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## Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Riches N, Henrion MYR, MacPherson P, et al. Vertical transmission of hepatitis B virus in the WHO African region: a systematic review and meta-analysis. *Lancet Glob Health* 2025; **13:** e447–58.

**Supplementary materials for Vertical transmission of hepatitis B in the World Health Organisation African region: systematic review and meta-analysis**

## Contents

## S1 Appendix: Systematic review protocol

**Review title:** Vertical transmission of hepatitis B in the World Health Organisation African region: systematic review and meta-analysis

**Anticipated or actual start date:** 30/11/22

**Anticipated completion date:** 31/05/24

**Stage of review at time of this protocol:** Review stage Started

Preliminary searches Yes; Piloting of the study selection process Yes; Formal screening of search results against eligibility criteria Yes; Data extraction No; Risk of bias (quality) assessment No ; Data analysis No

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**Organisation web address:**

https://www.lstmed.ac.uk/research/departments/international-public-health

https://www.liverpool.ac.uk/

https://www.mlw.mw/

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**Review questions:**

1. What is the prevalence of hepatitis B surface antigen (HBsAg) among pregnant women in the WHO African region, stratified by WHO African sub-regions?
2. What is the prevalence of HBsAg among infants of mothers with hepatitis B in the WHO African region, stratified by WHO African sub-regions, reflecting vertical transmission?
3. What is the trend in HBsAg prevalence in pregnant women and HBV-exposed infants in the WHO African region between 1992 and 2022?
4. What is the trend in vertical transmission events in the WHO African region, stratified by vaccination subgroup?

**Searches:**

We will search the following electronic bibliographic databases: PubMed, Scopus, EMBASE, Africa Index Medicus and African Journals Online. No language restrictions will be applied. The search will be limited to articles published between 1st January 1992 and 7th January 2024**.**

**PUBMED** (https://pubmed.ncbi.nlm.nih.gov/) Limit >1992

| |
|---|
| (hepatitis B[MeSH] OR hepatitis b[tiab] OR HBsAg[tiab] OR hepatitis b surface antigens[MeSH] or "hepatitis B surface antigen"[tiab]) |
| (Africa[MeSH] OR Africa South of the Sahara[MeSH] or Africa[tiab] OR Angola[tiab] OR Benin[tiab] OR Botswana[tiab] OR "Burkina Faso"[tiab] OR Burundi[tiab] OR Cameroon[tiab] OR "Cape Verde"[tiab] OR "Central African Republic"[tiab] OR Chad[tiab] OR Comoros[tiab] OR Congo[tiab] OR Djibouti[tiab] OR "Equatorial Guinea"[tiab] OR Eritrea[tiab] OR Eswatini[tiab] OR Ethiopia[tiab] OR Gabon[tiab] OR Gambia[tiab] OR Ghana[tiab] OR Guinea[tiab] OR "Guinea Bissau"[tiab] OR "Ivory Coast"[tiab] OR "Cote d'Ivoire"[tiab] OR Kenya[tiab] OR Lesotho[tiab] OR Liberia[tiab] OR Madagascar[tiab] OR Malawi[tiab] OR Mali[tiab] OR Mauritania[tiab] OR Mauritius[tiab] OR Mozambique[tiab] OR Mocambique[tiab] OR Namibia[tiab] OR Niger[tiab] OR Nigeria[tiab] OR Principe[tiab] OR Reunion[tiab] OR Rwanda[tiab] OR "Sao Tome"[tiab] OR Senegal[tiab] OR Seychelles[tiab] OR "Sierra Leone"[tiab] OR Somalia[tiab] OR "South Africa"[tiab] OR "South Sudan"[tiab] OR Sudan[tiab] OR Swaziland[tiab] OR Tanzania[tiab] OR Togo[tiab] OR Tunisia[tiab] OR Uganda[tiab] OR Zambia[tiab] OR Zimbabwe[tiab]) |

**EMBASE** (https://pubmed.ncbi.nlm.nih.gov/)
**Limit >1992**

| |
|---|
| hepatitis b.mp. or exp hepatitis B/ or hepatitis b surface antigen.mp. or exp hepatitis B surface antigen/ or hbsag.mp |
| (africa or angola or benin or botswana or "Burkina Faso" or burundi or cameroon or "Cape Verde" or "Central African Republic" or chad or comoros or congo or djibouti or "Equatorial Guinea" or eritrea or ethiopia or eswatini or gabon or gambia or ghana or guinea or "Guinea Bissau" or "Ivory Coast" or "Cote d'Ivoire" or kenya or lesotho or liberia or madagascar or malawi or mali or mauritania or mauritius or mozambique or mocambique or namibia or niger or nigeria or principe or reunion or rwanda or "Sao Tome" or senegal or seychelles or "Sierra Leone" or somalia or "South Africa" or "sub-Saharan Africa" or sudan or "South Sudan" or swaziland or tanzania or togo or tunisia or uganda or zambia or zimbabwe).mp or sub-Saharan Africa.mp. or exp "Africa south of the Sahara"/ |

**SCOPUS** (https://www.scopus.com/search/form.uri?)
**Limits: 1992-**
**Limits: Medicine/ Immunology/ Biochemsitry/ Multidisciplinary/ Health Professions/ Pharmacology**

| |
|---|
| ( TITLE-ABS-KEY ( africa OR angola OR benin OR botswana OR "Burkina Faso" OR burundi OR cameroon OR "Cape Verde" OR "Central African Republic" OR chad OR comoros OR congo OR djibouti OR "Equatorial Guinea" OR eritrea OR ethiopia OR eswatini OR gabon OR gambia OR ghana OR guinea OR "Guinea Bissau" OR "Ivory Coast" OR "Cote d'Ivoire" OR kenya OR lesotho OR liberia OR madagascar OR malawi OR mali OR mauritania OR mauritius OR mozambique OR mocambique OR namibia OR niger OR nigeria OR principe OR reunion OR rwanda OR "Sao Tome" OR senegal OR seychelles OR "Sierra Leone" OR somalia OR "South Africa" OR "sub-Saharan Africa" OR sudan OR "South Sudan" OR swaziland OR tanzania OR togo OR tunisia OR uganda OR zambia OR zimbabwe ) ) AND ( TITLE-ABS-KEY ( "hepatitis B" OR hbsag OR "hepatitis B surface antigen" ) ) AND PUBYEAR > 1991 AND PUBYEAR < 2023 AND ( LIMIT-TO ( SUBJAREA , "PHAR" ) OR LIMIT-TO ( SUBJAREA , "MEDI" ) OR LIMIT-TO ( SUBJAREA , "IMMU" ) OR LIMIT-TO ( SUBJAREA , "BIOC" ) OR LIMIT-TO ( SUBJAREA , "HEAL" ) ) |
| AND ( TITLE-ABS-KEY ( "hepatitis b" OR hbv OR hbsag ) ) |

**Africa Index Medicus (**https://indexmedicus.afro.who.int/)
**Limit: 1992-**

| |
|---|
| Title/ Abstract/ Subject: "hepatitis B surface antigen" OR "HBsAg" OR "hepatitis B" |

**Africa Journals Online** (https://www.ajol.info/index.php/ajol)
Searched using Google Scholar (https://scholar.google.com/)

| |
|---|
| site:ajol.info AND (HBsAg or "Hepatitis B surface antigen" or "hepatitis B") |

**Condition or domain being studied:** chronic hepatitis B

**Participants/population:**

**Inclusion:**

Pregnant women and infants living in the WHO African region who have been tested for hepatitis B surface antigen using a validated diagnostic test.

Studies should include details of the population location, sampling method, and describe a representative sampling framework (random, consecutive recruitment over a specified interval, or a complete-recruitment strategy.

**Exclusion:**

The following studies will be excluded:

- Studies that do not define a random, consecutive, or complete testing sampling strategy
- Laboratory-based studies (without a sampling framework describing selection and recruitment procedures)
- Studies of acute hepatitis
- Basic science or animal studies
- Hospital-based studies selecting patients with acute medical, surgical or obstetric disease
- Studies that use a rapid diagnostic test that has not been WHO prequalified, Food and Drug Administration approved or CE marked as an in-vitro diagnostic test, or which has publicly available validation data demonstrating sensitivity >90% relative to an approved ELISA test within a similar population group within the WHO African region.

**Intervention(s), exposure(s):**

Diagnostic tests: Studies testing for hepatitis B surface antigen (HBsAg) using one or more of the following testing methods will be included:

- *Laboratory-based tests*: enzyme linked immunoassay (ELISA), chemiluminescent immunoassay (CLIA), electrochemical assay (ECA)
- *Rapid diagnostic tests (RDTs)*: Any RDT which meets any of the following criteria will be included in the review:
  - WHO pre-qualification
  - CE (conformité européenne) marked in-vitro diagnostic device
  - United States (US) Food and Drug Administration FDA approved, or meeting stringent regulatory approval (Japan, Australia, Canada, EU or USA)
  - Published evidence showing validation data of the RDT device vs. an approved assay in a comparable geographic and population setting fulfilling WHO prequalification criteria.

Studies with the following characteristics will be excluded:

- Study design: Systematic reviews (where lists of included studies will be reviewed for potential inclusion), case studies, and editorials will be excluded.
- Sampling method: Method not stated or insufficient detail to allow reproducibility. Non-random methods (except for consecutive sampling).

We will assess vertical transmission according to vaccination subgroup defined as:

- HepB3: Receipt of a 3-dose vaccination series, typically at 6, 10 and 14 weeks of infancy.
- Timely HepB-BD: Receipt of a birth dose hepatitis B vaccine delivered within 24 hours of life
- Delayed HepB-BD:Receipt of a birth dose hepatitis B vaccine delivered between 24 hours and 1 week of life
- Unvaccinated: No hepatitis B vaccination given
- Maternal antiviral prophylaxis: Antenatal antiviral treatment for mothers with tenofovir disoproxil fumarate

**Comparator(s)/control:** None

**Types of study to be included:** Observational or interventional, prospective or retrospective, cross-sectional, case-control and cohort studies.

**Context:** We will include community studies or hospital based studies.

**Main outcome(s):**

1. Pooled seroprevalence of HBsAg in pregnant women and infants born to HBV-positive mothers.
2. Rates of vertical transmission from HBsAg positive pregnant women, stratified by vaccine: unvaccinated, HepB3 commencing at 6 weeks, delayed birth dose provided between 24 hour and 1 week and timely birth dose within 24 hours of birth.

**Additional outcome(s):**

1. Prevalence of HBeAg positivity in pregnant women
2. HBV DNA estimation in pregnant women (categorised by above or below 200,000 IU/ml).

**Data extraction (selection and coding):**

Studies retrieved from the search strategy will be deduplicated and then have titles and abstracts screened by two independent reviewers. Studies marked for inclusion by either reviewer will then proceed to full text screening. Full text review will also be conducted in duplicate by two independent reviewers. Discrepant results will be identified and resolved through discussion by the reviewers.

Data will then be extracted from the list of included studies in duplicate using a cloud-based data extraction tool (implemented in google forms). Any discrepancies between each independently extracted data for each study will be resolved by an independent reviewer.

**Risk of bias (quality) assessment**: Quality assessment will be performed using a modified prevalence study assessment tool, which will use nine questions to assess the sampling framework, sampling procedures, response rate and the quality and completeness of diagnostic testing. (REF: *Munn Z, Moola S, Lisy K, Riitano D, Tufanaru C. Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and incidence data. Int J Evid Based Healthc. 2015;13(3):147–153. )*

A principal component analysis will be used to estimate the overall risk of bias from these questions.

**Strategy for data synthesis:**

Describe the methods you plan to use to synthesise data. This must not be generic text but should be specific to your review and describe how the proposed approach will be applied to your data.

Assuming significant heterogeneity between study populations, we will estimate HBsAg prevalence with 95% confidence intervals using a binomial mixed model, with estimates weighted by the size of the population represented by the study (UN population estimates will be used for nationally-representative studies).

We will additionally as a sensitivity analysis consider the potential impact of the data quality score by adding the quality score as a variable in the binomial mixed model.

Forest plots will be made using the meta package in R. We will calculate $I^2$ to describe the proportion of variation attributable to heterogeneity, rather than sampling error.

We will describe the time trend in HBsAg prevalence in the WHO Africa region using linear regression models, adjusted for age, sex, study size, study quality.

We will conduct sensitivity analysis to investigate the effect of the type of study (e.g. sub-national vs. localised) included and the study quality (e.g. low vs. high study quality).

For assessment of the rate of vertical transmission we will use a generalised linear mixed model with random effects and logit transformation of transmission rates.

**Analysis of subgroups or subsets:**

Prevalence estimates will be stratified by:

1. Age
2. WHO African region subgroups:
    a. Central Africa 10 countries: Angola, Burundi, Cameroon, Central African Republic, Chad, Republic of Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, and Sao Tome and Principe.
    b. Eastern and Southern Africa 20 countries: Botswana, Comoros, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, South Africa, Seychelles, South Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.
    c. West Africa 17 countries: Algeria, Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria,

Subgroup analyses will depend on data availability.

**Language:** There will be no language restrictions applied, studies in languages unknown to the study team will be translated into English.

**Keywords:** Hepatitis B; pregnancy; vertical transmission; antenatal; prevalence; systematic review; meta-analysis; Africa

## S2 Appendix. Details of HBsAg tests used

| Author | Year of publication | HBsAg test type | HBsAg test name | Regulatory approval for RDTs |
|---|---|---|---|---|
| Aba, H. | 2016 | EIA/ELISA | Beijing Kinghawk Pharmaceutical Co., Ltd., China | |
| Abuku, V. | 2023 | RDT | Onsite HBsAg Rapid Test; CTK Biotech. San Diego, CA, USA | CE marked IVD |
| Adeyemi, A | 2014 | EIA/ELISA | Dia.Pro, Diagnositic Bioprobes Srl, Milan, Italy | |
| Adu-Sarkodie, Y. | 1996 | EIA/ELISA | Behring, Marburg, Germany | |
| Ahmed S. | 1998 | EIA/ELISA | Bioelisa, Barcelona, Spain | |
| Akani, C. | 2005 | EIA/ELISA | Not stated | |
| Andersson, M. | 2013 | EIA/ELISA | Abbott AxSYM, Abbott Diagnostics, Chicago, IL, USA | |
| Araya Mezgebo, T. | 2018 | EIA/ELISA | Monolisa HBsAg Ultra assay, Bio-Rad, France | |
| Arefaine, M. | 2023 | EIA/ELISA | Not stated | |
| Awole, M. | 2005 | RDT | Bioline HBsAG One Test, Abbott, USA | WHO PQ |
| Ayed, Z. | 1995 | EIA/ELISA | Auszyme Monoclonal diagnostic kit, Abbott, USA | |
| Bafa, T. | 2020 | EIA/ELISA | Not stated | |
| Balde,T. | 2021 | EIA/ELISA | DS-ELISA HBsAg; NPO Diagnostic Systems, Russia | |
| Bancha, B. | 2020 | RDT | Bioline HBsAg, Abbott, USA | WHO PQ |
| Bassey, E. | 2009 | EIA/ELISA | Monoclonal, ELISA, Abbot, USA | |
| Bayo, P. | 2014 | EIA/ELISA | Savyon Diagnostics Ltd, Ashod, Israel | |
| Bayu, H. | 2020 | EIA/ELISA | Dialab1 HBsAg, Dialab, Austria | |
| Bittaye, M. | 2019 | RDT | Determine, Abbott Laboratories, Chicago, USA | WHO PQ |
| Burnett, R. | 2007 | EIA/ELISA | IMxs assays HBsAg, Abbott Laboratories, Chicago, IL, USA | |
| Candotti, D. | 2007 | RDT | Determine, Abbott Laboratories, Chicago, USA | WHO PQ |
| Chotun, N. | 2017 | RDT | Determine, Alere Inc., MA, USA | WHO PQ |
| Croce, F. | 2007 | EIA/ELISA | Eti- Mak-4, DiaSorin, Vercelli, Italy | |
| Dabsu, R. | 2018 | RDT | SD Bioline, Abbott, USA | WHO PQ |
| Dagnew, M. | 2022 | EIA/ELISA | Linear Chemicals, SLU, Spain | |
| Dao, B. | 2001 | EIA/ELISA | Monolisa, Sanofi Pasteur Diagnoses, France | |
| De Paschale, M. | 2014 | EIA/ELISA | Hepanostika HBsAg Ultra, Marcy l'Etoile, France | |
| Deme, C. | 2016 | RDT | SD Bioline, Gyeonggi-do, South Korea | WHO PQ |
| Demeke, G. | 2021 | RDT | SD Bioline, Abbott, China | WHO PQ |
| Diale, Q. | 2016 | EIA/ELISA | Abbott Diagnostics, Germany | |
| Dionne-Odom, J. | 2016 | RDT | ABON, Alere, USA | CE marked IVD |
| Dortey, B. | 2020 | RDT | Onsite HBsAg Rapid Test; CTK Biotech, San Diego, CA, USA | CE marked IVD |
| Ducancelle, A. | 2013 | RDT | VIKIA HBs Ag, Biomerieux, Marcy l'Etoile, France | WHO PQ |

| | | | | |
|---|---|---|---|---|
| Ekra, D. | 2008 | EIA/ELISA | Uni-form, Processor FlexTek - bioMeriex, Marcy l'Etoile, France | |
| Etti, M. | 2021 | CLIA | Not stated | |
| Firde, M. | 2022 | EIA/ELISA | Dialab HBsAg enzyme linked immunosorbent assay kit, Dialab GmbH, Austria | |
| Fofana, D.B. | 2023 | CLIA | ARCHITECT HBsAg, Abbott Diagnostics Division, USA | |
| Fomulu, N. | 2013 | EIA/ELISA | Monalisa HBsAg Ultra ELISA kit, BIO-RAD Laboratories, USA. | |
| Fowotade, A. | 2021 | EIA/ELISA | ELISA kit for HBsAg, Dia.Pro, Milan, Italy | |
| Gedefaw, G. | 2019 | EIA/ELISA | Hepanostika, Biomerieux, Boxtel, Netherland | |
| Geffert, K. | 2020 | RDT | SureScreen, Derby, United Kingdom | CE marked IVD |
| Genetu, K. | 2022 | RDT | SD Bioline, Yongin, South Korea | WHO PQ |
| Guingane, A. | 2020 | EIA/ELISA | Vidas Ultra, Biomerieux, France | |
| Harry, T. | 1994 | EIA/ELISA | Abbott, USA | |
| Helegbe, G. | 2023 | RDT | HBV surface antigen RDT kit; Premier Co., Ltd., Nagpur, India, and Transnational Technologies Inc., Manchester, UK | CE marked IVD |
| Ifeorah, I. | 2017 | EIA/ELISA | Enzyme-linked immunosorbent assay (ELISA) kits; Diagnostic Automation/Cortez Diagnostic, California, USA. | |
| Ikeme, A. | 2006 | EIA/ELISA | Not stated | |
| Ilboudo, D. | 2002 | EIA/ELISA | Not stated | |
| Itou-Ngaporo, A. | 2016 | EIA/ELISA | Bio-Rad Laboratories, Marnes La Coquette, France | |
| Joseph Davey, D. | 2022 | CLIA | Elecsys HBSAg II assay, Roche diagnostics, Switzerland | |
| Kassa, D. | 2019 | EIA/ELISA | Hepanostika ELISA kit, Biomerieux, Marcy l'Etoile, France. | |
| Kfutwah, A. | 2012 | EIA/ELISA | Monolisa AgHBs Plus Biorad, France. | |
| Kibassa, C. | 2004 | EIA/ELISA | Hepanostika HBsAg Uni-Form 11 test kit, Organon Teknika, Boxtel, Netherlands. | |
| Kirkbak, A. | 2017 | EIA/ELISA | Murex, Abbott, Italy | |
| Kolawole, O. | 2012 | EIA/ELISA | Biotech HBsAg, USA | |
| Komas, N. | 2018 | EIA/ELISA | Abbott-Murex, United Kingdom | |
| Koumba Mavoungou, D. | 2023 | EIA/ELISA | Monolisa TM HBsAg ULTRA; Bio-Rad, Marnes la Coquette, France | |
| Ladner, J. | 1998 | EIA/ELISA | EIA, Auszyme, Abbott Laboratories, Abbott Park, IL, USA. | |
| Loarec, A. | 2022 | RDT | Determine HBsAg 2, Abbott, USA | WHO PQ |
| Lohoues-Kouacou, M. | 1998 | EIA/ELISA | MONOLISA Ag HBs 2nd generation, Sanofi Pasteur, France | |
| MacLean, B. | 2012 | EIA/ELISA | D BIO, Standard Diagnostic, India | |
| Maiga, Y. | 1992 | EIA/ELISA | Auszyme, Abbott, USA | |
| Makuwa, M. | 2008 | EIA/ELISA | Monolisa Ag HBV-Plus, Biorad, Marnes la Coquette, France | |
| Mamadou, S. | 2012 | EIA/ELISA | Monolisa HBsAg Ultra, Bio-Rad, USA; ImmunoComb II HBsAg, Orgenics, Israel | |
| Mansour, W. | 2012 | EIA/ELISA | ELISA; Axsym-Abbott, Rungis, France | |

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|---|---|---|---|---|
| Manyahi, J. | 2017 | EIA/ELISA | ARCHITECT ci4100 Integrated Immunoassay and Clinical Chemistry System, Abbott Laboratories, Abbott Park, IL, USA | |
| Marama, T. | 2020 | EIA/ELISA | Dialab GmbH, Wiener Neudorf, Austria | |
| Mavenyengwa, R. | 2010 | CLIA | Architect, Abbott, USA | |
| Meier-Stephenson, V. | 2020 | CLIA | Architect, Abbott, USA | |
| Menendez, C. | 1999 | EIA/ELISA | Ortho Diagnostics Systems, NJ, USA | |
| Metaferia, Y. | 2016 | EIA/ELISA | Dialab GmbH, Wiener Neudorf, Austria | |
| Mhata, P. | 2017 | CLIA | ARCHITECT Abbott Laboratories, Sligo, Ireland | |
| Morgan, C. | 2023 | RDT | Determine 2, Abbott | WHO PQ |
| Mugabiirwe, N. | 2022 | RDT | SD BIOLINE HBsAg, Abbott Diagnostics Korea Inc, Gihueng-gu, Yongin- si, Republic of Korea | WHO PQ |
| Mustapha, G. | 2020 | EIA/ELISA | LabACONR; Hangzhou Biotest Biotech Co., Ltd., China | |
| Mutagoma, M. | 2017 | CLIA | ARCHITECT, Abbott, USA | |
| Ndow, G. | 2023 | RDT | HBsAg RDT, Abbott, USA | WHO PQ |
| Ndumbe, P1. | 1992 | EIA/ELISA | Abbott Auszyme, USA | |
| Ndumbe P2. | 1994 | EIA/ELISA | Abbott Diagnostics, North Chicago, USA | |
| Ngaira, J. | 2016 | EIA/ELISA | Hepanostika, HBsAg Ultra ELISA kit, Biomerieux, Netherlands | |
| Nlinwe, N. | 2021 | RDT | OnSite HBsAg Rapid Test, CTK Biotech, Inc., USA | CE marked IVD |
| Oliveira, D. | 2020 | RDT | Laboquick HBsAg Test, Koroglu Medical Devices, Turkey | CE marked IVD |
| Oluremi, A. | 2020 | EIA/ELISA | HBsAg ELISA kit, Melsin Medical Co., Limited, China | |
| Ondigui, J. | 2023 | EIA/ELISA | Murex 168 HBsAg, Abbott, USA | |
| Onwere, S. | 2012 | EIA/ELISA | Acon laboratories, USA | |
| Osazuwa, F. | 2012 | EIA/ELISA | Clinotech Diagnostics, Canada | |
| Oshitani, H1 | 1996 | EIA/ELISA | Frelisa HBsAg, Fujirebio, Tokyo, Japan | |
| Oshitani, H2 | 1995 | EIA/ELISA | Frelisa HBsAg, Fujirebio, Tokyo, Japan | |
| Ouoba, S. | 2023 | RDT | Determine 2 HBsAg, Abbott, USA | WHO PQ |
| Peliganga, L. | 2022 | RDT | HBsAg Determine; Abbott, USA | WHO PQ |
| Pellizzer, G. | 1994 | EIA/ELISA | Abbott Laboratories, Chicago, IL, USA | |
| Ramos, M. | 2011 | EIA/ELISA | HBsAg II cobas, Roche Diagnostics, Mannheim, Germany. | |
| Rashid, S. | 2014 | EIA/ELISA | Microparticle enzyme immunoassay, Abbott AxSYM, Germany | |
| Roble, A. | 2020 | EIA/ELISA | Wantai HBV Diagnostic kit, China | |
| Roingeard, P. | 1993 | EIA/ELISA | Auszyme Monoclonal, Abbott, North Chicago, IL, USA | |
| Rouet, F. | 2004 | EIA/ELISA | Abbott Laboratories, Abbott Park, North Chicago, IL, USA | |
| Sangare, L. | 2009 | RDT | Determine HBsAg, Abbott, USA | WHO PQ |
| Shimakawa, Y. | 2022 | RDT | VIKIA HBsAg, BioMerieux, France | WHO PQ |
| Tamandjou, C. | 2019 | RDT | Determine HBsAg rapid test, Abbott, USA | WHO PQ |

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|---|---|---|---|---|
| Tanjong, R. | 2016 | RDT | SD Bioline, Standard Diagnostics, USA | WHO PQ |
| Tegegne, D. | 2014 | EIA/ELISA | Dialab GmbH, Wiener Neudorf, Austria | |
| Thahir, S. | 2023 | RDT | Standard Q HBsAg RDT; SD Biosensor, Gyeonggi-do, Republic of Korea | WHO PQ |
| Thomson P. | 2021 | RDT | Alere Determine HBsAg, Abbott Diagnostics, Abbott Park, IL, USA | WHO PQ |
| Thumbiran, N. | 2014 | EIA/ELISA | Siemens Healthcare Diagnostics, NY, USA | |
| Torimiro, J. | 2018 | EIA/ELISA | Monolisa, Bio-Rad, France | |
| Ugbebor, O. | 2011 | EIA/ELISA | Clinotech Diagnostics, Canada | |
| Umare, A. | 2016 | EIA/ELISA | Dialab HBsAg ELISA kit; Dialab GmbH, Austria | |
| Umer, A. | 2023 | EIA/ELISA | Human type, Germany | |
| Utoo, B. | 2013 | EIA/ELISA | DIA-PRO Diagnostic Bioprobes Srl via columella, Italy | |
| Volker, F. | 2017 | EIA/ELISA | HBsAg(v2)/AXSYM Abbott, Germany and HBsAg EIA Test Kit Ascon, USA | |
| Vueba, A. | 2021 | EIA/ELISA | VIDAS, Biomerieux, Portugal | |
| Wakjira, M. | 2022 | EIA/ELISA | Not stated | |
| Woldesonbet, Z1. | 2016 | EIA/ELISA | Not stated | |
| Woldesonbet, Z2. | 2016 | EIA/ELISA | Not stated | |
| Yohanes, T. | 2016 | EIA/ELISA | Dialab GmbH, Wiener Neudorf, Austria | |
| Zenebe, Y. | 2014 | EIA/ELISA | Linear chemicals, Barcelona, Spain | |

Abbreviations: CE marked IVD Conformité Européenne marked in vitro diagnostic device; CLIA chemiluminescent immunoassay; EIA/ELISA enzyme immunoassay/enzyme immunosorbant assay; RDT rapid diagnostic test; WHO PQ World Health Organization prequalified;

## S3 Appendix. Quality assessment checklist

Adapted from Munn Z, Moola S, Lisy K, Riitano D, Tufanaru C. Chapter 5: systematic reviews of prevalence and incidence. JBI Manual for Evidence Synthesis. JBI 2020. Available at: https://jbi.global/sites/default/files/2021-10/Checklist_for_Prevalence_Studies.docx [Accessed 18th July 2024]

| Domain | Description |
|---|---|
| a. Was the sampling framework appropriate to address the target population? | Is the sample representative of the target population? eg. avoided inappropriate exclusions, characteristics of the participants match the population of interest (for example consider socioeconomic bias from a private fee-paying provider if there is a public health system) |
| b. Were study participants sampled in an appropriate way? (to facilitate representative sampling of the population, description of how sampling was performed) | Representative sampling methods involve random probabilistic sampling from a define population of interest, or an attempt to recruit an entire eligible population over a given time/catchment population. Low representative samples include: convenience samples, a lack of a detailed sampling frame. |
| c. Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Are these reported in sufficient to reproduce this study? |
| d. Were the study subjects and the setting described in detail? | Sufficient detail should be provided to determine comparability to other cohorts: age distribution, HIV prevalence, gestational age at enrolment, clinic setting |
| e. Was the response rate described? | Is there a study flowchart or report of the number of refusals or losses at each stage of the survey/ sampling/ testing? |
| f. Was the response rate adequate? | If a high non-reponse rate (eg. >15%), have the authors performed an analysis of characteristics associated with response, especially considering socoioeconomic and demographic characteristics? Is non-response likely to be related to the outcome (HBsAg prevalence). |

## S4 Appendix. Binomial mixed model: additional details of statistical methods

As a sensitivity analysis, a binomial mixed model was developed to estimate the probability of HBsAg detection in pregnant women. Here we describe details of the statistical model and how prevalence estimates have been obtained.

Let $Y_i$ denote the number of pregnant women who tested positive for HBsAg out of $n_i$ for the i-th survey, for $i = 1, \ldots, n$.

We then assumed that, conditionally on independent and identically distributed Gaussian random effects $Z_i$ with mean zero and variance $\sigma^2$, the $Y_i$ were mutually independent random variables, distributed according to binomial distributions with probability of a positive HBsAg test $p_i$, such that:

$$log\left\{\frac{p_i}{1-p_i}\right\} = \beta_0 + \beta_1 + Z_i. \quad (1)$$

To estimate the unknown regression coefficients, $\beta_0$ and $\beta_1$, and random effects variance,$\sigma^2$, we then defined the likelihood function for $\boldsymbol{\theta} = (\beta_0, \beta_1, \sigma^2)$ as:

$$L(\theta) = \prod_{i=1}^{n} L_i(\theta), \quad (2)$$

where

$$L_i(\theta) = \int_{-\infty}^{+\infty} [Z_i][Y_i \mid Z_i]\, dZ_i \quad (3)$$

Finally, we maximised (2) by approximating the integral in (3) with a quasi Monte Carlo method.

Let $C$ denote the set of surveys falling within a predefined geographical area (e.g. WHO region). To predict HBsAg prevalence among pregnant women for a specific WHO region, we took $B$ = 10,000 samples, $p_i^{(j)}$, j=1, …, B, from the distribution of $p_i$ conditioned on the data, also known as the predictive distribution for $p_i$, to obtain, (4)

$$\hat{p}_C = \frac{1}{B}\sum_{j=1}^{B} \frac{\sum_{i\in C} w_i p_i^{(j)}}{\sum_{i\in C} w_i} \quad (4)$$

where $w_i$ is a weight representing the number of discrete geographical sites sampled by each study. A single centre study was given 1 point. Where a study sampled from multiple locations within one geographical area (e.g. a city), this was given 1.5 points. Where studies had multiple discrete and independent antenatal clinic locations the points for each location were added to a maximum total of 5 points. This procedure provided additional weighting to studies presenting data in aggregate form from multiple discrete underlying populations, with a maximum weighting applied to prevent excessive influence at the regional level from large studies from individual countries.

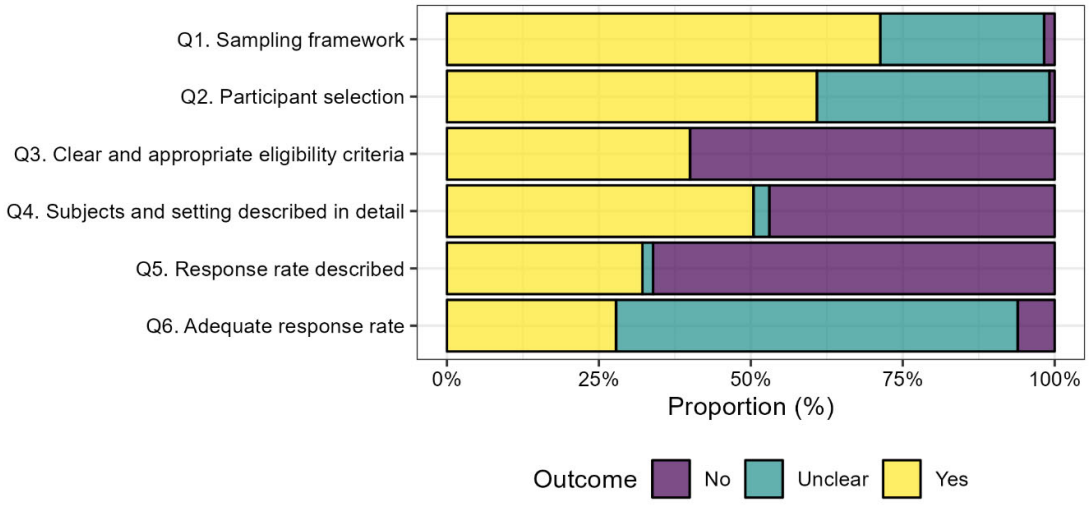
**S5 Appendix: Sensitivity analysis: comparison of primary binomial mixed model for HBsAg prevalence with i. a model that included all data (1992-2014) ii. Main model without the use of sampling weights**

| Region | Primary model, % [95% confidence interval] | Binomial mixed model described in Appendix 4 with sampling weights for geographic coverage: data from 2014-2023, % [95% confidence interval] | Binomial mixed model described in Appendix 4 with sampling weights for geographic coverage across entire data range: data from 1992-2023, % [95% confidence interval] | Binomial mixed model with country-level estimates weighted by proportion of women of childbearing age in WHO sub-region to provide regional and sub-regional estimates: data from 2014-2023, % [95% confidence interval] |
|---|---|---|---|---|
| WHO African Region | 6.2 [5.3 – 7.2] | 6.3 [6.0 -6.5] | 6.9 [6.7-7.2] | 5.88 (5.54-6.20) |
| Central Africa | 7.0 [4.9 – 10.0] | 7.4 [6.9 – 7.8] | 8.4 [8.0-8.9] | 4.95 (4.53-5.41) |
| East and Southern Africa | 4.4 [3.6 -5.4] | 5.5 [5.3 – 5.8] | 5.4 [5.1-5.6] | 7.77 (6.77-8.91) |
| West Africa | 7.5 [5.9 -9.4] | 7.1 [6.5 – 7.7] | 8.7 [8.2 – 9.1] | 6.06 (5.66-6.55) |

## S6 Appendix. Sources of data for modelled transmission estimates

| Indicator | Source | Link |
|---|---|---|
| HepB birth dose: The percentage in the target population who received HepB birth dose within the first 24 hours of birth in a given year. | WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) | https://immunizationdata.who.int/pages/coverage/HEPB.html |
| HepB3: The percentage in the target population who have received three doses of Hepatitis B containing vaccine in a given year. | WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) | https://immunizationdata.who.int/pages/coverage/HEPB.html |
| Total live births per year | United Nations, Department of Economic and Social Affairs, Population Division (2022). World Population Prospects. | https://population.un.org/wpp/ |
| Female population of reproductive age (15-49 years) | United Nations, Department of Economic and Social Affairs, Population Division (2022). World Population Prospects. | https://population.un.org/wpp/ |
| Antenatal care 1+ visit - percentage of women (aged 15-49 years) attended at least once during pregnancy by skilled health personnel | UNICEF data warehouse: Maternal, child and newborn health | https://data.unicef.org/resources/data_explorer/unicef_f/ |
| Institutional deliveries - percentage of deliveries in a health facility | UNICEF data warehouse: Maternal, child and newborn health | https://data.unicef.org/resources/data_explorer/unicef_f/ |

**S7 Appendix. Summary of aggregate quality score domains for included studies**



## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| **Aba, H., 2016** | Yes | Unclear | No | No | No | Unclear | -1.63 |
| **Abuku, V., 2023** | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| **Adeyemi, A., 2014** | Yes | Yes | No | No | No | Unclear | -0.91 |
| **Adu-Sarkodie, Y., 1996** | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| **Ahmed S., 1998** | Yes | Unclear | No | Yes | Yes | No | 0.19 |
| **Akani, C., 2005** | Yes | Yes | No | No | No | Unclear | -0.91 |
| **Andersson, M., 2013** | Unclear | No | Yes | Yes | Yes | Yes | 1.53 |
| **Araya Mezgebo, T., 2018** | Unclear | Unclear | No | Yes | No | Unclear | -1.47 |
| **Arefaine, M., 2023** | Yes | Unclear | No | No | No | Unclear | -1.63 |
| **Awole, M., 2005** | Yes | Unclear | No | No | No | Unclear | -1.63 |
| **Ayed, Z, 1995** | Yes | Unclear | No | No | No | Unclear | -1.63 |
| **Bafa, T., 2020** | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Balde,T., 2021 | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| Bancha, B., 2020 | Yes | Yes | Yes | No | Yes | Yes | 2.09 |
| Bassey, E., 2009 | Yes | Unclear | No | Yes | No | Unclear | -0.88 |
| Bayo, P., 2014 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Bittaye, M., 2019 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Burnett, R., 2007 | Yes | Unclear | No | No | Yes | Yes | 0.56 |
| Candotti, D., 2007 | Unclear | Unclear | No | No | No | Yes | -1.10 |
| Chotun, N., 2017 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Croce, F., 2007 | Yes | Yes | No | No | No | Unclear | -0.91 |
| Dabsu, R., 2018 | Yes | Yes | No | Yes | Yes | Yes | 2.04 |
| Dagnew, M., 2022 | Yes | Unclear | Yes | No | No | Unclear | -0.83 |
| Dao, B., 2001 | Unclear | Unclear | No | Yes | No | Unclear | -1.47 |
| De Paschale, M., 2014 | Yes | Unclear | No | Yes | No | Unclear | -0.88 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Deme, C., 2016 | Unclear | Yes | No | Yes | No | Unclear | -0.74 |
| Demeke, G., 2021 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Diale, Q., 2016 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Dionne-Odom, J., 2016 | Unclear | Unclear | No | Yes | No | Unclear | -1.47 |
| Dortey, B., 2020 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Ducancelle, A., 2013 | Unclear | Yes | No | No | No | Unclear | -1.49 |
| Ekra, D., 2008 | Yes | Unclear | Yes | Yes | Yes | Yes | 2.11 |
| Etti, M., 2021 | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| Firde, M., 2022 | Unclear | Yes | No | No | Yes | Yes | 0.70 |
| Fomulu, N., 2013 | Yes | Yes | Yes | Yes | Yes | No | 1.72 |
| Fowotade, A., 2021 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Gedefaw, G., 2019 | Yes | Yes | No | Yes | Yes | Yes | 2.04 |
| Geffert, K., 2020 | Yes | Yes | No | Yes | No | Unclear | -0.15 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Genetu, K., 2022 | Yes | Yes | No | Yes | Yes | Yes | 2.04 |
| Guidozzi, F.B., 1992 | Unclear | Yes | No | No | No | Unclear | -1.49 |
| Guingane, A., 2020 | Yes | Yes | Yes | No | Yes | No | 0.96 |
| Harry, TO., 1994 | Unclear | Yes | Yes | No | No | Unclear | -0.69 |
| Helegbe, G., 2023 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Ifeorah, I., 2017 | Yes | Unclear | No | No | No | Unclear | -1.63 |
| Ikeme, A., 2006 | Yes | Yes | No | No | No | Unclear | -0.91 |
| Ilboudo, D., 2002 | No | Unclear | Yes | No | No | Unclear | -1.42 |
| Itou-Ngaporo, A., 2016 | Yes | Unclear | No | No | No | Unclear | -1.63 |
| Joseph Davey, D., 2022 | Yes | Unclear | Yes | Yes | No | Unclear | -0.08 |
| Kassa, D., 2019 | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| Kfutwah, A., 2012 | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| Kibassa, C., 2004 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Kirkbak, A., 2017 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Kolawole, O., 2012 | Yes | Unclear | No | No | No | Unclear | -1.63 |
| Komas, N., 2018 | Yes | Yes | Yes | No | No | Unclear | -0.10 |
| Koumba Mavoungou, D., 2023 | Yes | Yes | Yes | No | Unclear | Unclear | -0.10 |
| Ladner, J., 1998 | Yes | Yes | Yes | No | No | Unclear | -0.10 |
| Loarec, A., 2022 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Lohoues-Kouacou, M., 1998 | Yes | Yes | No | No | No | Unclear | -0.91 |
| MacLean,B., 2012 | Yes | Yes | Yes | No | No | Unclear | -0.10 |
| Maiga, Y., 1992 | Yes | Unclear | No | No | No | Unclear | -1.63 |
| Makuwa, M., 2008 | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| Mamadou, S., 2012 | Unclear | Yes | No | Yes | Yes | Yes | 1.45 |
| Mansour, W., 2012 | Yes | Unclear | No | No | No | Unclear | -1.63 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Manyahi, J., 2017 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Marama, T., 2020 | Yes | Yes | Yes | No | Yes | Yes | 2.09 |
| Mavenyengwa, R., 2010 | Unclear | Yes | Yes | Yes | Yes | Yes | 2.25 |
| Meier-Stephenson, V., 2020 | Yes | Unclear | No | Yes | No | Unclear | -0.88 |
| Menendez, C., 1999 | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |
| Metaferia, Y., 2016 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Mhata, P., 2017 | Yes | Unclear | No | Yes | Yes | No | 0.19 |
| Morgan, C., 2023 | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| Mugabiirwe, N., 2022 | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| Mustapha, G., 2020 | Yes | Yes | No | No | No | Unclear | -0.91 |
| Mutagoma, M., 2017 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Ndow, G., 2023 | Yes | Yes | No | No | Yes | Yes | 1.28 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Ndumbe, P., 1992 | Yes | Unclear | No | No | No | Unclear | -1.63 |
| Ndumbe, P., 1994 | Unclear | Yes | No | Yes | Yes | Yes | 1.45 |
| Ngaira, J., 2016 | Unclear | Yes | Yes | Unclear | No | Unclear | -0.69 |
| Nlinwe, N., 2021 | Yes | Yes | Yes | No | Yes | Yes | 2.09 |
| Oliveira, D., 2020 | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| Oluremi, A., 2020 | Yes | Unclear | Yes | No | No | Unclear | -0.83 |
| Ondigui, J., 2023 | Unclear | Yes | No | No | No | Unclear | -1.49 |
| Onwere, S., 2012 | Unclear | Yes | No | Yes | No | Unclear | -0.74 |
| Osazuwa, F., 2012 | Yes | Yes | No | No | Yes | No | 0.16 |
| Oshitani, H., 1996 | Yes | Unclear | No | No | No | Unclear | -1.63 |
| Oshitani, H., 1995 | Yes | Yes | No | No | No | Unclear | -0.91 |
| Ouoba, S., 2023 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Peliganga, L., 2022 | Unclear | Unclear | No | Yes | No | Unclear | -1.47 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| Pellizzer, G., 1994 | Unclear | Yes | No | No | No | Unclear | -1.49 |
| Qolohle, D., 1995 | Yes | Yes | No | Yes | Yes | Yes | 2.04 |
| Ramos, M., 2011 | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| Rashid, S., 2014 | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| Roble, A., 2020 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| Rouet, F., 2004 | Unclear | Yes | No | No | No | Unclear | -1.49 |
| Sangare, L., 2009 | Yes | Unclear | Yes | Yes | Yes | Yes | 2.11 |
| Shimakawa, Y., 2022 | Yes | Yes | Yes | Yes | Yes | No | 1.72 |
| Tamandjou, C., 2019 | Unclear | Yes | No | No | No | Unclear | -1.49 |
| Tanjong, R., 2016 | Yes | Yes | No | Yes | Yes | Yes | 2.04 |
| Tegegne, D., 2014 | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| Thahir, S., 2023 | Yes | Unclear | Yes | No | No | Unclear | -0.83 |
| Thomson P., 2021 | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |

## S8 Appendix. Quality score assessment for included studies

| Study | Was the sampling framework appropriate to address the target population? | Were study participants sampled in an appropriate way? | Are the sampling methods and eligibility criteria (inclusion and exclusion criteria) both clear and appropriate? | Were the study subjects and the setting described in detail? | Was the response rate described? | Was the response rate adequate? | Quality score |
|---|---|---|---|---|---|---|---|
| **Thumbiran, N., 2014** | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| **Torimiro, J., 2018** | Yes | Unclear | No | Yes | No | Unclear | -0.88 |
| **Ugbebor, O., 2011** | Yes | Unclear | No | No | No | Unclear | -1.63 |
| **Umare, A., 2016** | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| **Umer, A., 2023** | Yes | Yes | Yes | Yes | Yes | Yes | 2.84 |
| **Utoo, B., 2013** | Yes | Unclear | No | No | No | Unclear | -1.63 |
| **Volker, F., 2017** | Unclear | Unclear | No | Yes | Yes | No | -0.40 |
| **Vueba, A., 2021** | Yes | Yes | No | Yes | No | Unclear | -0.15 |
| **Wakjira, M., 2022** | Yes | Yes | Yes | No | No | Unclear | -0.10 |
| **Woldesonbet, Z1, 2016** | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| **Woldesonbet, Z2., 2016** | Unclear | Unclear | No | No | No | Unclear | -2.22 |
| **Yohanes, T., 2016** | Yes | Yes | No | No | No | Unclear | -0.91 |
| **Zenebe, Y. , 2014** | Yes | Yes | Yes | Yes | No | Unclear | 0.65 |

## S9 Appendix: Summary of included prevalence surveys, stratified by WHO Africa sub-region

| Characteristic | Central Africa | Eastern and Southern Africa | West Africa | Overall |
|---|---|---|---|---|
| **Number of surveys** | 20 | 54 | 39 | 113 |
| **Countries included** | Angola, Cameroon, Central African Republic, Democratic Republic of Congo, Gabon, Republic of the Congo, | Ethiopia, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe | Algeria, Benin, Burkina Faso, Gambia, Ghana, Guinea, Ivory Coast, Mali, Mauritania, Niger, Nigeria | |
| **Total number of pregnant women tested for HBsAg** | 48,976 | 82,822 | 59,185 | 190,983 |
| **Number tested per study** (median; IQR) | 930 (429-1,448) | 408 (282-1,044) | 515 (302-1,020) | 498 (299-1,186) |
| **Age of participants** (median of mean ages; IQR) | 26·7 (25·4, 27·6) | 26·0 (25·6, 27·2) | 26·9 (24·8, 27·1) | 26·1 (25·1-27·5) |
| Not reported | 10 | 33 | 28 | 71 |
| **HBsAg test type** (n, %) | | | | |
| ELISA/EIA | 11 (55·0%) | 36 (66·7%) | 31 (79·5%) | 78 (69·0%) |
| CLIA | 0 (0%) | 5 (9·3%) | 0 (0%) | 5(4·4%) |
| RDT | 9 (45·0%) | 13 (24·1%) | 8 (20·5%) | 30 (26·5%) |
| **HIV prevalence** (%, median; IQR) | 3·5% (0·8-8·4%) | 5·1% (0·0-9·3%) | 2·0% (0·7-4·2%) | 3·5% (0·6-7·4%) |
| Not reported | 9 | 24 | 22 | 55 |
| **HBeAg prevalence reported (among HBsAg positive women)** | 13 (65·0%) | 14 (25·6%) | 15 (38·5%) | 42 (37·2%) |
| **Median year of national vaccine introduction among included studies** (range) | 2005 (2003-2006) | 2007 (1994-2014) | 2004 (1995-2008) | 2004 (1994-2014) |
| **Years between vaccine introduction and study mid-point** (median; IQR) | 8·2 (4·0-12·3) | 9·0 (5·0-13·3) | 6·7 (-1.2 -13·3) | 8·2 (1·8-13·4) |

Abbreviations: CLIA: Chemiluminescence assay; EIA: Enzyme immunoassay; ELISA: Enzyme-linked immunoassay; IQR: Interquartile range; RDT: Rapid diagnostic test

## S10 Appendix. Details of included prevalence studies

| Author | Country | WHO region | Location | Year of publication | Study start year | Study stop year |
|---|---|---|---|---|---|---|
| Aba, H.O | Nigeria | West Africa | Kaduna Metropolis<br>44 Nigerian Army Reference Hospital<br>St. Gerard Hospital<br>Barau Dikko Specialist Hospital<br>Dantsoho Memorial Hospital | 2016 | 2011 | 2011 |
| Adeyemi, A | Nigeria | West Africa | University College Hospital, Ibadan<br>Idi- Ogungun Health Centre<br>Adeoyo maternity Hospital. | 2014 | 2011 | 2011 |
| Andersson, M. I. | South Africa | Eastern and Southern Africa | Western Cape Province | 2013 | 2008 | 2008 |
| Araya Mezgebo, T | Ethiopia | Eastern and Southern Africa | SE zones of Tigray regional state, capital city Mekelle | 2018 | 2015 | 2015 |
| Bafa, TA. | Ethiopia | Eastern and Southern Africa | Atat Hospital, Azer | 2020 | 2017 | 2017 |
| Balde,T | Guinea | West Africa | Conakry | 2021 | NA | NA |
| Bancha, B. | Ethiopia | Eastern and Southern Africa | Wolaita Zone | 2020 | 2018 | 2018 |
| Bayo, P. | Uganda | Eastern and Southern Africa | Lacor Referral Hospital, Gulu Referral Hospital, Gulu District | 2014 | 2012 | 2013 |
| Bittaye, M. | Gambia | West Africa | Edward Francis Small Teaching Hospital, Banjul | 2019 | 2015 | 2015 |
| Chotun, N. | South Africa | Eastern and Southern Africa | Tygerberg Hospital, Cape Town | 2017 | 2014 | 2014 |
| Dabsu, R. | Ethiopia | Eastern and Southern Africa | Nekemte Referral Hospital<br>Nekemte Health Center<br>Getema Health Center<br>Arjo Gudetu and Sire Health Center<br>All in East Wollega Zone, West Oromia | 2018 | 2014 | 2014 |
| Dagnew, M. | Ethiopia | Eastern and Southern Africa | Amhara Regional State | 2022 | 2018 | 2019 |
| De Paschale, M. | Benin | West Africa | Saint Jean de Dieu de Tanguieta hospital, Atacora district | 2014 | 2011 | 2011 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Deme, C. | Ethiopia | Eastern and Southern Africa | Gambo Rural Hospital | 2016 | 2011 | 2012 |
| Demeke, G. | Ethiopia | Eastern and Southern Africa | Debre Markos Referral Hospital | 2021 | 2017 | 2017 |
| Diale, Q. | South Africa | Eastern and Southern Africa | 1 Military Hospital, Tshwane | 2016 | 2008 | 2013 |
| Dionne-Odom, J2 | Cameroon | Central Africa | Banso Baptist Hospital<br>Mbingo Baptist Hospital<br>Baptist Hospital Mutengene<br>Mboppi Baptist Hospital in Douala. | 2016 | 2014 | 2014 |
| Dortey, B. | Ghana | West Africa | Korle-Bu Teaching Hospital, Southern Ghana | 2020 | NA | NA |
| Ducancelle, A. | Cameroon | Central Africa | Tokombere | 2013 | 2009 | 2010 |
| Ekouevi, D.K. | Togo | West Africa | Lome, Tsevie, Atakpame, Sokode, Kara and Dapaong Cities | 2020 | 2017 | 2017 |
| Etti, M. | Uganda | Eastern and Southern Africa | Kawempe National Referral Hospital | 2021 | NA | NA |
| Firde, M. | Ethiopia | Eastern and Southern Africa | Shone Hospital in Hadiya Zone, Southern Ethiopia | 2022 | 2020 | 2020 |
| Fomulu, N.J. | Cameroon | Central Africa | Yaounde University Teaching Hospital, Biyem-Assi (BADH) and the Cite Verte District Hospitals (CVDH) of Yaounde, the capital of Cameroon | 2013 | 2011 | 2012 |
| Fowotade, A. | Nigeria | West Africa | University College Hospital, Ibadan | 2021 | 2018 | 2019 |
| Gedefaw, G. | Ethiopia | Eastern and Southern Africa | Felegehiwot referral hospital | 2019 | 2018 | 2018 |
| Geffert, K. | United Republic of Tanzania | Eastern and Southern Africa | Bugando Medical Centre, Mwanza City | 2020 | 2014 | 2015 |
| Genetu, K. | Ethiopia | Eastern and Southern Africa | Tikur Anbessa Specialized Hospital, Zewuditu Memorial Hospital, Ghandi Memorial Hospital, and St. Petros Hospital; all in Addis Ababa | 2022 | 2021 | 2021 |
| Guingane, A. | Burkina Faso | West Africa | Baskuy, Ouagadougou | 2020 | 2014 | 2016 |
| Ifeorah, I. M. | Nigeria | West Africa | Ade-Oyo State Hospital and University College Hospital, Ibadan | 2017 | 2012 | 2013 |

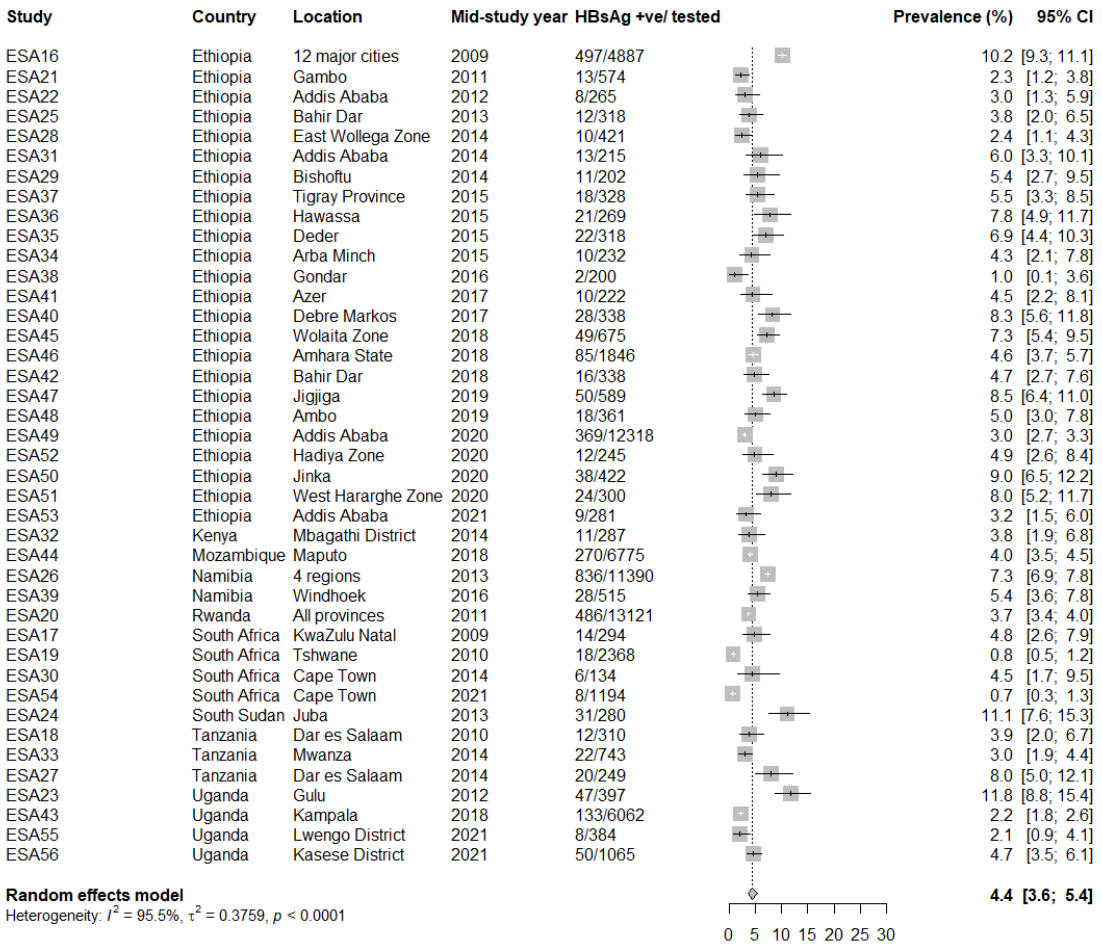
| | | | | | | |
|---|---|---|---|---|---|---|
| Itou-Ngaporo, A. | Republic of Congo | Central Africa | Four health centres in Brazaville: BISSITA, Jeanne Vialle, Marien Ngouabi and CHU | 2016 | 2014 | 2014 |
| Joseph Davey, D. | South Africa | Eastern and Southern Africa | Gugulethu Midwife Obstetrics Unit, Cape Town | 2022 | 2020 | 2022 |
| Kassa, D. | Ethiopia | Eastern and Southern Africa | 12 major cities of Ethiopia | 2019 | 2005 | 2014 |
| Kirkbak, A. | South Sudan | Eastern and Southern Africa | Juba Teaching Hospital, Juba County, Central Equatoria State | 2017 | 2012 | 2013 |
| Kolawole, O.M. | Nigeria | West Africa | Ladoke Akintola University Teaching Hospital, Osogbo City, Osun state, South-western Nigeria | 2012 | 2010 | 2011 |
| Komas, N.P. | Central African Republic | Central Africa | All six public health structures with maternity wards in Bangui | 2018 | 2010 | 2010 |
| Loarec, A. | Mozambique | Eastern and Southern Africa | Chamanculo General Hospital, Maputo | 2022 | 2017 | 2019 |
| Loriette, M | Cameroon | Central Africa | Seven district health facilities in Tokombere district | 2015 | 2009 | 2013 |
| Lunel-Fabiani, F. | Cameroon | Central Africa | North Cameroon | 2019 | 2009 | 2015 |
| Manyahi, J. | United Republic of Tanzania | Eastern and Southern Africa | Temeke hospital<br>Zakheem Health Center<br>Kizuiani Health Center | 2017 | 2014 | 2014 |
| Marama, T. | Ethiopia | Eastern and Southern Africa | Jinka Hospital, Jinka Town (capital of the south Omo zone in southern Ethiopia) | 2020 | 2020 | 2020 |
| Meier-Stephenson, V. | Ethiopia | Eastern and Southern Africa | Gondar | 2018 | 2016 | 2016 |
| Meier-Stephenson, V | Ethiopia | Eastern and Southern Africa | University of Gondar Hospital, Gondar | 2020 | 2016 | 2016 |
| Metaferia, Y. | Ethiopia | Eastern and Southern Africa | Hawassa University referral hospital, Hawassa | 2016 | 2015 | 2015 |
| Mhata, P | Namibia | Eastern and Southern Africa | Erong, Khomas, Ohangwena, Omusati, Oshana, Oshikoto and Zambezi regions | 2017 | 2013 | 2013 |
| Mugabiirwe, N. | Uganda | Eastern and Southern Africa | Kyazanga HCIV Antenatal Clinic, Lwengo District | 2022 | 2021 | 2021 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mustapha, G.U. | Nigeria | West Africa | Primary Health Centres (PHCs) of Gamawa LGA, Bauchi State | 2020 | 2018 | 2018 |
| Mutagoma, M. | Rwanda | Eastern and Southern Africa | Rwanda (National Study) | 2017 | 2011 | 2011 |
| Ngaira, J.A. | Kenya | Eastern and Southern Africa | Mbagathi District Hospital | 2016 | 2014 | 2014 |
| Nguyen, A. | Mozambique | Eastern and Southern Africa | Chamanculo General Hospital, Maputo City | 2019 | 2017 | 2019 |
| Nlinwe, NO. | Cameroon | Central Africa | Bamenda Regional Hospital, Mezam I Sub Division | 2021 | 2020 | 2020 |
| Oliveira, D. | Angola | Central Africa | Irene Neto Maternity of Lubango city | 2020 | 2016 | 2017 |
| Oluremi, AS. | Nigeria | West Africa | Adeoyo Maternity Teaching Hospital Ibadan, Oyo State | 2020 | 2019 | 2019 |
| Osazuwa, F | Nigeria | West Africa | ANC of Abaji General Hospital, Abaji | 2012 | 2010 | 2011 |
| Peliganga, L | Angola | Central Africa | Hospital Geral do Bie, Kuito, Luanda | 2022 | 2007 | 2007 |
| Rashid, S., C. | United Republic of Tanzania | Eastern and Southern Africa | Muhimbili National Hospital, Dar es Salaam | 2014 | 2010 | 2010 |
| Roble, A.K. | Ethiopia | Eastern and Southern Africa | Jigjiga University Sheik Hassen Bare Referral Hospital<br>Karamara Hospital<br>Jigjiga Health Centre | 2020 | 2019 | 2019 |
| Shimakawa, Y. | Cameroon | Central Africa | Tokombere District Hospital, Tokombere District | 2022 | 2009 | 2016 |
| Tamandjou, C., S | Namibia | Eastern and Southern Africa | Antenatal clinics in Windhoek, Namibia | 2019 | NA | NA |
| Tanjong, R.E. | Cameroon | Central Africa | Buea Health District Antenatal Clinics | 2016 | 2010 | 2010 |
| Tegegne, D | Ethiopia | Eastern and Southern Africa | St. Paul's Hospital Millenium Medical College and Selam Health Centre, Addis Ababa | 2014 | 2012 | 2012 |
| Thomson P | Democratic Republic of the Congo | Central Africa | Binza and Kingasani Maternity Centres, Kinshasa | 2021 | 2018 | 2019 |
| Thumbiran, N. | South Africa | Eastern and Southern Africa | KwaZulu-Natal Region | 2014 | 2009 | 2009 |
| Torimiro, J.N. | Cameroon | Central Africa | Yaounde, Cameroon | 2018 | 2011 | 2015 |
| Umare, A. | Ethiopia | Eastern and Southern Africa | Referral hospital, Deder, Eastern Ethiopia | 2016 | 2015 | 2015 |

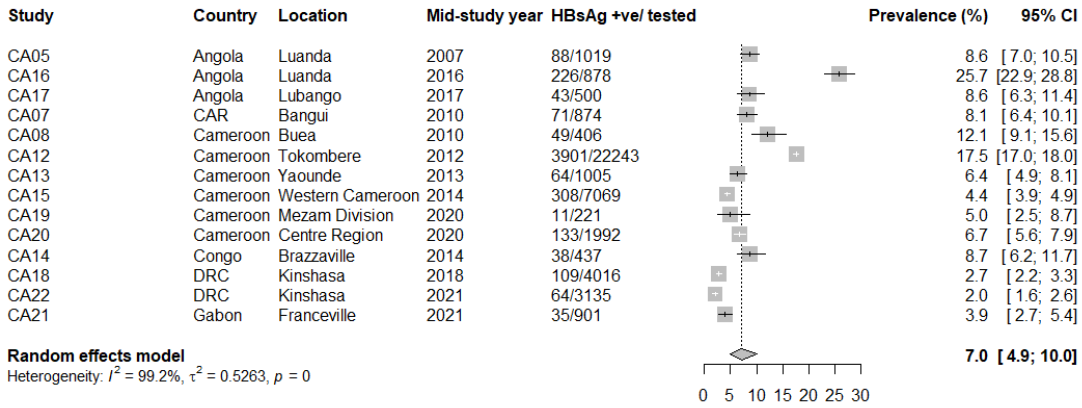
| | | | | | | |
|---|---|---|---|---|---|---|
| Utoo, B2 | Nigeria | West Africa | Sacred Heart Hopsital, Obudu, South Nigeria | 2013 | 2010 | 2010 |
| Vueba, A. N. | Angola | Central Africa | Lucrecia Palm Maternity Hospital, Luanda | 2021 | 2016 | 2017 |
| Volker, F., P. | Ghana | West Africa | Pregnant women from the Jomoro, Nzema East Municipal, Ahanta West, and Ellembelle district (Western Region of Ghana) | 2017 | 2011 | 2012 |
| Wakjira, M. | Ethiopia | Eastern and Southern Africa | Ambo town | 2022 | 2019 | 2019 |
| Woldesonbet, Z | Ethiopia | Eastern and Southern Africa | Addis Ababa | 2016 | 2014 | 2014 |
| Woldesonbet, Z.D. | Ethiopia | Eastern and Southern Africa | Bishoftu Hospital | 2016 | 2014 | 2014 |
| Yohanes, T. | Ethiopia | Eastern and Southern Africa | Arba Minch Hospital, Arba Minch Town | 2016 | 2015 | 2015 |
| Zenebe, Y. | Ethiopia | Eastern and Southern Africa | Bahir Dar City referral hospital and three randomly selected health centres, Amhara National Regional State | 2014 | 2013 | 2013 |

**S11 Appendix. Forest plot of HBsAg prevalence in pregnant women by WHO Africa sub-region** Surveys taken from the 2014-2023 dataset and results stratified by WHO sub-region; [A] Eastern and Southern Africa; [B] Central Africa and [C] West Africa. Pooled estimates are from a binomial mixed model.

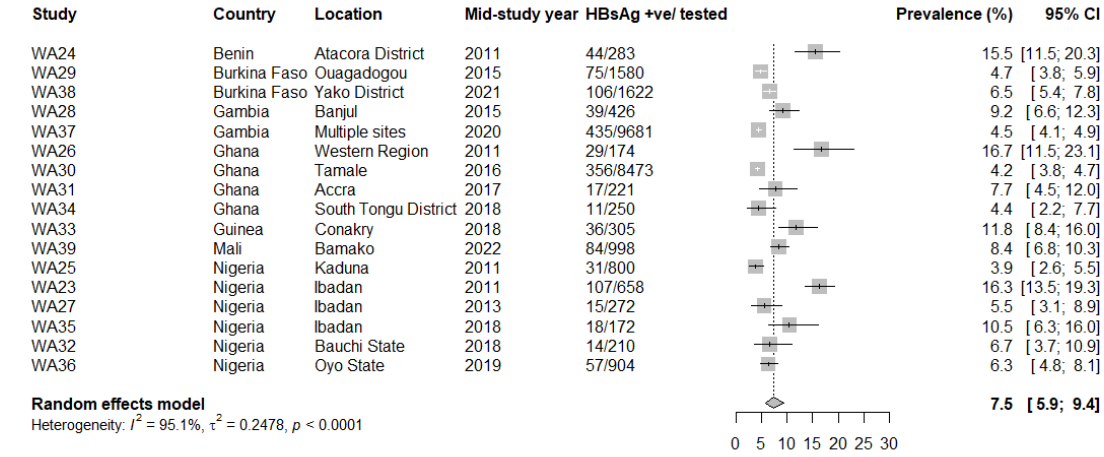
**A: Eastern and Southern Africa**



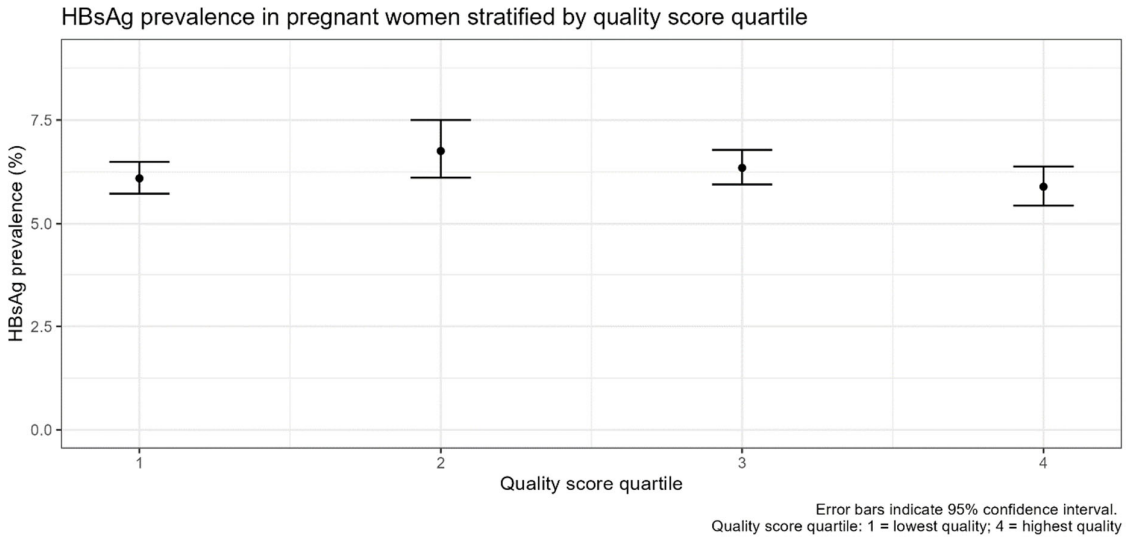

**B: Central Africa**




## C: West Africa



## S12 Appendix. Plot of HBsAg prevalence stratified by quality score quartile

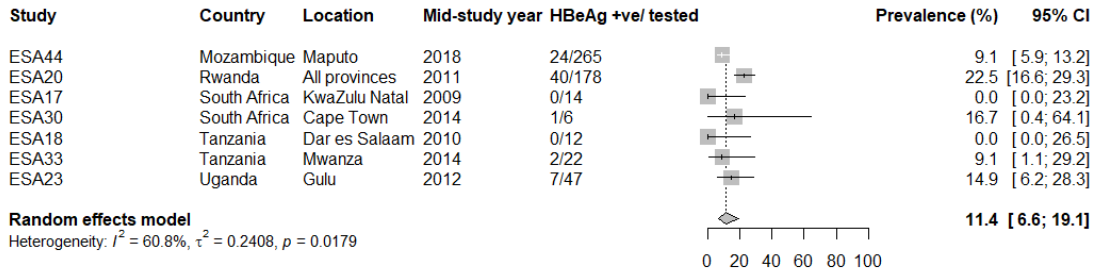


**S13 Appendix. Meta-regression of characteristics associated with HBsAg prevalence in pregnant women attending for antenatal care**

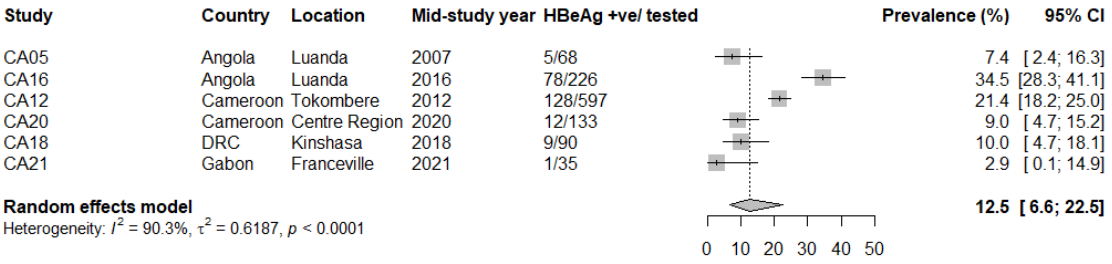
| | Univariate | | Multivariable | |
|---|---|---|---|---|
| **Characteristic** | **Odds ratio (95% CI)** | **p-value** | **Odds ratio (95% CI)** | **p-value** |
| **WHO region** | | | | |
| Eastern and Southern Africa | Reference | - | Reference | - |
| Central Africa | 1·78 (1·27-2·49) | <0·001 | 1·76 (1·27-2·45) | <0·001 |
| West Africa | 1·74 (1·33-2·29) | <0·001 | 1·61 (1·23-2·10) | <0·001 |
| **Test type** | | | | |
| ELISA/EIA - 78 studies | Reference | - | Reference | - |
| CLIA - 5 studies | 0·46 (0·24-0·88) | 0·020 | 0·68 (0·37-1·25) | 0·20 |
| RDT - 30 studies | 0·76 (0·57-1·02) | 0·071 | 0·85 (0·63-1·13) | 0·30 |
| **Interval from vaccine introduction to study start date (per 1 year increase)** | 0·98 (0·96-0·99) | <0·001 | 0·98 (0·97-1·00) | 0·010 |

## S14 Appendix. Forest plot of HBeAg prevalence in pregnant women, stratified by WHO Africa sub-region

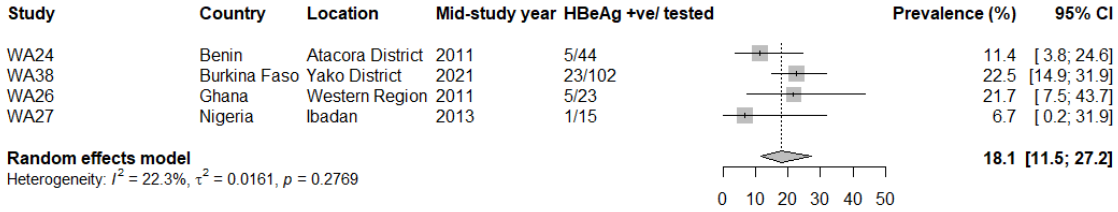
### A: Eastern and Southern Africa




### B: Central Africa




### C: West Africa



## S15 Appendix: Characteristics of included samples assessing mother to child transmission, stratified by vaccine status

| | Vaccine status assessed | | | | |
|---|---|---|---|---|---|
| **Characteristic** | **Birth dose (Hep-BD) within 24 hours** | **Delayed birth dose (>24 hours and <1 week)** | **Hep-B3 (without birth dose)** | **No HBV vaccine** | **Overall** |
| **Number of samples** | 7 | 4 | 5 | 6 | 22 |
| **Countries included** | Cameroon , DRC, Ethiopia, Gambia, Ivory Coast, Mozambique, South Africa | Cameroon, DRC, Gambia | DRC, Ethiopia, Gambia, Ivory Coast, Mozambique | Ethiopia, Gambia, Mozambique, Senegal, Tanzania | |
| **Total number of pregnant women tested for HBsAg** | 558 | 62 | 250 | 410 | 1280 |
| **Total number of infants testing positive for HBsAg** | 16 (2·9%) | 4 (6.5%) | 20 (8·0%) | 109 (26·6%) | 149 (11·6%) |
| **Number of mother-infant pairs tested per study** (median; IQR) | 74 (41-121) | 13 (7-22) | 35(4-81) | 39 (23-53) | 37 (11-79) |
| **Infant age (months) when tested** (median; IQR) | 8·0 (6·3-9·0) | 6.0 (6.0-7.5) | 9·0 (6·0-9·0) | 7·0 (6·0-8·8) | 8·0 (6·0-9·0) |

## S16 Appendix. Details of included MTCT studies

| Title | Country | Vaccine subgroup | start_dt (mm/yyy) | stop_dt (mm/yyyy) | Age at infant testing (months) | HBsAg test type (infant) | HBsAg test type (mother) | HBsAg +ve infants | No. infants tested | HIV prevalence (mothers) n/N | HBeAg prevalence (mothers) | Provision of maternal antivirals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Arefaine, M. (2023)** | Ethiopia | Birth dose | 01/2019 | 05/2021 | 9 | ELISA/EIA | Not reported | 5 | 139 | Not reported | Not reported | Not reported |
| **Arefaine, M. (2023)** | Ethiopia | HepB3 (not BD) | 01/2019 | 05/2021 | 9 | ELISA/EIA | Not reported | 9 | 35 | Not reported | Not reported | Not reported |
| **Bayu, H. (2020)** | Ethiopia | No vaccine | 01/2018 | 09/2019 | 9 | ELISA/EIA | Not reported | 95 | 249 | 55/401 in underlying sample | Not reported | 54/271 |
| **Chotun, N. (2017)** | South Africa | Birth dose | 06/2014 | 11/2014 | 7 | RDT | RDT | 0 | 4 | 0/4 | 1/4 | 2/4 |
| **Ekra, D. (2008)** | Ivory Coast | Birth dose | 01/2001 | 09/2002 | 9 | ELISA/EIA | ELISA/EIA | 9 | 156 | Not reported | 24/156 | 0/156 |
| **Ekra, D. (2008)** | Ivory Coast | HepB3 (not BD) | 01/2001 | 09/2002 | 9 | ELISA/EIA | ELISA/EIA | 10 | 129 | Not reported | 17/129 | 0/129 |
| **Kibassa, C. (2004)** | Tanzania | No vaccine | 01/2001 | 09/2002 | 6 | ELISA/EIA | ELISA/EIA | 6 | 51 | Not reported | Not reported | Not reported |
| **Loarec, A. (2022)** | Mozambique | Birth dose | 11/2017 | 09/2019 | 9 | Not reported | RDT | 0 | 103 | 98/270 in underlying sample | 24/265 in underlying sample | 36/103 |
| **Loarec, A. (2022)** | Mozambique | Delayed birth dose | 11/2017 | 09/2019 | 9 | Not reported | RDT | 1 | 3 | 98/270 in underlying sample | 24/265 in underlying sample | 1/3 |

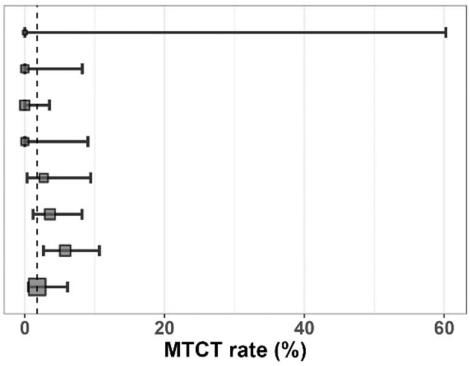
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Loarec, A. (2022)** | Mozambique | HepB3 (not BD) | 11/2017 | 09/2019 | 9 | Not reported | Not reported | 0 | 1 | 98/270 in underlying sample | 24/265 in underlying sample | 102/270 in underlying sample |
| **Loarec, A. (2022)** | Mozambique | No vaccine | 11/2017 | 09/2019 | 9 | Not reported | Not reported | 0 | 27 | 98/270 in underlying sample | 24/265 in underlying sample | 10/27 |
| **Menendez, C. (1999)** | Tanzania | No vaccine | 01/1995 | 10/1995 | 8 | ELISA/EIA | ELISA/EIA | 4 | 53 | Not reported | 12/62 | Not reported |
| **Ndow, G. (2023)** | Gambia | Birth dose | 2020 | 2022 | 6 | Not reported | RDT | 2 | 74 | Not reported | 2/60 | Not reported |
| **Ndow, G. (2023)** | Gambia | Delayed birth dose | 2020 | 2022 | 6 | Not reported | RDT | 2 | 33 | Not reported | 7/103 | Not reported |
| **Ndow, G. (2023)** | Gambia | HepB3 (not BD) | 2020 | 2022 | 6 | Not reported | RDT | 1 | 81 | Not reported | 7/103 | Not reported |
| **Ndow, G. Senegal** | Gambia | No vaccine | 2020 | 2022 | 6 | Not reported | RDT | 1 | 9 | Not reported | Not reported | Not reported |
| **Roingeard (1993)** | Senegal | No vaccine | NR | NR | 6 | ELISA/EIA | ELISA/EIA | 3 | 21 | Not reported | Not reported | Not reported |
| **Shimakawa, Y. (2022) Cameroon** | Cameroon | Delayed birth dose | 01/2009 | 12/2016 | 7-12m | ELISA/EIA | ELISA/EIA | 1 | 18 | 1/605 in underlying sample | 128/597 in underlying sample | Not reported |
| **Shimakawa, Y. (2022) Cameroon** | Cameroon | Birth dose | 01/2009 | 12/2016 | 7-12m | ELISA/EIA | ELISA/EIA | 0 | 43 | 1/605 in underlying sample | 128/597 underlying sample | Not reported |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thompson, P. (2021) Democratic Republic of Congo** | DRC | Birth dose | 09/2018 | 02/2019 | 6 | RDT | RDT | 0 | 39 | 1/90 in underlying sample | 10/90 in underlying sample | 7/53 in underlying sample |
| **Thompson, P. (2021) Democratic Republic of Congo** | DRC | Delayed birth dose | 09/2018 | 02/2019 | 6 | RDT | RDT | 0 | 8 | 1/90 in underlying sample | 10/90 in underlying sample | 7/53 in underlying sample |
| **Thompson, P. (2021) Democratic Republic of Congo** | DRC | HepB3 (not BD) | 09/2018 | 02/2019 | 6 | RDT | RDT | 0 | 4 | 1/90 in underlying sample | 10/90 in underlying sample | 7/53 in underlying sample |

**S17 Appendix. Forest plot of mother to child transmission rate, stratified by intervention sub-groups: [A] Birth dose; [B] Delayed birth dose; [C] HepB3 without a birth dose; [D] No vaccination; [E] Received maternal antiviral prophylaxis**

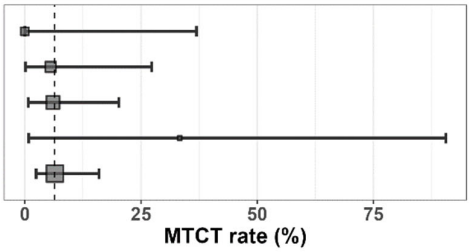
### [A] Birth dose (HEP-BD)

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| ESA30 | 2017 | South Africa | 0/4 | 0.0 (0.0-60.2) |
| CA12 | 2022 | Cameroon | 0/43 | 0.0 (0.0-8.2) |
| ESA44 | 2022 | Mozambique | 0/103 | 0.0 (0.0-3.5) |
| CA18 | 2021 | DRC | 0/39 | 0.0 (0.0-9.0) |
| WA37 | 2023 | Senegal | 2/74 | 2.7 (0.3-9.4) |
| ESA49 | 2023 | Ethiopia | 5/139 | 3.6 (1.2-8.2) |
| WA09 | 2008 | Ivory Coast | 9/156 | 5.8 (2.7-10.7) |
| **Random effects model** | | | | **1.8 (0.5-6.1)** |



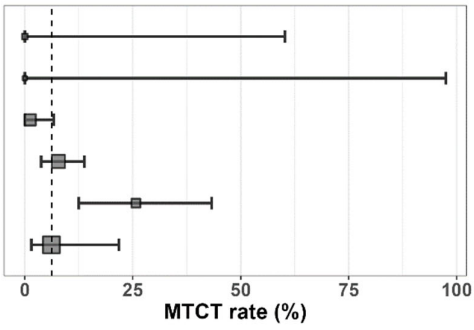

### [B] Delayed birth dose

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| CA18 | 2021 | DRC | 0/8 | 0.0 (0.0-36.9) |
| CA12 | 2022 | Cameroon | 1/18 | 5.6 (0.1-27.3) |
| WA37 | 2023 | Senegal | 2/33 | 6.1 (0.7-20.2) |
| ESA44 | 2022 | Mozambique | 1/3 | 33.3 (0.8-90.6 |
| **Random effects model** | | | | **6.4 (2.4-16.0)** |



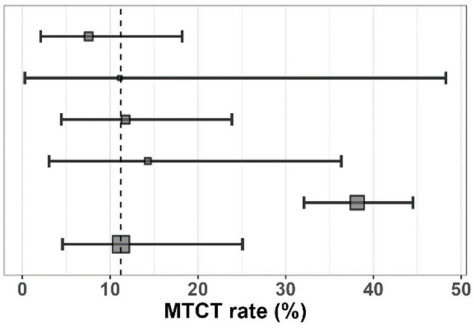

### [C] HEPB3 (not birth dose)

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| CA18 | 2021 | DRC | 0/4 | 0.0 (0.0-60.2) |
| ESA44 | 2022 | Mozambique | 0/1 | 0.0 (0.0-97.5) |
| WA37 | 2023 | Senegal | 1/81 | 1.2 (0.0-6.7) |
| WA09 | 2008 | Ivory Coast | 10/129 | 7.8 (3.8-13.8) |
| ESA49 | 2023 | Ethiopia | 9/35 | 25.7 (12.5-43.3) |
| **Random effects model** | | | | **6.2 (1.5-21.8)** |



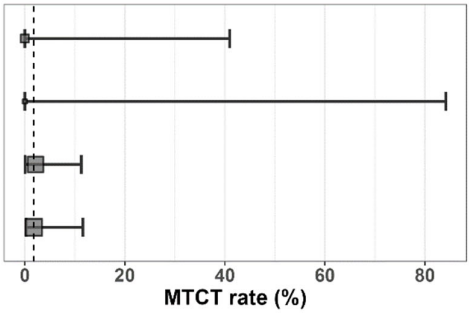
## [D] No HBV vaccination

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| ESA08 | 1999 | Tanzania | 4/53 | 7.5 (2.1-18.2) |
| WA37 | 2023 | Senegal | 1/9 | 11.1 (0.3-48.2) |
| ESA09 | 2004 | Tanzania | 6/51 | 11.8 (4.4-23.9) |
| WA40 | 1993 | Senegal | 3/21 | 14.3 (3.0-36.3) |
| ESA57 | 2020 | Ethiopia | 95/249 | 38.1 (32.1-44.5) |
| **Random effects model** | | | | **11.2 (4.6-25.1)** |




## [E] Maternal antiviral therapy

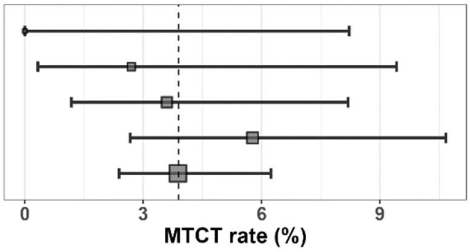
| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| CA18 | 2021 | DR Congo | 0/7 | 0.0 (0.0-41.0) |
| ESA30 | 2017 | South Africa | 0/2 | 0.0 (0.0-84.2) |
| ESA44 | 2022 | Mozambique | 1/47 | 2.1 (0.1-11.3) |
| **Random effects model** | | | | **1.8 (0.3-11.6)** |



**S18 Appendix. Mother to child transmission stratified by vaccination subgroups, excluding cohorts which offered maternal antiviral prophylaxis: [A] Birth dose; [B] Delayed birth dose; [C] HepB3 without a birth dose; [D] No vaccination**

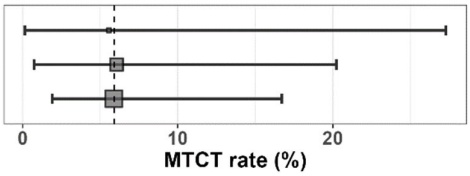
**[A] Birth dose (HEP-BD), excluding cohorts with maternal antiviral prophylaxis**

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| CA12 | 2022 | Cameroon | 0/43 | 0.0 (0.0-8.2) |
| WA37 | 2023 | Senegal | 2/74 | 2.7 (0.3-9.4) |
| ESA49 | 2023 | Ethiopia | 5/139 | 3.6 (1.2-8.2) |
| WA09 | 2008 | Ivory Coast | 9/156 | 5.8 (2.7-10.7) |
| **Random effects model** | | | | **3.9 (2.4-6.2)** |



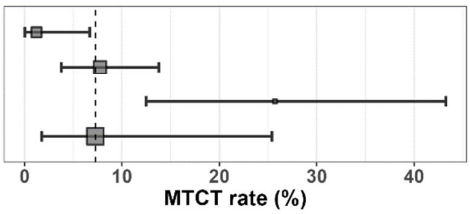

**[B] Delayed birth dose, excluding cohorts with maternal antiviral prophylaxis**

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| CA12 | 2022 | Cameroon | 1/18 | 5.6 (0.1-27.3) |
| WA37 | 2023 | Senegal | 2/33 | 6.1 (0.7-20.2) |
| **Random effects model** | | | | **5.9 (1.9-16.7)** |




**[C] HEPB3 (not birth dose), excluding cohorts with maternal antiviral therapy**

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| WA37 | 2023 | Senegal | 1/81 | 1.2 (0.0-6.7) |
| WA09 | 2008 | Ivory Coast | 10/129 | 7.8 (3.8-13.8) |
| ESA49 | 2023 | Ethiopia | 9/35 | 25.7 (12.5-43.3) |
| **Random effects model** | | | | **7.3 (1.8-25.4)** |




**[D] No HBV vaccination, excluding cohorts with maternal antiviral therapy**

| Study | Publication year | Country | +ve infants / total tested | Transmission (95% CI) |
|---|---|---|---|---|
| ESA08 | 1999 | Tanzania | 4/53 | 7.5 (2.1-18.2) |
| WA37 | 2023 | Senegal | 1/9 | 11.1 (0.3-48.2) |
| ESA09 | 2004 | Tanzania | 6/51 | 11.8 (4.4-23.9) |
| WA40 | 1993 | Senegal | 3/21 | 14.3 (3.0-36.3) |
| ESA57 | 2020 | Ethiopia | 95/249 | 38.1 (32.1-44.5) |
| **Random effects model** | | | | **15.5 (7.5-29.4)** |