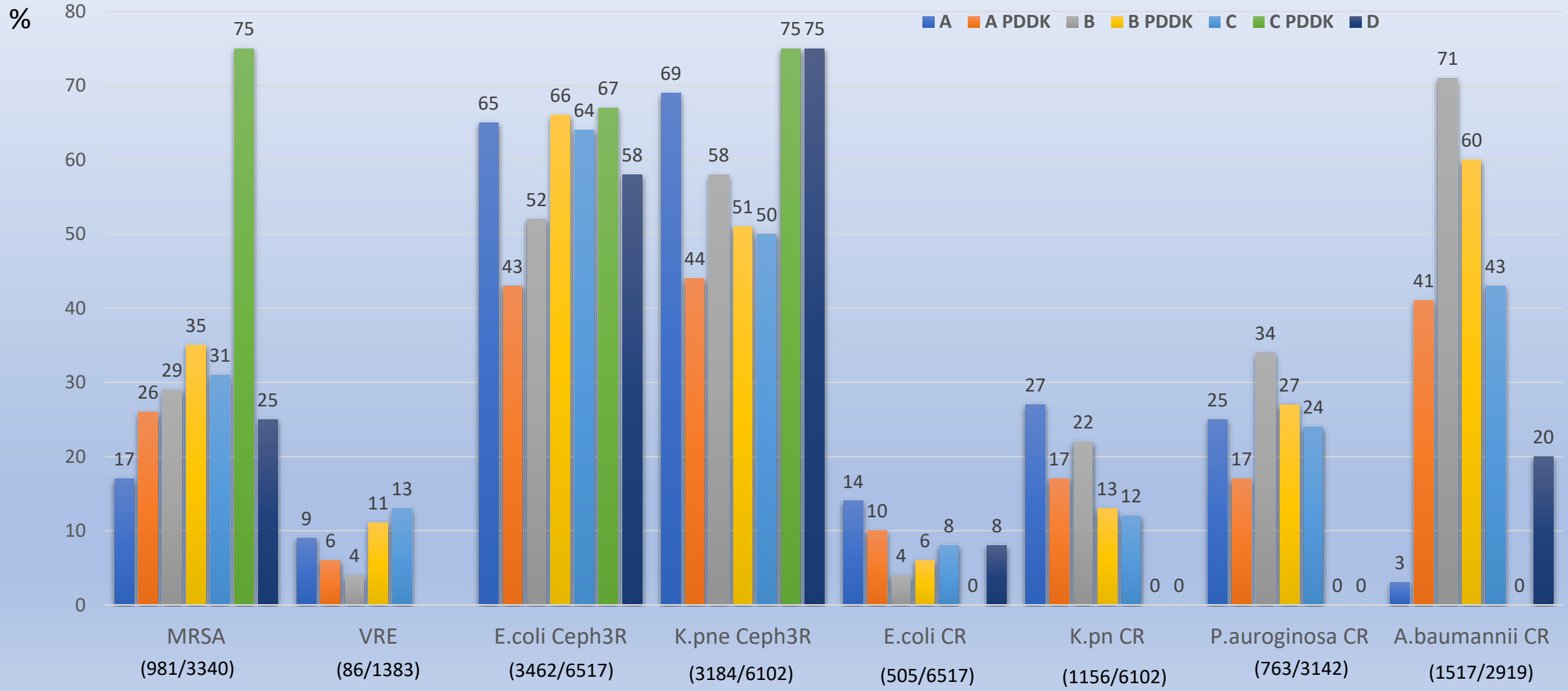
2021

16 RS Kelas A
30 RS Kelas B
5 RS Kelas C

2022

10 RS Kelas A
45 RS Kelas B
51 RS Kelas C
2 RS Kelas D

Sebaran MDR 2022 berdasarkan tipe RS



MDR 2022 : kepekaan antibiotik

GPB

		AMC	AMK	AMP	ATM	AZM	CHL	CIP	CLI	DOX	ERY	FOS	GEN	LNZ
MRSA	%S	0	63	0	0	58	55	43	58	68	55	57	52	89
	95% CI	0.0-1.1	46.9-77.4	0.0-3.7	0.0-24.1	53.7-62.5	49.6-60.1	39.5-46.2	54.5-61.1	61.6-74.1	52.2-58.7	47.0-66.0	48.5-55.4	86.7-91.5
	n	436	41	127	16	502	357	859	896	223	928	111	833	667
VRE	%S	84	0	63	58	95	17	51	0	0	16	9	36	34
	95% CI	68.1-93.4	0.0-37.1	49.1-74.7	34.0-78.9	75.1-99.8	2.9-49.1	37.2-64.5	0.0-20.0	0.0-43.9	6.1-34.5	1.5-29.5	18.0-59.2	20.1-51.4
	n	38	9	59	19	22	12	55	20	7	31	23	22	38
		LVX	MFX	MNO	NET	NIT	QDA	RIF	SXT	TE	TGC	VAN	SAM	OXA
MRSA	%S	48	51	89	52	91	95	77	69	56	98	81		
	95% CI	43.8-52.0	47.0-54.3	84.9-92.4	39.6-64.7	88.1-93.5	91.7-96.6	73.1-79.8	65.8-71.8	52.3-58.8	96.7-99.2	78.2-83.3		
	n	595	756	295	65	453	374	637	922	905	497	941		
VRE	%S	50	50	0	10	62	17	19	21	16	97		65	72
	95% CI	31.1-68.9	2.7-97.3	0.0-80.2	1.7-31.8	40.7-79.1	4.4-42.3	7.3-40.0	7.9-42.7	6.6-31.9	84.9-99.9		40.9-83.7	46.4-89.3
	n	28	2	2	21	26	18	26	24	38	39		20	18

MDR 2022 : kepekaan antibiotik

GNB

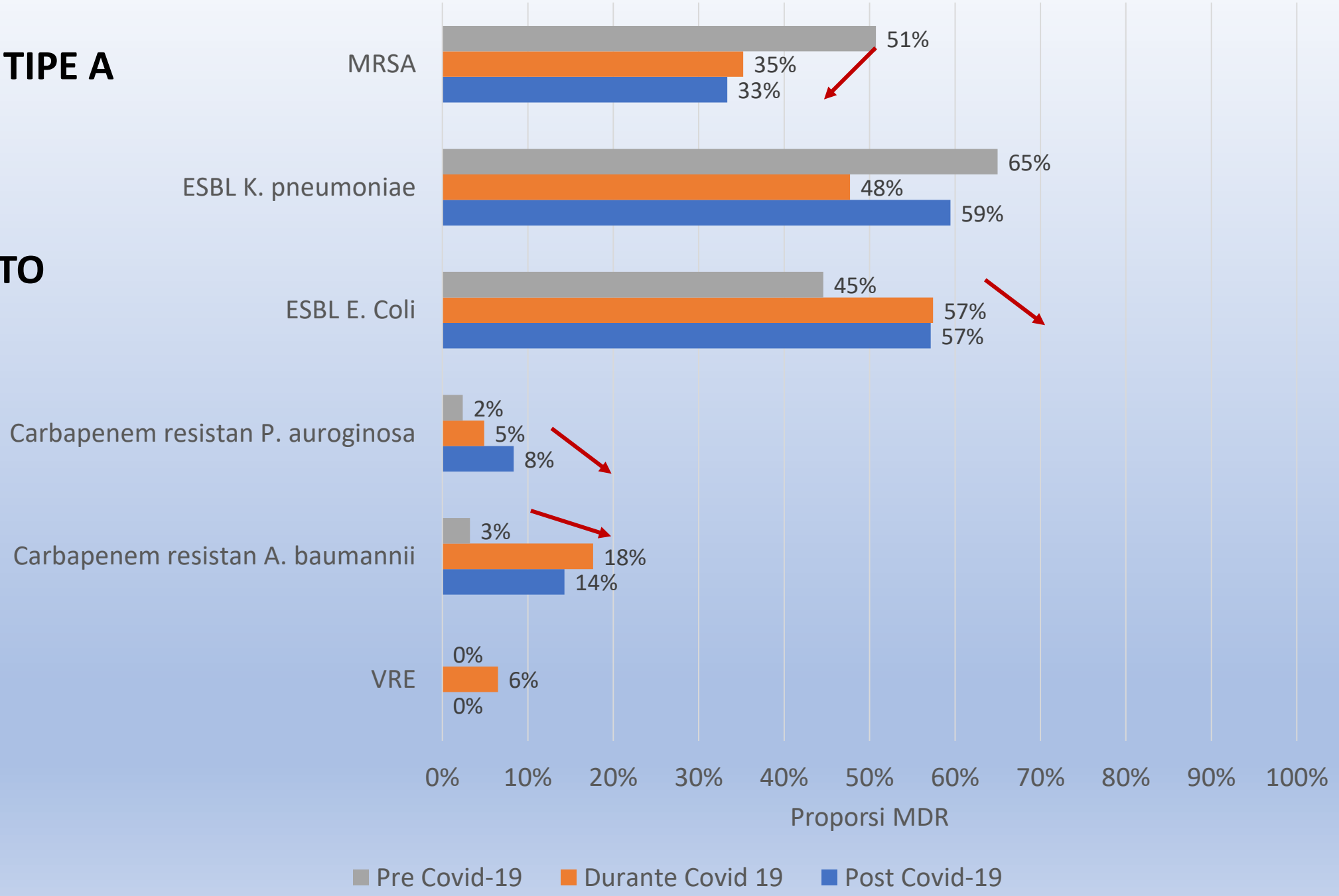
Difficult to treat

E. coli ceph3R	AMC	AMK	AMP	ATM	AZM	CAZ	CFM	CFR	CHL	CIP	CLI	CRO	CTX
%S	42	95	2	20	17	30	10	12	57	14	16	1	1
CI	39.2-44.3	94.6-96.1	1.4-2.4	18.0-21.7	12.7-23.2	28.2-31.8	6.8-14.7	8.2-16.3	53.1-61.5	12.8-15.4	11.4-20.9	0.6-1.3	0.3-1.0
n	1470	3244	3313	1894	219	2555	247	266	556	2915	244	2517	2099
	CXM	CZO	DOR	DOX	ERY	ETP	FEP	FOS	FOX	GEN	IPM	LNZ	LVX
%S	5	2	80	29	32	87	36	70	68	49	76	88	18
CI	3.2-7.2	1.1-2.2	76.0-83.0	23.7-34.0	23.9-40.7	85.5-88.7	34.7-38.2	66.3-73.1	64.1-71.0	47.7-51.2	73.5-78.0	83.9-91.5	16.7-20.3
n	517	2151	527	315	126	1732	3026	726	714	3221	1445	304	1810
	MEM	MFX	MNO	NET	NIT	OXA	QDA	SAM	SXT	TCC	TCY	TGC	
%S	89	24	49	55	87	50	84	26	39	19	38	97	
CI	87.4-89.6	20.1-29.4	43.5-54.2	45.2-64.7	85.4-88.6	42.5-58.0	75.7-90.3	24.3-27.5	37.6-41.2	12.1-28.3	33.1-43.1	95.7-97.4	
n	3263	348	346	107	1681	169	108	2931	2883	100	379	1809	

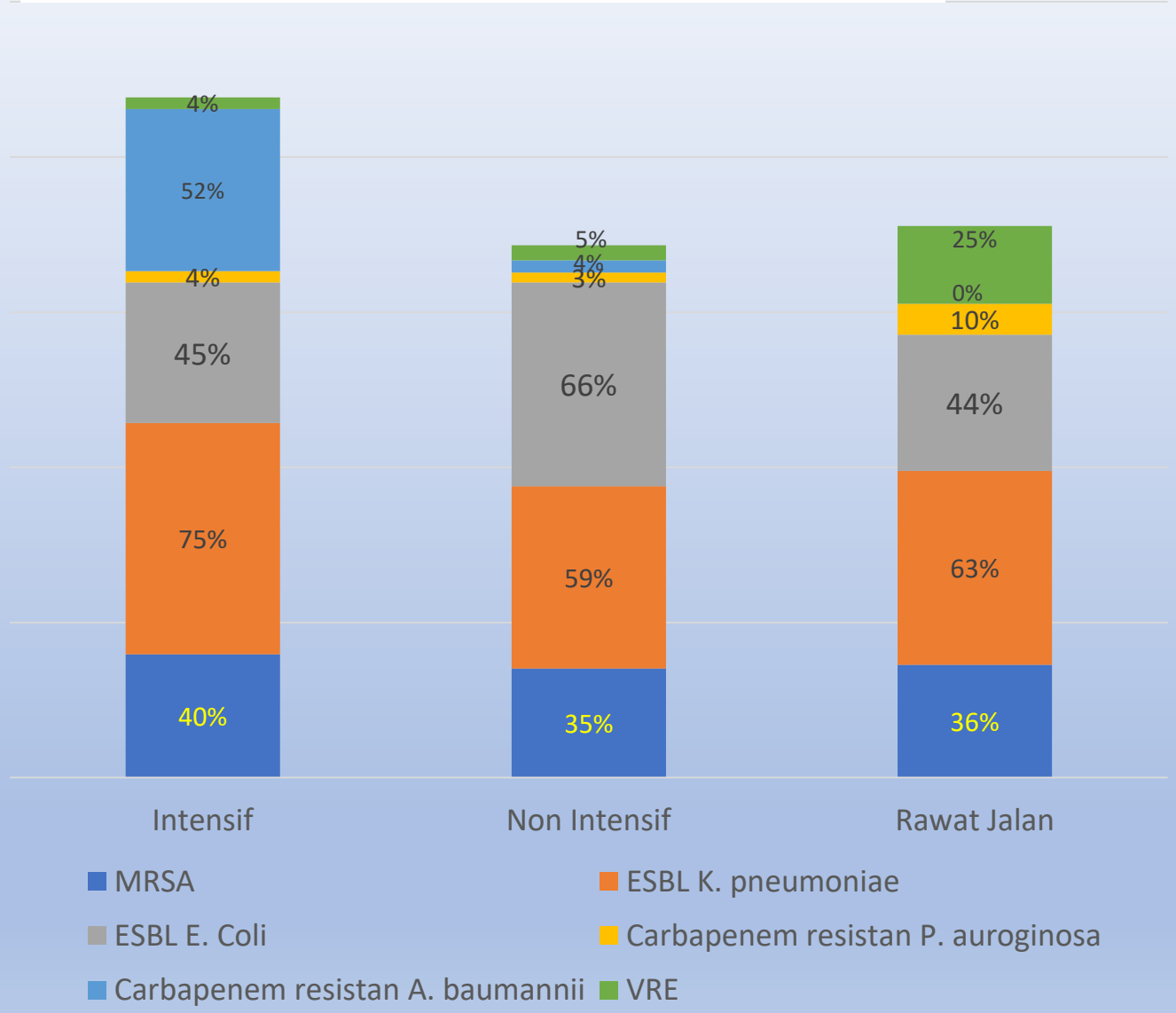
E.coli CR	AMC	AMK	AMP	ATM	AZM	CAZ	CFM	CFR	CHL	CIP	CLI	CRO	CTX
%S	14	80	6	38	11	11	25	9	16	14	20	7	8
CI	10.3-18.3	75.5-83.9	4.0-8.5	31.3-44.8	5.0-20.2	7.7-14.9	12.1-43.8	5.1-15.3	10.0-24.9	11.0-17.5	13.9-27.4	4.3-10.0	5.7-11.4
n	310	371	475	209	76	315	32	143	105	460	146	333	382
	CXM	CZO	DOR	DOX	ERY	ETP	FEP	FOS	FOX	GEN	IPM	LNZ	LVX
	5	6	6	6	25	12	17	59	59	43	7	80	17
	2.4-11.1	3.6-9.8	2.8-13.2	2.0-15.6	16.6-35.0	8.5-17.2	13.5-20.6	49.9-66.7	51.4-66.4	38.6-47.6	4.8-10.8	71.5-86.1	13.5-21.7
	131	266	109	66	93	245	447	140	176	474	329	128	349
	MEM	MFX	MNO	NET	NIT	OXA	QDA	SAM	SXT	TCC	TCY	TGC	
	18	30	19	31	85	37	94	11	31	6	54	87	
	14.5-21.8	21.8-39.6	8.8-36.6	19.9-44.7	79.8-89.8	28.7-46.1	86.5-97.9	8.3-14.5	26.7-35.4	1.7-18.6	44.9-62.6	83.0-90.8	
	442	110	36	58	213	127	87	417	450	47	130	302	

SURVEILANS RS TIPE A PENDIDIKAN

MDR
RSUP Dr SARDJITO
antar waktu



Sebaran MDR di ruang perawatan (2019-2022) RSUP Dr Sardjito



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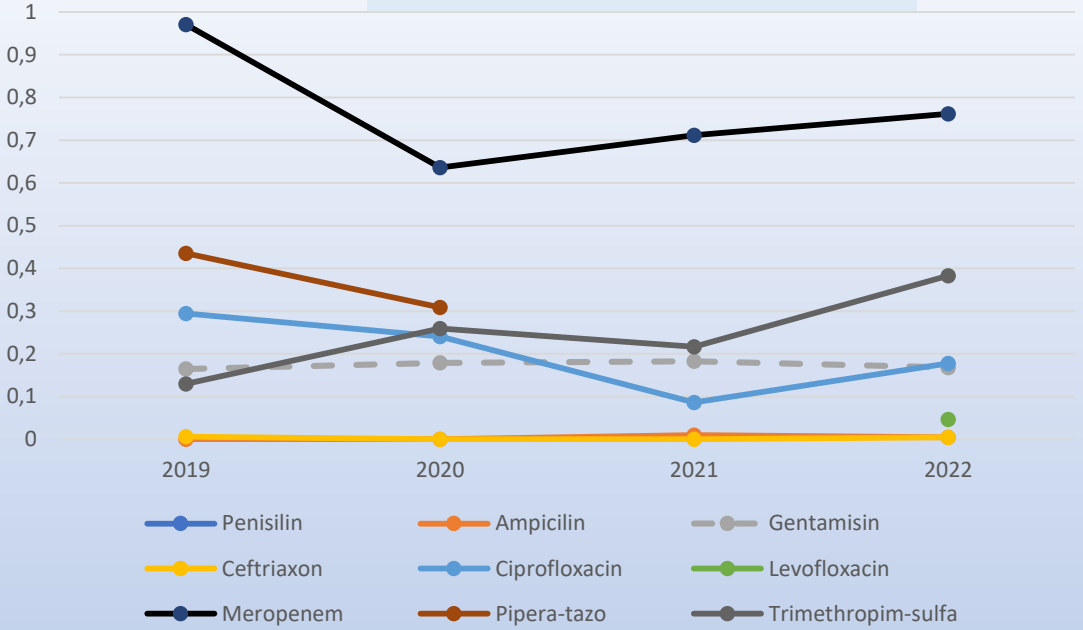

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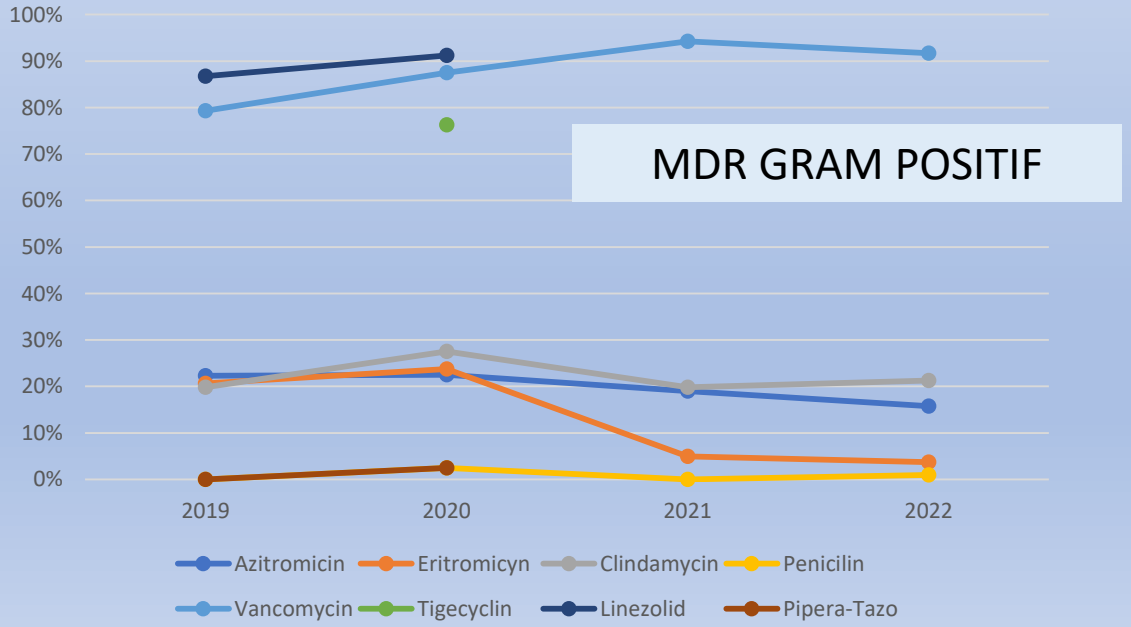
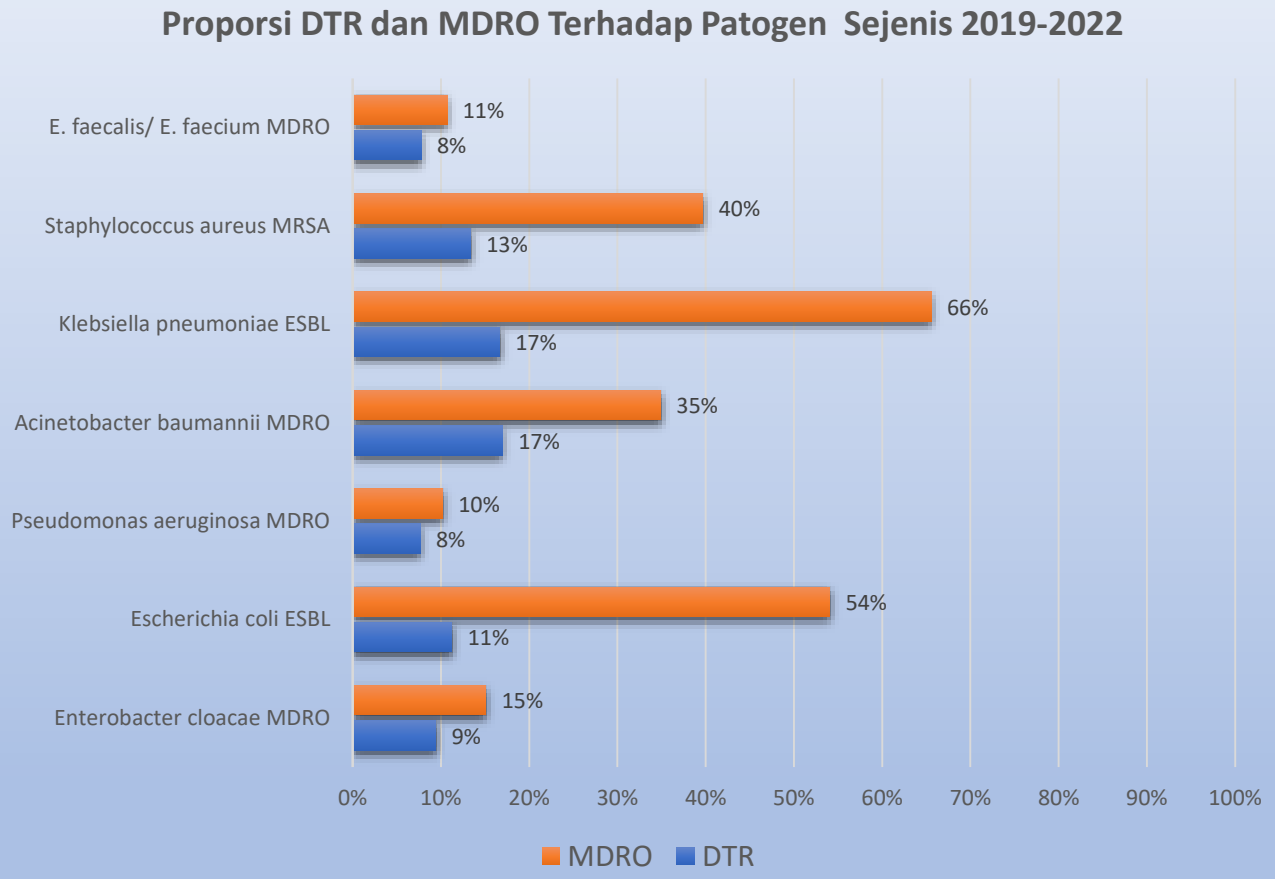
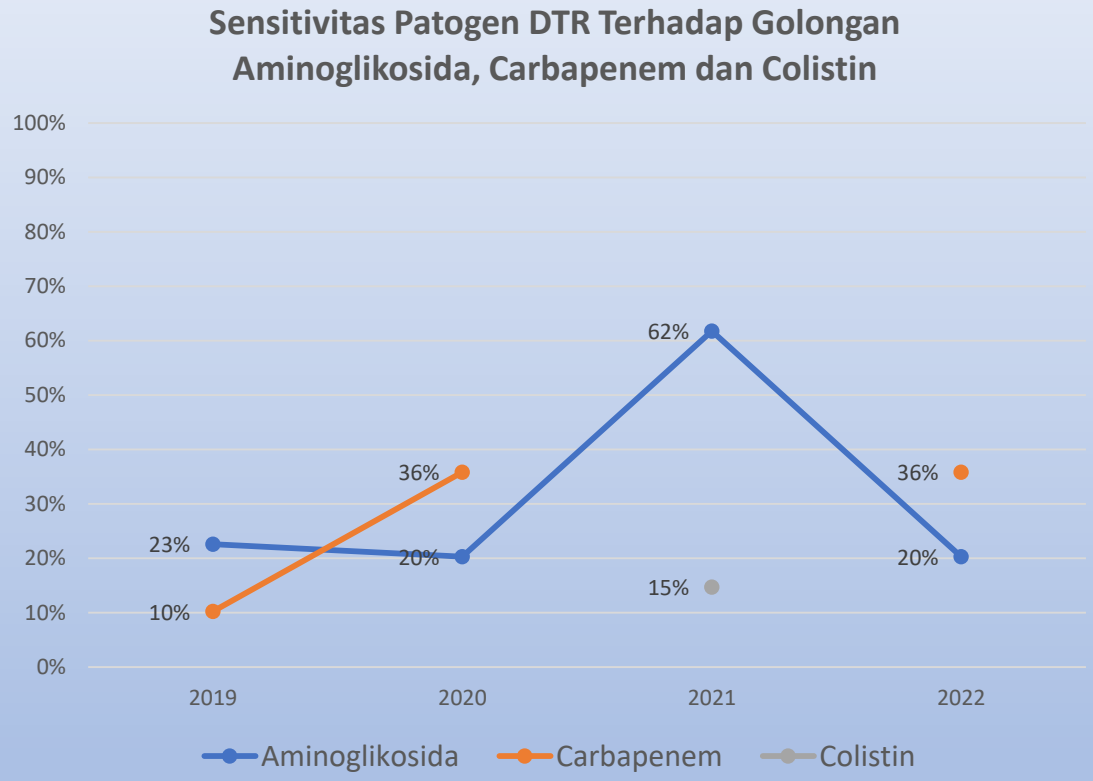


RSS : 2019-2022

Proporsi DTR dan Sensitivitas Terhadap Antibiotik Pilihan





Definisi Operasional:
DTR : MDR dengan resistansi terhadap semua golongan Beta Laktam spektrum luas, Sefalosporin gen 1-3 dan Kuinolon (dan Fluoroquinolon)

Lesson learnt

- Keaktifan surveilans dan penyusunan antibiogram di RS meningkat dan perlu didukung (sesuai target RAN 2024)
  - sebagai sumber data dan bahan evaluasi keberhasilan/ perbaikan Program/ Panduan, dll
- MDR ditemukan di semua tingkat RS
  - --- > Program PPRA perlu menjangkau seluruh Fasilitas Kesehatan
  - --- > Target RAN penurunan ESBL 10%
  - Waspada DTR : resistansi yang mempersulit pilihan terapi
- Berbagai data epidemiologi MDR nasional :
  - Bermanfaat menjadi rujukan
  - saling melengkapi & memperkaya
  - menjadi bahan kajian kritis objektif untuk evaluasi, perencanaan dan pengembangan Program

terima kasih