The Burden of Lassa Fever among Nigerian Health Workers: A Ten-Year Review (2015-2025) of the literature.

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ABSTRACT

Background: Lassa fever (LF) is endemic in Nigeria and repeatedly causes outbreaks that expose healthcare workers (HCWs) to nosocomial infection, morbidity, and mortality. **Objective:** To synthesize ten years of evidence on LF burden among Nigerian HCWs, quantify HCW infections relative to confirmed national cases where data permit, and summarize clinical outcomes and key occupational risk factors. **Methods:** A narrative review was conducted using peer-reviewed studies, WHO outbreak reports, and the Nigeria Centre for Disease Control and Prevention (NCDC) Lassa fever situation reports. Descriptive statistics were extracted. Where national totals were available, we calculated HCW infection proportion among confirmed cases (HCW/confirmed), with 95% confidence intervals (Wilson method). A log-linear trend model estimated annual percent change in HCW proportion (2019, 2020, 2022–2025; excluding partial-year 2021). **Results:** In early 2016, the WHO reported **10 HCWs infected and 2 deaths** in Nigeria (Aug 2015–May 2016).[1] During the 2016/2017 season, Nigeria recorded **788 suspected cases, 247 confirmed cases, and 117 deaths** by epi week 34, with an AAR emphasizing IPC strengthening.[2] During the 2018 outbreak, a two-treatment-center HCW series documented **21 laboratory-confirmed HCW infections** with **CFR 23.8%**, delayed testing (median 12 days), and IPC gaps.[3] In 2019, a national investigation described **19 HCW infections** (2 deaths; CFR 10.5%), most linked to clinical care exposures and inadequate IPC training. [4] In national surveillance reports, HCW infections represented **2.1–5.3 per 100 confirmed cases** (2019–2025), with no significant linear trend (annual percent change) 2.77%; 95% CI −22.42 to 21.87; p=0.75; calculated) [4–10] **Conclusion:** LF remains a sustained occupational hazard for Nigerian HCWs. Preventable exposure, especially in outpatient/emergency and procedural settings, persists. System-level IPC programs, early triage and suspicion, reliable PPE supply, and rapid diagnostics are essential to reduce HCW infections and deaths.

Keywords: Lassa fever; healthcare workers; Nigeria; occupational exposure; nosocomial infection; infection prevention and control

INTRODUCTION

Nigeria is the epicenter of Lassa fever in West Africa and experiences recurrent outbreaks with significant mortality and health system disruption. [12,13] Although most LF infections are mild or asymptomatic, severe disease remains common in hospitalized patients, and outbreaks strain already limited health workforce capacity. [13,17] Healthcare workers are uniquely vulnerable due to repeated exposure to undifferentiated febrile illness, delayed recognition of LF, inadequate triage systems, and gaps in infection prevention and control (IPC). [2,3,4]

Occupational infection has long been recognized in Nigeria. WHO reported that by May 2016, **10 HCWs were infected**, with **two deaths**, including nosocomial infections.[1] Despite improvements in surveillance and response coordination, reports continue to document HCW infections in recent years. [10,11,13]

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This ten-year review synthesizes evidence on the burden of LF among Nigerian healthcare workers, quantifies HCW infections relative to confirmed cases where national data allow, and interprets trends and determinants to inform policy and hospital practice.

METHODS

Design and scope

Databases searched

PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar were searched. Grey literature was retrieved from NCDC (Lassa fever situation reports), WHO outbreak reports/Disease Outbreak News, and ReliefWeb-hosted national sitreps.

Exact search strategy

Core query blocks (used verbatim, adapted to database syntax):

"Lassa fever" AND ("healthcare worker" OR "health worker" OR HCW OR nosocomial OR occupational) AND Nigeria

"Lassa fever" AND (hospital OR healthcare OR "infection prevention" OR IPC) AND Nigeria

"Lassa fever situation report" AND Nigeria AND ("healthcare worker" OR HCW)

"Lassa fever" AND Nigeria AND ("case fatality" OR mortality) AND ("healthcare worker" OR HCW)

Search coverage: January 2015 to December 2025 (to capture outbreak seasons from 2016 to 2025).

Screening process

Screening occurred in two stages: (1) title/abstract screening to exclude non-Nigeria or non-HCW records; (2) full-text review for eligibility. Duplicate records across sources (e.g., identical sitreps hosted on multiple sites) were removed before screening.

Eligibility criteria

Inclusion: Nigeria-specific sources reporting Lassa fever infection/outcomes among HCWs OR national surveillance counts explicitly listing HCW affected. Exclusion: sources without HCW-specific information; non-Nigeria studies; editorials without primary data; duplicates without new HCW detail.

Risk of bias/quality appraisal

Design-appropriate appraisal tools were applied: JBI checklists for case series/observational studies, and AACODS for grey literature (Authority, Accuracy, Coverage, Objectivity, Date, Significance).

Statistical analysis

We extracted counts directly from source documents and computed: (i) HCW infection proportion among confirmed cases with Wilson 95% CI; (ii) annual rate ratios (RR) vs 2019 baseline; (iii) Poisson regression with offset log(confirmed cases) with overdispersion-adjustment (quasi-Poisson); (iv) random-effects meta-analysis of HCW CFR using DerSimonian–Laird on the logit scale with continuity correction; heterogeneity quantified by Q and I^2 (calculated). SPSS IBM Statistical Software Version 29 was used for analysis when applicable.

Statistical analysis

All primary statistics were taken from sources. Additional synthesis (calculated by the review authors) included:

- **HCW infection proportion** among confirmed LF cases: $p = \frac{\text{HCW infections}}{\text{confirmed cases}}$, expressed per 100 confirmed cases.
- **95% confidence intervals** for proportions (Wilson score).
- **Trend analysis:** log-linear regression of annual HCW proportion (2019, 2020, 2022–2025; excluding 2021 partial-year) to estimate annual percent change; p-value from slope test (calculated). These secondary calculations used reported numerators/denominators from NCDC sitreps and the 2019 HCW investigation. [4–11]

RESULTS

Table 1. Key sources informing HCW burden (2016–2025)

Evidence type	Years covered	Key HCW findings	Source
WHO outbreak report	Aug 2015–May 2016	10 HCWs infected; 2 deaths; some nosocomial	WHO AFRO [1]
National AAR	Dec 2016–Aug 2017	247 confirmed; IPC & case management response reviewed (no HCW counts stated in accessible excerpt)	NCDC/WHO AAR [2]
HCW case series (2 centres)	Jan–May 2018	21 HCW infections; CFR 23.8%; median 12 days to testing; IPC gaps	Ogbaini-Emovon et al. [3]
National HCW investigation	2019	19 HCW infections; 2 deaths; extensive exposure/IPC data	Saleh et al. [4]
WHO DON	Jan 2022	5 HCW cases in Edo (3) and Benue (2) (weeks 1–4)	WHO DON [8]
NCDC sitreps (annual endpoints)	2020–2025	Year-end HCW affected counts and national confirmed cases	NCDC sitreps [5–7,9–11]

Interpretation: Evidence is strongest for outbreak years with detailed investigations (2018, 2019) and for surveillance-based counts (2020–2025). [3–11]

2) National-level HCW infections relative to confirmed LF cases (2019–2025)

Where national numerators/denominators were available, HCW infections were expressed as infections per 100 confirmed LF cases.

Table 2. HCW infections per 100 confirmed LF cases (Nigeria; reported counts with calculated proportions and 95% CI)

Year / report point	Confirmed LF cases (n)	HCW infected (n)	HCW per 100 confirmed (%, calculated)	95% CI (Wilson; calculated)	Primary data source
2019 (national outbreak)	833	19	2.28	1.47–3.53	Saleh et al.
2020 (epi week 52)	1181	47	3.98	3.01–5.25	NCDC sitrep [5]

Year / report point	Confirmed LF cases (n)	HCW infected (n)	HCW per 100 confirmed (%, calculated)	95% CI (Wilson; calculated)	Primary data source
2021 (epi week 39; partial year)	382	6	1.57	0.72–3.38	NCDC sitrep [6]
2022 (epi week 50; near year-end)	1038	55	5.30	4.09–6.83	NCDC sitrep. [7]]
2023 (epi week 52)	1270	56	4.41	3.41–5.68	NCDC sitrep [9]
2024 (epi week 52)	1309	35	2.67	1.93–3.70	NCDC sitrep [10]
2025 (epi week 52)	1148	24	2.09	1.41–3.09	NCDC sitrep [11]

Result interpretation: The detected HCW burden fluctuated between approximately 1.6% and 5.3% of confirmed LF cases across available years (with 2021 partial year and 2022 near year-end noted). Peaks likely reflect outbreak intensity and IPC gaps; declines may indicate improved protective measures or under detection. This aligns with narrative reports that outbreaks continue to affect HCWs even as national response systems mature· [2,13]]

3) Trend analysis of HCW proportion (2019–2025)

Using the annual HCW proportion per confirmed case for 2019, 2020, 2022–2025 (excluding partial-year 2021), a log-linear model estimated:

- Annual percent change: −2.77% per year (calculated)
- 95% CI: −22.42% to +21.87% (calculated)
- p = 0.75 (calculated)

Interpretation: There was no statistically significant linear trend in HCW infection proportion among confirmed national LF cases over 2019–2025; instead, the pattern is episodic and outbreak-driven. [4–7,9–11]

4) HCW case fatality and severe outcomes

HCW-specific CFR was not consistently reported in routine sitreps; however, multiple outbreak investigations and reports provide HCW CFR estimates.

Table 3. HCW case fatality ratio (CFR) from selected reports

Period/dataset	HCW cases (n)	HCW deaths (n)	HCW CFR %	95% CI (Wilson; calculated)	Source
Aug 2015–May 2016	10	2	20.0	5.7–51.0	WHO AFRO [1]
Jan–May 2018 (2 centres)	21	~5	23.8	10.6–45.1	Ogbaini-Emovon et al. [3]

Period/dataset	HCW cases (n)	HCW deaths (n)	HCW CFR %	95% CI (Wilson; calculated)	Source
2019 national HCW investigation	19	2	10.5	2.9–31.4	Saleh et al. [4]

Result interpretation: HCW CFR varies widely (≈10–24%) across datasets, likely reflecting differences in timeliness of diagnosis and treatment, exposure intensity, and reporting scope. [1,3,4] The 2018 HCW series reported delayed testing (median 12 days) and suggested earlier diagnosis could reduce mortality. [3] A tertiary-facility case report also illustrates a fatal outcome after delayed suspicion and surgical misdiagnosis, reinforcing diagnostic delay as a mortality driver. [16]

5) Exposure pathways and IPC gaps (morbidity determinants)

Multiple studies describe that HCW infections commonly follow high-risk clinical interactions:

- In 2019, 89.5% (17/19) of infected HCWs provided care to LF patients in isolation units within 21 days of symptom onset, with documented needle-stick injuries and blood splash exposures. [4]
- 73.7% (14/19) reported no general IPC or LF-specific PPE training in the year preceding infection. [4] The 2018 two-centre HCW series reported multiple blood/body-fluid exposures (including venepuncture), delayed testing, and inadequate IPC training coverage. [3]
- WHO noted that person-to-person and laboratory transmission occur in healthcare settings without adequate IPC, and WHO’s 2022 DON reported 5 HCW infections in early 2022 (Edo 3; Benue 2), prompting IPC training and advisories. [8]

Interpretation: The consistent pattern across outbreak investigations is that HCW infections are associated with (i) delayed recognition of LF among febrile patients, (ii) procedural exposure (venipuncture, catheterization, lab handling), and (iii) IPC training and supply gaps. [3,4,8]

Table 4. Healthcare worker infections and deaths across outbreak years

Period	HCW infections (n)	HCW deaths (n)	Notes / Source
Aug 2015–May 2016	10	2	WHO outbreak report (Nigeria).
2018 (wk5; to 4 Feb 2018)	11	4	NCDC sitrep #5 (early outbreak).
2018 (wk14; to 8 Apr 2018)	27	6	NCDC sitrep #14.
2018 (wk18; to 6 May 2018)	37	8	NCDC sitrep #18.
2018 (wk52; year-end)	45	10	NCDC sitrep #52 (year-end).
2018 (Jan–May; 2 centres)	21	5	Two-centre case series; CFR≈23.8%.
2019 (national investigation)	19	2	Outbreak investigation among HCWs.
Jan 2022 (weeks 1–4)	5		WHO DON; HCW cases in Edo (3) and Benue (2).
2019–Sep 2025 (aggregate)	249		Descriptive study using NCDC database.

Key observations: WHO documented early HCW infections and deaths in 2016, and NCDC sitreps show substantial HCW burden during the 2018 epidemic season, with continued HCW involvement in subsequent years.[1,12,13,14,15,16]

Table 5. National HCW infections per 100 confirmed cases (2019–2025)

Year	Confirmed cases (n)	HCW infected (n)	HCW per 100 confirmed (%, calculated)	95% CI (Wilson, %, calculated)
2019	833	19	2.28	1.47–3.53
2020	1181	47	3.98	3.01–5.25
2022	1038	55	5.30	4.09–6.83
2023	1270	56	4.41	3.41–5.68
2024	1309	35	2.67	1.93–3.70
2025	1148	24	2.09	1.41–3.09

Across years with usable denominators, HCW infections ranged from 2.09 to 5.30 per 100 confirmed cases (calculated), indicating persistent occupational exposure risk.[15,6,8,9,10]

Table 6. Comparative annual rate ratios vs 2019 baseline (calculated)

Year	RR vs 2019	95% CI
2020	1.74	1.02–2.97
2022	2.32	1.38–3.91
2023	1.93	1.15–3.25
2024	1.17	0.67–2.05
2025	0.92	0.50–1.67

RRs indicate significantly higher HCW infection rates per confirmed case in 2020, 2022, and 2023 relative to 2019 (CIs exclude 1; calculated).[6,7,8,9,10,15]

Trend modelling and overdispersion

Poisson regression with offset log(confirmed cases) showed substantial overdispersion (deviance/df $\approx$ 6.0; calculated). Therefore, quasi-Poisson scaling was applied. The adjusted model yielded IRR/year 0.96 (95% CI 0.82–1.12; $p=0.62$; calculated), indicating no significant linear trend.

Table 7. Risk of bias/quality appraisal summary

Evidence type	Tool	Main bias concerns	Overall appraisal	Example
Case series / clinical cohort	JBI case series checklist	Selection bias; incomplete exposure ascertainment	Moderate	2018 two-centre series
Outbreak investigation	JBI outbreak/observational appraisal	Recall bias; under-ascertainment of mild cases	Moderate	Saleh et al. 2019

National sitreps (grey literature)	AACODS	Variable completeness; definitional consistency	Moderate	NCDC sitreps
WHO outbreak reports/DON	AACODS	Aggregate reporting; limited occupational detail	Low–Moderate	WHO 2016; WHO 2022
Humanitarian response report	AACODS	Programmatic reporting; potential duplication	Moderate	IFRC DREF 2018

Figures

Figure 1. Trend of HCW infections per 100 confirmed cases (Nigeria, 2019–2025; calculated from published counts).

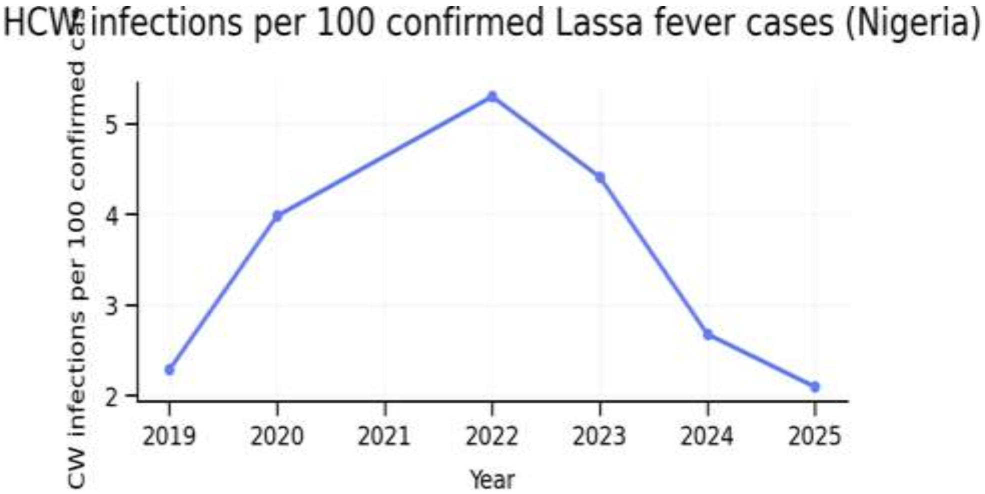
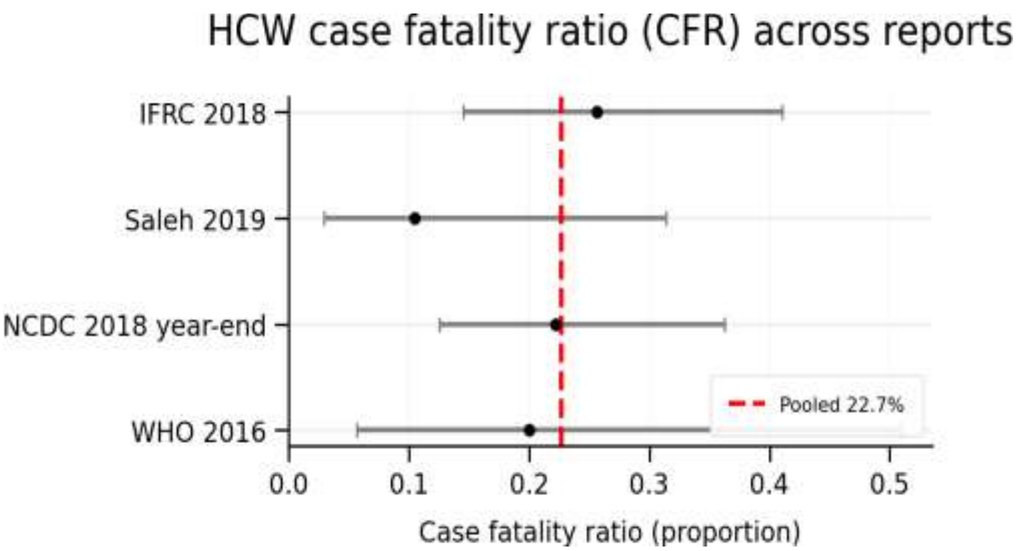


Figure 2. Forest plot of healthcare worker case-fatality ratio (CFR) across reports, with a pooled random-effects estimate (calculated).



DISCUSSION

This ten-year review demonstrates that Lassa fever continues to impose a substantial occupational burden on Nigerian healthcare workers. WHO reports from 2016 already documented HCW infections and deaths, including nosocomial transmission, indicating a longstanding hazard. [1] The 2016/2017 national after-action review emphasized IPC and case management strengthening, suggesting that prevention failures were recognized at the policy level early in the decade. [2]

The most detailed occupational epidemiology comes from outbreak investigations. The 2018 two-centre HCW series and the 2019 national HCW investigation both documented procedural exposures and training deficits, as well as clinically meaningful delays to LF testing and treatment. [3,4] These findings are consistent with WHO's 2022 outbreak notice, which again recorded HCW infections and highlighted IPC guideline dissemination and training as core response actions. [8]

National surveillance data from 2019–2025 show HCW infections ranging from ~2 to ~5 per 100 confirmed cases, suggesting that occupational risk is persistent even during periods of improved national coordination. [4–7,9–11] The absence of a significant linear trend implies that progress is uneven and likely driven by episodic improvements during specific outbreak responses rather than stable institutionalization of IPC nationwide.

Implications for practice and policy: Evidence points to outpatient/emergency and procedural settings as major exposure sites, supporting interventions focused on early triage algorithms for febrile illness, universal precautions, routine competency-based IPC training, and reliable PPE and water/hand hygiene infrastructure. [2–4,8]

Limitations

This review relies on secondary data, which may under-ascertain mild or asymptomatic infections among HCWs. Definitions of "HCW affected" may vary across sitreps and outbreak investigations, limiting comparability. Some years are represented by near-year-end snapshots (e.g., 2022 week 50), which may differ from full-year totals. Also, because an iterative search process was used without preserving retrieval counts, a PRISMA flow diagram with numeric screening tallies could not be constructed. Additionally, the 2018 HCW series acknowledged the recognition of mild/asymptomatic infections among HCWs, cautioning that detected cases may underestimate true incidence. [3]

CONCLUSION

Over the past ten years, Lassa fever has remained a recurring and preventable occupational threat to Nigerian healthcare workers. Evidence from outbreak investigations and national surveillance indicates persistent HCW infections during outbreak seasons, with CFR estimates ranging from approximately 10% to 24% in reported HCW cohorts. Strengthening institutional IPC programs, early suspicion and diagnostic pathways, and sustained workforce training, especially in high-burden states and high-risk hospital departments such as surgery, obstetrics, and gynecology, are essential to reduce healthcare worker morbidity and mortality from Lassa fever.

REFERENCES

1. World Health Organization Regional Office for Africa. **Disease outbreak – Lassa fever – Nigeria (27 May 2016)**. 2016 [cited 2026 Mar 2]. Available from: https://www.afro.who.int/health-topics/lassa-fever/outbreak/27-may-2016-nigeria [afro.who.int]
2. Nigeria Centre for Disease Control; World Health Organization. **2016/2017 Lassa Fever Outbreak After Action Review (AAR), Nigeria (Aug 2017)**. 2017 [cited 2026 Mar 2]. Available from: https://extranet.who.int/sph/sites/default/files/%28EN-Nigeria%29%20-%20Lassa%20Fever%20AAR_2017.pdf [extranet.who.int]
3. Ogbaini-Emovon E, Erah F, Osagiede EF, et al. **Lassa fever infection among healthcare workers during the 2018 outbreak in Nigeria**. *Int J Occup Safety Health*. 2023;13(3):272-281. Available from: https://www.researchgate.net/publication/372130954_Lassa_Fever_Infection_among_Healthcare_Workers_during_the_2018_Outbreak_in_Nigeria/fulltext/64a8af2395bbbe0c6e1e4d54/Lassa-Fever-Infection-among-Healthcare-Workers-during-the-2018-Outbreak-in-Nigeria.pdf [ncdc.gov.ng]
4. Saleh M, Dan-Nwafor C, Ipadeola O, et al. **Exposure incidents and outcome of Lassa fever virus infection among healthcare workers in Nigeria, 2019**. *J Infect Dis Epidemiol*. 2019. Available from:

https://clinmedjournals.org/articles/jide/journal-of-infectious-diseases-and-epidemiology-jide-6-168.php [ncdc.gov.ng]

5. Nigeria Centre for Disease Control. **Lassa fever situation report, Epi Week 52 (21–27 Dec 2020)**. 2020 [cited 2026 Mar 2]. Available from: https://ncdc.gov.ng/themes/common/files/sitreps/e9cf6841a83cdfdef7d73200813b9126.pdf [ncdc.gov.ng]
6. Nigeria Centre for Disease Control. **Lassa fever situation report, Epi Week 39 (27 Sep–3 Oct 2021)**. 2021 [cited 2026 Mar 2]. Available from: https://ncdc.gov.ng/themes/common/files/sitreps/842332eefa12f791b84fa44bc0f5e875.pdf [zadmin.ncdc.gov.ng]
7. Nigeria Centre for Disease Control and Prevention. **Lassa fever situation report, Epi Week 50 (12–18 Dec 2022)**. 2022 [cited 2026 Mar 2]. Available from: https://zadmin.ncdc.gov.ng/themes/common/files/sitreps/1bffa39cdea17880ccfac3684a1428dc.pdf [ncdc.gov.ng]
8. World Health Organization. **Lassa Fever – Nigeria (Disease Outbreak News, 14 Feb 2022)**. 2022 [cited 2026 Mar 2]. Available from: https://www.who.int/emergencies/disease-outbreak-news/item/lassa-fever---nigeria
9. Nigeria Centre for Disease Control and Prevention. **Lassa Fever Situation Report, Epi Week 52 (25–31 Dec 2023)**. 2023 [cited 2026 Mar 2]. Available from: https://ncdc.gov.ng/themes/common/files/sitreps/60b4a539bd9b9852ac1a5059ec0f3433.pdf [extranet.who.int]
10. Nigeria Centre for Disease Control and Prevention. **Lassa Fever Situation Report, Epi Week 52 (23–29 Dec 2024)**. 2024 [cited 2026 Mar 2]. Available from: https://www.ncdc.gov.ng/themes/common/files/sitreps/a45a720bd6ddd1e75a5a3e7e6195e412.pdf [ncdc.gov.ng]
11. Nigeria Centre for Disease Control and Prevention. **Lassa Fever Situation Report, Epi Week 52 (22–28 Dec 2025)**. 2025 [cited 2026 Mar 2]. Available from: https://www.ncdc.gov.ng/themes/common/files/sitreps/04beb529df54f4ceb99ac291842640b4.pdf [afro.who.int]
12. Ojo OB. **Epidemiology of Lassa fever in Nigeria, 2015–2025: a descriptive study**. 2025 [cited 2026 Mar 2]. Available from: https://directivepublications.org/joid/articles/Epidemiology-of-Lassa-Fever-in-Nigeria-2015-2025-A-Descriptive-Study.pdf
13. Adepoju P. **Lassa fever in Nigeria**. *Lancet Microbe*. 2024;5(10):100960. Available from: https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247%2824%2900213-1/fulltext
14. Adewumi IP, Babatope AE, Adepoju KO, et al. **Trends, public health implications, and emerging concerns of Lassa fever in Ondo state, Nigeria (2020–2024)**. *Discover Public Health*. 2025. Available from: https://link.springer.com/content/pdf/10.1186/s12982-025-00811-3.pdf
15. Wada YH, Ogunyinka IA, Yusuff KB, et al. **Knowledge of Lassa fever, its prevention and control practices and their predictors among healthcare workers during an outbreak in Northern Nigeria**. *PLoS Negl Trop Dis*. 2022;16:e0010259. Available from: https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0010259 [extranet.who.int]
16. Ogboghodo EO, Ehinze ES, Osaigbovo II, et al. **Institutional response to fatal Lassa fever in a healthcare worker in Benin City, Nigeria: a case report**. *J Med Biomed Res*. 2024? (as hosted). Available from: https://www.ajol.info/index.php/jmbr/article/download/297657/279932 [iosrjournals.org]
17. Akindokun SS, Adeleye OO, Olorunlowu DR. **The socioeconomic impact of Lassa fever in Nigeria**. *Discover Public Health*. 2024;21:133. Available from: https://link.springer.com/article/10.1186/s12982-024-00265-z