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Availability of radiotherapy in Africa: past and present of an unsolved problem

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Purpose/objective

To present data on availability of megavoltage (Mv) units (cobalt machines (Co) and linacs) in Africa from 1991 to 2015 and the additional resources needed to reach full capacity, including a cost analysis.

Material and methods

The list and income classification of countries were taken from the World Bank, Country and Lending Groups, 2017 fiscal year [1]. Data on population, number of cancer cases per country, and number of cancer cases for each cancer site was obtained from GLOBOCAN 2012 [2]. The number of radiotherapy courses needed to treat all patients with an indication for radiotherapy was calculated using the methodology from the Collaboration for Cancer Outcomes Research and Evaluation (CCORE) [3,4]. Data on availability of radiotherapy (RT) equipment was obtained from the IAEA Directory of Radiotherapy Centres (DIRAC) [5]. For the cost analysis we used an internally produced Excel sheet with data from December 2013. 51 countries were included in the analysis. Historical data was obtained from different published data [6,7,8,9]. Most of the other variables used for the calculations were taken from the GTFRC report [10].

Results

The population in Africa is 1.07 billion, with a weighted GNI per capita of US\$ 2,086, and it is calculated that 438,000 cancer cases need radiotherapy annually. Mv units were 103 in 1991 (71 Co and 32 linacs), 155 in 1998 (93 Co and 62 linacs), 277 in 2010 (88 Co and 189 linacs), 278 in 2013 (84 Co and 194 linacs), and 291 in 2015 (86 Co and 205 linacs), representing an increase of 283% in almost 25 years (fig 1). The proportion of Co units decreased from 69% to 30% in that period (fig 1). A total of 813 Mv units are required to treat 438,000 cancer patients needing RT. Only 149,000 can be treated with the installed capacity, which represents a coverage of 34% of the needs. Low income countries can only treat 4,800 cases, 3% of the needs.

Institution

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Country

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