



XVIII CURSO EN AVANCES  
EN INFECCIÓN VIH  
Y HEPATITIS VIRALES

# Salud Global, Emergencias Sanitarias y Enfermedades Infecciosas en Países con escasos recursos

*Experiencia en terreno*

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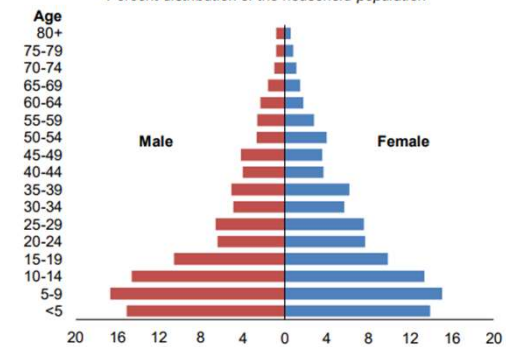
Vigo, 26 Enero 2024

# CONTEXTO

- 7 millones población (49.5% M, 50.5%H)

- 42.4% edad 0-14
- 53.2% edad 15-59
- 4.4% edad 60+
- 0.2 edad 80+

Figure 2.5 Population pyramid  
Percent distribution of the household population



- 40% urbana, 60% rural
- Esperanza de vida total (2016): 52 años
- Mortalidad, niños <5 años (por cada 1,000 nacimientos) (2016): 114



# Programas Enfermedades Infecciosas

- Malaria
- VIH
- Tuberculosis
- TB MULTIRRESISTENT
- Hepatitis B
- Ebola Virus Disease (EVD)

# MALARIA

Figure 3: Under Five mortality for malaria

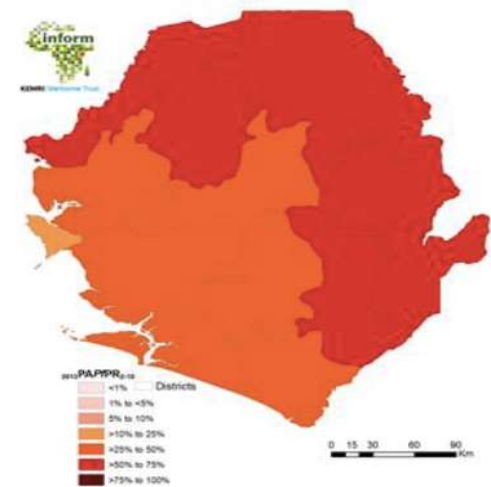
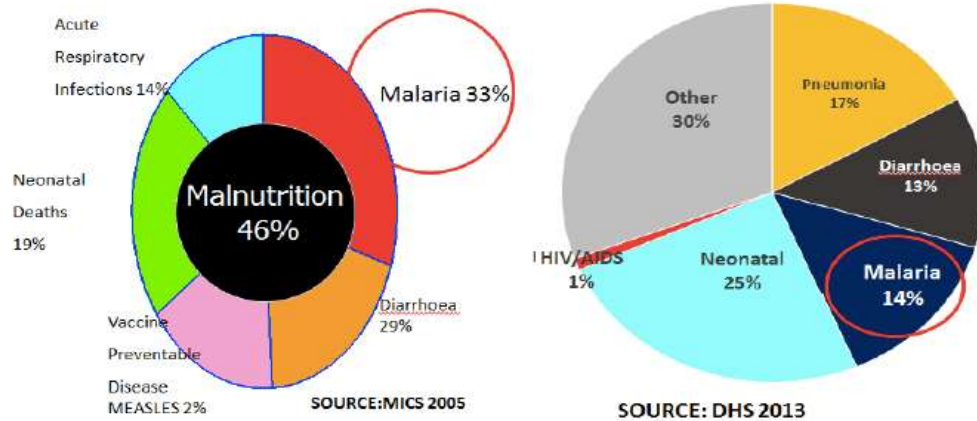
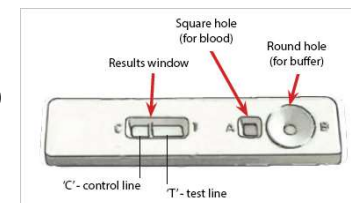


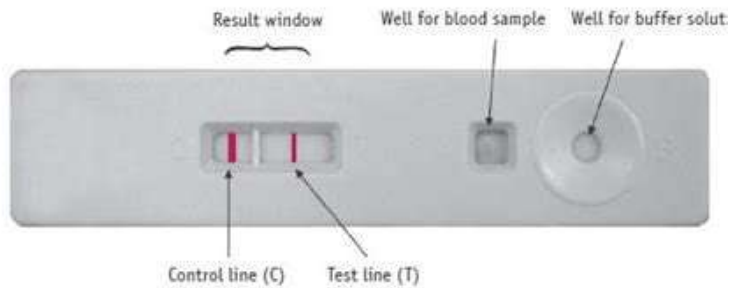
Figure 12b: Map of the population-adjusted *Plasmodium falciparum* parasite rate among children 2-10 years of age (PAPfPR<sub>2-10</sub>) by district in 2013

- 43% de los niños < 5 años tienen parasitemia positiva para malaria
- 51.1% de los niños sospechosos de malaria reciben un test diagnóstico
- 96.5% de los niños diagnosticados de malaria reciben tratamiento apropiado
- Malaria es la causa #1 de mortalidad infantil prematura
- 1 de cada 3 muertes en niños <5 años es atribuible a malaria

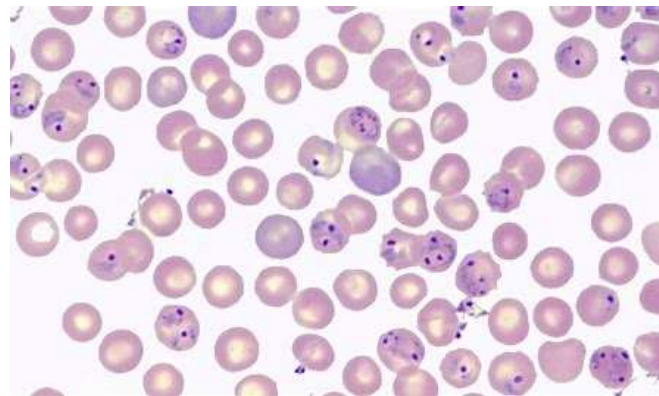


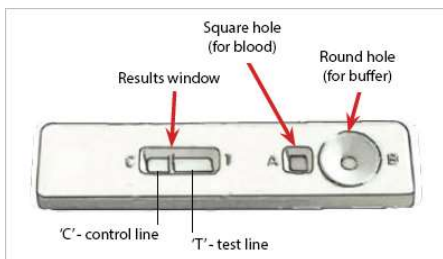
# MALARIA DIAGNOSTICO: TEST RAPIDOS Y MICROSCOPIA (Gota fina y gota gruesa)

e 1. Typical RDT for Malaria Diagnosis



e: Good practices for selecting and procuring rapid diagnostic tests for malaria. Geneva: WHO; 20





# DIAGNOSIS AND MANAGEMENT OF MALARIA

Clinical Guidelines  
University of Sierra Leone Teaching Hospitals Complex  
Connaught Government Hospital

## TEST FOR MALARIA RDT ± BLOOD FILM

**POSITIVE**  
Exception: If severe symptoms / signs do not delay treatment whilst awaiting test

**NEGATIVE**

**NO TREATMENT**  
Exception: If blood film negative and recent / incomplete treatment

### UNCOMPLICATED MALARIA

### SEVERE MALARIA\* or vomiting

**MANAGEMENT**  
**Oral Artemether-Lumefantrine (AL) 80/480mg Twice daily for 3 days**  
If unable to tolerate AL, then consider **artesunate plus amodiaquine (AS+AQ) 100/270mg as alternative**  
If 1<sup>st</sup> trimester → oral quinine + clindamycin

**MANAGEMENT**  
**Give Artesunate 2.4mg /kg IV/IM at 0,12,24 hrs**  
Continue once daily until no severe signs present & tolerating oral  
Patient **MUST** complete treatment with 3 days oral artemether-lumefantrine  
If artesunate not available consider Artemether 3.2mg/kg IM stat, then 1.6mg/kg daily until tolerates oral, then 3 days oral treatment  
Ensure you address **ALL** the severity symptoms:  
**A** Maintain airway  
**B** Give oxygen to maintain SpO<sub>2</sub>>95.  
**C** Give IL RL/DNS every 6-8 hourly  
**D** If GCS < 8 position patient on lateral side in recovery position  
Monitor for seizures and treat (*refer to seizure guideline*)  
Risk of hypoglycaemia – monitor glucose every 2-4 hourly  
**E** Regular antipyretics, check for bleeding, jaundice, poor urine output  
Check FBC, LFTs, U&Es - Transfuse If Hb < 7g/dl  
Insert urinary catheter  
Consider concomitant bacterial infections in particular pneumonia and bacterial meningitis and treat accordingly (*refer to antimicrobial guidelines*)

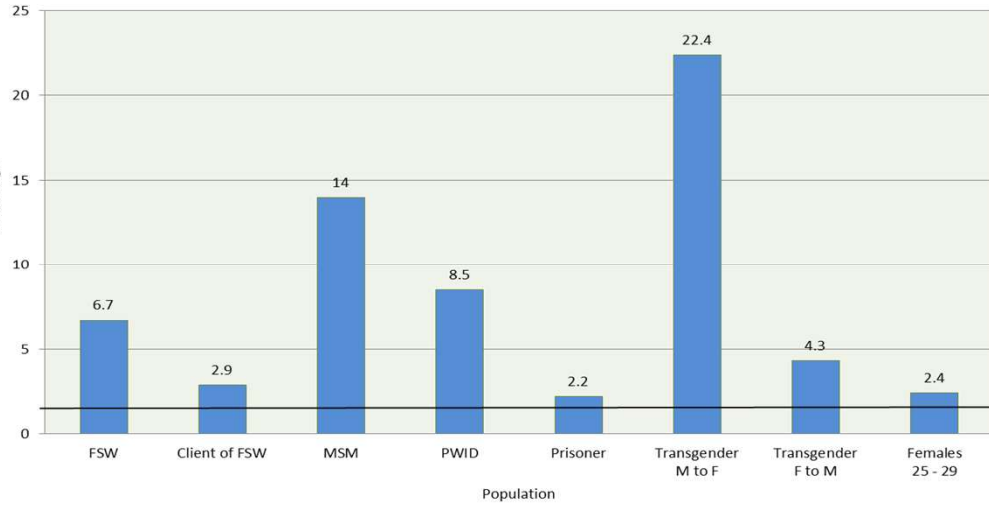
**\*\*TREATMENT FAILURE**  
If fever > 3 days after starting treatment and parasitemia present OR if incomplete recent treatment please use the following:  
**Failure within 28 days** - If 1<sup>st</sup> treatment AL then give artesunate plus amodiaquine (AS+AQ).  
If AS+AQ used as 1<sup>st</sup> line then give AL.  
**Failure after 28 days** -Treat as new infection with AL

### \* **Assessing severity: Severe if any (one or more) of the following**

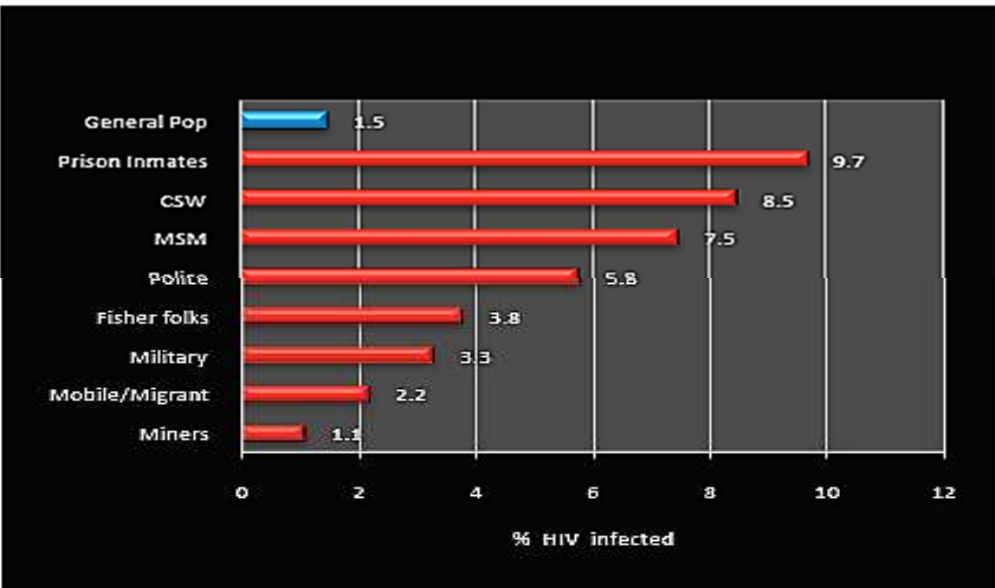
Prostration	Unable to sit/stand/walk without help due to weakness
Convulsions	> 2 fits in 24 hrs
Impaired consciousness	GCS < 11
Hypoglycaemia	Blood glucose <2.2mmol (<40mg/dL)
Pulmonary oedema	SpO <sub>2</sub> <92% & RR >30 on air with crepitations on auscultation, or xray
Bleeding	Recurrent/prolonged from nose/gums, haematemesis/melaena, venepuncture
Severe anaemia	Hb <7g/dL or Hct <20% & parasite count >0.2% or 10,000/μL
Renal impairment	Creatinine >265μmol/L (3 mg/dL) or Urea > 20mmol/L
Jaundice	Bilirubin > 50 μmol/L (3 mg/dL) & parasite count >2% or 100 000/μL
Acidosis	Base deficit > 8mEq/L; Bicarbonate < 15mmol/L or Venous lactate ≥ 5mmol/L Clinically: respiratory distress
Shock	Compensated: capillary refill ≥ 3s or leg temperature gradient, but normal BP Decompensated: syst BP <90 mmHg + cool peripheries/prolonged capillary refill
Parasitaemia	Greater than 10% or 500.000/μL

# VIH

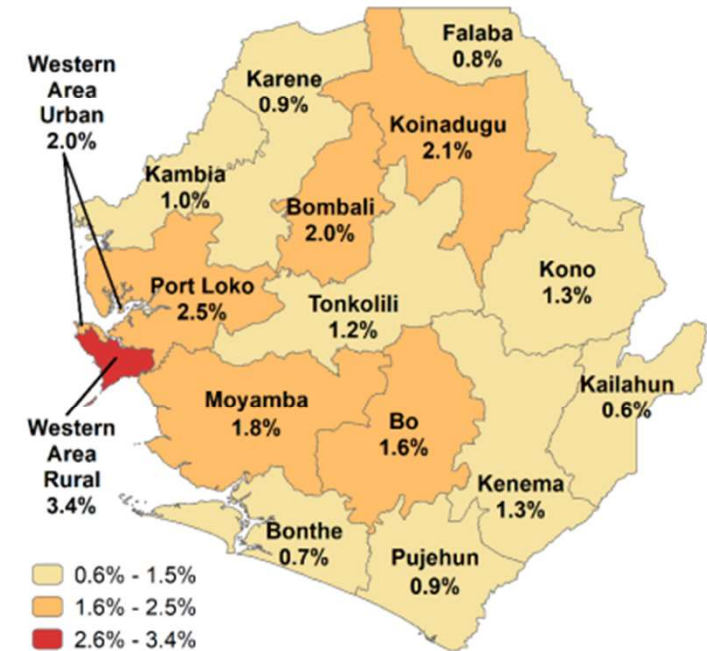
HIV prevalence among key populations



Últimas 1,000 VIH nuevas infecciones



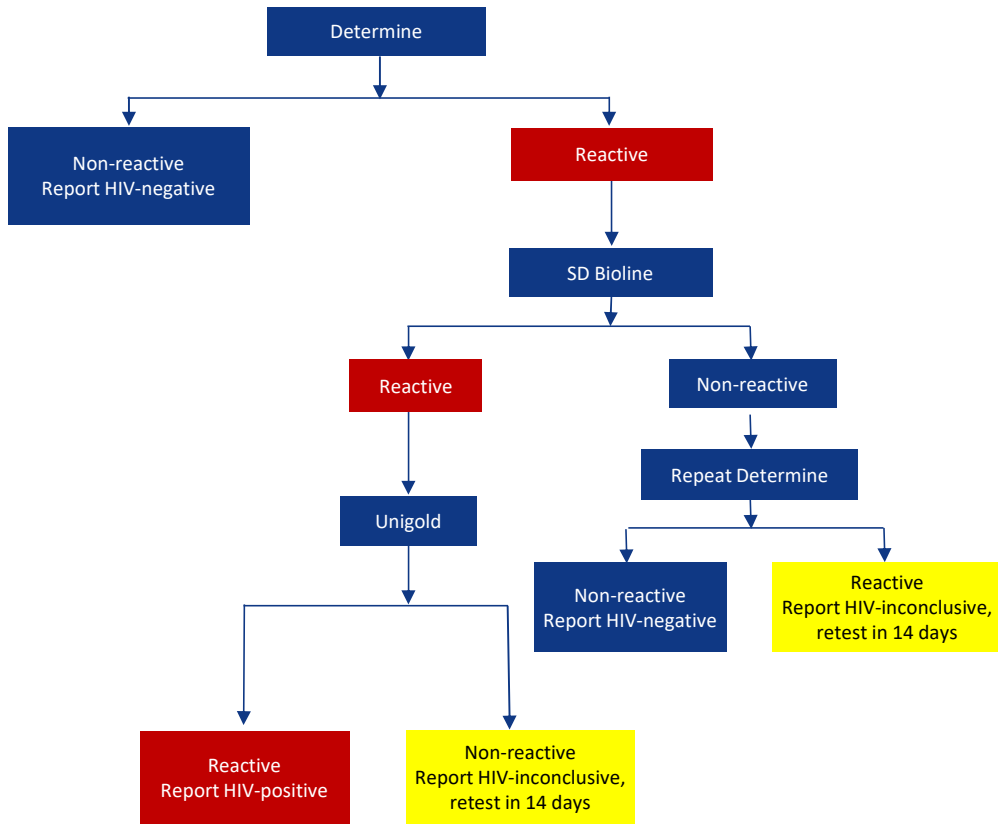
**Figure 13.4 HIV prevalence by district**  
Percentage of women and men age 15-49 who are HIV positive



DHS 2019 Sierra Leone  
[www.dhsprogram.com/publications/publication-fr365-dhs-final-reports.cfm?cssearch=395065\\_1](http://www.dhsprogram.com/publications/publication-fr365-dhs-final-reports.cfm?cssearch=395065_1)

Sierra Leona 2022,  
Estimación de adultos y niños viviendo con VIH  
77,000 [65,000-90,000]  
Estimación de gente viviendo con VIH en ART  
58,000 (76%)  
Fuente: UNAIDS, AIDS Info

# TEST RAPIDO VIH



Determine



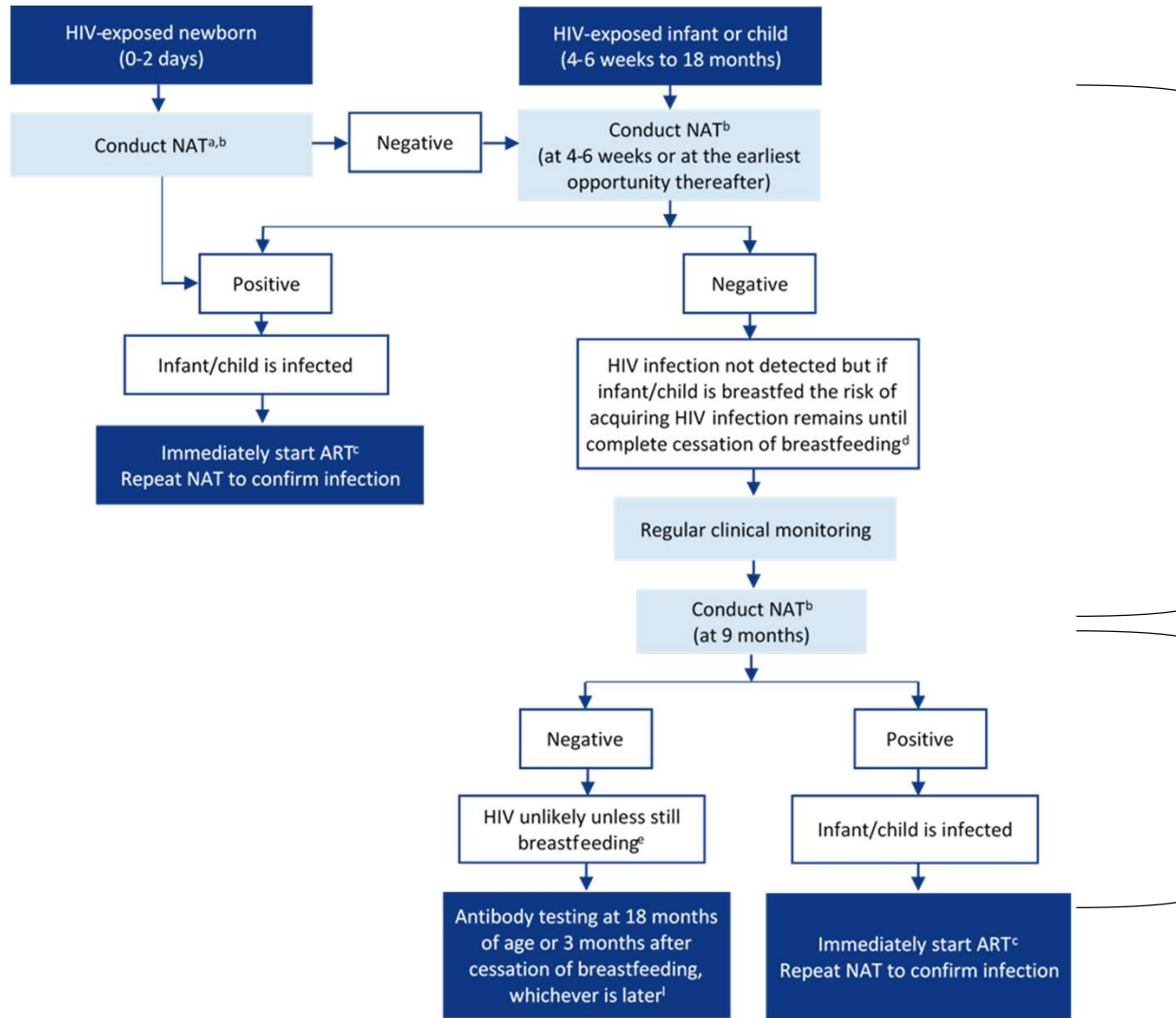
SD Bioline



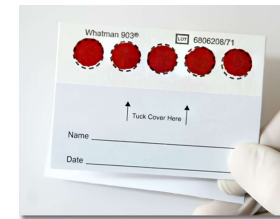
Unigold



# DIAGNOSTICO VIH infantil SL



<18 meses



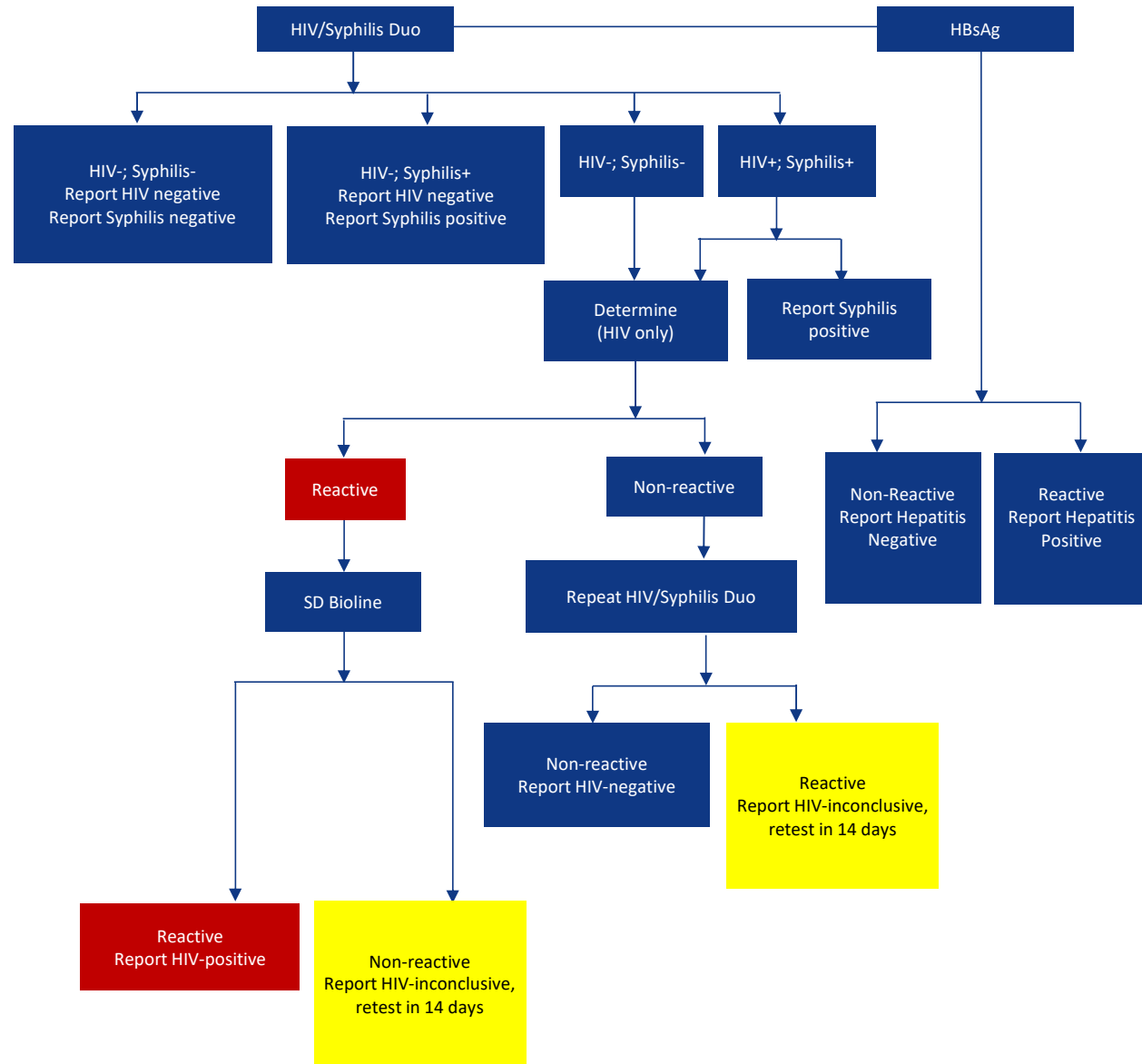
Blood spot test  
DBT



>18 meses



# Protocolo en mujeres embarazadas



# PROCOLO EMBARAZO (VIH y Sifilis)

## SD BIO DUO



Test pouch  
(Test Device)



Alcohol swab  
(06FK35 Only)



Lancet  
(06FK35 Only)



Disposable capillary  
pipette (20ul)  
(06FK35 Only)



Assay  
Diluents



Timer  
(Not Provided)



Disposable Gloves  
(Not Provided)



### Interpretation

#### POSITIVE

The presence of two or three bands (including "C-line") the patient is positive for HIV-1/2 and Syphilis as shown below. (Test is positive even if the test lines are faint.)

#### HIV 1/2 Positive



#### Syphilis Positive

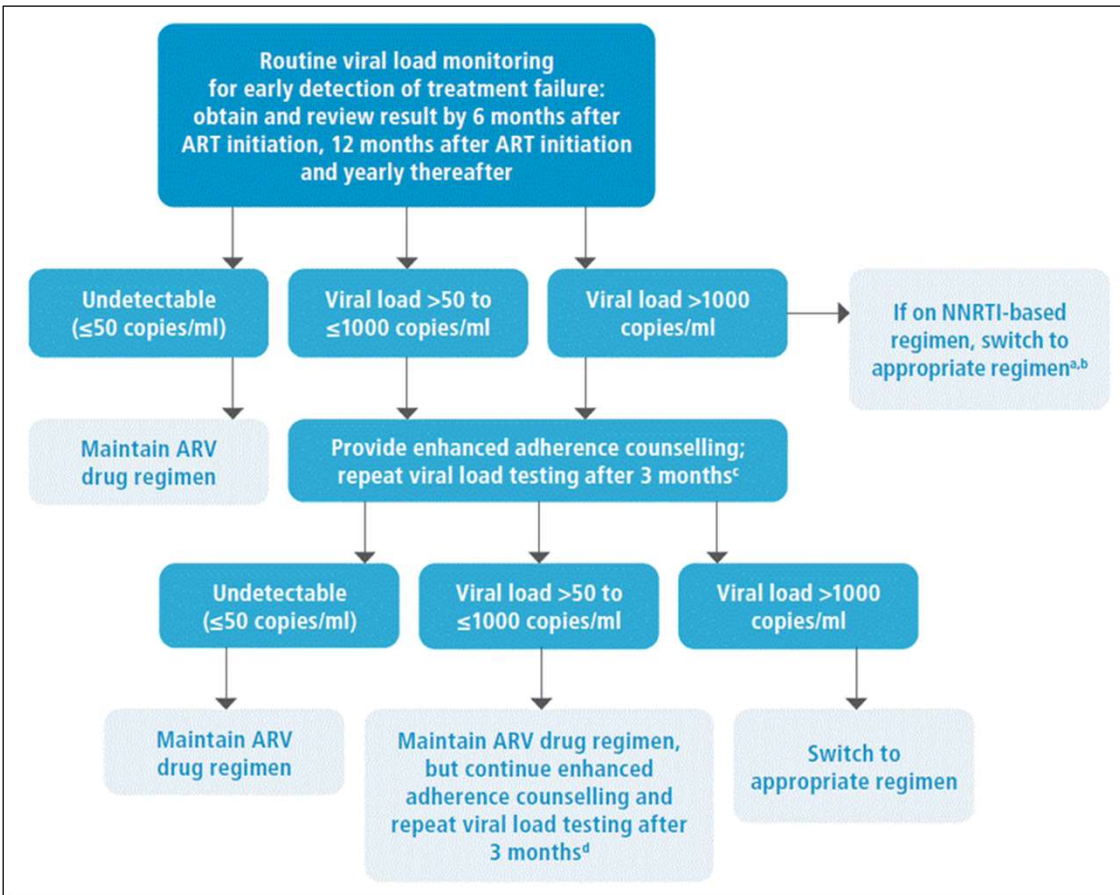


#### Mixed infection of HIV 1/2 and Syphilis



# SEGUIMIENTO VIH

## Carga Viral VIH



## Contaje Linfocitos CD4



# Primera línea de ART para Adultos, adolescentes, embarazadas, mujeres lactantes, infantes y neonatos

Populations	Preferred first-line regimen	Alternative first-line regimen	Special circumstances
Adults and adolescents	TDF + 3TC (or FTC) + DTG	TDF + 3TC + EFV 400 mg	TDF + 3TC (or FTC) + EFV 400 mg AZT + 3TC + EFV 400 mg TDF + 3TC (or FTC) + LPV/r TDF + 3TC (or FTC) + RAL TAF + 3TC (or FTC) + DTG ABC + 3TC + DTG TDF + 3TC (or FTC) + ATV/r
Pregnant and breastfeeding women	TDF+3TC+DTG	TDF+3TC+EFV 400 mg	ABC + 3TC + DTG AZT + 3TC + DTG
Children	ABC + 3TC + DTG	ABC + 3TC + LPV/r TAF + 3TC (or FTC) +DTG	ABC + 3TC + EFV (or NVP) ABC + 3TC + RAL AZT + 3TC + EFV (or NVP) AZT + 3TC + LPV/r (or RAL)
Neonates	AZT (or ABC) + 3TC + RAL	AZT + 3TC + NVP	AZT + 3TC + LPV/r

**Note:** If you cannot use the preferred first-line or alternative first-line regimen, go to the special circumstances\*. **DTG 10 mg is approved for use among children older than 4 weeks and weighing more than 3 kg.** Children should be transitioned to DTG 50 mg when they weigh 20 kg and above. Infants should be transitioned to ABC/3TC/DTG (10 mg) when older than 4 weeks and weighing above 3 kg.

**When children on ABC-based first-line regimen are 10 years of age and weight 30 kg and above, ABC should be substituted with TDF.** The children who are not virally suppressed should be investigated for treatment failure and managed accordingly

# Segunda línea Adultos, adolescentes, infantes y neonatos

Populations	Failing first-line regimen	Preferred second-line regimen	Alternative second-line regimens
Adults and adolescents including pregnant and breastfeeding women	TDF + 3TC (or FTC) + DTG	AZT+ 3TC + ATV/r (or LPV/r)	AZT + 3TC + DRV/r
	TDF + 3TC (or FTC) + EFV (or NVP)	AZT +3TC + DTG	AZT + 3TC + ATV/r (or LPV/r or DRV/r)
	AZT + 3TC +EFV (or NVP)	TDF + 3TC (or FTC) + DTG	TDF + 3TC (or FTC) + ATV/r (or LPV/r or DRV/r)
Children and infants	ABC + 3TC + DTG	AZT+ 3TC + LPV/r (or ATV/r)	AZT +3TC + DRV/r
	ABC (or AZT) +3TC + LPV/r	AZT+ 3TC + LPV/r (or ATV/r)	AZT (or ABC) +3TC + RAL
	ABC (or AZT) + 3TC + EFV	AZT (or ABC) + 3TC + DTG	AZT (or ABC) +3TC + LPV/r (or ATV/r)
	AZT + 3TC + NVP	ABC + 3TC + DTG	ABC + 3TC + LPV/r (or ATV/r)

# Poblaciones especiales

Population	Failing first-line regimen	Preferred second-line regimen
HIV/Hepatitis B co-infection	TDF + 3TC + DTG*	TDF + 3TC + (ATV/r or LPV/r)
	TDF + 3TC + EFV	TDF + 3TC + DTG
HIV 2**	TDF + 3TC + DTG	AZT + 3TC + LPV/r TDF + 3TC + LPV/r

\*TDF should not be initiated in patients with eGFR <60 mL/min (patients with kidney disease). However, laboratory testing is not mandatory to initiate treatment with TDF if there is no reason to suspect renal dysfunction. Renal disease should be managed to by a doctor, or the most senior health personnel in the facility. Please refer appropriately.

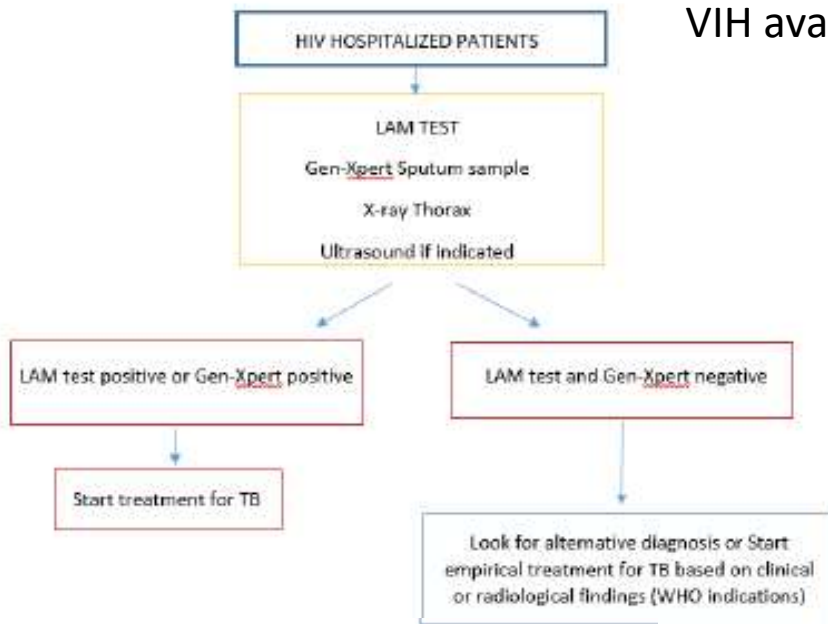
\*\* All HIV-2 and HIV1+2 should be confirmed, ideally at a higher-level health facility/laboratory (refer to HIV testing guidelines for additional guidance). For HIV1/HIV-2 dual infection, treat as HIV2. For further management refer to hepatitis guidelines.

# VIH- LAM TB

## DetECCIÓN Lipoarabinomano (LAM) en orina:

Para diagnóstico de pacientes VIH positivos con bajos CD4 o Enfermedad VIH avanzada con sospecha de TB diseminada.

Flow Chart of the study, Screening/diagnosis of TB



### TARGET PATIENT PROFILES

for Lateral Flow-LAM<sup>1</sup>



ALL HIV patients

symptomatic for TB  
irrespective of CD4 count



Cough



Fever



Weight  
loss



Night  
sweats



Inpatients

who have a CD4 cell  
count <200 cells/mm<sup>3</sup>  
seriously ill\* or Advanced  
HIV Disease (AHD)\*\*



Outpatients

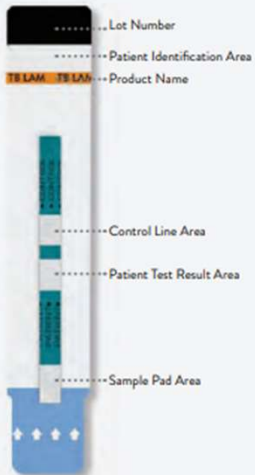
who have a CD4 cell  
count <100 cells/mm<sup>3</sup>  
or seriously ill or AHD

According to WHO guidelines children below the age of 5 are considered advanced HIV patients who are eligible for urine LAM testing.<sup>1</sup>

REFERENCE: 1. World Health Organization, 2021. WHO operational handbook on tuberculosis. Module 3: diagnosis—rapid diagnostics for tuberculosis detection 2021 update. Geneva, Switzerland: 2021.

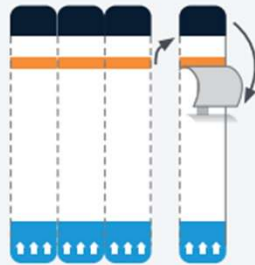


## Product Information

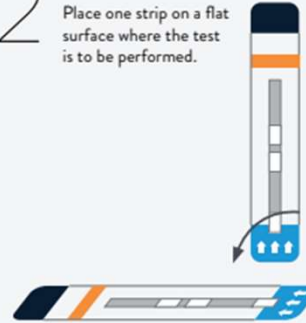


## Prepare & Perform

- 1 PREPARE TEST**  
Tear one strip from the right and remove cover.



- 2 PLACE TEST**  
Place one strip on a flat surface where the test is to be performed.



- 3 ADD SAMPLE**  
Apply 60 µL of urine to the sample pad.



**Caution:** Do not lift the capillary tube from the sample pad before all the urine has been transferred.

## Read Results

- 4 READ RESULTS**  
Wait 25 minutes and read the results.



- 5 CHECK RESULTS**



- 6 TEST RESULTS INTERPRETATION**

LINE	POSITIVE	NEGATIVE	INVALID
Control			
Patient			

# Infección oportunista por Criptococo

## CRIBADO:

- Todos los pacientes adultos infectados de HIV con CD4 <100 y considerar los que están entre 100–200 cel/mm<sup>3</sup>
- Todos los pacientes con HIV y estadio de WHO 3 o 4 (en ausencia de CD4)



Lakoh et al. *BMC Infectious Diseases* (2020) 20:141  
<https://doi.org/10.1186/s12879-020-4862-x>

BMC Infectious Diseases

RESEARCH ARTICLE

Open Access

Prevalence and mortality of cryptococcal disease in adults with advanced HIV in an urban tertiary hospital in Sierra Leone: a prospective study



Sulaiman Lakoh<sup>1,2\*†</sup>, Hannah Rickman<sup>3,4,5†</sup>, Momodu Sesay<sup>6</sup>, Sartie Kenneh<sup>2</sup>, Rachael Burke<sup>3,4,5</sup>, Mamadu Baldeh<sup>2</sup>, Darlinda F. Jiba<sup>2</sup>, Yusuf S. Tejan<sup>2</sup>, Sonia Boyle<sup>2</sup>, Comfort Koroma<sup>2</sup>, Gibrilla F. Deen<sup>1,2</sup> and Fenella Beynon<sup>3,4,5</sup>

*Un estudio prospectivo sobre enfermedades criptocócicas en el Hospital Connaught reveló que la mortalidad asociada a la meningitis criptocócica (MC) era de aproximadamente el 62,5% tras 28 días de seguimiento. Los pacientes con un recuento de células CD4 <100 presentaban el mayor riesgo de MC. También se demostró que la prevalencia de la antigenemia criptocócica era del 4,7% entre las personas con VIH con un recuento de CD4 <100 células/mm<sup>3</sup> en Sierra Leona.*

# Protocolo enfermedad criptococica

- **CrAg en suero positivo-** examen físico neurológico y punción lumbar +CrAg en LCR.
- LCR CrAg negativo- Terapia preventiva

Induction Phase	Consolidation Phase	Maintenance Phase
Fluconazole 800mg/day for 2 weeks or 12 mg /kg/day for children and adolescents	Fluconazole 400 mg (or 6 mg/kg/day up to 400mg) for 8 weeks	Fluconazole 200 mg/day until CD4 is above 200

- LCR CrAg positivo- Tratamiento de Meningitis criptococica

## TRATAMIENTO

- **Inducción-** Anfotericina B liposomal + Flucitosina 14 d
- **Consolidación-** Fluconazol 800mg/dia 8 semanas
- **Mantenimiento-** Fluconazol 200mg/dia 12 meses (CD4>200 o VL suprimida)

# Toxoplasma

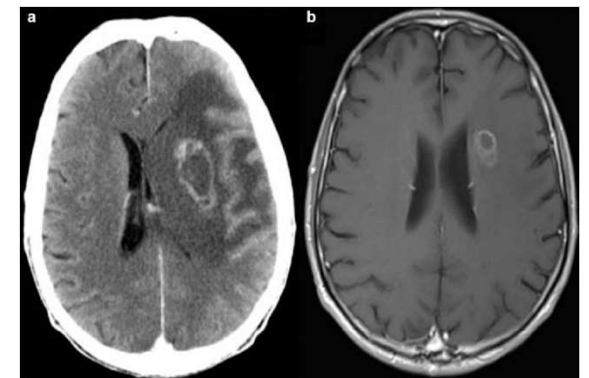
- Difícil de diagnosticar sin acceso a TAC cerebral con contraste, uso adjuvante de test rápidos de IgM e IgG

- TRATAMIENTO 6 semanas:

Pirimetamina 200mg una dosis, luego 50mg al día + Ac Fólico+Sulfadiazina 1-2g cada 6h

O

Cotrimoxazol 60mg/kg/día dividido en 2-4 dosis



# TUBERCULOSIS

**RHZE**



**MICROSCOPIO-ZN**



**GENEXPERT RRTB**

Regimens* Duration	Eligibility
2 HRZE/2 HR 4 months	Children >3 months and adolescents <16 years with: <ul style="list-style-type: none"> <li>• Pulmonary TB</li> <li>• Microscopy smear negative or Xpert result “negative”, “trace”, “very low,” and “low” or clinically diagnosed with TB lesions confined to one lobe and no cavities on chest X-ray</li> <li>• EPTB non-severe, i.e., pleural effusion without complications (e.g., no empyema, pneumothorax, or fistula)</li> <li>• Extra or intrathoracic lymph node TB with no airway obstruction</li> </ul>
2 RHZE/4 RH 6 months	Pulmonary TB and EPTB (except miliary TB, TB meningitis and bone and joint TB ) Adolescents 16 years and above and adults Children and adolescents <16 years not eligible for the 4-month regimen
2 RHZE/10 RH	Miliary TB and TB meningitis, bone and joint TB All children, adolescents, and adults
2 RHZE/7–9 RH 9–12 months	Bone and joint TB, miliary TB, and TB meningitis All children, adolescents, and adults

# Tuberculosis multirresistente

## DIAGNOSTICO

- Cultivo liquido
- DST: Test de sensibilidad
  1. Xpert MTB/RIF
  2. LPA (RIF, INH, FQ e inyectables segunda línea)
  3. Convencional-fenotípico DST primera y segunda línea de medicamentos (INH & RIF, FQ, inyectables)



**GENEXPERT RRTB**

# TRATAMIENTO PREVIO DE MDR TB hasta 2020

Phase of treatment	Duration	Drugs
<b>Intensive phase</b>	4-6 months Daily	Amikacin, Clofazimine, Moxifloxacin, Prothionamide, Isoniazid (high dose), Ethambutol, Pyrazinamide
<b>Continuation phase</b>	5 months Daily	Moxifloxacin, Clofazimine, Ethambutol, Pyrazinamide

# Cambio en paradigma del tratamiento de MDR TB en países de renta baja

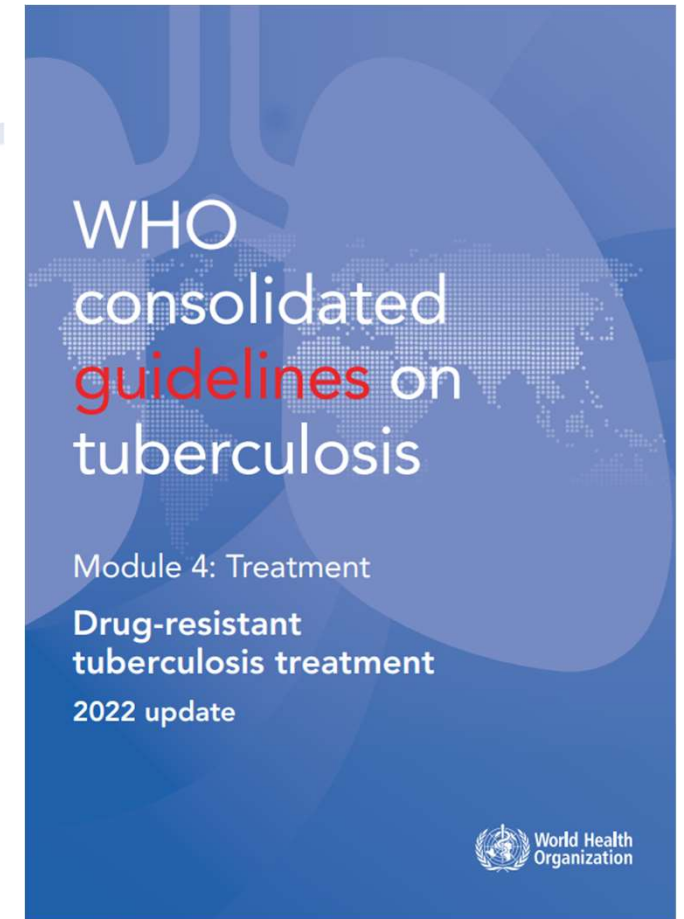
## Recommendations

**Section 1. The 6-month bedaquiline, pretomanid, linezolid and moxifloxacin (BPaLM) regimen for MDR/RR-TB (NEW)**

### 1.1 Recommendation

**NEW RECOMMENDATION**

No.	Recommendation
1.1	WHO suggests the use of a 6-month treatment regimen composed of bedaquiline, pretomanid, linezolid (600 mg) and moxifloxacin (BPaLM) rather than the 9-month or longer (18-month) regimens in MDR/RR-TB patients. <i>(Conditional recommendation, very low certainty of evidence)</i>





# Sierra Leona- Lakka Hospital

PRIMERA LINEA: 6 meses MDR-TB regimen: bedaquilina, pretomanid, linezolid y moxifloxacino (BPaLM)- 5-7 pastillas al dia

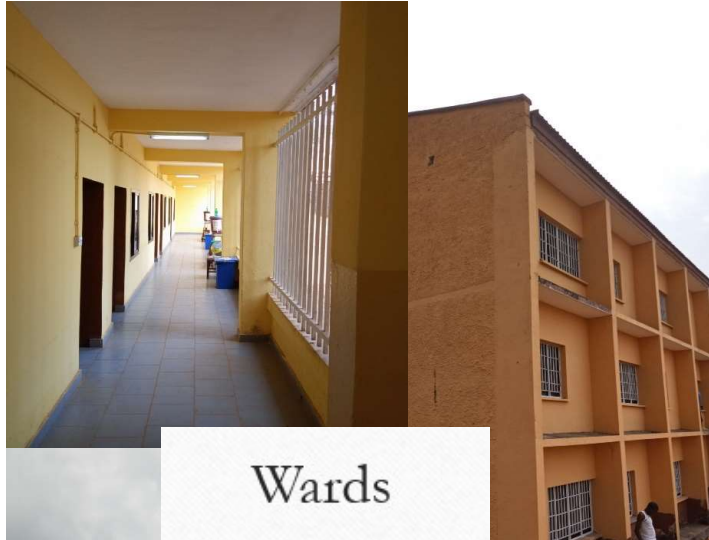


*Packets of medication and supplements (left) and a well-stocked pharmacy at Lakka Government Hospital. Modern medication is necessary for MDR-TB treatment, but not sufficient on its own. It must be combined with proper nutrition and social support. (Maya Brownstein / PIH).*

# Sierra Leona- Lakka Hospital



*Dr. Girum Tefera checks up on Sorie Kamara, a father of three from Bo, Sierra Leone, five days into his course of treatment for MDR-TB at PIH-supported Lakka Government Hospital. He came to Lakka unable speak easily, or walk at all (Caitlin Kleiboer / PIH).*



Wards



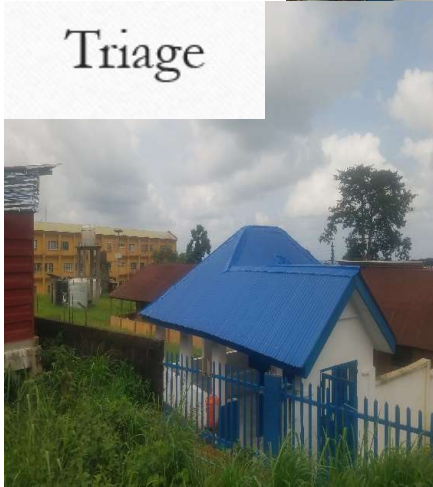
CCU



Clinical lab



Triage



Kitchen

# Lesotho-TB multiresistente



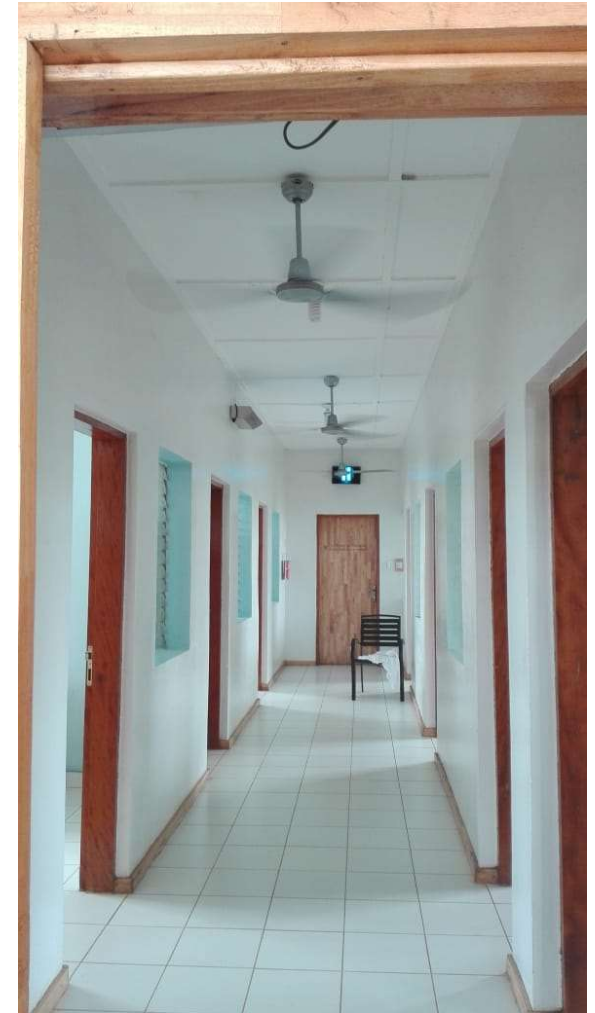
# Lesotho-TB multiresistente



# Liberia- TB multirresistente



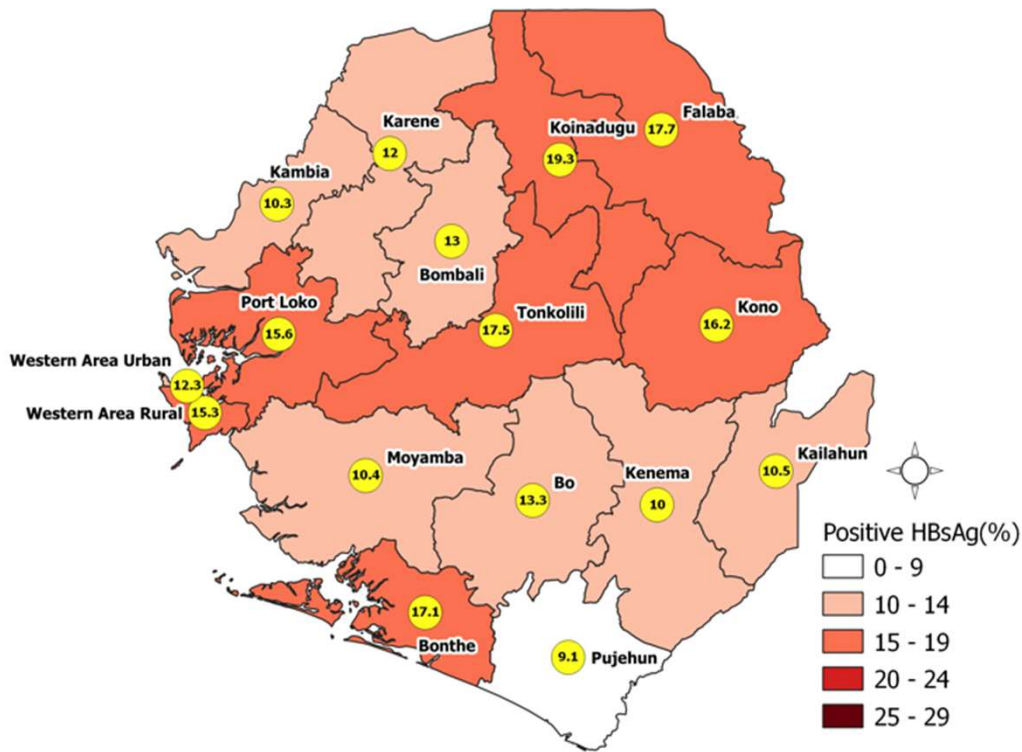
# Liberia-Tb multirresistente



# Epidemiologia Hepatitis- Sierra Leone

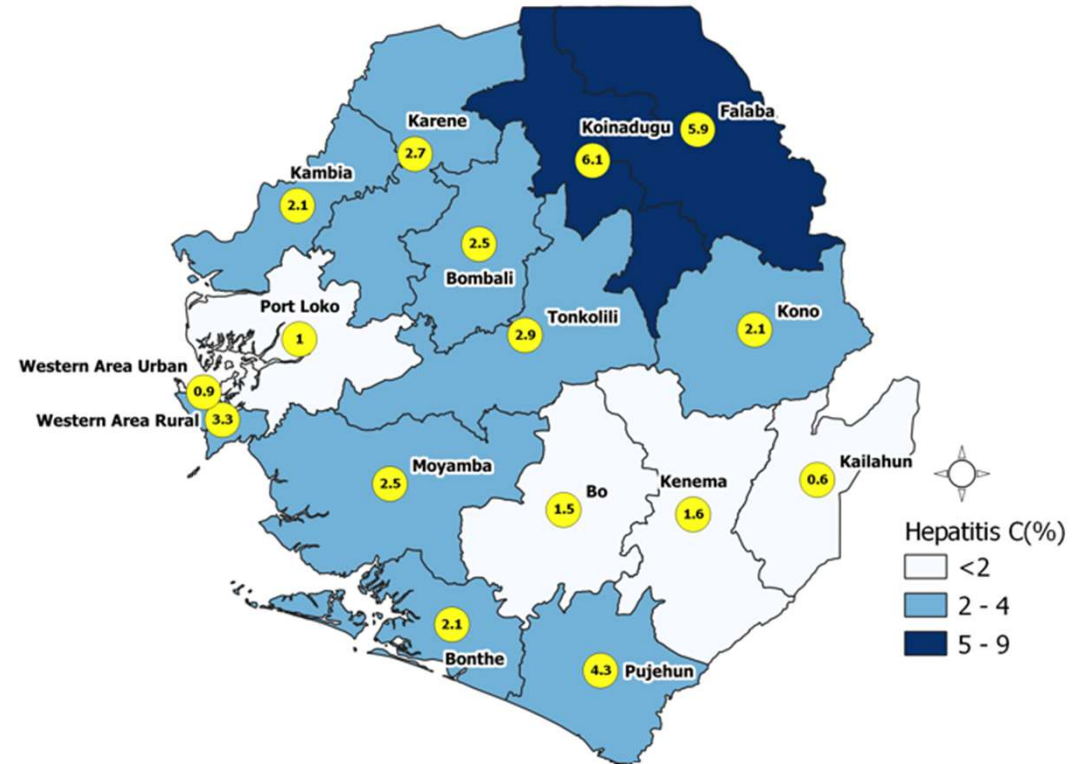
## HBsAg positivity

National 13.8%



## Hep C positivity

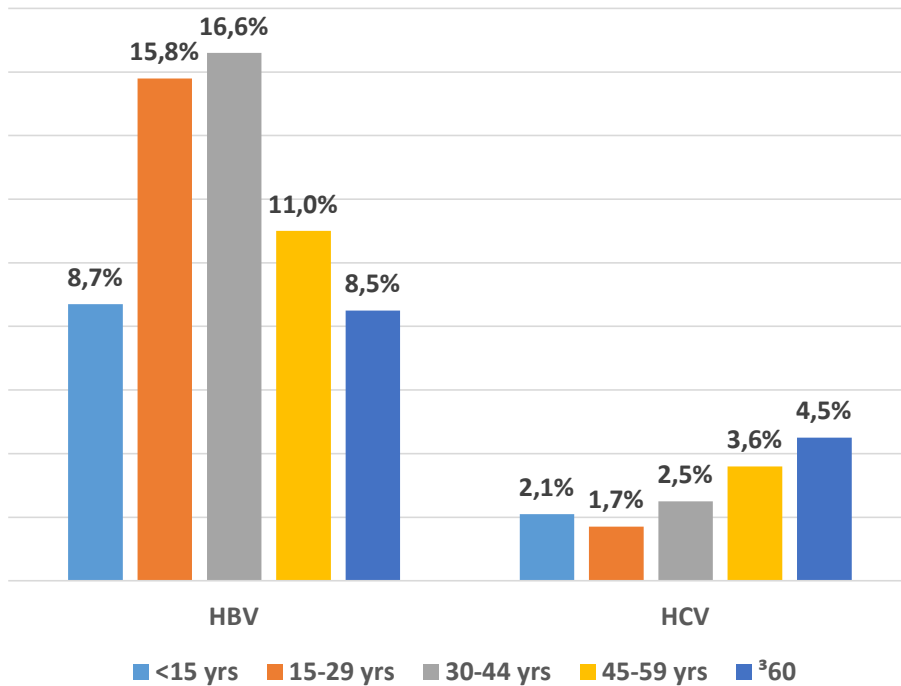
National 2.4%



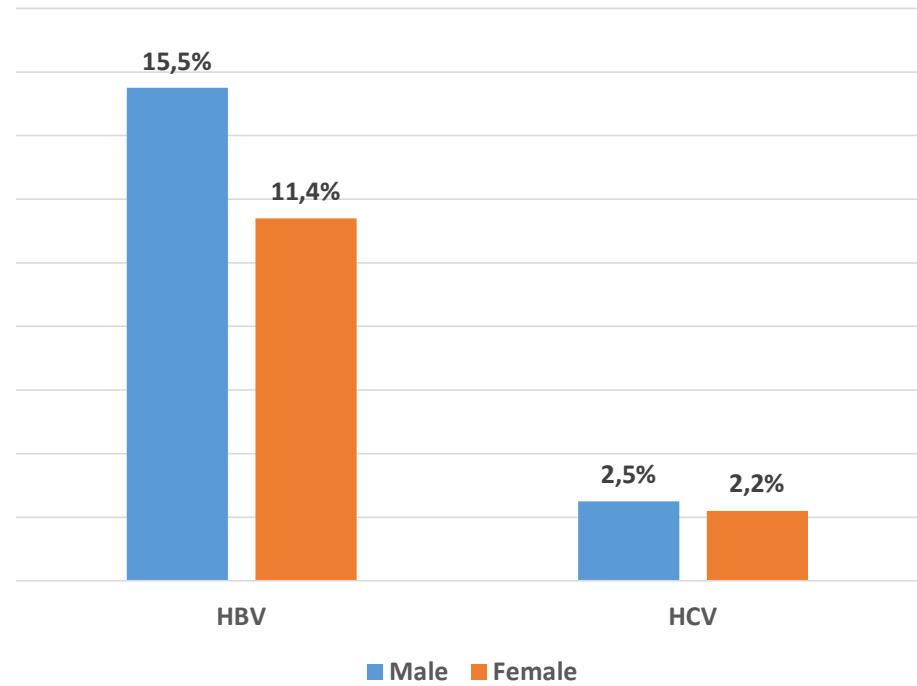


# Epidemiologia- Sierra Leone

Viral hepatitis % positivity by age group



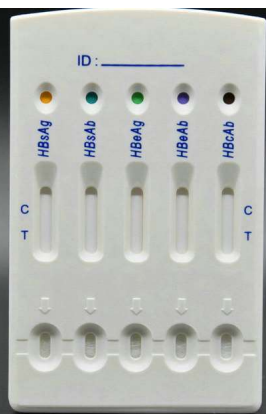
Viral Hepatitis positivity% by gender



# DIAGNOSTICO Hepatitis B



**Test rápido  
HBsAg**

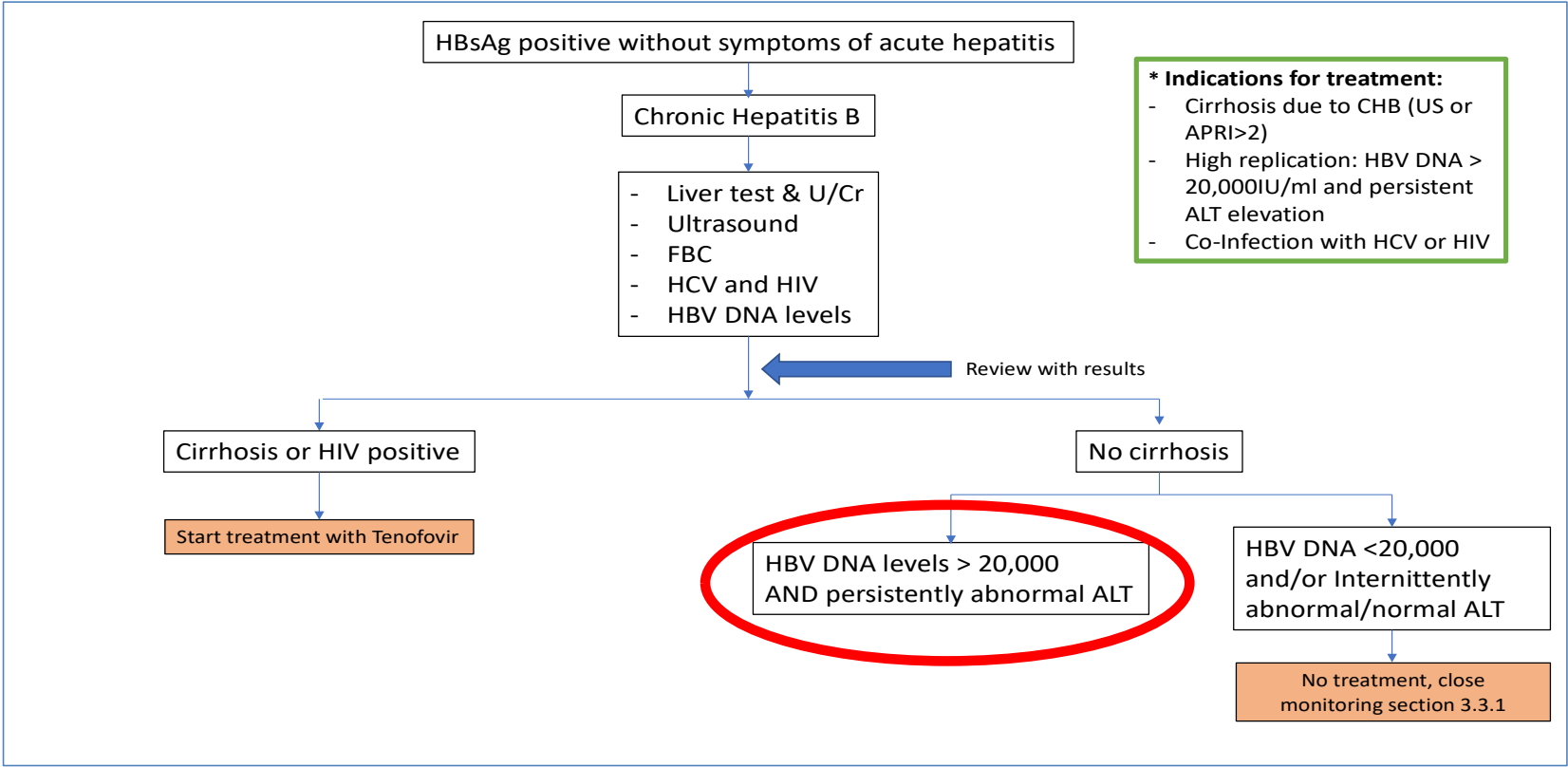


**Panel test  
rapido  
Hepatitis B**



**GeneXpert  
Carga Viral  
VHB**

# HEPATITIS B Crónica: protocol Koidu Government Hospital



- \* Indications for treatment:**
- Cirrhosis due to CHB (US or APRI>2)
  - High replication: HBV DNA > 20,000IU/ml and persistent ALT elevation
  - Co-Infection with HCV or HIV

The diagnosis of CHB in countries with a high prevalence of Hepatitis B (>0.4%) is based on the presence of **ONLY** one-assay testing with an RDT test for HBsAg. No need for confirmation test in 6 months, EXCEPT if there are recent signs/symptoms of acute infection.

## APRI score

$$APRI = \frac{\frac{AST \text{ Level}}{AST \text{ (Upper Limit of Normal)}}}{\text{Platelet Count (10}^9\text{/L)}} \times 100$$

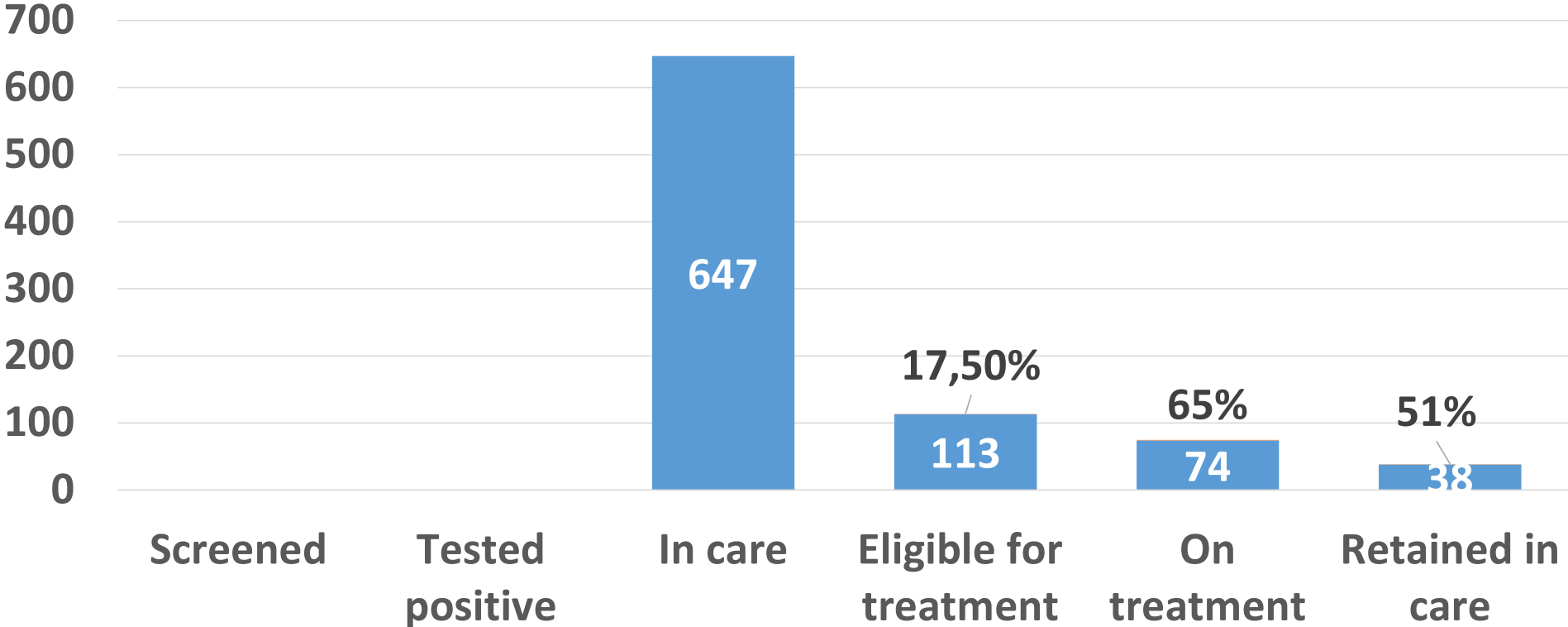
WHO has made available the membership of the Guidelines Development Group (GDG) for key updates of the 2015 WHO *Guidelines for the care and treatment of persons diagnosed with chronic hepatitis B virus infection* and the 2017 WHO *Guidelines on hepatitis B and C testing*.

# CONSULTA EXTERNA DE HEPATITIS B



- 1,300 número total de pacientes.  
(28.9% analfabetismo).
- 68.9% desde la consulta externa
- 50-70% realizados los estudios complementarios (LAB, CV, Eco)
- 70.3% continúan en la consulta tras 1 año

# Hepatitis B service cascade 2021: Koidu Government Hospital



# PROGRAMA HEPATITIS B

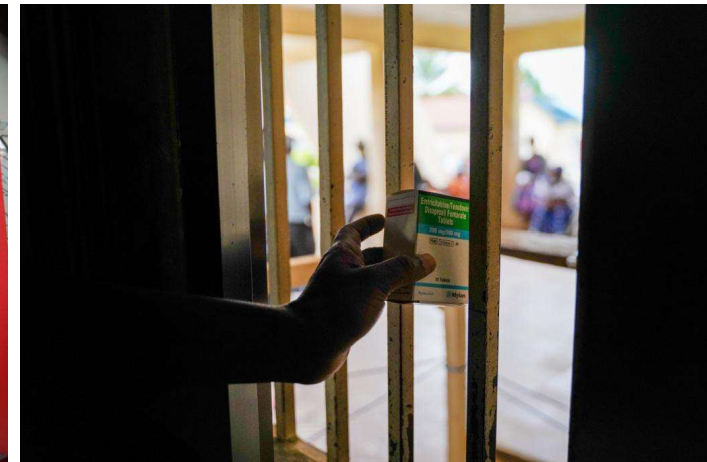
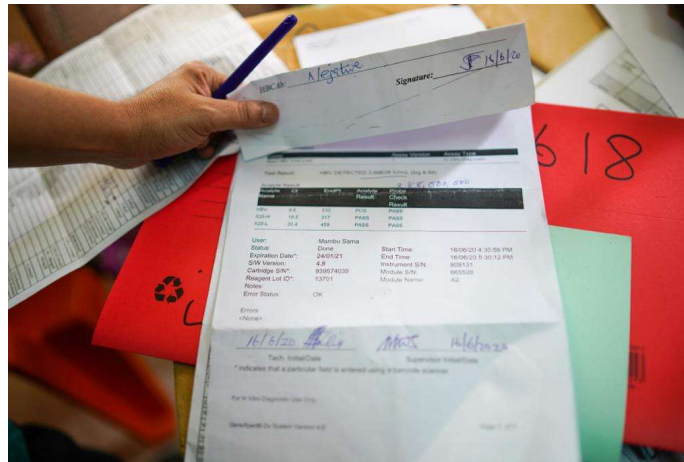
ORIGINAL ARTICLE



## Challenges of hepatitis B treatment in rural Sub-Saharan Africa: Treatment initiation and outcomes from a public hospital-based clinic in Kono, Sierra Leone

Emmanuel T. Nyama<sup>1</sup> | Lao-Tzu Allan-Blitz<sup>2,3</sup> | Remy Bitwayiki<sup>1</sup> | Mohamed Swaray<sup>1</sup> | Williams Lebbie<sup>1</sup> | Daniel Lavalie<sup>4</sup> | Michael Mhango<sup>1</sup> | Neil Gupta<sup>2</sup> | Marta Patiño Rodríguez<sup>1</sup>

- 17.5% tienen indicación de tratamiento
- 71.1% basado en datos cirrosis en Eco,
- 53.3% APRI >2
- 24.4% ambos
- 35.5% de pacientes presentan cirrosis descompensada
- 65% en tratamiento
- 51% continúan en seguimiento



# Novedades planteadas para las nuevas guías clínicas de la OMS

## HEPATITIS B

- Reducir el APRI score para diagnóstico de cirrosis
- Reducir el límite de CV HepB a 2,000 para inicio de tratamiento
- Que hacer con portadores crónicos de HBsAg
- Regímenes con TDF vs. TAF

## HEPATITIS C

- Tratamiento todos
- DAAS pan genómicos (no determinación genotipos): SOF/DAC (12), SOF/VEL (12), G/P (8)
- Adultos y niños de más de 3 años

SOF: sofosbuvir, DAC: daclatasvir, VEL: velpatasvir, G: glecaprevir, P: pibrentasvir

# Sierra Leona-Formacion en Hepatitis B





# Publicaciones Hepatitis en Sierra Leona

Research article

## Screening and linkage to care for medical students with hepatitis B virus infection in Sierra Leone

Chiyembekezo Kachimanga<sup>\*</sup>, Musa Bangura, Emmanuel Nyama, Michael Mhango, Vicky Reed, Marta Patiño Rodriguez, Marta Lado

*Partners In Health, Sierra Leone*



Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: [www.elsevier.com/locate/ijid](http://www.elsevier.com/locate/ijid)



## Seroprevalence of hepatitis B and hepatitis C among blood donors in Sierra Leone: A multi-year retrospective study

Francesca Tognon<sup>a,b</sup>, Stephen Sevalie<sup>c</sup>, Joseph Gassimu<sup>d</sup>, John Sesay<sup>e</sup>, Katrina Hann<sup>d</sup>, Mohamed Sheku<sup>e</sup>, Emily Bearse<sup>d</sup>, Francesco Di Gennaro<sup>b</sup>, Claudia Marotta<sup>b</sup>, Giampietro Pellizzer<sup>b</sup>, Giovanni Putoto<sup>b</sup>, Marta Lado<sup>d</sup>, Molly F. Franke<sup>f</sup>, Yusupha Dibba<sup>d</sup>, Sahr Gevao<sup>e</sup>, Fenella Beynon<sup>g</sup>, Annelies W. Mesman<sup>d,\*</sup>




*Tropical Medicine and  
Infectious Disease*



Article

## Screening, Vaccination Uptake and Linkage to Care for Hepatitis B Virus among Health Care Workers in Rural Sierra Leone

Musa Bangura<sup>1</sup>, Anna Frühauf<sup>1</sup>, Michael Mhango<sup>1</sup>, Daniel Lavallie<sup>2</sup>, Vicky Reed<sup>1</sup>, Marta Patiño Rodriguez<sup>1</sup>, Samuel Juana Smith<sup>3,4</sup>, Sulaiman Lakoh<sup>5,6</sup>, Emmanuel Ibrahim-Sayo<sup>5,6</sup>, Sorie Conteh<sup>5,6</sup>, Marta Lado<sup>1</sup> and Chiyembekezo Kachimanga<sup>1,7,\*</sup> 



# Formación COVID-19- AFRO Brazaville Marzo 2020



# Formacion COVID-19 Brazaville Marzo 2020



# Sierra Leona- Formacion COVID-19

## Abril 2020



# Sierra Leona- COVID-19 UCI Mayo 2020



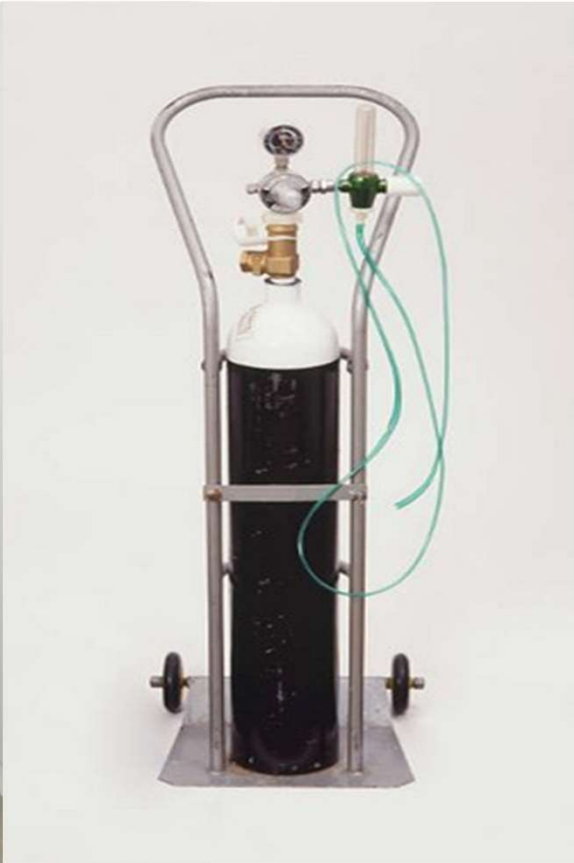
# Oxigenoterapia







# Oxigenoterapia



# Oxigenoterapia avanzada



# Alto flujo nasal- Ventilacion no invasiva

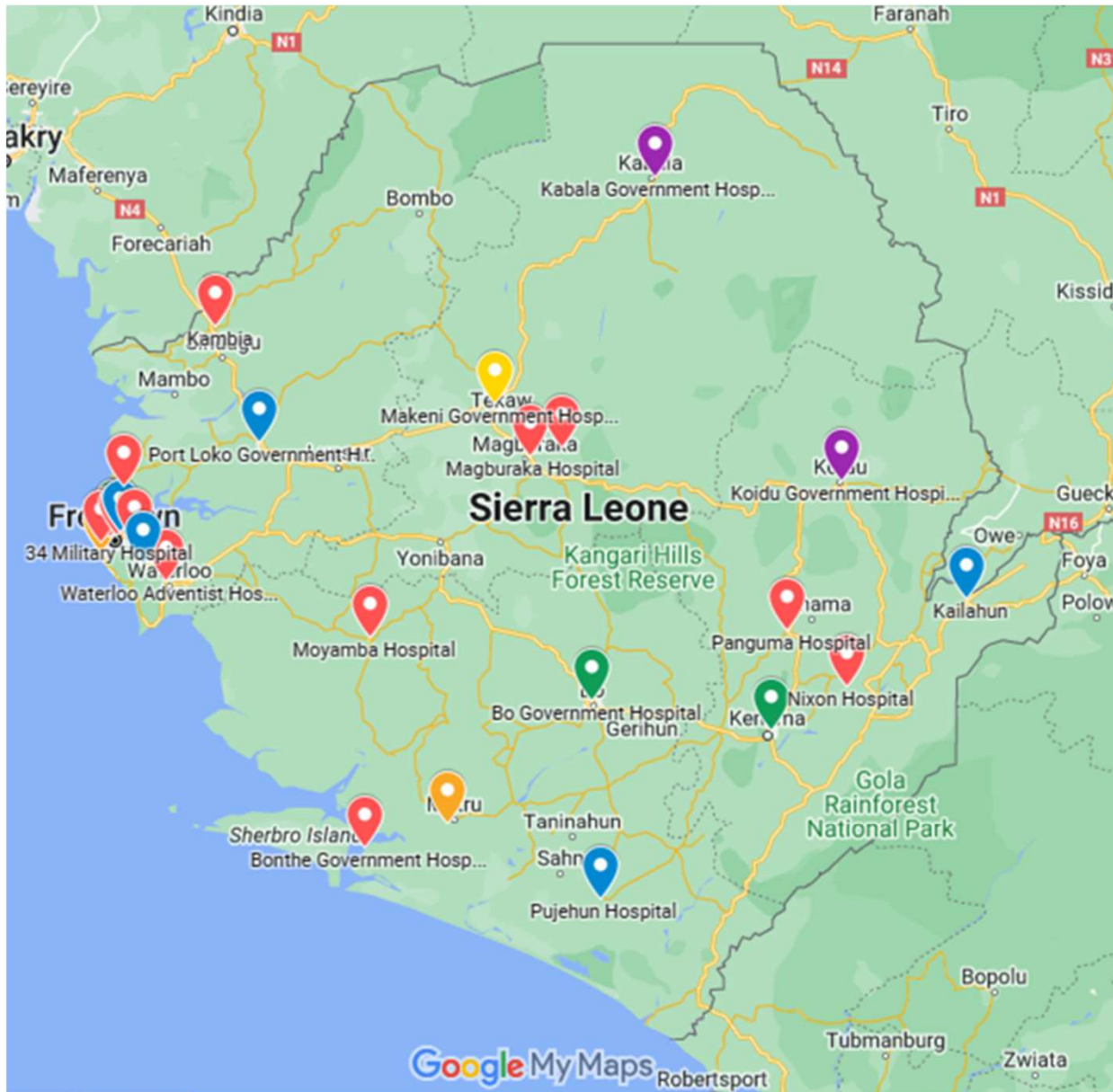


# Formacion en ventilacion invasiva



# Oxigenoterapia





- 🟢 Hospitals with functional PSA plants
- 🟡 Hospitals with anticipated PSA plants
- 🔴 Hospitals with no PSA/liquid sources
- 🟠 Hospital with failed PSA plant
- 🟣 Hospitals with PSA and liquid oxygen.
- 🟡 Hospitals with proposed liquid oxygen

Considerando la demanda diaria de  $5,260.08\text{m}^3/\text{dia}$  y la capacidad de producción de  $4,172.8\text{ m}^3/\text{dia}$ , el gap de producción de oxígeno entre los 28 hospitals del país es de  $1,087.28\text{m}^3/\text{dia}$  ( $5,260.08\text{m}^3/\text{dia} - 4,172.8\text{ m}^3/\text{dia}$ ) durante un consumo medio pero asciende a  $19,179.2\text{ m}^3/\text{dia}$  ( $19,179.2\text{ m}^3/\text{dia} - 4,172.8\text{ m}^3/\text{dia}$ ) durante una situación que aumente la demanda.

# Laboratorio COVID-19



# Necesidad de desarrollar laboratorio clínico/microbiología/biología molecular

Molecular lab capacity		Microbiology lab capacity	
Pandemic Preparedness	Clinical Care	Antimicrobial Resistance	
<ul style="list-style-type: none"> <li>• COVID-19 PCR and sequencing: detection of existing and new variants</li> <li>• Readiness for pandemic response for new, emerging, re-emerging pathogens               <ul style="list-style-type: none"> <li>• COVID and other respiratory pathogens</li> <li>• Ebola</li> <li>• mpox</li> <li>• Cholera</li> </ul> </li> <li>• Facilitate multi-disease respiratory screening</li> </ul>	<ul style="list-style-type: none"> <li>• HIV               <ul style="list-style-type: none"> <li>• EID</li> <li>• Resistance testing</li> <li>• Viral load</li> <li>• Some advanced OIs</li> </ul> </li> <li>• TB               <ul style="list-style-type: none"> <li>• Resistance testing</li> </ul> </li> <li>• Hepatitis B and C               <ul style="list-style-type: none"> <li>• Viral load</li> </ul> </li> <li>• COVID-19</li> <li>• HSV</li> <li>• Identify and treat resistant bacterial infections</li> <li>• Tailor antibiotic therapy in patients with severe or life-threatening infections</li> </ul>	<ul style="list-style-type: none"> <li>• Tailoring treatment protocols &amp; antibiotic formularies for local resistance profiles</li> <li>• Contribute to knowledge base about AMR with focus on rural settings and outside tertiary / referral hospitals</li> <li>• Qualify for participation in surveillance programs such as WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS) or the National Antibiotic Resistance Surveillance (NSAR) program</li> </ul>	



# Ebola Africa Occidental (2014-2016)

## Diferentes estandares



MoHS-Kenema



Emergency-Godrich

# Centro de tratamiento Ebola (ALIMA, Beni) Oct 2018 “The Cubes”





# Centro de tratamiento Ebola (ALIMA, Beni) Oct 2018 “The Cubes”





# MSF Butembo Nov 2018





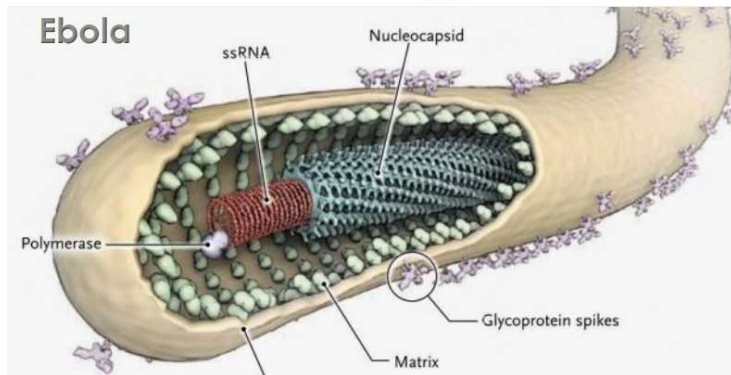
**MSF Bunia (Ituri)**  
**Marzo 2019**

# EVD (Ebola Zaire) GeneXpert



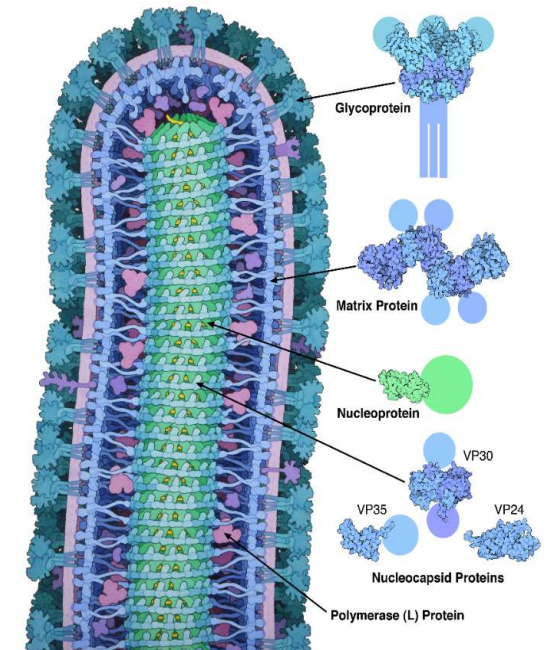
GP (Glicoproteína)  
NP (Nucleoproteína)

90 Minutos



Severidad de la enfermedad cuando  
**CT Value** (GP, NP) <20

Lanini et al, CID (2018)



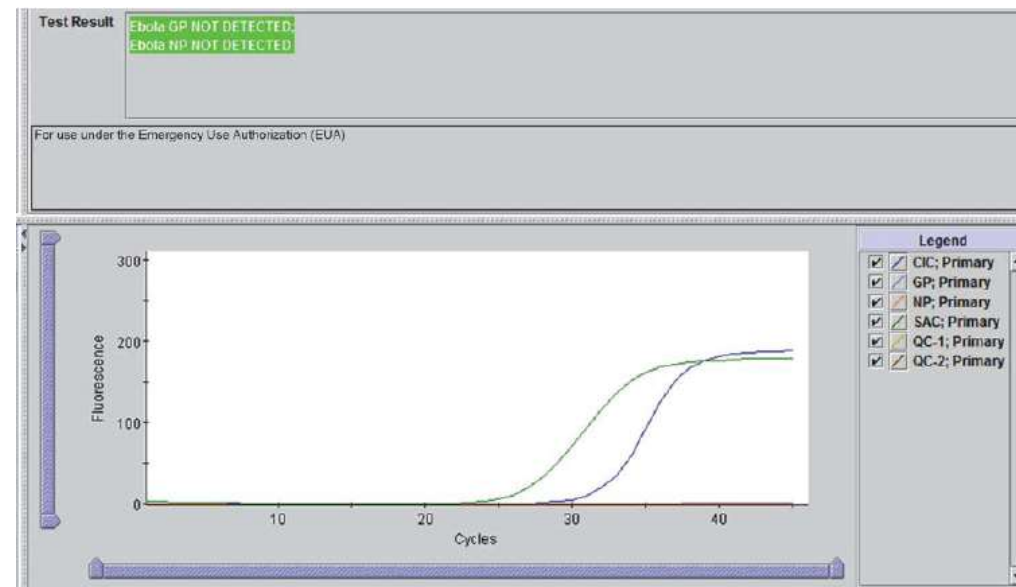
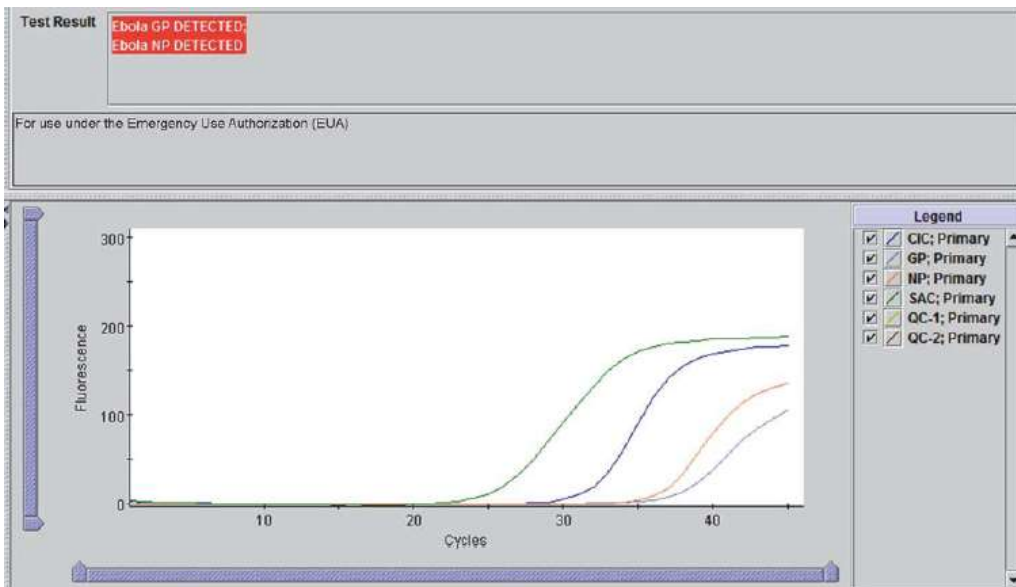


## Ebola GeneXpert RESULT INTERPRETATION NEGATIVO

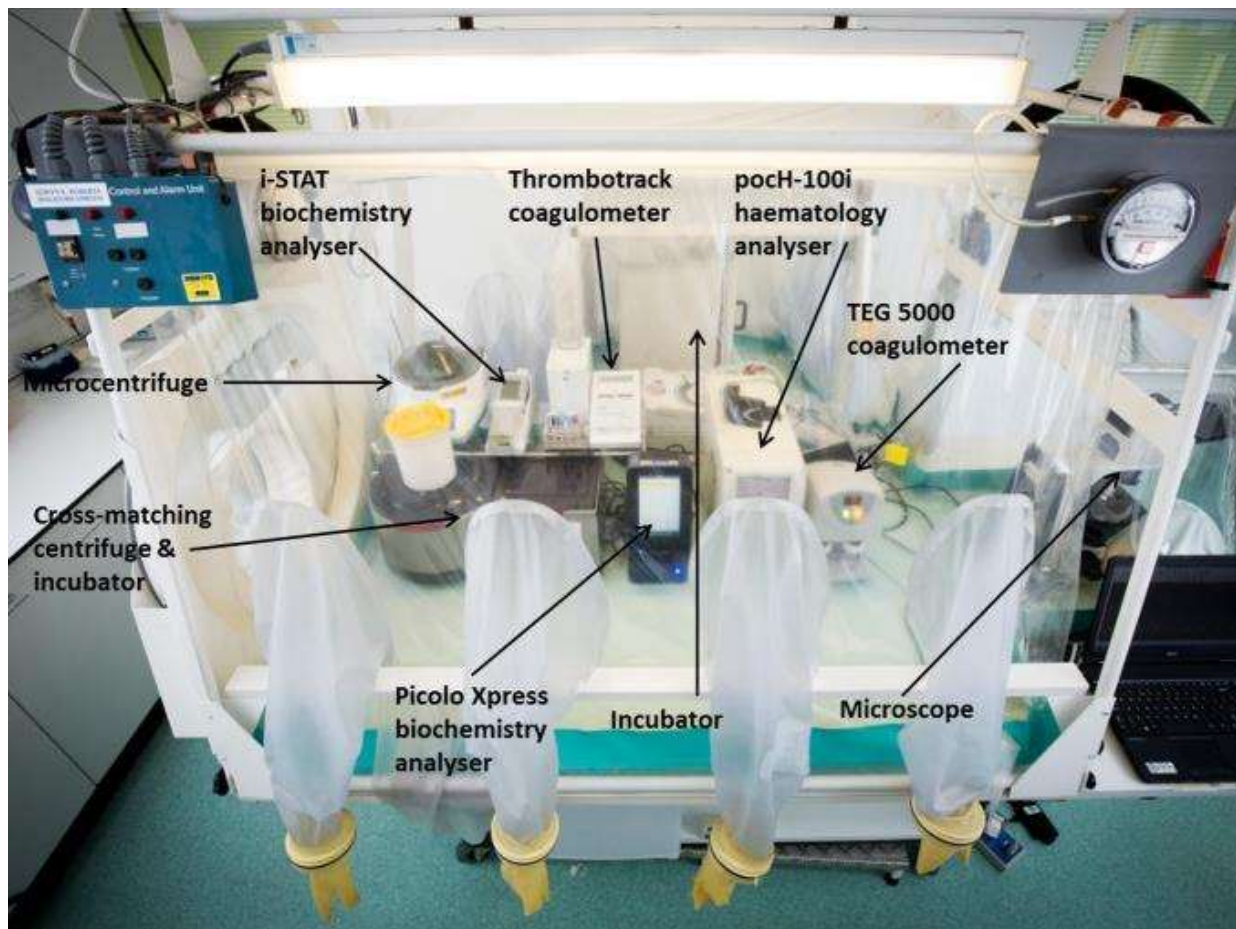
## POSITIVO

- Ebola GP **DETECTADA**, Ebola NP **DETECTADA**
- Ebola GP **DETECTADA**, Ebola GP NO DETECTADA
- Ebola GP NO DETECTADA, Ebola NP **DETECTADA**
- The EBOLA target nucleic acids are detected. The EBOLA signal for both or one of the two nucleic acids target have a Ct within the valid range and endpoint above the minimum setting

- Ebola GP NO DETECTADA
  - Ebola NP NO DETECTADA
- The EBOLA target nucleic acids are not detected



# PoC Laboratorio



**piccolo** *xpress*  
chemistry analyzer



**I-STAT**

# Control y monitorización de pacientes con ebola



# Repubblica democratica del Congo- Mangina IMC- Marzo 2019



# Guinea-Brote Ebola Abril 2021

## Centro de tratamiento MSF N'zerekore



# Guinea-Brote Ebola Abril 2021

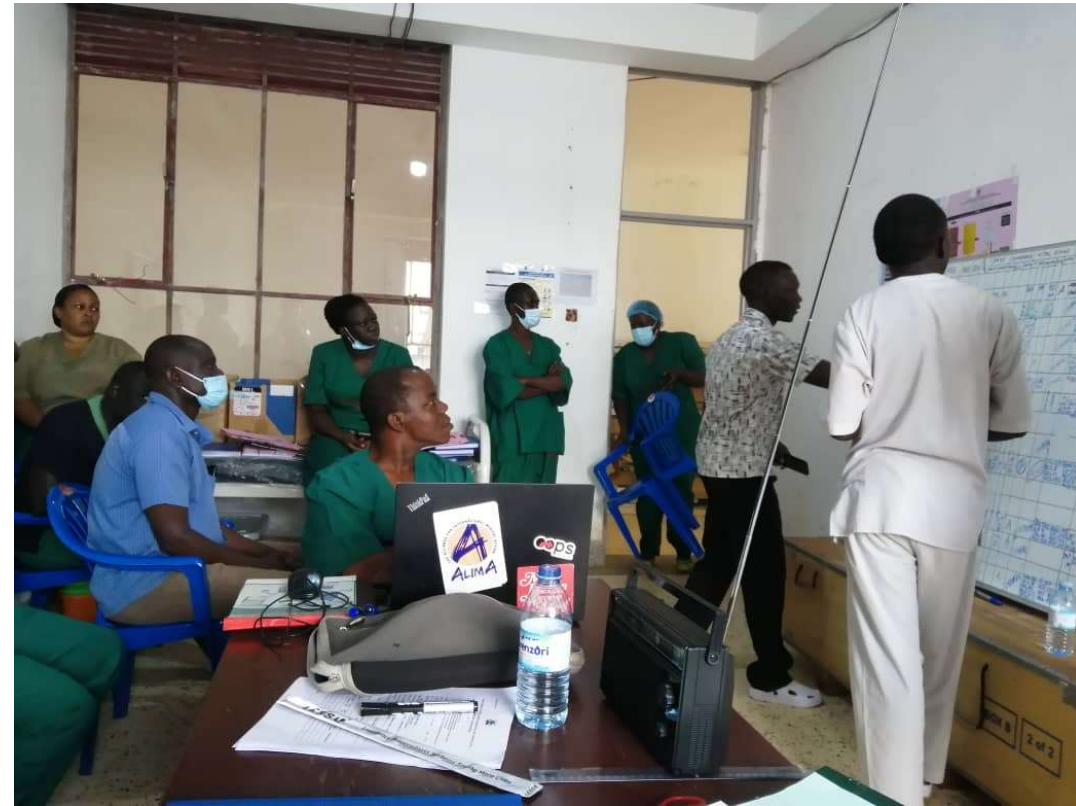
## Centro de tratamiento MSF N'zerekore



# Uganda-formacion en Ebola de personal sanitario Agosto 2022



# Formacion de personal sanitario en Ebola- Brote Ebola Sudan Uganda Noviembre 2022-Enero 2023





# Pase de guardia Centro de Tratamiento Ebola Sudan, Uganda Diciembre 2022



# Uganda-Centro de tratamiento Ebola Noviembre 2022



# Centro aislamiento Ebola, Jinja Uganda Noviembre 2022



# Nuevo modelo de Centro tratamiento Kampala Uganda Enero 2023



# Formacion Ebola y Enfermedades virales hemorrágicas en Zambia Diciembre 2023





¡¡ Muchas gracias !!  
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