

Techniques Used to Detect HIV Infections

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DESCRIPTION

Human Immunodeficiency Virus (HIV) diagnostics have been critical in the extraordinary success in detecting, staging, beginning, and following up infected people on life-threatening antiretroviral medication. They are also valuable in monitoring and epidemic reaction, allowing for infection burden assessment and identification of vulnerable groups and transmission "hot spots," allowing for planning, suitable interventions, and financial allocation [1]. To extend coverage, boost access, and favourably affect treatment of patients, HIV diagnostics must be a combination of traditional laboratory-based diagnostic tests and innovative technologies, including point-of-care (POC) testing. Ensuring HIV diagnostics prominent position in programmes necessitates regular monitoring and optimization with quality assurance in order to inform modifications or alignment for effective eradicate the epidemic [2].

HIV diagnostics must utilize comprised of standard laboratory-based diagnostic tests and novel technologies, including Point-Of-Care (POC) testing, to increase coverage, improve access, and improve patient treatment. HIV prevention and treatment with Antiretroviral Therapy (ART) have decreased new HIV infections by 14%, from 2.1 million in 2013 to 1.8 million in 2016. To accelerate progress towards this goal, Joint United Nations Programme on HIV and AIDS (UNAIDS) established ambitious 90-90-90 targets, with the first 90 defined as 90% of HIV-infected people knowing their status, the second 90% defined as 90% of patients with HIV infection receiving ART, and the third 90% defined as 90% of ART-treated patients having viral suppression [3,4].

For poor nations, issues include government regulations, budgetary supply, data-driven programming, operational coordination among health care agencies and implementing partners, and laboratory infrastructure. Recent President's Emergency Plan for AIDS Relief (PEPFAR)-sponsored population-based HIV impact studies in the United States, however, have shown that these aims are doable. The first and third 90 objectives, in particular, ask for the provision of high-quality diagnostic testing to detect infections, monitor the efficacy

of ART, and offer timely assessments of HIV/AIDS control and the evolution of Drug Resistance (DR) at both the individual and community levels. In Resource-Limited Settings (RLS), serologic testing techniques, primarily fast assays, are now employed to diagnose HIV infections [5].

Serology-based incidence assays are frequently used in cross-sectional surveys to estimate the rate of new infections, and are often paired with Viral Load (VL) assessment in an algorithm. The novel fast incidence test has sparked much interest since it has the potential to identify hot areas in real time when employed in programme settings [6,7].

Proper implementation of simple POC CD4 techniques to offer patients with same-day findings had a major influence on patient enrollment and retention in ART programmes. Similarly, ART programmes have used VL determination technology in both centralized and decentralized facilities to measure the efficacy of ART [8].

Furthermore, in the field of Early Infant Diagnosis (EID), Dried Blood Spot (DBS) and whole-blood-based POC techniques have done well. Transmitted Drug Resistance (TDR) is increasing in RLS as a result of the fast scale-up of ART. As a result, testing for DR to assess the presence of mutations is crucial in order to offer patients with optimum therapy without the need for a needless transition to second-line and maybe third-line ART regimens with greater expenses. Accurate HIV infection diagnosis is critical because it marks the moment at which infected individuals enter the treatment cascade. Furthermore, it has regained prominence in the period of "test and treat" with ART [9,10].

The World Health Organization (WHO) recommendations for HIV Testing Services (HTS) emphasized the necessity of quality control systems. With the effort to expand HIV testing in order to meet the UNAIDS 90-90-90 targets, it is both systematically and with integrity imperative, as well as a priority, for Ministries Of Health (MOH) and national AIDS control programmes, to implement robust quality assurance programmes to support the execution and delivery of accurate testing results to all those who have been tested [11].

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