

Understanding Laboratory Referrals

Dr Clothilde Oliphant

COO: Strategic Initiatives: NHLS

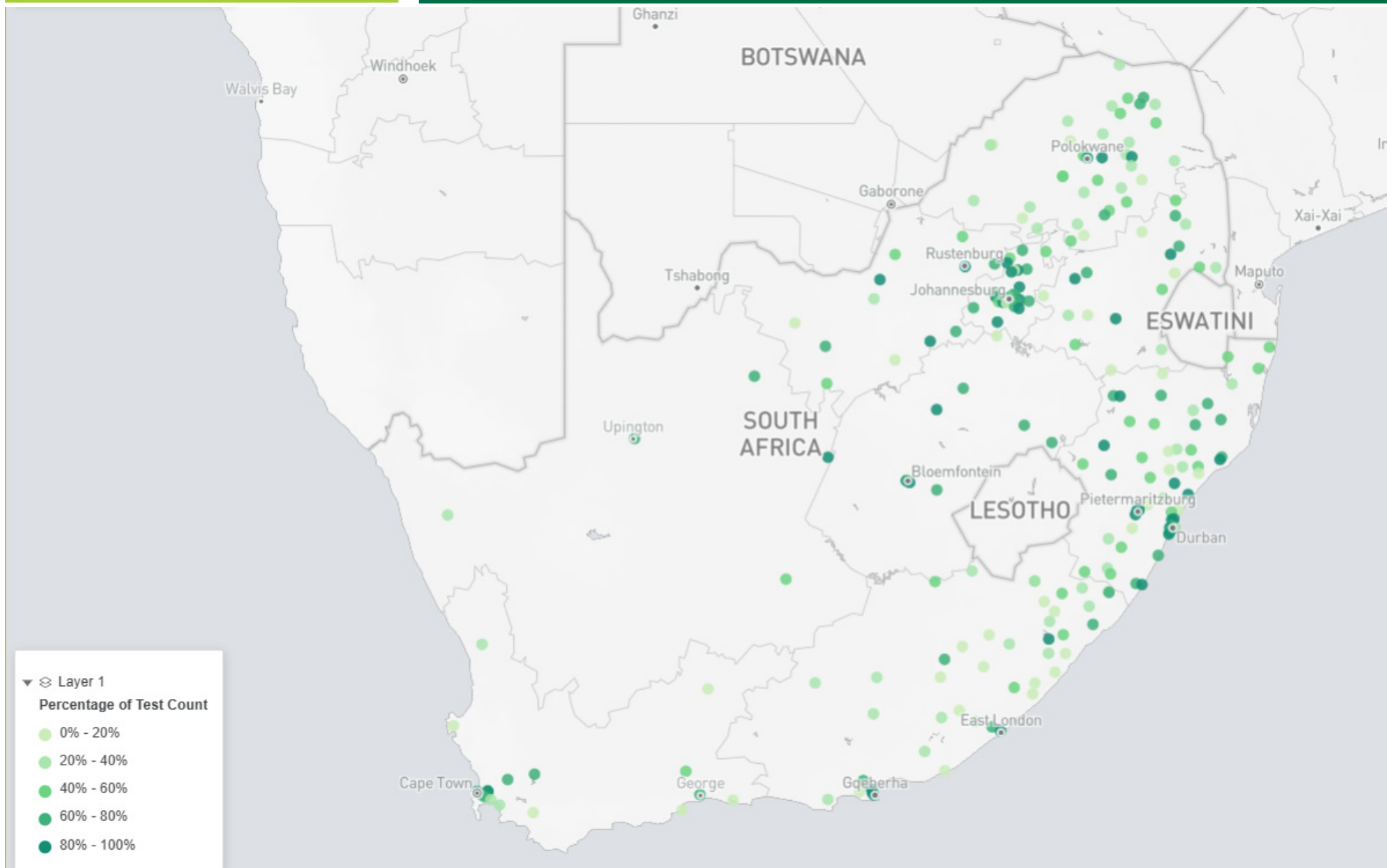
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1. NHLS Laboratories - Overview

2. Diagnostic Laboratories

3. Forensic Chemistry Laboratories



Suspected exposure to chemical substances

- Investigations are case-dependent
- Contact referral laboratory, discuss queries with pathologists
- Not always possible to identify exact agents – ensure supportive treatment

General Investigation

Test	Collection materials	
Arterial blood gas	Heparinised syringe	<ul style="list-style-type: none"> • Oxygenation • Acid-base disturbances, lactate
Plasma glucose	Sodium Fluoride tube	
FBC	K-EDTA tube	<ul style="list-style-type: none"> • Haemolysis • Thrombocytopenia
U&E, Creatinine	Serum sample	<ul style="list-style-type: none"> • Electrolyte disturbance • Renal function
Liver Function Tests	Serum sample	<ul style="list-style-type: none"> • Assess liver injury
CMP	Serum sample	<ul style="list-style-type: none"> • Abnormalities of calcium, magnesium or phosphorus

Specific Investigations

Suspected cause	Test	Collection material
Organophosphate or similar compound	Serum cholinesterase	• Serum sample
	Red cell cholinesterase (some laboratories)	• Check with Lab
Medication overdose (e.g. paracetamol, salicylates etc)	Confirm with lab which compounds they test for	• Serum sample
Warfarin related compounds (rat poisons)	INR	• Citrate tube
Ethylene glycol poisoning (e.g. antifreeze)	Urine for specific crystals (enquire with local laboratory)	• Urine sample

Introduction

Four laboratories: Cape Town, Durban, Johannesburg and Pretoria

Fully integrated with the NHLS with effect from 01 April 2022

Core Business & Legal Mandate

- The forensic testing of antemortem and post-mortem blood samples for alcohol content
National Road Traffic Act 93 of 1996 and Criminal Procedure Act, 51 (1977) s212 4(a) and 8(a)
- The testing of biological tissues and fluids for the presence of poisons and/or drugs in instances of unnatural deaths (toxicology analysis)
Criminal Procedures Act 51 of 1977, and the Inquest Act 58 of 1959
- The analysis of foodstuffs and cosmetics to test for compliance
Foodstuffs, Cosmetics and Disinfectant Act 54 of 1972.

Clients

- South African Police Service
- Forensic Pathology Services
- National Prosecuting Authority
- Environmental Health services – Local Authorities and National Department of Health

Blood Alcohol Analysis

Assist the SAPS and FPS in determining the concentration of alcohol in biological samples

- Antemortem: alleged cases of DUI
- Post-mortem: suspected unnatural death

Type of testing	Analytic Instruments
<ul style="list-style-type: none">• Ethanol in biological sample• Sodium fluoride	<ul style="list-style-type: none">• Gas Chromatography-Flame Ionization with Headspace (GCFID-HS)• Fluoride Analyser

Toxicology Analysis

- Biological samples collected by Forensic Pathology Officer at post-mortem
 - Blood, gastric contents, urine, vitreous fluid, organ specimens
 - Cause of death unknown and analysts screen for known poisons, drugs (medical and illicit)
- Physical exhibits collected from the scene by investigating officers

Type of testing	Analytic Instruments
<ul style="list-style-type: none"> • Pesticides • Drug identification (illicit and pharmaceutical) • Poison • Ethanol • Cyanide • Carbon Monoxide • Heavy Metals • Phosphine Gas • Volatiles (brake fluid, paraffin) 	<ul style="list-style-type: none"> • Gas Chromatography-mass spectrometry • Liquid Chromatography-mass spectrometry • Gas Chromatography-Flame Ionization with Headspace (GC-FID-HS) • Fluoride Analyser • Ultraviolet-visible spectrophotometry (UV-VIS) • Inductively-coupled plasma mass spectrometry (ICP-MS)

- Assist health authorities (EHPs and Port Health) with monitoring compliance of food manufacturers and distributors with the relevant legislation.
- No samples are accepted from private individuals or companies

Classification	Type of testing	Sample type from EHP
Contaminants	<ul style="list-style-type: none"> • Toxins (mycotoxins, hydroquinone) • Pesticides • Heavy metals • Melamine, 	<ul style="list-style-type: none"> • Nuts and nut products, cosmetic products • Grains • Fish and canned food • Infant cereals, foods, etc
Nutrient fortification	<ul style="list-style-type: none"> • Iodine • Metals, vitamins 	<ul style="list-style-type: none"> • Salt • Maize flour, bread, baked goods
Verification	<ul style="list-style-type: none"> • Preservatives, Additives and Sweeteners • Azo dyes /Colourants • Caffeine • Sodium Reduction 	<ul style="list-style-type: none"> • Fruit and Veggie juice, Soft Cola and Energy drinks, Sauces, Milk, Powder Milk, Infant formulae, other dairy products • Snacks, sweets, chocolates, biscuits. Fruit and Veggie juice, Soft, Cola and Energy drinks • Coffee and energy drinks • All Food Products
Adulteration <i>Verifying the authenticity of products</i>	<ul style="list-style-type: none"> • Extra Virgin Olive Oil • Sudan Red 	<ul style="list-style-type: none"> • Cooking Oils • Spice and Sauces
Allergens	<ul style="list-style-type: none"> • Gluten 	<ul style="list-style-type: none"> • Wheat products

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CAPE TOWN : 120 Albert Road, Woodstock

DURBAN : 85 Magwaza Maphalala Street, Umbilo

JOHANNESBURG: 110 Joubert Str, Braamfontein

PRETORIA: 271 Visagie Str, Burgerspark
Building 10F, CSIR Complex,

Thank You