

The Access Category Covers More Than 60% of Total Intravenous Antibiotic Prescriptions in Four Hospitals in Indonesia That Use Digital Antimicrobial Stewardship

Ronald Irwanto Natadidjaja^{1,2,6}, Widyawati Lekok^{2,3}, Hadiani Adlani^{2,4}, Triyoko Septio Marja^{2,5}, Siti Rahmah⁵, Sri Mulyani⁵,
Aziza Ariyani², Joyce Bratanata², Yenny Yenny^{1,6}, Meutia Atika Faradilla^{1,6}

- ¹ Faculty of Medicine, Universitas Trisakti, Jakarta, Indonesia
- ² RASPRO Indonesia Study Group for Antimicrobial Stewardship & Resistance
- ³ Trisakti School of Management, Indonesia
- ⁴ Faculty of Medicine, Syarif Hidayatullah State Islamic University
- ⁵ Hermina Hospital Group
- ⁶ Trisakti – RASPRO Indonesia Antimicrobial Stewardship Learning Centre



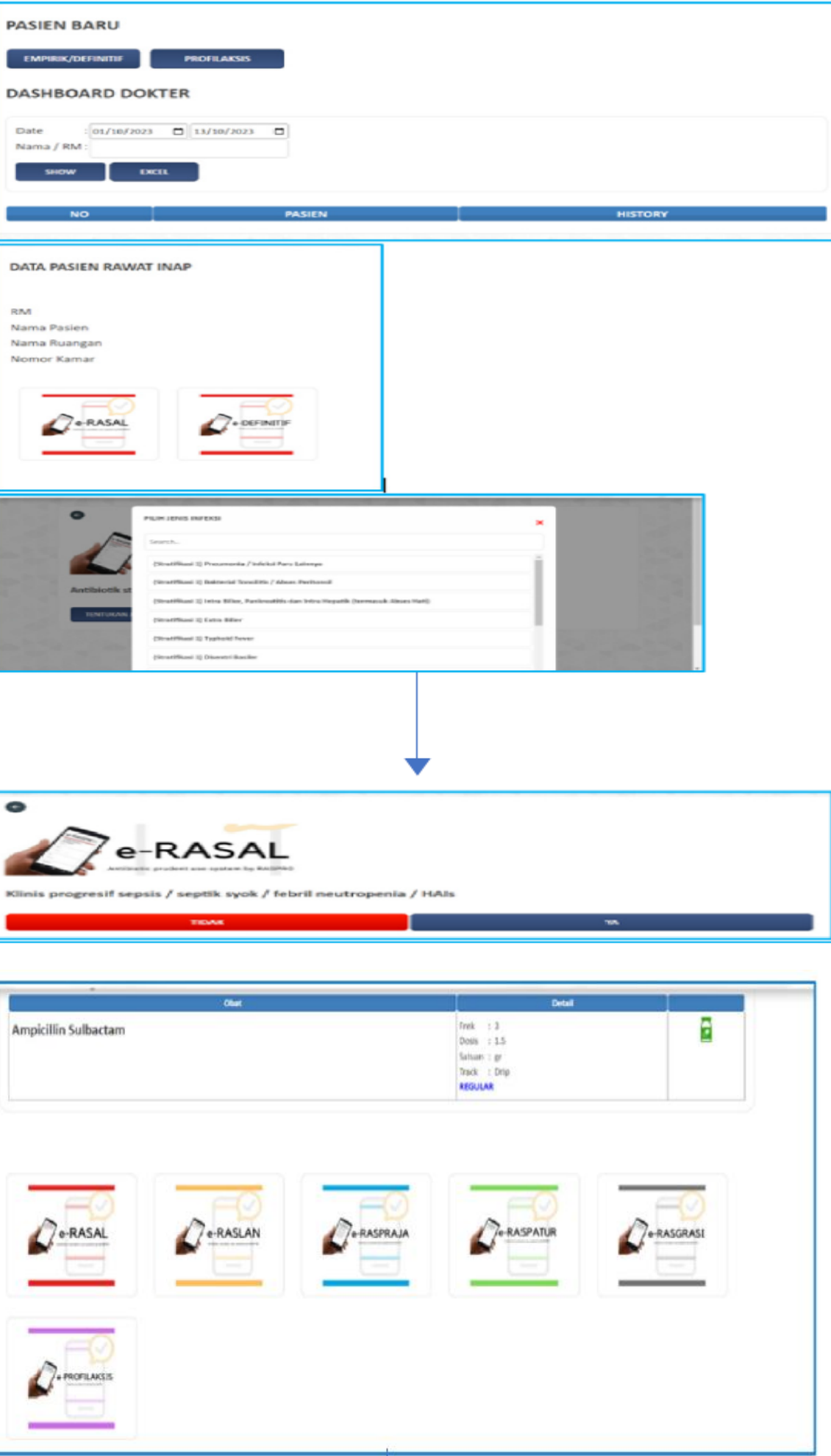
Background. By 2023, WHO has targeted that $\geq 60\%$ of antibiotic prescriptions must be categorized as Access.¹ e-RASPRO as a digital antimicrobial stewardship model developed in Indonesia aims to enable hospitals to achieve the WHO target.

Objective. To describe the achievements of 4 hospitals in Indonesia that used the e-RASPRO digital antimicrobial stewardship tool, which reached a percentage of Access category antibiotic usage $\geq 60\%$.

Methods. This descriptive observational study was conducted using ward intravenous antibiotic data from four hospitals in Indonesia with e-RASPRO implementation. The Access Watch and Reserve (AWARE) categorization was performed according to WHO guidelines, with minor adjustments to suit hospital conditions. Data were collected over a one-year period in 2024, calculating the percentage of antibiotics used for each category.

Doctor Screen

Empirical Prescription²



DOCTOR SCREEN: ²

Clinician was asked to determine the indication of the antibiotic used: PROPHYLACTIC / EMPIRIC/DEFINITIVE

If EMPIRIC indication was selected, then the clinician was asked to determine the focus of infection

DOCTOR SCREEN: (EMPIRIC) ²

After determining the focus of infection, clinician was asked to perform stratification

On the system, there would be a question regarding severity: Did the patient have sepsis / Healthcare Associated Infections (HAIs), Febrile Neutropenia?

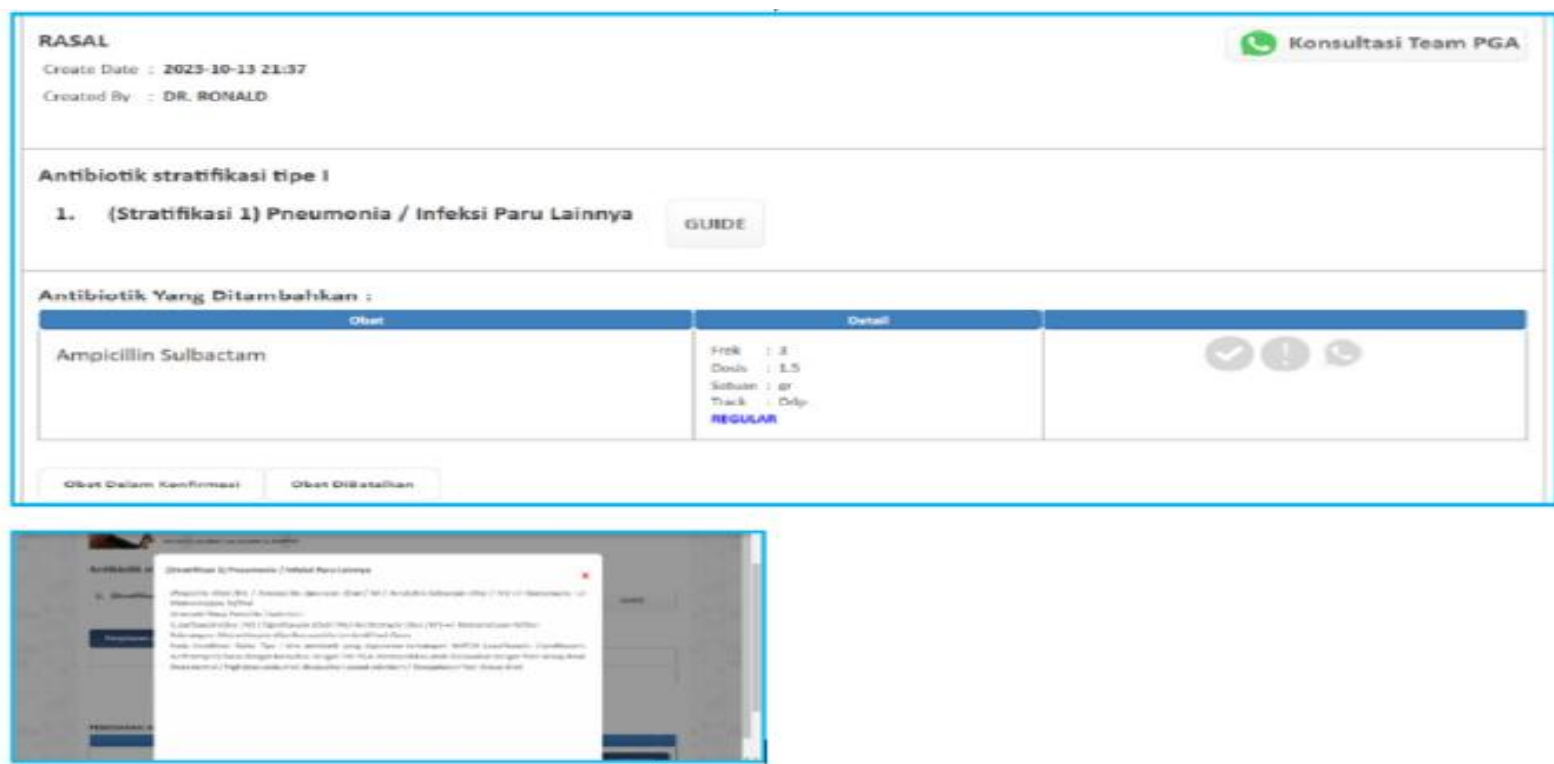
Did the patient have a threatening organ perforation?

Did the patient have impaired consciousness due to bacterial infection?

If there was nothing threatening, the system would ask whether there was a history of antibiotic use AND / OR Hospitalization ≥ 48 hours AND / OR the use of medical instruments in the last 30 OR 90 days?

When all questions had been answered, the system would convey information to the clinician about the patient's Risk Stratification along with the digital guidelines on whether Access/Watch/Reserve antibiotics must be given. The clinician could prescribe empiric antibiotics in accordance with digital guidelines along with the dose, route of administration and then SUBMITTED

Pharmacist Screen²

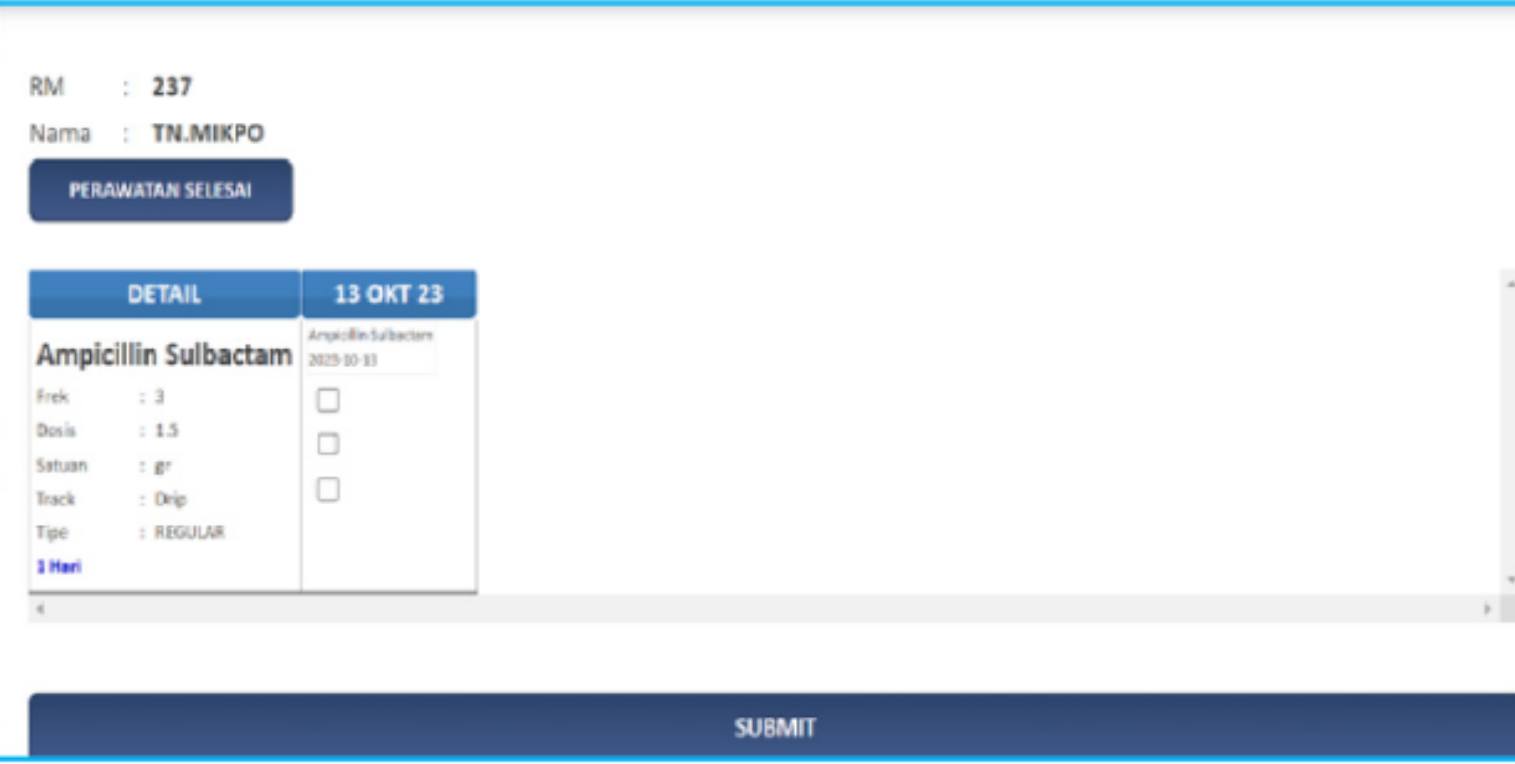


PHARMACIST SCREEN: ²

After the clinician finished prescribing and SUBMITTED, the prescription would go to the pharmacist and the pharmacist would perform verification on: the Type, Dose and Route of administration.

If the antibiotics given were not in accordance with the digital guidelines or if Watch/Reserve antibiotic must be given empirically, then the pharmacist could contact the Hospital PGA team via Whatsapp Call / Video Call. After approval, the pharmacist SUBMITTED the ordered empiric antibiotics.

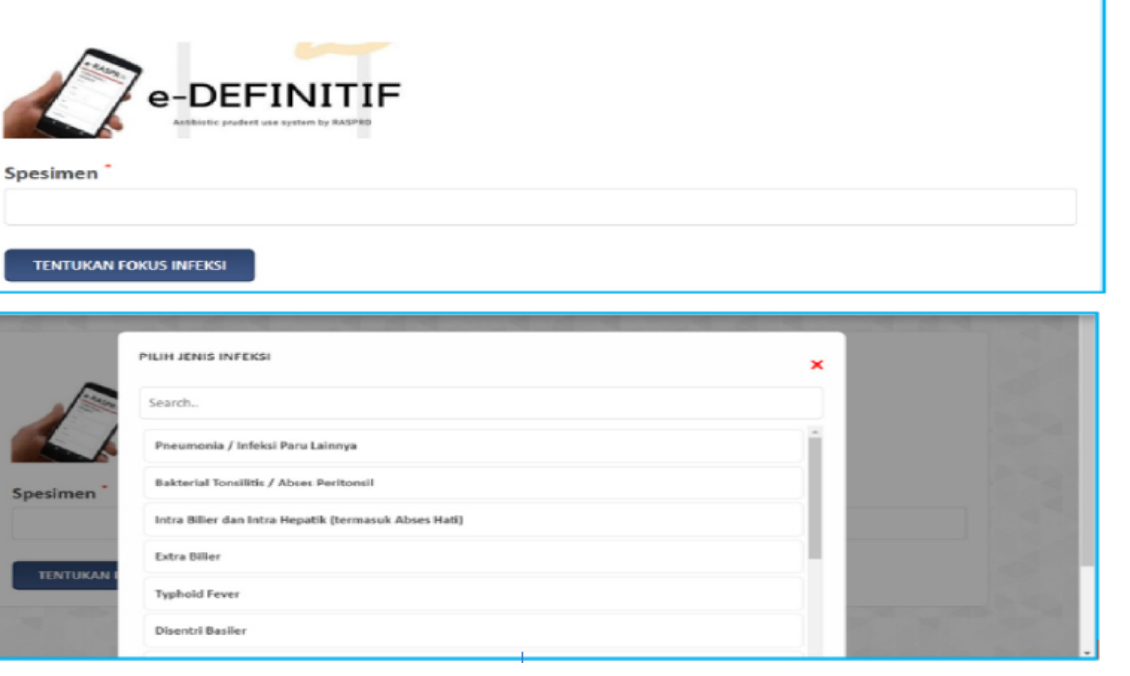
Nurse Screen²



NURSE SCREEN: ²

After the pharmacist SUBMITTED, the nurse would identify the type of antibiotics that would be used in accordance with the indication in the guidelines and had been approved for use by the pharmacist and the hospital PGA team. Nurses could also participate in monitoring the use of antibiotics through the nurse screen by filling out digital table each time the antibiotics had been given to the patient.

Definitive Prescription²

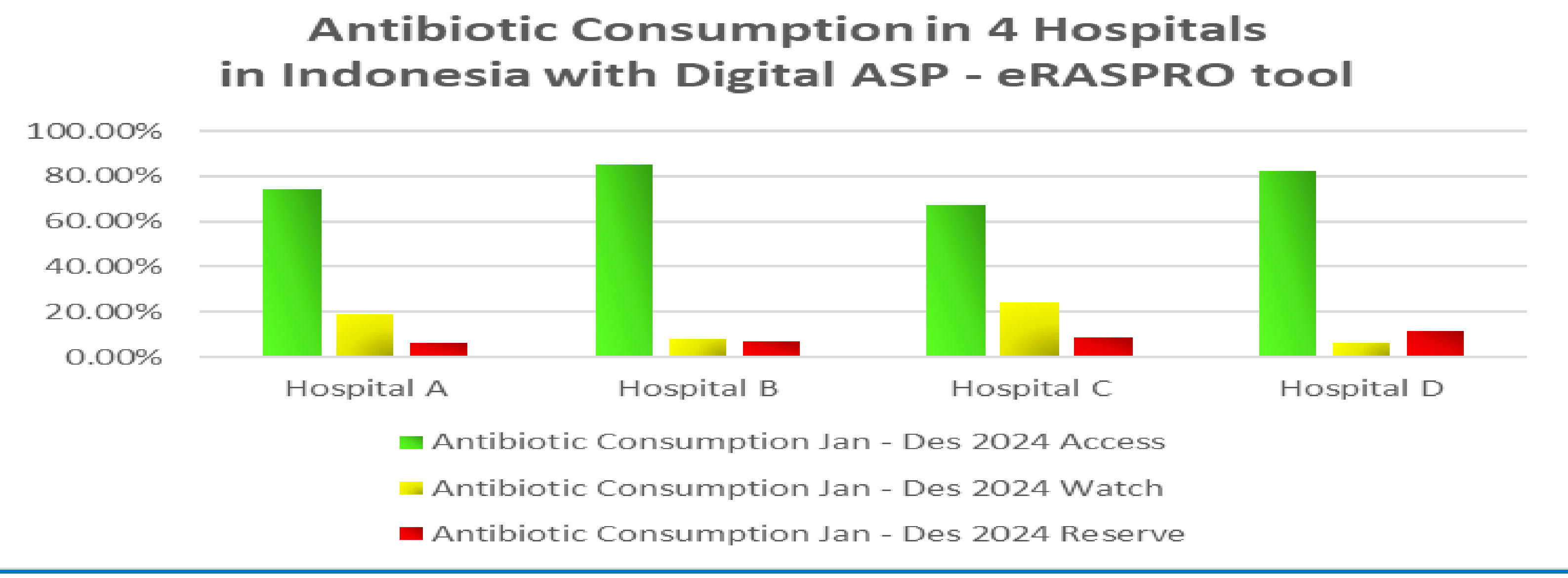


DOCTOR SCREEN: (DEFINITIVE) ²

When prescribing definitive antibiotics, clinician must fill out electronic form for definitive antibiotics, doses, route of administration as well as the focus of infection, types of specimen, and SUBMITTED

Result. In Hospital A, the use of antibiotics in the Access category was found to be 74.29% of the total antibiotic prescriptions, Watch was found to be 19.11%, and Reserve was found to be 6.60% of the total antibiotic prescriptions. Meanwhile, in Hospital B, the prescriptions for Access, Watch, and Reserve were 85.06%, 7.98%, and 6.96% of the total antibiotic prescriptions. In Hospital C, the Access category reached 67.20% of the total antibiotic prescriptions, followed by antibiotics in the Watch and Reserve categories, each 24.15% and 8.65% of the total antibiotic prescriptions, respectively. The prescriptions for Access, Watch, and Reserve in Hospital D were 81.98%, 6.43%, and 11.59% of the total antibiotic prescriptions.

Conclusion. Access category antibiotic use was $\geq 60\%$ in the digital antimicrobial stewardship implementation era in four Indonesian hospitals. Further research is needed to assess the correlation and benefits of this digital tool on antibiotic prescription in reaching the Access category target.



Discussion. The e-RASPRO digital antimicrobial stewardship tool empirically categorizes patients into Risk Stratification Type I, II, and III based on severity, immune status, and medical history. A previous three-month study across three Indonesian hospitals found that over 80% of patients fell into the Type I risk category, for which "Access" category antibiotics are the recommended choice for empirical treatment.³ This aligns with the findings of the current survey, which showed that "Access" category antibiotics accounted for more than 60% of prescriptions across the four e-RASPRO-using hospitals surveyed. The tool was developed to facilitate easier monitoring of antibiotic usage, aiming for an "Access" antibiotic prescription rate of over 60%, in accordance with WHO recommendations.

Reference

- Mudenda S, Daka V, Matafwali SK. World Health Organization AWaRe framework for antibiotic stewardship: Where are we now and where do we need to go? An expert viewpoint. *Antimicrob Steward Healthc Epidemiol.* 2023;3(1):1-3. doi:10.1017/ash.2023.164
- Natadidjaja RI, Ariyani A, Adlani H, Adianto R, Pertiwi II, Legoh GN, et al. A survey on define daily dose of watch- and access-category antibiotics in two Indonesian hospitals following the implementation of digital antimicrobial stewardship tool. *Clin eHealth.* (2024) 7:176–89. doi: 10.1016/j.ceh.2024.12.004
- Natadidjaja RI, Lekok W, Ariyani A, Adlani H, Adianto R, Maharani R, et al. A Quantitative Survey on Antibiotic Prescribing Pattern in Three Indonesian Hospitals Using Digital Antimicrobial Stewardship. *J Biomedika dan Kesehatan.* (2025) 8(2):127–41. doi: 10.18051/JBiomedKes.2025.v8.127-141