

Original Article

Factors associated with delayed antiretroviral therapy initiation among people living with HIV: A retrospective cross-sectional study

Hesti Sariningrum^{1*}, Najmah¹, Rafiah Maharani¹

¹ Master of Public Health Program, Faculty of Public Health, Universitas Sriwijaya, Palembang, Indonesia

***Corresponding Author:**

Hesti Sariningrum

Master of Public Health Program,
Faculty of Public Health, Universitas
Sriwijaya, Palembang, Indonesia
Email:
sariningrumhesti@gmail.com

Keyword:

Continuity of Patient Care; HIV
Infections; Indonesia; Retrospective
Studies; Treatment Delay

© The Author(s) 2026

DOI:

<https://doi.org/10.52235/lp.v7i4.1051>

Article Info:

Received : September 02, 2026

Revised: October 01, 2026

Accepted : October 22, 2026

Lentera Perawat

e-ISSN : 2830-1846

p-ISSN : 2722-2837



This is an Open Access article distributed
under the terms of the [Creative
Commons Attribution-NonCommercial
4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

Abstract

Background: Rapid initiation of antiretroviral therapy (ART) is a priority in HIV care, yet delays may occur between confirmed diagnosis, entry into care and treatment commencement. This study examined factors associated with ART initiation more than seven days after diagnosis among people living with HIV in Ogan Komering Ilir (OKI) Regency, Indonesia.

Methods: We conducted a retrospective cross-sectional analysis of 144 complete records from the December 2025 On-ART extract of the HIV/AIDS Information System (SIHA 2.1). Delayed ART initiation was defined as starting ART >7 days after HIV confirmation. Recorded demographic, clinical and service variables were examined using two-by-two comparisons and reported multivariable logistic regression estimates. Reporting used observational-study and routinely collected data guidelines.

Results: Of 144 individuals, 99 (68.8%) initiated ART within seven days and 45 (31.3%) initiated later. World Health Organization (WHO) clinical stage 3–4 was associated with delayed initiation (adjusted odds ratio [aOR] 2.618, 95% confidence interval [CI] 1.186–5.779; $p=0.017$), as was the recorded delayed entry-to-care category (aOR 12.624, 95% CI 3.108–51.273; $p<0.001$). Age, sex, recorded population group and facility type were not statistically significant in the reported model. The register-based design and inconsistencies in the timing fields limit interpretation of the linkage estimate.

Conclusion: Delayed ART initiation among individuals already recorded as receiving ART in OKI was associated with more advanced clinical stage and a recorded delay in entry to care. Audit of date fields and evaluation of post-diagnosis care pathways are warranted before drawing causal or program-effectiveness conclusions.

Background

Antiretroviral therapy (ART) reduces HIV-related morbidity and mortality, and earlier treatment has demonstrated clinical and prevention benefits in randomized studies. International recommendations therefore support treatment for people living with HIV (PLHIV) following confirmed diagnosis and appropriate clinical assessment, with rapid initiation generally defined as ART initiation within seven days and same-day treatment offered when clinically appropriate and acceptable to the individual (Cohen et al., 2011; Gandhi et al., 2023; INSIGHT START Study Group, 2015; TEMPRANO ANRS 12136 Study Group, 2015; World Health Organization [WHO], 2017, 2021a, 2021b, 2021c, 2025a, 2025b). Evidence syntheses and pragmatic trials indicate that streamlined initiation can improve treatment uptake, although retention and long-term engagement also require continuing support (Amstutz et al., 2020; Bakari et al., 2023; Boyd et al., 2019; Ford et al., 2018; Koenig et al., 2017; Labhardt et al., 2018; Mateo-Urdiales et al., 2019; Rosen et al., 2016).

Indonesia faces a substantial gap between HIV diagnosis and treatment delivery. In a February 2025 programmatic update, UNAIDS estimated approximately 570,000 people living with HIV in Indonesia, with about 31% receiving treatment; these estimates describe the country and should not be interpreted as measurements from OKI (UNAIDS, 2025). A multicentre Indonesian analysis of late HIV presentation also underscores the clinical importance of timely diagnosis and care (Arlinda et al., 2026). Earlier Indonesian program research identified improvements in linkage after expanded testing and treatment access but no corresponding change in ART initiation rates, indicating that the stages of the care cascade warrant separate evaluation (Tarigan et al., 2020). A more recent Indonesian retrospective study reported an association between rapid ART initiation and lower mortality, providing additional local motivation to examine time to treatment (Mauleti et al., 2025).

The HIV care cascade includes diagnosis, linkage or entry into HIV care, ART commencement, retention and viral suppression. These stages are

related but conceptually distinct (Sujianto et al 2026., Waluyo et al 2026., & Amirudin et al 2026). Reviews describe barriers involving referral processes, service integration, staffing, transportation, stigma, individual readiness and continuity of contact (Bulstra et al., 2021; Croxford et al., 2018a, 2018b; Fuge et al., 2022; Govindasamy et al., 2012, 2014; Kelly et al., 2019; Kennedy et al., 2024; Levison et al., 2023; Lujintanon et al., 2024; Nawfal et al., 2024; Okonkwo et al., 2022; O'Shea et al., 2025; Salomon et al., 2022; Wamuti et al., 2024; Zhang et al., 2024). In Indonesia, some HIV epidemics are concentrated among populations exposed to specific structural and epidemiological risks, and terminology requires care: "key populations" has a specific public-health meaning, whereas a binary programme field labelled "general" versus "at-risk" need not identify each key population (Kennedy et al., 2024; UNAIDS, 2025).

For Ogan Komering Ilir (OKI) Regency, the available study documents do not provide a district-level denominator of all new HIV diagnoses, ART coverage or treatment-cascade statistics. Instead, the December 2025 On-ART register enables a narrower assessment of treatment timing among individuals captured on ART, a distinction that limits population-level inference. Understanding associations within this service population may help identify areas for further data-quality review and local pathway evaluation without equating observed associations with effects of a particular intervention (Benchimol et al., 2015; Lujintanon et al., 2024; Vandenbroucke et al., 2007; von Elm et al., 2007).

This study aimed to assess associations of age at HIV confirmation, sex, recorded population category, WHO clinical stage, facility type and recorded diagnosis-to-care interval with ART initiation >7 days after confirmed HIV diagnosis among PLHIV in the OKI On-ART dataset.

Methods

Study Design

This retrospective cross-sectional observational analysis used secondary, routinely collected HIV programme records. The source dataset was the December 2025 On-ART report extracted from SIHA 2.1 for OKI Regency. The reporting was guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement and, because routine health records were used, the REporting of studies Conducted

using Observational Routinely-collected health Data (RECORD) extension (Benchimol et al., 2015; Vandenbroucke et al., 2007; von Elm et al., 2007). These guidelines informed transparent reporting and do not imply that all checklist items could be satisfied from the available documentation.

Setting, Population and Sample

The setting was the HIV care and treatment reporting system for OKI Regency, South Sumatra, Indonesia, using the December 2025 On-ART extract. The study population comprised PLHIV documented in the treatment programme. Total sampling was used for records meeting the stated eligibility criteria; the analytical dataset contained 144 complete records. The extract is a programme snapshot rather than an inception cohort of all individuals newly diagnosed with HIV during December 2025.

Eligibility, Completeness and Participant Flow

Records were eligible when HIV confirmation, care-entry and ART start dates were recorded and the variables used in the analysis were complete. Records lacking required primary information were excluded under the source study's complete-case approach. The number of source records screened, duplicate records identified, excluded records and variable-specific missing entries was not documented; therefore, exclusion percentages, missingness distributions and the sampling fraction cannot be reported reliably. Figure 1 presents the ascertainable participant flow without inventing intermediate counts.

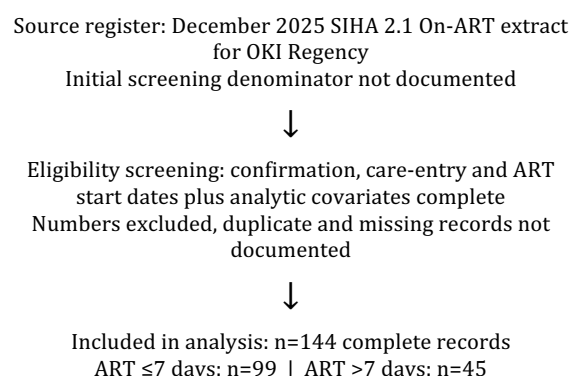


Figure 1. Participant flow based on available registry documentation

The flow summary should not be taken as evidence that no data were missing or duplicated;

only the final included number is supported by the supplied study records.

Variables and Operational Definitions

The primary outcome was delayed ART initiation, defined as a recorded ART commencement date more than seven calendar days after the recorded HIV confirmation date. Initiation within seven days (including the seventh day) was coded as timely; this clinical threshold was informed by WHO recommendations (Mateo-Urdiales et al., 2019; WHO, 2017, 2021a, 2021b). The included explanatory variables were age at confirmation (≤ 30 vs >30 years), sex (male or female), programme-recorded population category (general vs at-risk), clinical stage (WHO stages 1–2 vs 3–4), care facility (hospital vs primary health centre), and the programme-recorded category for the interval from HIV confirmation to entry into care (timely vs delayed).

The age split at 30 years was carried forward from the source analysis; a prespecified clinical rationale and age as a continuous variable were not documented. The clinical-stage split distinguishes WHO stages 1–2 from stages 3–4 and therefore separates less advanced from more advanced clinical presentation, although it is not a substitute for a CD4-based definition of advanced HIV disease (Arlinda et al., 2026; Boulware et al., 2014; WHO, 2025a). The precise codebook for the “at-risk” category, including constituent key-population groups, was not provided; it is consequently reported as a programme-defined binary category rather than reclassified as a verified key-population measure (Kennedy et al., 2024; UNAIDS, 2025).

The analytic description gives >30 days after HIV confirmation as the threshold for delayed entry into care. However, the cross-tabulation contains three individuals with “delayed” entry into care who nevertheless started ART within seven days of confirmation. If “entry into care” occurs before ART initiation and both intervals share the same confirmation date, this sequence is internally inconsistent. Because the data dictionary and individual timestamps were unavailable for verification, the recorded binary labels are retained without interpreting the >30 -day threshold as independently confirmed. The linkage variable is thus termed “recorded delayed entry-to-care category” throughout the analyses.

Data Source, Measurement and Quality

HIV confirmation, first care-entry and ART start dates and other covariates were obtained from programme records in SIHA 2.1 as described in the source report. No independent date validation, chart review or adjudication of inconsistent records was available to the analysis. Data-entry and classification errors cannot therefore be excluded. The analyses are presented in aggregate without personal identifiers. The Indonesian regulatory framework for medical records provides contextual relevance for responsible handling of routine documentation (Benchimol et al., 2015; Menteri Kesehatan Republik Indonesia, 2022).

Statistical Analysis

The source analysis summarized categorical data as frequencies and percentages, and reported crude odds ratios (ORs), 95% confidence intervals (CIs) and p values from two-by-two comparisons. The two-sided p values correspond numerically to Fisher exact tests when applied to the displayed two-by-two contingency counts; the original analysis syntax was not available for independent confirmation. Multivariable logistic regression estimates were reported for all six explanatory variables. Confounding assessment used a $>10\%$ change-in-estimate criterion as described in the analytic report. The exact covariate-removal sequence and final model configuration were not available for independent confirmation, so the reported adjusted estimates were not re-estimated. All p values are two-sided as reported; $p < 0.001$ is used rather than $p = 0.000$ (Benchimol et al., 2015; Vandembroucke et al., 2007; von Elm et al., 2007).

Results

The complete-case analytic sample contained 144 PLHIV in the December 2025 On-ART extract. Among them, 99 (68.8%) started ART within seven days of HIV confirmation and 45 (31.3%) started later. Men, people older than 30 years and people recorded in the at-risk programme category accounted for most included records. Table 1 summarizes participant characteristics. Percentages are based on $n = 144$; totals may differ

from 100.0 by 0.1 percentage point because of rounding.

Table 1. Characteristics of people living with HIV included in the OKI On-ART analysis

Characteristic	Category	n (%)
ART initiation	≤7 days	99 (68.8)
	>7 days	45 (31.3)
Age at HIV confirmation	≤30 years	67 (46.5)
	>30 years	77 (53.5)
Sex	Male	89 (61.8)
	Female	55 (38.2)
Recorded population category	General	46 (31.9)
	At-risk	98 (68.1)
WHO clinical stage	Stages 1–2	89 (61.8)
	Stages 3–4	55 (38.2)
Healthcare facility	Hospital	98 (68.1)
	Primary health centre	46 (31.9)
Recorded entry-to-care status	Timely	130 (90.3)
	Delayed	14 (9.7)

In the original two-by-two comparisons, clinical stage and recorded entry-to-care category were statistically associated with ART initiation after seven days (Table 2). For stages 3–4 relative to stages 1–2, the crude OR was 2.507 (95% CI

1.216–5.168; $p=0.016$). The recorded delayed entry-to-care category had a crude OR of 10.353 (95% CI 2.724–39.348; $p<0.001$). The other four comparisons were not statistically significant.

Table 2. Bivariate associations with delayed ART initiation (>7 days) in OKI Regency

Comparison (index vs reference)	ART ≤7 days index / ref, n (%)	ART >7 days index / ref, n (%)	Crude OR	95% CI	p
Age: >30 vs ≤30 years	52 (52.5) / 47 (47.5)	25 (55.6) / 20 (44.4)	1.130	0.557–2.294	0.857
Sex: female vs male	39 (39.4) / 60 (60.6)	16 (35.6) / 29 (64.4)	0.849	0.408–1.764	0.714
Population: at-risk vs general	68 (68.7) / 31 (31.3)	30 (66.7) / 15 (33.3)	0.912	0.430–1.933	0.848
WHO stage: 3–4 vs 1–2	31 (31.3) / 68 (68.7)	24 (53.3) / 21 (46.7)	2.507	1.216–5.168	0.016
Facility: primary care vs hospital	33 (33.3) / 66 (66.7)	13 (28.9) / 32 (71.1)	0.813	0.377–1.752	0.701
Entry into care: delayed vs timely	3 (3.0) / 96 (97.0)	11 (24.4) / 34 (75.6)	10.353	2.724–39.348	<0.001

The reported multivariable analysis showed higher odds of delayed ART initiation for clinical stage 3–4 (adjusted OR [aOR] 2.618; 95% CI 1.186–5.779; $p=0.017$) and for the programme-coded delayed entry-to-care category (aOR 12.624; 95% CI 3.108–51.273; $p<0.001$). Age, sex, population category and facility type were

not statistically significant in the reported multivariable estimates (Table 3). The adjusted association with entry-to-care status requires particular caution because temporal inconsistencies occur in the source cross-tabulation and the confidence interval is wide.

Table 3. Reported multivariable logistic regression estimates for ART initiation after seven days

Comparison (index vs reference)	Adjusted OR	95% CI	p
Age: >30 vs ≤30 years	1.338	0.602–2.973	0.475
Sex: female vs male	0.730	0.322–1.652	0.450
Population: at-risk vs general	0.852	0.363–2.000	0.714
WHO stage: 3–4 vs 1–2	2.618	1.186–5.779	0.017
Facility: primary care vs hospital	0.878	0.372–2.070	0.765
Entry into care: delayed vs timely	12.624	3.108–51.273	<0.001

Discussion

Approximately one-third of PLHIV included in the OKI On-ART extract started ART more than seven days after confirmation. This figure is a proportion among analysed records of people documented on ART, not the proportion of all newly diagnosed PLHIV in the district who eventually initiated treatment. National estimates and broader studies address different denominators and periods, precluding direct comparison as if they represented the same epidemiological quantity (Mauleti et al., 2025; Tarigan et al., 2020; UNAIDS, 2025). Nevertheless, the finding motivates examination of the time between diagnosis and ART start in local HIV services.

A substantial body of randomized evidence supports offering prompt ART when clinically appropriate. Trials in South Africa, Haiti and Lesotho and evidence syntheses show that simplified, same-day or rapid ART pathways can improve early initiation and, in some settings, viral suppression or retention (Boyd et al., 2019; Ford et al., 2018; Koenig et al., 2017; Labhardt et al., 2018; Mateo-Urdiales et al., 2019; Rosen et al., 2016). However, such interventions were not evaluated in OKI. Moreover, follow-up of the CASCADE trial and a later evidence synthesis suggest that early advantages do not always translate into persistently better long-term engagement, highlighting the need to distinguish rapid start from sustained care (Amstutz et al., 2020; Bakari et al., 2023).

Participants recorded at WHO clinical stages 3–4 had higher adjusted odds of delayed ART initiation than those at stages 1–2. This association is clinically plausible: advanced presentation can involve diagnostic clarification, symptomatic illness, opportunistic infections and coordination across services. Yet WHO clinical stage alone is not a reason for routine postponement of ART. Evidence supports early treatment for most patients, while conditions such as cryptococcal meningitis require specific timing decisions because very early ART may worsen outcomes (Boulware et al., 2014; Gandhi et al., 2023; Gerber et al., 2026; INSIGHT START Study Group, 2015; TEMPRANO ANRS 12136 Study Group, 2015; WHO, 2017, 2021a, 2025a). The present registry lacks documented opportunistic infections, CD4 counts and clinical contraindications; accordingly,

the observed association cannot identify the mechanism for delays.

The Indonesian INA-PROACTIVE cohort illustrates how late presentation remains an important national challenge, although it used a different outcome and cannot validate the OKI effect estimate (Arlinda et al., 2026). A prior Indonesian analysis linked rapid ART initiation with mortality benefits but did not establish that clinical stage caused delays (Mauleti et al., 2025). In the OKI setting, the responsible programme response is to review how individuals with stages 3–4 move through assessment, treatment of concomitant disease and ART initiation while preserving clinical judgement, rather than assuming that a universal fast-track intervention is proven effective by these data.

The largest reported adjusted OR was observed for the recorded delayed entry-to-care category. Timely entry into care is conceptually upstream of treatment commencement, and linkage reviews have documented losses and delays between HIV testing, initial visits and treatment initiation (Croxford et al., 2018a, 2018b; Fuge et al., 2022; Govindasamy et al., 2012, 2014; Kelly et al., 2019; Levison et al., 2023; Okonkwo et al., 2022; Wamuti et al., 2024; Zhang et al., 2024). However, the reported OR should not be interpreted as a measure of intervention effect, nor as an unequivocal independent clinical risk factor. Both variables are constructed from events occurring along the same post-diagnosis timeline and may be mechanically related. Three cases were coded as delayed entry into care despite ART initiation within seven days; without validating date definitions, the >30-day description and this observed sequence cannot both be assumed correct. A source-record audit is a precondition for firm interpretation of this association.

Potential system explanations—including delayed referral, lack of appointment coordination, multiple required visits or barriers to recontact—are hypotheses, not measurements made in this study. Evidence from systematic reviews identifies integrated services, patient navigation, tailored follow-up and coordination across HIV and tuberculosis services as candidate approaches for evaluation (Bulstra et al., 2021; Kennedy et al., 2024; Levison et al., 2023; Lujintanon et al., 2024; Okonkwo et al., 2022; Salomon et al., 2022; Wamuti et al., 2024). Peer navigation may be

especially relevant for some key populations, but the binary OKI programme grouping does not identify which populations received such support (Kennedy et al., 2024; Nawfal et al., 2024). Local implementation studies would need to measure these pathways directly.

Age, sex, at-risk classification and type of facility were not statistically associated with delayed initiation in the reported multivariable model. These null findings should not be interpreted as evidence of no differences or as proof of equivalence, particularly with only 45 delayed ART events and limited covariate detail. Broader literature finds variability in linkage by social circumstances, diagnosis setting, stigma, readiness and structural barriers (Croxford et al., 2018a, 2018b; Fuge et al., 2022; Govindasamy et al., 2012; Kelly et al., 2019; Levison et al., 2023; Nawfal et al., 2024; Zhang et al., 2024). The present programme dataset did not measure these factors. Similarly, hospital and primary-care categories are coarse indicators and do not describe staff capacity, medicine availability, referral performance or patient travel time. Evidence from service integration studies supports evaluating these specific processes rather than inferring uniform quality across facility types (Bulstra et al., 2021; Lujintanon et al., 2024; Okonkwo et al., 2022; Salomon et al., 2022).

Consistent use of numerator/denominator definitions, exposure coding and statistical labels is necessary for reproducible routine-care analysis (Benchimol et al., 2015; Vandenbroucke et al., 2007; von Elm et al., 2007). Verification of the archived analytic syntax and original programme record would strengthen confidence in the p-value procedure and the direction of the regression comparisons.

Strengths and Limitations

A strength of this analysis is its focus on an operational, district-level HIV treatment dataset with dated steps from diagnosis to ART initiation, a clinically interpretable seven-day outcome and reported multivariable estimates (Okafor, 2026 & Akbar, 2024). Several limitations materially constrain inference. First, its retrospective cross-sectional assessment of routinely collected programme data is vulnerable to entry errors, inconsistent timestamps and outcome or exposure misclassification; no source-record validation was documented. Second, complete-case inclusion can

introduce selection bias, while the original screening denominator, exclusions and variable-level missingness are unknown. Third, the analysis includes only individuals already recorded on ART, excluding those never linked or never initiated treatment; this selection can underestimate population-level delays and distort observed associations (Benchimol et al., 2015; Croxford et al., 2018b; Vandenbroucke et al., 2007).

Fourth, key constructs were coarse or incompletely documented. The >30-day delayed linkage threshold described in the source narrative conflicts with three observed cross-tabulated records and could reflect differing event definitions or coding errors. The age cut at 30 years was not justified a priori; binarizing age loses information. The at-risk programme label lacks a verified category dictionary. Fifth, socioeconomic position, distance, stigma, readiness, comorbidity, opportunistic infections and CD4 results were not measured in the supplied data, allowing residual confounding (Arlinda et al., 2026; Boulware et al., 2014; Fuge et al., 2022; Govindasamy et al., 2012; Nawfal et al., 2024). Sixth, only 14 people were classified as having delayed entry to care, and the large association estimate had a wide confidence interval, implying limited precision. Finally, findings from the December 2025 OKI On-ART register cannot automatically be generalized to all PLHIV in OKI, untreated individuals, other districts or later periods. All interpretations are associational rather than causal.

Implications for Practice, Management and Research

The immediate implication is to evaluate—not presume the effectiveness of—post-diagnosis care pathways. A record-level audit should reconcile HIV confirmation, first care-contact and ART start definitions, review cases with unexpected event ordering and document exclusions. Standard operating procedures for timestamp capture and routine cascade review may enhance programme monitoring (Benchimol et al., 2015; Menteri Kesehatan Republik Indonesia, 2022; von Elm et al., 2007). In parallel, clinicians and programme managers can assess whether stages 3–4 receive timely evaluation of opportunistic infection and an individualized ART initiation plan, balancing rapid access with clinical safety (Boulware et al., 2014; Gandhi et al., 2023; WHO, 2017, 2021a, 2025a).

Further research should recruit all newly confirmed diagnoses prospectively, including those not yet on ART; measure continuous time intervals, reasons for deferral, service readiness, patient preferences and socioeconomic barriers; and assess attrition before initiation. If pathway changes are introduced, controlled implementation evaluations should examine initiation and retention rather than relying on cross-sectional correlations (Bulstra et al., 2021; Coffey et al., 2019; Kennedy et al., 2024; Levison et al., 2023; Lujintanon et al., 2024; Okonkwo et al., 2022; Rosen et al., 2016; Salomon et al., 2022).

Conclusion and Recommendation

Among 144 people already documented in the OKI On-ART programme, delayed ART initiation was associated with WHO clinical stage 3–4 (reported aOR 2.618) and with a recorded delayed entry-to-care category (reported aOR 12.624). Interpretation of the latter is provisional because its coding and event chronology are internally inconsistent in the source summary. The findings support verification of routine data and evaluation of linkage and clinical-assessment pathways; they do not establish causal effects or demonstrate the effectiveness of a particular fast-track intervention.

Acknowledgement

The authors would like to express their deepest gratitude to the OKI Regency Health Office (Dinas Kesehatan Kabupaten Ogan Komering Ilir) for granting access to the SIHA 2.1 On ART secondary data used in this study.

Funding Source

None.

Declaration of conflict of interest

The authors declare no competing interests.

Declaration on the Use of AI

No AI tools were used in the preparation of this manuscript.

Data Availability Statement

Data sharing is not applicable to this article.

References

Akbar, M. A. (2024). Strategies to address stigma and discrimination of people with HIV/AIDS through community system strengthening. *Indonesian Journal of Health Services*, 1(1), 41-45. <https://doi.org/10.63202/ijhs.v1i1.2>

Amirudin, I., Waluyo, A., Akbar, M. A., Rohmawati, D. L., Aziyan, N., & Putri, R. H. (2026). The experience of double stigma among LGBT people living with HIV in Lampung, Indonesia: A qualitative study. *Nursing Practice Today*, 13(2), 230-241.

Amstutz, A., Brown, J. A., Ringera, I., Muhairwe, J., Lejone, T. I., Klimkait, T., Glass, T. R., & Labhardt, N. D. (2020). Engagement in care, viral suppression, drug resistance, and reasons for nonengagement after home-based same-day antiretroviral therapy initiation in Lesotho: A two-year follow-up of the CASCADE trial. *Clinical Infectious Diseases*, 71(10), 2608–2614. <https://doi.org/10.1093/cid/ciz1126>

Arlinda, D., Yuniastuti, E., Indrati, A. R., Merati, T. P., Papot, E., Cromer, D., Diana, A., Naysilla, A. M., Dewantara, R. D., Susanto, N. H., Lukman, N., Pranata, W. A., Kosasih, H., Lokida, D., Karyana, M., Hartono, T. S., Kosa, G. R., Theresia, D., Savitri, D., ... Watkins, K. (2026). Annual trends and risk factors of late presentation of HIV at 19 referral hospitals in Indonesia: Findings from the INA-PROACTIVE cohort. *The Lancet Regional Health – Southeast Asia*, 46, Article 100742. <https://doi.org/10.1016/j.lansea.2026.100742>

Bakari, H. M., Alo, O., Mbwana, M. S., Salim, S. M., Ludeman, E., Lascko, T., & Ramadhani, H. O. (2023). Same-day ART initiation, loss to follow-up and viral load suppression among people living with HIV in low- and middle-income countries: Systematic review and meta-analysis. *Pan African Medical Journal*, 46, Article 92. <https://doi.org/10.11604/pamj.2023.46.92.40848>

Benchimol, E. I., Smeeth, L., Guttman, A., Harron, K., Moher, D., Petersen, I., Sørensen, H. T., von Elm, E., Langan, S. M., & RECORD Working Committee. (2015). The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) statement. *PLOS Medicine*, 12(10), Article e1001885. <https://doi.org/10.1371/journal.pmed.1001885>

Boulware, D. R., Meya, D. B., Muzoora, C., Rolfes, M. A., Hullsiek, K. H., Musubire, A., Taseera, K., Nabeta, H. W., Schutz, C., Williams, D. A., Rajasingham, R., Rhein, J., Thienemann, F., Lo, M. W., Nielsen, K., Bergemann, T. L., Kambugu, A., Manabe, Y. C., Janoff, E. N., ... Meintjes, G. (2014). Timing of antiretroviral therapy after diagnosis of cryptococcal meningitis. *The New England Journal of Medicine*, 370(26), 2487–2498. <https://doi.org/10.1056/NEJMoa1312884>

Boyd, M. A., Boffito, M., Castagna, A., & Estrada, V. (2019). Rapid initiation of antiretroviral therapy at HIV diagnosis: Definition, process, knowledge gaps. *HIV Medicine*, 20(Suppl. 1), 3–11. <https://doi.org/10.1111/hiv.12708>

Bulstra, C. A., Hontelez, J. A. C., Otto, M., Stepanova, A., Lamontagne, E., Yakusik, A., El-Sadr, W. M., Apollo, T., Rabkin, M., & UNAIDS Expert Group on Integration. (2021). Integrating HIV services and other health services: A systematic review and meta-analysis. *PLOS Medicine*, 18(11), Article e1003836. <https://doi.org/10.1371/journal.pmed.1003836>

- Coffey, S., Bacchetti, P., Sachdev, D., Bacon, O., Jones, D., Ospina-Norvell, C., Torres, S., Lynch, E., Camp, C., Mercer-Slomoff, R., Lee, S., Christopoulos, K., Pilcher, C., Hsu, L., Jin, C., Scheer, S., Havlir, D., & Gandhi, M. (2019). RAPID antiretroviral therapy: High virologic suppression rates with immediate antiretroviral therapy initiation in a vulnerable urban clinic population. *AIDS*, 33(5), 825–832. <https://doi.org/10.1097/QAD.0000000000002124>
- Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M. C., Kumarasamy, N., Hakim, J. G., Kumwenda, J., Grinsztejn, B., Pilotto, J. H. S., Godbole, S. V., Mehendale, S., Chariyalertsak, S., Santos, B. R., Mayer, K. H., Hoffman, I. F., Eshleman, S. H., Piwowar-Manning, E., Wang, L., ... Fleming, T. R. (2011). Prevention of HIV-1 infection with early antiretroviral therapy. *The New England Journal of Medicine*, 365(6), 493–505. <https://doi.org/10.1056/NEJMoa1105243>
- Croxford, S., Burns, F., Copas, A., Pharris, A., Rinder Stengaard, A., & Delpech, V. (2018a). Factors associated with delayed linkage to care following HIV diagnosis in the WHO European Region. *HIV Medicine*, 19(Suppl. 1), 40–46. <https://doi.org/10.1111/hiv.12585>
- Croxford, S., Yin, Z., Burns, F., Copas, A., Town, K., Desai, S., Skingsley, A., & Delpech, V. (2018b). Linkage to HIV care following diagnosis in the WHO European Region: A systematic review and meta-analysis, 2006–2017. *PLOS ONE*, 13(2), Article e0192403. <https://doi.org/10.1371/journal.pone.0192403>
- Ford, N., Migone, C., Calmy, A., Kerschberger, B., Kanters, S., Nsanzimana, S., Mills, E. J., Meintjes, G., Vitoria, M., Doherty, M., & Shubber, Z. (2018). Benefits and risks of rapid initiation of antiretroviral therapy. *AIDS*, 32(1), 17–23. <https://doi.org/10.1097/QAD.0000000000001671>
- Fuge, T. G., Tsourtos, G., & Miller, E. R. (2022). Risk factors for late linkage to care and delayed antiretroviral therapy initiation among adults with HIV in sub-Saharan Africa: A systematic review and meta-analyses. *International Journal of Infectious Diseases*, 122, 885–904. <https://linkinghub.elsevier.com/retrieve/pii/S1201971222004325>
- Gandhi, R. T., Bedimo, R., Hoy, J. F., Landovitz, R. J., Smith, D. M., Eaton, E. F., Lehmann, C., Springer, S. A., Sax, P. E., Thompson, M. A., Benson, C. A., Buchbinder, S. P., del Rio, C., Eron, J. J., Günthard, H. F., Molina, J.-M., Jacobsen, D. M., & Saag, M. S. (2023). Antiretroviral drugs for treatment and prevention of HIV infection in adults: 2022 recommendations of the International Antiviral Society-USA panel. *JAMA*, 329(1), 63–84. <https://doi.org/10.1001/jama.2022.22246>
- Gerber, F., Semphere, R., Lukau, B., Mahlatsi, P., Mbale, H., Sanchez-Samaniego, G., Sass, N., Amstutz, A., Molatelle, M., Marake, N. B., Tarumbiswa, T., Nliwasa, M., Ayakaka, I., Glass, T. R., MacPherson, P., Burke, R. M., & Labhardt, N. D. (2026). Same-day versus rapid ART initiation in people with HIV and symptoms of tuberculosis (SaDAPT): A randomised, non-inferiority trial in Lesotho and Malawi. *The Lancet HIV*, 13(4), e225–e234. [https://doi.org/10.1016/S2352-3018\(25\)00276-0](https://doi.org/10.1016/S2352-3018(25)00276-0)
- Govindasamy, D., Ford, N., & Kranzer, K. (2012). Risk factors, barriers and facilitators for linkage to antiretroviral therapy care. *AIDS*, 26(16), 2059–2067. <https://journals.lww.com/00002030-201210230-00008>
- Govindasamy, D., Meghij, J., Negussi, E. K., Baggaley, R. C., Ford, N., & Kranzer, K. (2014). Interventions to improve or facilitate linkage to or retention in pre-ART (HIV) care and initiation of ART in low- and middle-income settings – a systematic review. *Journal of the International AIDS Society*, 17(1). <https://doi.org/10.7448/IAS.17.1.19032>
- INSIGHT START Study Group. (2015). Initiation of antiretroviral therapy in early asymptomatic HIV infection. *The New England Journal of Medicine*, 373(9), 795–807. <https://doi.org/10.1056/NEJMoa1506816>
- Kelly, N., Maokola, W., Mudasiru, O., & McCoy, S. I. (2019). Interventions to improve linkage to HIV care in the era of “Treat All” in sub-Saharan Africa: A systematic review. *Current HIV/AIDS Reports*, 16(4), 292–303. <https://doi.org/10.1007/s11904-019-00451-8>
- Kennedy, C. E., Yeh, P. T., Verster, A., Luhmann, N., Nguyen, V. T. T., de Mello, M. B., Baggaley, R., & Macdonald, V. (2024). Do peer navigators improve initiation and retention in HIV/VH/STI treatment programs for people from key populations? A systematic review of effectiveness, values and preferences, and cost. *Journal of Acquired Immune Deficiency Syndromes*, 95(4), 305–312. <https://doi.org/10.1097/QAI.00000000000003364>
- Koenig, S. P., Dorvil, N., Dévieux, J. G., Hedt-Gauthier, B. L., Riviere, C., Faustin, M., Lavoile, K., Perodin, C., Apollon, A., Duverger, L., McNairy, M. L., Hennessey, K. A., Souroutzidis, A., Cremieux, P.-Y., Severe, P., & Pape, J. W. (2017). Same-day HIV testing with initiation of antiretroviral therapy versus standard care for persons living with HIV: A randomized unblinded trial. *PLOS Medicine*, 14(7), Article e1002357. <https://doi.org/10.1371/journal.pmed.1002357>
- Labhardt, N. D., Ringera, I., Lejone, T. I., Klimkait, T., Muhairwe, J., Amstutz, A., & Glass, T. R. (2018). Effect of offering same-day ART vs usual health facility referral during home-based HIV testing on linkage to care and viral suppression among adults with HIV in Lesotho: The CASCADE randomized clinical trial. *JAMA*, 319(11), 1103–1112. <https://doi.org/10.1001/jama.2018.1818>
- Levison, J. H., Del Cueto, P., Mendoza, J. V., Ashour, D., Lydston, M., Freedberg, K. A., & Shebl, F. M. (2023). Systematic review and meta-analysis of linkage to HIV care interventions in the United States, Canada, and Ukraine (2010–2021). *AIDS and Behavior*, 27(12), 4070–4083. <https://doi.org/10.1007/s10461-023-04121-0>
- Lujintanon, S., Eshun-Wilson, I., Le Tourneau, N., Beres, L., Schwartz, S., Baral, S., Thompson, R., Underwood, A., Fox, B., Geng, E. H., & Kemp, C. G. (2024). Implementation strategies to improve HIV care cascade outcomes in low- and middle-income countries: A systematic review from

- 2014 to 2021. *Journal of the International AIDS Society*, 27(Suppl. 1), Article e26263. <https://doi.org/10.1002/jia2.26263>
- Mateo-Urdiales, A., Johnson, S., Smith, R., Nachega, J. B., & Eshun-Wilson, I. (2019). Rapid initiation of antiretroviral therapy for people living with HIV. *Cochrane Database of Systematic Reviews*, 2019(6), Article CD012962. <https://doi.org/10.1002/14651858.CD012962.pub2>
- Mauleti, I. Y., Wibisana, K. A., Syamsuridzal, D. P., Mulyati, S., Lisdawati, V., Hendarwan, H., & Saptarini, I. (2025). Rapid antiretroviral therapy initiation reduces mortality among people living with HIV in Indonesia: A retrospective observational study. *Journal of Preventive Medicine and Public Health*, 58(4), 360–369. <https://doi.org/10.3961/jpmph.24.622>
- Menteri Kesehatan Republik Indonesia. (2022). Peraturan Menteri Kesehatan Republik Indonesia Nomor 24 Tahun 2022.
- Nawfal, E. S., Gray, A., Sheehan, D. M., Ibañez, G. E., & Trepka, M. J. (2024). A systematic review of the impact of HIV-related stigma and serostatus disclosure on retention in care and antiretroviral therapy adherence among women with HIV in the United States/Canada. *AIDS Patient Care and STDs*, 38(1), 23–49. <https://doi.org/10.1089/apc.2023.0178>
- O'Shea, J., Yuan, X., Lu, J.-F., Buchacz, K., Iqbal, K., Johnston, M., Beer, L., & Weiser, J. (2025). Brief report: Barriers to rapid enrollment and ART initiation among US HIV care facilities. *Journal of Acquired Immune Deficiency Syndromes*, 99(5), 449–454. <https://doi.org/10.1097/QAI.0000000000003690>
- Okafor, C., & Bello, A. (2026). Self-stigma and antiretroviral therapy adherence among people living with HIV/AIDS: A cross-sectional study. *Journal of Community Nursing and Primary Care*, 3(1), 39–55. <https://doi.org/10.63202/jcnpc.v3i1.178>
- Okonkwo, N. E., Blum, A. B., Viswasam, N., Hahn, E., Ryan, S., Turpin, G., Lyons, C. E., Baral, S., & Hansoti, B. (2022). A systematic review of linkage-to-care and antiretroviral initiation implementation strategies in low- and middle-income countries across sub-Saharan Africa. *AIDS and Behavior*, 26(7), 2123–2134. <https://doi.org/10.1007/s10461-021-03558-5>
- Rosen, S., Maskew, M., Fox, M. P., Nyoni, C., Mongwenyana, C., Malete, G., Sanne, I., Bokaba, D., Sauls, C., Rohr, J., & Long, L. (2016). Initiating antiretroviral therapy for HIV at a patient's first clinic visit: The RapIT randomized controlled trial. *PLOS Medicine*, 13(5), Article e1002015. <https://doi.org/10.1371/journal.pmed.1002015>
- Salomon, A., Law, S., Johnson, C., Baddeley, A., Rangaraj, A., Singh, S., & Daftary, A. (2022). Interventions to improve linkage along the HIV-tuberculosis care cascades in low- and middle-income countries: A systematic review and meta-analysis. *PLOS ONE*, 17(5), Article e0267511. <https://doi.org/10.1371/journal.pone.0267511>
- Sujianto, U., Amiruddin, I., Marsiami, A. S., Akbar, M. A., Fujiana, F., & Ramdhanie, G. G. (2026). Stigma-Related Lived Experiences of Families Caring for Children with HIV in Indonesia: A Phenomenological Study. *Pacific Rim International Journal of Nursing Research*, 30(4), 1138–1154.
- Tarigan, Y. N., Woodman, R. J., Miller, E. R., Wisaksana, R., Wignall, F. S., & Ward, P. R. (2020). Changes in the HIV continuum of care following expanded access to HIV testing and treatment in Indonesia: A retrospective population-based cohort study. *PLOS ONE*, 15(9), Article e0239041. <https://doi.org/10.1371/journal.pone.0239041>
- TEMPRANO ANRS 12136 Study Group. (2015). A trial of early antiretrovirals and isoniazid preventive therapy in Africa. *The New England Journal of Medicine*, 373(9), 808–822. <https://doi.org/10.1056/NEJMoa1507198>
- UNAIDS. (2025, February 24). Status of HIV programmes in Indonesia. https://www.unaids.org/en/resources/presscentre/featurestories/2025/february/20250224_indonesia_fs
- Vandenbroucke, J. P., von Elm, E., Altman, D. G., Gøtzsche, P. C., Mulrow, C. D., Pocock, S. J., Poole, C., Schlesselman, J. J., & Egger, M. (2007). Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): Explanation and elaboration. *PLOS Medicine*, 4(10), Article e297. <https://doi.org/10.1371/journal.pmed.0040297>
- von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. *PLOS Medicine*, 4(10), Article e296. <https://doi.org/10.1371/journal.pmed.0040296>
- Waluyo, A., Amirudin, I., Akbar, M. A., Nursasi, A. Y., Binti Yahaya, N. A., & Sujianto, U. (2026). Lived Experience of Stigma among People Living with HIV-tuberculosis Co-infection: A Phenomenological Study. *International Journal of Community Based Nursing & Midwifery*, 14(4), 281–294.
- Wamuti, B., Jamil, M. S., Siegfried, N., Ford, N., Baggaley, R., Johnson, C. C., & Cherutich, P. (2024). Understanding effective post-test linkage strategies for HIV prevention and care: A scoping review. *Journal of the International AIDS Society*, 27(4), Article e26229. <https://doi.org/10.1002/jia2.26229>
- World Health Organization. (2017). Guidelines for managing advanced HIV disease and rapid initiation of antiretroviral therapy.
- World Health Organization. (2021a). Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: Recommendations for a public health approach. <https://www.who.int/publications/i/item/9789240094581>

World Health Organization. (2021b). Updated recommendations on HIV prevention, infant diagnosis, antiretroviral initiation and monitoring.

World Health Organization. (2021c). Updated recommendations on service delivery for the treatment and care of people living with HIV.

World Health Organization. (2025a). WHO guidelines on the management of advanced HIV disease.

World Health Organization. (2025b). WHO updated recommendations on HIV clinical management: Recommendations for a public health approach.

Zhang, Y., Goh, S. M., Tapa, J., Johnson, C. C., Chow, E. P. F., Zhang, L., Phillips, T., Fairley, C. K., & Ong, J. J. (2024). Linkage to care and prevention after HIV self-testing: A systematic review and meta-analysis. *Journal of the International AIDS Society*, 27(12), Article e26388. <https://doi.org/10.1002/jia2.26388>