POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI
PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA.

Abbas, A., Barkhouse, A., Hackenberger, D., & Wright, G.D. (2024). Antibiotic resistance: A key microbial survival mechanism that threatens public health. *Cell Host & Microbe*.

Abdelrazic, M.I., Gomaa, S.S., Mohamed, O.M., & Saleh, S.M. (2025). Outcome of Community-Acquired Pneumonia in Children Admitted to PICU at Minia Children University Hospital. *Minia Journal of Medical Research* 36 : 25–30.

Abdulsahib, N.B., Hussein, Y.A., & Jasim, B.H. (2024). Dissecting Molecular Pathways and Intricate Mechanisms Underpinning Antibiotic Resistance in Gram-Negative Bacteria: An Exhaustive and Integrative Review. *International Journal of Health & Medical Research*.

Alnimr, A. (2023). Antimicrobial Resistance in Ventilator-Associated Pneumonia: Predictive Microbiology and Evidence-Based Therapy. *Infect Dis Ther* 12 : 1527–1552.

Ao, X.-X. (2021). The epidemiology of hospital death following pediatric severe community acquired pneumonia. *Ital J Pediatr* 47 : 25.

Arkhaesi, N., Supriatna, M., Istanti, Y., Sari, D., & Azzahra, S.R. (2024). Characteristics and Risk Factor of Multidrug-Resistant-Organism Infection in the Pediatric Intensive Care Unit of Dr. Kariadi Hospital Semarang. *Medica Hospitalia : Journal of Clinical Medicine* 11 : 45–52.

Baran, A., Kwiatkowska, A., & Potocki, L. (2023). Antibiotics and Bacterial Resistance—A Short Story of an Endless Arms Race. *Int J Mol Sci* 24 : 5777.

Birlutiu, V., Birlutiu, R.-M., Birlutiu, V., & Birlutiu, R.-M. (2025). An Overview of the Epidemiology of Multidrug Resistance and Bacterial Resistance Mechanisms: What Solutions Are Available? A Comprehensive Review. *Microorganisms* 13.

Bradley, J.S., Byington, C.L., Shah, S.S., Alverson, B., Carter, E.R., Harrison, C., *et al.* (2011a). The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. *Clin Infect Dis* 53 : e25–e76.

Bradley, J.S., Byington, C.L., Shah, S.S., Alverson, B., Carter, E.R., Harrison, C., *et al.* (2011b). The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. *Clin Infect Dis* 53 : e25-76.

Burnham, J.P., Rojek, R.P., & Kollef, M.H. (2018). Catheter removal and outcomes of multidrug-resistant central-line-associated bloodstream infection. *Medicine* 97 : e12782.

UNIVERSITAS GADJAH MADA
POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Chen, D., Cao, L., & Li, W. (2023a). Etiological and clinical characteristics of severe pneumonia in pediatric intensive care unit (PICU). *BMC Pediatr* 23 : 362.

Chen, D., Cao, L., & Li, W. (2023b). Etiological and clinical characteristics of severe pneumonia in pediatric intensive care unit (PICU). *BMC Pediatr* 23 : 362.

Cillóniz, C., Dominedò, C., Garcia-Vidal, C., & Torres, A. (2018). Community-acquired pneumonia as an emergency condition. *Curr Opin Crit Care* 24 : 531–539.

Cornistein, W., Balasini, C., Nuccetelli, Y., Rodriguez, V.M., Cudmani, N., Roca, M.V., *et al.* (2025). Prevalence and Associated Mortality of Infections by Multidrug-Resistant Organisms in Pediatric Intensive Care Units in Argentina (PREV-AR-P). *Antibiotics* 14.

Costerton, J.W., Stewart, P.S., & Greenberg, E.P. (1999). Bacterial Biofilms: A Common Cause of Persistent Infections. *Science* 284 : 1318–1322.

da Silva, B.B.O., Silva, M., de Menezes, F.G., & Troster, E.J. (2022). Factors associated with multidrug-resistant bacteria in healthcare-associated infections: a pediatric intensive care unit case-control study. *Einstein (Sao Paulo)* 20 : eAO6704.

Damayanti, A.N., Rejeki, I.P.S., & Marpaung, F.R. (2022). Pediatric Sepsis by Multi-Drugs Resistance Organism: Length of Stay, Prognosis, and Hospitalization Cost Evaluation. *INDONESIAN JOURNAL OF CLINICAL PATHOLOGY AND MEDICAL LABORATORY* 28 : 165–169.

Darby, E.M., Trampari, E., Siasat, P., Gaya, M.S., Alav, I., Webber, M.A., *et al.* (2023). Molecular mechanisms of antibiotic resistance revisited. *Nat Rev Microbiol* 21 : 280–295.

Divala, T.H., Corbett, E.L., Stagg, H.R., Nliwasa, M., Sloan, D.J., French, N., *et al.* (2018). Effect of the duration of antimicrobial exposure on the development of antimicrobial resistance (AMR) for macrolide antibiotics: protocol for a systematic review with a network meta-analysis. *Syst Rev* 7 : 246.

Ebeledike, C., & Ahmad, T. (2025). Pediatric Pneumonia, in: *StatPearls*. Treasure Island (FL) : StatPearls Publishing.

Ebeledike, C., & Ahmad, T. (2023). Pediatric Pneumonia, in: *StatPearls [Internet]*. StatPearls Publishing.

Elward, A.M., Warren, D.K., & Fraser, V.J. (2002). Ventilator-Associated Pneumonia in Pediatric Intensive Care Unit Patients: Risk Factors and Outcomes. *Pediatrics* 109 : 758–764.

Emeriaud, G., López-Fernández, Y.M., Iyer, N.P., Bembea, M.M., Agulnik, A., Barbaro, R.P., *et al.* (2023). Executive Summary of the Second International Guidelines for the Diagnosis and Management of Pediatric Acute Respiratory Distress Syndrome (PALICC-2). *Pediatr Crit Care Med* 24 : 143–168.

Fernández-Billón, M., Llambías-Cabot, A.E., Jordana-Lluch, E., Oliver, A., & Macià, M.D. (2023). Mechanisms of antibiotic resistance in Pseudomonas aeruginosa biofilms. *Biofilm* 5 : 100129.

UNIVERSITAS GADJAH MADA
POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Florin, T.A., Plint, A.C., & Zorc, J.J. (2017). Viral bronchiolitis. *Lancet* 389 : 211–224.

Gan, M., Zhang, Y., Yan, G., Wang, Y., Lu, G., Wu, B., *et al.* (2024). Antimicrobial resistance prediction by clinical metagenomics in pediatric severe pneumonia patients. *Annals of Clinical Microbiology and Antimicrobials*.

Garnacho-Montero, J., Barrero-García, I., Gómez-Prieto, M. de G., & Martín-Loeches, I. (2018). Severe community-acquired pneumonia: current management and future therapeutic alternatives. *Expert Review of Anti-infective Therapy* 16 : 667–677.

Girona-Alarcón, M., Bobillo-Perez, S., Solé-Ribalta, A., Cuadras, D., Guitart, C., Balaguer, M., *et al.* (2022). RISK score for developing ventilator-associated pneumonia in children: The RISVAP study. *Pediatric Pulmonology* 57 : 1635–1642.

Halawa, E.M., Fadel, M., Al-Rabia, M.W., Behairy, A., Nouh, N.A., Abdo, M., *et al.* (2024). Antibiotic action and resistance: updated review of mechanisms, spread, influencing factors, and alternative approaches for combating resistance. *Front Pharmacol* 14 : 1305294.

Haseng, A., Tosepu, R., & Effendy, D.S. (2022). Surveillance of Pneumonia Disease Prevalence in Kendari City, Southeast Sulawesi, Indonesia. *KnE Life Sciences*.

Iqbal, Z., Akhtar, S., Maqbool, A., Khan, M.M., Shoaib, M., Jafri, S.A.A., *et al.* (2025). PREVALENCE OF MULTIDRUG-RESISTANT ORGANISMS IN PEDIATRIC PATIENTS WITH LOWER RESPIRATORY TRACT INFECTIONS. *Journal of Medical & Health Sciences Review* 2.

Jain, S., Williams, D.J., Arnold, S.R., Ampofo, K., Bramley, A.M., Reed, C., *et al.* (2015). Community-Acquired Pneumonia Requiring Hospitalization among U.S. Children. *N Engl J Med* 372 : 835–845.

Ketenci, A., Gochicoa-Rangel, L., & Yılmaz, Ö. (2021). Pneumonia in Children. *Pediatric ENT Infections*.

Kumar, V. (2020). Pulmonary Innate Immune Response Determines the Outcome of Inflammation During Pneumonia and Sepsis-Associated Acute Lung Injury. *Front. Immunol.* 11.

Lebeaux, D., Chauhan, A., Rendueles, O., & Beloin, C. (2013). From in vitro to in vivo Models of Bacterial Biofilm-Related Infections. *Pathogens* 2 : 288–356.

Lebeaux, D., Ghigo, J.-M., & Beloin, C. (2014). Biofilm-Related Infections: Bridging the Gap between Clinical Management and Fundamental Aspects of Recalcitrance toward Antibiotics. *Microbiol Mol Biol Rev* 78 : 510–543.

Long, M.E., Mallampalli, R.K., & Horowitz, J.C. (2022). Pathogenesis of pneumonia and acute lung injury. *Clin Sci (Lond)* 136 : 747–769.

M, S., & Vaithilingan, S. (2024). Childhood Pneumonia in Low- and Middle-Income Countries: A Systematic Review of Prevalence, Risk Factors, and Healthcare-Seeking Behaviors. *Cureus*.

Magiorakos, A.-P., Srinivasan, A., Carey, R.B., Carmeli, Y., Falagas, M.E., Giske, C.G., *et al.* (2012). Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim

UNIVERSITAS GADJAH MADA
POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

standard definitions for acquired resistance. *Clinical Microbiology and Infection* 18 : 268–281.

Mansour, M., & Assaleh, Y. (2026). Clinical Profile, Management, and Outcomes of Pediatric Pneumonia Patients Admitted to the Intensive Care Unit: A Retrospective Cohort Study. *Attahadi Medical Journal* 1–6.

McAllister, D.A., Liu, L., Shi, T., Chu, Y., Reed, C., Burrows, J., *et al.* (2019). Global, regional, and national estimates of pneumonia morbidity and mortality in children younger than 5 years between 2000 and 2015: a systematic analysis. *Lancet Glob Health* 7 : e47–e57.

McAllister, D.A., Liu, L., Shi, T., Chu, Y., Reed, C., Burrows, J., *et al.* (2018). Global, regional, and national estimates of pneumonia morbidity and mortality in children younger than 5 years between 2000 and 2015: a systematic analysis. *Lancet Glob Health* 7 : e47–e57.

Morrow, B.M. (2024). Prioritizing Childhood Pneumonia to Achieve Global Health Targets—Insights From the Pediatric Acute and Critical Care Medicine Asian Network (PACCMAN) Cohort*. *Pediatric Critical Care Medicine*.

Munita, J.M., & Arias, C.A. (2016). Mechanisms of Antibiotic Resistance. *Microbiol Spectr* 4 : 10.1128/microbiolspec.VMBF-0016–2015.

Mv, D.K., Ramanan, D.A.V., & R, D.S.A. (2024). Respiratory Vaccination And Their Correlation On Incidence, And Severity Of Illness In Children Admitted To Hospital For Pneumonia. *South Eastern European Journal of Public Health* 2528–2530.

Nair, H., Simões, E.A., Rudan, I., Gessner, B.D., Azziz-Baumgartner, E., Zhang, J.S.F., *et al.* (2013). Global and regional burden of hospital admissions for severe acute lower respiratory infections in young children in 2010: a systematic analysis. *Lancet* 381 : 1380–1390.

Nguyen, P.T.K., Robinson, P.D., Fitzgerald, D.A., & Marais, B.J. (2023). The dilemma of improving rational antibiotic use in pediatric community-acquired pneumonia. *Frontiers in Pediatrics*.

Ni, R., Jiang, L., Zhang, C., Liu, M., Luo, Y., Hu, Z., *et al.* (2023). Biologic Mechanisms of Macrophage Phenotypes Responding to Infection and the Novel Therapies to Moderate Inflammation. *International Journal of Molecular Sciences* 24 : 8358.

Pang, Z., Raudonis, R., Glick, B.R., Lin, T.-J., & Cheng, Z. (2019). Antibiotic resistance in *Pseudomonas aeruginosa*: mechanisms and alternative therapeutic strategies. *Biotechnology Advances* 37 : 177–192.

Partridge, S.R., Kwong, S.M., Firth, N., & Jensen, S.O. (2018). Mobile Genetic Elements Associated with Antimicrobial Resistance. *Clin Microbiol Rev* 31 : e00088-17.

Peleg, A.Y., Seifert, H., & Paterson, D.L. (2008). Acinetobacter baumannii: Emergence of a Successful Pathogen. *Clin Microbiol Rev* 21 : 538–582.

Peterson, E., & Kaur, P. (2018). Antibiotic Resistance Mechanisms in Bacteria: Relationships Between Resistance Determinants of Antibiotic Producers, Environmental Bacteria, and Clinical Pathogens. *Front. Microbiol.* 9.

UNIVERSITAS GADJAH MADA
POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Childhood Illnesses, 2nd ed (2013). , WHO Guidelines Approved by the Guidelines Review Committee. Geneva : World Health Organization.

Qi, Z., Li, T., Kong, F., Li, Y., Wang, R., Wang, J., *et al.* (2015). The Characteristics and Function of S100A7 Induction in Squamous Cell Carcinoma: Heterogeneity, Promotion of Cell Proliferation and Suppression of Differentiation. *PLOS ONE* 10 : e0128887.

Qureshi, S., Maria, N., Zeeshan, M., Irfan, S., & Qamar, F.N. (2021). Prevalence and risk factors associated with multi-drug resistant organisms (MDRO) carriage among pediatric patients at the time of admission in a tertiary care hospital of a developing country. A cross-sectional study. *BMC Infect Dis* 21 : 547.

Rahmah, N.S. (2020). Profil Multidrug Resistant Organism (MDRO) Pada Kasus Pneumonia: Systematic Literature Review (bachelorThesis). UIN Syarif Hidayatullah Jakarta-FIKES.

Rezk, A.R., Bawady, S.A., & Omar, N.N. (2021). Incidence of emerging multidrug-resistant organisms and its impact on the outcome in the pediatric intensive care. *Egyptian Pediatric Association Gazette* 69 : 25.

Rhedin, S., Lindstrand, A., Hjelmgren, A., Ryd-Rinder, M., Öhrmalm, L., Tolfvenstam, T., *et al.* (2015). Respiratory viruses associated with community-acquired pneumonia in children: matched case–control study. *Thorax* 70 : 847–853.

Saeedi, F.A., Hegazi, M.A., Alsaedi, H., Alganmi, A.H., Mokhtar, J.A., Metwalli, E.M., *et al.* (2024). Multidrug-Resistant Bacterial Infections in Pediatric Patients Hospitalized at King Abdulaziz University Hospital, Jeddah, Western Saudi Arabia. *Children (Basel)* 11 : 444.

Shahab, S.N., Karuniawati, A., Syarif, O.M., Saharman, Y.R., Sinto, R., & Sudarmono, P.P. (2024). Multidrug-Resistant Bacteria Colonization in Patients Admitted to Dr. Cipto Mangunkusumo Hospital Jakarta, Indonesia. *Acta Medica Indonesiana* 56 : 191–191.

Shamji, M.H., & Durham, S.R. (2017). Mechanisms of allergen immunotherapy for inhaled allergens and predictive biomarkers. *Journal of Allergy and Clinical Immunology* 140 : 1485–1498.

Shindo, Y., Ito, R., Kobayashi, D., Ando, M., Ichikawa, M., Shiraki, A., *et al.* (2013). Risk Factors for Drug-Resistant Pathogens in Community-acquired and Healthcare-associated Pneumonia. *Am J Respir Crit Care Med* 188 : 985–995.

Sidabutar, E., Ansariadi, Wahiduddin, Bustan, N., Stang, & Birawida, A.B. (2024). Analysis of risk factor for pneumonia in children less than five years in Makassar. *Journal of Education and Health Promotion*.

Slocker-Barrio, M., López-Herce-Cid, J., Bustinza-Arriortúa, A., Fresán-Ruiz, E., Jordán-García, I., de Carlos-Vicente, J.C., *et al.* (2023). Increase in Incidence Rates and Risk Factors for Multidrug Resistant Bacteria in Septic Children: A Nationwide Spanish Cohort Study (2013–2019). *Antibiotics* 12 : 1626.

UNIVERSITAS GADJAH MADA
POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Soedarsono, S., Widyaningsih, P.D., & Mertaniasih, N.M. (2021). The Risk Factors of Multidrug-Resistant Organisms in Hospitalized Patients with Community-Acquired Pneumonia in Dr. Soetomo Hospital Surabaya, Indonesia. *Acta Med Indones* 53 : 169–176.

Sritippayawan, S., Sri-Singh, K., Prapphal, N., Samransamruajkit, R., & Deerojanawong, J. (2009). Multidrug-resistant hospital-associated infections in a pediatric intensive care unit: a cross-sectional survey in a Thai university hospital. *International Journal of Infectious Diseases* 13 : 506–512.

Tacconelli, E., Carrara, E., Savoldi, A., Harbarth, S., Mendelson, M., Monnet, D.L., *et al.* (2018). Discovery, research, and development of new antibiotics: the WHO priority list of antibiotic-resistant bacteria and tuberculosis. *The Lancet Infectious Diseases* 18 : 318–327.

Tamma, P.D., Heil, E.L., Justo, J.A., Mathers, A.J., Satlin, M.J., & Bonomo, R.A. (2024). Infectious Diseases Society of America 2024 Guidance on the Treatment of Antimicrobial-Resistant Gram-Negative Infections. *Clin Infect Dis* ciae403.

Troeger, C., Blacker, B., Khalil, I.A., Rao, P.C., Cao, J., Zimsen, S.R.M., *et al.* (2018). Estimates of the global, regional, and national morbidity, mortality, and aetiologies of lower respiratory infections in 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Infectious Diseases* 18 : 1191–1210.

Walker, C.L.F., Rudan, I., Liu, L., Nair, H., Theodoratou, E., Bhutta, Z.A., *et al.* (2013). Global burden of childhood pneumonia and diarrhoea. *Lancet* 381 : 1405–1416.

Wang, Z., & Xia, Z. (2020a). What we can do? The risk factors for multi-drug resistant infection in pediatric intensive care unit (PICU): a case-control study. *Ital J Pediatr* 46 : 17.

Wang, Z., & Xia, Z. (2020b). What we can do? The risk factors for multi-drug resistant infection in pediatric intensive care unit (PICU): a case-control study. *Italian Journal of Pediatrics* 46 : 17.

Weiner, L.M., Webb, A.K., Limbago, B., Dudeck, M.A., Patel, J., Kallen, A.J., *et al.* (2016). Antimicrobial-Resistant Pathogens Associated With Healthcare-Associated Infections: Summary of Data Reported to the National Healthcare Safety Network at the Centers for Disease Control and Prevention, 2011–2014. *Infection Control & Hospital Epidemiology* 37 : 1288–1301.

WHO (2022). Global antimicrobial resistance and use surveillance system (GLASS) report: 2022 [WWW Document]. URL https://www.who.int/publications/i/item/9789240062702 (accessed 12.23.25).

Wong, J.J.M., Abbas, Q., Wang, J.Q.Y., Xu, W., Dang, H., Phan, P.H., *et al.* (2024). Severe Pneumonia in PICU Admissions: The Pediatric Acute and Critical Care Medicine Asian Network (PACCMAN) Observational Cohort Study, 2020–2022*. *Pediatric Critical Care Medicine* 25 : 1035.

UNIVERSITAS
GADJAH MADA
POLA MIKROORGANISME DAN SENSITIVITAS ANTIBIOTIK PASIEN PNEUMONIA DENGAN VENTILATOR MEKANIK DI PEDIATRIC INTENSIVE CARE UNIT (PICU) RUMAH SAKIT SARDJITO
Coraega Gena Ernestine, Dr. Med. dr. Intan Fatah Kumara, M.Sc, Sp.A(K); dr. Amalia Setyati, Sp.A(K)
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Zhang, L., Tian, X., Sun, L., Mi, K., Wang, R., Gong, F., *et al.* (2024). Bacterial Efflux Pump Inhibitors Reduce Antibiotic Resistance. *Pharmaceutics* 16 : 170.