

## Original Article

# Situation Analysis of the National Comprehensive Cancer Control Program in the I. R. of Iran; Assessment and Recommendations Based on the IAEA *imPACT* Mission

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## Abstract

**Introduction:** Iran was engaged in the Program of Action for Cancer Therapy (PACT) in 2012, and delegates from the International Atomic Energy Agency (IAEA), and the World Health Organization (WHO) evaluated the National Cancer Control Program (NCCP) status (the *imPACT* mission), based on which they provided recommendations for improvements of NCCP in the I.R. of Iran. We reported the results of this situational analysis and discussed the recommendations and their implication in the promotion of NCCP in the I.R. of Iran.

**Methods:** International delegates visited the I.R. of Iran and evaluated different aspects and capacities of NCCP in Iran. In addition, a Farsi version of the WHO/IAEA self-assessment tool was completed by local experts and stakeholders, including experts from different departments of the Ministry of Health and Medical Education (MOHME) and representatives from the National Cancer Research Network (NCRN). Following these evaluations, the PACT office provided recommendations for improving the NCCP in Iran. Almost all the recommendations were endorsed by MOHME.

**Results:** The PACT program provided 31 recommendations for improvement of NCCP in Iran in six categories, including planning, cancer registration and information, prevention, early detection, diagnosis and treatment, and palliative care. The most important recommendation was to establish a strong, multi-sectoral NCCP committee and develop an updated national cancer control program.

**Conclusion:** The *imPACT* mission report provided a comprehensive view about the NCCP status in Iran. An appropriate response to these recommendations and filling the observed gaps will improve the NCCP status in the I.R. of Iran.

**Keywords:** Cancer, Control, Situational Analysis, I.R. of Iran

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## Introduction

After cardiovascular disease and trauma, cancer is the third most common cause of mortality in Iran.<sup>1</sup> According to the World Health Organization (WHO), Iran is currently affected and challenged by a significant burden of Non-Communicable diseases (NCD), as they account for over 70% of all deaths in the country.<sup>2</sup>

Globocan 2012 determined that approximately 84,829 new cases and 53,350 cancer deaths occur annually in Iran<sup>3</sup>. According to the Globocan 2012, the age standardized incidence rate (ASR) of different types of cancer (excluding non-melanoma skin cancer) was estimated at about 134.7/100,000 in males and 120.1/100,000 in females (Table 1). The most common cancers are: stomach, bladder, prostate and colorectal cancers among Iranian men, and

breast, colorectal, stomach and esophageal cancers among Iranian women.

The National Cancer Control Program (NCCP) is a cooperative entity designed to decrease the number of cancer deaths through prevention, early detection, effective treatments, and palliative care programs<sup>4</sup>. The first NCCP was developed in Iran in 2007 by the Cancer Office of the Ministry of Health and Medical Education (MOHME).<sup>5,6</sup> Because of the traditional task-oriented structure in MOHME of Iran, different departments have been responsible for each section of the NCCP. For instance, prevention and health promotion is governed by the deputy of health, while policies and governance for cancer treatment are administered independently, in the deputy of treatment.

The Program of Action for Cancer Therapy (PACT) was created within the International Atomic Energy Agency (IAEA) in 2004 as its response to the World Health Assembly's call to action against cancer. It stands as the IAEA's umbrella program for fighting cancer and builds upon the experience of the IAEA in radiation medicine expertise and technology, in collaboration with the WHO, its regional offices, and other key partners. PACT program aimed to enable member states in low and middle income countries to introduce, expand and improve their cancer cure rates and capacity by integrating radiotherapy into a comprehensive cancer control program, thus improving its therapeutic effectiveness.<sup>7</sup>

Through an official request from the MOHME in 2010, the I.R

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**Table 1.** Age Standardized Incidence Rate (ASR) of Different Cancer Types Among Iranian Men and Women in 2012 (Source: Globocan2012 <http://www-dep.iarc.fr>).

Cancer Type	Women			Men			
	Number	Frequency (%)	ASR*	Cancer	Number	Frequency (%)	ASR*
Breast	9795	24.5	28.1	Stomach	6640	14.8	20.6
Colon and Rectum	3352	8.4	10.5	Prostate	4111	9.2	12.6
Stomach	3020	7.6	9.7	Bladder	4277	9.5	13.2
Esophagus	2445	6.1	8.0	Colon and Rectum	3811	8.5	11.6
Ovary	1637	4.1	4.8	Lung	3307	7.4	10.3
Leukemia	1588	4.0	4.7	Esophagus	2898	6.5	9.0
Thyroid	1512	3.8	4.0	Leukemia	2338	5.2	6.9
Brain	1358	3.4	3.8	Non-Hodgkin lymphoma	1998	4.5	5.7
Corpus Uteri	795	2.0	2.5	Brain	1699	3.8	4.6
Melanoma of Skin	236	0.6	0.7	Melanoma of Skin	295	0.7	0.9
Other Types	14253	35.5	–	Other	13464	29.9	–
All Cancer types (excl. non-melanoma skin cancer)	39991	100	120.1	All Cancer Types (excl. non-melanoma skin cancer)	44838	100	134.7

\*ASR: Age Standardized Incidence Rate per 100,000.

**Table 2.** The gaps observed in the planning process of the NCCP of the I.R of Iran developed in 2007.

Main Concern	Accessory Concerns & Indicators	Score
Stakeholder involvement	Balance among consumers, providers, government, non-governmental and private sectors during planning	1/9
	Priority research areas to support the implementation of the plan	2/9
Critical sections in the NCCP	Costing of the action plan and resources needed for implementation	3/9
	Plan of action to meet the objectives based on evidence, affordability, and equity	3/9
	Integration of activities to existing chronic disease and other related programs	3/9
	Adoption with the primary health care system and structure of the national health system	3/9

of Iran was engaged in the PACT program, and their cancer control program was evaluated through the *imPACT* mission in 2011. In this paper, we report the findings of this assessment and discuss the recommendations provided and their implications for improving the NCCP in the I.R of Iran.

## Material and Methods

### *imPACT* review

The *imPACT* review is a cancer control assessment tool used to evaluate the capacities and readiness of countries to implement a comprehensive NCCP. The *imPACT* review is carried out by the IAEA upon a formal request from a member state, in consultation with the WHO and the International Agency for Research on Cancer (IARC). So far, over 40 countries have received an *imPACT* Review Mission.<sup>8</sup>

### Self-assessment of NCCP

Based on recommendations from the PACT program, we used a standard NCCP self-assessment tool provided by the WHO/IAEA and reported on the NCCP status in Iran.<sup>9</sup> In order to conduct the

self-assessment, a national ad-hoc committee was established to work under the supervision of the focal point of the PACT program in the I.R of Iran. The committee members were representatives from different departments of the Ministry of Health, as well as members of the national cancer research network (NCRN) and scientific societies.

We translated and validated the self-assessment tool in Farsi. A few items were added to the standard tools based on suggestions from the working group. The self-assessment tool consisted of three main sections, including (1) cancer control planning, (2) core processes for prevention, early detection and screening, diagnosis and effective treatment, and palliative care, and (3) supporting processes for the NCCP such as policy making, financial management, human resource management and training, cancer research, etc. The final questionnaire contained 132 items.

The committee members answered the questions based on a 9-point Likert type scale. After analysis of the data from the first round, the committee members were invited to a one-day meeting to discuss the controversial responses before reaching a consensus on all of the items. The final results were submitted to the PACT office for their consideration.

**Table 3.** The weakest concerns and indicators in the core processes (services) of the NCCP.

Main Concern	Accessory concerns and indicators	Score	
PREVENTION	Environmental Health	2/9	
	Occupational Health	2/9	
	Nutritional safety	2/9	
	National policies and guidelines	2/9	
	Strategy implementation settings	Workplace	3/9
		Schools	3/9
		Household	3/9
	Strategy implementation Interventions	National policies and guidelines	2/9
		Behavior modification programs	2/9
		Promotion of healthy lifestyle	2/9
	Strategy implementation participators	Media	3/9
Civil Societies		3/9	
Evaluation of the impacts of interventions		3/9	
EARLY DETECTION	Early diagnosis of oral cancer	1/9	
	Early diagnosis of bladder cancer	1/9	
	Early diagnosis of prostate cancer	2/9	
	Early diagnosis of skin cancer	2/9	
	Quality Control Program for all screening actions	3/9	
	General awareness on cancer early detection and treatment	3/9	
	Early diagnosis of cervical cancer	3/9	
DIAGNOSIS & TREATMENT	Delay and patient expectation time assessment	1/9	
	Follow-up of cancer patients	1/9	
	National Guidelines for DG & T	3/9	
	Psychosocial support for cancer patients and family members	3/9	
	Rehabilitation of cancer patients	3/9	
PALLIATIVE CARE	Psychosocial and spiritual support of patients	2/9	
	Psychosocial support for family members and caregivers	2/9	
	Bereavement care for family members and caregivers	2/9	
	Home-based care supervised by trained health caregivers	2/9	

#### Field Visit to the I.R. of Iran

A multi-disciplinary team of delegates of the PACT program visited the I.R. of Iran in November 2011 to carry out an assessment of the NCCP. The experts met the key stakeholders of the NCCP in Iran and visited different departments of the Ministry of Health, cancer hospitals, NGOs, etc. including the Cancer Institute of Iran, Bone Marrow Transplantation Center in Shariati Hospital, Shohaday-e-Tajrish Hospital, and Mahak Charity Hospital in Tehran. In addition, they visited Shiraz University of Medical Sciences, as well as Namazi and Amir Hospitals in Fars province in southern Iran. In addition to interviewing local authorities, scientists, and clinicians, the experts studied available reports and papers published in the scientific journals. Following this evaluation, the formal report of the NCCP status and recommendation for the improvement was provided in 2011.

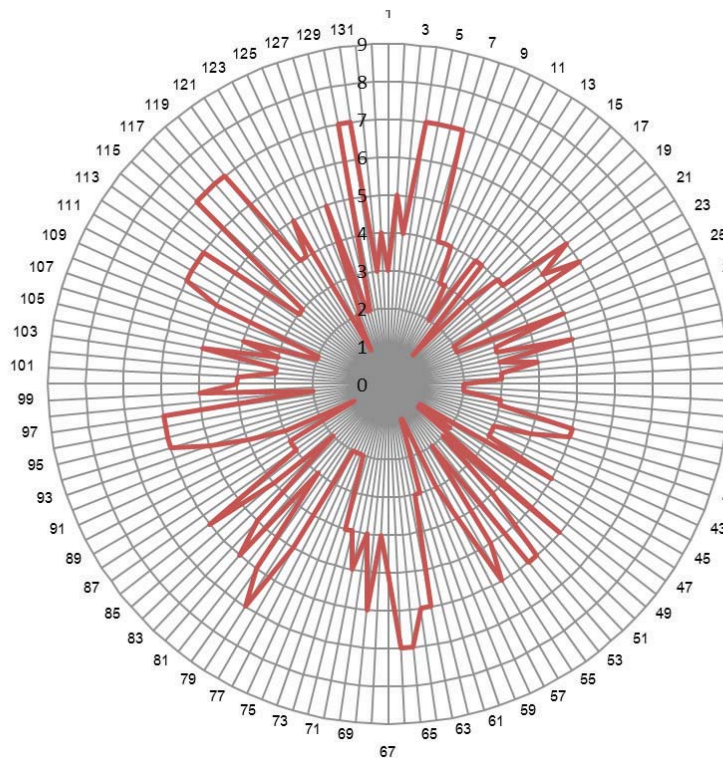
The recommendations were discussed and almost all of them were endorsed by the Ministry of Health and Medical Education and were included in the national agenda for improvement of the NCCP in the I.R. of Iran.

#### Results

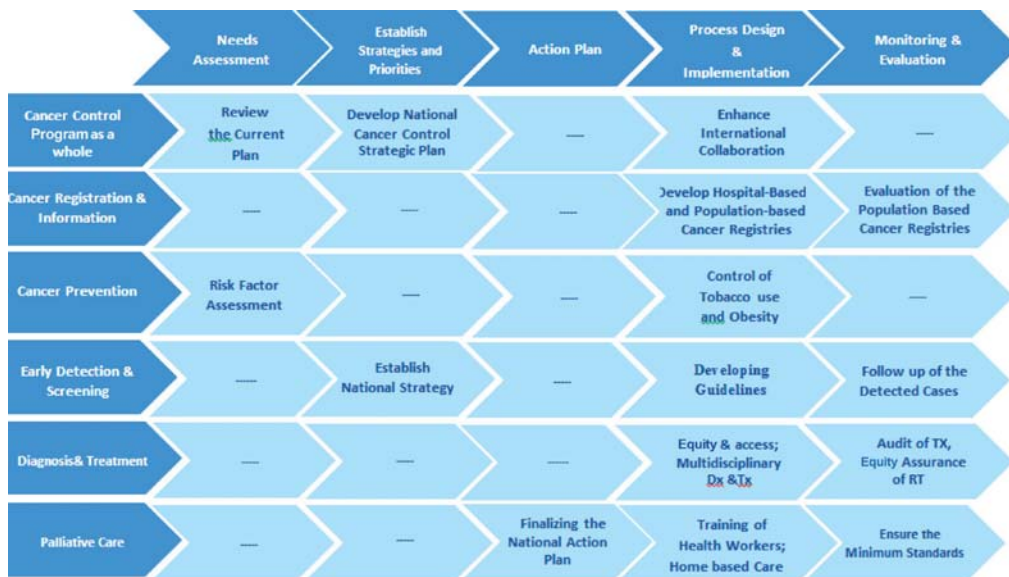
Figure 1 illustrates the current gaps in Iran's cancer control program and shows an imbalance picture from the cancer control program in Iran. In some areas, like education and manpower, the average score achieved as high as 7 points on a 9-point Likert scale (item 109-116). However, some aspect of cancer control, such as palliative care, had a very low score (items 70-77). The most important and biggest gaps and limitations of the NCCP are presented in Tables 2-4, including planning, core process, and supporting process. Detailed data of the scores are available upon request.

The *imPACT* experts provided 31 recommendations (Table 5). The recommendations were stratified by different aspects of the NCCP, including NCCP planning (No. 1-7), cancer registration and information (No.8-12), cancer prevention (No.13-14), early detection (No. 15-18), diagnosis and treatment (No. 19-28), and palliative care (No. 29-31).

Figure 2, presents endorsement of the recommendations by different level of program implementation. While the diagnosis and



**Figure 1.** A radar diagram showing the gap between “As is” and “To be” conditions in the NCCP in the I.R. of Iran in 2012. Answers to the questions were based on a 9 point Likert type scoring system. Zero indicates low score and 9 indicated high score. Area inside the red line is the achievements of NCCP and the area outside the red line indicates the gap in the NCCP. The new NCCP in Iran should be comprehensive to fill this gap and lead to a balance achievement in the future.



**Figure 2.** Endorsement of the recommendations of the imPACT mission, stratified by different level of program implementation. i.e. from need assessment to monitoring&evaluation.

treatment stands in the process design & implementation phase, we still need assessment for the cancer control planning as whole and cancer prevention. All aspects of the cancer control program needs improvement in the process design and implementation. In addition, most of the NCCP, require monitoring and evaluation.

### Discussion

We discussed the results of an assessment of the NCCP in the I.R. of Iran based on the imPACT mission review and the 31 rec-

ommendations provided by the IAEA office of the PACT program in different categories, including policy making and planning, cancer registration and information, cancer prevention, early detection, diagnosis and treatment, and palliative care.

#### Policy Making and NCCP Planning

Establishment of a national steering committee was recommended in the report. In addition, it was recommended to revise the NCCP and consider 3, 5, and 10-year action plans.

Iran is a large country consisting of 30 provinces, and there is



**Table 4.** The weakest concerns and indicators in the supporting processes (resource related management) of NCCP of the I.R of Iran in 2012.

Main Concern	Accessory Concerns and Indicators	Score
POLICY MAKING	Comprehensive cancer control advisory committee (Composition, times of meeting/year, expertise, sector representatives)	3/9
	Promotion and advocacy of social activity (non-governmental) organizations (Patient right)	2/9
MONITORING & EVALUATION	Surveillance systems for occupational carcinogens	1/9
	Assessment of cancer incidence and mortality trends	3/9
	Assessment of the stage of cancer	3/9
	Surveillance system of the most common non-communicable risk factors	3/9
	Clear process and outcome indicators for monitoring an evaluation	3/9
FINANCIAL M.	Resources to support cancer services at the secondary and tertiary care level (i.e. specialized palliative care centers)	2/9
	Basic palliative care (i.e. pain management)	3/9
	Payment Percentage as out of pocket for diagnosis and treatment	3/9
INFORMATION SYSTEM M.	IT support for monitoring of cancer incidence and mortality trends	2/9
	IT support for surveillance system of the most common NCD risk factor	2/9
	IT support for hospital based cancer registration	2/9
HUMAN RESOURCE M.	Oncology nurses	3/9
	Palliative care specialists	3/9
KNOWLEDGE M.	Policy and managerial guidelines for cancer prevention and control public health programs	2/9
	Clinical guidelines for pediatric cancers that are curable or treatable but not curable	2/9
	Clinical guidelines for cancers in adults that are curable or treatable but not curable	2/9
	Pain and palliative care clinical guidelines for children	2/9
TECHNOLOGY & DRUG M.	Essential list of medicines for chemotherapy	2/9
	Technology assessment for the radiotherapy devices	3/9

wide geographical variation in the incidence of cancer within the country. For instance, a six fold difference has been reported for stomach cancer mortalities in different area of Iran.<sup>10</sup> In the Ardabil Province, which is a high risk area for esophageal and gastric cancer, the incidence rate of gastric cancer is even higher than breast cancer among females<sup>11</sup>. In addition, there are significant variations in the infrastructure and capacities of different provinces. There is a unique structure for governance of public health programs in Iran, where both public health services and medical training are integrated in the Ministry of Health and Medical Education (MOHME).<sup>12</sup> At least one Medical University exists in each province and the university chancellor is in charge of all health care affairs and medical education in that province. Therefore, public health policy making and governance are conducted both on the national and regional levels. This system will be beneficial in the execution of the NCCP in the country and indicates that the establishment of a NCCP advisory committee and planning should be done on both the national and regional level.

#### Cancer Registration and Information

Population-based cancer registries (PBCR) play an important role in the design and monitoring of cancer control programs, including conduct of epidemiological research, monitoring and evaluation of screening programs, follow-up of cancer patients, estimation of population-based cancer survival, and priority set-

ting and allocating resources for NCCP.<sup>13</sup> Iran established a pathology-based cancer registry in 2002 which covers the entire country. The Cancer Office updated the program and recently started a population-based cancer registry. In 2008, the National Cancer Registry Report provided data from the population-based cancer registry in 20 provinces. In a recent evaluation, it was shown that the percentage of death certificate only cases was more than 20% in the PBCR.<sup>14</sup> Therefore, the available evidence indicates that the registration program should be improved in order to estimate the true incidence and mortality rates of cancer in Iran.<sup>15,16</sup> It is noteworthy that during the last decade, a few population-based cancer registries were launched regionally in some provinces, including Tehran, Semnan, Ardabil, Tabriz, Golestan, and Kerman provinces.<sup>17-21</sup> These registries collected data actively from different sources and reported the incidence rate of cancer in different populations over a defined period. However, none of these registries were sustained as an organized registration program, except the Golestan population-based cancer registry which has continued for more than five years and published a report in the Cancer in Five Continents in 2012.<sup>22</sup> The *imPACT* mission report appropriately suggested selecting a few provinces and launching high quality population based-cancer registries in these provinces and extended to other areas after successful experiences in the selected registries. Particular attention is needed to improve the National Mortality Registry, which is an important source for cancer

**Table 5.** Recommendations of the *imPACT* review team in 2012 for improvement of the cancer control status in I.R Iran, stratified by the main concerns

<b>CANCER CONTROL PLANNING</b>
1. Establish and officially appoint a multi-disciplinary National Cancer Control Steering/Advisory Committee (NCCSC) composed of representatives from all the areas of cancer control (health planning and economics, public health and epidemiology, cancer information/registration, prevention, early detection, diagnosis, treatment, palliative care, training, education, research). Designate a Chairperson with recognized expertise in cancer and a Coordinator directly linked to the Ministry of Health and Medical Education.
2. Review the current National Cancer Control Plan (NCCP) or develop a new one, to ensure that the plan includes updated and clearly defined activities, milestones, a timeline, an estimated budget, measurable indicators and a monitoring mechanism to meet the short- and medium-term objectives in a 3, 5 and 10 year action plan.
3. Regularize the meetings of the NCCSC and develop a work plan according to the General Action Plan of the NCCP. The participation of the WHO Country Office in the NCCSC is highly recommended.
4. Implement evidence-based approaches as “demonstration projects”. Establish an efficient mechanism to monitor and evaluate those projects before deciding on scaling them up to the national level.
5. Promote the development of Cancer Control Plans at regional level and the organization of national workshops to discuss progress and share experiences on their implementation among different regions throughout the country. Lessons learnt from the implementation at a region or province level will save funds, efforts and will generate trust.
6. Assure that locally published scientific information is used in the planning process
7. Develop a national cancer research plan based on national cancer control priorities. Use these priorities and plan to announce national cancer research grants.
<b>CANCER REGISTRATION &amp; INFORMATION</b>
8. Pursue high quality cancer registration as a priority to efficiently understand the situation of cancer in the country aimed at developing population-based cancer registry or registries with high coverage levels. There is no need to cover the entire country, but the population covered should be representative and of good quality to allow accurate estimates of cancer incidence in Iran, and enable efficient health services planning.
9. Develop hospital-based cancer registries in major hospitals to ensure that information on stage of the disease, access to treatment, treatment outcomes and cancer survival is collected.
10. Steps should be taken to enhance the quality of the mortality information system, the analysis of cancer mortality, as well as to link the information with the cancer registry data. Accurate data on cancer incidence and mortality are crucial for monitoring and evaluation of cancer control interventions.
11. In order to improve data quality and especially to ensure proper and efficient data analysis, MOHME should assign a well-trained epidemiologist and statistician to work in collaboration with the cancer registry.
12. Stronger collaboration and links should be pursued with IARC, either through IAEA/PACT or WHO Country Office. An expert mission on cancer registration could be requested.
<b>CANCER PREVENTION</b>
13. Strengthen on-going activities on tobacco control, obesity and HBV vaccination.
14. Increase the number of research projects on cancer epidemiology at the NCD Control Centre to accurately assess the most common cancer risk factors among Iranian population and to monitor prevention interventions.
<b>CANCER EARLY DETECTION</b>
15. Establish a national strategy on early detection of cancer (screening and early diagnosis) based on scientific evidence and according to the available resources (funds and qualified human resources). This approach is highly recommended particularly before starting to implement screening projects
16. Develop evidence-based early detection guidelines for those cancers amenable to early detection, either through screening (breast and colorectal cancer) or through early diagnosis (colorectal, prostate, bladder, and stomach cancers) program.
17. Consider to organizing a workshop on early detection interventions in order to develop the national strategy assistance from WHO, IARC and IAEA/PACT could be requested
18. Develop early diagnosis awareness programs through general public and health professionals’ education on early signs of cancer (especially for breast, colorectal, bladder, and prostate cancers); and ensure that referral system for symptomatic cases is well organized and access to quality treatment is available.
<b>DIAGNOSIS AND TREATMENT</b>
19. Strengthen infrastructure across the country. Future investments to expand facilities for cancer diagnosis and treatment should be distributed across the country to avoid lengthy travel time for patients and provide better access to health services.
20. Develop and standardize multi-disciplinary clinical protocols of cancer treatment (Oncological Guidelines) for most common cancer sites according to the scientific evidence, cost/benefit analysis and availability of resources.
21. Promote multi-disciplinary approach for cancer diagnosis and treatment. Set up regular joint clinics/tumor board for greater number of patients, especially for most common cancer sites.
22. Conduct regular audit of the patient treatment and outcome to refine and develop treatment policies.
23. For those teletherapy machines with sources older than five years, proceed with the replacement of old sources or the entire machines.

**Table 5.** Recommendations of the *imPACT* review team in 2012 for improvement of the cancer control status in I.R Iran, stratified by the main concerns

24. Design a National Plan for the Development of Radiotherapy within the NCCP with different phases of development in terms of the quantity and complexity of the equipment and the human resources needed. Two IAEA publications: "Setting up a Radiotherapy Program" and "Planning National Radiotherapy Services" are recommended references.
  25. Ensure quality of cancer treatment by establishing an effective quality assurance program in radiotherapy at center and national levels.
  26. Develop maintenance policy/contract of the equipment with the main supplier for long-term regular maintenance of the equipment.
  27. Evaluate the feasibility of increasing the access to generic anti-cancer medicines for all cancer cases.
  28. Evaluate and update the Residential Training Program for Radiotherapy, Medical Oncology and Surgical Oncology according to the international standards.
- PALLIATIVE CARE**
29. Finalize the draft of the National Palliative Care Action Plan, including the development of home-based care, the training of health professionals and access to adequate levels of morphine and/or analgesic drugs free of charge.
  30. Provide training to caregivers (e.g. medical doctors at all levels, medical assistants and nurses) and family members in the proper management of the patient in this phase of the disease (e.g. pain relief, control of other symptoms, psychosocial support), and ensure that home-based palliative care meets minimum standards.
  31. Update the existing five-year-old palliative care guidelines.

**Source:** PACT program, IAEA, Mission Report submitted to Ministry of Health and Medical Education of Iran, 2012 (with permission from IAEA).

registration and estimations of cancer burden in the country.

While population-based cancer registries provide incidence rates of cancer in the target population, hospital-based cancer registries are used for clinical and administrative purposes, including monitoring patient care and evaluating the pattern of care and treatment outcome, methods of diagnosis, clinical audit, and management of the hospital.<sup>23,24</sup> The data from this type of registry can be used to forecast future demands for services, equipment and manpower, as well as clinical and epidemiological research.<sup>23</sup> During the last ten years, several studies have published the survival and clinical results of common cancers, including stomach, esophageal, breast, lung, and colorectal cancers.<sup>25-50</sup> However, almost all of these publications were based on retrospective data and suffered from missing information and inadequate follow-up. Endorsement of the *imPACT* recommendation to establish hospital-based cancer registration in some hospitals will help the country to evaluate pattern of care, and improve the treatment outcomes.

#### Cancer Prevention

The *imPACT* recommendations emphasized the strengthening of ongoing activities on tobacco control, obesity, and HBV vaccination for the purpose of cancer prevention. According to the recent WHO global action plan, a 30% relative reduction in the prevalence of current tobacco use in persons aged 15+ years was considered as the target for tobacco control worldwide.<sup>51</sup> Priorities for countries with resource constraints include reduction of the affordability of tobacco products by increasing tobacco taxes, creation of completely smoke-free environments in all indoor workplaces, public places and public transportation, educating people the dangers of tobacco and tobacco smoke through effective health warnings and mass media campaigns, and banning all forms of tobacco advertisement, promotion and sponsorship.

According to the 2009 STEPS survey, 20% of Iranian adult males over 15 years of age and 1% of adult women were daily cigarette smokers.<sup>52</sup> The I.R. of Iran signed and ratified the Framework Convention on Tobacco Control (FCTC) in 2005, and the implementation is ongoing by the National Headquarters for Tobacco Control at the MOHME. Based on national regulations, the government should: 1) increase the price of domestic cigarettes by 10% per year and for the imported cigarettes by 20% per year through taxation; 2) implement the environmental smoke expo-

sure protection provisions of the FCTC; 3) comprehensively ban tobacco advertisement and promotion; 4) implement the FCTC packaging and labeling provisions using 13 pictures for packets which rotate four at a time; 5) combat tobacco smuggling; 6) increase public awareness about dangers of tobacco use.

In addition to tobacco use, water pipe smoking is a potential problem threatening Iranian men, women and children. According to recent data from the national demographic health survey (DHS), the prevalence of current smoking was 0.75% among women, while 5.04% of respondents reported hookah use<sup>53</sup>. The report showed that hookah use among Iranian women varied from 0.23% in the West Azarbaijan Province in the northwestern part of Iran to 18.3% in the Bushehr Province in the southern part of the country. The incidence of other types of smoking (i.e. pipe or cigarette) was quite low (0.05). So far, few epidemiological studies have evaluated the association of hookah use and the risk of cancer in Iran. A case-control study showed that hookah users had a 2.35- fold higher risk of esophageal cancer compared to never users of tobacco conducted in the Golestan Province in northern Iran.<sup>54</sup> These data emphasize that hookah use needs further consideration in anti-tobacco campaigns. It is also important to conduct further epidemiological studies and evaluate the association of different types of tobacco use and cancer in Iran.

A pathology-based cancer registry showed that lung cancer, which is highly associated tobacco use, was not common among Iranian males and females. However, because lung cancer is highly lethal, the pathology-based cancer registry underestimates these types of cancer and the true incidence rate is higher than the reported rate in the pathology-based registry.<sup>15</sup> After stomach and esophageal cancer, lung cancer was the most common cancer in Golestan population-based cancer registry,<sup>22</sup> indicating that the burden of lung cancer and other tobacco related cancers is higher than the rates reported by the pathology based registry and tobacco control activities should be prioritized. In the absence of an efficient tobacco control program, we will witness an increasing trend in the incidence rate of lung and other tobacco-related cancers in the near future.

The 2009 STEPS survey reported that 49% of women aged 15–64 years were overweight or obese, and 20% were obese.<sup>52</sup> In addition, 39% of men aged 15–64 years were overweight or obese, and 10% were obese, based on their BMI. The Global Action Plan

of WHO for the control of NCD advocates promoting physical activities and healthy practices through multi-sector approaches and social movement. A national plan for obesity control has been ratified in the I.R. of Iran. The plan emphasizes three strategies to decrease overweight and obesity, including: public and professional education, social marketing and advocacy, and modifications in the population's lifestyle through a comprehensive approach in everyday life. Increasing physical activity and controlling body weight will affect colorectal cancer, breast cancer and other cancers that are known to be related to this risk factor.<sup>55</sup>

The *imPACT* report recommended conducting epidemiological studies and evaluating the risk factors of the most common cancers and monitoring the effectiveness of the NCCP interventions. Although epidemiological studies about the established risk factors of different cancers can confirm the role of these risk factors on the occurrence of cancer among Iranian population, such studies may also reveal new risk factors in our population. For instance, recent studies have shown that opium use, which is common among the Iranian population, increases the risk of upper GI cancer and overall mortality.<sup>54,56,57</sup> A high prevalence of hookah use in the Iranian population also warrants further consideration in cancer research.<sup>58-62</sup> Furthermore, Iran is a large country with a multiethnic population, which creates unique opportunities for etiologic cancer research.<sup>63</sup> National cancer research network and more than 40 research centers are collaborating to promote the epidemiological cancer research and monitor effectiveness of the interventions in the NCCP.

#### Early Detection

According to the recommendations, Iran should develop a national strategy for early detection of cancer and develop evidence-based early detection guidelines for those cancers that are amenable to early detection through screening (breast and colorectum) or early diagnosis (colorectum, prostate, bladder, and stomach).

Although screening for prevention of breast and colorectal cancers have gained attention worldwide, due to controversies on cost-effectiveness of the program<sup>64,65</sup> and lack of sufficient funding, there is currently no organized screening programs for these cancers in Iran. Based on personal communication, the Cancer Office, NCDC, and MOHME announced that screening programs for breast and colon cancers were recently, launched in some limited geographical regions. However, there are no published reports on the efficacy and cost-effectiveness of these programs. Suggestions provided by the World Health Organization, and Breast Health Global Health Initiative (BHGI) for low and middle income countries seem to be the most reasonable approach and Iran should prioritize the efforts to downstage breast cancer through population awareness and improved and equitable access to care.<sup>66-68</sup> If affordable, mammography screening should target population of high risk women, (e.g., women aged 50-69 years); and for younger age groups, we should plan for public awareness programs, breast self-exam and clinical breast exam.<sup>67,68</sup> Any guideline for breast cancer prevention requires an implementation process. It is important to conduct pilot research and run demonstration projects before implementation of a national program. Results of these studies will measure the effectiveness of the suggested guideline in the health care system and will create evidence and knowledge about the extension of program to other regions in the country.

Although it was recommended that early detection of other common cancers (i.e., stomach, bladder, prostate) should be consid-

ered in the NCCP, cervical cancer is ignored, probably because of its low incidence in Iran.<sup>69</sup> On the other hand, due to lack of appropriate screening programs and lack of awareness among women, most women do not attend the screening and most cervical cancer cases are diagnosed at an advanced stage and experience poor prognosis. We suggest an organized program for cervical prevention, in which cervical screening with a longer intervals, i.e. 5-10 years is offered for all women after the age of 30 years.<sup>69</sup>

#### Diagnosis and Treatment

The recommendations for cancer diagnosis and treatment included a number of different strategies including strengthening infrastructures to enable better access to treatment, development and implementation of a multi-disciplinary approach, and clinical protocols for diagnosis and treatment, as well as conducting regular clinical audits. In Iran, there is at least one medical university that is responsible for the management of the health care system in each province. In 24 out of 30 provinces, at least one hospital has been equipped as the main center for cancer diagnosis and treatment. Although the spread of these hospitals in the country has improved access to care, quality of care and equipment may varies in these hospitals. While the five-year survival of stomach cancer patients was reported to be about 15%–20% in Tehran,<sup>28</sup> it was around zero in the high risk area of Ardabil Province<sup>32</sup>. Likewise, the hospital mortality rate of esophageal cancer varied from 27% over the entire country<sup>29</sup> to 8% in the Cancer Institute of Iran.<sup>31</sup>

While the development of clinical practice guidelines and providing evidence based healthcare services are necessary, it is also important to consider the barriers for implementing these guidelines in a country like Iran.<sup>70</sup> The NCCP should consider an efficient action plan for development and implementation of cancer diagnosis and treatment guidelines in the country. It is important to seek a sustainable mechanism to implement these guidelines, such as using an electronic medical record system, appropriate training programs, and promotion of an efficient audit program, establishment of multidisciplinary tumor boards and high quality joint clinics.<sup>71</sup>

The *imPACT* report recommended strengthening radiotherapy capacity and infrastructure, as well as increasing the quality of service through a national plan and the establishment of a quality assurance program on both hospital and national levels. Fortunately, the National Steering Committee of Radiotherapy has been established in the Iranian Atomic Energy Organization (IAEO) to develop policies and regulations for an integrated quality assurance (QA) system for radiation therapy activity, based on the IAEA standards and promote the national plan for development of radiotherapy services in cancer care and

Iran and many low and middle income countries face challenges regarding the access to generic anti-cancer medicines for all cancer cases, particularly the new expensive and high tech drugs. Iran had a successful experience in the management of trastuzumab use in Iranian breast cancer women. In this case, following a fair priority setting process, successful consensus was achieved by scientists and governmental and non-governmental organizations. In addition, we used an information technology system to control the prescription and use of this expensive drug by clinician and patients, respectively<sup>72</sup>. As the number of new molecules and expensive oncology drugs are increasing, the lesson learned from this experience should be extended to other drugs and make appropriate decisions about the prescription and use of all expensive



drugs in the low and middle income countries.

### Palliative Care

The Iranian Food and Drug Organization provides free of charge morphine and/or analgesic drugs for cancer patients in cancer hospitals and clinics. However, hospital based and home based palliative care services are limited in Iran and the few palliative care centers are operated by charitable organizations. The MOHME has developed a national plan to strengthen cancer palliative care in the country. A fellowship program has been approved by the MOHME to train local palliative care specialists. However, the current activities do not correspond to the present needs and a more liberal approach for providing basic palliative care support for cancer patients is urgently needed. As recommended by the *imPACT* report, it is important to make sure that palliative care services meet minimum standards.

### Conclusion

The *imPACT* mission report provided a comprehensive overview and provided useful recommendations for the improvement of the NCCP in Iran. A balanced and comprehensive approach for the improvement of different elements of national cancer control program and strengthening the ongoing activities and initiating the missing parts can definitely improve the NCCP in the I.R. of Iran. Particular attention is needed to cover the gaps and limitations that were observed in this evaluation. Among the other, the establishment of a strong national cancer control advisory committee and the involvement of different stakeholders and key-players seems to be the most appealing step. This committee can guarantee appropriate planning, decision making and implementation of the NCCP in the short and long term in the I.R. of Iran.

### Conflict of Interest

The authors declare no conflict of interest.

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