

KENYA RESEARCH AND TRAINING CENTER

University of Washington

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Prepared by Vrasha Chohan

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INTRODUCTION

Kenya Research training Centre at University of Washington (KRTC) faculty members were in agreement that there was a need to re-inventory the laboratory capacity of the KRTC sites in Kenya. In 2008, Pamela Kohler had prepared a report for UW CFAR- International Core on an inventory of the laboratories in Kenya.

In order to obtain the laboratory capacities that are available in the KRTC affiliated laboratories in Kenya a short survey was sent to key personnel at each site and the feedback was compiled into this report. The contacts of these personnel were obtained from the KRTC members who are using the laboratory services.

The purpose of this report is to understand what testing is available and where people have the potential to run testing for new studies. A list of equipment that each site has was requested so that we have an idea on how to utilize or expand the capacity for basic science research in different labs.

LABORATORY SITE DETAILS

MOMBASA

Laboratory Name: University of Washington/University of Nairobi HIV/STI Laboratory
Institution: University of Washington/University of Nairobi
Physical address: Coast Provincial General Hospital, Kisauni Rd, Mombasa.
Contact Name: JUMA SHAFI
Contact Email: 2008smshafi@gmail.com

NAIROBI

Laboratory Name: Clinical Trial Research Laboratory
Institution: Partners In Health Research And Development
Physical address: Department Of Obstetric And Gynecology, Ground floor
University of Nairobi, KNH, Hospital Street, off Ngong Rd, Nairobi
Contact Name: Dr. Bhavna Chohan (Laboratory director)
Contact Email: bchohan@u.washington.edu

Laboratory Name: UW/UON Paediatrics Research Laboratory
Institution: University of Nairobi
Physical address: Departments of Paediatrics and Child Health Faculty of Medicine,
College of Health Sciences, Kenyatta National Hospital Complex,
University of Nairobi, Hospital Street, off Ngong road.
Contact Name: Dr. Bhavna Chohan (Laboratory director)
Brian Khasimwa (Laboratory Manager)
Contact Email: bchohan@u.washington.edu
brayo2k@gmail.com

Laboratory Name: UW/UON Molecular Virology Research Laboratory
Institution: University of Nairobi
Physical address: Departments of Clinical Chemistry, Faculty of Medicine,
College of Health Sciences, Kenyatta National Hospital Complex,
University of Nairobi, Hospital Street, off Ngong road
Contact Name: Dr. Bhavna Chohan (Laboratory director)
Brian Khasimwa (Laboratory Manager)
Contact Email: bchohan@u.washington.edu
brayo2k@gmail.com

Laboratory Name: Centre for Microbiology Research
Institution: Kenya Medical Research Institute
Physical address: Mbagathi Road, Nairobi
Contact Name: Sam Kariuki
Contact Email: samkariuki2@gmail.com

Laboratory Name: University of Washington – Treatment, Research and Expert Education Laboratory
Institution: University of Washington – Treatment, Research and Expert Education Program
Physical address: Coptic Mission Hospital, Ngong Road, Nairobi
Contact Name: Professor Michael H. Chung
James munyao
Contact Email: mhchung@uw.edu
munyaojam@gmail.com

THIKA

Laboratory Name: Partners In Health Research And Development Clinic Laboratory
Institution: Partners In Health Research And Development
Physical address: Thika Section 9, next to Thika Nursing Home
P.O. Box 1353 - 00232
Ruiru Tel: +254-67-22561 / 21305 Mobile: 0725-641110
E-mail: phrd@pipsthika.org
Contact Name: Dr. Bhavna Chohan (Laboratory director)
Contact Email: bchohan@u.washington.edu

KERICHO

Laboratory Name: Microbiology Hub Kericho
Institution: USAMD-K/ KEMRI-WRP
Physical address: Walter Reed project- Microbiology Hub Kericho
USHMA Plaza- Along temple road
P. O. Box 1357
Code 20200, Kericho
Contact Name: Elizabeth Odundo
Contact Email: elizabeth.odundo@usamru-k.org

KISUMU

Laboratory Name: HIV- Research Laboratory
Institution: KEMRI/CGHR--HJFMRI
Physical address: Kenya Medical Research Institute Ground
Kisian Field Station
off Kisumu- Busia Road
Kisumu, Kenya
Contact Name: Boaz Ouma Oyaro
Contact Email: boyaro@kemricdc.org

Laboratory Name: KEMRI/CDC TB Laboratory
Institution: KEMRI CGHR
Physical address: Off Busia Road
Contact Name: Albert Okumu
Contact Email: AChiengOkumu@kemricdc.org

ELDORET

Laboratory Name: AMPATH Reference Lab
Institution: AMPATH
Physical address: Moi Teaching and Referral Hospital Eldoret, AMPATH bldg
Contact Name: Wilfred Injera
Contact Email: weinjera@gmail.com

University of Washington/University of Nairobi HIV/STI Laboratory Mombasa

Lab services/tests:

Name of the Assay	Method/kit used
Chlamydia Trachomatis	Aptima Combo 2 GC/CT
Trichomonas Vaginalis	Aptima TV
HPV	Aptima HPV
M genitalium	Aptima M genitalium
HIV qualitative	Aptima HIV qualitative
HIV screening, rapid	Determine, Unigold
Gonorrhea	culture
Lactobacillus	culture
Syphilis testing	RPR, TPHA
HSV-2 ELISA	Focus Diagnostics
IL-6	ELISA
CRP	ELISA
CD4 Count	CD3/CD4 FACScout
Yeast	culture
PSA rapid	Abacard
HB	HB Reflotron
GPT/ALT	GPT/ALT Reflotron
Creatinine	Creatinine Reflotron
Cervical smear	gram stain
Bacterial Vaginosis	gram stain

List of Equipment in the lab

Culture incubators 30C, 35C
Biosafety Cabinet BSL-2
Refrigerated centrifuge
FACScout
Microscopes
DTS 400
PANTHER
-80C freezers
2-8C fridges
ELISA Plate Reader
ELISA Plate Washer
Reflotron dry Chemistry

Biological Specimen Repository Plasma, serum, vaginal swabs, cervical swabs, PBMCs

Digital storage of inventories: Freezerworks program

Un-Utilized Capacity: Tissue Culture

Test costs: contact Tammy Wilson at UW for the Cost Center charges.

Clinical Trial Research Laboratory – Nairobi

Lab services/tests:

Name of the Assay	Method/kit used
HSV2 ELISA	Focus herpes select hsv-2 elisa Kit
HIV 1+2 Ag/Ab ELISA	HIV CBios ELISA Kit
HBsAg	Murex HBsAg Elisa Kit
HBsAb	Murex HBsAg Elisa Kit
Serum Creatinine Levels	Cobas/Roche Kit-(self-contained multiuse cassettes)
CD4 Tcell counts	BD FACSCCount CD4 Reagents
BV smears	Gram staining

List of Equipment in the lab

Centrifuges refrigerated, normal and microcentrifuge
-80 C freezers
2-8⁰C Fridge
Liquid N2 Tank
Class II Biosafety Cabinet
BD FACSCCount
Beckman coulter ACT 5 DIFF
ELISA Washer Biotek ELX 508
ELISA Reader Multiskan EX
Cobas Integra 400 plus
Incubator -EN400 37⁰C
Binocular Microscope
RPR Shaker
Portable Autoclave (15 liters)
Reflotron plus clinical chemistry analyser
Deionizer

Biological Specimen Repository Plasma, serum, vaginal swabs, cervical swabs, PBMCs, urine, fixed smear slides

Digital storage of inventories: Freezerworks program

Un-Utilized Capacity: Cobas Integra 400 plus only used for S. Creatinine and can be used for anaemia, diabetes, cardiac, general chemistries, specific proteins, ISE, D-dimer, homocysteine. Haematology counter for complete blood count and PBMC separations can be done.

UW/UON Paediatrics Research Laboratory – Nairobi

Lab services/tests:

Name of the Assay

Dried Blood spot preparation (room temperature and -20°C storage)

Plasma isolation(-80°C storage)

Serum Isolation (-80°C storage)

PBMCs separation and PBMC viability testing Liquid Nitrogen storage)

List of Equipment in the lab

Centrifuges refrigerated and non- refrigerated

Microfuge

Freezers -80C and -20C

Liquid Nitrogen tanks

Refrigerator 2-8C

Biosafety Cabinets class II

BD FACSCalibur

ELISA Plate reader Emax Molecular devices

ELISA Washer Biotek ELx50 (Automated)

ELISA semi-auto washer NUNC Immuno-wash 12 (Hand held)

Elispot/immunospot reader

VWR CO₂ Incubator with two CO₂ gas cylinders

Olympus CH20 microscope (Binocular)

Liquid Nitrogen Dry Vapor Shippers

Omni filter Cell harvester

1450 micro beta plus liquid scintillation counter

Biological Specimen Repository: Plasma, serum, vaginal swabs, cervical swabs, PBMCs, penile swabs, semen, PaxGene, urine, dried blood spots, nasal swabs, Breast milk- whole and supernatant and cells.

Digital storage of inventories: Freezerworks, Excel and Access programs

Un-Utilized Capacity: BD FacsCalibur, CO₂ incubator for tissue culture, Immunospot reader and Elisa reader washer.

UW/UON Molecular Virology Research Laboratory – Nairobi

Lab services/tests:

Name of the Assay	Method/kit used
DNA/RNA extraction from FP DBS and PBMCs	Qiagen kits
RNA extraction from plasma	Qiagen kits
HIV-1 Early Infant Diagnosis (EID) DNA in-house PCR	In-house nested PCR
Gel electrophoresis	Fisher Scientific reagents; Biorad reagents
ARV drug resistance testing. In-house genotypic population based ARV resistance testing	ABI reagents

List of Equipment in the lab

Centrifuges Eppendorf centrifuge 5417C – p free
Microcentrifuges
Freezers -20C
Refrigerators 2-8C
ABI 2720 thermo cycler
ABI Gene Amp PCR systems 9600
ABI 3130xl Genetic analyzer - sequencer
ABI 7000 sequence detection system – Real time PCR
Kodak EDAS 290 imaging system (PC supported) – for gel pictures

Biological Specimen Repository: Extracted DNA from PBMCs and extracted FP DNA lysates.

Digital storage of inventories: Excel, Access and sequencer programs

Un-Utilized Capacity: all instruments are under - utilized.

Centre for Microbiology Research-Nairobi

Lab services/tests:

Name of the Assay	Method/kit used
HIV assay, screening and confirmatory	Determine and Unigold
Sickles cell testing, immunoblot assay	
Malaria testing	
Typhoid assays	Stool Ag test, Culture Blood and fecal

List of Equipment in the lab

Incubators, hot air oven, microwave
Medical Refrigerator's
Medical Freezers @ -20⁰ C, and -80⁰C.
Biological safety cabinets
Autoclaves, weighing balance
PCR thermo cyclers
Gel Electrophoresis and imaging
BSL 2 cabinets
Centrifuges
Microscopy

Biological Specimen Repository: Pathogenic bacterial culture isolates

Digital storage of inventories: Excel, Access and Freezerworks programs

Un-Utilized Capacity: Anaerobic culture and microscopy.

Test costs: Available.

UW/Coptic – Treatment, Research and Expert Education Laboratory- Nairobi

Lab services/tests:

Name of the Assay	Method/kit used
Oligonucleotide Ligation Assay (OLA) for HIV drug resistance testing	OLA ELISA kit (from Dr. Lisa Frenkel's lab, Seattle Children's Hospital, USA)
Sample collection and shipment for CD4 testing	BD Vacutainer tubes
Peripheral blood mononuclear cells (PBMC) processing	Histopaque, Phosphate Buffered Saline (PBS), Trypan blue stain
DNA extraction from PBMC	ArchivePure DNA Cell/Tissue Kit

List of Equipment in the lab

Labconco Class II Type A2 Biological Safety Cabinet
New Brunswick Scientific Ultra Low Temperature Freezer (-80⁰C)
STAT FAX 2600 ELISA Plate Washer
Gel Electrophoresis and PhotoDocIt Imaging System
ABI 9600 Thermal cycler
Biorad Imark Micro ELISA Plate Reader
Heraeus Megafuge Sorval ST 88 Centrifuge Ventilated
Nanodrop Lite Spectrophotometer for nucleic acid quantification
Zeiss Binocular Microscope
Fridge 2-8⁰C
Freezer -15 to -25⁰C

Biological Specimen Repository: plasma, serum, PBMCs, re-suspended pellet for HPV, cervical histology blocks and slides, cervical pap smear slides.

Digital storage of inventories: Excel program

Un-Utilized Capacity: PBMC cell separation, Oligonucleotide ligation assay (OLA).

Partners in Health Research and Development Clinic Laboratory-Thika

Lab services/tests:

Name of the Assay	Method/kit used
CD4 Tcell counts	BD FACSCCount CD4 Reagents
Smear microscopy	Wet preparation microscopy

List of Equipment in the lab

Centrifuges Eppendorf 5804 R
NUVE NF 200 Microcentrifuge
-80 C freezer
2-8⁰C Fridge
BD FACSCCount
Cervalec Heating Block
Teaching Microscope

Biological Specimen Repository: plasma, serum, cervical/vaginal swabs, servical fluid, fixed smear slides, urine

Digital storage of inventories: Freezerworks program

Un-Utilized Capacity: Microscopy

Microbiology Hub Kericho

Lab services/tests:

Name of the Assay	Method/kit used
Bacterial culture	Conventional culture plates, conventional PCR, serotyping
Blood culture	Bactec blood culture bottles- Automated, conventional culture plates
Bacterial Identification	MicroScan/ Autoscan/ MALDI/ FilmArray/ API strips
Antimicrobial susceptibility test	MicroScan panel, Etest strips, disc diffusion
Stool Parasitology	Microscopy, Quant studio, conventional PCR
Enteric Virology	Seeplex Kit, Rota clone, rT PCR, Quant studio

List of Equipment in the lab

Microscan walk away 40+/ Autoscan 4
MALDI- ToF Biotyper
Bactec 9050
FilmArray
Thermocyclers –conventional PCR
Quant studio V7
ABI 7500 rT PCR
Freezers
Centrifuges
Microscopes

Biological Specimen Repository: protocol specific stool specimens and glycerol stocks of culture isolates

Digital storage of inventories: Excel/Access program

Un-Utilized Capacity: Anaerobic cultures

Test costs: NB- The cost of testing is dependent on cost associated with processing such as but not limited to, target organisms, cultivation media used, extent and method of identification and/or detection, organism class (Gram positive/ negative, fastidious/ non-fastidious) as well as VAT.

AMPATH Reference Lab

Lab services/tests:

Name of the Assay	Test kit used	Name of the Assay	Test kit used
Blood chemistries, CSF	cobas Integra cassette	HIV-1 DNA PCR	Abbott
Full haemogram / Complete blood counts	Act 5 diff reagent	HIV-1 Viral load	Abbott
Isoelectric focusing (screening)	Resolve system	Hepatitis B viral load	Abbott
HB Electrophoresis (quantification)	Hellena laboratories	CT/GC PCR Abbott	Abbott
Factor VIII, Factor IX, Inhibitors, Prothrombin Time Index(PTI)	Star system	HPV DNA PCR	Abbott
Urine pregnancy test	Star system	PBMCs Viablility	
HIV 1 and 2 ELISA	Quickvue	CRAG	Remel
Hepatitis B Ag ELISA/ Ab ELISA	Vironostica/Murex	Gram stain	
Hepatitis C virus antibody test	Murex	Bacterial culture and identification , yeast	Scharlau
HSV	Murex	Fungal culture	Scharlau
Syphilis screening (RPR)	Kalon	Trichomonas(in-pouch)	
CD4:CD8 Count	Omega diagnostic	Malaria slide and Pf test	Giemsa
Retic count	BD Flow cytometer		
Lymphomas marker s	BD		

List of Equipment in the lab

ACT 5 DIF OV	ELISA plate reader/washer
ACT 5 DIF AL	ABBOTTM2000rt
START COAGULATION	ABBOTTM2000sp
Cobas Intergra	IEMS Incubator and shaker
Centrifuge micro	Biosafety Cabinets
Rotamixer	Freezers
microscopes	STERIDIUM AUTOCLAVE
Refrigrator	Refrigerated Centrifuge
FACsCalibur	start COAGULATION
Biosefety Cabinet	Quick scan 2000win
CENTRIFUGE ROTANTA-460	Titan power supply (electrophoresis)
Incubator	Refrigerator

Test costs: Price list is available on request

HIV- Research Laboratory- Kisumu

Lab services/tests:

Name of the Assay	Method/kit used
HIV-1 RNA (Viral load)	Roche CAP/CTM, C8800, Abbott m200rt
DNA -PCR	Roche CAP/CTM, Abbott m200rt
HIV-1 Genotyping	VIROSEQ, and in-house kit
Hepatitis C qualitative (Molecular)	Abbott m2000rt
Hepatitis C Quantitative (Molecular)	Roche CAP/CTM
Hepatitis B Qualitative(Molecular)	Abbott m2000rt
Hepatitis B Quantitative (Molecular)	Abbott m2000rt
HBsAg-serology	Murex
HBcAb-serology	Diasorin
HBeAb-serology	Diasorin
Anti -HBV	Murex
Anti-HCV-serology	Murex
HSV-2	Kalon
RPR-Syphilis	MacroVue
Syphilis	SD Biolline
HIV-1/2 ELISA	3 rd /4 th Gen BioRad and 4 th Gen Murex Combo
General Chemistries and Immunoassays	Roche
CD4/CD8	Multi set
Heamatology	
CT/NG-PCR	Abbott
Bacterial Vaginosis	Wet mount Microscopy /Nugent score

List of Equipment in the lab

Abbott m200rt	Heamatology analyzer-Act 5diff Coulter Counter
CAP/CTM	Hematology analyzer-Sysmex 5part
C8800	FacsCalibur
ABI 3130 genetic analyzer	Vicel counter
Cobas 400+	Liquid Nitrogen freezer(60,000 vial capacity)
C311	Biosafety Cabinets
E411	
Tecan Elisa Reader/Washers	
-80 freezers	
Centrifuges	
Refrigerators	

Biological Specimen Repository: whole blood, plasma, serum, CVLs, swabs, DBS, PBMCs, and urine

Digital storage of inventories: LDMS, Freezerworks, Excel program

Un-Utilized Capacity: Anaerobic cultures, Elispot, Inverted microscope

KEMRI/CDC TB Laboratory – Kisumu

Lab services/tests:

MGIT Culture	Fluorescence tube culture
LJ culture	LJ tubes
Fluorescent microscopy	Auramine O
Ziehl Neelsen Technique	Basic fuchsin
Hain line probe assay	Genotype MTBDR plus
MGIT DST	Fluorescence tube culture
Quantitative culture	Middlebrook 7H11S
GeneXpert testing	MTB/RIF
TB blood culture	BD Myco F lytic tubes
DNA sequencing	Dye terminator
Identification	Hain Genotype CM
Identification	Hain Genotype AS
MTB speciation	Hain Genotype MTBC
Interferon gamma release assay(IGRA)	Quantiferon TB Gold
PBMC separation	CPT, leucosep, ficoll
Whole blood stimulation assay	Protocol specific
Elispot	Tspot

List of Equipment in the lab

Bactec MGIT 960
CO2 incubators
Biosafety cabinet
Refrigerator
Thermocycler
Twincubator
GT blot 48
Fluorescent microscope
Light microscope
-80 freezer
GeneXpert machine
Refrigerated centrifuge
Micro centrifuge
Sonicator
ELISA reader
ELISA washer

Biological Specimen Repository: MTBC isolate, MTB DNA, sputum pellets, urine, processed stool, plasma, PBMCs, whole blood and culture supernatant.

Digital storage of inventories: TB lab storage database.

Un-Utilized Capacity: Flow cytometry- 4 colored shared.

Test costs: Costs of each test available.

EQUIPMENT SUMMARY	Msa lab	CTRL	UW Paeds	CMR	TREE/ Coptic	PHRD	MH Kericho	AMPATH	HIV-R Kis	CDC-TB Kis
Incubators	•	•		•				•		•
Incubator CO2			•							•
Biosafety Cabinet BSL-2	•	•	•	•	•			•	•	•
Refrigerated centrifuge	•	•	•	•	•			•	•	
Refrigerated non-centrifuge	•	•	•	•		•	•	•	•	•
Microcentrifuge		•				•		•		•
FACSCount	•	•								
FACSCalibur			•					•	•	
Microscope	•	•	•	•	•	•	•	•		•
Fluorescent microscope										•
DTS 400	•									
PANTHER	•									
Freezers -80C	•	•	•	•	•	•	•			•
Freezers -20C	•		•	•	•					
2-8C fridges	•	•	•	•	•	•				•
LN storage tanks	•		•						•	
ELISA Plate Reader/washer	•	•	•		•			•	•	•
Reflotron dry Chemistry	•	•								
Beckman coulter ACT 5 DIFF		•						•	•	
Cobas Integra		•						•		
Elispot reader			•							
Omni filter Cell harvester			•							
Liquid scintillation counter			•							
Thermo cycler				•			•			•
ABI Gene Amp PCR systems					•		•			
Genetic analyzer - sequencer										
Real time PCR										
imaging system for gel pictures				•	•					
Nanodrop spectrophotometer					•					
Microscan / Autoscan 4							•			
Bactec							•			•
FilmArray							•			
Quant studio V7							•		•	
Abbott m200rt								•	•	
CAP/CTM									•	
C8800									•	
ABI 3130 genetic analyzer									•	
Cobas 400+									•	
C311/E411									•	
GeneXpert machine										•
GT blot 48										•

<u>SUMMARY OF TESTS</u>	MSA lab	CTRL	UW Mol/Vir	CMR	TREE/Coptic	PHRD	AMPA TH	MHK	HIV-R	CDC-TB
Chlamydia Trachomatis	•						•		•	
Trichomonas Vaginalis	•								•	
HPV	•						•			
M genitalium	•									
HIV qualitative	•									
HIV rapid and ELISA	•	•		•			•		•	
Gonorrhea	•									
Lactobacillus	•									
Syphilis testing	•						•			
HSV-2 ELISA	•						•		•	
IL-6	•	•							•	
CRP	•									
CD4 Count	•	•				•	•		•	
Yeast	•									
PSA rapid	•									
HB	•									
GPT/ALT	•									
Creatinine	•	•								
Cervical smear	•									
Bacterial Vaginosis	•	•							•	
Vaginal wet prep	•					•				
HBsAg		•							•	
HBsAb		•							•	
DNA/RNA extraction			•		•					
RNA extraction from plasma			•							
HIV-1 Early Infant Diagnosis (EID)			•							
Gel electrophoresis			•							
ARV drug resistance testing			•		•					
Sickles cell testing, immunoblot				•						
Malaria testing				•						
Typhoid assays				•						
Bacterial culture								•		
Blood culture								•		

<u>SUMMARY OF TESTS</u>	MSA lab	CTRL	UW Mol/Vir	CMR	TREE/Coptic	PHRD	AMPA TH	MHK	HIV-R	CDC-TB
Bacterial Identification								•		
Antimicrobial susceptibility test								•		
Stool Parasitology								•		
Enteric Virology										
HIV-1 RNA (Viral load)							•		•	
DNA-PCR						•			•	
HIV-1 Genotyping									•	
Hepatitis B qual/quant							•		•	
Hepatitis C qual/quant									•	
Anti HBV/HCV serology							•		•	
General chemistries							•		•	
Haematology							•		•	
MGIT Culture										•
LJ culture										•
Fluorescent microscopy										•
Ziehl Neelsen Technique										•
Hain line probe assay										•
MGIT DST										•
Quantitative culture										•
GeneXpert testing										•
TB blood culture										•
DNA sequencing										•
MTB speciation										•
Interferon gamma (IGRA)										•
Whole blood stimulation assay										•
Elispot										•