

Guide on how-to

Preparing a radiotherapy development plan

Table of contents

Purpose of the guide	
Structure and suggested contents	
1 Introduction	
2 Baseline information	
3 Methodology for the analysis	
4 Interventions packages	
5 Conclusions	
6 Contributors	
7 References and bibliography	

Purpose of the guide.

The purpose of these guidelines is to summarize the steps and procedures for designing a radiotherapy development plan within the framework of City Cancer Challenge Foundation's (C/Can) project in response to the urgent need to reduce inequalities in accessing quality radiotherapy treatment in selected cities.

The recommendations made in this document are the result of a technical revision made by an external expert in planning radiotherapy services nominated by the International Atomic Energy Agency (IAEA), Dr Rodolfo Alfonso, in consultation with the C/Can team and based on the experiences and outputs developed by the radiotherapy groups in C/Can's initial cities, and are expected to be interpreted, analysed and tailored on the basis of the local context and the need to build a multisectoral consultative process within the city.

Structure and suggested contents

1. Introduction.

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- Provide a short description of the cancer burden, and when feasible, the epidemiological trends in the world, region, country and city.
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- Estimate the economic impact of cancer care in the country and a summary of the measures needed to fill gaps in the near future.
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- Provide a short description of the role of radiotherapy in cancer control and care and a brief description of the problems accessing care, with a focus on both demand (e.g. referral systems, awareness of the benefits of radiotherapy among oncology professionals, insurance coverage), as well as the supply side (e.g. availability of adequate infrastructure, equipment and skilled professionals).
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- Provide links to radiotherapy-related results from the needs assessment phase conducted in the city within the C/Can city process.
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- Describe the process and methodology followed by the city team when designing the plan.
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AIM OF THE DOCUMENT

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- To describe the purpose of the document and potential interested parties.
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- The general aim of the plan is to describe the radiotherapy capacity installed in the city (and its catchment area) in the public and private sectors, and to estimate the clinical demand within a set timeframe (up to 10 years) and to propose feasible interventions to bridge the gap in terms of facilities, equipment and trained staff, taking into account concepts like rational use of existing city resources and technology transfer and deployment within a stepwise approach.
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- To align the radiotherapy community in the city toward common goals to enable collaboration, allocation and mobilisation of resources for radiotherapy in the city.
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OBJECTIVES

- To state the overall objective to which the project will contribute, and demonstrate its linkage with a national or broader development programme or priority. It has to be in line with the problems/needs identified, contributing to the expected impact.

- To describe the particular objectives and their links to expected outcomes.

- The specific objectives should address changes and effects expected along the implementation of the plan. For instance, the increase of coverage in terms of equipment and personnel workload, the projected improvements in the accessibility to Radiotherapy services and in the quality and safety of treatments, the expected developments in the technologies and in the corresponding staff training

2. Baseline information.

DEMOGRAPHICS

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- ▶ Provide a general description of the country's geographical situation, population, distribution between rural and urban areas with respective references, according to the following preferred order for sources:

 - › National censuses.

 - › UN populations prospects.

 - › Other (specified).

 - ▶ Define the catchment area, which will be the scope of analysis throughout the document.
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EPIDEMIOLOGY

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- ▶ An in-depth breakdown of the cancer burden in the country/city, compared with other communicable and non-communicable diseases.

 - ▶ Data on incidence and mortality of common cancers in the city with respective references, according to the following preferred order for sources:

 - › Population-based cancer registry (when available)

 - › GLOBOCAN

 - › Hospital registries

 - › Other (specified)
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CURRENT RADIOTHERAPY CAPACITY AVAILABLE IN THE CITY

- Estimate the proportion of all cancer cases currently receiving radiotherapy in the city (based on observational data).

- Provide a detailed description of the current radiotherapy situation in the city, including facilities, equipment, workforce, and services productivity (e.g. patient throughput, waiting time, fractions delivered in a given period, hours of operation per day, number of shifts).

- Describe existing educational and training programmes in the city for all professionals relevant to radiotherapy.

- Describe the radiation safety and regulatory infrastructure in the country, including references to national laws, regulations and guidelines on the practical implementation of safety standards in medical exposure.

3. Methodology for the analysis.

- ▶ Describe the assumptions used (from literature review) in the predictive model, including:
 - › A projection of the population distribution and epidemiological data of the city's catchment area;
 - › A definition of appropriate indicators of optimal radiotherapy use rates;
 - › An estimate of the number of cancer patients that could benefit from radiotherapy;
 - › Machine throughput: new cancer cases treated annually per machine;
 - › The standards applied for calculating staffing requirements.
- ▶ Include, when appropriate, formulas used to quantify the gap and coverage in accessing radiotherapy services (in terms of equipment and human resources).

4. Interventions packages.

- ▶ Provide a detailed description of the timeframe of the plan, prepared in accordance with the programmatic periods of the city, with the respective projected intervention packages.
- ▶ For each intervention package, short- (two years) , mid- (five years) and long- term (10 years), a short explanation of the main challenges that each period could face, including the number of patients projected annually, as well as equipment and staff requirements. This section should give an in-depth description of the projected increase in the coverage of radiotherapy needs in the target city / region, from the current situation to what is expected by the final phase of the plan.
- ▶ Under each package of interventions, a distinction between core and desirable elements to be included could be made, so as to account for planning with scarce resources, while complying with minimal requirements, while not leaving out optimal scenarios.
- ▶ This section should provide tables, figures and graphs to help illustrate the interventions and their expected impact in covering the estimated gap.

5. Conclusions.

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- ▶ Summarise the main projected outcomes of the intervention packages in covering the estimated gap in accessing radiotherapy in the city.
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- ▶ Summarise the recommendations to advance the plan toward implementation and collaboration at the local, regional, and international levels.
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- ▶ Provide a critical assessment of the limitations of the analysis.
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6. Contributors.

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- ▶ Include a detailed list of all members of the city team that contributed to the drafting of the document, including participants in the peer review meetings conducted in the city, as well as all the external experts who reviewed and edited the final document.
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7. References and bibliography.

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- ▶ List all publications referenced in the document.
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- ▶ The use of international benchmarks to estimate radiotherapy use rates, machine throughput and staff requirements is highly recommended, such as those included in the references below (not exhaustive):
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- › IAEA Setting up a radiotherapy programme: clinical, medical physics, radiation protection and safety aspects. International Atomic Energy Agency, 2008.
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- › IAEA Planning national radiotherapy services: a practical tool. International Atomic Energy Agency, 2011.
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- › IAEA Staffing in Radiotherapy: An Activity Based Approach. International Atomic Energy Agency, 2015.
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- › IAEA Roles and Responsibilities, and Education and Training Requirements for Clinically Qualified Medical Physicists. International Atomic Energy Agency, 2013.
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- › Delaney, G., Jacob, S., Featherstone, C. and Barton, M. (2005) The Role of Radiotherapy in Cancer Treatment: Estimating Optimal Utilization from a Review of Evidence-Based Clinical Guidelines. *Cancer*, 104, 1129-1137.
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- › Pagano, E., Di Cuonzo, D., Bona, C., Baldi, I., Gabriele, P., Ricardi, U., et al. (2007) Accessibility as a Major Determinant of Radiotherapy Underutilization: A Population Based Study. *Health Policy*, 80, 483-491.
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- › Erridge, S.C., Featherstone, C., Chalmers, R., Campbell, J., Stockton, D. and Black, R. (2007) What Will Be the Radiotherapy Machine Capacity Required for Optimal Delivery of Radiotherapy in Scotland in 2015. *European Journal of Cancer*, 43, 1802-1809.
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- › Camacho, R., Neves, D., Piñeros, M., Rosenblatt, E., Burton, R., Galán, Y., et al. (2014) Prescription of Cancer Treatment Modalities in Developing Countries: Results from a Multi-Centre Observational Study, 5, 989-999.
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