South Sudan's journey to defeat Guinea Worm Disease: The role of President Jimmy Carter and the Carter Center

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Introduction

Guinea Worm Disease (GWD), caused by the parasitic worm *Dracunculus medinensis*, is a debilitating condition characterized by painful skin ulcers. This waterborne disease, transmitted by ingesting contaminated drinking water infected with the larvae poses a significant public health challenge, primarily affecting rural communities with limited access to safe drinking water and proper sanitation facilities. Since 1986, The Carter Center has led the international campaign to eradicate Guinea worm disease, working closely with ministries of health and local communities, the U.S. Centers for Disease Control and Prevention, the World Health Organization, UNICEF, and many others. South Sudan is one of the last remaining endemic countries in the world, along with Angola, Chad, Ethiopia, and Mali.

How President Jimmy Carter joined the fight against GWD

The global campaign for Guinea worm eradication was first championed as a major indicator to measure the success of the United Nations International Water and Sanitation Decade campaign (1981-1990). This conceptualized GWD as an indicator of the isolation of poor rural residents from national development programmes such as water supply, education, and health care.[1,2]

However, getting GWD eradication into the Water Decade would not have been an easy task were it not for the persistent and determination of Dr Donald Hopkins, then at the U.S. Centers for Disease Control and Prevention (CDC), a veteran of the smallpox eradication and the first to lead the global GWD campaign at the Carter Center. Dr Hopkins was surprised to see no reference to GWD in that month's Special Issue of WHO's World Health magazine that was devoted to the Water and Sanitation Decade, while attending a conference in Geneva in October 1980., the year in which the Water Decade campaign was supposed to begin. Dr Hopkins then took the initiative about how to address the disease, including adding its eradication to the Water Decade agenda. Dr Ernesto Ruiz, the second Director for the Guinea worm eradication programme at the Carter Center, explained some of the reasons for lack of enthusiasm: GWD was mostly unknown in the developed world, there was no vaccine or cure, and its one-year incubation period meant progress would be slow.[3] The efforts of Dr Hopkins while working at the Center for Disease Control and Prevention (CDC), as the Assistant Director for International Health, materialized when the first national conference on GWD in 1985 was held in Nigeria. In the following year (1986), WHO's governing body passed the first resolution calling for the eradication of GWD.[2] and the First African Regional Conference on Dracunculiasis Eradication was convened at Niamey, Niger in July.

However, it became clear to Dr Hopkins and colleagues at the CDC that getting the necessary funding for the global eradication campaign was not forthcoming and diplomacy on a grand scale was essential. There was a need for a global champion and President Jimmy Carter was approached. President Carter wasted no time in committing himself, his family, and his NGO (The Carter Center) to lead a global drive for the eradication of GWD.

The impact of the Carter Center

President Carter brokered a nearly six-month long ceasefire in Sudan's civil war in 1995. This Guinea worm ceasefire enabled countrywide active case searches and implementation of Guinea worm eradication interventions, vaccination of children against measles and polio and the treatment of populations in endemic areas against onchocerciasis (river blindness). It also provided corridors for other humanitarian interventions to areas affected by conflict. Dr Donald Hopkins and Craig Withers wrote about the ceasefire: *"In our opinion, at this stage of the Sudan GWEP, temporary cease-fires or days of tranquillity are only useful to the extent that they are confidence-building steps toward the main goal, which is ending the war altogether."*[4]

With financial, technical and management support, mainly from the Carter Center as well as WHO, UNICEF, and NGOS working in southern Sudan, two guinea worm programmes operated (one through the Federal Ministry of Health and one through Operation Lifeline Sudan supported NGOs) from 1995 to 2005. After the Comprehensive Peace Agreement, the Carter Center continued to date with support for the programme in South Sudan. In 2006, Southern Sudan reported 20,851 cases of GWD accounting for 98% of cases reported worldwide. As of 2024, South Sudan has reduced cases by 99.99% compared to the cases reported in 2006.

Reduction in the cases of GWD

The civil war in Sudan (1983-2005), meant that the health infrastructures were destroyed, with humanitarian, health and social services being provided mainly by a consortium of non-governmental organizations. Therefore, the South Sudan Guinea Worm Eradication Programme (SSGWEP) was established in 2006 with the daunting task of establishing a community-based surveillance system from scratch capable of:

1. Detecting all Guinea worm cases in endemic and at-risk villages. Figure 1
2. Establishing an effective intervention delivery system to break guinea worm transmission. Figure 2.
3. Establishing a village-based surveillance system covering thousands of villages that became the model for a community healthcare system across the country.[5]

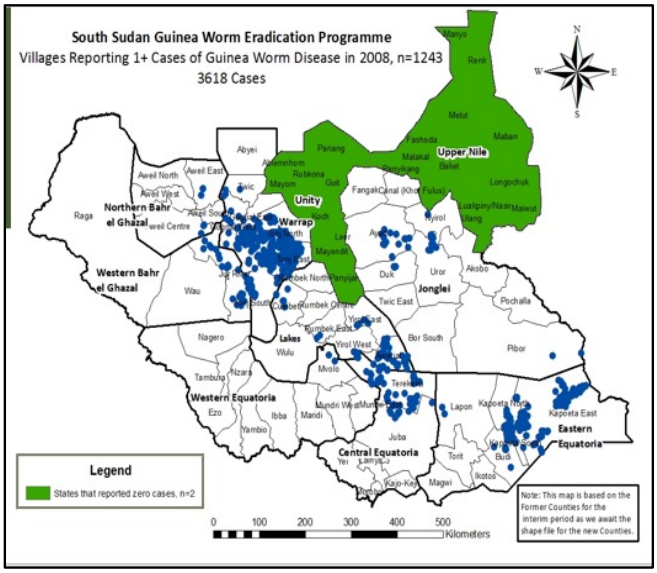

Figure 1. South Sudan Guinea worm eradiation progamme 2008. (Source: SSGWEP)

Figure 2. Filters for drinking water in Guinea worm areas (Southern Sudan Guinea Worm Mid-year 2006 report)

Challenges in eradicating GWD

The persistence of GWD in South Sudan is compounded by ongoing socio-political challenges, including civil unrest, population displacement, and limited access to clean drinking water. Additionally, the recognition of Guinea worm infections in animals, particularly among domestic dogs and wild cats, raises new challenges for interrupting transmission.

Recommendations

The South Sudan Guinea Worm Eradication Programme (SSGWEP) greatly contributed to strengthening the national health system through the Boma Health Initiative. The programme has consistently advocated and supported the management capacities especially at the county and payam levels as an integral part of strengthening the existing health systems. In view of the apparent donor fatigue, it is important that the gains of the eradication efforts must be sustained in addressing the challenges of the last-mile.

Conclusion

From 2023 - 2024 the SSGWEP implemented a new strategy based on effective engagement of communities in endemic areas, utilizing their knowledge of home-ranges for domesticated and wild animals and applying all interventions in bomas with villages that reported one or more cases or animal infections from 2018-2024. The strategy has not only resulted in increased identification and treatment of water sources, that pose risks to both host human population and animals, it has also resulted in the surge of screening animals for GWD contributing to heightened surveillance. This gives the momentum that interruption of transmission is still possible, and South Sudan has turned the corner to achieve the much-anticipated attainment of guinea worm elimination targets.

President Jimmy Carter died on 29 December 20024 at the age of 100. The South Sudan National Minister of Health, Ms Yolanda Awel, commented on his passing: *"[President] Jimmy Carter's life was dedicated to saving millions of lives in the World through [the] initiative of the Carter Center Organization. His legacy shall continue to inspire us to serve humanity, provide peaceful [re]solution of conflicts and advancement of democracy in the developing countries including South Sudan."*

His wish was to outlive the Guinea worm and make the world a better place for all. Now we will only have his legacy.

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