The role of the African Union Pan African Veterinary Vaccine Centre (AU-PANVAC) in rinderpest eradication

Background
PANVAC originated in 1986 in response to the need for effective control of rinderpest in Africa. Earlier attempts to eradicate the disease through the multi-national JP15 had failed in the 1970s, partly because insufficient levels of immunity were sustained in vaccinated animals, owing to the use of vaccines that had not been certified by independent quality control.

This failure prompted the then OAU (now the AU) to request FAO’s assistance in setting up a system for independent quality control of the rinderpest vaccines used in the campaign. Initially, this was achieved through a short-term FAO TCP project in 1986, which established two regional vaccine quality control and training centres: one in Dakar (Senegal) for Central and Western Africa; and one in Debre Zeit (Ethiopia) for Eastern and Southern Africa (TCP/RAF/6767). These centres operated from 1989 to 1992 under a project funded by UNDP; in 1993, they were merged into PANVAC, hosted by the Ethiopian Government at the National Veterinary Institute (NVI), Debre Zeit. PANVAC’s mandate was to perform quality control on priority vaccines (primarily rinderpest and contagious bovine pleuropneumonia), according to international standards; promote the adoption of biological standardization and control of veterinary vaccines in Africa, through establishment of a repository of characterized reference vaccine materials; develop internationally recognizable quality control criteria; and promote the principles of good manufacturing practice.

PANVAC’s contributions
PANVAC’s greatest impact on the global rinderpest eradication campaign was in improving the quality of the rinderpest vaccine used in the field. A total of 193 batches of rinderpest vaccine from all the vaccine producing laboratories in Africa were tested between 1996 and 1998, and it was found that the strict, standardized quality control of rinderpest vaccines initiated by PANVAC had resulted in significant improvements in the quality of the vaccines applied. The proportion of African vaccine lots meeting international quality standards rose from about 33 percent in 1985 to more than 90 percent in 1997. Implementation of the quality assurance system enabled managers of PARC to insist that only PANVAC-certified vaccines were used in national rinderpest eradication programmes. At one point, possession of a PANVAC quality assurance certificate was a prerequisite for any rinderpest vaccine purchased for use in Africa or any country where the battle against rinderpest was being waged. Vaccine production and quality assurance technologies based on the PANVAC quality assurance procedures were transferred to countries in other...
regions, such as Pakistan, India and Iraq. It was noted that these transfers, carried out by PANVAC staff in 1995, may have been decisive in eliminating rinderpest from the countries concerned.

PANVAC’s activities throughout PARC were not restricted to laboratory processes to ensure that vaccines released for the campaign were of good quality. PANVAC was also active at the producer level, promoting the concept of good manufacturing practices, in training laboratory personnel and in the following activities:

- **Standardization of biologics and standard operation procedures**: A repository of well-characterized reference materials was established, comprising cell lines, virus and bacterial vaccine seed stocks, antisera and antigens. Most vaccine production laboratories in Africa have benefited from supplies derived from these materials. Standard operating procedures for the production and quality control of major vaccines were published, and contributed to the adoption of harmonized procedures in Africa.

- **Training and technology transfer**: PANVAC trained more than 400 veterinarians and technicians from national vaccine production laboratories in Africa. The training sessions were organized as workshop fellowships or in-house arrangements. PANVAC also provided technical expertise to vaccine producing laboratories, to improve their productivity. It pioneered the development of an alternative method for preparing thermo-tolerant peste des petits ruminants vaccines, and this technology was transferred to Ethiopia’s NVI and Mali’s Laboratoire Central Vétérinaire (LCV), through FAO TCP support. Representatives from veterinary laboratories in Cameroon, Egypt and Kenya also benefited from knowledge of this vaccine technology, during a workshop organized in April 2003 at Debre Zeit (Ethiopia).

- **Countries that did not produce vaccines**, such as Burundi, the United Republic of Tanzania and Uganda, benefited from PANVAC assistance in revalidating the potency of their priority vaccine stocks and emergency vaccine banks. PANVAC is still involved in the periodic testing of emergency vaccine stock for AU-IBAR. Within the framework of GREP, batches of rinderpest and peste des petits ruminants vaccine from production units in Jordan, the Syrian Arab Republic and India were tested at PANVAC. Senior staff of these laboratories benefited from PANVAC training programmes in quality control and production.

- **Information collection and dissemination**: While UNDP funding continued, PANVAC published a quarterly bulletin on vaccine technology and science, which it distributed to network laboratories.

- **A network of vaccine production laboratories**: PANVAC’s quality control services and supply of biological material led to the creation of a network of vaccine production laboratories throughout Africa and the Near East. This network brought benefits to member laboratories.

- **Collaboration with other centres of vaccine sciences**: PANVAC built collaborative partnerships with leading global institutions in vaccine science (IAH-Pirbright, CIRAD-EMVT, CTVM-Edinburgh, NVSL/APHIS/VS/USDA, IAEA, ILMB/
UC-Davis, etc.) and participated in international working groups such as the OIE working group on veterinary drug registration and the FAO/AU-IBAR/OIE/IAEA consultative group on contagious bovine pleuropneumonia.

PANVAC’s contribution to the success of PARC was noted by various evaluation and review teams, who reported that “The success of … PARC and PACE clearly demonstrated that no amount of vehicles, syringes, trained personnel, communication materials would have eliminated rinderpest if the vaccine batches used were of poor quality. It was the secondary and independent level of quality control assessment assured by AU-PANVAC which played a major role in this success and led at the same time to a sustained improvement in the quality of vaccines against rinderpest and contagious bovine pleuropneumonia produced in Africa”.

To strengthen these achievements in the interests of Africa, the 67th ordinary session of the OAU Council of Ministers (Addis Ababa 23 to 27 February 1998) decided to make PANVAC an OAU Specialized Agency. AU-PANVAC was officially launched as a specialized Regional Technical Centre of the AU under the Department of Rural Economy and Agriculture on 12 March 2004.

Following the eradication of rinderpest, AU Member States have given AU-PANVAC the mandate to collect and safeguard all materials containing rinderpest: AU-PANVAC is currently concluding talks on the modalities for implementing this activity, and has concluded the arrangements for acquiring a biosafety level-3 laboratory for the purpose. According to its mandate, AU-PANVAC is to serve as the only repository for rinderpest materials and emergency vaccine stock for the event of an outbreak of rinderpest on the African continent.

Contributor: Karim Tounkara (Director AU-PANVAC), Nick Nwankpa (AU-PANVAC) and Charles Bodjo (AU-PANVAC)