

# Rapid Assessment of Cancer Management Care in Syria

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## Executive Summary

In coordination with WHO Headquarters, WHO Regional Office and the National Committee for Cancer Care, WHO Syria Office has conducted a rapid assessment in 8 hospitals from different governorates between 4<sup>th</sup> October and 15<sup>th</sup> Nov, 2016 to evaluate the cancer care management in the country and to address the gaps in health care delivery including early detection, palliative care, and medicines and medical supplies needed for effective cancer treatment.

The main study's findings were:

1. Overview and burden of disease:

- A current National Cancer Control Plan NCCP does not exist.
- A functional national cancer registry as source of data for epidemiologic research/ studies as well as health information systems to monitor cancer programs including early diagnosis and screening are not available.
- Most common cancers seen and treated were breast, colorectal and lung cancer, followed by leukemia (adult and children) and lymphoma (adult and children). Bladder, stomach and prostate were less common.
- Average number of patients who started treatment for cancer per month at each facility ranged from 226 to 500. The greatest number of patients was seen in Albaironi hospital, the main referral oncology hospital in the country.
- Average number of children cancer patients treated at each facility per month ranged from 31 to 150 patients. The greatest number of patients was seen in Children Hospital.

2. Early detection:

- Breast and colon cancer were diagnosed at late stages.
- Unawareness of cancer symptoms was reported as a cause of delayed or inaccessible treatment by 88% of the respondents.
- Patients are generally unaware of cancer symptoms and cancer services and/or they are afraid of the disease and required treatment.
- Educational programs for patients and oncology health workers are not available.

3. Palliative care:

- Immediate-release oral morphine was not available at the oncology facilities.
- Palliative care (community- or home-based) was available in 63% of the surveyed facilities.
- The main barriers to palliative care were: (1) inadequate financial resources available, (2) limited human resources expertise and (3) low health priority.

4. Diagnosis:

- Anatomic pathology and hematopathology were available only in MOHE hospitals (Alabaironi, Children, Almosat and Tishreen hospitals). These hospitals are facing obstacles to regular availability of pathology services; the main obstacles are the limited resources for procurement, unreliable supply chain,

non-functioning equipment, insufficient support for processing and the excessive volume resulting in delays.

- Cytogenetic and flow cytometry services were not available in any of the assessed hospitals.

All hospitals have x-ray and ultrasound capacity, while CT scan was available in all hospitals except for the children hospital. 5. Treatment:

- Treatment costs and stigma associated with treatment are reported as the main factors for failure to receive treatment. While factors related to accessibility to the hospital, fragmented referral mechanisms to higher levels of care, and unawareness of patients and their families of cancer symptoms were additional reasons for failure to receive treatment
  - All hospitals were not able to get consistent supply of the essential cytotoxic drugs. And the delay in treatment caused by non-availability of drugs occurred 1 to 2 times a month.
  - Radiotherapy was only available in two hospitals: Al Bairouni and Tishreen hospital. Linear accelerator was available in both hospitals (100%), while cobalt 60, brachytherapy and other types of radiotherapy were (50%) available in only one.
  - 55% of patients completed the systemic therapy/chemotherapy without interruption and 46% completed their radiotherapy without interruption.
  - About 93 patients out of 1603 patients abandoned treatment (6% of patients). This was mainly due to financial, logistic, then disruption in services availability, while abandonment treatment due to health related (toxicities) ranked at the bottom among cases for abandonment treatment.
  - Estimated average total number of deaths per year due to cancer treatment was 103 death /year in all the surveyed facilities.
  - For breast cancer, about 87 % of deaths were due to progressive disease or relapse, while 13 % of deaths were due to treatment related toxicities.
6. Staff and patient safety.
- Personal protective equipment for staff administering chemotherapy was only available in 50% of the facilities, while 38% of the facilities did not have protective equipment for staff preparing chemotherapy.
  - Laminar flow hood for chemotherapy preparation was not available in all the facilities.
  - Designated hazardous waste disposal for chemotherapy were available at wards in 63% of the surveyed facilities.
  - To confirm the identity of patients prior to chemotherapy administration, 38% of facilities had specific process available, while 63% of the hospitals did not have unique identifiers and only check patient's name verbally,

The results from the study were shared with key staff from Ministry of Health and Ministry of Higher Education, management, and health care providers in a two- day workshop to highlight

the main gaps in cancer care delivery including palliative care, early detection, and treatment. In addition, a framework of the national cancer strategy was developed and revised later by Dr. Andre ILBAWI –HQ and Dr. Ibtihal Fadhil– Regional Office.

The recommendations from the study focused on the importance of establishing an effective national cancer registry; hence coordination with the Regional Office and International Agency for Research Cancer (IARC) was conducted to discuss and agree on the best ways to implement the development work plan of the national cancer registry program and strengthening the capacity of its staff.



## **1. Introduction:**

The regional burden of non-communicable diseases (NCDs) continues to grow and tackling this burden constitutes one of the major development challenges of the 21st century.

Countries surrounded in dangers and hardships often face major challenges to their health systems. Emergency-related injuries, displacement and the deterioration of living conditions as well as the difficulties in provision of regular medical treatment, often linked to obstacles to access health facilities, unavailability of doctors, shortage in medications, can affect the health of people living with a chronic health conditions such as NCDs.

While the impact of NCDs on the health of populations, health systems and socio-economic development is progressively evident and recognized worldwide, their importance in humanitarian emergencies has not yet received the full attention it deserves. Poorly documented, the specific needs and practices related to the management of patients with NCDs during emergencies are just beginning to receive the needed attention from health officials in the countries affected by security challenges.<sup>(1)</sup>

Cancer care is one of the main NCDs and contributes greatly to the global burden of disease. The estimated number of new cases globally each year is expected to rise from 14.1 million in 2012 to 19.3 million by 2025, with nearly 60% of those cases occurring in developing countries.<sup>(2)</sup>

Therefore, WHO office in Syria with coordination with WHO headquarter and the national committee for cancer care in the country conducted a rapid assessment in 8 hospitals from different governorates.

## **2. Objectives:**

The objective of the study is to get an overview of the cancer care management in the country and to address the gaps in health care delivery including palliative care, early detection, diagnosis and treatment.

It is expected that the findings of the study will help donors and decision makers in bridging the gaps of cancer care and alleviating the suffering of cancer patients.

## **3. Literature review:**

The current global cancer burden in low- and medium- resource countries is significant, and effective cancer control is limited by inadequate health budget, limited number of cancer treatment facilities and inaccessible diagnostic services and life-saving therapies.

In 2015, 8.8 million cancer deaths occurred worldwide. About 70% of cancer deaths occur in low-income and middle-income countries and this number is likely to increase in the future. It is estimated that cancer kills almost 400,000 people each year in the WHO Eastern Mediterranean Region alone.

The main increase in cancer incidence in the next 15 years is also likely to be in the Eastern Mediterranean Region, taking into account the trends for all related risk factors. The most

frequent cancers in the region are breast cancer in females, and lung and bladder cancers in males.<sup>(3)</sup>

The projected increase in cancer can be attributed to population ageing, better detection and registration, and to increased exposure to risk factors. The most important of these factors is tobacco consumption which is responsible for approximately 22% of all cancer deaths.<sup>(4)</sup> Other risk factors include unhealthy diet, physical inactivity, other behavioral and lifestyle changes, pollution and increased exposure to industrial and agricultural carcinogens.

In Syria, lack of NCD medicines especially those needed for cancer patients is a national public health problem. A national cancer registry was established in 2001 with the following objectives:

1. "Primary goal is to define the population- based incidence in Syria and the knowledge of the extent and the nature of cancer burden in the community.
2. To be used as a source of material for epidemiologic research and studies, and programs of early detection and cancer screening.
3. To help in planning for cancer centers around the countries."

Over the past few years, incidence reporting has improved in the national cancer registry. However, prevalence data were lacking, and there was no information on outcomes such as survival rates. Basically, the cancer registry is hospital-based, rather than population-based, despite attempts to include population data. The national registry had been awarded an Associate Membership to the International Association of Cancer Registries (IACR). Due to the central role the national cancer registry should play in a national cancer registry, it was important to strengthen the capacity of the national cancer registry. Therefore training on CanReg 4 registration form was introduced. However, the registry is severely under- staffed and there is no follow up or information system regarding cancer deaths.<sup>(5)</sup>

Unfortunately, due to the crisis and the disruption of the health system that resulted in scarcity of resources, limited of human resources, movements of patients, damaged health facilities, and unavailability of health information system, all these factors limited the role of the national cancer registry and its functionality. The last statistics available are dated in 2009, and no statistics or reports were produced later.

According to the top 10 causes of mortality / morbidity in 2009, cancer is ranked 3rd among the 10 leading diseases of mortality and 7<sup>th</sup> from the 10 leading diseases of morbidity/ disability (Syrian health system profile, 2011), as shown in Table 1.

**Table 1: Top 10 causes of Mortality/Morbidity -2009**

Rank	Mortality	Morbidity/Disability
1	Cardiovascular Diseases	Digestive Diseases
2	Respiratory Diseases	Respiratory Diseases
3	Cancer	Cardiovascular Diseases
4	Injuries	Poisoning
5	Certain Conditions Originating in the P-natal Period	Injuries
6	Genitourinary Diseases	Infectious and Parasitic Diseases
7	Congenital Malformations , Deformations and Chromosomal Abnormalities	Cancer
8	Nervous Diseases	Kidney Diseases
9	Digestive Diseases	Blood Diseases
10	Endocrine , Nutritional and Metabolic Diseases	Certain Conditions Originating in the Pre-natal Period

Source: 1- Mortality (Civil registrations + Funeral Offices + Hospitals /Public +Private) 2- Morbidity (Reports of public and private hospitals) <sup>(6)</sup>

Most of the cancer cases are located in the coastal area, northeast area where oil production is active (in Lattakia, Qamishli, Sweida, Hama, and Aleppo) as well as the central area of Syria where most factories and the Homs refinery are located (Damascus and Homs).

Data provided by health resources and services program (HeRAMS - June 2016) showed the following:

1- Out of 82 functional public hospitals, 23% (19) provided cancer treatment services.

2- Approximately, 11,270 patients received cancer treatment consultations. The highest number of cancer patients' consultations were in Damascus (Al-Mouwasat university hospital), Rural Damascus (Al-Bairouni hospital), and Lattakia (Tishreen university hospital). An overview of the distribution of public hospitals cancer care is shown in Annex 2.

According to the 2009 statistics of the cancer registry of the Ministry of Health in Syria, there were about 17,599 patients diagnosed with cancer of which about:

- (i) 10% (1760) were children. Unfortunately, it is expected that 800 of them will not survive. In 2013, there were about 2500 -3000 children will be diagnosed with cancer. The most common types of cancer among children 0- 15 years old are leukemia and brain cancers, as shown in Table 2.
- (ii) The remaining 90% (15,839) were adult patients: Approximately there were 8386 (48%) adult female and 9213 adult male (52%). While breast cancer and leukemia were the major types of cancer among female (30 %, 8% respectively), lung and colon cancers were the main cancers among males (17%, 12% respectively).

**Table 2: Most common types of cancer among children, (0-15 years old), by sex, 2009**

Boys(0-15 years)		Girls (0-15 year)	
Disease	Number	Disease	Number
Leukemia	357 (37%)	Leukemia	236 (34%)
Brain & C.N.S	196 (20%)	Brain & C.N.S	148(22%)
Lymphoma	161(17%)	Bones & ST	96 %( 14%)
Bones & ST	114(12%)	Lymphoma	88 (13%)
Kidney & Other Endocrine	72 (7%)	Kidney & Other Endocrine	39 (6%)
All other sites	68% (7%)	All other sites	78 (11%)

Source: Registry of national Cancer program – MOH-2009 (7)

**Table 3: Most common types of cancer among adults, 2009**

Male 9213 (52%)		Female 8386 (48%)	
Disease	Number	Disease	Number
Lung cancer	1566 (17%)	Breast	2516 (30%)
Colon and rectum	1105 (12%)	Colon and rectum	922 (11%)
Leukemia	921 (10%)	Leukemia	671 (8%)
Lymphoma	737 (8%)	Thyroid	587 (7%)

Brain & C.N.S	645 (7%)	Endometriosis	419 (5%)
Bladder	553 (6%)	Lymphoma	419 (5%)
Prostate	461 (5%)	Ovary	335 (4%)
Bones & ST	461 (5%)	Brain & C.N.S	335 (4%)
Stomach	368 (4%)	Bones & ST	252 (3%)
Larynx	276 (3%)	Lung	252 (3%)
Liver	276 (3%)	Stomach	252 (3%)
Skin	276 (3%)	Cervical	168 (2%)
Thyroid	185 (2%)	Liver	168 (2%)
other sites	1383 (15%)	Bones & ST	252 (3%)
		other sites	1090 (13%)

Source: Registry of national Cancer program – MOH-2009 (7)

The cure rates for cancer in developed countries have increased in recent years to approximately 75 - 80%. This is mainly due to early stage diagnosis, scientific advances in drug discovery and new treatment protocols. Also, decentralized cancer treatment centers and availability well trained health professional teams are also important factors contributing to higher survival rates and improved treatment outcomes.

In Syria, the cure rate is approximately 40%. Due to the current situation in the country and complicating factors such as shortage of medicines, it is expected that number of cancer patients with advance stages and those without access to treatment will rapidly increase. Cancer medicines are not available locally, and the import procedures by the government is currently hindered by many factors including the economic boycott, drop in currency value, and decrease in the allocated budget from Ministry of Health. The shortage of trained nurses is another obstacle faced for proper provision of cancer treatment programs. Quality of services provided is another concern including cancer medicines, most of which require cooling chains and conditions for storage and transportation that are not necessarily achievable by all suppliers in the country.

The treatment for cancer patients requires a combination of 3 elements (i) systemic therapy, (ii) surgery, and (iii) radiology. If lives are to be saved, the suffering of those afflicted with cancer reduced, and the quality of life of the patients and by consequence also that of their families improved, immediate support is required. This includes the goal of restoring the targeted persons to functionality preventing costly complications, and reducing the financial strain in the longer term. Diagnosis cancer early and providing the needed treatment improves the likelihood of survival for cancer patients and reduces the treatment cost. This is also an important priority in cancer control planning.

## **4. Methodology:**

The assessment conducted was facilitated by a national committee of representatives from the Ministry of health (MOH) and Ministry of Higher education (MOHE) under the supervision of Dr. André Ilbawi from HQ and Dr. Ibtihal Fadhil and Slim Slama from the Regional Office. The National committee revised the assessment tool, followed the progress of assessment, advised and agreed with WHO focal point on the implementation methods and the recommendations for bridging the gaps of cancer health care.

### **4.1. Semi-structured interviews:**

A rapid assessment tool for determining current status and needs was shared by headquarters and revised by the national committee of country's representatives. (The final revised tool used in the assessment attached - Annex 1.)

7 surveyors were identified by the national committee to implement the assessment. The committee agreed on the following interviewees' list that surveyors should ask in order to complete the questionnaire: Head of the hospital, head of the oncology, unit, two oncologists, head of nurses, 2 laboratory technicians, head of statistic department, pharmacists (list of the committee and surveyor are listed in Annex 4).

Data collection was done by a group of well- trained doctors identified within the national team. It was completed in 12 days from 24<sup>th</sup> Oct till 4<sup>th</sup> Nov, 2016. The assessment was conducted in 8 hospitals in Damascus, Rural Damascus, Lattakia, Aleppo, Hama, and As- Sweida. Criteria for selection depended on the highest number of cancer treatment consultations, bed capacity, and availability of qualified medical staff, and accessibility by the surveyors (list of study's locations listed in table 1). Due to difficulties in reaching the focal point at Aleppo university hospital, the committee decided to replace this hospital with Zahi Azrak –MOH hospital as it has similar workload.

### **4.2. Objective work flow observations:**

In order to support and enrich the study; observation of provision of care will be important. Surveyors did not engage informal period of observations and made the most of opportunities between, during, and after interviews to informally observe people at work. This permitted the surveyor to observe discretely the following: observations of work in outpatients clinics, patient's room, environment of work, relationships among staff, dynamic of staff and patients/ patient's family interactions.

Surveyors recorded their impressions and noted important information as soon as they were comfortably outside the setting. These notes were then cross-references with the interviews to build up the picture of cancer care management in Syria.

### **4.3. Cause effect diagrams:**

A cause effect diagram will be drawn to show the main causes of the gaps/ problems faced oncology cancer care in the country. For each problem, the main causes will be categorized to align with the activities of four major actors: (i) Ministry of Health (MoH) and Ministry of Higher

Education (MOHE) (ii) Oncology facility (iii) Human resources (IV) Patients. Then Finally, the sub causes will be listed under each group.

**Table 1: List of proposed hospitals for the rapid assessment study and overview of data – HeRAMS June 2016**

#	Ministry	Hospital Name	Governorate	Hospital Type	Number of consultations (outpatient consultations and emergency cases)	inpatient capacity (number of available beds)	Number of cancer treatment consultations
1	MoHE	Al-Bairouni hospital	Rural Damascus	Specialized	5894	449	5894
2	MoHE	Tishreen university hospital	Lattakia	General	13013	852	1812
3	MoHE	Al-Mouwasat university hospital	Damascus	General	16747	820	1142
4	MOH	Zahi Azrak	Aleppo	General	7837	15	
5	MoH	Ebn An-Nafis hospital	Damascus	General	13539	146	658
6	MoH	Hama National hospital	Hama	General	14095	298	430
7	MoHE	Children hospital	Damascus	Specialized	7660	440	176
8	MoH	Zaid Ash-Shariti hospital	As-Sweida	General	13528	345	105

Source: HeRAMS and Secondary Program at WHO Syria Office- August- 2016.

Data was verified for quality and accuracy by the national committee and HIS focal team. And then data was entered on a excel sheet and analyzed by using SPSS. The analysis took about 15 days from 31 Oct till 15 Nov, 2016.

Limitation of the study: The study did not capture patients' perception of cancer care the collected data were mainly for cancer patients as a whole as the study did not differentiate cancer diseases according to age group or sex (female or male). It is recommended that more

studies to be conducted in the future to examine (i) patient's perception of cancer care and (ii) cancer types among specific age group and sex.

## **5. Findings:**

### **I. Semi-structured interviews:**

The surveyors used the rapid assessment tool, attached in Annex 1. And Data was collected from the 8 hospitals listed in Table 1. The duration needed for completing the questionnaire was about 55- 60 minutes. Head of the hospital, head on the oncology department, oncologists, and statistic unit were the main respondents. The findings showed the following:

#### **5.1. Facility introduction and infrastructure:**

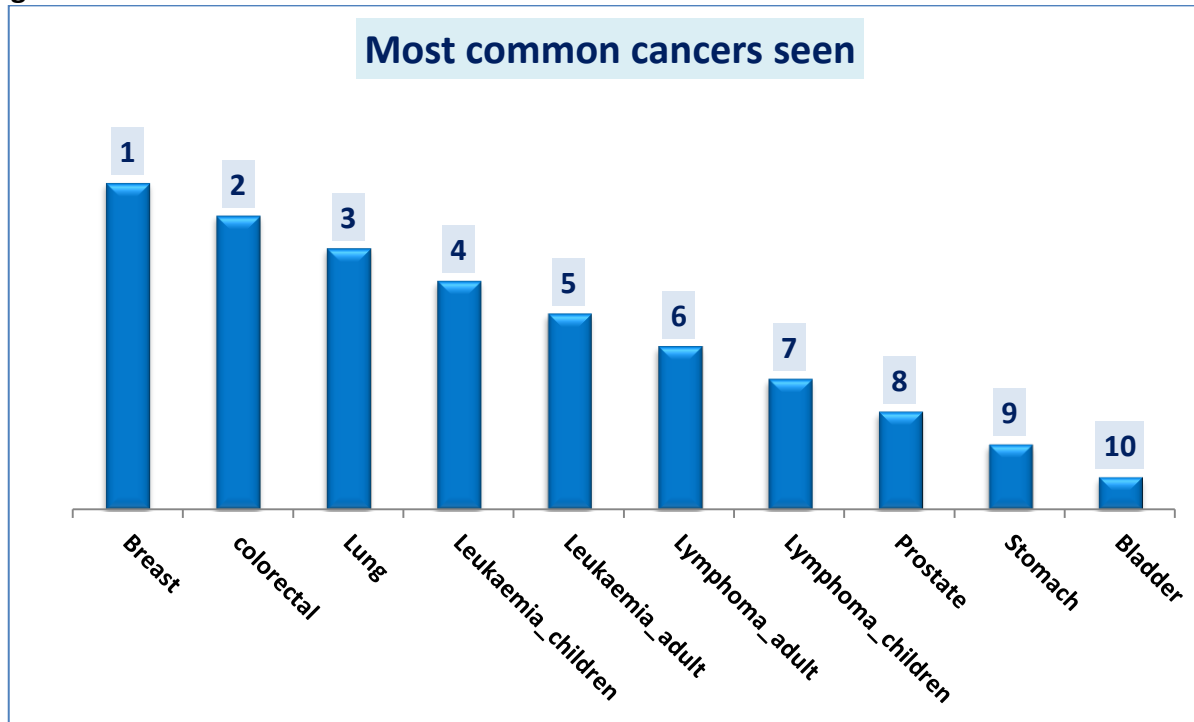
- All the eight hospitals where the study was conducted were public hospitals where all services are provided free of charge except for the one specialized hospital (Albyroni hospital).
- Funding mechanisms: Only two hospitals (25%) had mixed funding from government and private funds. And percentage from public funding reached 90 % of the total funding.

#### **5.2. Current service provision:**

- 7 hospitals (88%)of the hospitals where the study was conducted have hospital-based cancer registry and only one hospital (Children hospital) 13% did not have a hospital –based cancer registry
- On a monthly basis, average number of adults who started treatment was 226 and the maximum number of patients seen reached 500 patients at Albyroni hospital. For children, the average number diagnosed with cancer each month was only 31 patients and the maximum of children patients seen was 150 patients recorded at children hospital
- The most common types of cancer seen were breast, colorectal, lung, and leukemia -children. While bladder, stomach, and prostate were the least cancer diseases, among surveyed cancer types, seen in the locations of the study, as shown in Figure 1.

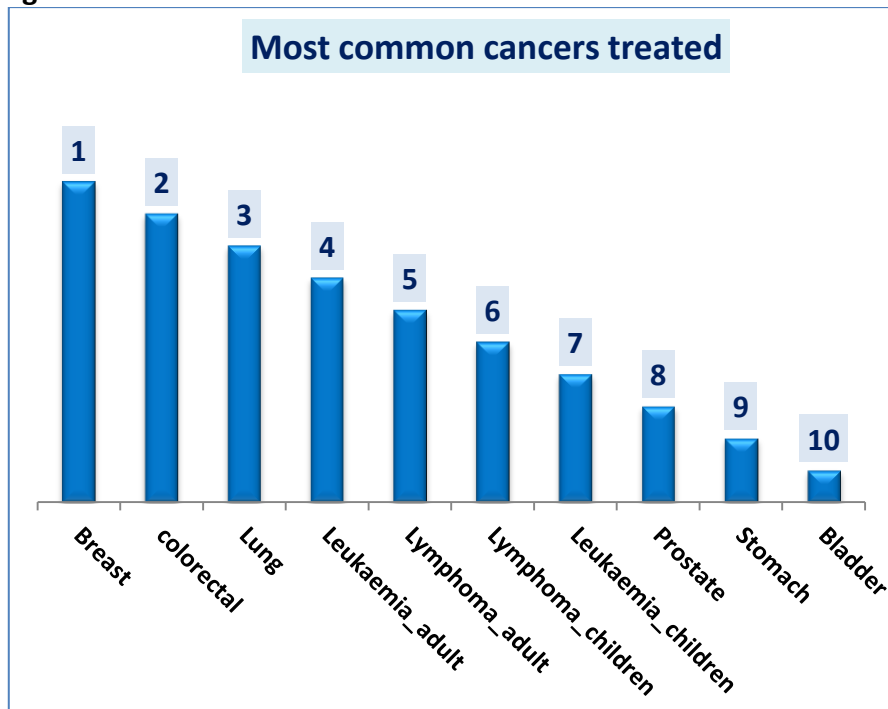


Figure 1: Most common cancers seen



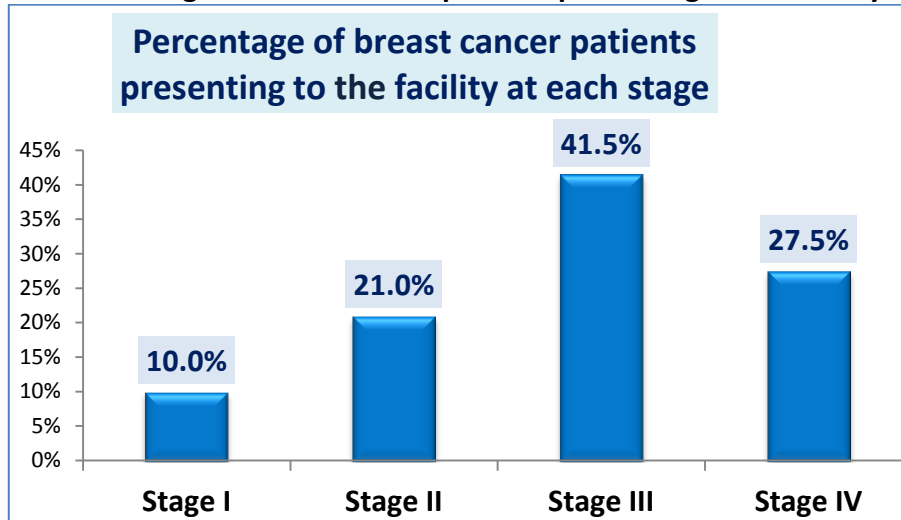
- Breast, colorectal, lung, and leukemia-adult were the most types of cancer diseases treated. However, bladder, stomach, and prostate were the least types of cancer seen in the study locations. And leukemia- children and adult, and lymphoma and children were in the middle in ranking, as shown in Figure 2.

Figure 2: Most common cancers treated



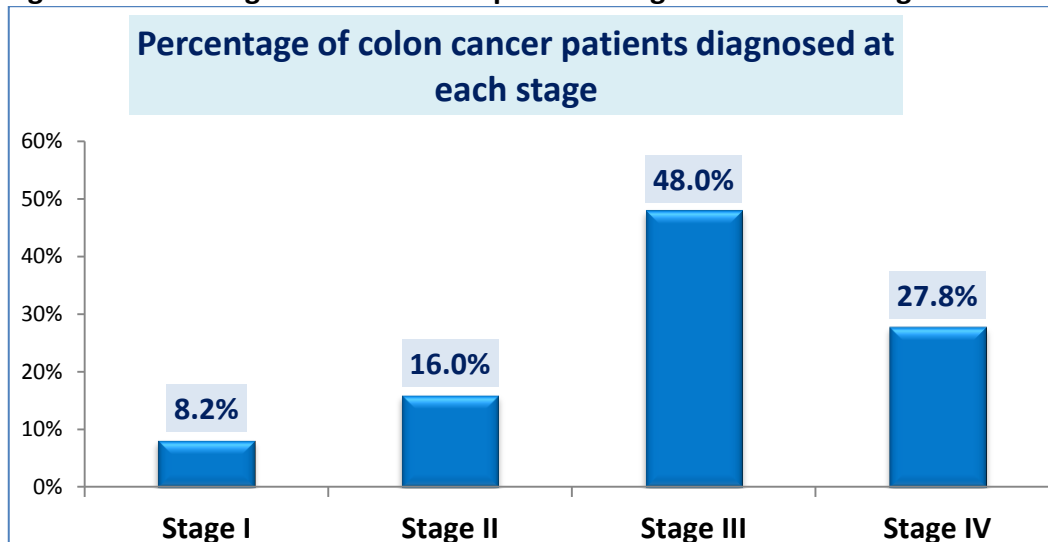
- About 41.5% of women with breast cancer presented with stage III disease, followed by 27.5% presenting to hospitals with stage IV disease. While only 21% presenting in Stage II and 10% presenting in stage I, as shown in Figure 3.

**Figure 3: Percentage of breast cancer patients presenting to the facility at each stage.**



- 48% of colon cancer patients were diagnosed at stage III, followed by 27.8% diagnosed at stage IV and 16% diagnosed at stage II. And only 8.2% were diagnosed at stage I, as shown in Figure 4.

**Figure 4: Percentage of colon cancer patients diagnosed at each stage**

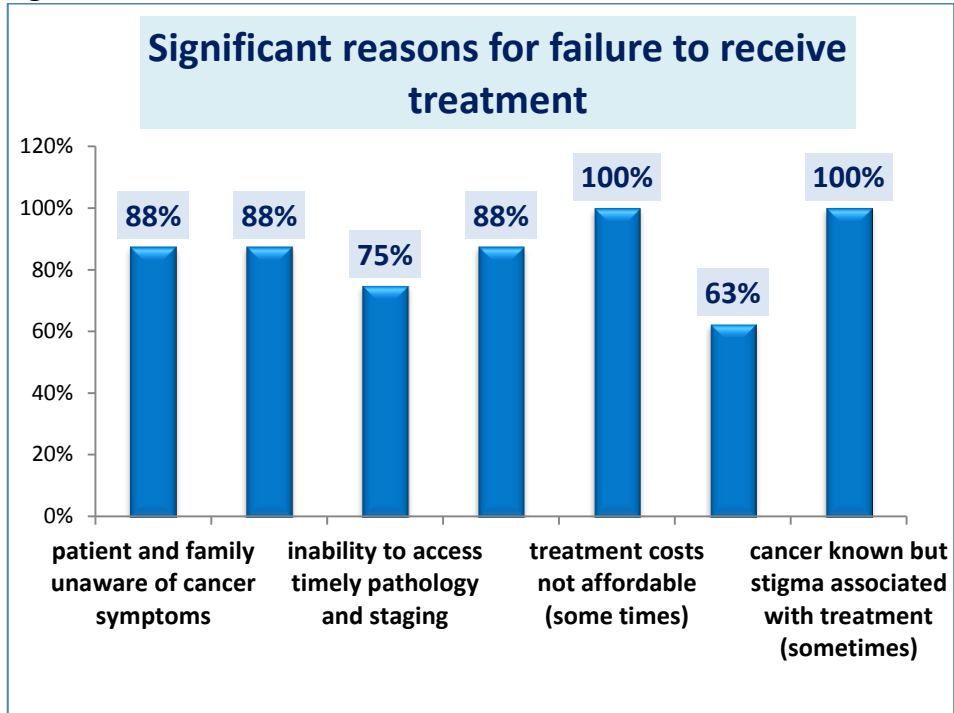


### 5.3. Delayed diagnosis & treatment:

100 % of the respondents mentioned that affordability of treatment and stigma are common reasons for failure to receive treatment. And 88% of respondents mentioned that treatment facility not geographically accessible, fragmented referral mechanisms to higher levels of care, and patient and family unaware of cancer symptoms were additional reasons for failure to receive treatment. 75% of the respondents believe that inability to access timely pathology and staging was a reason for failure to receive diagnosis and treatment. Finally, treatment viewed

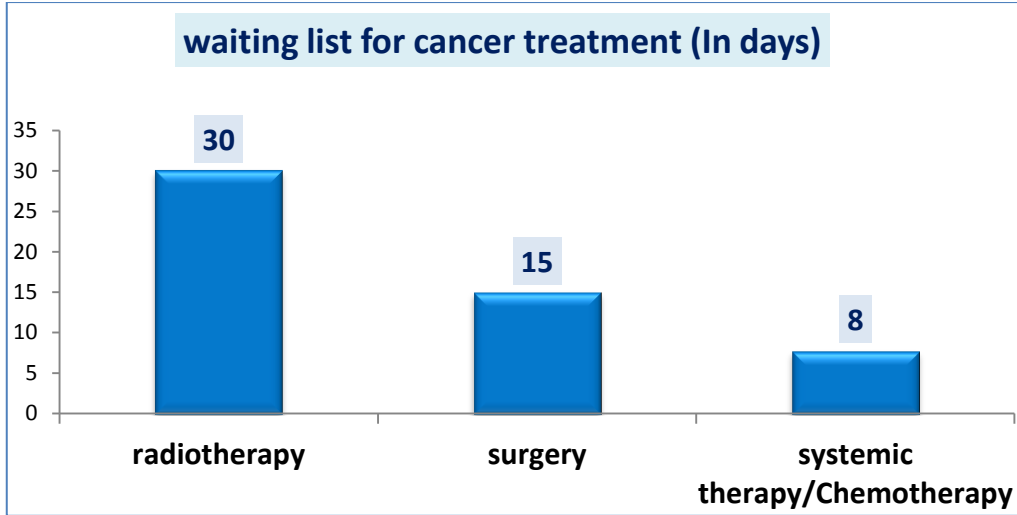
as insufficient family priority was the least reason for failure to receive treatment (only 63%), as shown in Figure 5.

**Figure 5: reasons for failure to receive treatment**



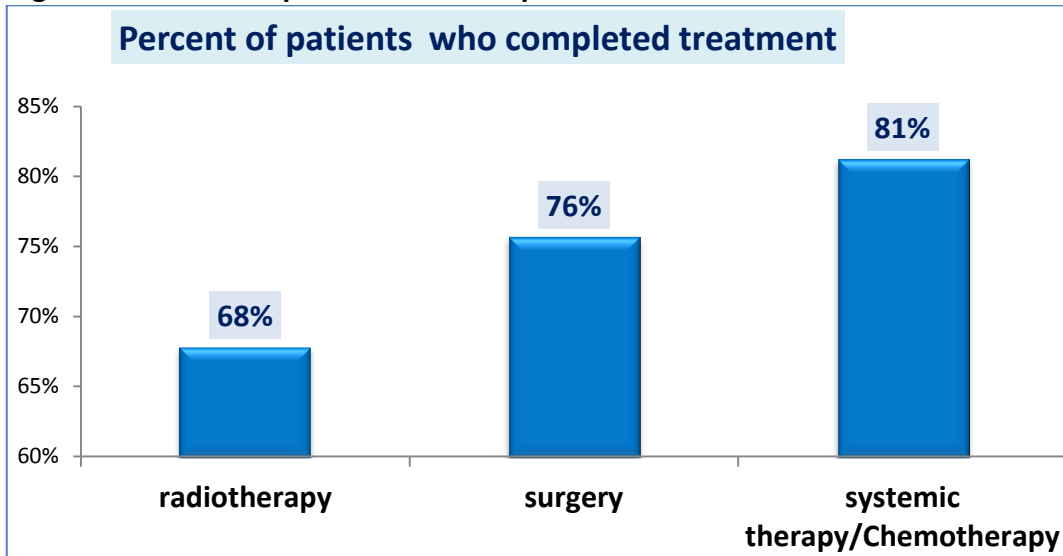
- The longest waiting for cancer treatment was before radiotherapy then surgery and systemic therapy/chemotherapy (30 days, 15 days, 8 days) respectively, as shown in Figure 6.

**Figure 6: Waiting list for cancer treatment**



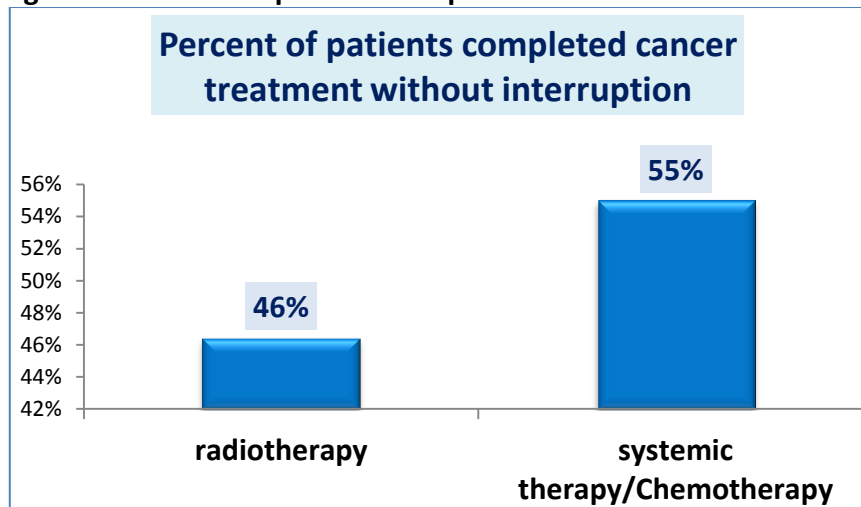
- Systemic therapy/ Chemotherapy was completed by 81% of cancer patients then surgery and radiotherapy (76%, 68%) respectively, as shown in Figure 7.

**Figure 7: Percent of patients who completed treatment**



- 55% of patients completed systemic therapy /chemotherapy without interruption, while only 46% patients completed radiotherapy without interruption, as shown in Figure 8

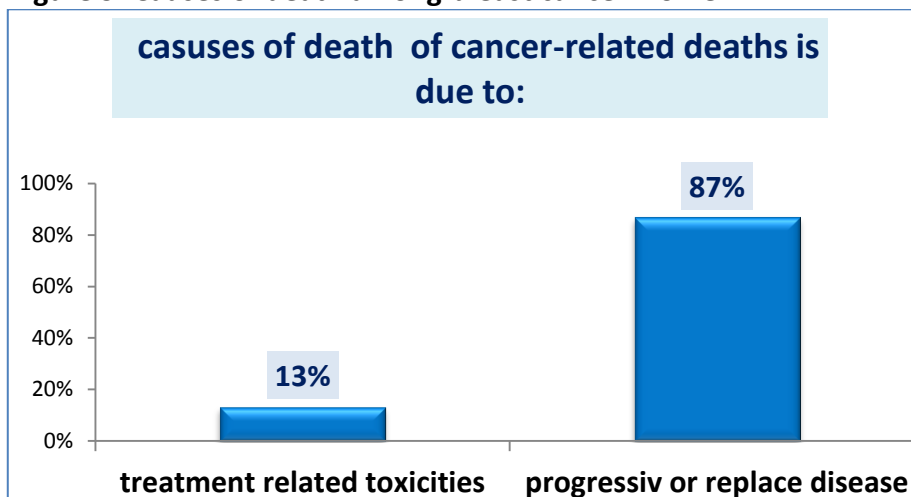
**Figure 8: Percent of patients completed cancer treatment without interruption**



#### **5.4. Treatment Toxicities & Survivorship Care:**

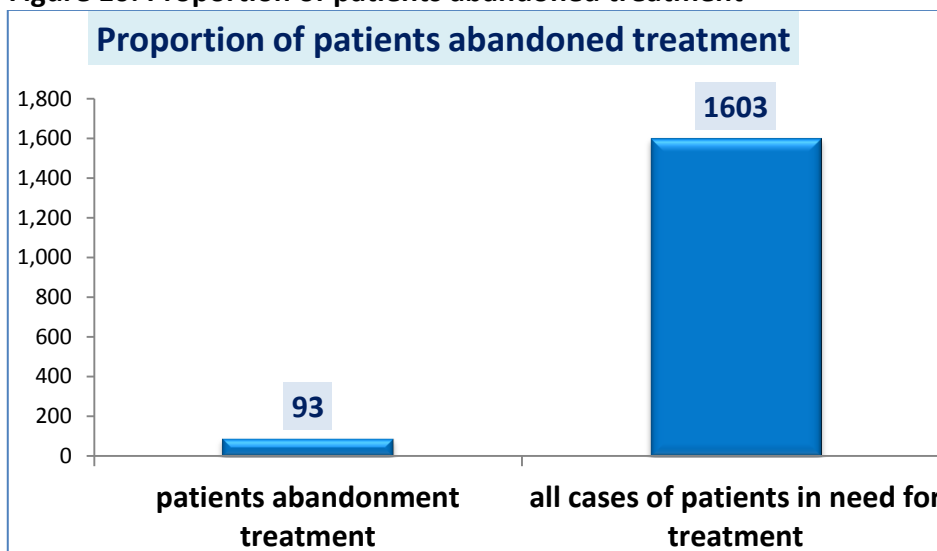
- The estimated average number of deaths per year from cancer in each of the surveyed facilities combined was 103, and ranged from 50 to 210 deaths per year.
- 87% of death among breast cancer women were due to progressive or relapse in the disease, while the 13 % of the death cases resulted from treatment related toxicities, as shown in Figure 9.

**Figure 9: Causes of death among breast cancer women**



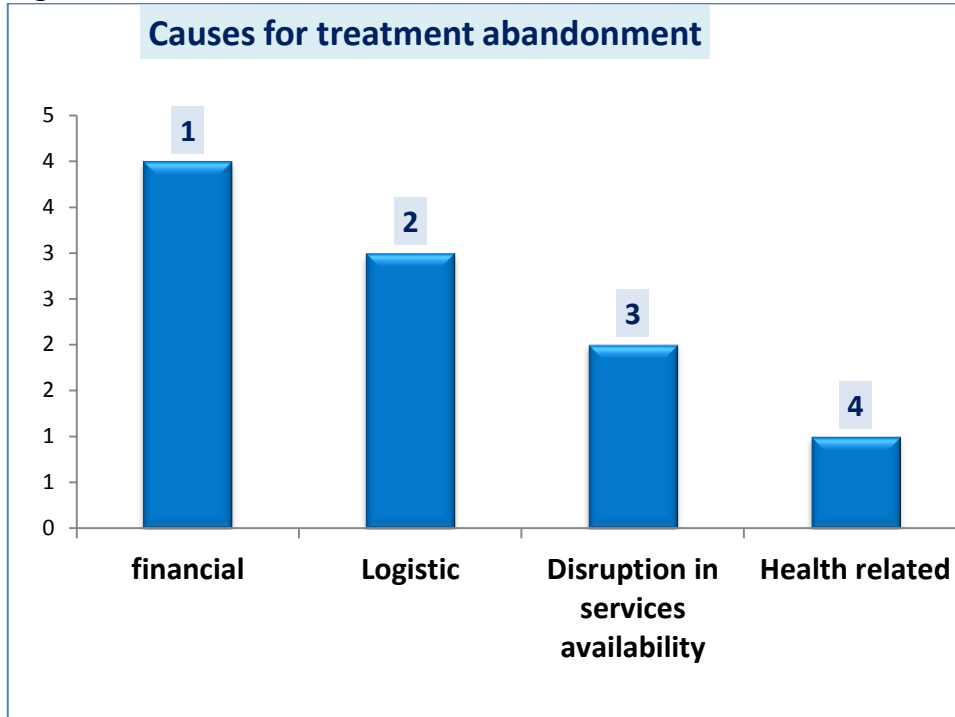
- Among 1603 patients in need for treatment, only 93 patients abandoned treatment, as shown in Figure 10.

**Figure 10: Proportion of patients abandoned treatment**



- Financial, logistic, and disruption in services availability were the main three ranks for treatment abandonment (1, 2, 3) respectively, while reasons related to health issues ranked 4, as shown in Figure 11.

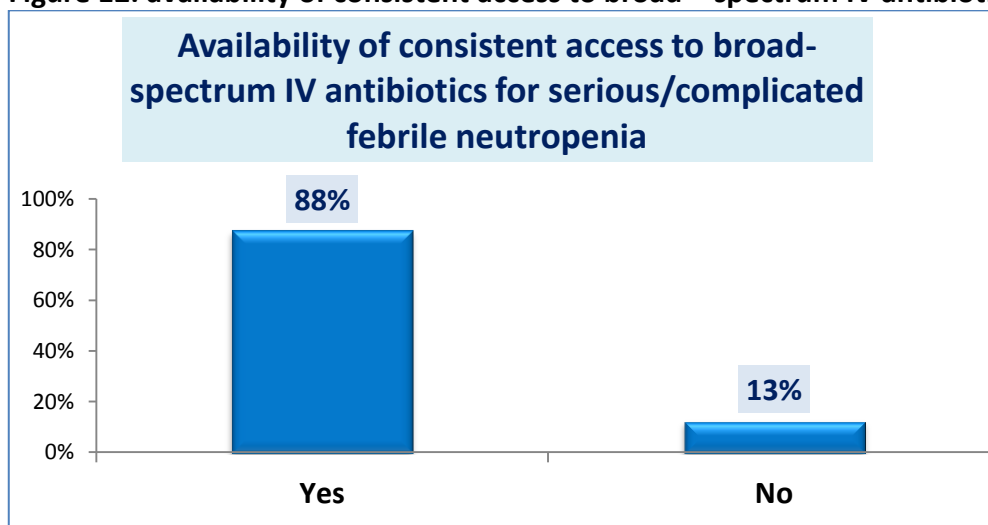
**Figure 11: causes for treatment abandonment**



- 100% of the respondents mentioned that surveillance protocols are used after completion of therapy.

- 88% of the respondents mentioned that they have consistent access to broad – spectrum IV antibiotics for serious/ complicated febrile neutropenia, as shown in Figure 12.

**Figure 12: availability of consistent access to broad – spectrum IV antibiotics**

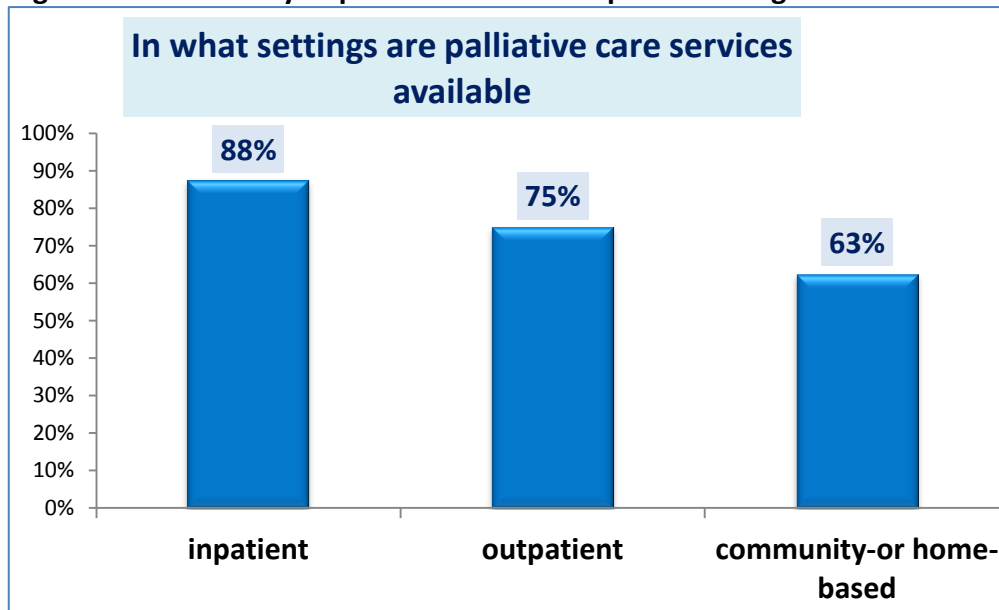


- Respondents mentioned that all cancer patients in the study locations (100%) have access to antiemetic medicines during chemotherapy treatment.

### 5.5. Palliative care:

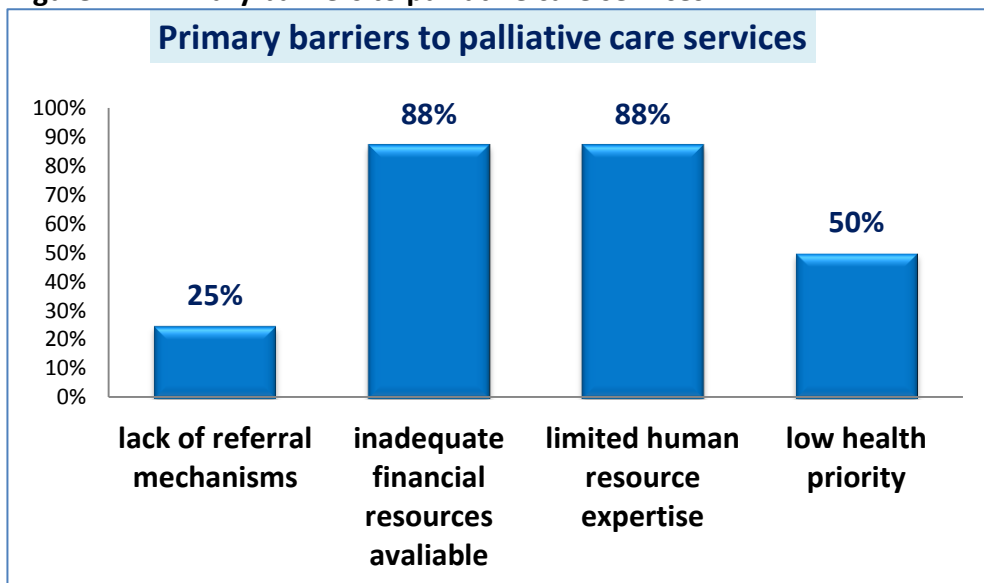
- 88% of inpatient setting has palliative care, while the mentioned service was available in 75% of outpatients and in 63% of community or home based, as shown in Figure 13.

**Figure 13: Availability of palliative care in hospitals' settings**



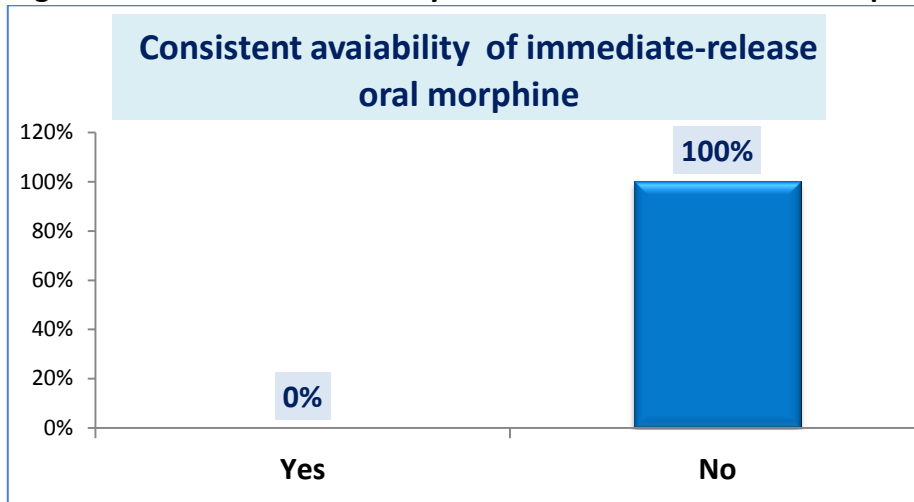
- The highest primary barriers to palliative care services were inadequate financial resources and limited human resources expertise (88%), while low health priority accounts for (50%) among primary barriers and the lowest barriers were related to lack of referral mechanisms, as shown in Figure 14.

**Figure 14: Primary barriers to palliative care services**



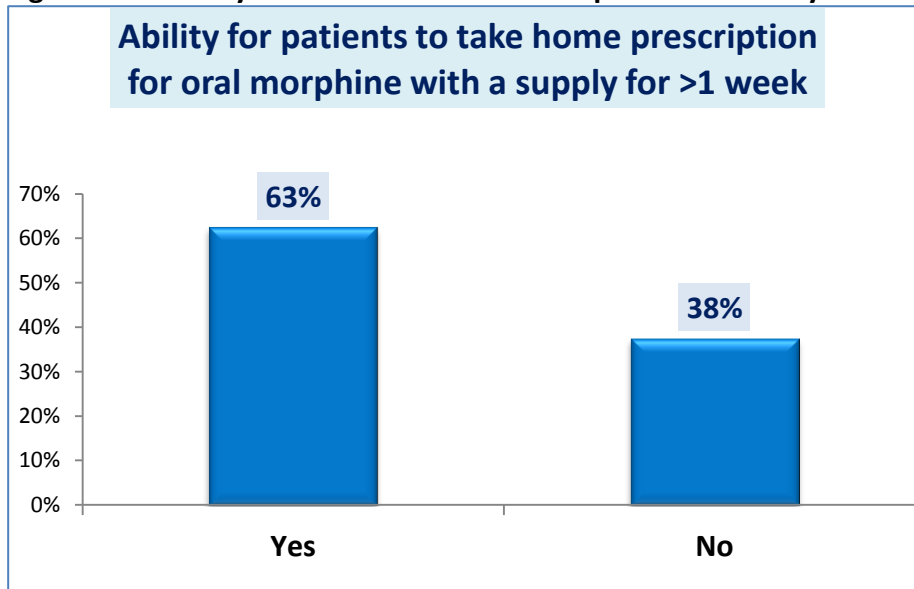
- All respondents mentioned that immediate –release oral morphine was consistently not available, as shown in Figure 15.

**Figure 15: Consistent availability of immediate-release oral morphine**



- 63% of patients are able to take home prescription for oral morphine with a supply for > 1 week, as shown in Figure 16.

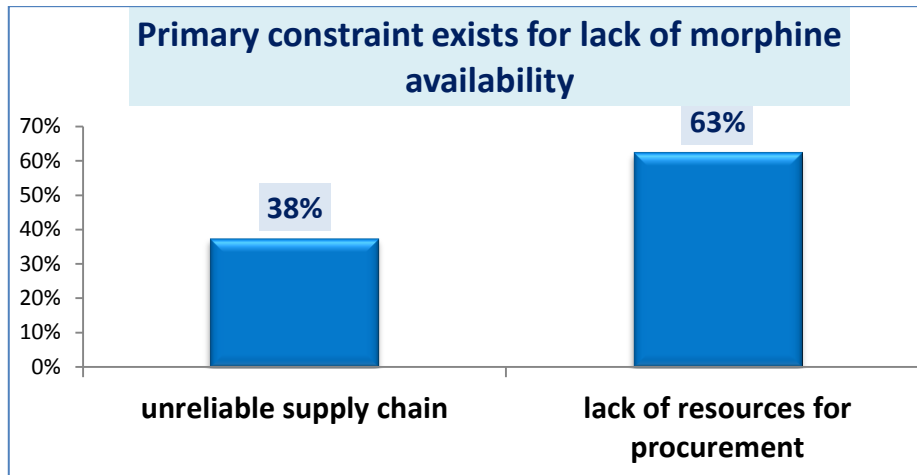
**Figure 16: Primary constraint for lack of morphine availability**



- Lack of resources for procurement was the main primary constraint exists for lack of morphine availability (63%), while unreliable supply chain was only 38%, as shown in Figure 17.



**Figure 17: Primary constraints for lack of morphine availability**



**5.6. Medical staff, pediatric oncology team:**

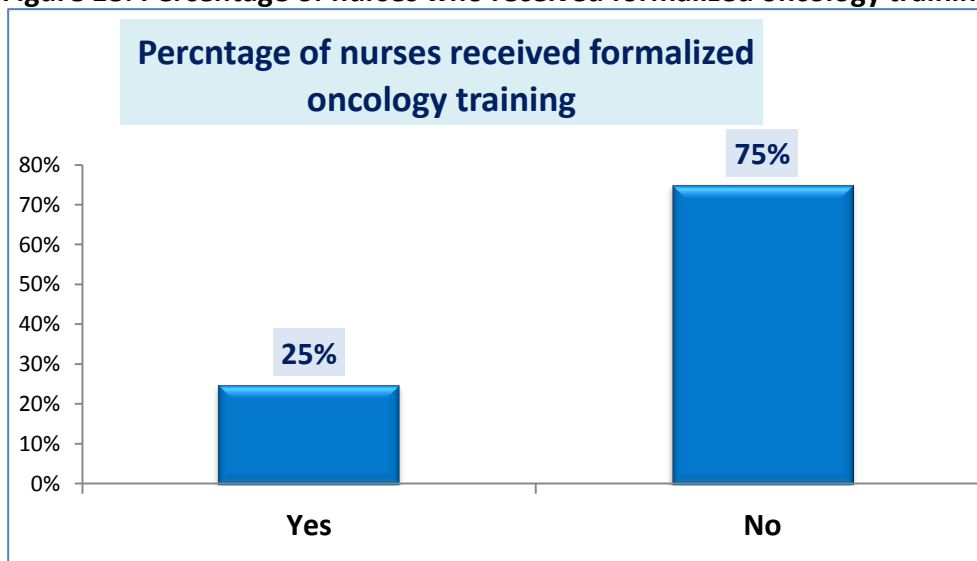
- Average number of staff available in the study's locations was:

- Medical oncologists: 5
- Surgeons performing cancer operations: 9
- Radiation oncologists: 2
- Palliative & supportive care providers: 0
- Medical physicist: 4
- Biomedical engineer: 1

- The nurse to patient ratio on the weekday shift was 3/ 16 patients.

- Only 25 % of nurses got formalized oncology training, while 75% of nurses did not receive formalized oncology training, as shown in Figure 18.

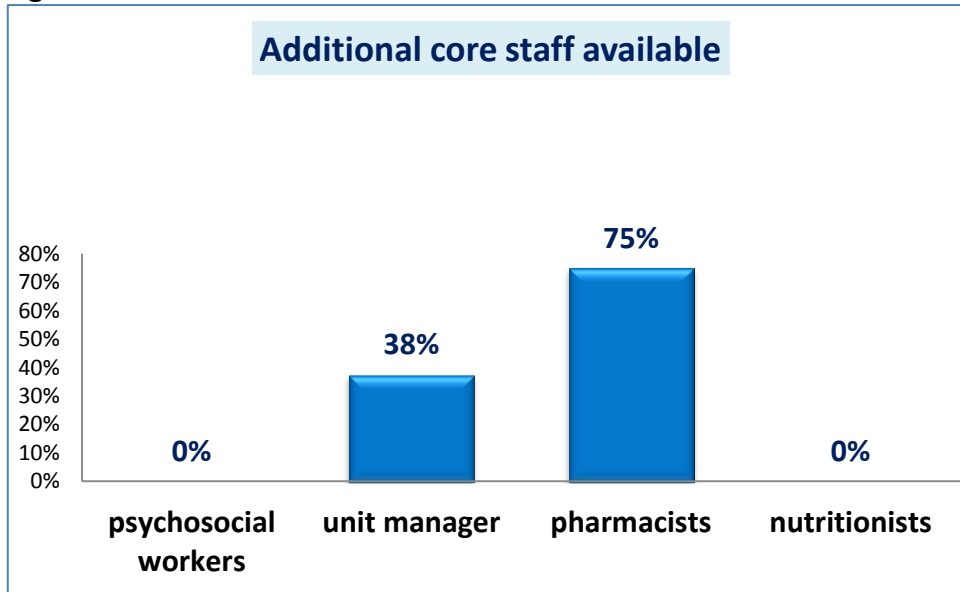
**Figure 18: Percentage of nurses who received formalized oncology training**



### 5.7. Multi-disciplinary Providers:

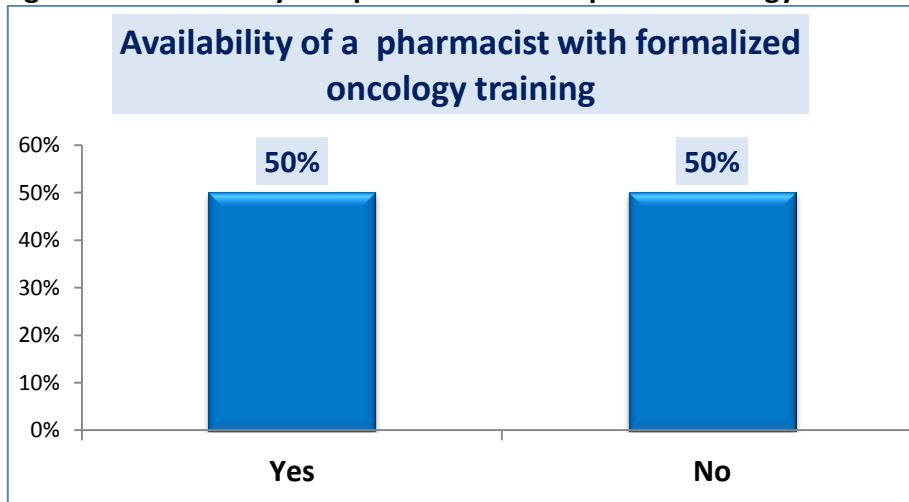
- Only pharmacists and unit manager were available as additional core staff (75%, 38%) respectively, as shown in Figure 19.

**Figure 19: Additional available core staff**



- Pharmacists with special oncology-related training were available in 50% of the study's locations only, as shown in Figure 20.

**Figure 20: Availability of a pharmacist with special oncology – related training**



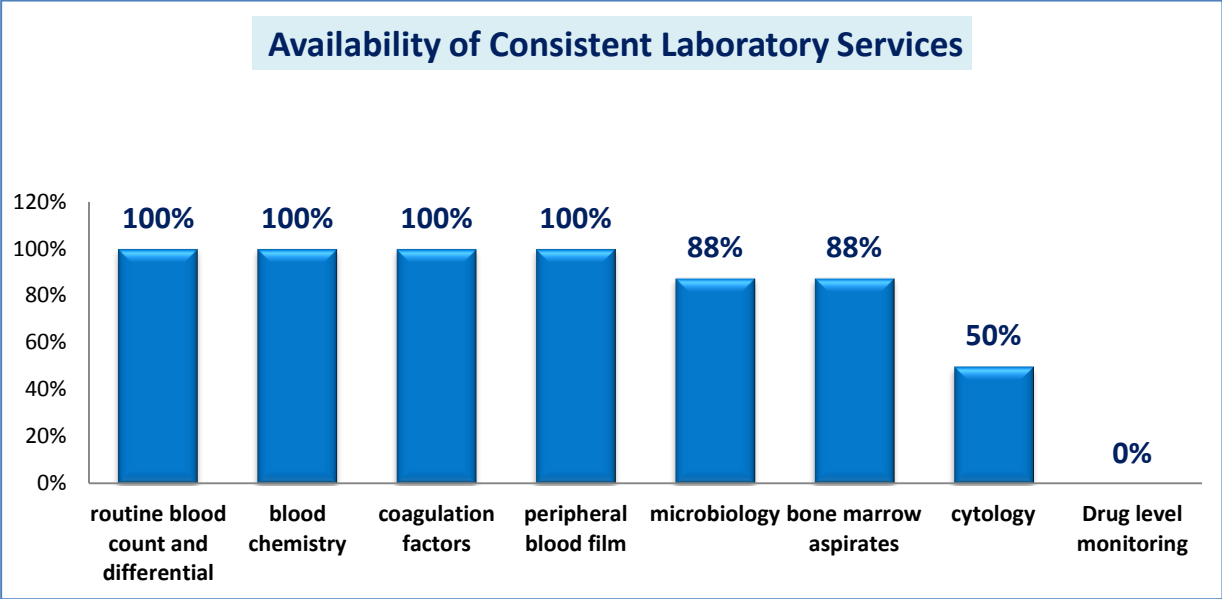
### 5.8. Hospital Facilities:

#### 1-General Laboratory:

- Routine blood count and differential, blood chemistry, coagulation factors, and peripheral blood film were fully available (100%) in the study's location. Microbiology and bone marrow

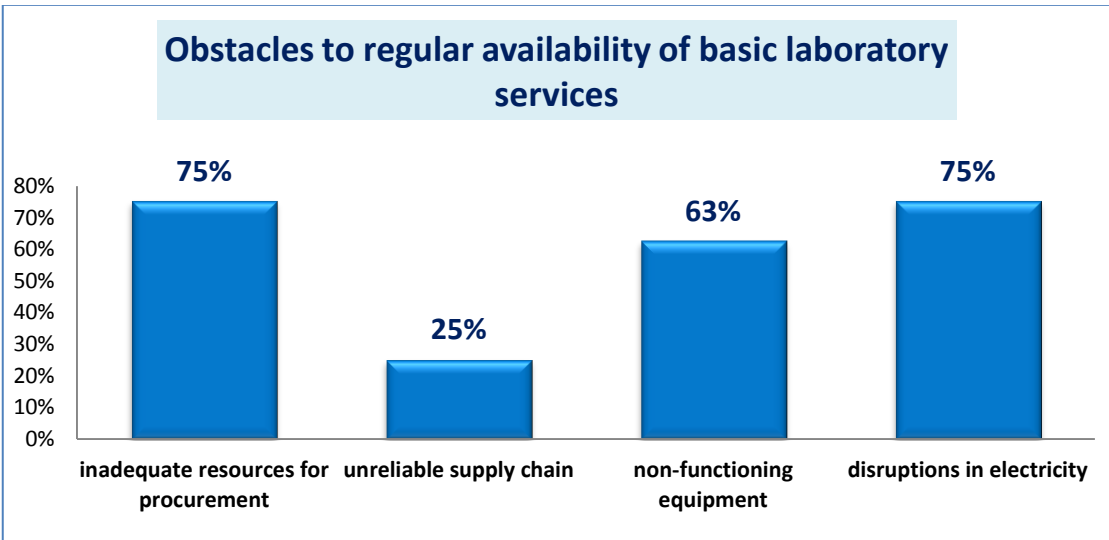
aspirates were available in 88%, and cytology was available in 50% of the study's location. However, drug level monitoring was not available in any of the hospitals, as shown in Figure 21.

**Figure 21: Laboratory services available consistently at the hospital**



- The main obstacles to regular availability of basic laboratory services were inadequate resources for procurement and disruption in electricity (75%, 75%) respectively. Other obstacles to regular availability included non- functioning equipment and unreliable supply chain were (63 % and 25%) respectively, as shown in Figure 22.

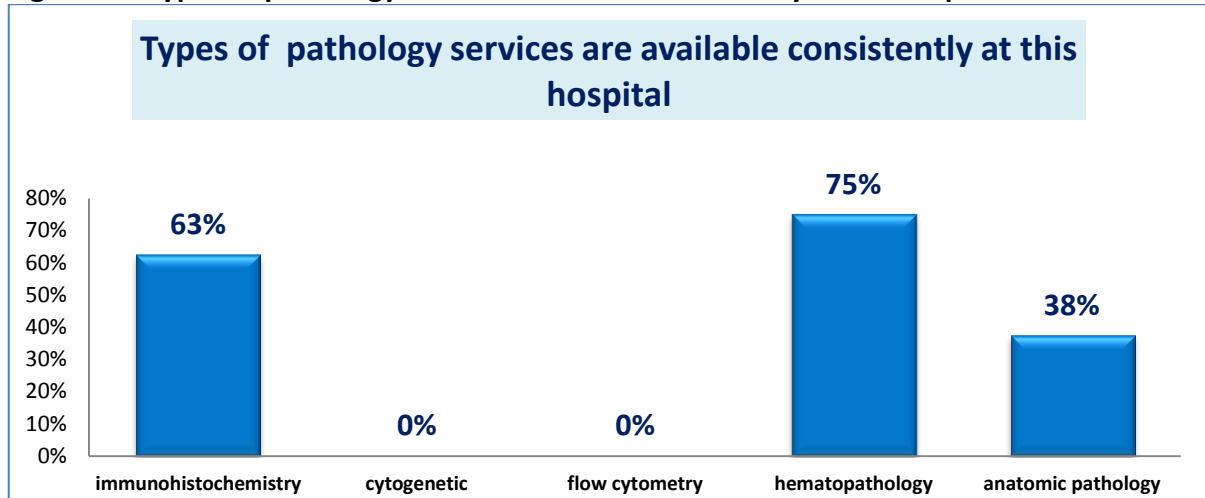
**Figure 22: Obstacles to regular availability of basic laboratory services.**



## 2 – Pathology:

- The main available pathology services were hematopathology, immunohistochemistry, and anatomic pathology (75%, 63%, 38%) respectively. While, flow cytometry and cytogenetics were not available in all hospitals where the study was conducted, as shown in Figure 23.

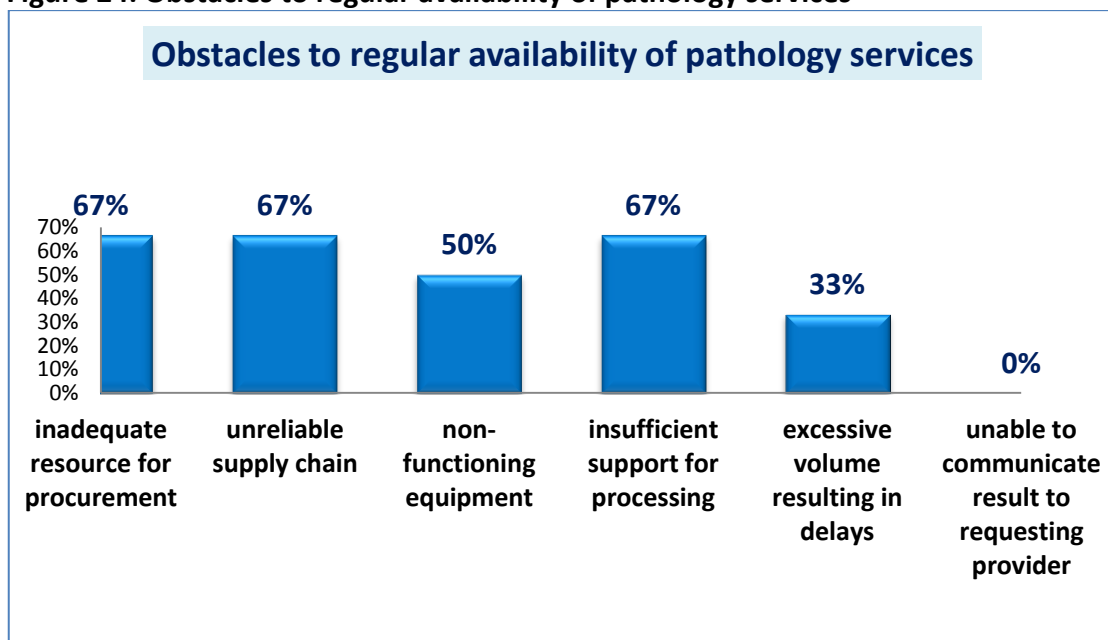
**Figure 23: Types of pathology services available consistently at the hospital**



- 75% of the hospitals had obstacles to regular availability of pathology services, and this was not applicable in the remaining 25% of the hospitals.

- The main obstacles to regular availability of pathology services were inadequate resource for procurement, unreliable supply chain, and insufficient support for processing (67% each) equally. While non-functioning equipment and excessive volume resulting in delays were obstacles (50%, 33%) respectively. And unable to communicate result to requesting provider was not among the obstacles in all the study's locations, as shown in Figure 24.

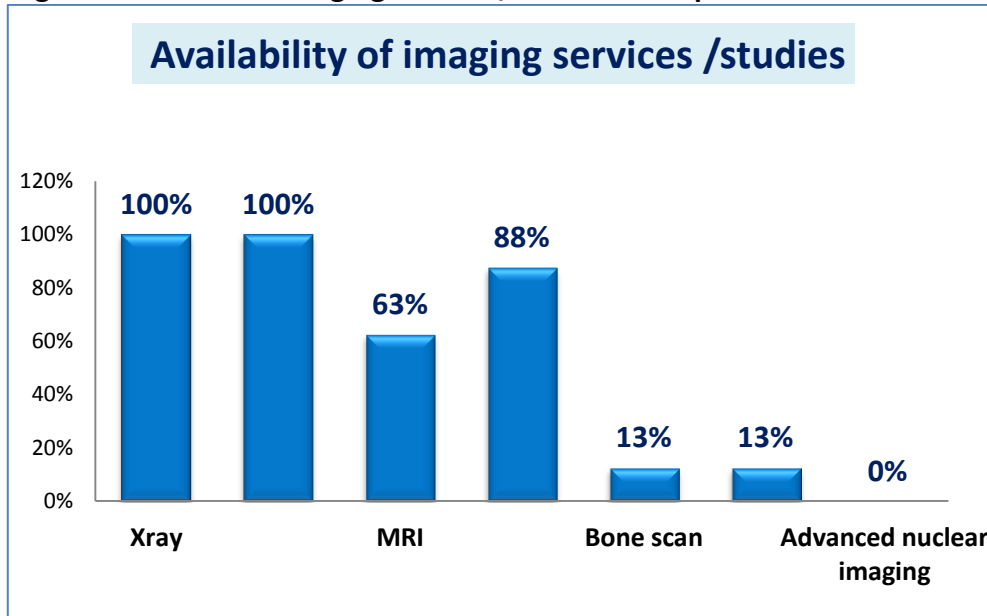
**Figure 24: Obstacles to regular availability of pathology services**



3 – Radiology:

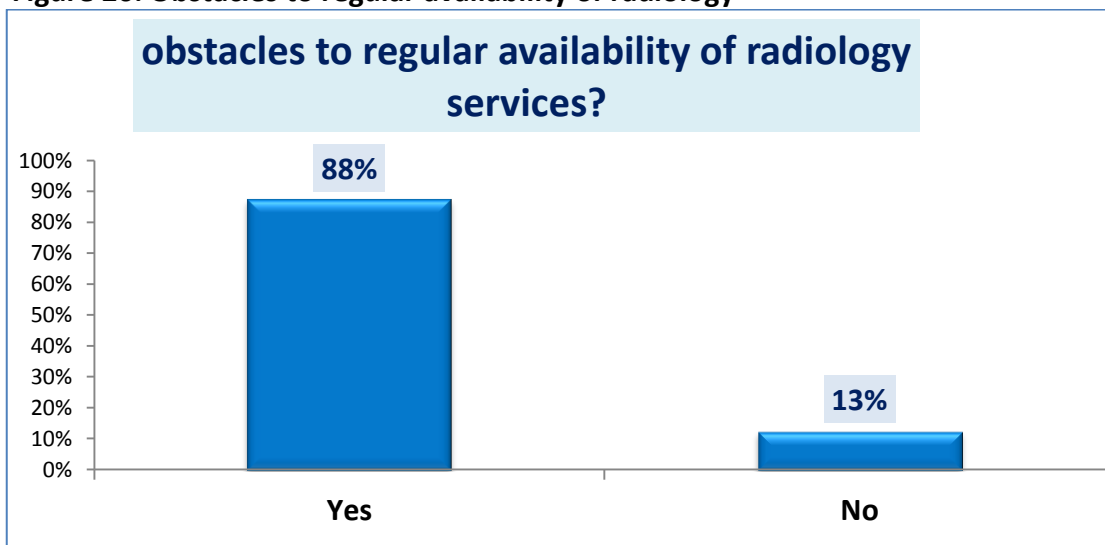
- While X-ray and ultrasound were fully available in all the hospitals (100%) equally, CT scan and MRI availability were (88%, 63%) respectively. Bone scans and nuclear medicines procedures were available (13%) of surveyed hospitals, and none of the hospitals have advanced nuclear imaging, as shown in Figure 25.

**Figure 25: Available imaging services/studies in hospitals**



- 88% of the hospitals mentioned that they were facing obstacles to regular availability of radiology services, and only one hospital (13%) did not have any obstacles, as shown in Figure 26.

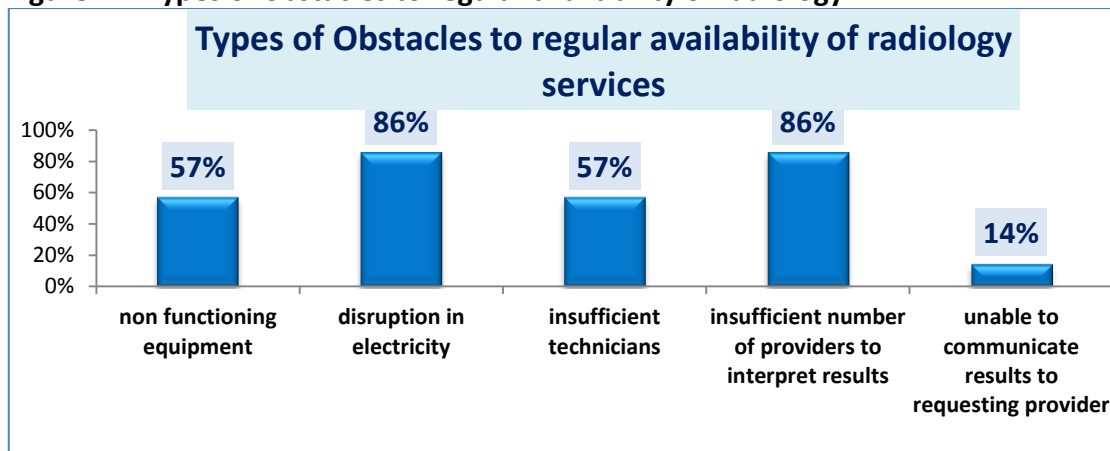
**Figure 26: Obstacles to regular availability of radiology**



- While disruption in electricity and insufficient number of providers to interpret results were the main obstacles in (86%) of the hospitals equally, non- functioning equipment and

insufficient technicians came second (57%) equally, then unable to communicate results to requesting provider (13%) in one hospital only, as shown in Figure 27.

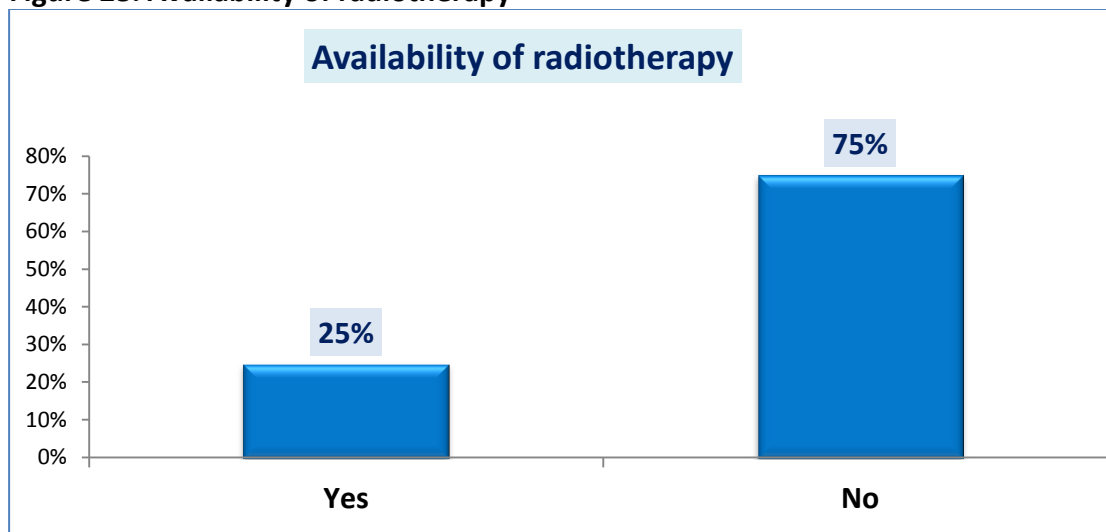
**Figure 27: Types of obstacles to regular availability of radiology**



#### 4- Radiation Therapy:

- Radiotherapy was only available in two hospitals (25%), as shown in Figure 28.

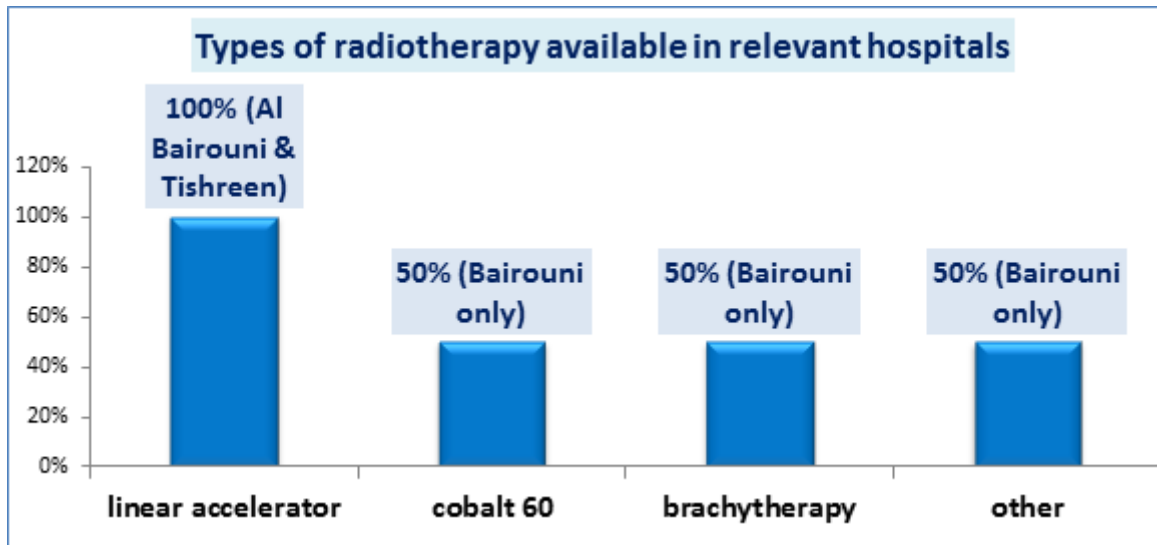
**Figure 28: Availability of radiotherapy**



- Radiotherapy was only available in two hospitals (25%): Albairni and Tishreen hospitals.

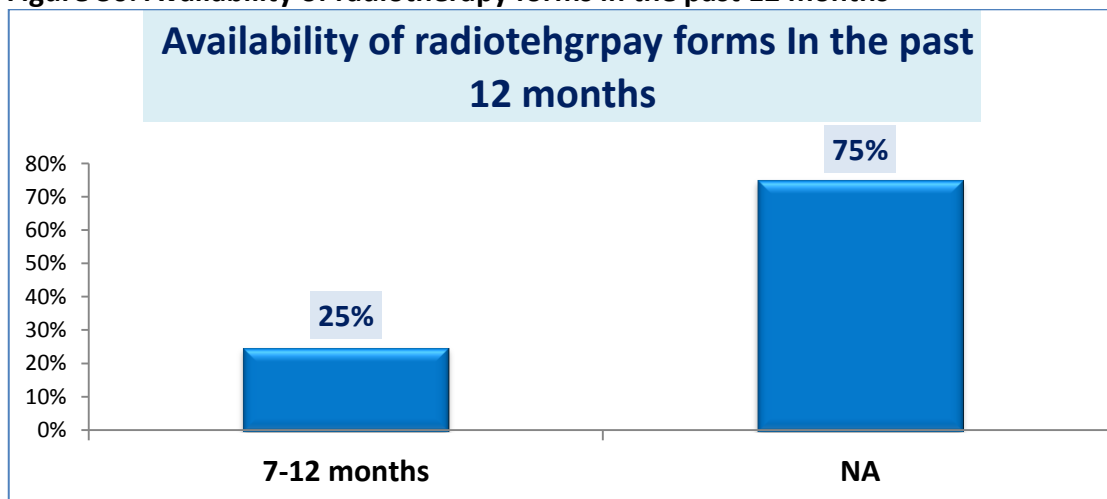
Linear accelerator was available in the mentioned two hospitals, while cobalt 60, brachytherapy, and other types were only available in Albaironi hospital, as shown in Figure 29.

**Figure 29: Types of radiotherapy available in relevant hospitals**



- In the past 12 months, radiotherapy treatment was available for 7-12 months of the year in the two hospitals University Tishreen Hospital – Lattakia and Al-Bairouni hospital – Rural Damascus (25%), as shown in Figure 30.

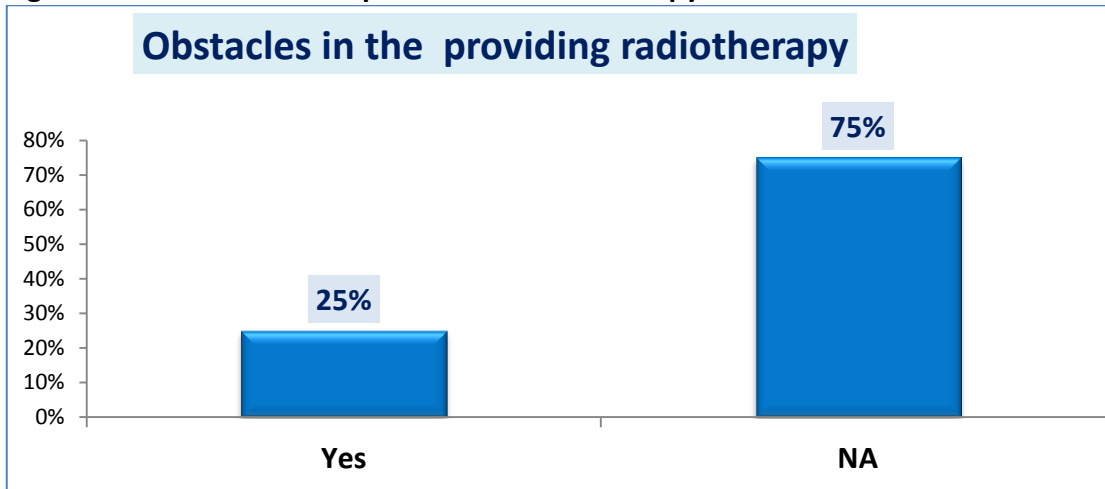
**Figure 30: Availability of radiotherapy forms in the past 12 months**



-The two hospitals (25%) in University Tishreen Hospital – Lattakia and Al-Bairouni hospital – Rural Damascus, where the radiotherapy was available, faced obstacles in providing the mentioned service.

The remaining hospitals did not have the radiotherapy, as shown in Figure 31.

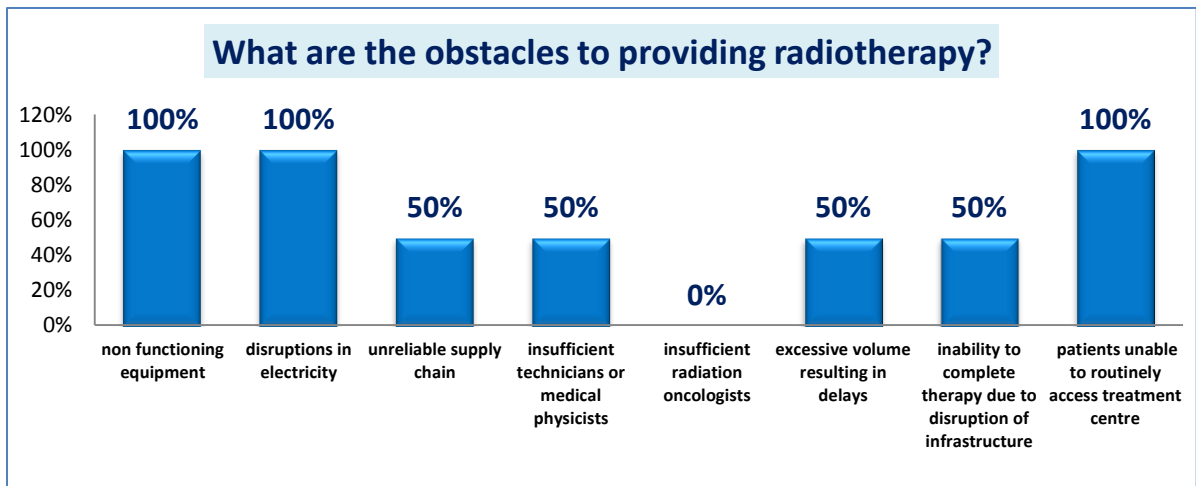
**Figure 31: Obstacles in the provision of radiotherapy**



-The main obstacles to providing radiotherapy were:

1. Non-functioning equipment, disruption in electricity, and unreliable supply chain (100%) equally.
2. Unreliable supply chain, insufficient technicians or medical physicists, and excessive volume resulting in delays (50%) equally.
3. None of the hospitals mentioned any obstacles related to insufficient radiation oncologists, as shown in Figure 32.

**Figure 32: Types of obstacles to providing radiotherapy**

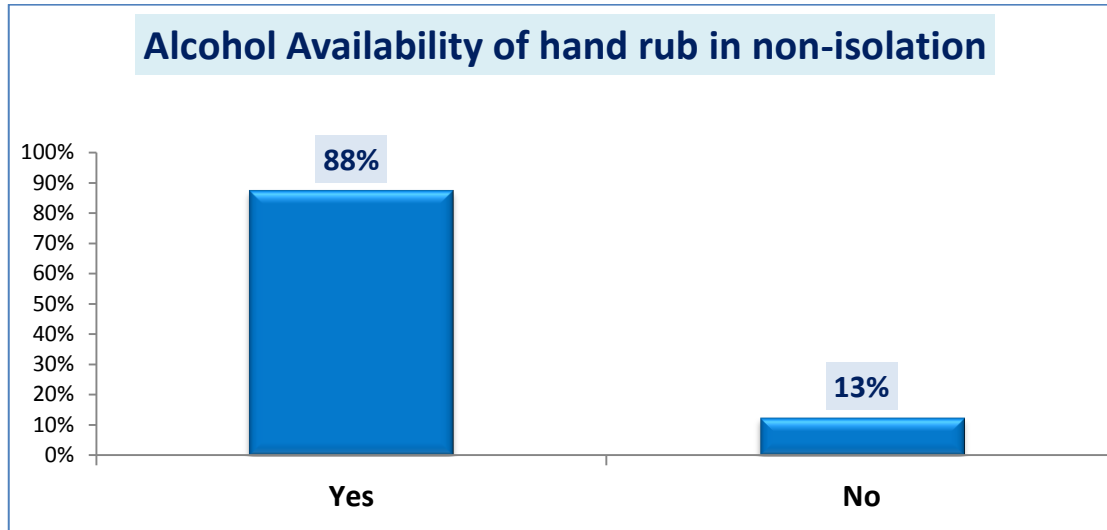




### 5. 9. Safety and Standard Precautions:

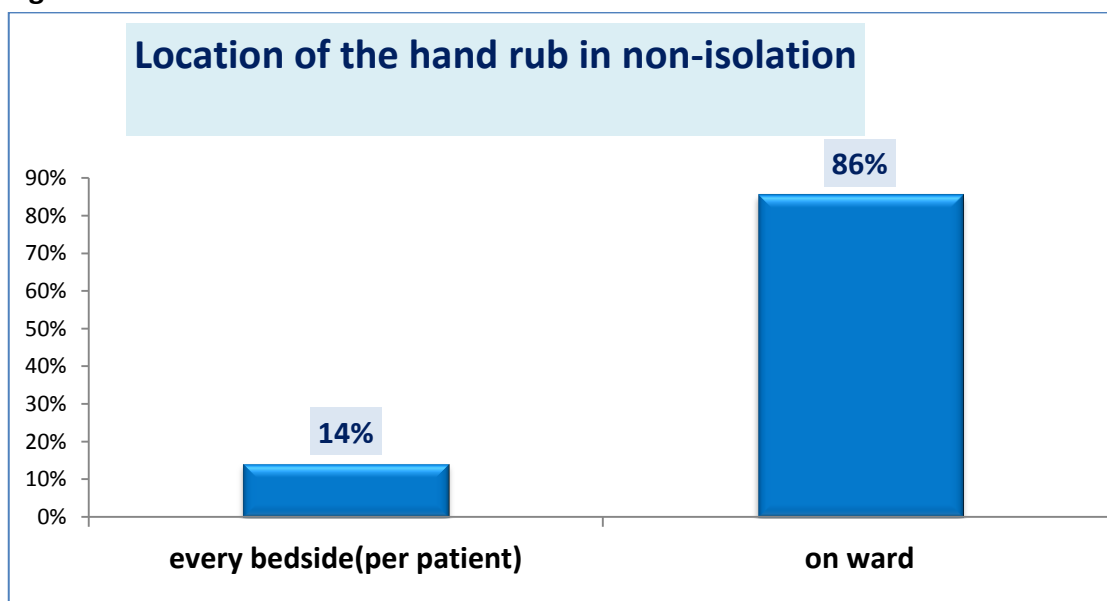
- 88% of the hospitals have alcohol based hand rub in no – isolation, as shown in Figure 33.

**Figure 33: Availability of alcohol based hand rub in non- isolation area**



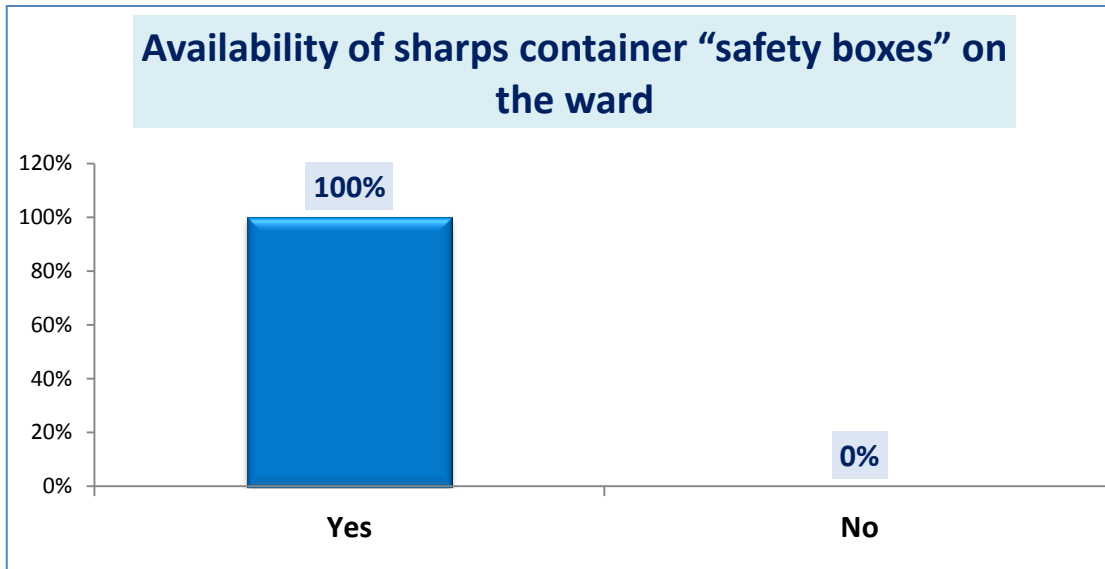
- Among the hospital that have alcohol based hand rub in non - isolation, 86% have them in ward while only 14% have them in every bedside (per patient), as shown in Figure 34.

**Figure 34: Locations where alcohol based rub available in non-isolation**



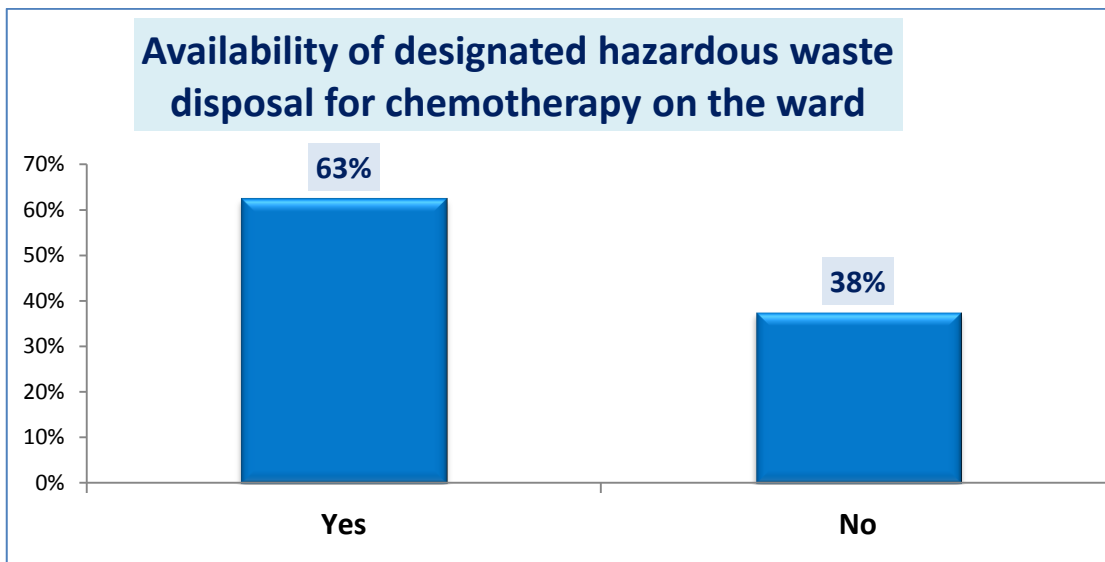
- Safety boxes for sharp needles were available on ward in all the hospitals where the study was conducted as shown in Figure 35.

**Figure 35: Availability of safety boxes on ward**



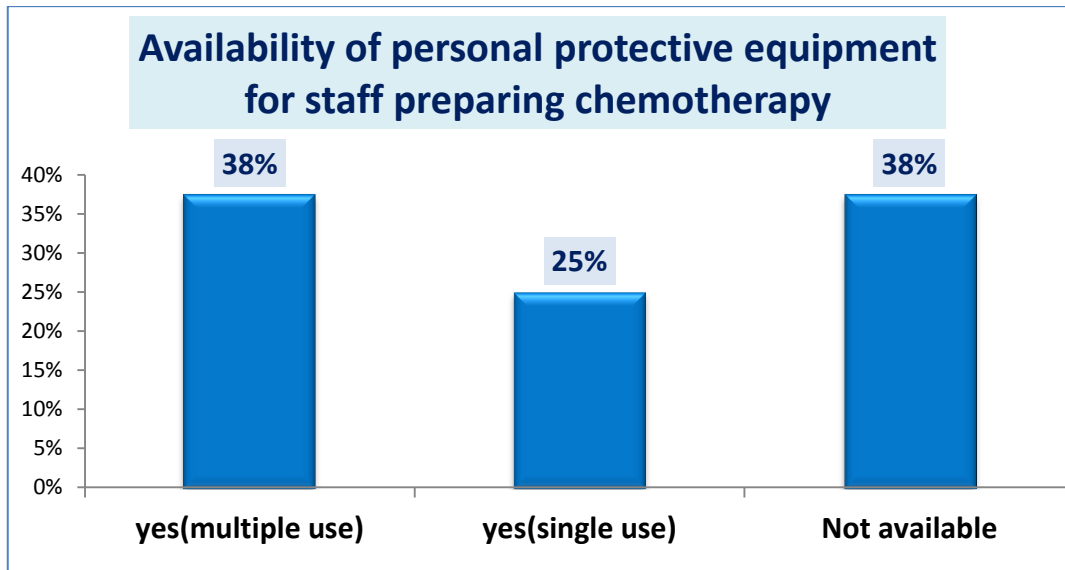
- Only 63% of hospitals have designated hazardous waste disposal for chemotherapy on the ward, as shown in Figure 36.

**Figure 36: Availability of designated hazardous waste disposal for chemotherapy on the ward**



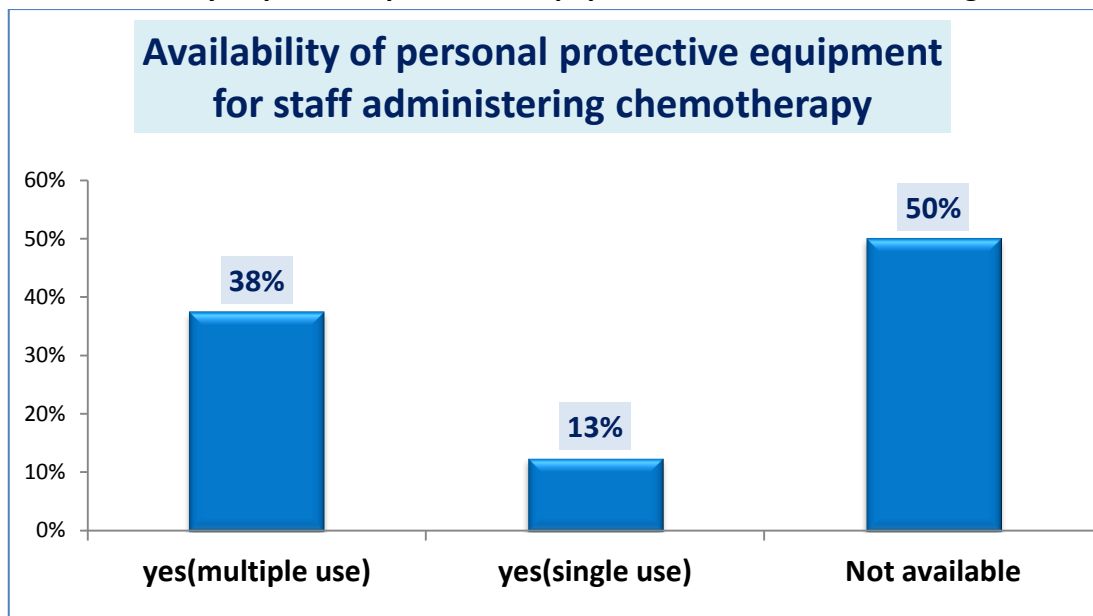
- 38 % of the hospitals have protective equipment for staff preparing chemotherapy for multiple use and 25 % of hospitals have these equipment for single use. However 38% of the hospitals did not have protective equipment for staff during the preparation of chemotherapy, as shown in Figure 37.

**Figure 37: Availability of protective equipment for staff preparing chemotherapy.**



- Regarding personal protective equipment for staff administering chemotherapy, it was only available for multiple use in three hospitals (38%) in Al Bairouni university - Rural Damascus, Zaid Alshariti hospital - Sweida, and Hama hospital. And only Ibn - Alnafiss hospital (13%) had this protective equipment for single use, as shown in Figure 38.

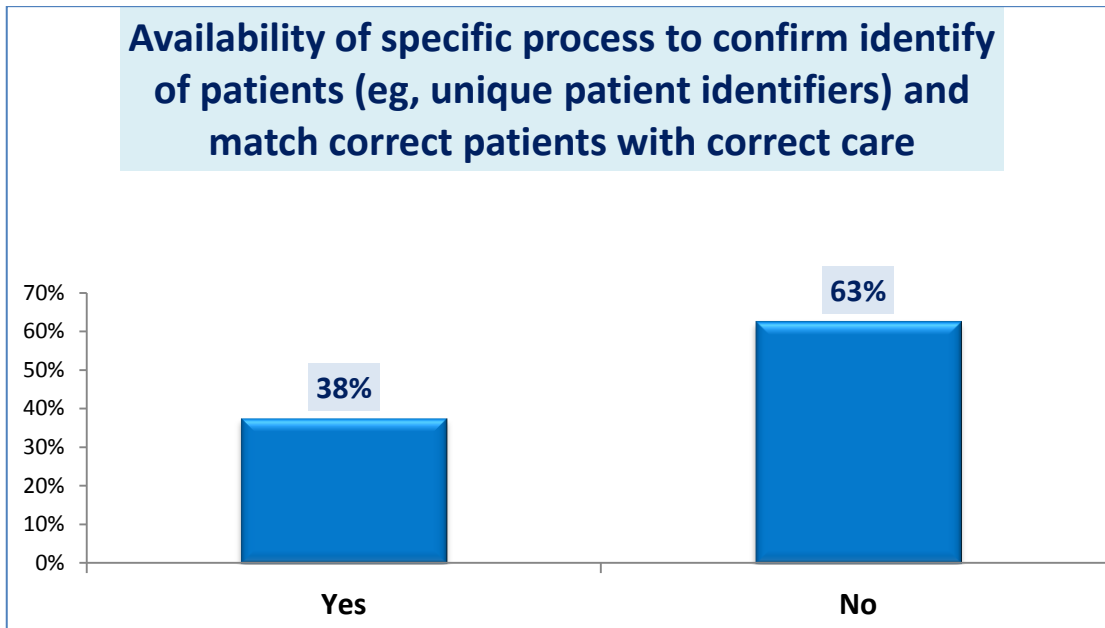
**Figure 38: Availability of personal protective equipment for staff administering chemotherapy**



- None of the hospitals have laminar flow hood for chemotherapy preparation.

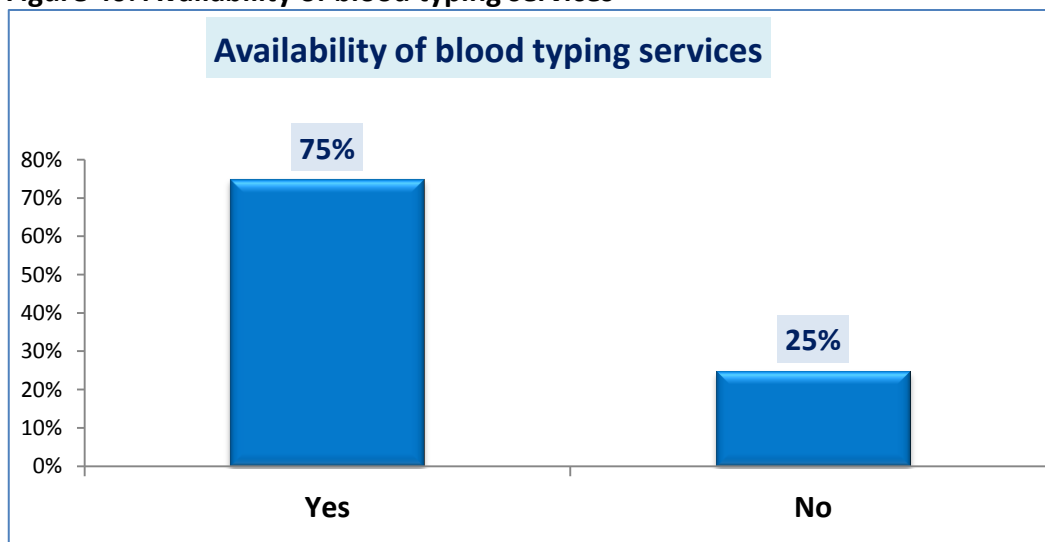
- Only 3 hospitals (38%) confirmed that they had specific process to confirm identity of the patient's prior to chemotherapy administration. and 63% of the hospitals did not have such type of patient's identifiers and that they only check patient's name, as shown in Figure 39.

**Figure 39: Availability of patient's identifiers.**



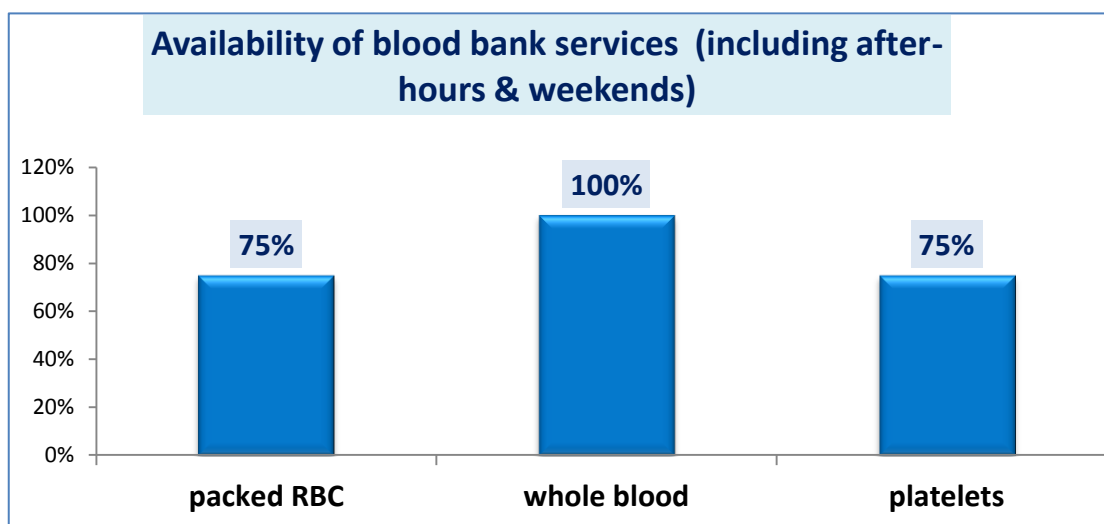
- While 6 hospitals (75%) of hospitals have blood typing services available in the facility, only two hospitals did not have such services as shown in Figure 40.

**Figure 40: Availability of blood typing services**



- Regarding the availability of blood bank services, all the hospitals (100%) perform whole blood. While, packed RBC and platelets were conducted in (75%) of the hospitals equally, as shown in Figure 41.

**Figure 41: Types of blood bank services available consistently at the hospital**



**5.10. Availability of essential medicines and technologies:**

All the hospitals (100%) mentioned the following:

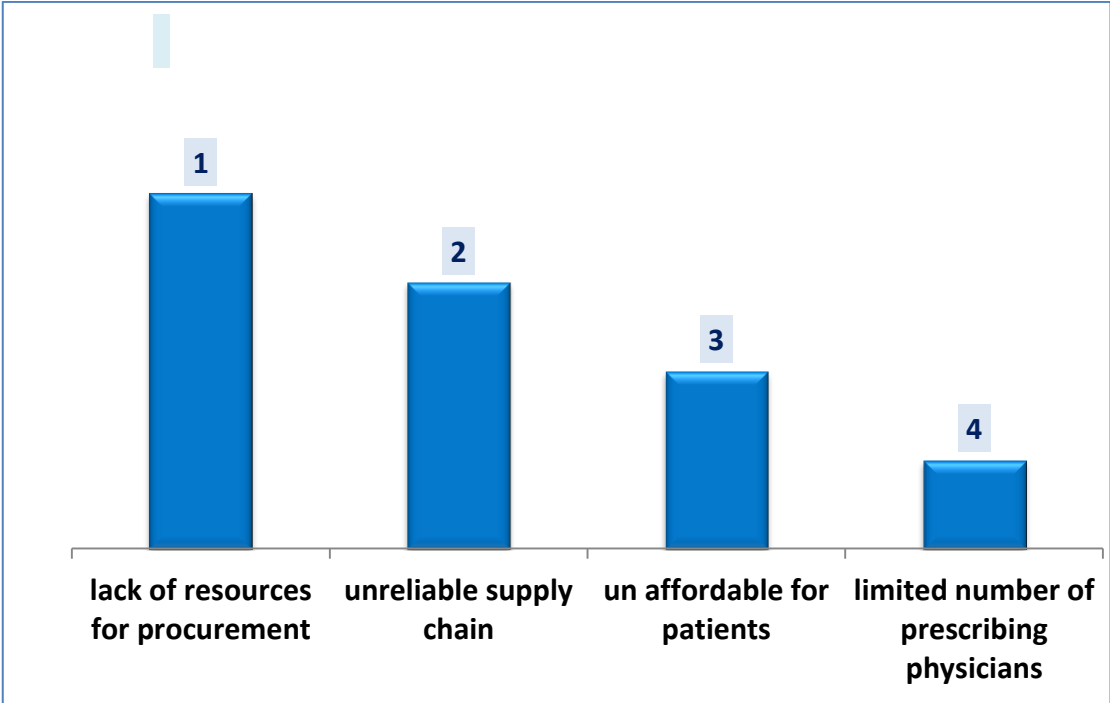
- Unavailability of consistent supply of the essential cytotoxic drugs.
- Delay in treatment due to availability of drugs occurred 1 to times a month.
- Medicines from WHO Essential list were available in the facility. However, the frequency and availability is shown in Table 2.

**Table 2: Availability of anti-cancer Medicines List**

Medicines	%
Carboplatin	100%
Dacarbazine	75%
Etoposide	88%
Oxaliplatin	38%
Tamoxifen	25%
Cisplatin	100%
Docetaxel	38%
Fluorouracil	88%
Vincristine	63%
Leuprorelin	25%
Cyclophosphamide	63%
Doxorubicin	88%
Filgrastim	63%
Anastrozole	13%

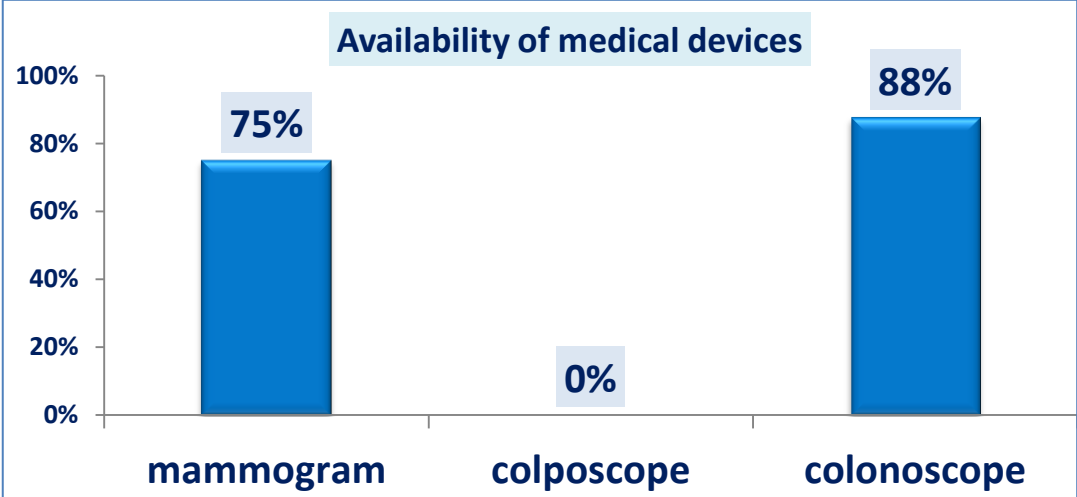
- The three main causes for the unavailability of medicines were lack of resources, unreliable supply chain, and unaffordable for patients. While the causes related to limited number of prescribing physicians was the bottom in ranking, as shown in Figure 42.

**Figure 42: Ranking of the causes for unavailability of essential medicines**



-Colonoscopy and mammogram were available in (88%, 75%) of the hospitals. However, colposcopy was not available in all the hospitals, as shown in Figure 43.

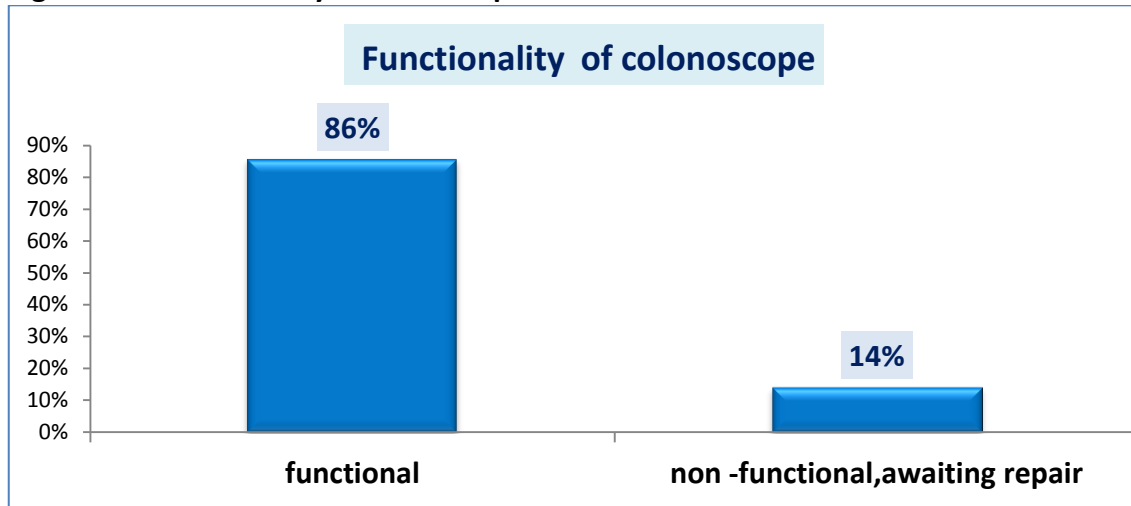
**Figure 43: Availability of medical devices for cancer care**



- Mammogram was functioning in all the hospitals (100%), while colposcopy was not available in the facilities.

- Colonoscopy was functioning in 86% of the hospitals, while it was not functioning in Ibn – Alnafis as the machine not working and waiting for repair, as shown in Figure 44.

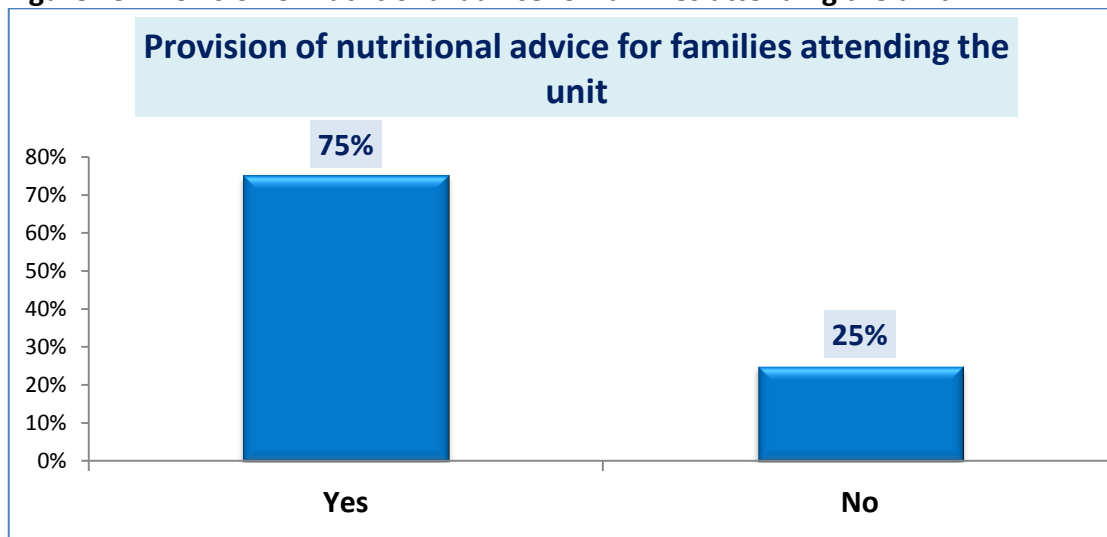
**Figure 44: Functionality of colon scope**



### 5.11. Nutritional support:

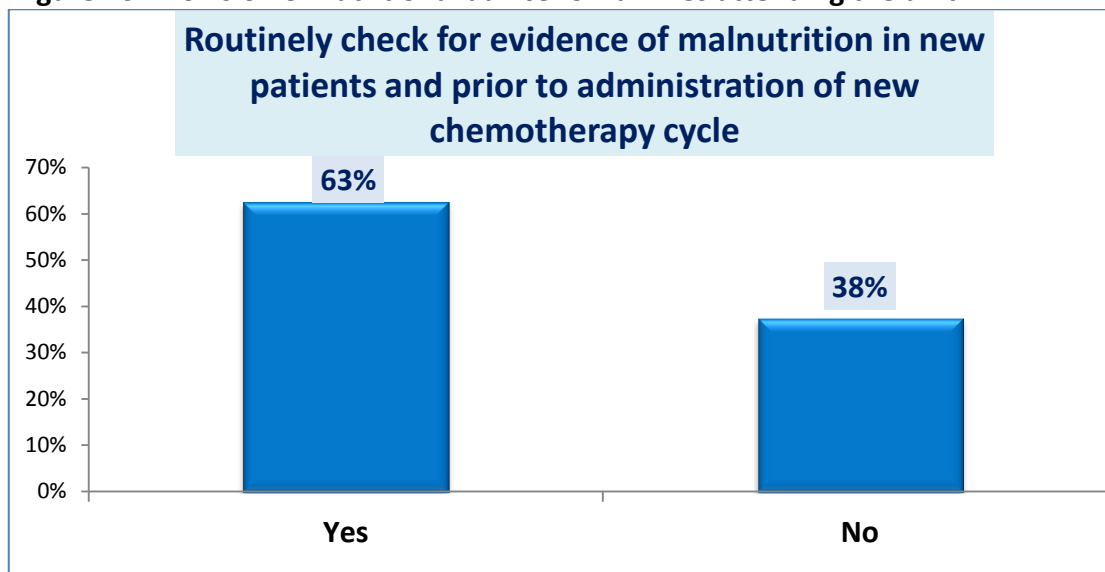
- Nutritional advice for families was provided in 75% of hospitals in Ibn – Alnafiss, children hospital, Zaid Alshariti, Hama, and Al- Mouwasat hospital, while only 25% did not have similar service, as shown in Figure 45.

**Figure 45: Provision of nutritional advice for families attending the unit**



- Routinely check for evidence of malnutrition was done for new patients and prior to administration of new chemotherapy cycle were done in 63% of hospitals, while only 38% did not provide the mentioned services, as show in Figure 46.

**Figure 46: Provision of nutritional advice for families attending the unit**

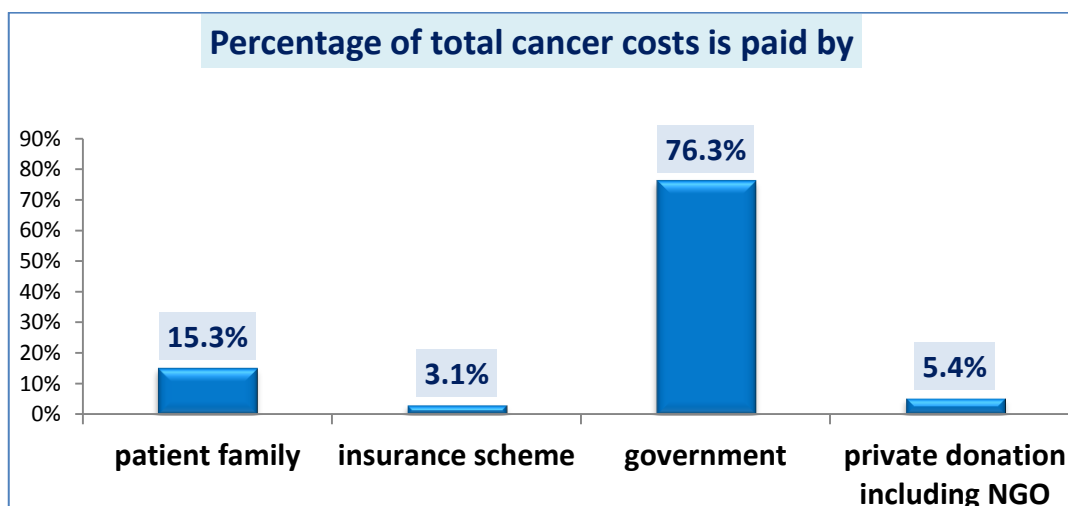


- All the hospitals have access to total parenteral nutrition.

#### 5.12. Financing of cancer care:

- Costs for covering cancer care were mainly paid by government (76.3% ), then the patient family (15.3%), while private donation including NGO and insurance scheme paid was about (5.4%, 3.1%) respectively, as shown in Figure 47.

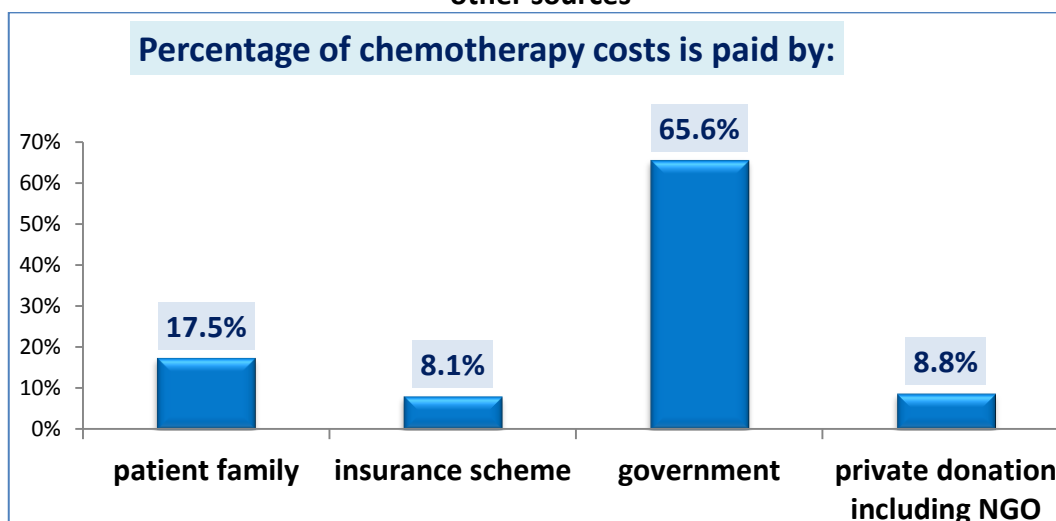
**Figure 47: Total cancer care costs paid by government and patient family and other sources**



- Regarding chemotherapy costs, the highest percentage was paid by the government (65.6 %) followed by the percentage paid by thy patient family (17.5%). And the less costs were paid by private donation including NGO and insurance scheme (8.8%, 8.1%) respectively, as shown in Figure 48.

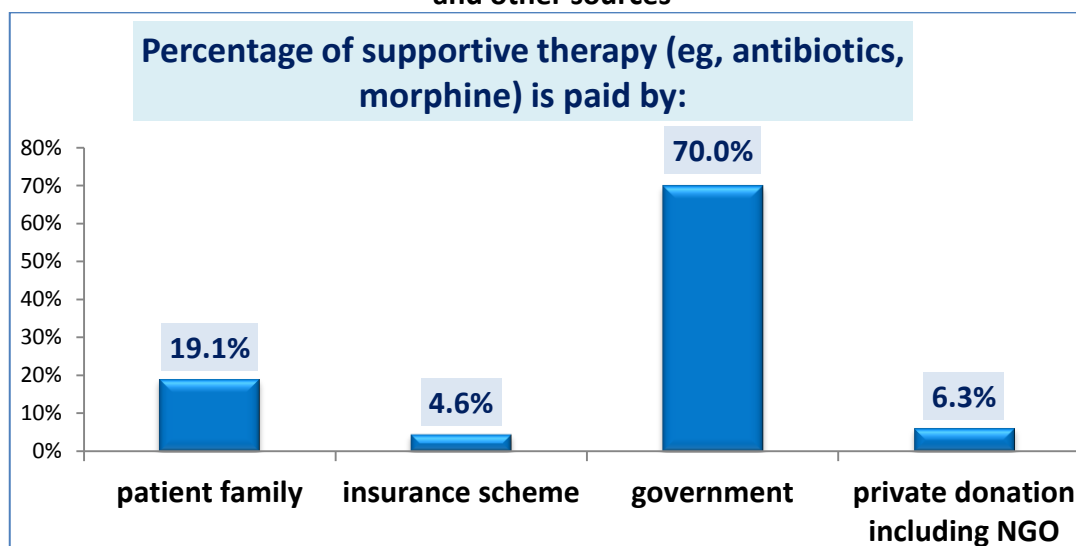


**Figure 48: Percentage of chemotherapy costs paid by government and patient family and other sources**



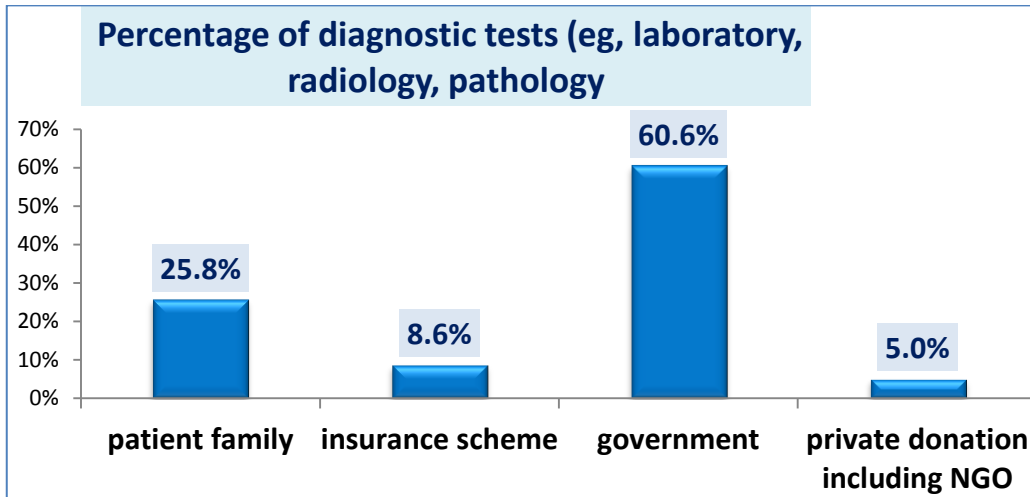
- Percentage of costs paid by government to cover supportive therapy was the highest percentage (70%), followed by the percentage paid by patient family (19.1%) the ones paid by private donation including NGO and insurance scheme (6.3%, 4.6%) respectively, as shown in Figure 49.

**Figure 49: Percentage of supportive therapy paid by government and patient family and other sources**



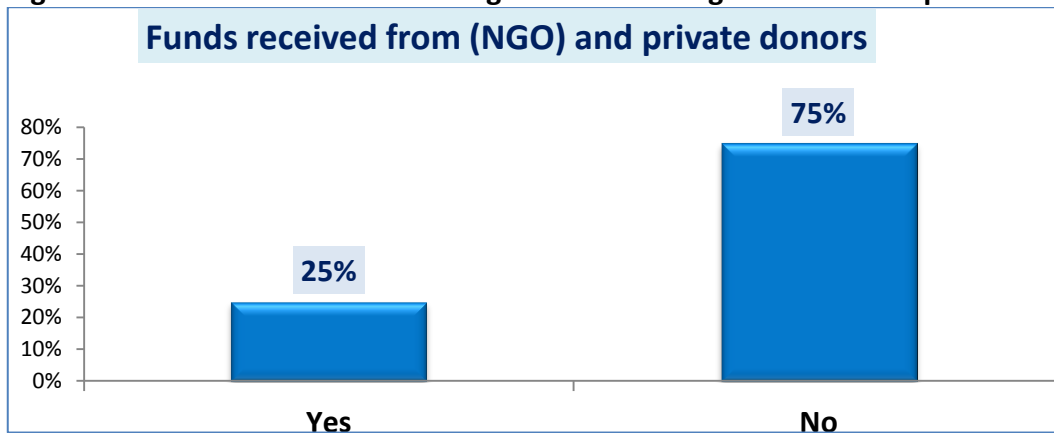
- Government covered the highest percent costs for diagnostics test (e.g. laboratory, radiology, pathology) (60.6%). Patient's family covered only 25.8% of the total costs, and the remainder by insurance schemes and private donation (8.6%, 5% respectively), as shown in Figure 50.

**Figure 50: Percentage of diagnostic tests paid by government and patient family and other sources**



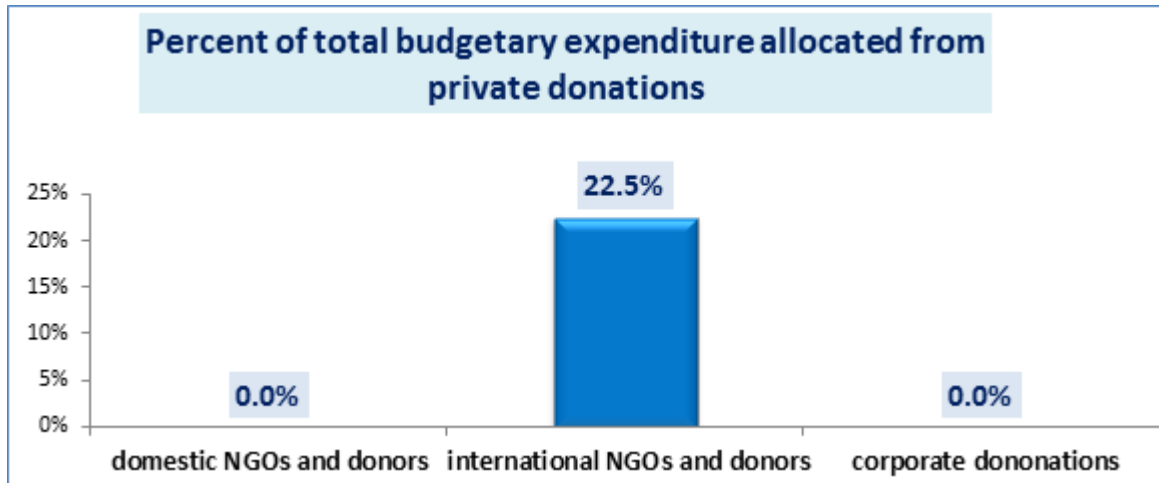
- Only two hospitals (25%) received donations from non-governmental organizations (NGOs) and private donors (Zaid Alshariti hospital Sweida and National Hama Hospital), as shown in Figure 51.

**Figure 51: Funds received from non-governmental organizations and private donors**



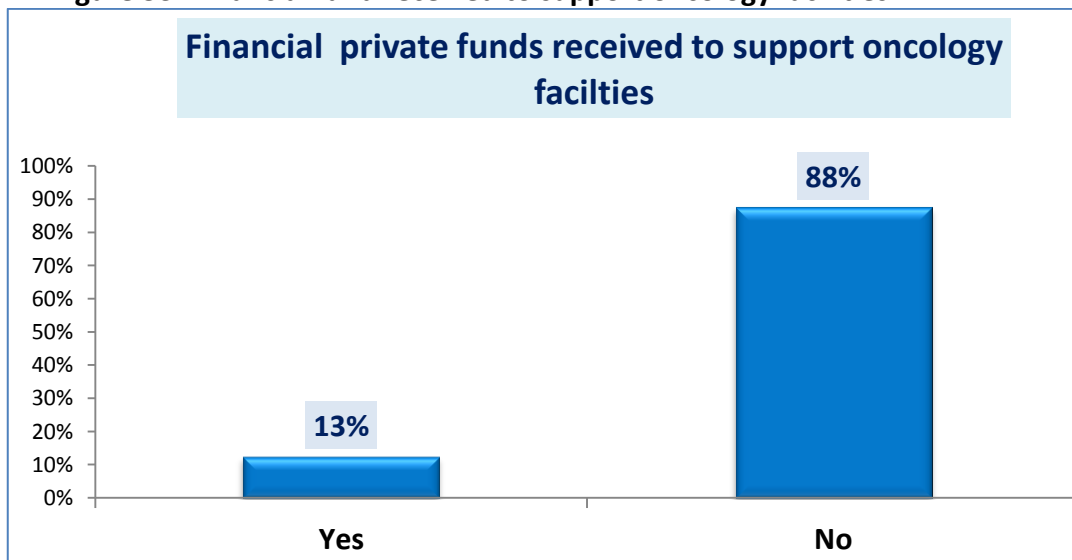
- The percent of total budgetary expenditure from private donation was (22.5%) mainly from international NGOs and donors, as shown in Figure 52.

**Figure 52: Percent of total budgetary expenditure from private donations.**



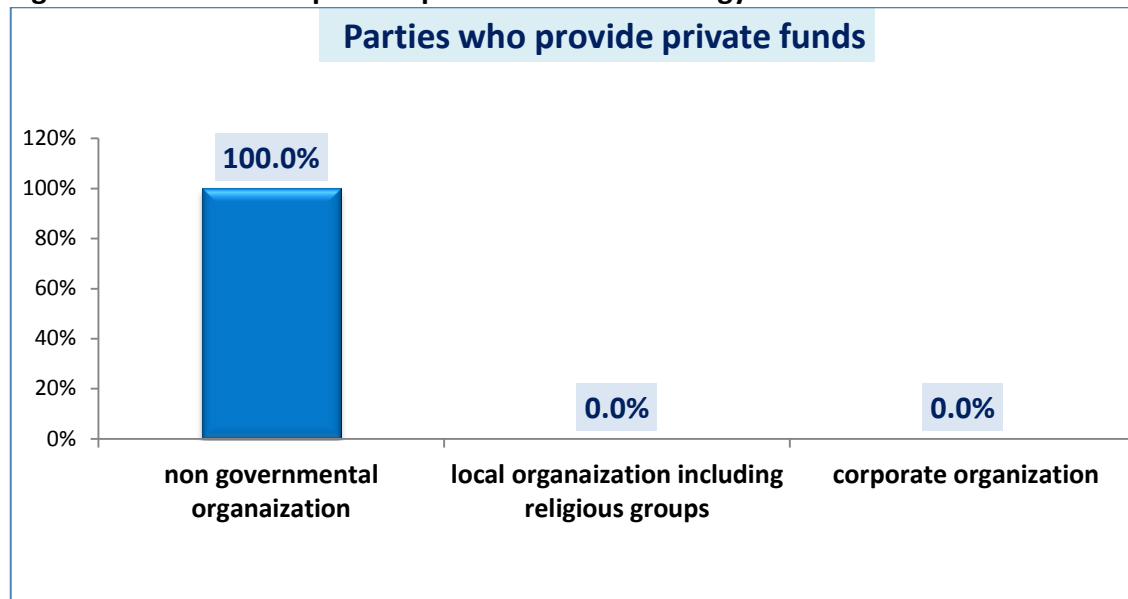
- Only children hospital (13%) received private financial support for oncology care, as shown in Figure 53.

**Figure 53: Financial fund received to support oncology facilities**



- The Children Hospital gets private funds mainly from NGOs, as shown in Figure 54.

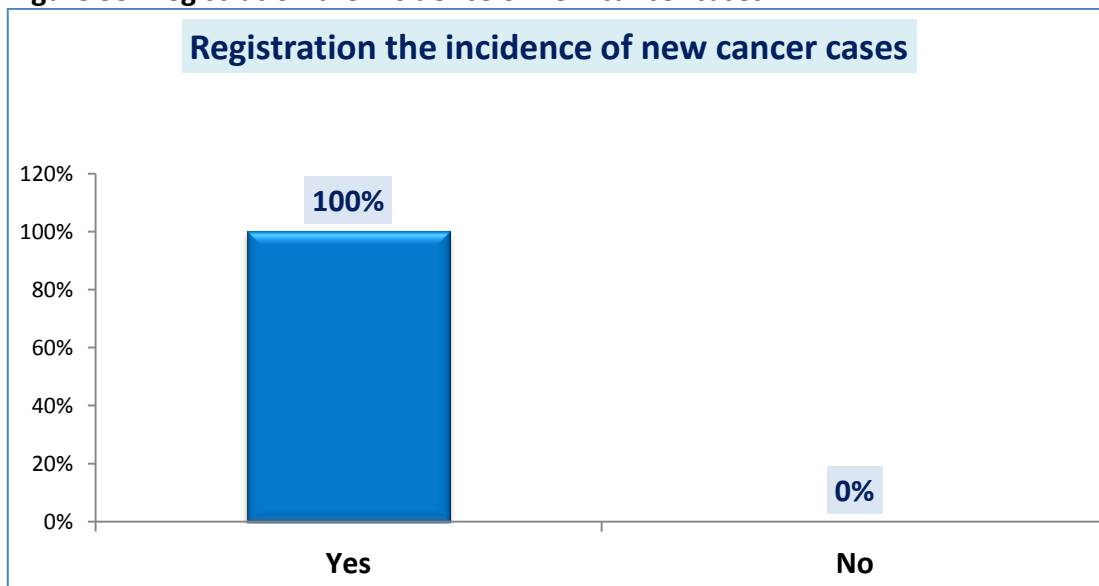
**Figure 54: Parties who provide private fund to oncology facilities**



5.13. Health information systems and cancer registries

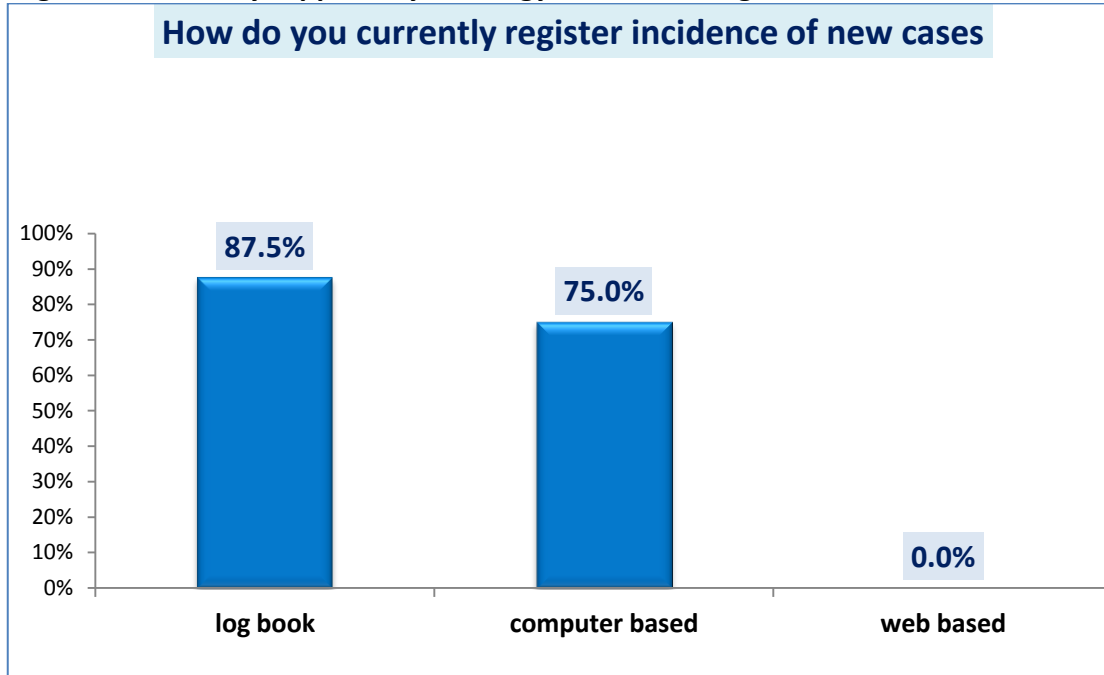
- All the oncology facilities registered incidence of new cancer cases, as shown in Figure 55.

**Figure 55: Registration the incidence of new cancer cases**



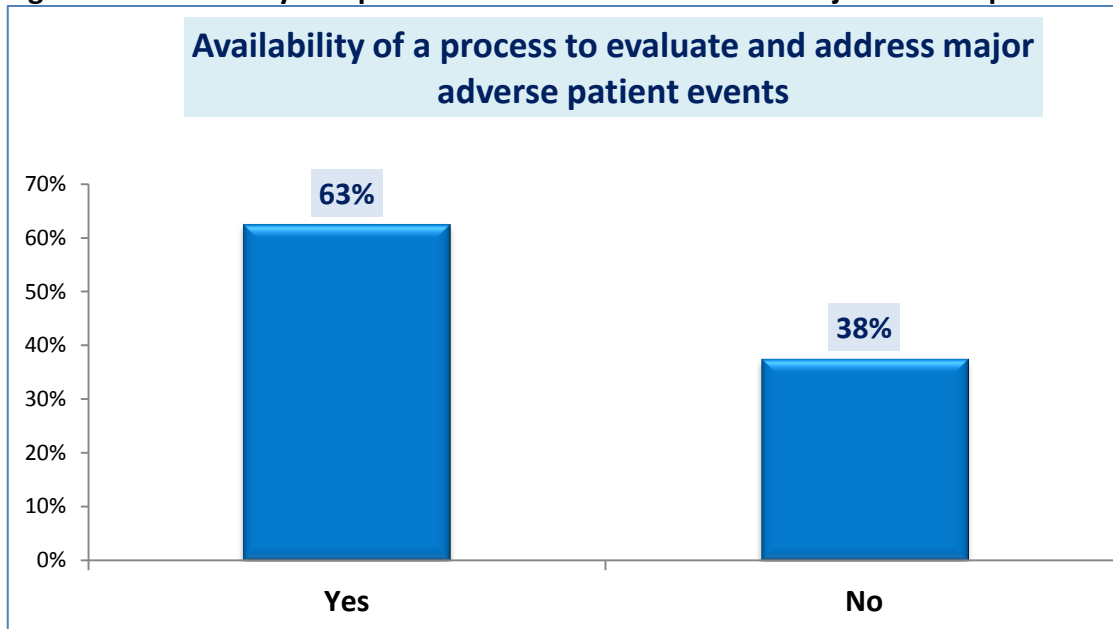
- 87.5% of hospitals used the log book to register incidence of new cases, while 75% of oncology facilities depended on the computer based system and none of the hospitals use the web based application for the registration, as shown in Figure 56.

**Figure 56: The ways applied by oncology facilities to register the new cancer cases.**



- Only three hospitals (38%) MOHE Children hospital, Zaid Alshariti hospital - Sweida, Hama Hospital did not have a process to evaluate and address major adverse patient events, as shown in Figure 57.

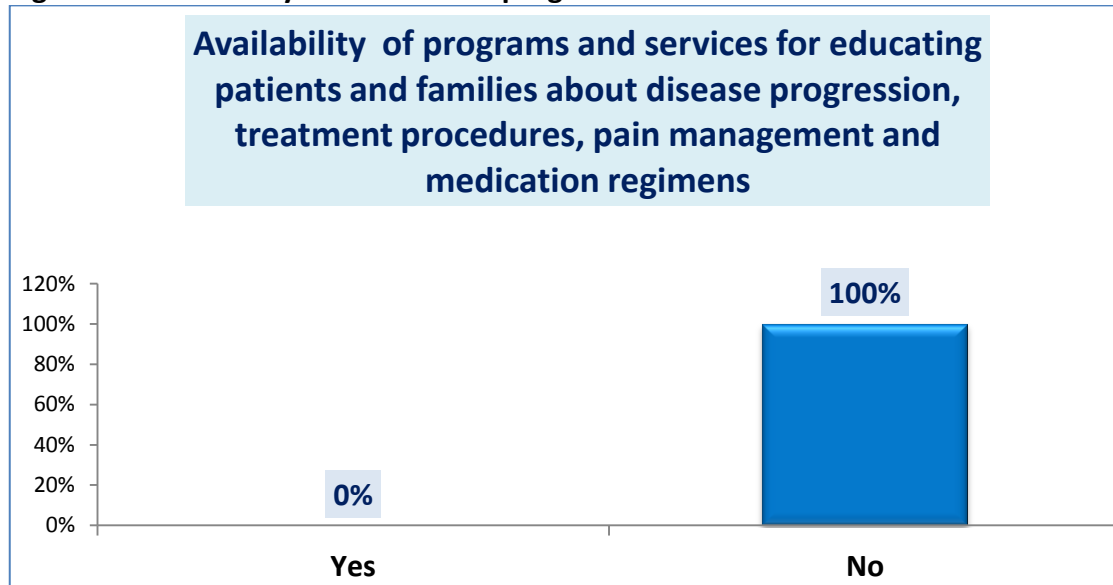
**Figure 57: Availability of a process to evaluate and address major adverse patient events**



### **5.13. Patients and family education:**

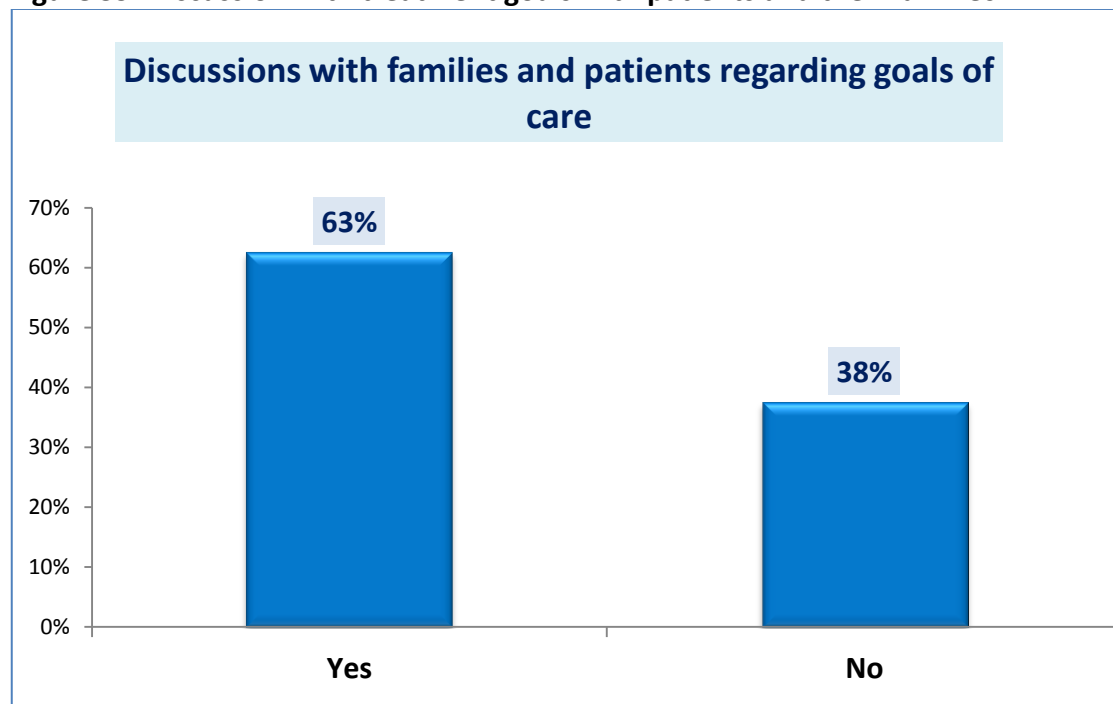
- None of the oncology facilities had educational programs for patient and families, as shown in Figure 58.

**Figure 58: Availability of educational programs**



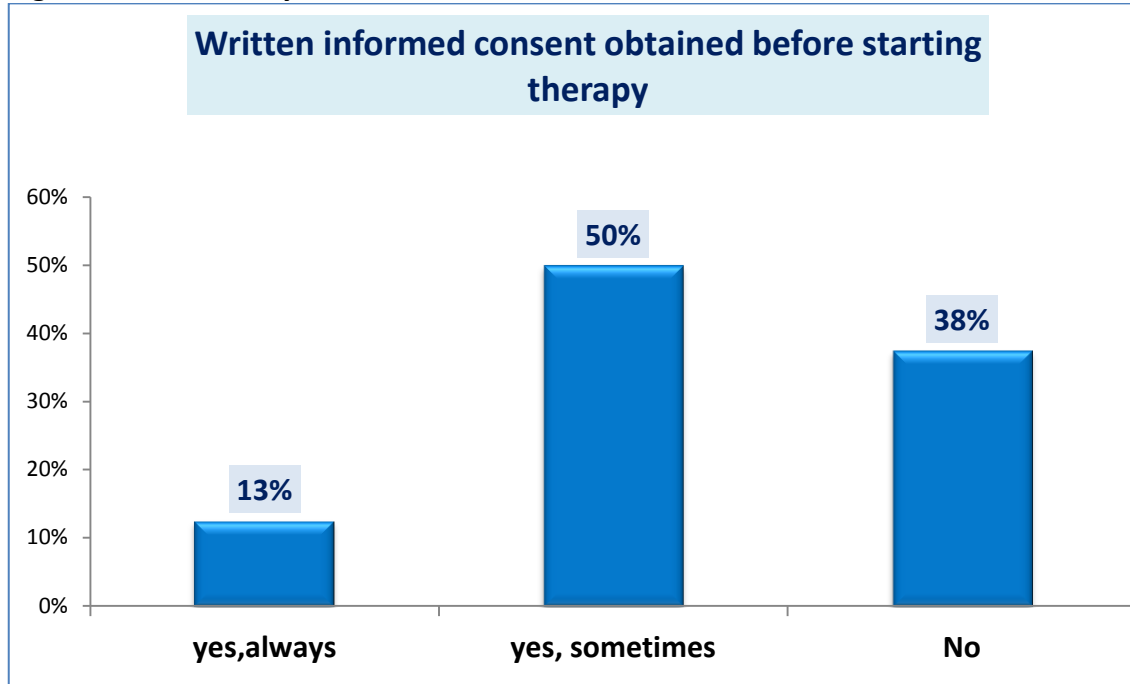
- Discussions with treatment goals of care were followed in 63% of the oncology facilities in Ibn - Alnafiss hospital, children hospitals, Zaid Alshariti, Hama Hospitals, and Al- Mouwasat university hospital, as shown in Figure 59.

**Figure 59: Discussion with treatment goals with patients and their families**



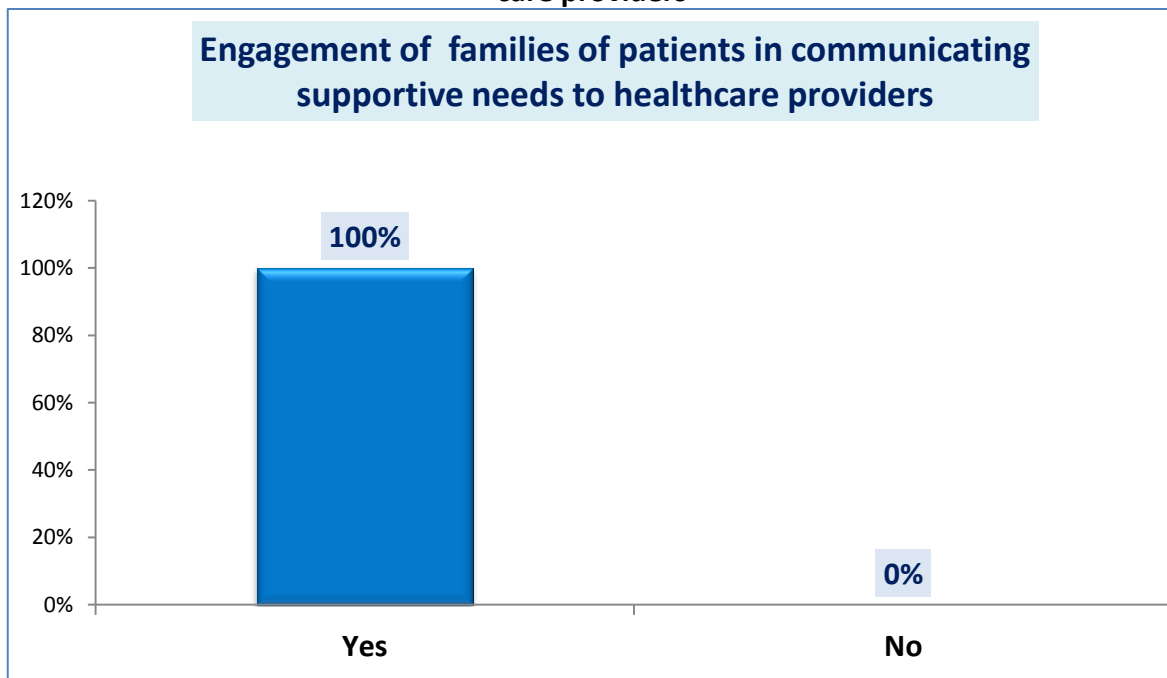
- 50 % of oncology facilities obtained written consent before starting therapy sometimes (Ibn - Alnafiss hospital, Zaid Alshariti hospital - Sweida, Hama, and Tishreen hospital university), while only one hospital (Zahi- Azrak hospital) got this consent all the times, as shown in Figure 60.

**Figure 60: Availability of informed consent**



- All families of patients in all the oncology facilities (100%) were actively involved in communicating supportive needs with health care providers, as shown in Figure 61.

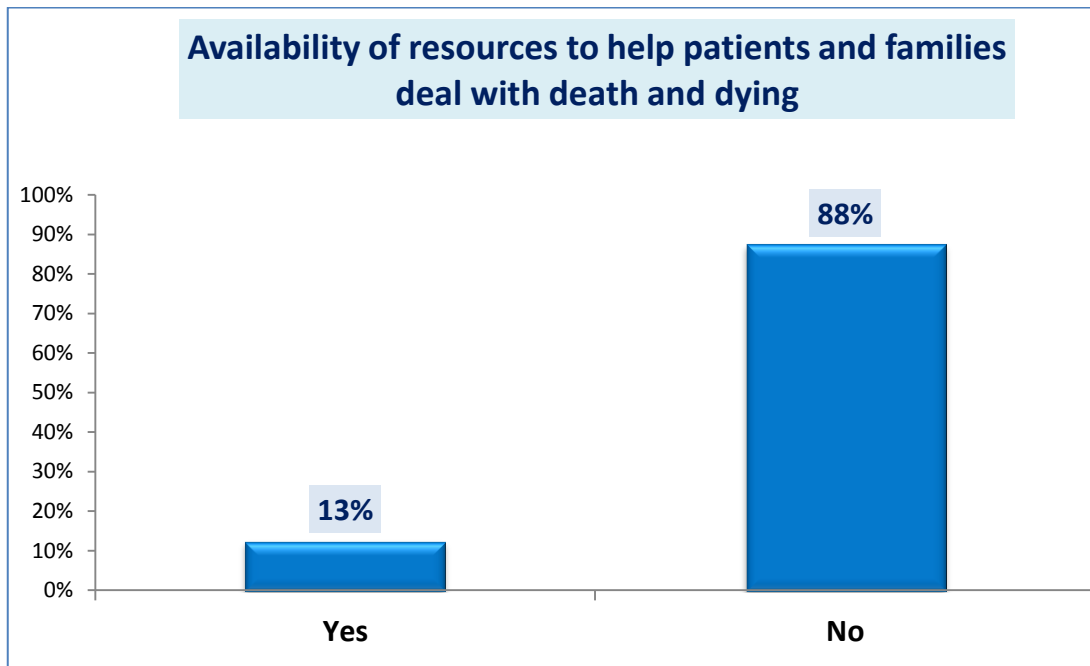
**Figure 61: Engagement of families of patients in communicating supportive needs to health care providers**



**5.14. Psychosocial support:**

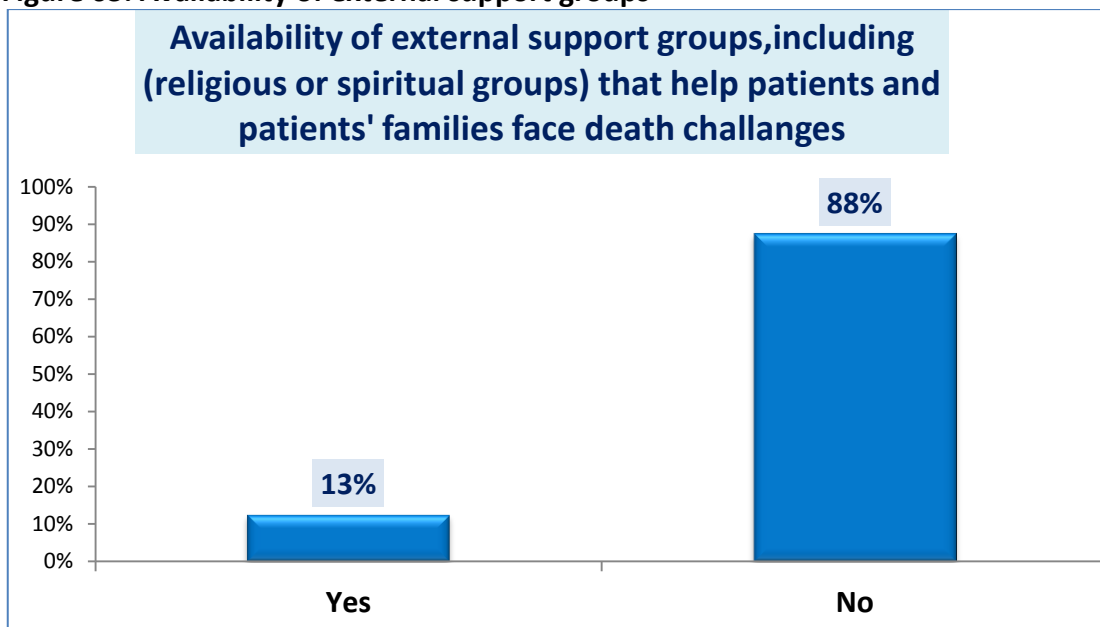
- Only one hospital (Ibn - Alnafiss hospital) had available resources to help patients and families deal with death and dying, as shown in Figure 62.

**Figure 62: Availability of resources to help patients and families to deal with death and dying**



- Only one hospital (Al- Mouwasat university hospital MOHE) had external support including religious and spiritual groups that help patients and patients' families to face death challenges, as shown in figure 63.

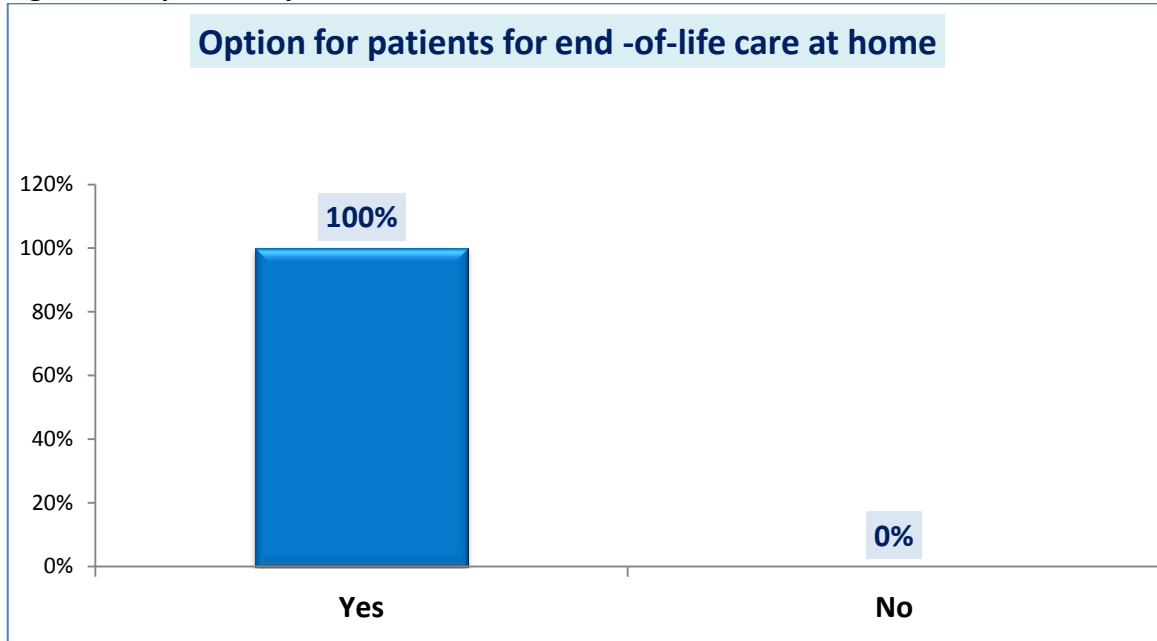
**Figure 63: Availability of external support groups**



- In all the oncology facilities, end-of-life care at home was an option for patients, as shown in Figure 64.

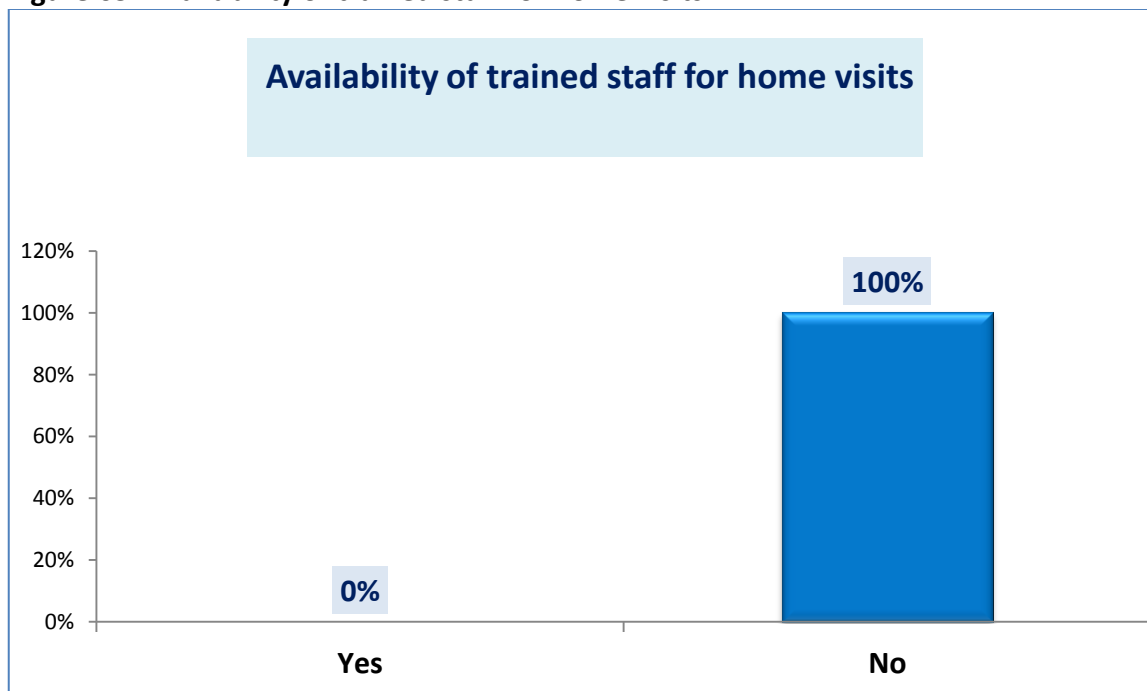


**Figure 64: option for patients for end -of-life care at home**



- Trained staff for home visits were not available in all the oncology facilities, as shown in figure 65.

**Figure 65: Availability of trained staff for home visits**



### **5.15. Understanding strengths, weaknesses, opportunities and threats:**

#### **- The main 5 root challenges facing oncology facility with regards to oncology treatment and care are:**

1. Establishment of national cancer registry is needed.
2. Limited number of specialized nurses, nutritionists, and doctors.
3. Palliative care is not available properly.
4. Shortage of anti-cancer medicines.
5. Educational training programs are needed for nurses, nutritionists, and other health workers .

#### **- The top five interventions that could improve the capacity for effective treatment are:**

1. WHO program for Data entry (Can Reg 5).
2. Insert IV access as port-a- cath.
3. Availability of chemotherapy hood.
4. Availability of equipment for early detection to enable cancer screening and diagnosis services that will result in improving the outcomes of treatment including mammograms, colonoscopy, and colposcopy .
5. Continuous training program for health workers and patients.

#### **- Support and actions needed by Other organizations:**

1. Fill the gap of anti-cancer medicines shortage.
2. Provision of radiotherapy treatment in Aleppo, Sweida, and Iben alnafis Hospital.
3. Strengthening the capacity of nurses in the area of oncology.
4. Support the oncology centers and chemical waste management.

#### **- Strategies to address procurement of opioid analgesics are:**

- Increasing the share of opioid analgesics allocated by MOH to oncology facilities.
- To make oral morphine medicines available to alleviate the suffering of patients.

### **I. Surveyor's Observations:**

Observation of work at oncology facility in departments, outpatients, admission office were noted to identify other findings not captured from the semi-structured interview and that will participate in addressing the gaps of health care delivery. Therefore, surveyors did not engage in a formal period of observations but rather made the most of opportunities between, during, and after interviews to informally observe people at work. This permitted the surveyors to observe discretely the following:

- Dynamic of staff and patients interactions.
- Overview of activities performed in outpatient, inpatient units, and others.
- Patient flow.
- Relationship among staff
- Environment of work.

The surveyors recorded their impression and important information as soon as they were comfortably outside the setting. These notes were then cross-referenced with the interviews to build up the picture of cancer care in the country.

The main observations recorded were as the following:

**- Patients and relatives awareness and behaviors:**

Surveyor from Albairouni hospital mentioned that patients are coming without any idea or knowledge of their medical status, procedures and directions to go and the process they should follow. As a result, patients start to ask many questions to their doctors who will answer some of their queries and not fully respond as they are overloaded and have to see other patients. Other surveyors noticed that patient's family will repeat the same questions several time. "*As if patients are lost*", as the surveyors mentioned. In addition, due to the crisis, patients especially those who see their doctors in clinics are not organized and each patient will be accompanied by 4 or 5 family members. Moreover, they might shout at health workers for any unpleasant reasons such as delay in seeing the doctor or behavior from health worker that unsatisfied the patients or his family "*I am in a public facility and should be served*" as the surveyor from Albairouni mentioned. As a result, the provision of health care services is disrupted.

The surveyor from Iben Alnafis mentioned that there was a harmony and team spirit in among health staff that was reflected in a positive way on patients.

**- Cleanness and Hygiene:**

Surveyor from Albairouni hospital mentioned that about 30 % of patients and their families are not taking care of personal hygiene and cleaning practices and as the patient's room is crowded with family's members, especially for patients coming from far governorates such as Raqa and Hasaka, and due to the availability of limited number of HR responsible for cleaning, all of these reasons participated in increasing infection rates at hospitals.

**- Patients are arriving earlier for their appointment:**

Surveyors mentioned that patients were arriving earlier of the time scheduled for them to see their doctors and the reason behind this is patients' fears and concerns of the road security and accessibility to the oncology center.

**- Patient's compliance:**

Patients who are taking oral medication for long term and live far away from the oncology facility have obstacles to routine access of medicines. Therefore, they will not follow doctors' orders and will take the medicine every other day for example instead of daily use as it was written in their prescription.

**- Wrong practices followed by patients and their families:**

Patients and their families were using types of medications/ alternative medicines proposed by their neighbors and friends and not recommended by their doctors. Patients will hide this issue and will not inform their doctors unless they suffer from their diseases or get abnormal blood tests that delay their recovery.

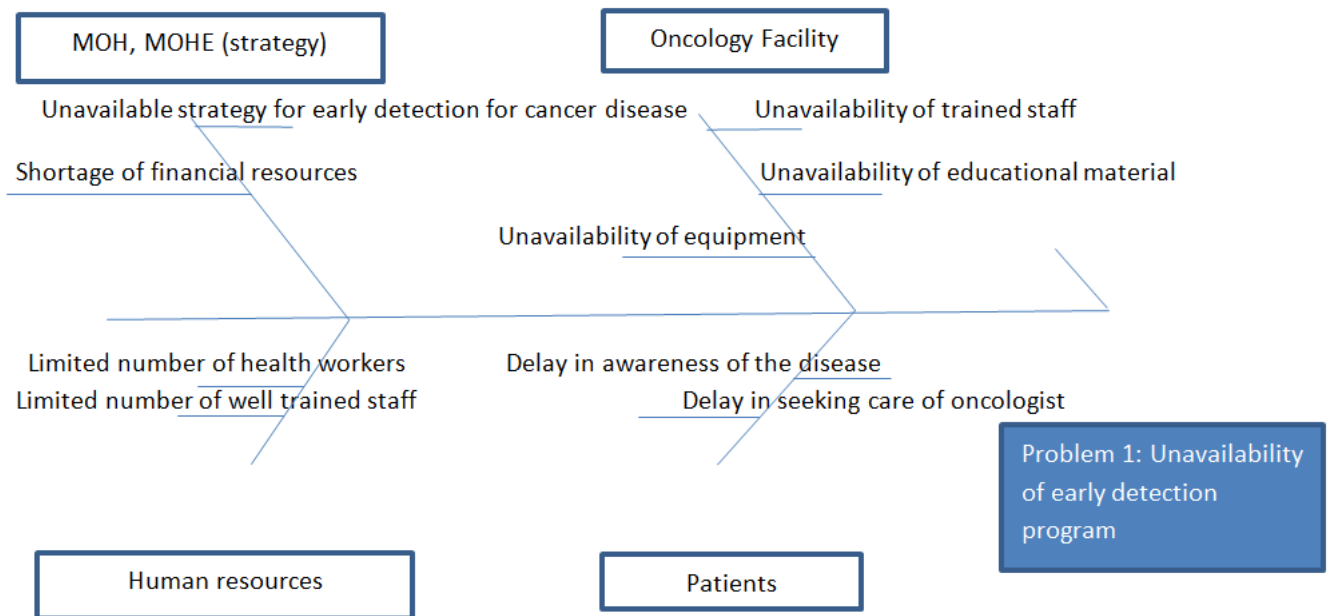
## II. Cause-effect Diagrams:

The committee and the surveyors identified the following main problems in cancer care:

- 1- Ineffective early detection program.
- 2- Breast and colorectal cancers are diagnosed and treated at late stage.
- 3- Obstacles to regular availability of basic laboratory services.
- 4- Unavailability of palliative care.

A cause effect diagram is drawn to show the main causes of the gaps/ problems faced oncology cancer care in the country. For each problem, the main causes were categorized to align with the activities of four major actors: (i) Ministry of Health (MoH) and Ministry of Higher Education (MOHE) (ii) Oncology facility (iii) Human resources (IV) Patients. Finally, the sub causes were listed under each group.

### Problem 1: Ineffective early detection program.



### MOH, MOHE:

Both ministries for Health and Higher Education faced the following issues that affected the cancer care in the country:

Unavailable strategy for early detection: Both MOH and MOHE do not have effective strategy for early detection program for cancer diseases. Before crisis, small steps were made regarding breast cancer and cervix cancer early diagnosis; however, this progress was lost during the crisis.

Shortage of financial resources: Due to the crisis and its impact of economic situation which made it difficult for the country and especially the Ministry of Health to allocate more resources for preventive care and similar strategies such as early detection for cancer diseases

**Oncology Facility:**

Unavailability of trained staff: The oncology facilities do not have well trained staff to perform early detection procedures for cancer diseases. And management of the facilities does not also have policies and procedures in this regard.

Unavailability of equipment: The oncology facilities do not have equipment or means to enable health workers to perform early detection for different types of cancer diseases.

Unavailability of educational materials: Also, educational materials to educate patients and their families are not available at the facilities.

**Human Resources:**

Limited number of health workers: Number of health workers is limited and facilities are overburdened with patients. Hence, health workers do not have time for providing extra supportive services to educate patients about early detection for cancer diseases.

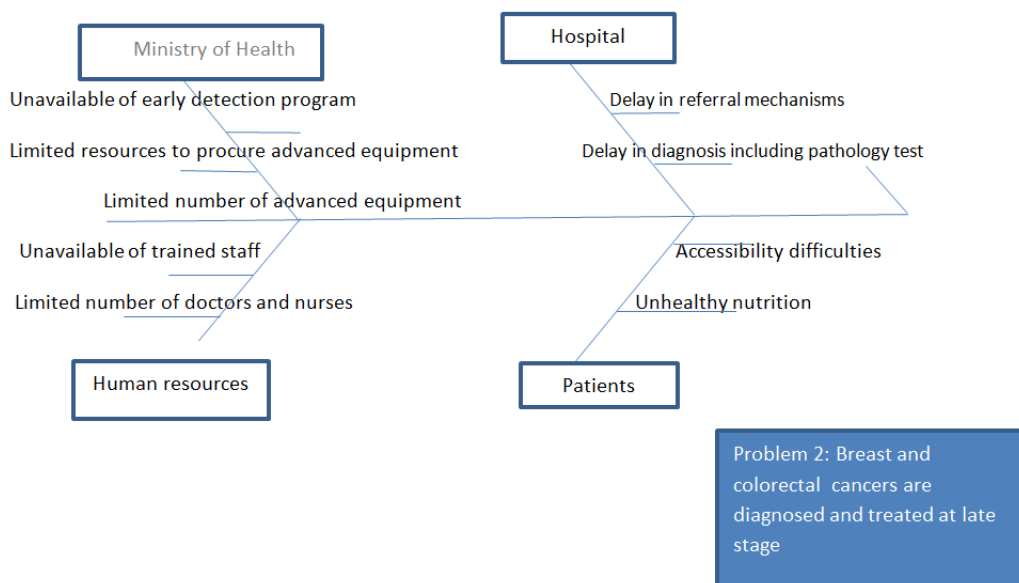
Unavailability of well trained staff: Staff at oncology facilities does not have previous training in the area of early detection for cancer diseases and they do have the means or skills to provide such type of training.

**Patients:**

Delay in awareness of the disease: Patients are with limited educational level of and are unaware of the cancer’s signs and they will not check the abnormal signs they have on early stages .

Delay in seeking the advice of oncologist: Patients do not seek the advice of oncologist regarding any abnormal changes they are facing due to different reasons including accessibility issues, unawareness of the cancer's signs or the procedures that should follow and even sometimes they are afraid of the disease itself and the procedures they should follow.

**Problem 2: Breast and colorectal cancers are diagnosed and treated at late stage**



## MOH, MOHE:

Both ministries for Health and Higher Education faced the following issues that affected the cancer care in the country:

Unavailable strategy for early detection: because effective strategy for early detection does not exist at oncology facility, patients did not have regular checkup on earlier stages of the cancer diseases.

Limited resources to procure advanced equipment: Limited resources did not allow MOH to procure advanced equipment

## Oncology Facility:

Delay in diagnosis including pathology test and referral mechanisms to ensure the patient reaches the oncology center.

## Human Resources:

Limited number of doctors and nurses: Number of health workers is limited and facilities are overburdened with patients. Therefore, health workers do not have time and efforts to educate patients or to provide extra supportive diagnostic and preventive services.

Unavailability of well trained staff: Staff at oncology facilities does not have previous training in the area of early detection for cancer diseases and they do not have the means or skills to provide such type of training.

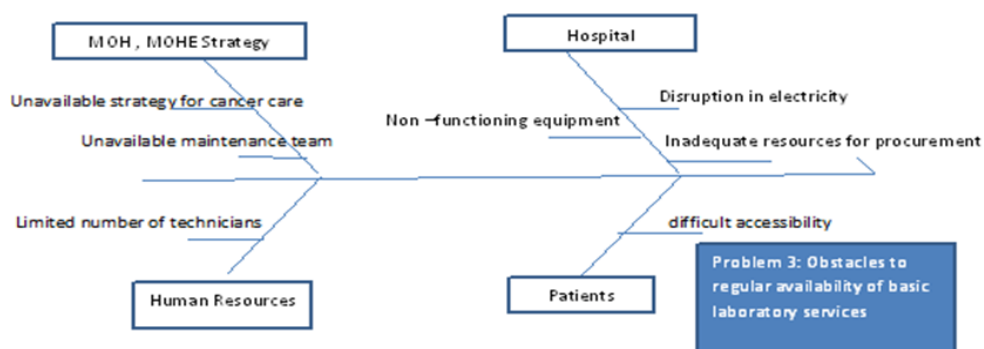
## Patients:

Unawareness of checkup and follow up: Patients and their families are not aware or educated to perform regular checkup when they recognize a strange mass or any unexplained health issue requires a doctor's advice.

Accessibility difficulties: Sometimes the oncology facility and the road security might not allow the patients to have regular timely visits to the oncology facility.

Unhealthy nutrition: Due to the crisis and difficult economic situation, patients did not afford to get healthy food such as vegetables and fruit.

### Problem 3: Obstacles to regular availability of basic laboratory services



## **MOH, MOHE:**

Both ministries for Health and Higher Education faced the following issues that affected the cancer care in the country:

Ineffective strategy for cancer care: Both MOH and MOHE do not have effective strategy for cancer care and therefore the related diagnostic services such as laboratory services are not working properly in all the facilities.

Ineffective maintenance team: Due to the crisis and sanctions over the country and limited resources, the maintenance team might not be able to provide the needed services in all the health facilities

## **Oncology Facility:**

Disruption of electricity: Persistent electricity power cut led to interruption of the machines' functionality. Therefore, the laboratory will not be able to perform the needed lab test.

Non-functioning equipment: Due to the crisis and sanctions over the country, health facilities are facing the problem of maintenance services and availability of spare parts. Machines might be not functioning due to missing spare part.

Inadequate resources for procurement: As the resources are limited, oncology facilities might not be able to procure the laboratory solutions

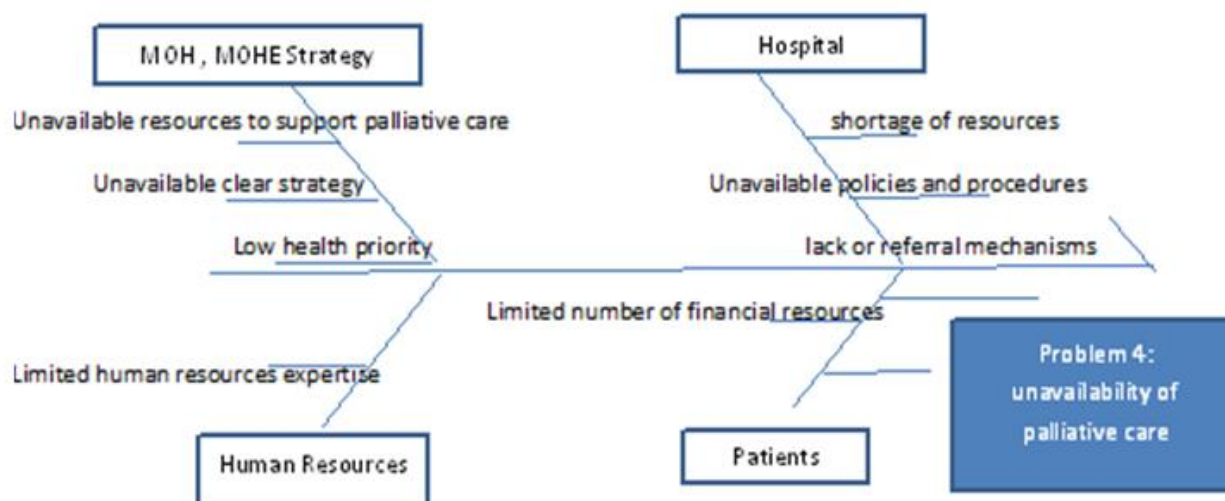
## **Human Resources:**

Limited number of technicians: Due to the crisis and the movement of human resources, oncology facilities are facing the problem of limited number of technicians needed to perform tests.

## **Patients:**

Accessibility difficulties: Sometimes the oncology facility and the road security might not allow the patients to have regular timely visits to the oncology facility.

## Problem 4: Unavailability of palliative care



### MOH, MOHE:

#### Unavailable resources to support palliative care:

Both Ministry of Health (MOH) and Ministry of Higher Education (MOHE) do not have enough resources for palliative care including prevention, means for early identification, assessment and treatment of pain and other problems, physical, psychosocial and spiritual. The emphasis is to support the critical health services needed in trauma and emergency care in order to meet the uprising health needs of population in crisis.

#### Unavailable clear strategy for palliative care:

Clear strategy of palliative care does not exist. Both Ministry of Health (MOH) and Ministry of Higher Education (MOHE) do not have a clear strategy for palliative care. Moreover, management at oncology facilities

#### Palliative care is not among health priorities:

Palliative care is not among the priority health needs for MOH and MOHE. This is due to scarcity of resources and limited number of health staff or health care providers specialized in palliative care. As mentioned earlier, the demand during crisis is on trauma and emergency services more than palliative care

### Oncology Facility:

#### Shortage of resources:

Oncology facilities are public hospitals, in general, and do not have enough resources to invest on palliative care. Unavailability of policies and procedures:



Policies and procedures for palliative care are not available on the facility's level as the facility's management has more health priorities needed mainly for trauma and emergency care.

Lack of referral mechanisms:

Due the disruption of the health system, referral mechanisms from primary care level to the oncology facility do not exist and patients usually go directly to the hospital as they believe that the availability of services that meet their health needs are better there.

**Human Resources:**

Limited human resources expertise:

Number of health workers especially the specialized ones are limited as the majority left the country during the crisis or moved to another secured area inside the country. Moreover, well trained staff on palliative care is limited due to scarcity of resources and the increasing demand for critical services needed in trauma and emergency care.

**Patients:**

Limited number of financial resources:

Limited number of financial resources especially during crisis does not allow patients to seek a doctor's advice regularly. Moreover, sometimes can go the public hospital, where services are free of charge, but they might not afford to get the medicines from the private pharmacy , in case the medicines was not available in the hospital.

## **6. Discussion:**

### **a. Disease overview:**

According to WHO, 40% of cancers could be avoided (prevention), 40% could be cured (if detected early) and the rest should be managed with palliation.<sup>(14)</sup> Cancer can be prevented just by thoughtful tobacco control policy and reduced alcohol use on one hand, and on second hand, encouraging healthy diet, physical activities, and viral hepatitis B prevention through the immunization.<sup>(6,7)</sup>

- Average number of patients who started treatment for cancer per month was 226 patients and the maximum number of patients seen was 500 in Albaironi hospital which is the main referral oncology hospital in the country equipped with radio and chemotherapy services, and has available oncologists and nurses to provide the cancer care. About 28% of cancer patients are treated in the mentioned hospital (500 out of 1810).

- Average number of children cancer patients was 31 patients and the maximum number of patients seen was 150 patients. Similarly to the earlier mentioned case, the maximum number of cancer children is recorded at children hospital which is the main referral oncology hospital for children in Damascus which provides and treats cancer care for about 90% of children cancer patients.

- The most common cancers seen and treated were breast, colorectal and lung cancer, then leukemia (adult and children) and lymphoma (adult and children), and least common were bladder, stomach and prostate among the surveyed cancer types. According to Registry of national Cancer program – MOH-2009, breast, colorectal and leukemia were the main three cancers seen among females, while lung cancer, colorectal, and leukemia were the main three cancers among men. <sup>(8)</sup>

The committee stated that leukemia among children is the most common cancer seen. This is also match with statistics from the Registry of national cancer program – MOH-2009 which showed that Leukemia ranked number 1 among boys and girls of age (0-15 years).

However, in the study it was ranked in the middle. This was due to the limitation of the assessment as it targeted all cancer patients in the study's locations and did not capture the distribution of cancer cases according to specific age group or sex (male or female).

- The study's findings showed that breast and colon cancer were diagnosed at late stages and the reasons provided by the group were:

- 1- Unawareness of the symptoms of cancer disease.
- 2- Educational level of people.
- 3- Patient's fear of the disease and the procedure itself.
- 4- Accessibility of oncology facilities and road security.
- 5- Ineffective early detection program at health facilities.
- 6- Due to the crisis, security and being safe is more important than health itself.

- Estimated total number of deaths per year from cancer treatment during treatment was 103 as an average. This was also crosscutting and match with the mortality committee records at Al Baironi Hospital.

#### **b. General facility overview:**

All the oncology facilities were secondary hospitals except for the Albiaroni hospital which was as specialized hospital.

#### **c. Early diagnosis:**

Early detection of cancer greatly increases the chances for effective treatment. There are two main components of early detection of cancer: education to promote early diagnosis and screening.

Recognizing possible warning signs of cancer and taking prompt action leads to early diagnosis. Increased awareness of possible warning signs of cancer, among physicians, nurses and other health care providers as well as among the general public, can have a great impact on the disease. Some early signs of cancer include lumps, sores that fail to heal, abnormal bleeding, persistent indigestion, and chronic hoarseness. Early diagnosis is particularly relevant for cancers of the breast, cervix, mouth, larynx, colon and rectum, and skin.

Screening refers to the use of basic tests across a healthy population in order to identify individuals who have disease, but do not yet have symptoms. Examples include breast cancer screening using mammography and cervical cancer screening using cytology screening methods, including Pap smears.

Screening programs should be undertaken only when their effectiveness has been demonstrated, when resources (personnel, equipment, etc.) are sufficient to cover nearly all of the target group, when facilities exist for confirming diagnoses and for treatment and follow-up of those with abnormal results, and when prevalence of the disease is high enough to justify the effort and costs of screening. Early detection is only successful when linked to effective treatment.

Based on the existing evidence, mass population screening can be advocated only for breast and cervical cancer, using mammography screening and cytology screening, in countries where resources are available for wide coverage of the population. Several ongoing studies are currently evaluating low cost approaches to screening that can be implemented and sustained in low-resource settings. For example visual inspection with acetic acid may prove to be an effective screening method for cervical cancer in the near future. More studies that evaluate low cost alternative methods to mammography screening, such as clinical breast examination, are needed. <sup>(9)</sup>

i. Diagnostic:

- Routine blood count and differential, blood chemistry, and coagulation factors were available in all the study's locations while peripheral blood film and microbiology were available in 88% of the mentioned hospitals. And cytology was available in 50 % of the hospitals. And drug level monitoring was not available in all the study's hospitals.
- Obstacles to regular availability of basic laboratory services such as inadequate resources for procurement and disruption in electricity were mentioned in 75% of the hospitals. While non-functioning equipment was the obstacle in 63% of the hospital (Ibn - alnafiss hospital, Zaid Alshariti, and Hama hospital) which all are ministry of health hospitals. And unreliable supply chain was only the obstacle in 25% of the hospitals (MOHE Children hospital and Tishreen university hospital).
- As Albiaroni hospital is the main referral hospital, the machines were fully functioning and there was no problem in electricity power cut. Regarding non functionality of equipment, Children hospital in Damascus and Tishreen hospital in Lattakia encountered such type of problems.
- Iben alnafis in Damascus and Zaid Alshariti hospital in Sweida do not have pathology services.
- Cytogenetic and flow cytometry services are not available in all the hospitals where the study was conducted. However, anatomic pathology and hematopathology were available only in MOHE hospitals ( Alabaironi – Children - Almosat , and Tishreen hospital). And these hospitals are facing obstacles to regular availability of pathology services and the main obstacles are the limited resources for procurement, unreliable supply chain, non-functioning equipment, insufficient support for processing then the excessive volume resulting in delays.
- Mammogram was functioning in all the locations where it exists.

The adverse impact of the Syrian crisis on the most vulnerable people continues to be compounded by the disrupted health system. The health care system is challenged both by the destruction of buildings, the lack of medical device maintenance and spare parts, and the loss of human resources that will lead to interruption of health care delivery. <sup>(10)</sup>

- Colonoscope was available in all hospitals. However, it was not functioning and waiting for repair in Iben Alnafis hospital.
- Patients and support groups do not exist in all the facilities. Awareness campaign to improve understanding of cancer symptoms and treatment options and educational programs for a patient and the family about disease do not exist in all the facility, and it is the doctor's individual effort to advise the patient and his/ her family about the disease itself, symptoms and management of the disease that will alleviate the suffering of the disease.

#### ii. Staging:

- All the hospitals have x-ray and ultrasound while CT scan was available in all the hospitals except for the children hospital.
- MRI was not available in Iben alnafis, Zahi- Azrak hospital, and Tishreen hospital.
- Nuclear medicines were only available in Al-baironi hospital.
- Advanced nuclear imaging was not available in all the study's locations. WHO estimates that 40% of cancers could be prevented and 40% could be healed if detected early. At present, resources for cancer control in the Region as a whole are not only inadequate but directed almost exclusively to treatment. Prevention therefore gives the greatest public health potential and the most cost-effective long-term approach for cancer control.<sup>(11)</sup>

#### d. Treatment:

##### i. Access and adherence:

- All respondents mentioned that treatment costs and stigma associated with treatment are sometimes the main factors for failure to receive treatment. While factors related to accessibility to the hospital, fragmented referral mechanisms to higher levels of care, and patient and family unawareness of cancer symptoms were mentioned as significant factors to received treatment by 88% of the respondents. Then reasons related to inability to access timely pathology and staging which were mentioned by 75% of respondents. Finally, reasons related to the fact that treatment viewed as insufficient family priority were mentioned by 63% of the respondents.

Accessibility to health facility and was among the main findings of the assessment final assessment study of secondary hospital conducted between 2015- Feb 2016 as it showed that relevant health care is not accessible by the affected population and technical equipment for diagnostic procedures (e.g. X-ray, ultrasound, and endoscopy) is generally insufficient in terms of availability and functionality due to lack of maintenance and non-availability of spare parts.

- The current waiting time for radiotherapy was 30 days while it was 15 days before surgery and 8 days for the systemic therapy/chemotherapy.
- Study showed that 81% of patients completed their systemic/chemotherapy, while 76% of patients completed the surgery and 68% of patients completed the radiotherapy.
- 55% of patients completed the systemic therapy/chemotherapy without interruption and 46% completed their radiotherapy without interruption.
- About 93 patients out of 1603 patients abandoned treatment (6% of patients). This was due mainly to financial, logistic, then disruption in services availability, while abandonment

treatment due to health related (due to toxicities) ranked at the bottom among cases for abandonment treatment.

- Patients in all the hospitals did not have access to total parenteral nutrition.

ii. Quality:

-Estimated total number of deaths per year from cancer during treatment was 103 and the maximum was 210 in Al Bairouni university hospital.

Also, Tishreen hospital university and Zahi- Azrak hospital recorded high number of deaths (200, 100) respectively. The reason is due to the fact that the mentioned hospitals accepted all the referrals cases of cancer patients.

-For breast cancer, about 87 % of death cases was due to progressive or relapse in the disease. While 13 % of death cases were due to treatment related toxicities.

- Quality of service delivery can be assessed by assessing if any facility had >20% of deaths due to treatment-related toxicities. Study's findings showed that the highest percentage was (20%) captured in Tishreen Hospital in Lattakia. The committee interpreted the findings as the following:

Patients who started their medications should be under close observation so that doctors can follow up closely the health status of their patients and interfere when appropriate to reduce or stop the side effects of medicines that might be varied according to types of medicines used on different patients. However during the crisis, patients usually leave the facility directly after the completion of their treatment course and go home directly after administering the medication. Some patients are not able to reach the facility again in case of profound medicines toxicity. Furthermore, well trained staff and oncology facilities might not be available in the areas where patients live. Also, due to security on road or geographical barriers, patients might not be able to revisit the oncology center to see their doctors' advice or to follow up. Therefore, all the mentioned reasons might affect badly the health of patients and lead to their death.

- All patients in all hospitals had access to antiemetic medicines during chemotherapy treatment.

- Pharmacists and unit managers were the only additional core staff available to care for patients with cancer. While none of the hospitals have either nutritionists or psychosocial workers.

- Blood typing services were available in all the hospitals.

- Regarding blood bank, the whole blood test was available in all the hospitals, while packed RBC and Platelets were available in 75% of the hospitals (Ibn - Alnafiss hospital and Tishreen university hospital).

- 75% of hospitals provided nutritional advice for families attending the unit. The two hospitals which Al Bairouni university hospital and Zahi- Azrak hospital were overloaded with patients and doctors and nurses did not have time to provide any advice regarding nutrition advice. In all hospitals, nutritionists do not exist and it is the personal effort and interest of the doctor to provide the proper advice for the patients and the family.

- Routine check for evidence of malnutrition in new patients was done in 63% of hospitals. The hospitals where this procedure was not applied were Zaid Alshariti hospital - Sweida ministry of health, Hama hospital, and Zahi- Azrak hospital.
- All the hospitals had routine check for malnutrition prior to administration of new chemotherapy cycle.
- 63% of hospitals had a process to evaluate and address major adverse patient events, while Children hospital, Zaid Alshariti hospital - Sweida, and Hama hospital did not have such process.

### iii. Safety:

- Only one hospital, Zaid Alshariti hospital - Sweida ministry of health had consistent access to broad –spectrum antibiotics for serious/ complicated febrile neutropenia. “This is due to the cooperative positive role that the health directorate in Sweida plays by meeting health needs for oncology care in Sweida”, as the head of oncology unit stated.
- 88% of hospitals had alcohol based hand rub in non- isolation. Only Zahi- Azrak hospital in Aleppo did not have alcohol hand rub. And this was applied on ward in 86% of the hospitals, while only 14 % of the hospitals (Ibn alnafis ) had alcohol rub on every bedside.
- All the hospitals had safety boxed for sharp needles.
- 63% of hospitals had designated hazardous waste disposal for chemotherapy on the ward, while 38% (Al- mouwasat university hospital MOHE, Zahi- Azrak hospital, and Tishreen hospital university ) did not have such type of equipment.
- Only 38% of hospitals (Al Bairouni university hospital, Zaid Alshariti hospital - Sweida ministry of health, and Hama Hospital) had multiple personal protective equipment for staff preparing chemotherapy. And two hospitals (25%) (Ibn - alnafiss hospital and Tishreen hospital university) had single use personal protective equipment for staff preparing chemotherapy, while 38% of hospitals (MOHE Children hospital, Al- mouwasat university hospital MOHE, and Zahi- Azrak hospital) did not have these equipment
- Regarding personal protective equipment for staff administering chemotherapy, it was not available in 50% of hospitals. And 38% of hospitals (Al Bairouni university hospital, Zaid Alshariti hospital - Sweida, and Hama Hospital ) had personal protective equipment for multiple use. Only one hospital Ibn - Alnafiss (13%) had single use personal protective equipment.
- All the hospitals did not have laminar flow hood for chemotherapy preparation.
- Regarding patient identification prior administration of medicines, only 38% of hospitals (Ibn - alnafiss hospital, Al- mouwasat university hospital MOHE, and Zaid Alshariti hospital - Sweida ministry of health) confirmed that they have a clear process to check patient identification. These hospitals had limited number of patients which will allow more time for doctors and nurses to check patient ID. Moreover, doctors know their patients and this also another reason made it easier for health workers to administer the correct medicine.

### iv. Integrated, people-centered care:

- All the hospitals where the study was conducted did not have available and services available for educating patients and families about disease progression, treatment procedures, pain management and medication regimens.
- 63% of hospitals had discussions with families and patients regarding goals of care, while 38 % of hospitals (Al Bairouni university hospital, Zahi- Azrak hospital,) did not have such kind of discussions with families and patients. This is due to high volume of work at these hospitals that did not give doctors and nurses time to advice and guide patients and their families.

- 50% of hospitals obtained written informed consent before starting therapy sometimes, and 38% of hospitals (Al Bairouni university hospital, MOHE Children hospital, and Al- mouwasat university hospital MOHE) did not obtain such type of documents , and 13% of hospitals (Zahi- Azrak hospital) obtained consent all the times.
- All families of patients in all hospitals engaged in communicating supportive needs to healthcare providers.
- 88% of hospitals did not have resources to help patients and families deal with death and dying. And only 13% (Ibn – alnafiss) hospital had such type of resources.
- 88% of hospitals did not have external support groups. While only 13 % ( Ibn - Alnafiss hospital) had external support.

v. Radiotherapy:

- Radiotherapy was only available in two hospitals: in Al Bairouni and Tishreen hospital. And linear accelerator was fully available in these two hospitals (100%), while cobalt 60, brachytherapy and other types of radiotherapy were available only in Al Bairouni (50%) available.

- In the past 12 months, all the firms of radio therapy were available in the two mentioned hospital (Al Bairouni and Tishreen), while the other hospitals did not have such type of service.

- The two hospitals where the radio therapy exists faced obstacles to providing radiotherapy such as non-functioning equipment, disruption in electricity, and accessibility to the facility followed by other obstacles such as unreliable supply chain, insufficient technicians, excessive volume resulting in delays, inability to complete therapy due to disruption of infrastructure. The radiation oncologists were available in the mentioned two hospitals and there was no obstacle in this regards.

vi. Medicines:

- All the hospitals were not able to get consistent supply of the essential cytotoxic drugs. And the delay in treatment caused by non- availability of drugs occurred 1 to 2 times a month.

- All the hospital mentioned that the medicines from the essential medicines were available and non-expired. The availability of medicines were varied among the different types of medicines as shown in the below table:

Description	Availability %
Carboplatin	100%
Dacarbazine	75%
Etoposide	88%
Oxaliplatin	38%

<b>Tamoxifen</b>	<b>25%</b>
<b>Cisplatin</b>	<b>100%</b>
<b>Docetaxel</b>	<b>38%</b>
<b>Fluorouracil</b>	<b>88%</b>
<b>Vincristine</b>	<b>63%</b>
<b>Leuprorelin</b>	<b>25%</b>
<b>Cyclophosphamide</b>	<b>63%</b>
<b>Doxorubicin</b>	<b>88%</b>
<b>Filgrastim</b>	<b>63%</b>
<b>Anastrozole</b>	<b>13%</b>

- There is a fluctuation in the availability of tamoxifen and Anastrozole; and these two medicines are available most of the times, however oncology facilities might run out of them for few months till the mentioned medicine being available again.

The main reasons for that the essential medicines being unavailable were ranking as the following:

- 1- Lack of resources for procurement.
- 2- Unreliable supply chain.
- 3- Medicines are unaffordable for patients.
- 4- Limited number of prescribing physicians.

Medicines for cancer diseases are among the 10% of the medicines that are not locally produced and imported. And the country is taking the responsibility to make these medicines available and free of charge for all cancer patients. However due to the crisis and sanctions over the country, it was difficult to make such medicines fully available in all facilities. The country tried to find solutions by developing lists of medicines to be used as first and second lines according to medicines availability. In addition, with support from WHO, it was agreed with MOH on the medicines to be listed in the country's essential medicines list.

Another problem observed in the study is that oncology facility does not have a system to track / identify the list of medicines that a patient got from other facilities. This is because; oncology facilities are not linked in a net- work to share information. Also, the referral system does not work properly and a patient does not have a card with all the medicines prescribed to him/her so that another doctor from another facility can review the medicines to decide the quantity to



be prescribed. Hence, a patient might get his/ her share of medicines from multiple facilities to ensure that he/she collects enough quantities needed for the treatment course.

#### **e. Palliation:**

- Palliative care (in community –or home- bases) was available in (63%).
- The primary barriers to palliative care services were:
  - Inadequate financial resources available and limited human resources expertise (88%).
  - Low health priority (50%).
  - Lack of referral mechanisms (25%).
  - Immediate – release of oral morphine was consistently unavailable in all the hospitals.
  - All cancer patients were unable to take home prescription for oral morphine with a supply for > 1 week.
  - Lack of resources for procurement was the primary constraints for morphine availability in 63% of the oncology facilities. While unreliable supply chain was among primary constraints in 38% of the hospitals (Ibn-Alnafiss hospital, MOHE Children hospital, and Tishreen university hospital).
- The end-of- life care at home was an option for all patients. However, trained staff is not available for home visits in all the study's locations.

#### **f. Survivorship care:**

- All the hospitals use surveillance protocols after completion of therapy. For a number of reasons cancer patients in Syria often have poorer survival predictions than in European countries. This is partly because patients tend to have a more advanced stage of diseases by the time of disease onset. This may be either because they are not certain when to seek health care and do not recognize possible symptoms, or because doctors and nurses may have difficulties in recognizing symptoms in those at highest risk, or because of the time delays. While some cancer patients receive reasonable treatment, distribution of services is very irregular, number of cancer specialists in each discipline is limited, and oncology facility might not be accessible by patients; which will result in poor follow up and interruption of treatment and increasing of mortality care.

Studies showed that cancer care is poorly coordinated during and after treatment. The growing number of cancer survivors demands innovative strategies to improve the quality and coordination of post-cancer patient care. Nurses play an important role in the implementation and delivery of treatment summaries and survivorship care plans. Incorporation of cancer prevention and health promotion counseling is a natural activity for nurses as the health care system focuses on improving care for cancer survivors. The newer data show that surveillance carcinoembryonic antigen(CEA) test, chest and liver imaging, and colonoscopy can also improve survival through early diagnosis of recurrence; thus, these modalities are now included in the current guideline. Although the optimum strategy of surveillance for office visits, CEA, chest and liver imaging, and colonoscopy is not yet defined, routine surveillance does improve the detection of recurrence that can be resected with curative intent.<sup>(12, 13)</sup>

#### **g. Cross-cutting:**

i. Health information systems:

- Funding mechanisms provided by public hospitals/ government accounted for 75% of total funding and the remaining 25% are covered by mixed government and privately and funded facilities.
- All hospitals had a hospital-based cancer registry. However, there is a need to update and use a unified form according to WHO standards, as the committee stated.
- All the hospitals registered the incidence of new cancer cases. And this is done by log book (87.5%), Computer based (75%), and none of the hospitals had web based.

#### ii. Human resources:

- The average number of staff as per specialty were:
  - Medical oncologists: 5
  - Surgeons performing cancer operations: 9
  - Radiation oncologists: 2
  - Palliative & supportive care providers: 0
  - Medical physicist: 4
- Nurse to patients' ratio was 3 nurses for 16 patients.

The Syrian MoH has a benchmark of 2 nurses per physician, which is comparable with some countries in the WHO European Region, such as the Russian Federation, but which is lower than the OECD median of 2.8. Looking more specific into cultural comparable EMRO countries the ratio in Jordan is 1.0; Lebanon 1.1 and Palestine 1.2. In addition, the annual HeRAMS report for 2015 gives cause for alarm concerning developments in the availability of medical personnel in Syria. The report showed that the number of medical doctors in public hospitals decreased by 11% from 10 586 in January to 9455 in December 2015. In the same period, the number of nurses decreased by 9% from 16 450 to 14 892. <sup>(14)</sup>

- Nurses received formalized oncology training in only 25% of hospitals in Ibn - Alnafiss hospital and Hama Hospital.
- 50% of the facilities where the study was conducted had a pharmacist with special oncology-related training in Al Bairouni university hospital, Ibn – Alnafiss, Hama, and Tishreen Hospital.

#### iii. Financing:

- Government paid 76.3% of the total cancer costs. While 15.3% was paid by patient family. Then the remaining costs were covered by private donation including NGO and insurance scheme (5.4%, 3.1%) respectively.

Since 2000, there was a large growth in the private hospital sector with an unclear sharing of responsibility between the private and public sectors. There have also been concerns regarding standardization and quality assurance. <sup>(14)</sup>

- 65.6% of total costs for chemotherapy were paid by government, then patients will pay 17.5% of the total costs and the remaining will be covered by private donation including NGO and insurance scheme (8.8%, 8.1%).
  - Government covered 70 % of the supportive therapy (eg., antibiotics, morphine). While patient family paid 19.1% of the total costs, and the remaining were covered by private donation including NGO and insurance scheme (6.3%, 4.6%) respectively.

- Government covered the costs of 60.6% of the diagnostic tests (e.g. laboratory, radiology, pathology). While the remaining costs were covered by private donation including NGO and patient's family (5%, 25.8%) respectively.
- Only 25% of hospitals received funds from non-governmental organization (NGO) and private donors. This is because the main public governmental hospitals are responsible for the provision of cancer care services free of charge. However, due to the crisis that affects the consistent availability of medicines and some specific diagnostic services, patients have to spend on their treatment to cover the treatment's expenses either from their own pockets or from other NGOs (such As Basmah NGO that provides cancer care for children ).
- About 22.5% of total budgetary expenditure is from private donations.
- Only one hospital (MOHE Children hospital) received private financial support for its programs and this support is fully provided by non-governmental organization.

**The main five root challenges facing facility with regards to oncology treatment and care are:**

- 1- Establishment of national cancer registry is needed.
- 2- Limited number of specialized nurses, nutritionists, and doctors.
- 3- Palliative care is not available properly.
- 4- Shortage of anti-cancer medicines.
- 5- Educational training programs are needed for nurses, nutritionists, and other health workers.

**The top five interventions that could improve the capacity for effective treatment are:**

- 1- WHO program for Data entry (Can Reg 5).
- 2- Insert IV access as port-a- cath.
- 3- Availability of chemotherapy hood.
- 4- Availability of equipment for priority medical equipment for cancer management including early detection and equipment needed for interventions of different types of cancers that will participants in better health outcomes. A list of priority of medical equipment for cancer care management. <sup>(15)</sup>

- 5- Continuous training program for health workers and patients.

**How can other organizations assist oncology facilities:**

- 1- Fill the gap of anti-cancer medicines shortage.
- 2- Provision of radiotherapy treatment in Aleppo, Sweida, and Iben Alnafis Hospital.
- 3- Strengthening the capacity of nurses in the area of oncology.
- 4- Support the oncology centers and chemical waste management.

**Strategies to address procurement of opioid analgesics are:**

- Increasing the share of such medicines allocated to oncology facilities.
- To make oral morphine medicines available to alleviate the suffering of patients

**Laboratory and pathology services and strategies to be followed are:**

- Provision of consistent maintenance services for lab equipment and pathology.
- Provision of essential lab equipment.
- Provision of flow Cytometry and Cytogenetic machines in the recovery phase in the country.

**Strategies to address radiotherapy are:**

- Discussion with the government to facilitate importing radiotherapy Isotopes.
- Increasing the number of radiotherapy services at oncology facilities.
- Support/empower the role Atomic Energy National Body to make the relevant needed material for radiotherapy available in the country.

**Strategies to address EML anti-neoplastics are:**

- Encourage procurement of generics.
- Develop strategic plan of the anti- cancer medicines with actual needed quantities.
- There is a fluctuation in the availability of tamoxifen and Anastrozole; as the two medicines are not persistently available at oncology facilities. And it is recommended to keep these two medicines available as they are on the WHO List of Essential Medicines

**Strategies to be implemented to strengthen the safety of personnel:**

- The role of infection control unit and team should be strengthened so that policies and procedures should be in place and staff is committed to apply them at work.
- Laminar hood should be available in oncology facilities along with safe disposal of chemotherapy.

**Strategies to bridge knowledge gaps for patients and support groups**

- Conducting awareness campaign to improve understanding of cancer symptoms and treatment options, educational programme about disease for cancer patients and family, and availability end-of-life services.
- Strengthening the capacity of health staff working in palliative care, oncology nursing, oncology pharmacy etc.,
- Introducing educational training programs in palliative care, oncology nursing and oncology pharmacy in medical and nursing schools.

## 7. Conclusion and Recommendations:

### 7.1 Conclusion

Overview of the diseases:

- A functional national cancer registry to be used as source of data for epidemiologic research /studies, and programs of early detection and cancer screening is not available.

Early detection: The findings showed the following:

- Breast and colon cancer were diagnosed at late stages.
- Patients are unaware of the procedures for early detection of cancer diseases and they are afraid of the disease and the procedure itself.
- Educational programs for patients and oncology health workers are not available.

Palliative care:

- Immediate-release oral morphine was not available at the oncology facilities.
- The two main barriers to palliative care were (1) inadequate financial resources for procurement of medicines (2) limited human resources expertise and (3) palliative care is listed as low health priority

Diagnosis and Treatment:

- Cytogenetic and flow cytometry services are not available in all the hospitals where the study was conducted. Hospitals are facing obstacles to regular availability of pathology services including the limited resources for procurement, unreliable supply chain and non-functioning equipment.
- Treatment costs and stigma associated with treatment were the main factors for failure to receive treatment. While factors related to accessibility to the hospital, fragmented referral mechanisms to higher levels of care, and unawareness patient and their families were additional reasons for failure to obtain treatment.
- All the hospitals were not able to get consistent supply of the essential cytotoxic drugs.

55% of patients completed the systemic therapy/chemotherapy without interruption and 46% completed their radiotherapy without interruption.

The findings were shared with the health staff, management, key staff at MOH and MOHE in a two –day workshop and as a result a framework of the national cancer strategy was developed and revised later by Dr. André Ilbawi , as shown in Annex 3

### 7.2 Recommendations

1. WHO to support the implementation of the development of a national strategy for cancer care to reduce cancer incidence and mortality and improve quality of life of cancer patients, through the systematic and equitable implementation of evidence-based strategies for

prevention, early detection, diagnosis, treatment, palliation, training and research while making the best use of available resources.

2. To undertake an assessment of the capacity of the national cancer registry in coordination with WHO regional office and IARC.
3. Establish national cancer datasets that links MOH Health Information System to the national data set for cancer( cancer registry)
4. Develop reinforcement policies for prevention of cancer diseases such as tobacco control policy and immunization against Hepatitis B.
5. Making essential medicines and medical equipment for cancer care available in the country.
6. To build the capacity of health workers working in oncology health care in the areas of palliative care, early detection, and nutrition and diagnosis services.
7. Develop a communication strategy to raising the community awareness of the cancer.

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Annex 1: Questionnaire- Assessment tool

## Rapid Needs Assessment for Cancer Management in Syria

*October 2016*

To examine the scope of support to be provided by WHO and partners, it is proposed to undertake a rapid needs assessment for cancer management in Syria. The approach will involve the use of a tool for determining current status and needs followed by a round table discussion with cancer programme managers, service providers, experts and partners

A : FACILITY INTRODUCTION & INFRASTRUCTURE	
1	<b>Name of Health Facility</b> <i>name of hospital and affiliation</i>
2	<b>Head of Hospital or Contact Person</b> <i>Job description (head of hospital, head of oncology)</i>
3	<b>Name</b>
4	<b>Email</b>
5	<b>Phone</b>
6	<b>Fax</b>
7	<b>Mailing Address</b>
8	<b>Classification of facility:</b> <input type="checkbox"/> Secondary facility (public) <input type="checkbox"/> Specialized care facility (public)
9	<b>What funding mechanisms are provided for this facility?</b> <input type="checkbox"/> Public/government <input type="checkbox"/> Private <input type="checkbox"/> Mixed government and privately funded  If so, what percent provided if public/government funding <span style="float: right; border: 1px solid black; padding: 2px 10px;">  %  </span>

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## B : CURRENT SERVICE PROVISION

10	Do you have a hospital-based cancer registry?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, please reference to answer questions below
11	Average number of patients who started treatment for cancer per month. <i>For all patients (old and new cases)</i>	<input type="text"/>	
12	Average number of children (0-14 years) who started treatment for cancer per month	<input type="text"/>	
13	<b>Most common cancers seen</b> <i>(please rank #1-7), as follow: (1) most seen (7) least seen</i>	<input type="checkbox"/> Breast <input type="checkbox"/> Colorectal <input type="checkbox"/> Lung <input type="checkbox"/> Prostate <input type="checkbox"/> Stomach <input type="checkbox"/> Bladder <input type="checkbox"/> Leukaemia (adult) <input type="checkbox"/> Leukaemia (children) <input type="checkbox"/> Lymphoma (adult) <input type="checkbox"/> Lymphoma (children)	
14	<b>Most common cancers treated</b> <i>(please rank #1-7), as follow: (1) most treated (7) least treated</i>	<input type="checkbox"/> Breast <input type="checkbox"/> Colorectal <input type="checkbox"/> Lung <input type="checkbox"/> Prostate <input type="checkbox"/> Stomach <input type="checkbox"/> Bladder <input type="checkbox"/> Leukaemia (adult) <input type="checkbox"/> Leukaemia (children) <input type="checkbox"/> Lymphoma (adult) <input type="checkbox"/> Lymphoma (children)	
15	<b>Percentage of breast cancer patients presenting to this facility at each stage</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Stage I	<input type="text"/> % Stage II
		<input type="text"/> % Stage III	<input type="text"/> % Stage IV
16	<b>Percentage of colon cancer patients diagnosed at each stage</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Stage I	<input type="text"/> % Stage II
		<input type="text"/> % Stage III	<input type="text"/> % Stage IV

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C : Delayed diagnosis & treatment			
Causes for delayed diagnosis and/or upfront abandonment (refusal of treatment):			
17	Are the following factors significant reasons for failure to receive	1	Patient and family unaware of cancer symptoms <input type="checkbox"/> Yes <input type="checkbox"/> No
		2	Fragmented referral mechanisms to higher levels of care due to disrupted health system <input type="checkbox"/> Yes <input type="checkbox"/> No
		3	Inability to access timely pathology and staging <input type="checkbox"/> Yes <input type="checkbox"/> No
		4	Treatment facility not geographically accessible (including transportation costs) <input type="checkbox"/> Yes <input type="checkbox"/> No
		5	Treatment costs not affordable <input type="checkbox"/> Yes <input type="checkbox"/> No
		6	Treatment viewed as insufficient family priority <input type="checkbox"/> Yes <input type="checkbox"/> No
		7	Cancer known but stigma associated with treatment (eg, fear of amputation) <input type="checkbox"/> Yes <input type="checkbox"/> No
		8	Other causes, please specify .....
18	How long is the current waiting list for cancer treatment? <i>In days</i>	1	Radiotherapy <input type="text"/>
		2	Surgery <input type="text"/>
		3	Systemic therapy/chemotherapy <input type="text"/>
19	What percent of patients complete cancer treatment? <i>All patients</i>	1	Radiotherapy <input type="text"/> %
		2	Surgery <input type="text"/> %
		3	Systemic therapy/chemotherapy <input type="text"/> %
20	What percent of patients complete cancer treatment <u>without interruption</u> ? <i>Patients committed to the treatment schedule</i>	1	Radiotherapy <input type="text"/> %
		2	Systemic therapy/chemotherapy <input type="text"/> %

# Rapid Needs Assessment for Cancer Management in Syria

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## D: Treatment Toxicities & Survivorship Care

21	Estimated total number of deaths per year from cancer during treatment		<input type="text"/>
22	For breast cancer, what percentage of cancer-related deaths is due to: <i>Cause of death among breast cancer women</i>	1 Treatment related toxicities	<input type="text"/> %
		2 Progressive or relapse disease	<input type="text"/> %
23	What proportion of patients abandons treatment? <i>patients abandonment treatment / all cases of patients in need for treatment</i>		<input type="text"/> / <input type="text"/>
24	Please rank cases of treatment abandonment: <i>(1) is the highest (4) is the lowest</i>	1 Financial	<input type="text"/>
		2 Logistic (unable to access facility)	<input type="text"/>
		3 Disruption in service availability	<input type="text"/>
		4 Health-related (due to toxicities)	<input type="text"/>
25	Do you use surveillance protocols after completion of therapy?		<input type="checkbox"/> Yes <input type="checkbox"/> No
26	Do you have consistent access to broad-spectrum IV antibiotics for serious/complicated febrile neutropenia?		<input type="checkbox"/> Yes <input type="checkbox"/> No
27	Do patients have access to antiemetic medicines during chemotherapy treatment?		<input type="checkbox"/> Yes <input type="checkbox"/> No

## E: Palliative care

28	In what settings are palliative care services available? <i>Check all that apply</i>	<input type="checkbox"/> Inpatient hospital <input type="checkbox"/> Outpatient <input type="checkbox"/> Community- or home-based
29	What are the primary barriers to palliative care services? <i>Check all that apply</i>	<input type="checkbox"/> Lack of referral mechanisms <input type="checkbox"/> Inadequate financial resources available <input type="checkbox"/> Limited human resource expertise <input type="checkbox"/> Low health priority

# Rapid Needs Assessment for Cancer Management in Syria

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30	Is immediate-release oral morphine consistently available?	<input type="checkbox"/> Yes <input type="checkbox"/> No																		
31	Are patients able to take home prescription for oral morphine with a supply for >1 week?	<input type="checkbox"/> Yes <input type="checkbox"/> No																		
32	<b>What primary constraint exists for lack of morphine availability?</b> <i>please select the most important</i>	<input type="checkbox"/> Unreliable supply chain <input type="checkbox"/> Lack of resources for procurement <input type="checkbox"/> Limited number of prescribing physicians <input type="checkbox"/> Unaffordable for patients																		
<b>F: MEDICAL STAFF, PEDIATRIC ONCOLOGY TEAM</b>																				
33	<b>How many of each type of providers are there in the facility?</b> <i>Give numbers, put (0) if not available</i>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 65%;">Medical oncologists</td> <td style="width: 30%; text-align: center;"><input style="width: 90%;" type="text"/></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Surgeons performing cancer operations</td> <td style="text-align: center;"><input style="width: 90%;" type="text"/></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Radiation oncologists</td> <td style="text-align: center;"><input style="width: 90%;" type="text"/></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Palliative &amp; supportive care providers</td> <td style="text-align: center;"><input style="width: 90%;" type="text"/></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Medical physicist</td> <td style="text-align: center;"><input style="width: 90%;" type="text"/></td> </tr> <tr> <td style="text-align: center;">6</td> <td>Biomedical engineer</td> <td style="text-align: center;"><input style="width: 90%;" type="text"/></td> </tr> </table>	1	Medical oncologists	<input style="width: 90%;" type="text"/>	2	Surgeons performing cancer operations	<input style="width: 90%;" type="text"/>	3	Radiation oncologists	<input style="width: 90%;" type="text"/>	4	Palliative & supportive care providers	<input style="width: 90%;" type="text"/>	5	Medical physicist	<input style="width: 90%;" type="text"/>	6	Biomedical engineer	<input style="width: 90%;" type="text"/>
1	Medical oncologists	<input style="width: 90%;" type="text"/>																		
2	Surgeons performing cancer operations	<input style="width: 90%;" type="text"/>																		
3	Radiation oncologists	<input style="width: 90%;" type="text"/>																		
4	Palliative & supportive care providers	<input style="width: 90%;" type="text"/>																		
5	Medical physicist	<input style="width: 90%;" type="text"/>																		
6	Biomedical engineer	<input style="width: 90%;" type="text"/>																		
34	<b>What is the nurse to patient ratio on the weekday shift?</b> <i>Number of nurses / patients</i>	<input style="width: 90%;" type="text"/> / <input style="width: 20%;" type="text"/>																		
35	Have the nurses received formalized oncology training?	<input type="checkbox"/> Yes <input type="checkbox"/> No																		
<b>G: Multi-disciplinary Providers</b>																				
36	<b>What additional core staff are available to care for patients with cancer (eg, participates in multi-disciplinary rounds)?</b> <i>Check all that apply</i>	<input type="checkbox"/> Psychosocial workers <input type="checkbox"/> Unit manager <input type="checkbox"/> Pharmacists <input type="checkbox"/> Nutritionists																		
37	Does your facility have a pharmacist with special oncology-related training?	<input type="checkbox"/> Yes <input type="checkbox"/> No																		

# Rapid Needs Assessment for Cancer Management in Syria

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H: HOSPITAL FACILITIES (General Laboratory)		
38	<p><b>What laboratory services are available consistently at this hospital?</b></p> <p><i>Check all that apply</i></p>	<input type="checkbox"/> Routine blood counts and differential <input type="checkbox"/> Coagulation factors <input type="checkbox"/> Microbiology <input type="checkbox"/> Cytology (CSF) <input type="checkbox"/> Blood chemistry <input type="checkbox"/> Peripheral blood film <input type="checkbox"/> Bone marrow aspirates <input type="checkbox"/> Drug level monitoring
39	<p><b>Are there obstacles to regular availability of basic laboratory services?</b></p> <p><i>Check all that apply</i></p>	<input type="checkbox"/> Inadequate resources for procurement <input type="checkbox"/> Non-functioning equipment <input type="checkbox"/> No obstacles <input type="checkbox"/> Unreliable supply chain <input type="checkbox"/> Disruptions in electricity
H: HOSPITAL FACILITIES (Pathology)		
40	<p><b>What pathology services are available consistently at this hospital?</b></p> <p><i>Check all that apply</i></p>	<input type="checkbox"/> Immunohistochemistry <input type="checkbox"/> Flow cytometry <input type="checkbox"/> Anatomic pathology <input type="checkbox"/> Cytogenetics <input type="checkbox"/> Hematopathology
41	<p><b>Are there obstacles to regular availability of pathology services?</b></p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
42	<p><b>If yes, what are the obstacles?</b></p> <p><i>Check all that apply</i></p>	<input type="checkbox"/> Inadequate resources for procurement <input type="checkbox"/> Non-functioning equipment <input type="checkbox"/> Excessive volume resulting in delays <input type="checkbox"/> Unable to communicate results to requesting provider <input type="checkbox"/> Unreliable supply chain <input type="checkbox"/> Insufficient support for processing
H: HOSPITAL FACILITIES (Radiology)		
43	<p><b>What imaging services /studies are currently available in your facility?</b></p> <p><i>Check all that apply</i></p>	<input type="checkbox"/> X Ray <input type="checkbox"/> Ultrasound <input type="checkbox"/> MRI <input type="checkbox"/> CT Scan <input type="checkbox"/> Bone Scan <input type="checkbox"/> Nuclear medicine <input type="checkbox"/> Advanced nuclear imaging (eg, PET)
44	<p><b>Are there obstacles to regular availability of radiology services?</b></p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
45	<p><b>If yes, what are the obstacles?</b></p> <p><i>Check all that apply</i></p>	<input type="checkbox"/> Non-functioning equipment <input type="checkbox"/> Disruptions in electricity <input type="checkbox"/> Insufficient technicians <input type="checkbox"/> Insufficient number of providers to interpret results <input type="checkbox"/> Unable to communicate results to requesting provider



# Rapid Needs Assessment for Cancer Management in Syria

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## H: HOSPITAL FACILITIES (Radiation Therapy)

46	Do you have radiotherapy in your hospital?	<input type="checkbox"/> Yes <input type="checkbox"/> No
47	<b>If yes, specify</b> <i>Check all that apply</i>	<input type="checkbox"/> Linear Accelerator <input type="checkbox"/> Cobalt 60 <input type="checkbox"/> Brachytherapy <input type="checkbox"/> Other
48	In the past 12 months, how often have the following forms of radiotherapy been available ?	<input type="checkbox"/> always <input type="checkbox"/> 7-12 months <input type="checkbox"/> 1-6 months <input type="checkbox"/> never
49	Are there obstacles to providing radiotherapy?	<input type="checkbox"/> Yes <input type="checkbox"/> No
50	<b>What are the obstacles?</b> <i>Check all that apply</i>	<input type="checkbox"/> Non-functioning equipment <input type="checkbox"/> Disruptions in electricity <input type="checkbox"/> Unreliable supply chain <input type="checkbox"/> Insufficient technicians or medical physicists <input type="checkbox"/> Insufficient radiation oncologists <input type="checkbox"/> Excessive volume resulting in delays <input type="checkbox"/> Inability to complete therapy due to disruption of infrastructure <input type="checkbox"/> Patients unable to routinely access treatment centre (including financial and geographic barriers)

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## I: Safety & Standard Precautions

51	Do you have alcohol based hand rub in non-isolation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
52	If yes:	<input type="checkbox"/> Every bedside (per patient) <input type="checkbox"/> >1 per room in multi-occupancy <input type="checkbox"/> On ward <input type="checkbox"/> Not available
53	Do you have a sharps container "safety boxes" on the ward?	<input type="checkbox"/> Yes <input type="checkbox"/> No
54	Do you have designated hazardous waste disposal for chemotherapy on the ward?	<input type="checkbox"/> Yes <input type="checkbox"/> No
55	Do you have personal protective equipment for staff preparing chemotherapy?	<input type="checkbox"/> Yes (multiple use) <input type="checkbox"/> Yes (single use) <input type="checkbox"/> Not available
56	Do you have personal protective equipment for staff administering chemotherapy?	<input type="checkbox"/> Yes (multiple use) <input type="checkbox"/> Yes (single use) <input type="checkbox"/> Not available
57	Do you have laminar flow hood for chemotherapy preparation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
58	Do you have a specific process to confirm identify of patients (eg, unique patient identifiers) and match correct patients with correct care (eg, prior to chemotherapy administration)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
59	Are blood typing services available?	<input type="checkbox"/> Yes <input type="checkbox"/> No
60	What blood bank services are available consistently at this hospital (including after-hours & weekends)? <i>Check all that apply</i>	<input type="checkbox"/> packed RBC <input type="checkbox"/> whole blood <input type="checkbox"/> platelets



# Rapid Needs Assessment for Cancer Management in Syria

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## J: AVAILABILITY OF ESSENTIAL MEDICINES & TECHNOLOGIES

61	Is your facility able to obtain a consistent supply of the essential cytotoxic drugs?	<input type="checkbox"/> Yes <input type="checkbox"/> No						
62	If No, in general, how frequently are delays in treatment caused by non-availability of drugs?	<input type="checkbox"/> Once per year <input type="checkbox"/> 1 to 2 times a month <input type="checkbox"/> 1 to 2 times a week <input type="checkbox"/> Daily						
63	Are the following from the WHO model list of Essential Medicines are currently available and non-expired in your pharmacy? <i>Yes means one or more medicines are available</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No						
64	If yes: <i>Check all that apply</i>	<input type="checkbox"/> Carboplatin <input type="checkbox"/> Cisplatin <input type="checkbox"/> Cyclophosphamide <input type="checkbox"/> Dacarbazine <input type="checkbox"/> Docetaxel <input type="checkbox"/> Doxorubicin <input type="checkbox"/> Etoposide <input type="checkbox"/> Fluorouracil <input type="checkbox"/> Filgrastim <input type="checkbox"/> Oxaliplatin <input type="checkbox"/> Vincristine <input type="checkbox"/> Anastrozole <input type="checkbox"/> Tamoxifen <input type="checkbox"/> Leuprorelin						
65	Please rank the following causes of essential medicines being unavailable <i>rank : most common #1 to least common #4</i>	<input type="checkbox"/> Unreliable supply chain <input type="checkbox"/> Lack of resources for procurement <input type="checkbox"/> Limited number of prescribing physicians <input type="checkbox"/> Unaffordable for patients						
66	Does the facility have the following devices? <i>(mark device if available)</i>	<input type="checkbox"/> Mammogram <input type="checkbox"/> Colposcope <input type="checkbox"/> Colonoscope						
67	What is the state of these devices for cancer (mammogram, colposcope, colonoscope)?	<table border="1"> <tr> <td><b>Mammogram</b></td> <td> <input type="checkbox"/> Functional  <input type="checkbox"/> Non-functional, awaiting repair  <input type="checkbox"/> Non-functional, unable to repair or maintain                 </td> </tr> <tr> <td><b>Colposcope</b></td> <td> <input type="checkbox"/> Functional  <input type="checkbox"/> Non-functional, awaiting repair  <input type="checkbox"/> Non-functional, unable to repair or maintain                 </td> </tr> <tr> <td><b>Colonoscope</b></td> <td> <input type="checkbox"/> Functional  <input type="checkbox"/> Non-functional, awaiting repair  <input type="checkbox"/> Non-functional, unable to repair or maintain                 </td> </tr> </table>	<b>Mammogram</b>	<input type="checkbox"/> Functional <input type="checkbox"/> Non-functional, awaiting repair <input type="checkbox"/> Non-functional, unable to repair or maintain	<b>Colposcope</b>	<input type="checkbox"/> Functional <input type="checkbox"/> Non-functional, awaiting repair <input type="checkbox"/> Non-functional, unable to repair or maintain	<b>Colonoscope</b>	<input type="checkbox"/> Functional <input type="checkbox"/> Non-functional, awaiting repair <input type="checkbox"/> Non-functional, unable to repair or maintain
<b>Mammogram</b>	<input type="checkbox"/> Functional <input type="checkbox"/> Non-functional, awaiting repair <input type="checkbox"/> Non-functional, unable to repair or maintain							
<b>Colposcope</b>	<input type="checkbox"/> Functional <input type="checkbox"/> Non-functional, awaiting repair <input type="checkbox"/> Non-functional, unable to repair or maintain							
<b>Colonoscope</b>	<input type="checkbox"/> Functional <input type="checkbox"/> Non-functional, awaiting repair <input type="checkbox"/> Non-functional, unable to repair or maintain							

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## K: NUTRITIONAL SUPPORT

68	Do you provide nutritional advice for families attending the unit?	<input type="checkbox"/> Yes <input type="checkbox"/> No
69	Do you routinely check for evidence of malnutrition in new patients?	<input type="checkbox"/> Yes <input type="checkbox"/> No
70	Do you routinely check for malnutrition prior to administration of new chemotherapy cycle?	<input type="checkbox"/> Yes <input type="checkbox"/> No
71	Do your patients have access to total parenteral nutrition?	<input type="checkbox"/> Yes <input type="checkbox"/> No

## L: FINANCING OF CANCER CARE

72	<b>What percentage of total cancer costs is paid by</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Patient family <input type="text"/> % Government <input type="text"/> % Insurance scheme <input type="text"/> % Private donation including NGO
73	<b>What percentage of chemotherapy costs is paid by:</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Patient family <input type="text"/> % Government <input type="text"/> % Insurance scheme <input type="text"/> % Private donation including NGO
74	<b>What percentage of supportive therapy (eg, antibiotics, morphine) is paid by:</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Patient family <input type="text"/> % Government <input type="text"/> % Insurance scheme <input type="text"/> % Private donation including NGO
75	<b>What percentage of diagnostic tests (eg, laboratory, radiology, pathology) is paid by:</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Patient family <input type="text"/> % Government <input type="text"/> % Insurance scheme <input type="text"/> % Private donation including NGO
76	Do you receive funding from non-governmental organization (NGO) and private donors?	<input type="checkbox"/> Yes <input type="checkbox"/> No
77	<b>If Yes, what percent of total budgetary expenditure is from private donations?</b> <i>Make sure that the total of percentages is 100</i>	<input type="text"/> % Domestic NGOs and donors <input type="text"/> % International NGOs and donors <input type="text"/> % Corporate donations
78	Does your oncology unit receive private financial support for any programmes?	<input type="checkbox"/> Yes <input type="checkbox"/> No
79	<b>If Yes, is support provided by:</b> <i>Check all that apply</i>	<input type="checkbox"/> Non-governmental organizations <input type="checkbox"/> Local organizations including religious groups <input type="checkbox"/> Corporate organizations

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M: CANCER REGISTRY & HEALTH INFORMATION SYSTEMS		
80	Do you currently register incidence of new cancer cases in your facility?	<input type="checkbox"/> Yes <input type="checkbox"/> No
81	If Yes, How do you currently register incidence of new cases? <i>Check all that apply</i>	<input type="checkbox"/> Log Book <input type="checkbox"/> Computer based (e.g. Excel File) <input type="checkbox"/> Web Based
82	Is there a process to evaluate and address major adverse patient events?	<input type="checkbox"/> Yes <input type="checkbox"/> No
N: PATIENT & FAMILY EDUCATION		
83	Are there programs and services for educating patients and families about disease progression, treatment procedures, pain management and medication regimens?	<input type="checkbox"/> Yes <input type="checkbox"/> No
84	Are there discussions with families and patients regarding goals of care?	<input type="checkbox"/> Yes <input type="checkbox"/> No
85	Is written informed consent obtained before starting therapy?	<input type="checkbox"/> Yes, always <input type="checkbox"/> Yes, sometimes <input type="checkbox"/> No
86	Do families of patients actively engage in communicating supportive needs to healthcare providers (eg, need for pain relief)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
O: PSYCHOSOCIAL SUPPORT:		
87	Are there resources to help patients and families deal with death and dying?	<input type="checkbox"/> Yes <input type="checkbox"/> No
88	Are there external support groups (including religious or spiritual groups) that help patients and patients' families face these challenges?	<input type="checkbox"/> Yes <input type="checkbox"/> No
89	Is end-of-life care at home an option for patients?	<input type="checkbox"/> Yes <input type="checkbox"/> No
90	If Yes, are the trained staff available for home visits?	<input type="checkbox"/> Yes <input type="checkbox"/> No

# Rapid Needs Assessment for Cancer Management in Syria

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## P: SUMMARY: UNDERSTANDING STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS

91	A1. What are the 5 main root challenges facing your facility right now with regards oncology treatment and care?	1	
		2	
		3	
		4	
		5	
92	A2. What are your top 5 interventions that could improve your capacity for effective treatment?	1	
		2	
		3	
		4	
		5	
93	A3. How can other organizations assist/help your facility/unit? Do you have any other aspects of your service which we have not covered and which you would like to bring to our attention?		

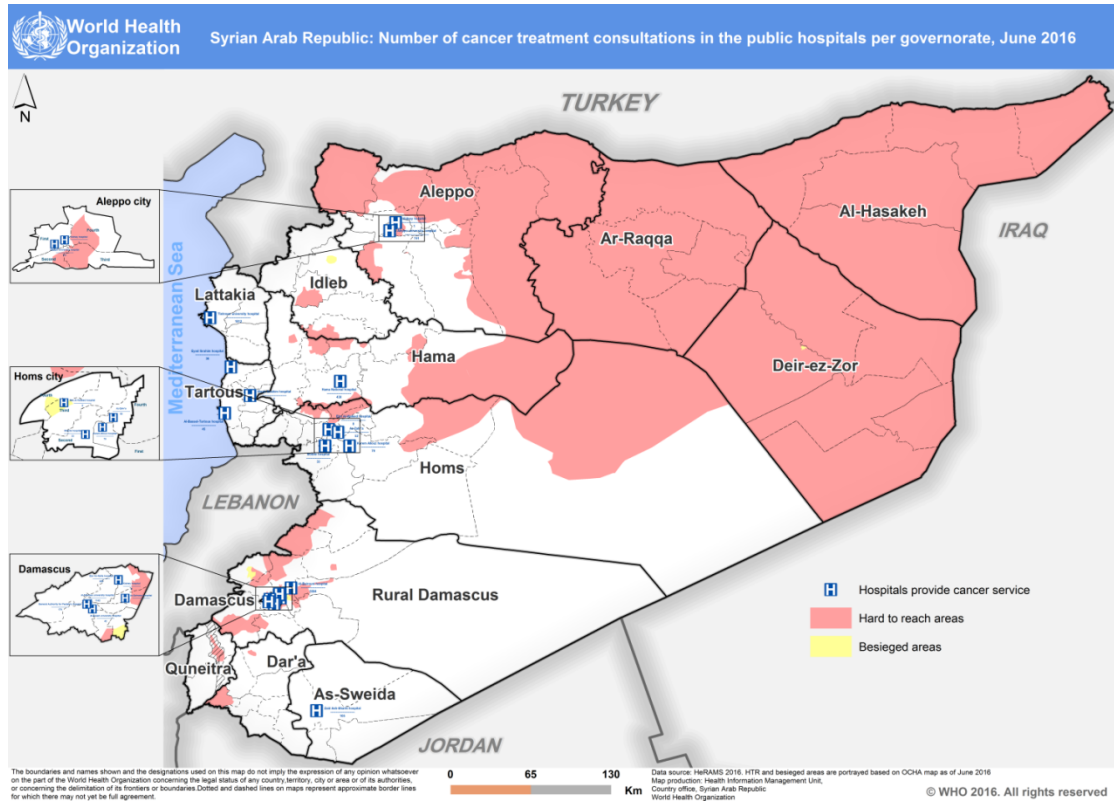
## Rapid Needs Assessment for Cancer Management in Syria

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### P: Surveyor's Observation Notes

*Please add your observation regarding the service delivery, administration of medicines, general environment of hospital, .... and other observations you find it important to be mentioned in the study*

## Annex 2: Distribution of public hospitals provided cancer treatment services



Annex3: Framework for Syria Cancer Strategy

Pillar	Description	Objectives	Indicators	Frequency	Method and technique for collecting data and feedback
1	Governance	<ul style="list-style-type: none"> <li>Develop a multi-sectoral strategy/action plan for cancer prevention and control</li> </ul>	<ul style="list-style-type: none"> <li>Development of a national multi-sectoral strategy/action plan for cancer prevention and control, encompassing all areas of the cancer pathway (prevention, early detection, treatment, palliative care, surveillance and research)</li> </ul>	3- 6 years	<ul style="list-style-type: none"> <li>Monitoring visits, Questionnaire , regular meetings</li> </ul>
		<ul style="list-style-type: none"> <li>Establish a national multi-sectoral committee for cancer prevention and control</li> </ul>	<ul style="list-style-type: none"> <li>Availability of committee for cancer prevention and control</li> </ul>	Annually	<ul style="list-style-type: none"> <li>Conduct regular meeting, identifying roles and responsibilities of committee's members</li> </ul>
		<ul style="list-style-type: none"> <li>Increase national budget availability for cancer control</li> </ul>	<ul style="list-style-type: none"> <li>Ratio of cancer budgetary to the total expenditures allocated per each sector</li> </ul>	Annually	<ul style="list-style-type: none"> <li>Financial report submitted by each sector</li> </ul>
		<ul style="list-style-type: none"> <li>Periodically assess national capacity for cancer prevention and control</li> </ul>	<ul style="list-style-type: none"> <li># of trainees</li> <li># Assessed health worker of the following specialties : Imaging technologist, Radiologist, Anatomic pathologist, Pathology technician BLS, Medical oncologist Cancer surgeon, Radiation oncologist, Palliative care provider , Medical physicist, Oncology nurse, Oncology pharmacist, Epidemiologist , Biomedical engineer, Oncology , Patient navigator</li> </ul>	Annually	<ul style="list-style-type: none"> <li>Final reports</li> </ul>



		<ul style="list-style-type: none"> <li>• Appoint or one or two regional focal points of NCD programme managers in two regions/governorates</li> </ul>	1-2 national focal points of NCD programme are appointed	Annually	<ul style="list-style-type: none"> <li>• Actions taken in terms of strengthening the national cancer control program</li> </ul>
2	<b>Surveillance and research</b>	<ul style="list-style-type: none"> <li>• Establish and strengthen population-based cancer registry that covers a population not less than one million</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of national cancer registry</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Outputs from cancer registry such as new cancer cases, mortality rate among cancer patients as per disease type, age group, sex, and geographical areas are identified</li> </ul>
			<ul style="list-style-type: none"> <li>• Strengthen the capacity of at least three staff who will manage the cancer registry</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Outputs, reports released by the cancer registry with coordination with International Agency for Research on Cancer (IARC),</li> </ul>
		<ul style="list-style-type: none"> <li>• Introduce a system to capture and report on indicators for the most common cancers including staging, survival and mortality</li> </ul>	<ul style="list-style-type: none"> <li>• Development of cancer patient form for data entry</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Outputs, reports released by the cancer registry</li> <li>• Gathering quality indicators (process, outcome and structure outcomes such as % of cancer patients who complete treatment and % who experience delay in care</li> </ul>
		<ul style="list-style-type: none"> <li>• Establishment of a qualified team to prepare and implement researches and assessments of cancer care, epidemiology, and surveillance.</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity building of at least 4 qualified team members in the areas of epidemiology, medical statistics, is strengthened</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Final reports of training and achievements prepared by national cancer program</li> </ul>



		<ul style="list-style-type: none"> <li>• Conduct assessments of cancer care</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct 3-4 assessments per year</li> </ul>	Annually	<ul style="list-style-type: none"> <li>•Qualitative and quantitative studies, surveys</li> </ul>
		<ul style="list-style-type: none"> <li>• Conduct cost effectiveness studies</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct cost effectiveness studies</li> </ul>	2 years	<ul style="list-style-type: none"> <li>• Technologies and programs to the cost-effectiveness studies. For example, cost-effectiveness of advanced diagnostic tests and/or cost-effectiveness of prostate cancer screening.</li> </ul>
3	<b>Prevention</b>	<ul style="list-style-type: none"> <li>• Ensure healthy nutrition in early life and childhood including breastfeeding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in obesity among children</li> </ul>	2 years	<ul style="list-style-type: none"> <li>•National surveys</li> </ul>
		<ul style="list-style-type: none"> <li>• Enforcement of smoking law and prevention of smoking in public places.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in Tobacco use</li> </ul>	2 years	<ul style="list-style-type: none"> <li>•National surveys</li> </ul>
		<ul style="list-style-type: none"> <li>•Promote best practices of blood and sharp needles safety</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of best practices for blood and needles safety at health facilities</li> </ul>	Annually	<ul style="list-style-type: none"> <li>•Assessments</li> </ul>
		<ul style="list-style-type: none"> <li>• Ensure vaccination against hepatitis B</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in prevalence / incidence</li> </ul>	3- 5 years	<ul style="list-style-type: none"> <li>•National surveys</li> </ul>
		<ul style="list-style-type: none"> <li>•Establishment of HPV vaccination program</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in the incidence of HPV cases</li> </ul>	3-5 years	<ul style="list-style-type: none"> <li>•Gathering information about incidence rate of cervical cancer and mortality rate</li> <li>•Assessment of the feasibility and cost - effectiveness studies of inclusion of HPV vaccination</li> </ul>
		<ul style="list-style-type: none"> <li>•Reduce exposure to occupational and environmental carcinogens</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring incidence of cancers due to occupational and environmental carcinogens</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Statistics from the national cancer registry of the main cancers resulted from occupational and</li> </ul>

					<p>environmental carcinogens</p> <ul style="list-style-type: none"> <li>• Assessments of current environmental and occupational exposures to better understand what should be prioritized.</li> </ul>
4	<b>Management</b>	<ul style="list-style-type: none"> <li>• Develop guidelines for management of priority adult and childhood cancers</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of evidence-based guidelines for management of priority adult and childhood cancers</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Guidelines of breast, colorectal cancer and other types of cancer are available at oncology unit at Ministry of Health</li> </ul>
		<ul style="list-style-type: none"> <li>• Ensure availability and affordability of essential medicines for cancer treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Availability and affordability of quality, safe and efficacious essential cancer medicines, including generics</li> </ul>	3 years	<p>(1) Facility based assessment of medicines and technologies for cancer control (as done in WHO SARA)</p> <p>(2) Catastrophic health expenditure: reference: WHO core indicator approach to collect (see pg 123 of <a href="http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf">http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf</a>).</p>
		<ul style="list-style-type: none"> <li>• Ensure availability and affordability of specialized cancer interventions including surgery and radiotherapy</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of specialized cancer interventions including surgery and radiotherapy</li> </ul>	6 months	facility based assessment

		<ul style="list-style-type: none"> <li>•Ensure availability and affordability of technology for cancer diagnostic services including pathology and imaging, in line with priority cancers</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of quality technologies for cancer care diagnostic services including pathology and imaging, in line with priority cancers.</li> </ul>	6 months	<ul style="list-style-type: none"> <li>•Feedback from oncology facilities of the availability of technology for cancer diagnostic services including pathology and imaging, in line with priority cancers</li> </ul>
		<ul style="list-style-type: none"> <li>• Establish a committee for pharmacovigilance studies for cancer medicines</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of studies regarding side effects and toxicities of cancer medicines</li> </ul>	Annually	cost and quality assessments of the studies testing the side effects and toxicities of cancer medicines
		<ul style="list-style-type: none"> <li>•Strengthening the capacity of health workers in oncology support staff</li> </ul>	# trainees on nutrition support	6 months	<ul style="list-style-type: none"> <li>• Conduct 2 training courses for doctors and nurses on nutrition support for cancer patients</li> </ul>
			# trainees on psychosocial support	6 months	<ul style="list-style-type: none"> <li>• Conduct 2 training courses for doctors and nurses on psychosocial support for cancer patients</li> </ul>
			curriculum of a patient's navigator skills and knowledge is available	6 months	<ul style="list-style-type: none"> <li>•Develop a curriculum to build patient's navigator skills and knowledge</li> </ul>
			# trainees on cancer survivors	6 months	<ul style="list-style-type: none"> <li>•Conduct 2 training courses for doctors and nurses on cancer survivors</li> </ul>

			# trainees on patient-centered care and off-load existent oncologist	6 months	<ul style="list-style-type: none"> <li>• Conduct 2 training courses for doctors and nurses on patient-centered care</li> </ul>
5	<b>Early Detection</b>	<ul style="list-style-type: none"> <li>• Promote education of the public about the early signs and symptoms of cancer</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in the mortality from cancers for which early detection programs have been introduced</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Cancer registry and surveys</li> </ul>
		<ul style="list-style-type: none"> <li>• Implement screening programs for colon rectal</li> </ul>	<ul style="list-style-type: none"> <li>• Assessment of coverage rates in cancer screening programmes</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Assessment of the highest types of cancers in one region/ governorate</li> <li>• cost - effectiveness analysis</li> </ul>
		<ul style="list-style-type: none"> <li>• Ensure that proper diagnostic means are available at oncology facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in the mortality from cancers for which early detection programs have been introduced</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Feedback from oncology facilities</li> </ul>
6	<b>Palliative Care</b>	<ul style="list-style-type: none"> <li>• Raise awareness of the need for palliative care at all levels of society</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness of palliative care is recognized among society</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Media, surveys</li> </ul>
		<ul style="list-style-type: none"> <li>• Introduce palliative care into the curricula of doctors and nurses at all levels of education</li> </ul>	<ul style="list-style-type: none"> <li>• Palliative care programs are included into the curricula of doctors and nurses at all levels of education</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Coordination with Ministry of Higher Educations and Universities</li> </ul>
		<ul style="list-style-type: none"> <li>• Develop affordable, multidisciplinary palliative care services, including pain relief, psychosocial support and spiritual support</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of palliative care services</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Feedback from Ministry of Health and Ministry of Higher and oncology facilities</li> </ul>
		<ul style="list-style-type: none"> <li>• Ensure availability and accessibility of opioids and other analgesics for palliative care</li> </ul>	<ul style="list-style-type: none"> <li>• using WHO Indicator from GMF for NCD of: Consumption of morphine-equivalent strong opioid analgesics (excluding methadone) per death from cancer in a given time period</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Surveys and assessments, feedback from Ministry of Health and Ministry of Higher and oncology facilities</li> </ul>

			(pg 32) <a href="http://www.who.int/nmh/ncd-tools/indicators/GMF_Indicator_Definitions_Version_NOV2014.pdf">http://www.who.int/nmh/ncd-tools/indicators/GMF_Indicator_Definitions_Version_NOV2014.pdf</a>		
		<ul style="list-style-type: none"> <li>• Ensure availability and implementation of national guidelines for palliative care</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of palliative care guidelines</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Feedback from Ministry of Health and Ministry of Higher and oncology facilities</li> </ul>
		<ul style="list-style-type: none"> <li>• Establishment of palliative care team in each oncology facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of palliative care team in each oncology facility</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Feedback from oncology facilities</li> </ul>

## Annex 4: List of Priority medical equipment for cancer care management :

### Annex 4. List of priority medical devices for cancer management, by categories

WHO list of priority medical devices for cancer management

#### Capital equipment

MEDICAL EQUIPMENT	
Anaesthesia unit, mobile, basic	MRI compatible biopsy procedure equipment
Aneroid sphygmomanometer	MRI compatible infusion pump
Biopsy gun	MRI compatible patient physiologic monitoring system
Blood glucometer	MRI compatible resuscitation trolley equipped with medicines and defibrillator
Bronchoscope	Nebulizer
Cerebrospinal fluid manometer	Non-heated respiratory humidifier
Colposcope	Operating light, light source (lamp & flashlight)
Computed Tomography (CT) System (multi-slice)	Oxygen humidifier with flowmeter
Computerized treatment planning systems (three-dimensional)	Oxygen therapy flowmeter, dialtype
Contrast medium injection system	Patient positioning/tracking system
Conventional simulator with digital imaging systems	PET/CT system
Cryosurgery unit	Proctoscope
Defibrillator	Pulse oximeter
Diagnostic spirometer	Radionuclide generator
Elastomeric pump	Rectal irrigation system
Electrocardiography system	Remote-afterloading brachytherapy system, at least 12 channels
Electrosurgical unit	Respirator
Emergency cart with medicines	Resuscitation trolley, equipped with medicines and defibrillator with laryngoscope
Endoscope sterilization/ disinfection support set	Resuscitator bag valve and mask (adult and paediatric)
Endoscope washer/disinfector	Rigid cystoscope
Endoscopy tower system	Rigid sigmoidoscope
Examination light	Rotary saw (optional)
Fixed examination/treatment light	Single-patient physiologic monitoring system for ECG, Capnography, SpO <sub>2</sub> , blood pressure
Flexible sigmoidoscope	Stadiometer (wall mounted)
Floor scale with stadiometer	Stepping unit and stabilizer
Gamma camera system	Stethoscope, adult, binaural and paediatric
Gamma probes (for intraoperative use)	Suction and irrigation device
General physical examination set (Ophthalmoscope, Otoscope, Lamp)	Syringe pump
General ultrasound colour Doppler imaging system	Thermometer, clinical, digital 32-43°C
General-purpose digital radiography system	Thin layer chromatography scanner
General-purpose suction system, vacuum	Tympanic thermometer
Gynaecological examination/treatment table	Ultrasonic washer
Hammer for neurological examination	ultrasound imaging system specific for TRUS
Infant scale	Ultrasound unit with biplanar transducer
Infusion pump	Universal operating table
Infusion pump for enteral nutrition	Universal operating table radiotransparent
Linear Accelerator (LINAC) 3D Conformal therapy	Vibratory (reciprocating) saw
Magnetic Resonance Imaging (MRI) System (1.5 T )	Video-colonoscopy
Mammographic stereotactic biopsy system	Weighing scale, range 0 -150 Kg
Mammographic X-ray system	
Mobile diagnostic X-ray digital system (C-arm)	
MR-safe stethoscope and sphygmomanometer	
MRI compatible anaesthesia machine	





Radioactive source for checking the stability of ionization chambers

Survey meter

Thermometer calibrated at a standards laboratory

Water phantom for calibration

Waterproof cylindrical ionization chambers

Waterproof plane-parallel ionization chamber

Well-type ionization chamber or an isotope calibrator with source holding inserts calibrated at a standards laboratory

### SURGICAL INSTRUMENTS

Abdominal Hysterectomy set

Aspiration tray

Basic Colon Surgery set

Basic Rectal Surgery set

Basic Surgery set/ Minor tray

Biopsy forceps

Blunt obturator

Bone marrow aspiration set

Catheter placement set

Cervical punch biopsy forceps

Cervix conization set

Cheron forceps

Chest Aspirations set

Chest tube insertion kit

Chest tube set

Clamp, test tubes

Cricothyroidotomy set

Cystoscope sheath

Cystoscopy biopsy forceps

Dressing set

Endo-GIA stapler

Endocervical curette

Endoclip-applicator

Endoscopic hemoclip

Endotracheal tube

Examination/suturing, vaginal/cervical set

Excisional breast biopsy set

Forcep, artery

Forceps

Forceps tissue-long

Forceps, dressing, 155 mm, straight

General-purpose surgical scissors, reusable

Gynaecologic biopsy set

Gynecological and Kidney set

Hysterometer

Internally-anchored endotherapy retractor

Laparoscope holder

Laparoscopic biopsy forceps

Laparoscopic dissection spatula

Laparoscopic electro-surgical blunt dissector

Laparoscopic grasper

Laparoscopic grasping forceps

Laparoscopic irrigation/aspiration cannula

Laparoscopic multi-instrument access port

Laparoscopic needle holder

Laparoscopic swab forceps

Laparotomy ring

Laparotomy set

Laryngoscope handle with Macintosh blades

Lobectomy and segmental lung set

Long needle holders

Lumbar Puncture set, Adult

Lumbar Puncture set, Paediatrics

Manual expandable cervical dilator

Mastectomy set

McGill forceps adult and paediatric

Measurement ruler

Metzenbaum scissors

Needle holders

Pleural Biopsy set

Polypectomy snare

Prostatectomy set

Punch, Dry Blood Spot (DBS), 3.0 mm

Retractors (various sizes)

Ring forceps

Scalpel with blades

Scissors

Spatula, stainless steel (various sizes)

Suture set

Suture set

Thoracentesis set

Thoracotomy set

Tracheostomy set

Trocars with safety sheath (multiple sizes)

Urology set

Uterine forceps

Vaginal hysterectomy set

Vaginal sidewall retractors

Vaginal speculum, Non conducting preferably with side retractors

Vaginal speculum, reusable

Wire oval snare





## Accessories

LABORATORY AND PATHOLOGY EQUIPMENT	
Bag, disposable for biohazardous waste	Gloves, examination, non-sterile, single use (various sizes)
Bags for contaminated disposable supplies	Gloves, nitrile, powder-free, nonsterile, single use
Containers for hazardous waste (solutions and others)	Gown, impermeable single use
Faecal occult blood test (FOBT) rapid test kit (slides and applicator sticks)	Gown, patient
Graduated pipettes	Heat-resistant gloves
HPV DNA Test	Mask, surgical, non-woven
Micropipettes (different microliters)	Medical scrubs for healthcare workers or similar
Microplate, ELISA, 96 U-well	Non-conductive shoe cover
Pasteur Pipette	Operating room gown, reusable
Pipette, digital, 10-100 ul	Plastic face shield
Pipette, digital, 100-1000 ul	Surgical cap for patients and healthcare worker
Pipette, digital, 2-20 u	Surgical face mask
Pipette, digital, 20-200 ul	
Pipette, digital, 8 channel, 20-200 ul	
Pipette, digital, 8 channel, 5-50 ul	
Pipette, filler, wheel-run, set/2	
Pipette, repeating, 5 volume	
Pipette, stand, 4 positions	
Pipettes, blood graduated, 0.05 ml	
Rack, drying glass & plastic ware	
Rack, staining slides	
Rack, test tubes, 24 positions	
Rack, tubes, 0.5/2.0/5.0 ml, 24 positions	
Safety box for used syringes/needles	
Serological pipette	
Staining rack	
PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING	
Apron impermeable	
Clogs, plastic (various sizes)	
Coat, medical, woven, white (various sizes)	
Disposable apron or heavy duty plastic apron (washable, reusable)	
Drawsheet, plastic, approx. 90x180 cm	
Examination/treatment table cover	
Eye protective wear	
Face masks N95	
General-purpose sterile drape	
Glasses, safety, regular size	
RADIATION PROTECTION/MONITORING DEVICES	
Area monitoring devices (area survey meter)	
Area radiation monitor (audible alarm)	
Breast shielding	
Clamps for the source management	
Dosimeter, personal	
Dummy sources	
Emergency container and emergency source handling instruments	
Geiger-Müller counter radiation survey meter and measuring probe	
Gonadal shielding	
Ion chamber survey meter	
Patient radiation shielding	
Portable radiation protection barriers	
Radiation shielding apron	
Radiation shielding apron rack	
Radiation shielding gloves	
Radiation shielding goggles	
Radiation shielding headwear	
Radioactive waste storage	
Ring dosimeter	
Source handling instruments and accessories	
Source loading and cutting devices	
Source storage and transport containers within the department	
Thyroid shielding	

SINGLE USE DEVICES/DISPOSABLES/ MEDICAL SUPPLIES	
Absorbent tipped applicator	Dressing sets for malodours/ fungating wounds (carbon pads/ silver impregnated pads, etc.)
Adult/children diapers (incontinence pads)	Dressing strip, adhesive, diameter 3.0 cm, sterile
Anaesthesia breathing circuit	Elastic bandage
Asepto syringe	Endotracheal tubes adult and paediatric
Bag, biohazard, 20 L	Envelope, packing, 27x36 cm
Bag, re-sealable, plastic	Epidural catheter
Bags for contaminated supplies	Examination table paper cover
Bandage, adhesive, 3.0 cm, 100/box	Female sanitary products
Bandage, elastic, 7.5 cm x 5 m, roll	Fiducial markers/soft tissue markers
Biopsy needle	Film, sealing, flexible, 10 cm x 38 m, roll
Blood collection tube, neonatal cord blood, sterile	Filter Discs
Blood giving sets and cannulas	Filter needles
Cannulas, Intra Venous (IV) short, sterile, single use (sizes G)	Filter Venting devices
Cassettes	First aid gauze/bandage
Catheter (18 gauge or larger)	Flexible silicon catheter with needle
Catheter bag	Gastrostomy material for skin medication and use
Catheter, Foley, sterile, single use (sizes G)	Gauze strip antimicrobial
Catheter, urethral, sterile, single use (sizes G)	Gelfoam (for plugged biopsy)
Cervical aspiration catheter	General-purpose sterile drape
Cervical cytology brush or cervical cytology scraper	Grey bottle, sterile universal specimen bottles
Chest tube	Hemoclips/clip cartridge or similar for cardiothoracic surgery
Chest tubes drainage	Hypodermic needles: gauge 25 G, 23 G, 21 G
Closed system drug transfer devices	ICD set / Thoracic tube insertion set
Closed-wound drainage reservoir system with closed wound drain connector	Infusion giving set, sterile, single use
Collection tube/sterile plastic tubes	Infusion set, sterile, single use
Collector, urine, adhesive, 10-100 ml	Inoculation loop, plastic, sterile
Combined spinal epidural anaesthesia trays (spring-wound catheter, spinal epidural needles)	Instrument/equipment drape, single-use, non-sterile
Compress gauze, sterile & non-sterile, single use	Intravenous catheters
Compress, gauze, antiseptic, 6x3 cm, sterile	Intubating bougies, adult and paediatric
Compression bandages (for Deep Vein Thrombosis)	IV burettes
Container, sample, 50 ml	IV catheters
Cotton wool, 500 g, roll, non-sterile	IV infusor bags/sets
Cover glass, slides	Kato-Katz, kit, stool sample preparation
Cover glass/cover slips	Lancet, 2 mm, safety, sterile
Cryptographic/urethrographic catheter, female	Lancet, blood, safety, sterile (various sizes)
Devices to deliver enemas through stomas	Laryngeal mask airways
Devices to manage genital fistulae	Lead sharps container according to isotope energy used
Drainage bag including gravitational IV tube or connect to suction system	Markers, fine point, permanent black, for glassware and slides
Dressing retention roll	Mask and tubing for oxygen
	Medication cups
	Micro-vial tubes



Nasogastric tube	Sclerotherapy endoscopic needles
Nasogastric tube fixator	Sealant, compound
Needle cradle	Secondary set with drip chamber
Needle holder, vacuum tubes, sterile	Septo syringe
Needle, vacuum tube, 20 G/ 22 G, sterile	Sheet, absorbent, bench, 50x40 cm
Needles, luer, sterile, single use (sizes G)	Skin-cleansing wipe
Needles, scalp vein, sterile, single use (sizes G)	Skin-cover adhesive strip
Needles, spinal, sterile, single use (sizes G)	Slide, microscope
Needles, sterile, single use: • 20–24G (for fine needle aspiration)• 11–14 G (for bone biopsy)• 16–20G (for other tissue biopsy)	Slide, microscope, frosted
Non-implantable needle guide	Specimen container
Non-sterile coupling gel	Spinal anaesthesia needle, single-use
Operating room laundry bag	Sponges
Organ bag	Sputum containers
Oropharyngeal airway (adult size)	Staplers (linear and thoracotomy) with staples reloads
Ostomy bag	Sterile culture tube
Paediatric foley catheters and nasogastric tubes	Sterile sample container
Paediatric spinal needles	Sterile ultrasound coupling gel
Paper towels	Stoma/ostomy bags and adhesive
Paper, dry blood spot	Suprapubic catheter
Paper, exam table	Surgery table, padded accessories for patient positioning or similar
Paper, filter	Surgical clip
Paper, lens	Surgical scrub brush, single-use
Paper, pH indicator 2.0 to 9.0	Surgical scrub sponge
Paper, weighing	Suture, synthetic, non-absorbable (sizes USP/DEC) with needle (sizes G), sterile, single use, nylon, catgut, silk
Paracentesis set	Sutures
Parafilm paper	Swab-pad, alcohol
Parenteral/enteral solution bag	Swab, cotton-tip, tube, sterile
Partial-rebreathing oxygen face mask	Syringes (various capacities)
Pipette, repeat, tip 2.5/5.0 ml, 10/25 ml	Syringes for drug preparation/ formulation
Pipette, tip, barrier, 200 ul / 1000 ul, sterile	Syringes for the biopsy and holder (optional)
Pipette, tip, blue, 100-1000 ul	Syringes with needles (disposable)
Pipette, tip, white, 2-20 ul	Syringes, autodisable (AD), (various capacities)
Pipette, tip, yellow, 10-100 ul / 20-200 ul	Syringes, luer, sterile, single use (various capacities)
Pipette, transfer, 3 ml, non-sterile	T-tube and ties
Pipette, transfer, 3 ml, sterile	Tape, medical, roll (various sizes)
Pneumonectomy pleurevacs only for Pneumonectomy	Three-way-stopcock
Prongs, nasal, oxygen, non sterile, single use (various sizes)	Tongue depressor, single use (wooden or plastic spatula)
Rack, drying DBS cards, 10 positions	Transparent film dressings
Radiographic or radiochromic film	Transparent film dressings with a gel pad
Rectal probe or rectal catheter	Tube containing EDTA anticoagulant
Reservoir, reagent, 60 ml	Tube suction, Yankauer, 270 mm/Yankauer suction tips







May Grunewald stain (BDH)	Trichloroacetic acid, crystals, bottle
Methanol, bottle	Wash solution
Methylene blue, bottle	Washing buffer
Monsel's paste	Xylene, bottle
Mounting medium	
MRI contrast medium, injectable	
Neutral Buffered Formalin 10%	<b>OTHER (glassware, utensils, etc.)</b>
Nitric acid	Acetate sheets
Oil, immersion, bottle	Arm/leg tourniquet
Orange Gelb-6	Basic sedation equipment
Oxidase test	Basin, kidney, polypropylene
Oxygenated water	Beaker, glass, 100 ml / 250 ml
Paraffin	Bedpan
Peracetic acid disinfectant anticorrosion additive (for endoscopes or similar)	Bolus
Peroxidase	Bottle reagent
Petroleum gel, paraffin, bottle	Bottle, amber, dropper, 30 ml
Phosphate Buffer (pH 6.8)	Bottle, amber, screw cap, 100 ml /250 ml / 1000 ml
Pipettes cleaning solution	Bottle, plastic, 1 L
Potassium iodide	Bowl, polypropylene
Preservative solutions	Bowl/Emesis bowl
Primary antibodies	Box, refill, pipette tips, empty
Rubber cement	Box, specimen transport, 2 L/4 L
Saline solution	Box, storage 0.5/2/5 ml tubes, 100 positions
Sclerodesis agent (e.g. talc)	Box, storage, 100 slides
Secondary antibodies	Brush, bottles and flasks (various sizes)
Silica gel (desiccant for DBS), pouch	Brush, hand, scrubbing, plastic
Sodium bicarbonate	Brush, test tubes (various sizes)
Sodium chloride, powder, bottle	Container for specimen immersion
Sodium hypochlorite solution	Container for warm water
Sodium hypochlorite, tablets	Coplin jar
Sodium persulfate	Cover plates
Stain, Field A, solution	Cover slipper - Shandon cover plate
Stain, Field B, solution	Cylinder, measuring, glass, 10 ml/ 100 ml / 500 ml/ 100 ml
Stain, Giemsa, solution	Cytotoxic waste receptacle
Stain, Gram, set	Drill
Stain, May-Grunwald Giemsa, set	Dropper bottles
Stain, Ziehl-Neelsen, solution, bottle	Funnel, glass
Substrate, adamantyl phosphate oxetane	Funnel, plastic
Sugar fermentation tests	Glassware Beaker
Sulphuric acid, 95%	Hand/body hygiene products
Test, Nickerson or sabouraud medium, kit	Hazardous drug spill kits
Test, potassium hydroxide KOH, preparation	Hot water bath for thermoplastic immobilization system
Transurethral-instrument lubricant	Hot wire cutter

Jar, Coplin, staining	Receptacle, waste, stainless steel, pedal action
Knife for specimens	Rod, glass
Label or pen for labelling specimen containers	Rubber hammer
Label, biohazard, adhesive, 3x4 cm	Ruler
Label, self-adhesive, different sizes	Sample distribution container
Label, self-adhesive, freezer	Skin marker pen
Labels for the drugs identification	Smoke evacuator
Magnetic metal detector	Specimen cup
Manual brachytherapy source, temporary placement	Sponge bowl
Marker pen, cryoware	Thermic containers
Marker pen, glassware	Urinal
Marker, diamond	Warming cabinet for contrast media
Markers, fine point, permanent black, for glassware	Wash bottle, 250 ml
Mould materials (Foam blocks/Styrofoam/Polystyrene, Thermoplastic, vacuum bag or similar as needed)	Waste disposal container
MRI compatible oxygen canisters	
Oxygen/gas pipeline, cylinder	<b>SOFTWARE</b>
Petri dish, glass, with lid	Laboratory Information System (LIS)
Pot for cerrobend cadmium free low melting point alloy	Picture Archiving Communication System (PACS)
Pressure cooker	Radiology Information System (RIS)
Pressure relief products (e.g. Cushions, mattresses)	

Annex 5: List of the committee and surveyors

Name	Title	Governorate
Dr. Feras Al Jerf	Cancer program director at MoH	Damascus
Dr. Maher Salamon	Tumours specialist at Al Bairouni hospital - MoHE	Damascus
Dr. Saad Aldeen Jawish	Blood diseases supervisor at Al-Mouwasat university hospital – MoHE	Damascus
Dr.Maha Manashy	Doctor at Al Bairouni hospital - MoHE	Damascus
Dr. Ehab Alnakry	Al Bairouni hospital manager - MoHE	Damascus
Dr.Nidal Khder	Head of tumours department at Ebn An-Nafis hospital - MoH	Damascus
Dr. Moanas Abo Mansour	Medical manager for Zaid Ash-Shariti hospital – MoH	Sweida
Dr. Eyad Alaryan	Head of tumors department at Zahi Azrak hospital – MoH	Aleppo
Dr. Ahmad Faour	Medical manager at Zahi Azrak hospital - MoH and head of tumors department at Aleppo health directorate	Aleppo