

Inequities in Clinical Trial Distribution for Neglected Tropical Diseases: A Cross-Sectional Analysis of Global Research Concentration

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Synthesis · E156 Research Letter · Vol 2 No 5 · 2026 · Published 10 July 2026 · doi: [synthesis.v40.r2](https://doi.org/10.2196/synthesis.v40.r2)

Correction and Editorial Note (Version 2 — 10 July 2026)

This corrected version confirms the original finding and repairs its references. The central result reproduces: neglected tropical diseases receive ~0.85% of African clinical-trial activity, versus roughly 8× more for HIV. Corrections: five of six checkable reference PMIDs were wrong and are fixed; a substring-matching artifact (the token “noma” matching melanoma/carcinoma/lymphoma) that had inflated the NTD count 2.5-fold was removed; and the burden-weighted “~30-fold” gap is softened to the verified 8× trial-count gap. The African deficit is reframed as the local expression of a global ~1% allocation of trial and drug-development effort to neglected diseases (Pedrique 2013; Trouiller 2002).

This corrected and expanded Version 2 supersedes Version 1, which remains available in this article's version history. Every quantitative claim is regenerated by a deterministic companion verification script, and every retained reference PMID was re-verified against PubMed metadata.

Abstract

Background. Neglected tropical diseases (NTDs) impose a large burden on low-income populations, especially in Africa, yet attract little clinical-trial activity. We reproduce and reference-repair the original registry analysis.

Methods. African-site trials for NTDs (WHO-Roadmap African-endemic set) and three comparators (HIV/AIDS, cancer, cardiovascular disease) were recomputed from the AACT April-12-2026 snapshot (`40-ntd-verify.py`), with careful exclusion of substring false-matches. Every PMID was re-verified against PubMed metadata.

Results. Of 25,125 African-site trials, **214 (0.85%)** targeted NTDs, versus HIV/AIDS **1,713 (6.8%)**, cancer **1,731 (6.9%)**, and CVD **946 (3.8%)** — reproducing the v1 counts (209 / 1,691 / 1,659 / 1,012). HIV alone has ~8× the NTD trial count. This African under-representation mirrors a **global** neglect: Pedrique 2013 found only ~1% of registered clinical trials and 1% of new chemical entities (2000–11) targeted neglected diseases, and Trouiller 2002 found 16 of 1,393 NCEs (1975–99) were for tropical diseases and TB. The v1's burden-weighted “~30-fold” gap depends on GBD burden inputs not verifiable here and is softened to the verified trial-count gap.

Conclusion. The NTD trial deficit is real and reproduces cleanly. It is best understood as the African expression of a *global* structural neglect of neglected-disease R&D — a framing that both the reproduced counts and two independent verified landscape studies support.

1. Introduction

Clinical research is not distributed in proportion to suffering; it follows commercial markets and advocacy. NTDs — schistosomiasis, lymphatic filariasis, onchocerciasis, leishmaniasis, human African trypanosomiasis, Chagas disease, soil-transmitted helminths, leprosy, trachoma, and related conditions — are the clearest example, affecting >1 billion people (WHO 2021 NTD Roadmap) with little corresponding trial or drug-development activity. Trouiller 2002 documented that only 16 of 1,393 new chemical entities marketed in 1975–99 targeted tropical diseases and TB — a 13-fold lower chance of reaching market than a CNS or cancer drug. This paper asks, and answers reproducibly, whether Africa's expanding trial enterprise

has extended to its NTD burden.

2. Methods

Trial counts. From the AACT April-12-2026 snapshot, African-site trials (≥ 1 African facility) were counted by condition-keyword group: NTD (core African-endemic set), HIV/AIDS, cancer, and cardiovascular disease. The script `40-ntd-verify.py` is deterministic and read-only. **A reproducibility safeguard:** the bare token "noma" was *excluded* from matching because it is a substring of melanoma/carcinoma/lymphoma and false-matches thousands of oncology trials (uncorrected, it inflates the NTD count from 214 to 532 — a 2.5× error); "trachoma" was matched but "trachomatis" (genital chlamydia) excluded. These are exactly the silent-substring traps that make naive registry keyword counts unreliable.

Burden. The v1's burden figures (Africa ~25% of NTD burden; ~57 million DALYs globally) are secondary-source estimates; the correct GBD 2019 citation is restored (PMID 33069326), but the specific percentages require primary GBD-table extraction and are reported **AS-CITED**, not asserted.

References. Every PMID was matched to PubMed metadata (title/journal/pages) on 2026-07-09; wrong ones were corrected or removed.

3. Results

3.1 The NTD trial deficit reproduces

Disease area	African-site trials	% of African trials	v1 reported
NTDs (core)	214	0.85%	209 (0.8%)
HIV/AIDS	1,713	6.82%	1,691 (6.8%)
Cancer	1,731	6.89%	1,659 (6.7%)
Cardiovascular	946	3.77%	1,012 (4.1%)

All four counts reproduce the v1 within definitional tolerance. NTDs receive **0.85%** of African trial activity; **HIV alone carries ~8× as many African trials** (1,713 vs 214). An inclusive NTD definition adding dengue, chikungunya, rabies, and snakebite raises the NTD count only to 233 (0.93%) — the deficit is not an artifact of excluding those conditions.

3.2 The African deficit mirrors a global one (NEW corroboration)

The reproduced African figure gains meaning from two independent, verified landscape studies:

- **Pedrique 2013** (Lancet Glob Health; PMID 25104602): of 148,445 registered

clinical trials to end-2011, only **2,016 (1%)** were for neglected diseases; of 336 new chemical entities approved (2000–11), only **4 (1%)** were for neglected diseases.

- **Trouiller 2002** (Lancet; PMID 12090998): **16 of 1,393** NCEs (1975–99) for

tropical diseases + TB; a 13-fold lower market-entry chance than CNS/cancer.

Africa's 0.85% NTD trial share is therefore not an African anomaly — it is the local reflection of a global research market that allocates ~1% of its trial and drug-development effort to neglected diseases. Moran 2005/2009 (PMIDs 16138789, 19192946) attribute this to market failure — low purchasing power, not scientific intractability — the correctable structural cause.

3.3 On the "30-fold" burden gap

The v1 abstract stated the NTD burden-to-trial ratio is "~30-fold less favourable" than HIV's. The **trial-count** gap is verified (~8× fewer NTD than HIV trials). A burden-weighted ratio would be larger, but it depends on GBD DALY inputs (NTD vs HIV African DALYs) that are not verified here; the "30-fold" figure is therefore withdrawn as a precise claim and replaced by the reproduced 8× trial-count gap plus the qualitative statement that burden-weighting widens it.

4. Discussion

Two contributions distinguish this version. First, the finding is *confirmed*, not overturned — a useful contrast with equity claims that dissolve under a like-for-like denominator. NTDs genuinely receive a small share of African trial activity (0.85%), and HIV receives roughly eight times more. Second, the honest framing is structural: the deficit is the African expression of a *global* neglect of neglected-disease R&D, independently quantified at ~1% of trials and NCEs (Pedrique 2013; Trouiller 2002). This reframing matters for policy — it argues that the remedy is not merely "do more NTD trials in Africa" but reform of the global R&D incentive model (product development partnerships, push/pull financing, WHO prequalification pathways), whose benefits would then reach African sites.

The methodological lesson is also worth stating: the uncorrected "noma" substring match would have inflated the NTD count 2.5-fold and manufactured a *smaller* apparent deficit. Registry keyword analyses that are not audited for substring false-matches (a documented failure mode across this journal's registry papers) can silently distort both directions of an equity claim.

5. Limitations

Condition-keyword counting cannot capture trials that mention an NTD only in a free-text summary, and definitional choices move the NTD count (214 core vs 233 inclusive); both are reported. "African-site" counts any African facility, not African sponsorship or leadership. The burden figures (25%; 57M DALYs) are secondary and flagged AS-CITED pending primary GBD extraction. The comparator counts (cancer, CVD) use broad keyword sets and are approximate. No individual-trial adjudication of condition assignment was performed.

6. Conclusion

Recomputed from AACT, NTDs receive **214 of 25,125 African-site trials (0.85%)** — reproducing the original 209/0.8% — against HIV's 1,713 (6.8%), an ~8× gap. The deficit is real and mirrors a global ~1% allocation of trial and drug-development effort to neglected diseases (Pedrique 2013; Trouiller 2002). The remedy is structural reform of neglected-disease R&D incentives, whose benefits would reach African sites. Reference integrity was restored (5 of 6 wrong PMIDs corrected) and a substring-matching artifact that would have understated the deficit was removed.

7. References (PMIDs verified against PubMed on 2026-07-09)

1. Trouiller P, Olliaro P, Torreele E, Orbinski J, Laing R, Ford N. Drug development for neglected diseases: a deficient market and a public-health policy failure. *Lancet*. 2002;359(9324):2188-2194. **PMID 12090998**. (*v1 correct*)
2. Pedrique B, Strub-Wourgaft N, Some C, et al. The drug and vaccine landscape for neglected diseases (2000-11): a systematic assessment. *Lancet Glob Health*. 2013;1(6):e371-e379. **PMID 25104602**. (*added — verified global trial/NCE landscape*)
3. Moran M. A breakthrough in R&D for neglected diseases: new ways to get the drugs we need. *PLoS Med*. 2005;2(9):e302. **PMID 16138789**. [**corrected — v1's 16150943 = a childhood-AML genetics paper**]
4. Moran M, Guzman J, Ropars AL, et al. Neglected disease research and development: how much are we really spending? *PLoS Med*. 2009;6(2):e30. **PMID 19192946**. [**corrected — v1's 19143470 = a brain-tumour immunology paper**]
5. GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019. *Lancet*. 2020;396(10258):1204-1222. **PMID 33069326**. [**corrected — v1's 33308453 = a long-COVID editorial**]

6. World Health Organization. *Ending the Neglect to Attain the Sustainable Development Goals: A Road Map for Neglected Tropical Diseases 2021–2030*. Geneva: WHO; 2021. (policy document — no PMID; v1's 31973896 = a congenital-heart-surgery training paper)

Removed as wrong/unlocatable (reproduce-or-remove): v1's Chirac & Torreele citation (PMID 16698404 = a chronic-fatigue-syndrome letter) — the market-failure argument it supported is carried by the verified Moran and Trouiller references above.