



AAPM 2025

JULY 27-30 | WASHINGTON, DC
67TH ANNUAL MEETING & EXHIBITION

COMING TOGETHER TO FORGE AHEAD
IN MEDICAL PHYSICS

The European colonial legacy's influence on modern-day access to radiological health services in sub-Saharan Africa

Ann T. Nguyen¹, Eman Suliman², Gage Redler³, Shalom Kpetsu⁴, Daniela Branco⁵, John M. Bryant³, Peter Sandwall⁶, Charles R. Thomas Jr.^{7,8}, Joseph Weygand^{7,8}

ABSTRACT

Purpose: Access to radiological health services in sub-Saharan Africa (sSA) remains extremely inadequate, with over 90% of the population in most countries lacking access to radiotherapy and facing similar deficits in diagnostic imaging¹⁻³. These disparities arise from a complex intersection of historical, socioeconomic, ethnic, and geopolitical influences. This study examines the impact of the European colonial legacy on contemporary access to radiological health services across sSA.

Methods: Sub-Saharan African countries were categorized by former colonizer (United Kingdom, France, Portugal, Belgium). Radiotherapy access was evaluated using megavoltage unit data from the IAEA's Directory of Radiotherapy Centers (DIRAC), while diagnostic imaging availability (MRI, CT, PET, nuclear medicine, mammography) was obtained from the WHO's Global Atlas of Medical Devices. Population-normalized metrics and IAEA benchmarks were then used to estimate the percentage of populations with access to each service. Intergroup differences were analyzed to explore the impact of colonial legacy.

Results: Former British colonies exhibit markedly greater access to radiological health services compared to their French, Portuguese, and Belgian counterparts. For instance, 27.2% of the population in former British colonies has access to radiotherapy, compared to 8.2%, 6.0%, and 2.5% in former French, Portuguese, and Belgian colonies, respectively. A similar pattern is observed across multiple diagnostic imaging modalities; for example, access to CT is available to 47.3% of the population in former British colonies, contrasted with 33.7%, 25.8%, and 6.9% in French, Portuguese, and Belgian colonies, respectively.

Conclusion: The findings suggest that European colonial legacy continues to influence access to radiological health services in 2024 (six decades after independence), with former British colonies demonstrating greater availability compared to their French, Portuguese, and Belgian counterparts. Addressing these disparities requires targeted global health interventions, particularly in French- and Portuguese-speaking regions, focusing on infrastructure development, capacity-building, and language-specific outreach to promote equitable access to radiological healthcare.

AUTHOR AFFILIATIONS

¹University of South Florida Morsani College of Medicine, Tampa FL, USA

²Department of Medicine, Alzahraa University Hospital, Cairo, Egypt

³Department of Radiation Oncology, Moffitt Cancer Center, Tampa FL, USA

⁴Department of French, Purdue University, West Lafayette IN, USA

⁵Department of Radiation Medicine and Applied Sciences, University of California San Diego, La Jolla CA, USA

⁶Department of Radiation Oncology, Ohio Health, Mansfield, OH, USA

⁷Department of Radiation Oncology and Applied Sciences, Geisel School of Medicine, Dartmouth College, Lebanon NH, USA

⁸Dartmouth Cancer Center, TEC Research Program, Hanover NH, USA

CONTACT

Joseph Weygand, Ph.D., DABR
Director of Global Radiation Oncology
Dartmouth-Hitchcock Medical Center
1 Medical Center Drive
Lebanon NH, USA 03766
joeweygand@gmail.com

INTRODUCTION

The movement to decolonize global health^{1,2} highlights the need to address structural inequities rooted in colonial legacies. This study examines how European colonial history influences access to radiological health services in sub-Saharan Africa (sSA), where over 90% of the population lacks radiotherapy and faces severe diagnostic imaging deficits^{3,4}. These disparities arise from a complex interplay of historical, socioeconomic, ethnic, and geopolitical factors, with this work focusing on the historical impact of colonialism on current radiological health access.

METHODS AND MATERIALS

Nations in sSA were categorized by their former colonial ruler (United Kingdom, France, Portugal, Belgium). Data on radiotherapy access came from the IAEA's Directory of Radiotherapy Centers (DIRAC)⁵, while diagnostic imaging metrics (MRI, CT, PET, nuclear medicine, mammography) were sourced from the WHO's Global Atlas of Medical Devices⁶. Population-adjusted metrics and IAEA benchmarks estimated the proportion of the population with access to these services. Variations between groups were analyzed to explore potential influence of colonial heritage.

RESULTS

The analysis shows markedly greater access to radiological health services in former British colonies compared to those colonized by France, Portugal, or Belgium. For example, 27.2% of individuals in former British colonies have access to radiotherapy, compared to 8.2%, 6.0%, and 2.5% in former French, Portuguese, and Belgian colonies, respectively. Similar disparities exist in diagnostic imaging; CT access reaches 47.3% of the population in former British colonies but only 33.7%, 25.8%, and 6.9% in French, Portuguese, and Belgian colonies, respectively. This same trend holds across each imaging modality.

DISCUSSION

Historical institutions continue to shape access to radiological health services across sub-Saharan Africa. Colonial administrations established distinct governance models. British rule often relied on indirect administration, while Portuguese and Belgian systems were highly centralized and extractive. These institutional foundations influenced post-independence state capacity and investment priorities. Language remains one of the most enduring legacies, shaping access to training, mentorship, and global engagement. Anglophone countries tend to be better positioned within international radiological health networks, while Francophone and Lusophone countries face structural barriers to participation. The disparities observed in this study are not only the result of present-day decisions but also reflect historical patterns of authority and exclusion. Targeted educational initiatives and outreach across language divides are essential to promoting equity. This work represents one step toward a broader effort to understand how inherited systems influence health service delivery and to support more inclusive and historically grounded strategies in global health.

Figure 1

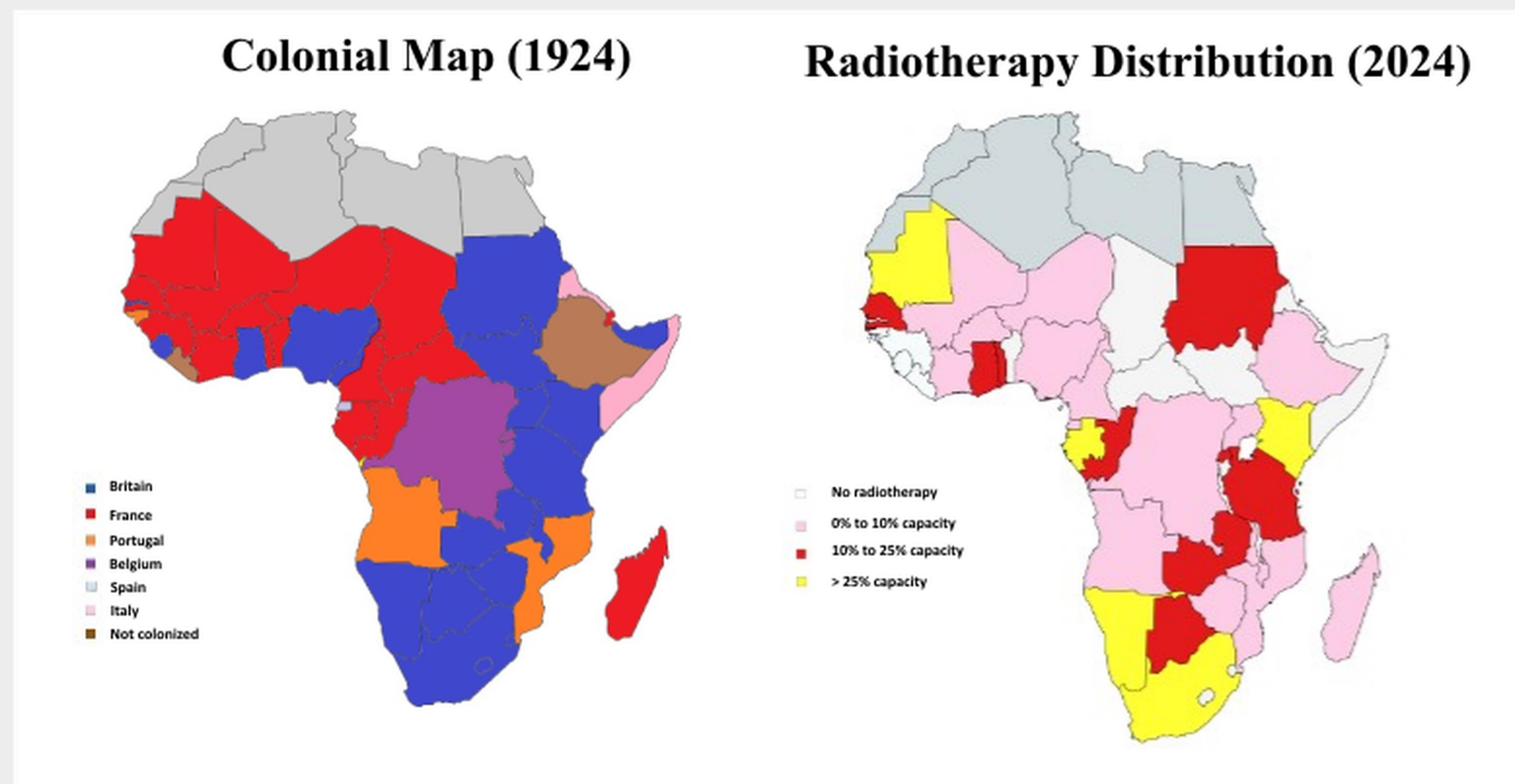


Figure 1 juxtaposes a 1924 map of colonial Africa with the contemporary distribution of radiotherapy equipment, quantified as the proportion of each country's population with hypothetical access to radiotherapy services. Despite some exceptions, the geographic patterns reveal a striking continuity. Regions of western and central Africa, historically dominated by French and Belgian colonial rule, remain critically underserved, with less than 10% of their populations having access to radiotherapy. Notably, only five out of approximately fifty sub-Saharan African countries achieve population access rates exceeding 25%, underscoring persistent disparities in the region.

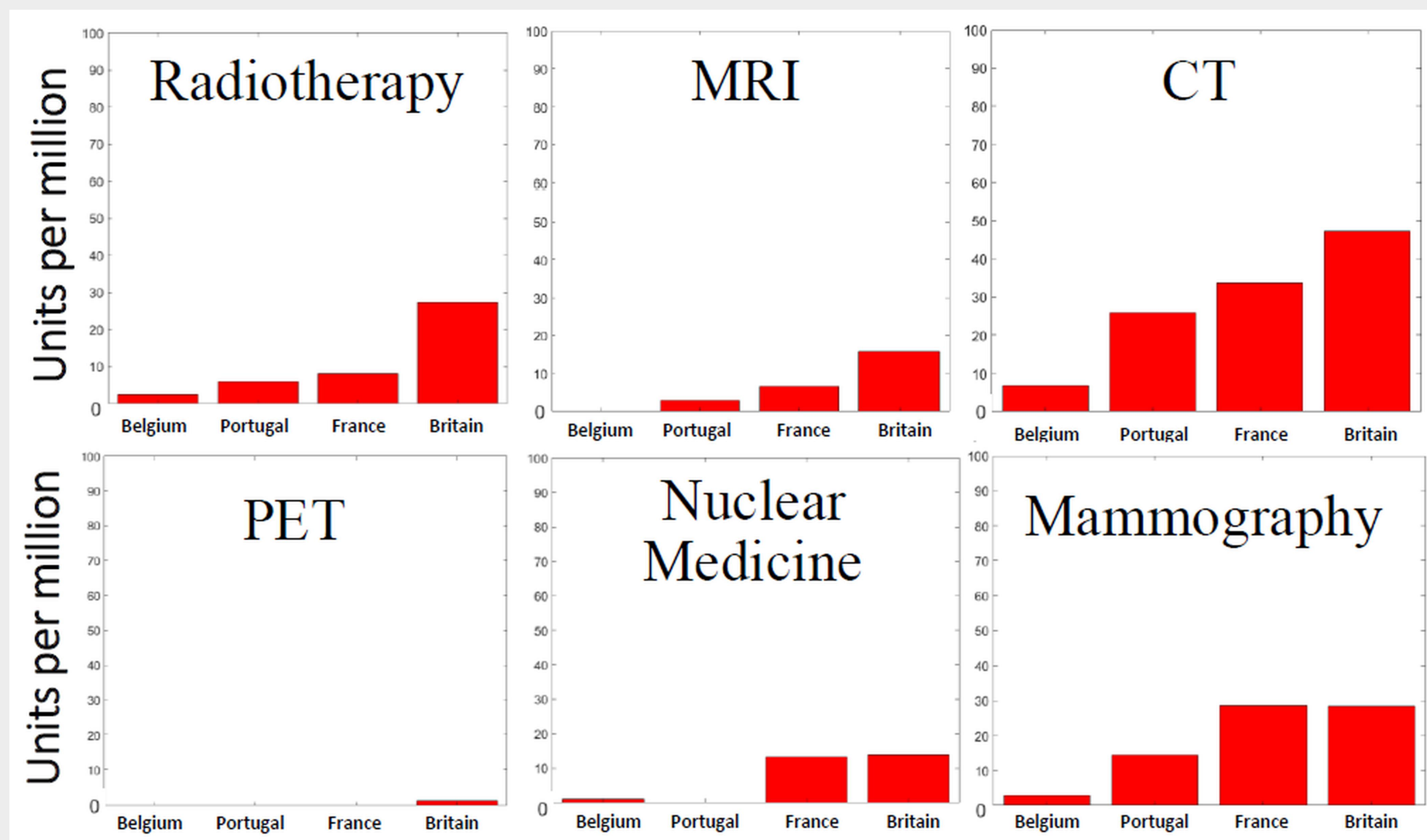


Figure 2 illustrates the correlation between colonial legacy and access to radiological health services, with a consistent trend observed across radiotherapy and diagnostic imaging modalities: former British colonies exhibit the highest access, followed by French, Portuguese, and Belgian colonies.

CONCLUSION

The findings reveal the lasting influence of European colonialism on radiological health access in 2024 (six decades post-independence). Former British colonies have significantly greater access to these services than French, Portuguese, and Belgian counterparts, reflecting entrenched colonial-era institutional structures that continue to shape resource distribution and governance⁷. Addressing these disparities requires targeted global health strategies focused on infrastructure, capacity-building, and culturally and linguistically tailored outreach in French- and Portuguese-speaking regions.

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