

# Dr. Ronald Irwanto Natadidjaja, SpPD, Subsp.PTI(K), FINASIM



## Formal Education

- **Universitas Indonesia**, Subspesialis / Konsultan Penyakit Tropik dan Infeksi, Lulus 2013
- **Universitas Indonesia**, Spesialis Penyakit Dalam (Internist), Lulus 2009
- **Universitas Trisakti**, Dokter Umum, Lulus 2002
- **SMP-SMA Kolese Kanisius**, Jakarta, Lulus 1994

## Organization

- **Tim Covid-19**, RSPI Puri Indah, 2020 – sekarang
- **Bendahara**, Perhimpunan Ilmu Kedokteran Tropis dan Penyakit Infeksi Indonesia (PETRI) Jakarta, sejak 2016 - 2023
- **Sekretaris Jenderal (Sekjen)**, Pengurus Pusat Perhimpunan Pengendalian Infeksi Indonesia (PERDALIN), sejak 2016 - 2022
- **Tim Ahli** Pokja Pencegahan dan Pengendalian Infeksi (PPI), Kemenkes RI, sejak 2017-2024
- **Kepala Bagian** Ilmu Penyakit Dalam Fakultas Kedokteran Universitas Trisakti, 2013-2020
- **Pendiri dan Perintis** RASPRO Indonesia Study Group, **Yayasan Pelita RASPRO Indonesia** untuk studi resistensi antimikroba dan penggunaan antimikroba bijak Indonesia
- **Ketua PPI** RSPI Bintaro Jaya
- **Internist-Konsultan**, RSPI Puri Indah, RSPI Bintaro Jaya, dan Tzu Chi Hospital – Pantai Indah Kapuk, Jakarta Utara



@rasproindonesia

Instagram

[www.new.rasproindonesia.com](http://www.new.rasproindonesia.com)

# Membangun PPRA / PGA di Rumah Sakit

**Ronald Irwanto Natadidjaja**

RASPRO Indonesia Study Group and Education for Antimicrobial Stewardship & Resistance  
Trisakti – RASPRO Indonesia Antimicrobial Stewardship (TRIASE) Learning Centre  
Fakultas Kedokteran Universitas Trisakti



Instagram

@rasproindonesia

[www.new.rasproindonesia.com](http://www.new.rasproindonesia.com)

# Agenda

- I. Latar belakang : Mikrobiologi & Tekanan Seleksi
- II. Dari Regulasi Makro menuju Ekosistem
  - a. Regulasi Makro : Evolusi
  - b. Regulasi Mikro : Kesulitan dan Kebutuhan
  - c. Sistem : eRASPRO Manual menuju Digital
  - d. Ekosistem : Dampak Timbal Balik menuju Desain Mikro
- III. Infrastruktur – Implementasi – Evaluasi Pelaksanaan PPRA / PGA

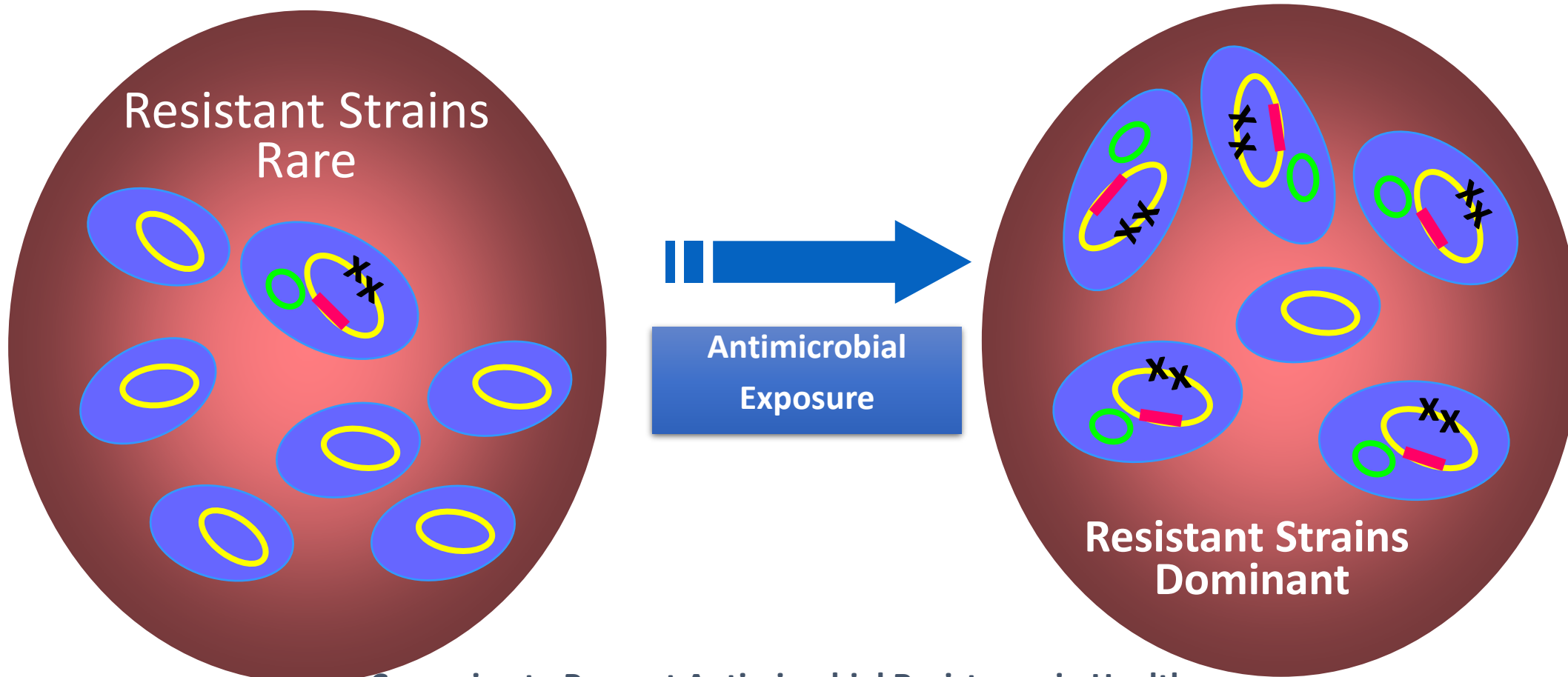




# I. Mikrobiologi & Tekanan Seleksi

---

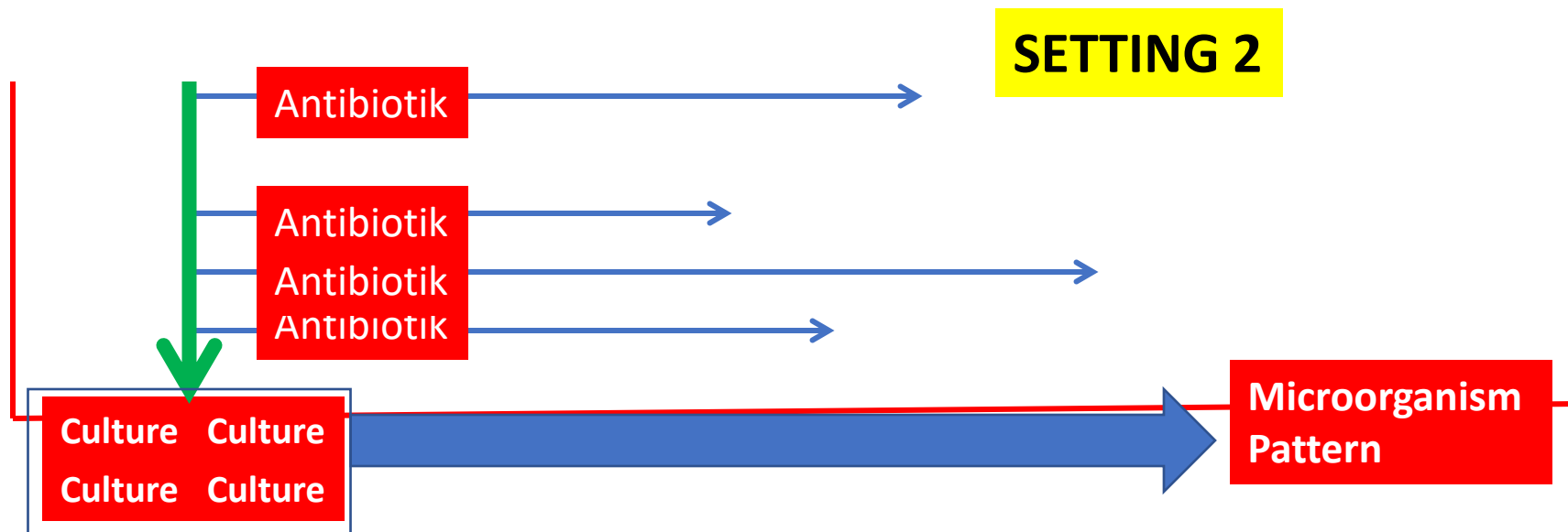
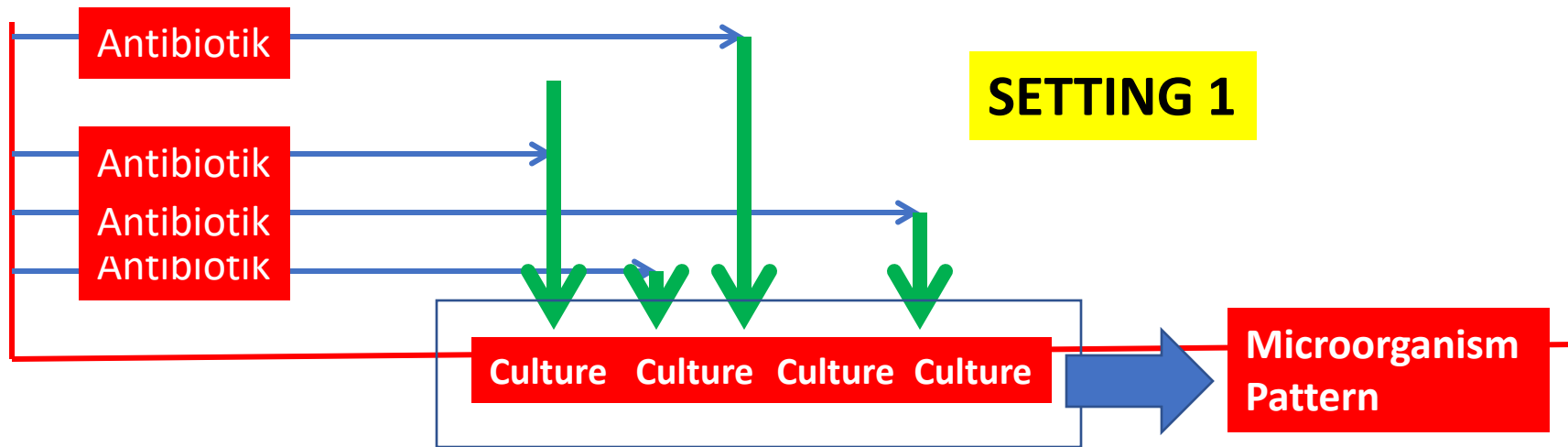
Mechanism of Antimicrobial Resistance:  
“Selective Pressure” for Antimicrobial-Resistant Strains



Campaign to Prevent Antimicrobial Resistance in Healthcare  
Settings, CDC 2002

# Fungsi Kultur

- **Diagnosis Infeksi Individu**
- **Diagnosis Komunitas :**
  - **Surveillance**
  - **Pertimbangan pembuatan panduan antimikroba empirik**



# Community

Pola Kepekaan dan Resistensi Mikroorganisme  
Aerob pada  
Infeksi Jaringan Lunak Komplikata dengan  
Berbagai Manifestasi Klinisnya  
di Tiga IGD Rumah Sakit di Jakarta

## GRAM Positive

OXA Sensitive *S. aureus* : **95.5%**

## GRAM NEGATIVE

*Pseudomonas* sp Sensitive to

MEM : **92.3%**

IMP : **92.3%**

TZP : **92.3%**

LVX : **69.2%**

AMK : **84.6%**

Ronald Irwanto ,Suhendro, Khie Chen,  
Yeva Rosana, 2009

# Hospital

## UNIVERSA MEDICINA

*January-April, 2013*

*Vol.32 - No.1*

## Culture-and nonculture-based antibiotics for complicated soft tissue infections are comparable

Ronald Irwanto<sup>\*,\*\*</sup>, Suhendro<sup>\*\*</sup>, Khie Chen<sup>\*\*</sup>, and Murdani Abdullah<sup>\*\*\*</sup>

## GRAM Positive

OXA Sensitive *S. aureus* : **84.6 %**

## GRAM NEGATIVE

*Pseudomonas* sp Sensitive to

MEM : **68.2%**

IMP : **78.7%**

TZP : **50.0%**

LVX : **54.5%**

AMK : **68.2%**

Ronald Irwanto ,Suhendro, Khie Chen,  
et al . Universa Medicina 2013



**@rasproindonesia**

**www.new.rasproindonesia.com**



## Laporan Peningkatan Mutu

**PENINGKATAN MUTU PENGGUNAAN ANTIBIOTIK BIJAK MELALUI KESESUAIAN TEMUAN HASIL KULTUR DENGAN KAJIAN RISIKO PASIEN MENURUT MODEL REGULASI ANTIMIKROBA SISTEM PROSPEKTIF (RASPRO)**RONALD IRWANTO NATADIDJAJA<sup>1,2</sup>, HADIANTI ADLANI<sup>2</sup>, HADI SUMARSONO<sup>2,3</sup><sup>1</sup>Departemen Ilmu Penyakit Dalam FK TRISAKTI, Jakarta<sup>2</sup>RASPRO Indonesia Study Group<sup>3</sup>Ikatan Apoteker Indonesia

Tabel 3. Kesesuaian Temuan Hasil Kultur dengan Kajian Risiko Pasien Menurut Model RASPRO

|                            | Multisensitif |               | MDR      |               |           |               | Prediksi  |              |
|----------------------------|---------------|---------------|----------|---------------|-----------|---------------|-----------|--------------|
|                            |               |               | ESBL     |               | Non ESBL  |               | Sesuai    | Tidak Sesuai |
|                            | n             | %             | n        | %             | n         | %             |           |              |
| <b>Gram Negatif</b>        |               |               |          |               |           |               |           |              |
| Acinetobacter sp.          | 0             | 0,00          | 0        | 0,00          | 4         | 10,00         | 4         | 0            |
| Pseudomonas sp.            | 0             | 0,00          | 0        | 0,00          | 7         | 17,50         | 7         | 0            |
| Klebsiella pneumonia       | 15            | 26,32         | 2        | 22,22         | 6         | 15,00         | 21        | 2            |
| Escherichia coli           | 18            | 31,58         | 7        | 77,78         | 6         | 15,00         | 28        | 3            |
| Citrobacter koseri         | 0             | 0,00          | 0        | 0,00          | 1         | 2,50          | 1         | 0            |
| Enterobacter sp.           | 1             | 1,75          | 0        | 0,00          | 1         | 2,50          | 2         | 0            |
| Proteus sp.                | 0             | 0,00          | 0        | 0,00          | 2         | 5,00          | 2         | 0            |
| Providencia stuartii       | 0             | 0,00          | 0        | 0,00          | 1         | 2,50          | 1         | 0            |
| Pantoea agglomerans        | 1             | 1,75          | 0        | 0,00          | 0         | 0,00          | 1         | 0            |
| Raoultella ornithinolytica | 0             | 0,00          | 0        | 0,00          | 1         | 2,50          | 1         | 0            |
| Serratia fonticola         | 1             | 1,75          | 0        | 0,00          | 0         | 0,00          | 1         | 0            |
| <b>Total</b>               | <b>36</b>     | <b>63,15</b>  | <b>9</b> | <b>100,00</b> | <b>29</b> | <b>72,50</b>  | <b>69</b> | <b>5</b>     |
| <b>Gram Positif</b>        |               |               |          |               |           |               |           |              |
| Staphylococcus aureus      | 4             | 7,02          | 0        | 0,00          | 1         | 2,50          | 5         | 0            |
| Staphylococcus epidermidis | 1             | 1,75          | 0        | 0,00          | 2         | 5,00          | 3         | 0            |
| Enterococcus faecalis      | 4             | 7,02          | 0        | 0,00          | 2         | 5,00          | 5         | 1            |
| Enterococcus faecium       | 1             | 1,75          | 0        | 0,00          | 1         | 2,50          | 1         | 1            |
| Streptococcus sp.          | 8             | 14,04         | 0        | 0,00          | 4         | 10,00         | 12        | 0            |
| Staphylococcus sp.         | 3             | 5,26          | 0        | 0,00          | 1         | 2,50          | 3         | 1            |
| <b>Total</b>               | <b>21</b>     | <b>36,84</b>  | <b>0</b> | <b>0,00</b>   | <b>11</b> | <b>27,50</b>  | <b>29</b> | <b>3</b>     |
| <b>TOTAL</b>               | <b>57</b>     | <b>100,00</b> | <b>9</b> | <b>100,00</b> | <b>40</b> | <b>100,00</b> | <b>98</b> | <b>8</b>     |

\* MRSA \*\* MRSE

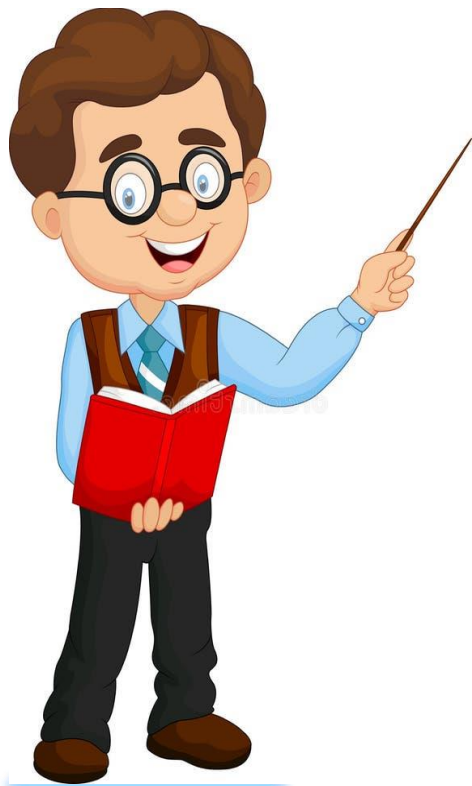
Tabel 4. Persentase Kesesuaian Hasil Kultur dengan Kajian Risiko Infeksi Multisensitif dan MDR Model RASPRO

|                      | Sesuai |       | Tidak Sesuai |       | Total |        |
|----------------------|--------|-------|--------------|-------|-------|--------|
|                      | n      | %     | n            | %     | n     | %      |
| <b>Multisensitif</b> | 54     | 94,74 | 3            | 5,26  | 57    | 100,00 |
| <b>MDR</b>           | 44     | 89,80 | 5            | 10,20 | 49    | 100,00 |



## II. Dari Regulasi Makro menuju Ekosistem

---



**Desain  
Mikro**

**Regulasi MAKRO**

Disposisi

**Regulasi MIKRO**

Integrasi

**SISTEM**

Terkondisi

**EKOSISTEM**

Permenkes 8/2015

Permenkes 28/2021

Buku Panduan PGA di RS Kemenkes RI 2021

KMK No HK.01.07/MENKES/1128/2022

To KMK No. HK 01.7 / MENKES / 1596 / 2024

**GLOBAL - BIROKRATIF**

SOP – Job Desk Infrastruktur2 Birokratif

Alur Kerja PGA

Alur Pengambilan Sampel

Alur Peresepan Antimikroba

Alur Pre-otorisasi & Audit Prospektif

dll

**EKSKLUSIF - OPERASIONAL**

*Integrated Guiding - Monitoring – Evaluating –  
Reporting – Action Plan*

**KOMITMEN - KONTINUITAS**

Kondisi timbal balik yang telah terjadi antara  
kebiasaan penggunaan antimikroba bijak  
dengan turunnya risiko kemunculan MDR



## II. Dari Regulasi Makro menuju Ekosistem

### a. Regulasi Makro : Evolusi

# Regulasi MAKRO

GLOBAL - BIROKRATIF

Permenkes 8/2015

Permenkes 28/2021

Buku Panduan PGA di RS Kemenkes RI 2021

KMK No HK.01.07/MENKES/1128/2022

## Evolusi

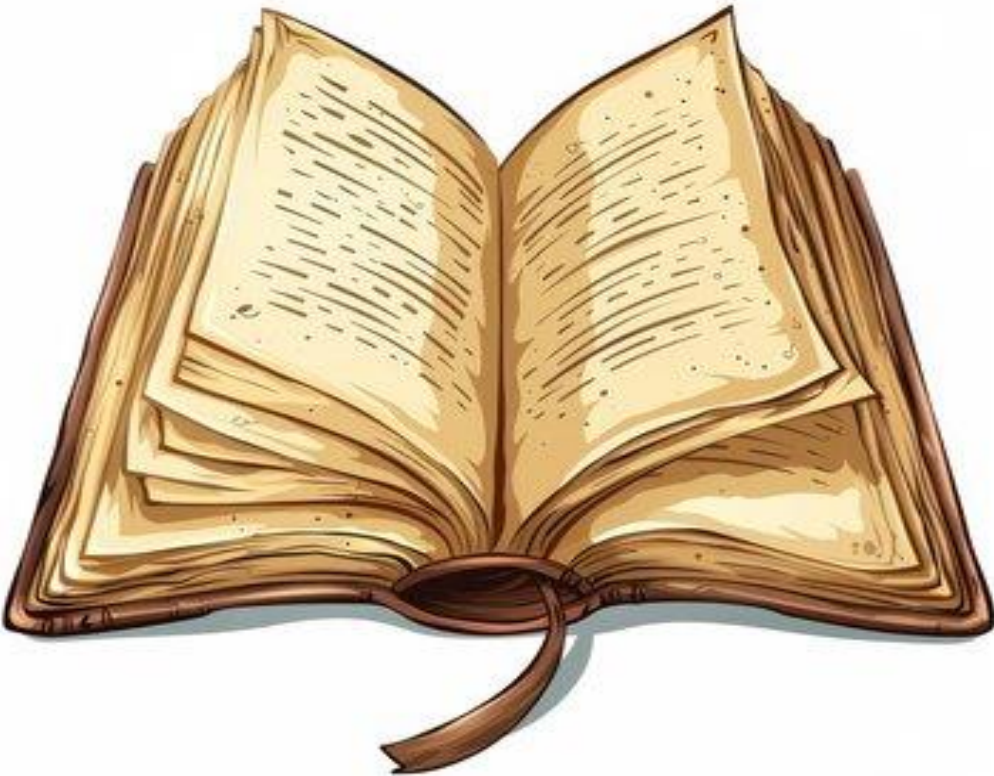
Permenkes 8 / 2015

Buku Panduan PGA  
di RS Kemenkes RI 2021

Audit Retrospektif



Audit Prospektif





KEPUTUSAN MENTERI KESEHATAN REPUBLIK INDONESIA  
NOMOR HK.01.07/MENKES/1128/2022  
TENTANG  
STANDAR AKREDITASI RUMAH SAKIT

**a. Pengelolaan Kegiatan Peningkatan Mutu, Keselamatan Pasien, dan Manajemen Risiko**

**1) Standar PMKP 1**

Rumah sakit mempunyai Komite/Tim Penyelenggara Mutu yang kompeten untuk mengelola kegiatan Peningkatan Mutu dan Keselamatan Pasien (PMKP) sesuai dengan peraturan perundang-undangan.

**2) Maksud dan Tujuan PMKP 1**

Peningkatan mutu dan keselamatan pasien merupakan proses kegiatan yang berkesinambungan (*continuous improvement*) yang dilaksanakan dengan koordinasi dan integrasi antara unit pelayanan dan komite-komite (Komite Medik, Komite Keperawatan, Komite/Tim PPI, Komite K3 dan fasilitas, Komite Etik, Komite PPRA, dan lain-lainnya). Oleh karena itu Direktur perlu menetapkan Komite/Tim Penyelenggara Mutu yang bertugas membantu Direktur atau Kepala Rumah Sakit dalam mengelola kegiatan peningkatan mutu, keselamatan pasien, dan manajemen risiko di rumah sakit.

Dalam melaksanakan tugasnya, Komite/ Tim Penyelenggara Mutu memiliki fungsi sesuai dengan peraturan perundang-undangan yang berlaku.

## **h. Program Pengendalian Resistansi Antimikroba**

### **1) Standar PKPO 8**

Rumah sakit menyelenggarakan program pengendalian resistansi antimikroba (PPRA) sesuai peraturan perundang-undangan.

### **2) Maksud dan Tujuan PKPO 8**

Resistansi antimikroba (*antimicrobial resistance* = AMR) telah menjadi masalah kesehatan nasional dan global. Pemberian obat antimikroba (antibiotik atau antibakteri, antijamur, antivirus, antiprotozoa) yang tidak rasional dan tidak bijak dapat memicu terjadinya resistansi yaitu ketidakmampuan membunuh atau menghambat pertumbuhan mikroba sehingga penggunaan pada penanganan penyakit infeksi tidak efektif. Meningkatnya kejadian resistansi antimikroba akibat dari penggunaan antimikroba yang tidak bijak dan pencegahan pengendalian infeksi yang belum optimal. Resistansi antimikroba di rumah sakit menyebabkan menurunnya mutu pelayanan, meningkatkan morbiditas dan mortalitas, serta meningkatnya beban biaya perawatan dan pengobatan pasien.

Tersedia regulasi pengendalian resistensi antimikroba di rumah sakit yang meliputi:

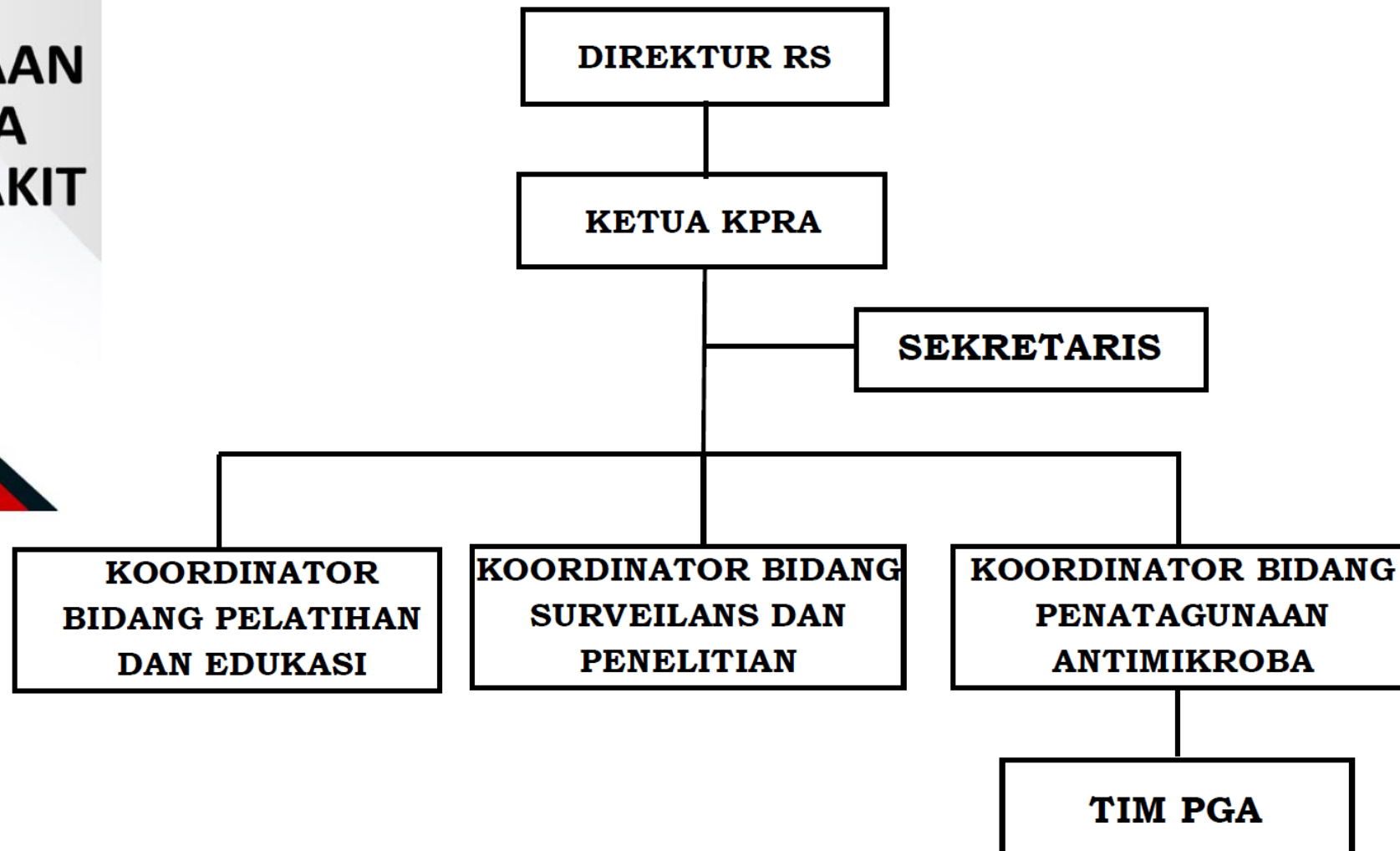
- a) kebijakan dan panduan penggunaan antibiotik
- b) pembentukan komite/tim PRA yang terdiri dari tenaga kesehatan yang kompeten dari unsur:
  - (1) Klinisi perwakilan SMF/bagian;
  - (2) Keperawatan;

- (3) Instalasi farmasi;
- (4) Laboratorium mikrobiologi klinik;
- (5) Komite/Tim Pencegahan Pengendalian Infeksi (PPI);
- (6) Komite/tim Farmasi dan Terapi (KFT)

# PANDUAN PENATAGUNAAN ANTIMIKROBA DI RUMAH SAKIT

Edisi I

Direktorat Pelayanan Kesehatan Rujukan  
Direktorat Jenderal Pelayanan Kesehatan  
Kementerian Kesehatan RI  
2021





## II. Dari Regulasi Makro menuju Ekosistem

b. Regulasi Mikro : Kesulitan dan kebutuhan

# Regulasi MIKRO

EKSKLUSIF - OPERASIONAL



**SOP – Job Desk Infrastruktur2 Birokratif**

**Alur Kerja PGA**

**Alur Pengambilan Sampel**

**Alur Peresepan Antimikroba**

**Alur Pre-otorisasi & Audit Prospektif  
dll**

PPK

PPAB

It is sometimes difficult to draw a direct relationship between system interventions and their effects. In the hospital sector, many of the studies of the efficacy of AMS have reported on structural and process measures (such as the presence of guidelines and reduction in antimicrobial use)

McGowan JE. Antimicrobial stewardship: the state of the art in 2011 – focus on outcome and methods. *Infect Control Hosp Epidemiol* 2012;33(4):331–7. 7.

MacDougall C, Polk R. Antimicrobial stewardship programs in health care systems. *Clin Microbiol Rev* 2005;18(4):638–56.



## Artikel Penelitian

### Survei Persepsi Kebutuhan dan Hambatan Rumah Sakit dalam Menjalankan Fungsi Panitia Pengendalian Resistensi Antibiotik

RONALD IRWANTO<sup>1,2</sup>, DJOKO WIDODO<sup>2</sup>, AZIZA ARIYANI<sup>3</sup>, HADIANTI ADLANI<sup>2</sup>

<sup>1</sup> Fakultas Kedokteran, Universitas Trisakti, Jakarta

<sup>2</sup> Perhimpunan Kedokteran Tropis dan Penyakit Infeksi Indonesia

<sup>3</sup> Pengurus Pusat Perkumpulan Pengendalian Infeksi Indonesia

**Hasil:** Pada survei ini diperoleh 26.92% dari 156 rumah sakit yang telah menjalankan program PPRA di rumah sakit. 65.38% menyatakan hanya sebagian dokter yang duduk sebagai anggota PPRA mampu melakukan tugasnya. 40.48% dari responden rumah sakit yang telah menjalankan program PPRA mengatakan bahwa tidak adanya sistem implementasi merupakan kesulitan utama dalam menjalankan program PPRA. Sementara 61.90% mengatakan anggota PPRA rumah sakitnya baru setengah mampu melakukan restriksi antibiotik. 93.86% dari 114 responden rumah sakit yang belum menjalankan program PPRA menyatakan saat ini yang paling dibutuhkan adalah konsep yang jelas untuk menjalankan program PPRA.

**Persepsi Responden Terhadap Kemampuan Dokter sebagai Anggota PPRA di Rumah Sakit**

|                |            |                |
|----------------|------------|----------------|
| <b>Mampu</b>   | 36         | 23.0%          |
| Sebagian Mampu | 102        | 65.38%         |
| Tidak Mampu    | 12         | 7.69%          |
| Tidak Tahu     | 6          | 3.85%          |
| <b>TOTAL</b>   | <b>156</b> | <b>100.00%</b> |

**Persepsi Terhadap Hambatan dalam Pelaksanaan Program di RS yang Sudah Menjalankan PPRA**

|                           |           |                |
|---------------------------|-----------|----------------|
| Membuat PPAB              | 8         | 19.05%         |
| Praktik Implementasi PPAB | 17        | 40.48%         |
| Restriksi Antibiotik      | 14        | 33.33%         |
| Evaluasi Antibiotik       | 3         | 7.14%          |
| <b>TOTAL</b>              | <b>42</b> | <b>100.00%</b> |

Journal of Hospital Accreditation, 2019  
Vol 01, Edisi 2, hal 36-40

**Persepsi Responden Terhadap Kemampuan Anggota PPRA dalam Melakukan Restriksi AB**

|                        |           |                |
|------------------------|-----------|----------------|
| Sepenuhnya Mampu       | 6         | 14.29%         |
| Belum Sepenuhnya Mampu | 26        | 61.90%         |
| Belum mampu            | 9         | 21.43%         |
| Tidak tahu             | 1         | 2.38%          |
| <b>TOTAL</b>           | <b>42</b> | <b>100.00%</b> |

**Persepsi Kebutuhan dalam Pelaksanaan PPRA bagi Rumah Sakit yang Belum Menjalankan PPRA**

|                                                                     |            |                |
|---------------------------------------------------------------------|------------|----------------|
| Konsep pelaksanaan program yang jelas                               | 107        | 93.86%         |
| Restriksi Antibiotik                                                | 1          | 0.88%          |
| Evaluasi dan Pelaporan Penggunaan Antibiotik                        | 1          | 0.88%          |
| Pengambilalihan Tanggung Jawab Pemberian Semua Antibiotik oleh PPRA | 5          | 4.39%          |
| <b>TOTAL</b>                                                        | <b>114</b> | <b>100.00%</b> |



## II. Dari Regulasi Makro menuju Ekosistem

a. Sistem : eRASPRO Manual menuju Digital

# SISTEM

KOMITMEN - KONTINUITAS



*Integrated Guiding - Monitoring –  
Evaluating – Reporting – Action  
Plan*

## Futuristic Fashion in Antimicrobial Used - The WHO “Kick of” in 2023

- Shifting WATCH to  $\geq 60\%$  ACCESS



RASPRO Indonesia

[www.new.rasproindonesia.com](http://www.new.rasproindonesia.com)

Aztrenonam  
Ceftazidime Avibactam  
Ceftaroline Fosamil  
Ceftolozane Tazobactam

Imipenem cilastatin-  
relebactam

Fosfomycin IV  
Colistin  
Polymixin B  
Tygecycline

RESERVED

This group includes antibiotics and antibiotic classes that **should be reserved** for treatment of confirmed or suspected infections due to multi-drug-resistant organisms. Reserve group antibiotics should be treated as “last resort” options.

Quinolones  
Azithromycin

2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> Generation  
of Cephalosporin

Piperacillin Tazobactam  
Carbapenems

WATCH

This group includes antibiotic classes that have higher resistance potential and includes most of the highest priority agents among the Critically Important Antimicrobials for Human Medicine and/or antibiotics that are at relatively high risk of selection of bacterial resistance. These medicines should be prioritized as key targets of stewardship programs and monitoring. Selected Watch group antibiotics are recommended as essential first or second choice empiric treatment options for a limited number of specific infectious syndromes and are listed as individual medicines on the WHO Model Lists of Essential Medicines.

Ampicillin Sulbactam  
Ampicillin  
Amoxicillin Clavulanate  
Amoxicillin

1<sup>st</sup> Generation of  
Cephalosporin

Amikacin  
Gentamycin

ACCESS

This group includes antibiotics that have activity against a wide range of commonly encountered susceptible pathogens while also showing lower resistance potential than antibiotics in the other groups. Selected Access group antibiotics are recommended as essential first or second choice empiric treatment options for infectious syndromes reviewed by the EML Expert Committee and are listed as individual medicines on the Model Lists of Essential Medicines to improve access and promote appropriate use.

AWARE 2021

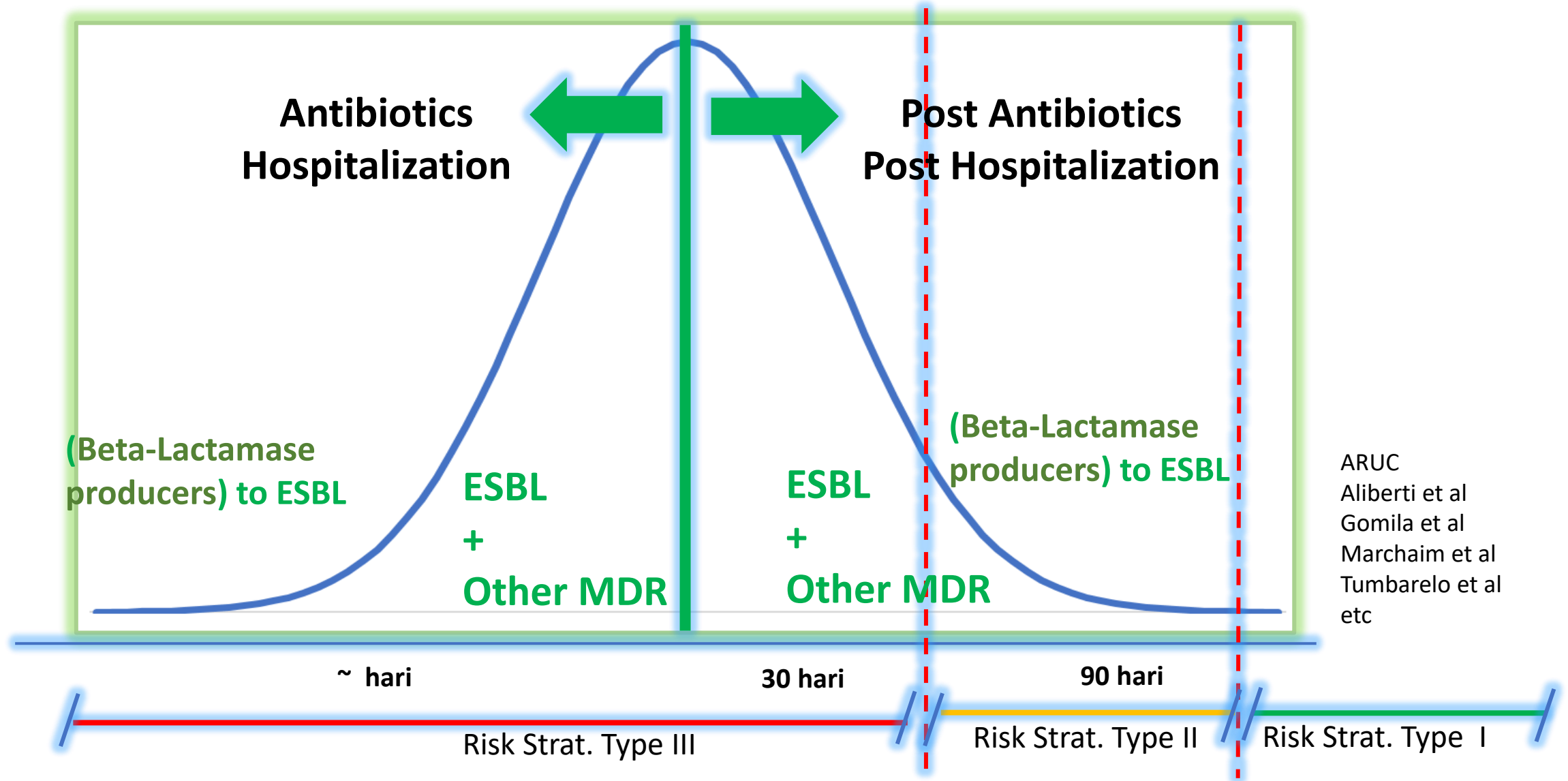


USAID MEDICINES, TECHNOLOGIES, AND  
PHARMACEUTICAL SERVICES (MTaPS) PROGRAM  
*Improved Access. Improved Services. Better Health Outcomes.*



## A Technical Guide to Implementing the World Health Organization's AWARe Antibiotic Classification in MTaPS Program Countries

**Goals of AWARe Categorization:** The overall goal is to reduce the use of antibiotics in the Watch and Reserve groups (the antibiotics most crucial for human medicine and at higher risk of resistance) and to increase the use of Access antibiotics where availability is low. The first goal of AWARe is to have all countries report antibiotic use, through the Antimicrobial Resistance Surveillance System (GLASS), by 2023, and the second is for 60% of global antibiotic consumption to come from medicines in the Access category.<sup>7</sup> Currently, 65 countries track antibiotic use but only 29 meet the 60% Access national consumption goal.<sup>8</sup> Evidence shows that meeting the 60% goal will result in not only better use of antibiotics but also reduced costs and increased access. Reaching this threshold by 2023 will contribute to countries' achievement of the health-related Sustainable Development Goals.



| Risk Stratification Type 3                                                                                                                                                                                                                                                                                                                           | Risk Stratification Type 2                                                                                                                                                                                                                                                                                  | Risk Stratification Type 1                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Severe /HAIs / Febrile Neutropenia / Threatening Organ Perforation<br/>AND / OR<br/>Immunocompromized AND / OR<br/>Uncontrolled DM :<br/>+<br/>History of antibiotic use in the last 30 days<br/>AND / OR<br/>History of ≥ 48 hours hospitalization in the last 30 days<br/><br/>AND / OR<br/>History medical devices use in the last 30 days</p> | <p>Non Severe / Non Life Threatening – Non HAIs<br/>Immunocompromized<br/>AND / OR Uncontrolled DM :<br/>History of antibiotic use in the last 90 days<br/>AND / OR<br/>History of ≥ 48 hours hospitalization in the last 90 days<br/><br/>AND / OR<br/>History medical devices use in the last 90 days</p> | <p>Non Risk Stratification Type 3 and / or 2</p> <div data-bbox="1793 469 2507 672">  </div> <div data-bbox="2303 758 2525 1072">  </div> |
| <p><b>Empiric Antibiotic for Severe Case or Suspected ESBLs or Other MDRO</b></p>                                                                                                                                                                                                                                                                    | <p><b>Empiric Antibiotic for Suspected (Beta Lactamase Producers) to ESBLs</b></p>                                                                                                                                                                                                                          | <p><b>Empiric Antibiotic for Multi-Sensitive Organism</b></p>                                                                                                                                                                                                                                                    |
| <div>RESERVE</div> <div>RESERVE</div> <div>WATCH</div> <div>WATCH</div>                                                                                                                                                                                                                                                                              | <div>WATCH</div> <div>WATCH</div> <div>WATCH</div> <div>ACCESS</div>                                                                                                                                                                                                                                        | <div>ACCESS</div> <div>ACCESS</div> <div>ACCESS</div> <div>ACCESS</div> <div>ACCESS</div>                                                                                                                                                                                                                        |

# Risk Stratification Type 3

Gomila A, Shaw E, Carratalà J, Leibovici L, Tebé C, Wiegand I, et al. Predictive factors for multidrug-resistant gram-negative bacteria among hospitalised patients with complicated urinary tract infections. *Antimicrob Resist Infect Control*. 2018;7(1):1–11. doi: 10.1186/s13756-018-0401-6

Falcone M, Russo A, Giannella M, Cangemi R, Scarpellini MG, Bertazzoni G, et al. Individualizing risk of multidrug-resistant pathogens in community-onset pneumonia. *PLoS One*. 2015;10(4):1–16. doi: 10.1371/journal.pone.0119528

Musikataworn K, Chumpengpan C, Sujinpram C. Risk factors of extended-spectrum beta-lactamase-producing Enterobacteriaceae bacteremia in Thai emergency department: A retrospective case-control study. *Asian Biomed*. 2011;5(1):129–38. doi: 10.5372/1905-7415.0501.016

Patolia S, Abate G, Patel N, Patolia S, Frey S. Risk factors and outcomes for multidrug-resistant Gram-negative bacilli bacteremia. *Ther Adv Infect Dis*. 2018;5(1):11–8. doi: 10.1177/2049936117727497%0A

Seligman R, Ramos-Lima LF, Oliveira V do A, Sanvicente C, Sartori J, Pacheco EF. Risk factors for infection with multidrug-resistant bacteria in non-ventilated patients with hospital-acquired pneumonia. *J Bras Pneumol*. 2013;39(3):339–48. doi: 10.1590/s1806-37132013000300011

Prina E, Ranzani OT, Polverino E, Cillóniz C, Ferrer M, Fernandez L, et al. Risk factors associated with potentially antibiotic-resistant pathogens in community-acquired pneumonia. *Ann Am Thorac Soc*. 2015;12(2):153–60. doi: 10.1513/AnnalsATS.2014.07.305OC

Haque M, Sartelli M, McKimm J, Abu Bakar M. Infection and Drug Resistance Dovepress Health care-associated infections-an overview. *Infect Drug Resist*. 2018;11(1):2321–33. doi: 10.2147/IDR.S177247

Revelas A. Healthcare - associated infections: A public health problem. *Niger Med J*. 2012;53–64(2):59. doi: 10.4103/0300-1652.103543

Cardoso T, Almeida M, Friedman ND, Aragao I, Costa-Pereira A, Sarmento AE, et al. Classification of healthcare-associated infection: a systematic review 10 years after the first proposal. *AJIC Am J Infect Control*. 2014;12(40):1–13. doi: 10.1186/1741-7015-12-40

World Health Organization. Report on the Burden of Endemic Health Care-Associated Infection Worldwide Clean Care is Safer Care. World Health Organization. Geneva, Switzerland; 2011. Available from: [www.who.int](http://www.who.int)

Natadidjaja RI, Kusuma AS, Sudradjad GB, Nugrohowati L. The Association between Medical History-based Risks and Sepsis Events in Immunocompromised Patients according to Type III Stratification of the Indonesian Regulation on the Prospective Antimicrobial System (Regulasi Antimikroba Sistem Prospektif / RASPRO). *Bali Med J*. 2021;10(3):1031–6. doi: 10.15562/bmj.v10i3.2561

Empiric Antibiotic for Severe Case or Suspected ESBLs or Other MDRO

# Risk Stratification Type 2

Empiric Antibiotic for Suspected (Beta Lactamase Producers) to ESBLs

# Risk Stratification Type 1

Ben-Ami R, Rodríguez-Baño J, Arslan H, Pitout JDD, Quentin C, Caibo ES, et al. A multinational survey of risk factors for infection with extended-spectrum  $\beta$ -lactamase-producing enterobacteriaceae in nonhospitalized patients. *Clin Infect Dis*. 2009;49(5):682–90. doi: 10.1086/604713

Marchaim D, Gottesman T, Schwartz O, Korem M, Maor Y, Rahav G, et al. National multicenter study of predictors and outcomes of bacteremia upon hospital admission caused by Enterobacteriaceae producing extended-spectrum  $\beta$ -lactamases. *Antimicrob Agents Chemother*. 2010;54(12):5099–104. doi: 10.1128/AAC.00565-10

Hayakawa K, Gattu S, Marchaim D, Bhargava A, Palla M, Alshabani K, et al. Epidemiology and risk factors for isolation of escherichia coli producing ctx-m-type extended-spectrum-lactamase in a large U.S. Medical Center. *Antimicrob Agents Chemother*. 2013;57(8):4010–8. doi: 10.1128/AAC.02516-12

Johnson SW, Anderson DJ, May BD, Drew RH. Utility of a Clinical Risk Factor Scoring Model in Predicting Infection with Extended-Spectrum  $\beta$  -Lactamase-Producing Enterobacteriaceae on Hospital Admission. *Infect Control Hosp Epidemiol*. 2013;34(4):385–92. doi: 10.1086/669858

Aliberti S, Di Pasquale M, Zanaboni AM, Cosentini R, Brambilla AM, Seghezzi S, et al. Stratifying risk factors for multidrug-resistant pathogens in hospitalized patients coming from the community with pneumonia. *Clin Infect Dis*. 2012;54(4):470–8. doi: 10.1093/cid/cir840

Capsoni N, Bellone P, Aliberti S, Sotgiu G, Pavanello D, Visintin B, et al. Prevalence, risk factors and outcomes of patients coming from the community with sepsis due to multidrug resistant bacteria. *Multidiscip Respir Med*. 2019;14(23):1–11. doi: 10.1186/s40248-019-0185-4

Journal citations



Empiric Antibiotic for Multi-Sensitive Organism

RESERVE

RESERVE

WATCH

WATCH

WATCH

WATCH

WATCH

ACCESS

ACCESS

ACCESS

ACCESS

ACCESS

# RASPRO Manual Model



# RASPRO Digital Model

Parallel & Integrated with Hospital IT

## Formulir RASPATUR 1.0

Ketentuan

Nama Pasien

Nomor RM

Fokus Infeksi

Spesimen

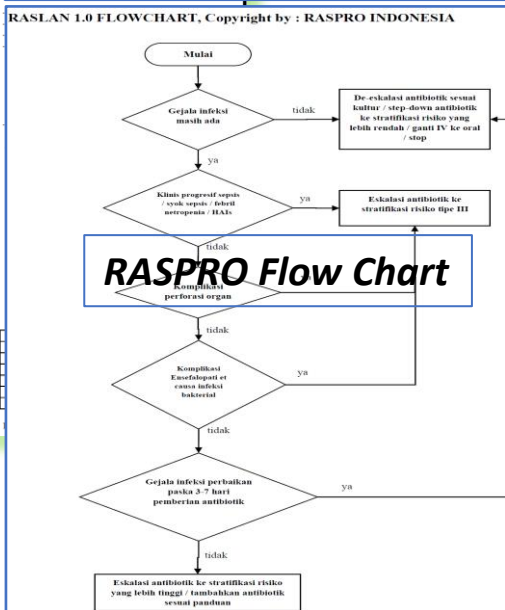
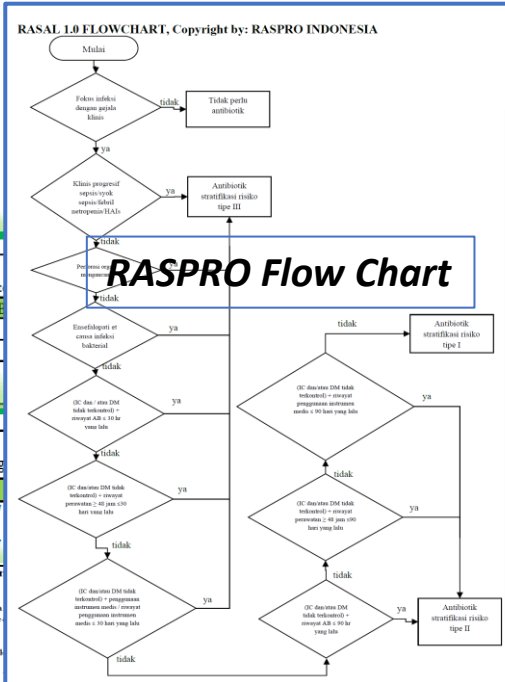
Antibiotik diberikan

1. ....

2. ....

| RASPRO Alur Antibiotik Awal (RASAL 1.0) |                                                                              |       |       |                                         |
|-----------------------------------------|------------------------------------------------------------------------------|-------|-------|-----------------------------------------|
| NO.                                     | SPEKIFIKASI                                                                  | FLOW  | KET.  | TINDAKAN                                |
| 1.                                      | Fokus infeksi dengan gejala infeksi                                          | Tidak | henti | Tidak perlu antibiotik                  |
| 2.                                      | Klinis progresif Sepsis / Septic Shock / Febril Netropenia / Terkategori HAI | Ya    | henti | Antibiotik Stratifikasi Risiko Tipe III |
| 3.                                      | Perforasi                                                                    | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 4.                                      | Encephalopathy                                                               | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 5.                                      | (Immunocompromised) riwayat ke                                               | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 6.                                      | (Immunocompromised) riwayat pe                                               | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 7.                                      | (Immunocompromised) pengguna instrumen                                       | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 8.                                      | (Immunocompromised) riwayat ke                                               | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 9.                                      | (Immunocompromised) riwayat pe                                               | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |
| 10.                                     | (Immunocompromised) riwayat pe                                               | Ya    | henti | Antibiotik stratifikasi risiko tipe I   |

| RASPRO Alur Antibiotik Lanjutan (RASLAN 1.0) |                                                                 |       |                          |                                                                                                                  |
|----------------------------------------------|-----------------------------------------------------------------|-------|--------------------------|------------------------------------------------------------------------------------------------------------------|
| NO.                                          | SPEKIFIKASI                                                     | FLOW  | KETERANGAN               | TINDAKAN                                                                                                         |
| 1.                                           | Gejala infeksi masih ada                                        | Tidak | Henti (Isi AB awal - AB) | De-escalasi antibiotik sesuai kultur / step-down antibiotik ke stratifikasi risiko yang lebih rendah / pindah IV |
| 2.                                           | Klinis progresif Sepsis / Syok Sepsis / Febril Netropenia / HAI | Ya    | Henti                    | De-escalasi antibiotik sesuai kultur / step-down antibiotik ke stratifikasi risiko yang lebih rendah / pindah IV |
| 3.                                           | Komplikasi perforasi organ                                      | Ya    | Henti                    | De-escalasi antibiotik sesuai kultur / step-down antibiotik ke stratifikasi risiko yang lebih rendah / pindah IV |
| 4.                                           | Komplikasi ensefalopati et causa infeksi bakterial              | Ya    | Henti                    | De-escalasi antibiotik sesuai kultur / step-down antibiotik ke stratifikasi risiko yang lebih rendah / pindah IV |
| 5.                                           | Gejala infeksi perbaikan pada 3-7 hari pemberian antibiotik     | Ya    | Henti                    | De-escalasi antibiotik sesuai kultur / step-down antibiotik ke stratifikasi risiko yang lebih rendah / pindah IV |



Request by system and local empiric guidelines for WATCH or RESERVE Group Antibiotic

Anti ESBLs / Pseudomonas sp / Anti MRSA

Note: by onsite consultation with ASP team

Life threatening

Define the Patient Risk Stratification

Type 3 Local empiric guidelines: WATCH Group Antibiotic

Type 2 Local empiric guidelines: ACCESS Group Antibiotic

Type 1 Local empiric guidelines: ACCESS Group Antibiotic

Digital Empiric Antibiotic Guidelines by Patient Risk Stratification (RASPRO Indonesia Model)

Pharmacist screen

Evaluation:

If:

Empiric / Prophylaxis Antibiotic:

Is it Antibiotic ACCESS / WATCH / RESERVE?

Is it proper with local guidelines?

If:

Definitive:

Check the data is it Antibiotic ACCESS / WATCH / RESERVE?

Duration of Empiric Antibiotic Use

De-Escalation to DEFINITIVE Antibiotic

Is the any dose adjusted?

Onsite consultation with ASP team

Nurse Screen

Watching:

Empiric / Prophylaxis / Definitive

Dose & Duration of Empiric Antibiotic Usage

De-Escalation to DEFINITIVE Antibiotic

MENU: RUMAH SAKIT & PASIEN

MENU: TIN PDA

MENU: GUIDELINES

# Digital Model e-RASPRO Parallel & Integrated System

## • Clinical

### Site of infection:

#### Bacterial:

“Big Four”: Pneumonia, UTI, SSTI, Intra-Abdominal  
Others: Intracranial, Central Line Associated BSIs, etc

#### Viral:

Upper respiratory tract  
Lower respiratory tract – viral pneumonia  
GI Tract  
Unspecified

## • Laboratory

Full Blood Count, CRP, Procalcitonin  
PCR

If the infection syndrome caused by viral  
such as Influenzae, Dengue, COVID-19, others

→ The antibiotic should be **RESTRICTED**

PASIENT BARU

EMPIRIK/DEFINITIF PROFILAKSIS

DASHBOARD DOKTER

Date : 01/10/2023 13/10/2023

Nama / RM :

SHOW EXCEL

NO PASIENT HISTORY

1 Choose the antibiotic indication:  
Empiric/Definitive  
Prophylaxis

DATA PASIENT RAWAT INAP

RM

Nama Pasien

Nama Ruangan

Nomor Kamar

e-RASAL e-DEFINITIF

2 If we choose empiric/definitive:  
Confirmation:  
empiric (e-RASAL) or  
definitive (e-definitive)

e-RASAL

Antibiotic prudent use system by RASPRO

Fokus infeksi dengan gejala

TIDAK YA

3 If we choose empiric:  
Define the bacterial focus of infection

PILIH JENIS INFEKSI

Search..

(Stratifikasi 1) Pneumonia / Infeksi Paru Lainnya

(Stratifikasi 1) Bakterial Tonsilitis / Abses Peritonsil

(Stratifikasi 1) Intra Bilier, Pankreatitis dan Intra Hepatik (termasuk Abses Hati)

(Stratifikasi 1) Extra Bilier

(Stratifikasi 1) Typhoid Fever

(Stratifikasi 1) Disentri Bakterial

4 Choose the focus of infection  
1,2,3 and more focus of infection can be  
covered by the system

**e-RASAL**  
Antibiotic prudent use system by RASPRO

Klinis progresif sepsis / septic syok / febril neutropenia / HAls

**TIDAK** **YA**

**e-RASAL**  
Antibiotic prudent use system by RASPRO

Perforasi organ mengancam

**TIDAK** **YA**

**e-RASAL**  
Antibiotic prudent use system by RASPRO

Ensefalopati ec. infeksi bakterial

**TIDAK** **YA**

**5**

Is patient sepsis / febrile neutropenia / healthcare associated infections?  
AND / OR  
Is there any threatening organ perforation?  
AND / OR  
Is there any bacterial encephalopathy?  
**If Yes**

**Life threatening**

Request by system and local empiric guidelines for **WATCH** or **RESERVE** Group Antibiotic

Anti ESBLs / Pseudomonas sp / Anti MRSA  
Note: by onsite consultation with ASP team

**6**

Is patient sepsis / febrile neutropenia / healthcare associated infections?  
AND / OR  
Is there any threatening organ perforation?  
AND / OR  
Is there any bacterial encephalopathy?  
**If NO**

Define the Patient Risk Stratification

Type 3 Local empiric guidelines:  
Type 2 **WATCH** Group Antibiotic  
Type 1 Local empiric guidelines:  
**ACCESS** Group Antibiotic

**e-RASAL**  
Antibiotic prudent use system by RASPRO

(Imunokompromis DAN / ATAU DM tidak terkontrol) + (Riwayat Penggunaan Antibiotik DAN / ATAU Riwayat Hospitalisasi >=48 jam DAN / ATAU Riwayat Penggunaan Instrumen Medis) < 30 hari yang lalu) ATAU  
(Imunokompromis DAN / ATAU DM tidak terkontrol dengan Penggunaan Instrumen Medis saat ini)

**TIDAK** **YA**

**e-RASAL**  
Antibiotic prudent use system by RASPRO

(Imunokompromis DAN / ATAU DM tidak terkontrol) + (Riwayat Penggunaan Antibiotik DAN / ATAU Riwayat Hospitalisasi >=48 jam DAN / ATAU Riwayat Penggunaan Instrumen Medis) < 90 hari yang lalu)

**TIDAK** **YA**

Antibiotik s... (Strategi 1) Pneumonia / Infeksi Paru Lainnya

1. (Strategi 1) (Amoxicillin (Oral / IV) / Amoxicillin clavulanat (Oral / IV) / Amoxicillin Subcutan (Oral / IV) +/- Gentamycin +/- Metronidazole IV/Oral)

Alternatif: Amoxicillin / Levofloxacin

(Levofloxacin (Oral / IV) / Ciprofloxacin (Oral / IV) / Azithromycin (Oral / IV) +/- Metronidazole IV/Oral)

Keterangan: Metronidazole diberikan apabila terdapat infeksi Abses

Pada Stratifikasi Risiko Tipe 1 bila antibiotik yang digunakan terkategori WATCH (Levofloxacin, Ciprofloxacin, Azithromycin) harus dengan konsultasi dengan Tim PSA. Kontraindikasi anak disesuaikan dengan Peer Group Anak

Dosis normal / high dose pada anak disesuaikan sesuai anamnesis / Konsultasi Peer Group Anak

**Digital Empiric  
Antibiotic Guidelines by  
Patient Risk Stratification  
(RASPRO Indonesia Model)**



| Obat                 | Detail                                                                   |  |
|----------------------|--------------------------------------------------------------------------|--|
| Ampicillin Sulbactam | Frek : 3<br>Dosis : 1.5<br>Satuan : gr<br>Track : Drip<br><b>REGULAR</b> |  |

Clinicians should “click” here if need to add antibiotic combination or change the empiric antibiotic by Risk Stratification system

Spesimen \*

TENTUKAN FOKUS INFEKSI

Antibiotic De-Escalation  
Timing  
Focus of Infection  
Specimen from site of infection

Spesimen \*

TENTUKAN FOKUS INFEKSI

PILIH JENIS INFEKSI

Search..

Pneumonia / Infeksi Paru Lainnya

Bakterial Tonsilitis / Abses Peritonsil

Intra Bilier dan Intra Hepatik (termasuk Abses Hati)

Extra Bilier

Typhoid Fever

Disentri Basiler

**RASAL**  
 Create Date : 2023-10-13 21:37  
 Created By : DR. RONALD

Konsultasi Team PGA

Antibiotik stratifikasi tipe I  
 1. (Stratifikasi 1) Pneumonia / Infeksi Paru Lainnya
 

GUIDE

Antibiotik Yang Ditambahkan :
 

| Obat                 | Detail                                                            |
|----------------------|-------------------------------------------------------------------|
| Ampicillin Sulbactam | Frek : 3<br>Dosis : 1.5<br>Satuan : gr<br>Track : Drip<br>REGULAR |

Obat Dalam Konfirmasi

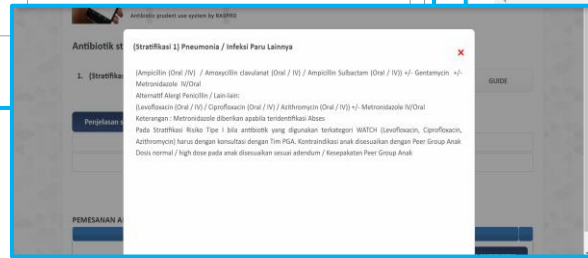
Obat DiBatalkan

RM : 237  
 Nama : TN.MIKPO  

PERAWATAN SELESAI

| DETAIL                      | 13 OKT 23                       |
|-----------------------------|---------------------------------|
| <b>Ampicillin Sulbactam</b> | Ampicillin Sulbactam 2023-10-13 |
| Frek : 3                    | <input type="checkbox"/>        |
| Dosis : 1.5                 | <input type="checkbox"/>        |
| Satuan : gr                 | <input type="checkbox"/>        |
| Track : Drip                |                                 |
| Tipe : REGULAR              |                                 |
| 1 Hari                      |                                 |

SUBMIT



## Pharmacist screen

Evaluation:

If:

Empiric / Prophylaxis Antibiotic:

Is it Antibiotic ACCESS / WATCH / RESERVE?

Is it proper with local guidelines?

If:

Definitive:

Check the data Is it Antibiotic ACCESS / WATCH /

RESERVE?

Duration of Empiric Antibiotic Usage

**De-Escalation to DEFINITIVE Antibiotic**

Is the any dose adjusted?

**Onsite consultation with ASP team if it's needed**

## Nurse Screen

Watching :

Empiric / Prophylaxis / Definitive

Dose & Duration of Empiric Antibiotic Usage

**De-Escalation to DEFINITIVE Antibiotic**

| Obat                 | Detail                                                            |
|----------------------|-------------------------------------------------------------------|
| Ampicillin Sulbactam | Frek : 3<br>Dosis : 1.5<br>Satuan : gr<br>Track : Drip<br>REGULAR |

e-RASAL

e-RASLAN

e-RASPRAJA

e-RASPATUR

e-RASGRASI

e-PROFILAKSIS

Clinicians should "click" here if the antibiotic use more than time limit. Explain the reason of antibiotic prolong usage. if NOT → Automatic Stop Order (ASO) will be enforced

# RASPRO Model on AWARE Categories Hospital Setting

Digital Mode

Patient with  
bacterial  
Infection /  
preoperative

Empiric

De-escalation

Definitive

Prophylaxis

Empiric  
Step Up  
Step Down

Guidelines  
Strat Risk Type I  
Strat Risk Type II  
Strat Risk Type II



ACCESS

WATCH

RESERVE

ACCESS

WATCH

RESERVE

ACCESS

If there is a  
special case,  
outside regulation

FREE by Indication

Supervision – Restricted  
by Indication  
PGA team agreement

FREE by Indication

Supervision – Restricted  
by Indication  
PGA team agreement

Supervision  
PGA team agreement

Automatic STOP  
Order if not  
reasonable



Integrated  
Assessment  
(FORKIT)

# e-RASPRO Digital Antimicrobial Stewardship Implementation INDONESIA

## HERMINA HOSPITAL GROUP - INDONESIA

### 27 User Hospitals with Centralized Monitoring in Jakarta

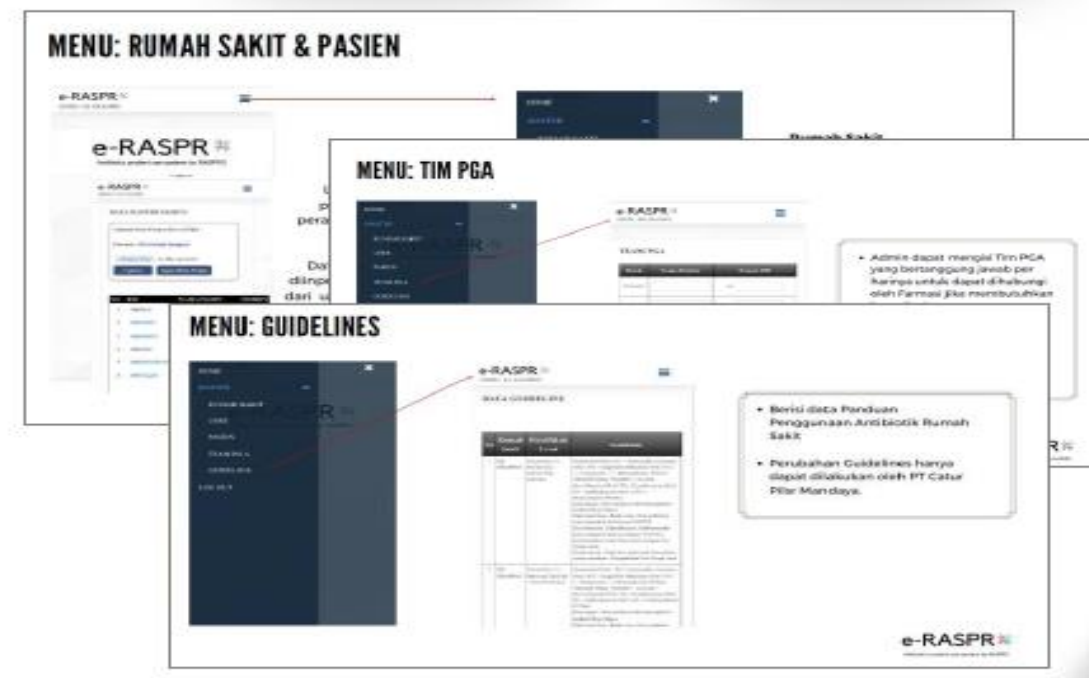
|                          |                              |
|--------------------------|------------------------------|
| RS. Hermina Jatinegara   | RS. Hermina Jogjakarta       |
| RS. Hermina Grand Wisata | RS. Hermina Solo             |
| RS. Hermina Bogor        | RS. Hermina Tangkuban Perahu |
| RS. Hermina Galaxy       | RS. Hermina Padang           |
| RS. Hermina Bekasi       | RS. Hermina Pasteur          |
| RS. Hermina Daan Mogot   | RS. Hermina Arcamanik        |
| RS. Hermina Ciputat      | RS. Hermina Sukabumi         |
| RS. Hermina Kemayoran    | RS. Hermina Karawang         |
| RS. Hermina Tangerang    | RS. Hermina Bitung           |
| RS. Hermina Ciruas       | RS. Hermina Purwokerto       |
| RS. Hermina Serpong      | RS. Hermina Bitung           |
| RS. Hermina Depok        |                              |
| RS. Hermina Banyumanik   |                              |
| RS. Hermina Pandanaran   |                              |
| RS. Hermina Makassar     |                              |
| RS. Hermina Ubaya        |                              |

RS Tugu Ibu  
(e-RASPRO Beta Version mode)

RS Mardi Rahayu

RS. Marzoeki Mahdi

RSUD Cempaka Putih





## II. Dari Regulasi Makro menuju Ekosistem

a. EkoSistem : Dampak Timbal Balik menuju Desain Mikro

# EKOSISTEM



**Kondisi timbal balik yang telah terjadi antara kebiasaan penggunaan antimikroba bijak dengan turunnya risiko kemunculan MDR**



## **Desain Mikro**

**Desain Mikro** adalah suatu desain kerja dimana telah terjadi kesinambungan Sistem dan Ekosistem dan rumah sakit / fasilitas kesehatan telah dapat secara mantap memberikan pelayanan dengan antimikroba bijak

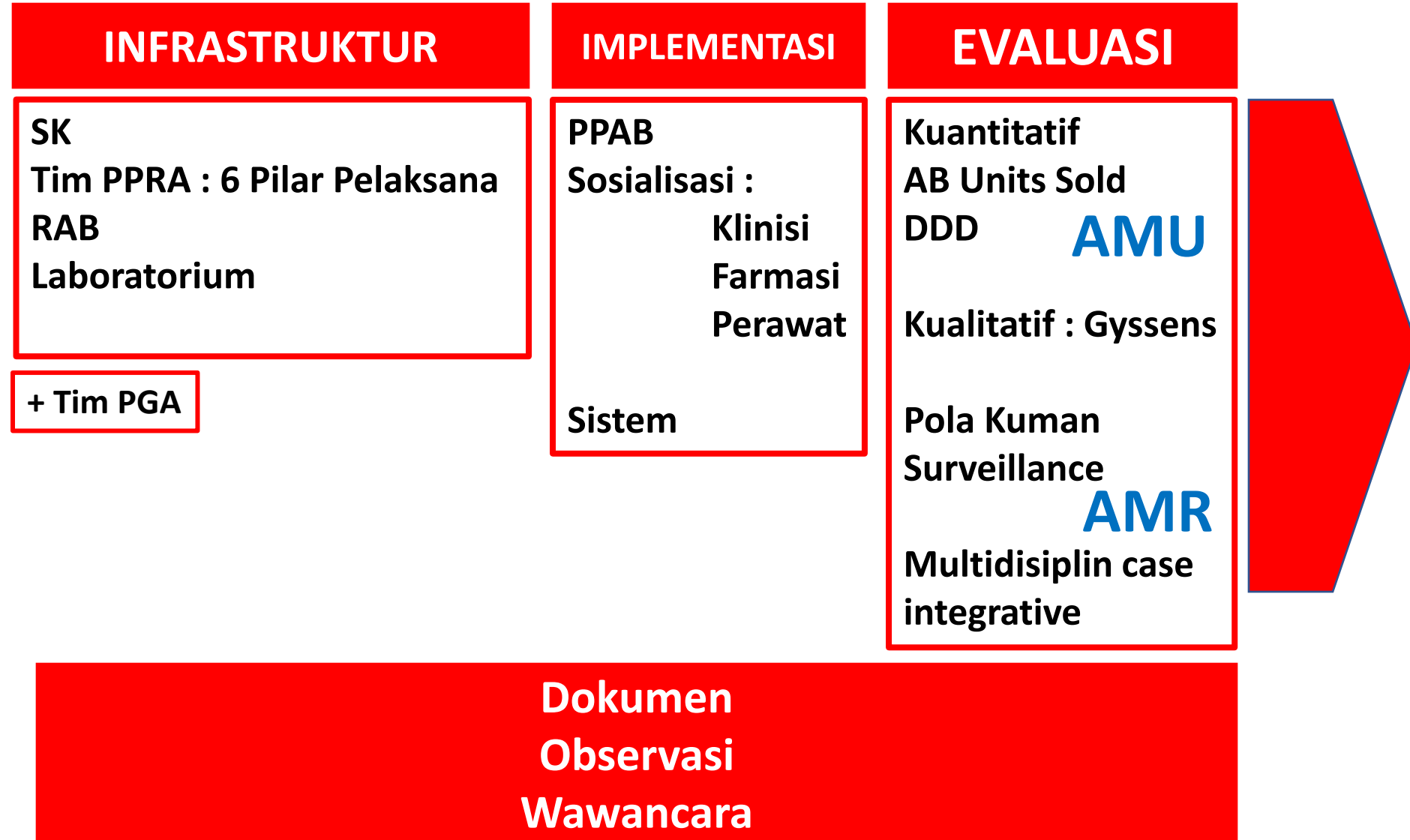
Desain Mikro secara timbal balik dibangun dari Sistem dan Ekosistem, sebaliknya juga membangun sistem dan ekosistem pengendalian resistensi antimikroba di rumah sakit



# I. Infrastruktur – Implementasi - Evaluasi Pelaksanaan PPRA / PGA

---

# PPRA



# BAB IV.

## EVALUASI PGA

Untuk mengetahui keberhasilan kegiatan PGA di suatu rumah sakit dilakukan monitoring dan evaluasi terhadap kegiatan PGA, secara berkala setiap 3-6 bulan dengan mengukur struktur, proses, dan hasil. Hasil evaluasi dilaporkan kepada pimpinan rumah sakit dan Kementerian Kesehatan.

### IV.1. Pengukuran struktur

- adanya komitmen pimpinan rumah sakit
- adanya pedoman PRA dan pedoman PPI
- adanya KPRA dan tim PGA
- adanya PPK dan CP untuk penyakit infeksi yang selalu diperbarui
- adanya FRS dan PPAB yang selalu diperbarui
- adanya laporan antibiogram setiap 6-12 bulan

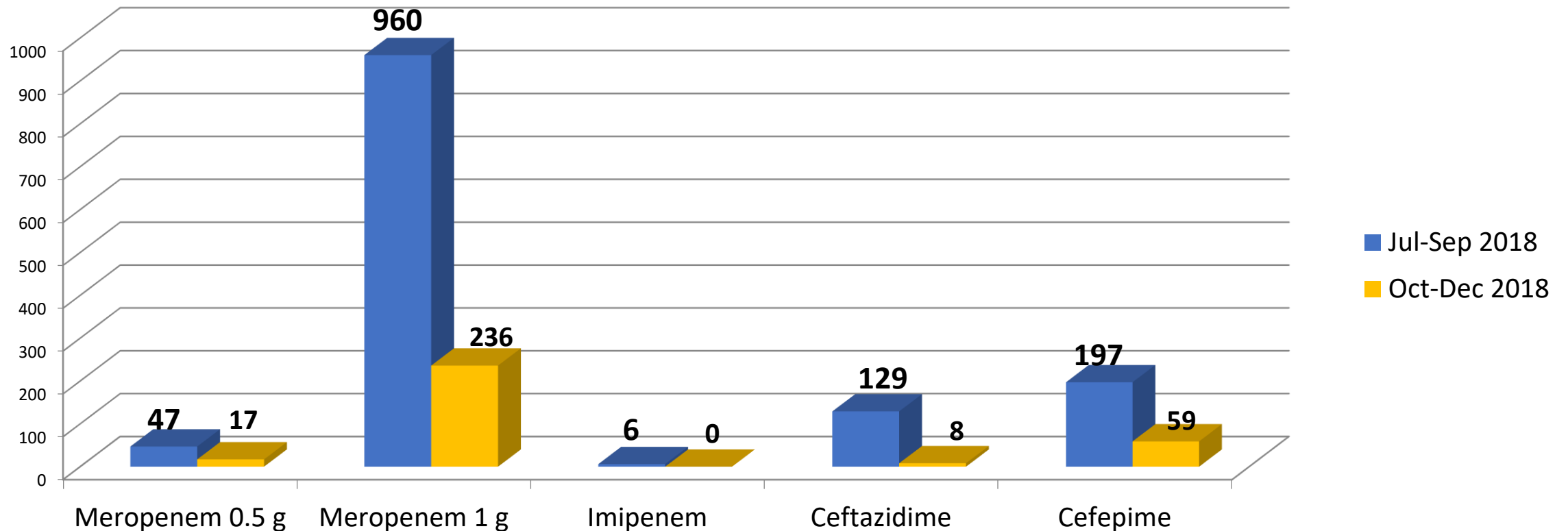
### IV.2. Pengukuran proses

- Adanya data kuantitas penggunaan antimikroba
  - dinyatakan dalam unit DDD/100 hari rawat
- Adanya data kualitas penggunaan antimikroba
  - persentase berbagai kategori metoda Gyssens dalam penggunaan antimikroba
  - persentase penerimaan DPJP terhadap umpan balik dari tim PGA
  - persentase perubahan terapi berdasarkan hasil pemeriksaan laboratorium mikrobiologi
  - persentase perubahan rute pemberian dari IV ke oral
  - saat mengubah rute pemberian dari IV ke oral

### IV.3. Pengukuran hasil

- Dari aspek mikrobiologi
  - persentase indikator MDRO
  - persentase infeksi *Clostridium difficile*
- Dari aspek klinis
  - lama hari rawat (*length of stay*, LOS)
  - angka kematian akibat penyakit infeksi
  - persentase *readmission* dan *reinfection*
- Dari aspek keuangan
  - biaya antimikroba per pasien selama perawatan
  - biaya pembelian antimikroba oleh rumah sakit
- Dari aspek diseminasi informasi
  - hasil kegiatan PGA dipublikasikan dalam majalah yang terakreditasi dan terpercaya setiap 12-24 bulan

## Three Months Comparison of Broad Antibiotics Unit Sold: Before and After RASPRO-RASAL Criteria Implemented



Ronald Irwanto Natadidjaja\*<sup>#</sup>, Yuhana Fitra\*\*<sup>\*</sup>, Yudianto Budi Saroyo\*\*<sup>\*</sup>,  
Augustine Matatula\*\*<sup>\*</sup>, Rinna Wamila Sundariningrum

(MANUAL Model)

ORIGINAL ARTICLE

Antibiotic usage at a private hospital in Central Java: results of implementing the Indonesian Regulation on the Prospective Antimicrobial System (Regulasi Antimikroba Sistem Prospektif Indonesia [RASPRO])

Ronald Irwanto Natadidjaja<sup>1,2\*</sup>, Tarcisius Henry<sup>1</sup>, Hadiani Adlani<sup>1</sup>, Aziza Ariyani<sup>1</sup> and Rika Bur<sup>1</sup>

<sup>1</sup>RASPRO Indonesia Study Group, Jakarta, Indonesia; <sup>2</sup>Infectious Disease Division, Trisakti School of Medicine, Trisakti University, Jakarta, Indonesia

*Abstract*

**Methods:** A pre–post-descriptive study was conducted in 2019 for 3 months at a private hospital in Central Java, Indonesia, to evaluate the implementation of the Regulation on Indonesian Antimicrobial Stewardship Program (ASP), namely, the Prospective Antimicrobial System/Regulasi Antimikroba Sistem Prospektif Indonesia (RASPRO). Outcomes were measured before and after the implementation of the RASPRO in the ward including: 1) intravenous antibiotic defined daily dose (DDD) per 100 patient-days, 2) antibiotic expenditure, and 3) antibiotic expenditure per inpatient.

**Result:** The total antibiotic consumption was expressed in DDD/100 patient-days. For the levofloxacin category, the number increased intensely from 2.38 to 15.29; carbapenem escalated from 0.51 to 2.31, ceftriaxone from 32.10 to 38.03, and ampicillin sulbactam from 1.14 to 1.18. In contrast, cefuroxime significantly reduced from 17.25 to 1.38, cefotaxime decreased from 10.33 to 6.83, gentamicin decreased from 3.18 to 1.91, and amikacin decreased from 2.27 to 2.13. The overall cephalosporin usage decreased from 19.89 to 15.41. The total antibiotic expenditure had a decline of 20.28%, followed by 14.44% reduction on the percentage of antibiotic expenditure per inpatient.

**Conclusion:** Our study describes the 3-month analysis of antimicrobial usage before and after the implementation of the RASPRO by evaluating several parameters. The antibiotic consumption expressed in DDD/100 patient-days for each antibiotic category has demonstrated that there are different impacts that may be debatable and calls for further evaluation. A decrease in the total antibiotic expenditure has also been reported. However, since our study is a preliminary study, it should be continued by further studies that involve longer study duration to observe further impacts of the program.

MEETING ABSTRACTS

Open Access

# International Conference on Prevention and Infection Control 2023



## A quantitative survey of antibiotic use at a hospital in Jambi Province Indonesia in three-month before and after implementation of antimicrobial resistance control program by Raspro concept

R. I. Natadidjaja<sup>1,2,\*</sup>, R. Asmajaya<sup>2</sup>, H. Basrie<sup>2</sup>, H. Sumarsono<sup>2</sup>

<sup>1</sup>Internal Medicine, Faculty of Medicine, Universitas Trisakti, <sup>2</sup>Pelita RASPRO Indonesia Foundation, Jakarta Barat, Indonesia

**Correspondence:** R. I. Natadidjaja

*Antimicrobial Resistance & Infection Control* 2023, **12**(Suppl 1):P309

**Introduction:** Based on Decree of Minister of Health Number 8/2015 in article 11 concerning quality indicators of Antimicrobial Resistance Control Program (ARCP)/Program Pengendalian Resistensi Antimikroba (PPRA) implementation in hospitals, it has been known that reduced quantity of antimicrobial use has become one of those indicators.

**Objectives:** This survey is a descriptive study using secondary data retrieved between July and September 2019 (3 months before implementation of RASPRO concept) as well as between October and December 2019 (3 months after the implementation), which was aimed to evaluate impacts on implementing *Regulasi Antimikroba Sistem Prospektif (RASPRO)* concept at a hospital in Jambi province, Indonesia.

**Methods:** The survey was carried out by calculating the expenditure of 3 antibiotic classes, which were the most commonly used and usually given by injection in hospitals and Intensive Care Units (ICU)s, i.e. the beta-lactam, quinolones and carbapenem.

**Results:** We found reduced use of Ceftriaxone as many as 890 ampules (37.11%), for Cefotaxime the reduction was 580 ampules (67.13%); while the use of Cefoperazone reduced as many as 76 ampules (47.50%) and Ceftazidime reduced as many as 10 ampules (7.14%). The use of Ciprofloxacin reduced as many as 327 ampules (71.40%), but there was a drastic increase in the use of Levofloxacin as many as 59 ampules (>100%). The use of Carbapenems increased, which included 79 ampules (34.20%) for Meropenem; while the use of Imipenem increased as many as 9 ampules (100%). In three months after the implementation of RASPRO concept, 92.5% prophylaxis antibiotic had been given for appropriate indication and the antibiotic use of Cefazolin 71.3%. Within three months before and after the implementation of RASPRO concept, there was a total reduction of antibiotic use, which reached 1736 ampules (40.57%).

**Conclusion:** In conclusion, the implementation of RASPRO concept can be executed as an effort to reduce the quantity of antimicrobial use in hospitals. However, larger studies and longer monitoring are required in order to identify the impact of implementation of RASPRO concepts at a hospital.

**Disclosure of Interest**  
None declared.

(MANUAL Model)

# Qualitative Evaluation of Antibiotic with Gyssens Method by RASPRO Concept for Pneumonia at Pediatric Intensive Care Unit

Rinna W. Sundariningrum,<sup>1</sup> Darmawan Budi Setyanto,<sup>2</sup> Ronald Irwanto Natadidjaja<sup>3</sup>

**Background.** Pneumonia remains the commonest infective reason for admission to intensive care as well as being the most common secondary infection acquired whilst in the pediatric intensive care unit. Inappropriate use of antibiotics can increase morbidity, mortality, patient cost, and antibiotic resistance.

**Objective.** To qualitatively evaluate antibiotic use in pneumonia with The Gyssens method by RASPRO concept.

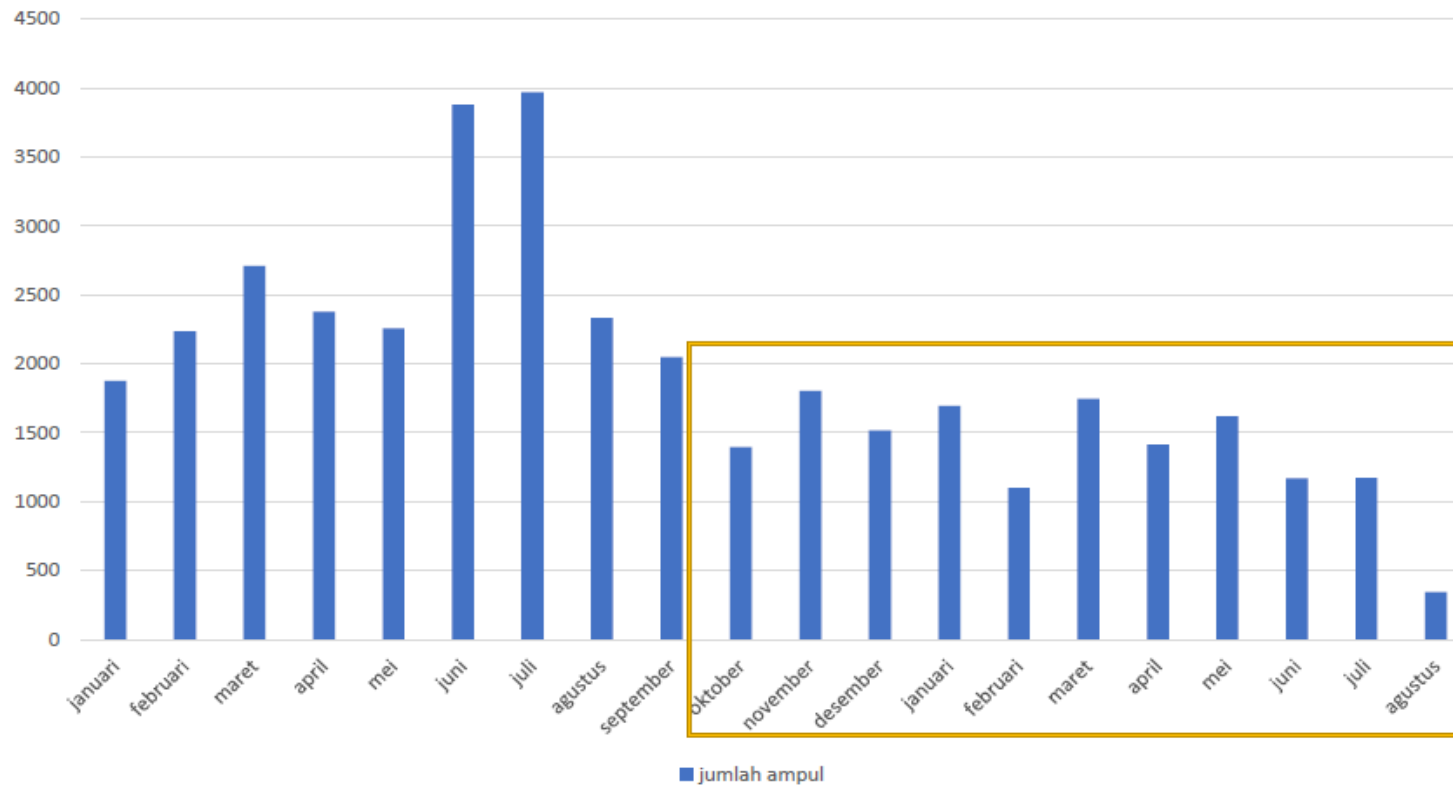
**Methods.** We performed a descriptive, retrospective study data based on medical records of patients with pneumonia who admitted to the pediatric intensive care unit in Hermina Bekasi Hospital from May to October 2019. Records were evaluation its qualitative antibiotic using the Gyssens method by RASPRO concept.

**Result.** This study discovered 51 cases (14,46%) of severe pneumonia. We found 119 antibiotics uses including 90 (75,63%) empirical therapies and 29 (24,37%) devinitive therapies. Ampicilin sulbactam was the most common antibiotic used (15,98%), followed by cefotaxime (15,12%), meropenem (13,44%), azithromycin (11,78%) and ceftriaxone (10,92%). Based on Gyssens method by RASPRO concept, appropriate antibiotic use (category 0) accounted for 63,02%, while inappropriated use accounted for 1,68% category IVa (improper; other antibiotics were more effective), 22,69% category IIIa (improper; duration too long), 9,24% category IIIb (improper; duration too short) and 3,36% category IIa (improper; incorrect dose).

**Conclusion.** Appropriate use of antibiotics showed quite good results, namely 63,03%. The RASPRO concept can be used to reduce subjectivity bias in qualitative antibiotic assessments by the Gyssens method for pneumonia treated in the pediatric intensive care unit. **Sari Pediatri** 2020;22(2):109-14

## 9 months before & after using digital ASP model

43% decline of Inpatient Antibiotic Usage



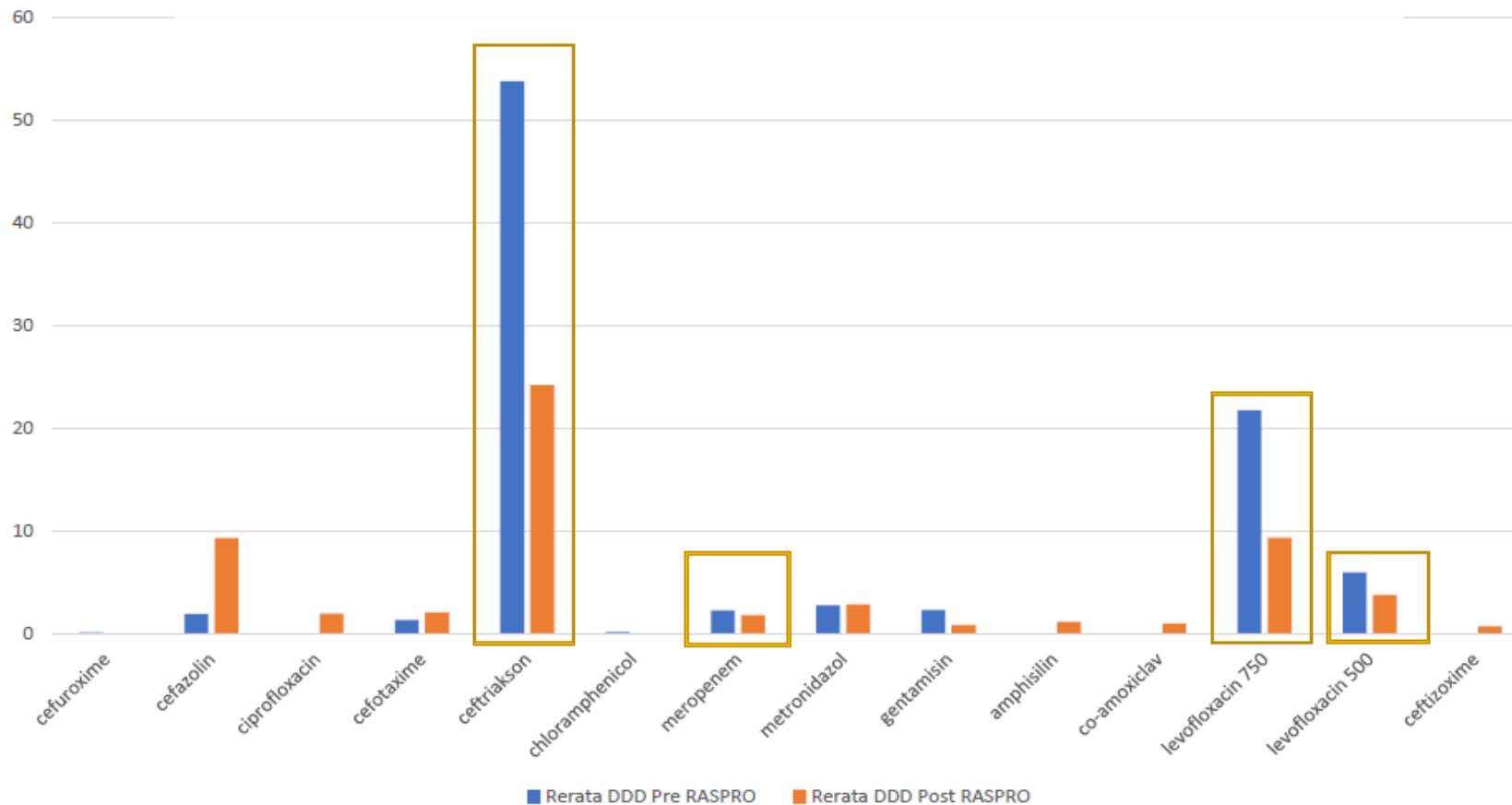
Dr. Iin Indra Pertiwi SpPD

RASPRO Indonesia - Indonesian Grass Root Meeting on Antimicrobial Stewardship (INDOGRAM)  
World Antimicrobial Awareness Week, November 2022

To do further research in 3 hospitals , In progress publication

(Digital Model)

## 9 months before & after using digital ASP model : average of DDD



20% Define Daily Dose (DDD) **Decline** of Meropenem  
57% Define Daily Dose (DDD) **Decline** of 750mg Levofloxacin  
37% Define Daily Dose (DDD) **Decline** of 500mg Levofloxacin  
55% Define Daily Dose (DDD) **Decline** of Ceftriaxone

Dr. lin Indra Pertiwi SpPD

RASPRO Indonesia - Indonesian Grass Root Meeting on Antimicrobial Stewardship (INDOGRAM)  
World Antimicrobial Awareness Week, November 2022

**To do further research in 3 hospitals , In progress publication**

**(Digital Model)**



## Trend Changing to the ACCESS Category Antibiotic Usage after Digital Antimicrobial Stewardship Tool e-RASPRO 9 Months Implementation in an Indonesian Hospital

Hadianti Adlani<sup>1,2</sup>, Aziza Ariyani<sup>2</sup>, Ronald Irwanto Natadidjaja<sup>1,2,3</sup>, Anti Dharmayanti<sup>1,2</sup>

<sup>1</sup> Indonesian Society of Infection Control (INASIC) Branch Banten

<sup>2</sup> RASPRO Indonesia *Study Group*

<sup>3</sup> Faculty of Medicine Universitas Trisakti

**Background:** Antimicrobial Stewardship Program (ASP) is a global issue. World Health Organization (WHO) stated, there are 3 categories of antimicrobial: ACCESS, WATCH, and RESERVE. e-RASPRO as a digital ASP may alter antibiotic prescribing pattern by prioritizing ACCESS category as suggested by WHO.

**Methods:** This manuscript was a ward retrospective survey data of 9 months Define Daily Dose (DDD) average before-after implementing the electronic-RASPRO (e-RASPRO) on ACCESS & WATCH antibiotic.

**Results:** Number of inpatients 9 months before-after e-RASPRO implementation were 7,754 and 6,794. Within 9 months after implementing e-RASPRO there was a trend of antibiotic prescription shifting from WATCH category antibiotic to ACCESS category antibiotic. There was a trend of reduced Define Daily Dose (DDD) average of WATCH category antibiotic. 24.82% of 3<sup>rd</sup> generation Cephalosporin, 33.20% of Quinolones, 14.76% of Carbapenems and 100% of Piperacillin Tazobactam DDD average were reduced. While, in ACCESS Category Antibiotic, there were an elevation of Penicillin and Aminoglycosides DDD average up to 528.66% and 137.66%.

**Conclusion:** There are trend changing of DDD average from WATCH to ACCESS category antibiotic following the 9 months implementation of e-RASPRO. We need further study to judge the effectiveness of e-RASPRO as a digital ASP tools.



## A Survey on Define Daily Dose of Watch- and Access-Category Antibiotics in Two Indonesian Hospitals Following the Implementation of Digital Antimicrobial Stewardship Tool

Ronald Irwanto Natadidjaja, Aziza Ariyani, Hadiani Adlani, Raymond Adianto, Iin Indah Pertiwi, Grace Nerry Legoh, Alvin Lekonardo Rantung, Hadi Sumarsono

**Background:** In 2023, the World Health Organization (WHO) began targeting a shift in antibiotic prescribing trends from WATCH to ACCESS category.

**Method:** This survey was a preliminary study, in which our study group designed a digital model of antimicrobial stewardship and the model was known as e-RASPRO. The survey on the use of antibiotic Define Daily Dose (DDD) was carried out in two hospitals in Indonesia at 3 months and 9 months of use, respectively. Data was retrieved retrospectively at the inpatient wards of both hospitals.

**Result:** Three months before and after the implementation of e-RASPRO in Hospital 1, the DDD of prophylactic antibiotic Cephazolin showed an increased of 167.18%. In hospital 2, Cephazolin had been used since the hospital applied the manual RASPRO concept. DDD of WATCH category antibiotics within 9 months following the implementation of e-RASPRO tool in hospital 1 showed a decrease of 49.01%. Meanwhile, the implementation of e-RASPRO for 3 months in Hospital 2 still showed an increase in WATCH category antibiotics by 20.18%; however, there was a decrease in DDD of Cephalosporin and Glycopeptide antibiotics by 7.63% and 49.30%, respectively. In the meantime, as a way of saving antibiotic use and shifting antibiotic prescribing to the ACCESS category, we found a decrease in DDD of ACCESS category antibiotics in Hospital 1 by 3.64% and an increase in Hospital 2 by 8.14%.

**Conclusion:** The survey may indicate that there are savings attempts in antibiotic use as well as an early change in DDD antibiotics from the WATCH category to the ACCESS category following the implementation of e-RASPRO tool in both hospitals. The time period of using the digital devices may still affect the results; however, this survey certainly has not illustrated a strong cause-and-effect correlation between the use of e-RASPRO tool and antibiotic DDD.

(Digital Model)



**@rasproindonesia**

*Instagram*

[www.new.rasproindonesia.com](http://www.new.rasproindonesia.com)

# THANK YOU!