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MASS SCREENING FOR COLORECTAL CANCER: PRINCIPLE OF METHODOLOGY "ABOUT AN EXPERIENCE IN THE WILAYA OF BEJAÏA"

CHAHIRA MAZOUZI
Medical Oncology Chu of Bejaia.

M. LAOUSSATI
Medical Oncology Chu of Bejaia.

R. BENYAHIA
Diagnostic Radiology CPMC.

M. HAMDICHERIF
Epidemiology University Hospital of Setif.

K. BOUZID
Medical Oncology CPMC.

K. LAYADA
Gastroenterology University Hospital Mustafa Pasha.

Abstract

Identifying a disease early to intervene early and improve its prognosis is an immediately understandable concept. Applied to *asymptomatic* individuals, this concept is called screening, and in fact becomes a complex procedure. This article recalls the nosological reasoning which bases the principles of screening, in particular, Report the principles and the method applied during the first operation of mass screening for colorectal cancer in the wilaya of Bejaia, which took place between January 2017 and December 2019, the results reported rather concern the strategy implemented and its application on the Algerian field which seems to be virgin hence the need to focus on the feasibility of this type of pilot action, We have developed a strategy with the construction stages and their implementation methods which we explain in detail in this article.

INTRODUCTION

Several definitions of screening are used. We propose that of Alan S. Morrison **[1-2]** in the second edition of his work *"Screening in chronic disease"*: screening is "the examination of asymptomatic individuals to determine their probability of having the condition that causes the purpose of the screening. Individuals whose probability of being affected is high enough are then subjected to comprehensive diagnostic investigations. Individuals with the condition are then treated." It appears from this definition that screening is a threefold process. The first aims to determine the probability that an individual presents a condition (most often, a disease, but also a premorbid condition or a risk factor). The second process aims to establish a diagnosis, and the third consists of intervening in the event of a positive diagnosis. This intervention is most often curative

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(medical or surgical), but it can also be aimed at monitoring (for example: by regularly repeating the dosage of a biomarker). The effectiveness of screening depends on numerous and complex conditions. Clinicians, both hospital and outpatient, are often confronted with this complexity. This article presents a summary of the methodological and practical issues of screening, highlighting the aspects linked to the disease on the one hand and to the screening test on the other. The concept of a screening *program* as well as the validity of measures of screening effectiveness are presented. And the biases frequently encountered when evaluating the effectiveness of screening are discussed. In addition to a review of the literature, we report the methodology used to carry out mass screening of a pilot study of mass screening for colorectal cancer in Algeria.

Goals

Main objective: Carry out an organized mass screening strategy for colorectal cancers in the wilaya of Bejaia as a pilot project as part of the 2015-2019 cancer plan. Intermediate objective: Evaluate the effectiveness of the mass screening program for colorectal cancer Secondary objectives: Determine the rates of cancers detected: invasive cancers and in situ cancers. Determine the rates of cancers by stage: stage 0, stage I, stage II, stage III, stage IV Determine the rates of precancerous lesion polyps and adenomas detected and their histological characteristics. Intermediate Objective: Evaluate the Quality of the colorectal cancer screening program Secondary Objectives: Determine the rates of tests declared non-analyzable. Determine the recall rates: number of subjects with a negative test/number of subjects screened. Determine the predictive values of the screening test: number of cancers detected/number of positive screening tests. Determine the rates of examinations carried out for diagnostic and therapeutic purposes: colonoscopy, biopsy, pathological examination, surgical procedure, medical treatments and their waiting times. Determine the complication rate linked to therapies or diagnostics. Intermediate Objective Evaluate the cost/effectiveness of the organized colorectal cancer screening program implemented in the wilaya of Bejaïa. Secondary objectives: Determine the cost of the mass screening campaign for colorectal cancer in the wilaya of Bejaia

METHOD AND PATIENTS

a) Type of study:

This is a screening-type epidemiological study. Requiring the citizen's agreement and consent by signature or fingerprint.

b) Study population:

Definition of Eligible Subjects: Male or female persons aged between 50-74 years old with an average risk of developing colorectal cancer and living in the following three Daïras: Souk El Ténine (SET), Adekar daïra, Amizour commune.

Non-inclusion criteria: -Individuals with family history and/or personal history of colorectal cancer. -Individuals presenting symptoms suggestive of colorectal cancer. -Individuals of whom a first-degree relative has been affected by colorectal cancer or an adenoma of

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more than one centimeter in diameter documented before age 65 -Individuals of whom two first-degree relatives have been affected by this type of cancer regardless of regardless of their age at the time of diagnosis. -Individuals suffering from extensive inflammatory bowel disease (IBD) at the time of diagnosis or screening and having been present for more than 20 years. -Individuals with a history of familial adenomatous polyposis (FAP). -Individuals with LYNCH syndrome. -Individuals with several cases of colorectal cancers in the same family branch regardless of the patients' age at the time of screening. Duration of the study: from January 2, 2017 to February 28, 2019, i.e. 26 months

Number of subjects necessary: In our mass screening study the number of subjects must target a sufficiently large population, presenting homogeneous elements. The risk of errors is minimized when the population is exhaustive. However, other methods could be used such as random sampling and its variants, cluster sampling, systematic sampling, stratified sampling, digital sampling.

Since the number of target population in the wilaya of Bejaia is estimated at 100,000 inhabitants, 10% of the population corresponds to 10,000 people. We are working on a representative sample of 10,000 citizens and we want to reach 40% of this population, which corresponds to 4,000 citizens in the three dairas. The choice of the dairas concerned was made on the basis of the following elements: The wilaya of Bejaïa (is an Algerian wilaya, located in the northeast of the country, in the Kabylia region on its Mediterranean coast. It is administratively divided into 19 daïras and 52 communes. The resident population as assessed during the 2015 census is 912,577 inhabitants. The population aged over 50 and under 74 is estimated at 100,000 inhabitants.

This study was carried out on a population representative of the general population, i.e. 10% of the target population, which represents 10,000 citizens residing in the following daïras: -Daïra of Souk el etenine composed of two municipalities: Souk el etenine and Melbou located at the outlet of Assif Augrioun on the coast with a target population of 4000 inhabitants. -The Daïra of Adekar: located in the northwest of the wilaya of Béjaïa and borders the wilaya of Tizi-Ouzou. Located in a mountainous region reaching an altitude of 859 m, the daïra brings together the three municipalities of Adekar, Taourirt Ighil and Beni Ksila and the target population concerned is 2000 citizens. -The daïra of Amizour in its commune Amizour with a target population of 4000 citizens.

The choice fell on these three dairas for the following reasons: -Each daira represents a different geographical model from the other: coastal, inland, mountainous. - Urban, suburban and rural characteristics; exists in each of the chosen daïras. - The target population in each daïra is exhaustive to the extent that the daïra of Souk el Tenine is concerned by its 4,000 inhabitants, the Daïra of Adekar is represented by its 2,000 inhabitants and the commune of Amizour brings together 4,000 inhabitants. These residents are aged over 50 and under 74.

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Means and tools of the study:

1. Health Map of the pilot Daïras: The health map of the wilaya was consulted and we find the number of doctors presented in Tables 1, Table 2 concerns the number of general practitioners at the level of the pilot Daïras:

Table 1: Health map of the wilaya of Bejaïa 2015

Doctors Structure sanitary	generalist	endoscopist	Internist	Anato-mopathologists	Cancer surgery	Oncologists
University Hospital	02	05	06	07	14	02
EPH	06	03	-	-	08	05
Polyclinic	52	00	-	-	-	-
EPH (private)	02	08	03	04	16	00
TOTAL	**61**	**16**	**09**	**11**	**38**	**07**

Table 2: Number of general practitioners at the level of pilot Daïras

Structure sanitary	Doctor Generalist SP
Souk Etenine Polyclinic	10
Melbou Polyclinic	10
Amizour Polyclinic	15
Adekar Polyclinic	05
Total	40

2. Colorectal cancer screening management structure

The colorectal cancer screening management structure, which was set up in December 2016, is the operational body ensuring the local organization of colorectal cancer screening in the wilaya of Bejaïa. Its missions are to raise awareness and inform the population, create and manage a centralized file of invited people, the results of tests and examinations carried out, evaluate the quality of the program and provide feedback. Towards health professionals. This structure is located at the Khellil Amrane University Hospital in Bejaia. The management structure is placed under the responsibility of a general practitioner who has received training in screening and general oncology. It is assisted by a regional scientific committee comprising representatives of professionals involved in the screening program, namely an oncologist, a cancer surgeon, a gastroenterologist, an epidemiologist, accompanied by a medical secretariat and a platform of communication: landline telephone, printer, and computer.

3. Software:

Created in September 2016 and set up by a computer scientist from the University Hospital, the screening software (CD attached) is made up of several applications that can be manipulated using a simple web browser. It is placed on a server allowing actions on WIDGETS (buttons, forms, etc.) via a computer network which once the user is connected by a password ensuring the security of the information, it is directed to a table page of board summarizing the situation and the state of play as well as the progress of the project in the pilot Daïras.

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4. The Questionnaire:

The questionnaire is one of the main instruments in our study, in particular to identify eligible people, and those who are not with an orientation of a course of action based mainly on the existence of symptoms or personal history or familial colorectal cancer. The questionnaire is made up of the following sections:

- Section for the identification of the General Practitioner of the screening unit and the place of practice with a citizen identification number (this number found on the stool sample) - Section concerning the citizen's marital status and contact details: address and telephone number - Section detailing health indices: age, weight and height, body mass index, diet, personal and family medical history of the citizen. - Section concerning information on the organized screening program for colorectal cancer in the daïra, information on the risks of colonoscopy and the consent of the citizen for the practice of the immunological test on his stools by his signature or his fingerprint on the end of the questionnaire.

5. Colorectal cancer screening test used: The colorectal cancer screening test used in our study is **a** rapid chromatography immunological test which allows the qualitative detection of blood in stools, the membrane is coated with anti-hemoglobin antibodies in the test area. During the test, the sample reacts with the particle coupled with the anti-hemoglobin antibody, the mixture moves along the chromographic membrane by capillarity and thus generates a colored line. The presence of a colored line at the test area indicates a positive result and its absence indicates a negative result. At the same time a colored line will always appear in the control zone; if this line is missing the result is considered invalid **Figure 1.** The detection threshold for human hemoglobin is preset at 50 ng/ml.

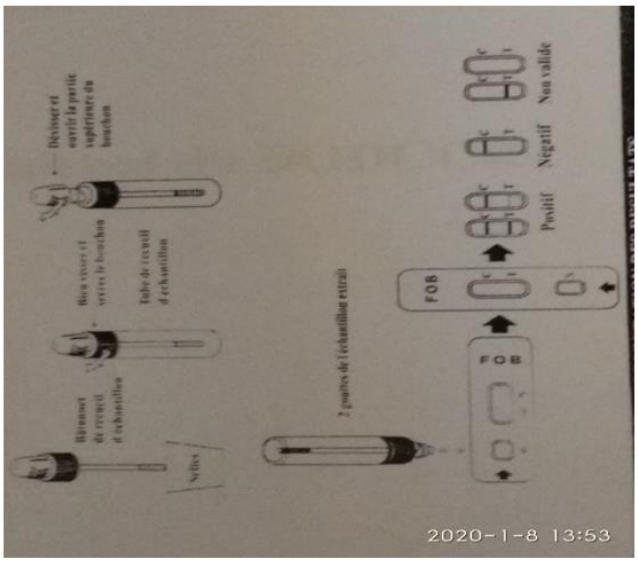

Figure 1: Réaction possible dans le test du dépistage utilisé dans l'étude

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6. Planning the Colorectal Cancer Screening Program:

To ensure the smooth running of our prevention and fight against colorectal cancer program, we were obliged to initiate a methodical organization. Before proceeding with the development and implementation of the program, we began with a first step which consisted of defining the general political will at the national level represented by the 2015-2019 cancer plan. The first contact with the plan coordinator was made in March 2016. Convinced by the idea of the proposed project, he proceeded with the creation of the national colorectal cancer screening committee in May 2016. It was at this time that he the foundations of the program have been established and a colorectal cancer screening coordinator in the wilaya of Bejaïa has been designated. Before moving on to the organization of the program itself, the coordinator formed a regional committee, which will join in his efforts to involve the people concerned at the local level. **Figure 2** illustrates the different stages of the program development and implementation process and how they fit into the initial stage of choosing the general policy (cancer plan 2015-2019). The process approach was adopted for the development of the colorectal cancer screening program in our study which is defined according to the ISO 9000/2015 standard as: **"a set of correlated or interacting activities which uses input elements to produce an expected result.**

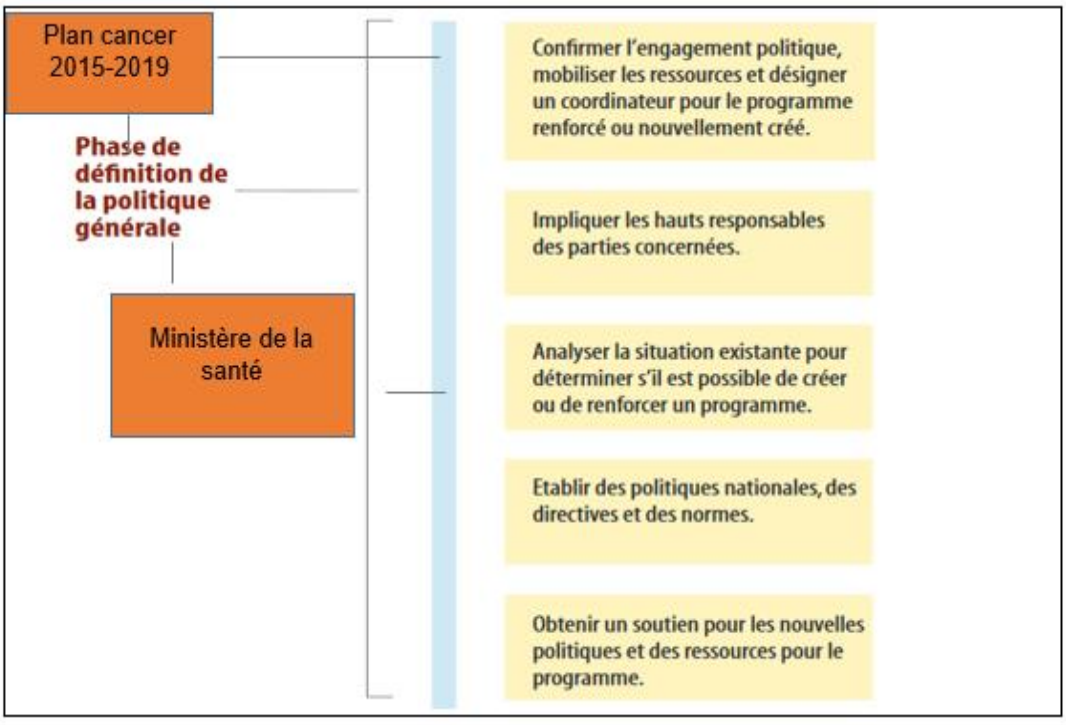

Figure 2: Precursor steps for developing the DOCCR program

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A. Regional committee for colorectal cancer screening in the wilaya of Bejaïa:

Created in June 2016, it is made up of different players and experts in the colorectal cancer screening process: medical oncologist, gastroenterologist specializing in digestive endoscopy, epidemiologist, oncological surgeon for colorectal cancer, pathologist, computer scientist specializing in development of medical software, expert in quality and process development, an administrator of the university hospital establishment of Bejaia University Hospital, a representative of the health department of the wilaya of Bejaia, a health economist, a representative of Civil society. The main roles of the regional committee consist of: -Involving local stakeholders in the development and implementation of the program. -Assessing local needs for the program. -Supporting all administrative, financial and marketing activities. Evaluation throughout the course of the program. -Coordinate activities between the different elements of the program. The first mission carried out was to create the identity of the approach to the screening process in our Wilaya, and the Logo**, figure 3** below is a sheet expressing the identity, the logo, the objectives in a summary manner.

	PROCESSUS DE DEPISTAGE DU CCR	Réf.	PRO
		Version	01
		Date	Juin 15
Objectif Principal	Réaliser une stratégie de dépistage du CCR		
Entité pilote	D.S.P W. Bejaia, C.H.U khelil Amrane		
Périmètre d'application	Structures sanitaires de la Wilaya de Bejaia/commune (Polyclinique)		
Bénéficiaires du processus et leurs attentes			
Bénéficiaires	**Attentes**		
Les collectivités	• détection précoce des CCR • Prise en charge • Guérison		
Pouvoirs publics	•Outils efficace « stratégie de dépistage organisé pilote » •Réduction de la Mortalité et du cout lié a la prise en charge du CCRm		

Figure 3: Colorectal cancer screening identity sheet in the wilaya of Bejaïa

B. Identification and implementation of the diagnostic and therapeutic network:

Our prevention strategy includes stages of diagnosis and therapy, it was first necessary to check the functioning of the services practicing colonoscopy and biopsy (for the examination of presumed invasive lesions) as well as the histopathology laboratories, but also the care services for patients with invasive cancer, in particular the cancer surgery service, medical oncology service and radiotherapy (prescribed for cancer of the lower and middle rectum). A multidisciplinary consultation meeting was created on January 5, 2018 and is an integral part of all treatment services.

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The smooth running of the prevention program required qualified personnel, equipment and materials in working order. They must also be closely linked to each other to guarantee patients appropriate care and the continuity of care required by the ethics of screening. It was also necessary to designate other hospital structures even outside the wilaya to ensure replacement in the event of equipment breakdown or to make up for the lack of specialized medical personnel, in order to guarantee the diagnostic and therapeutic aspect of the colorectal cancer screening process. And its continuity. **Figure 4** shows the nominal network of doctors involved in the screening process.

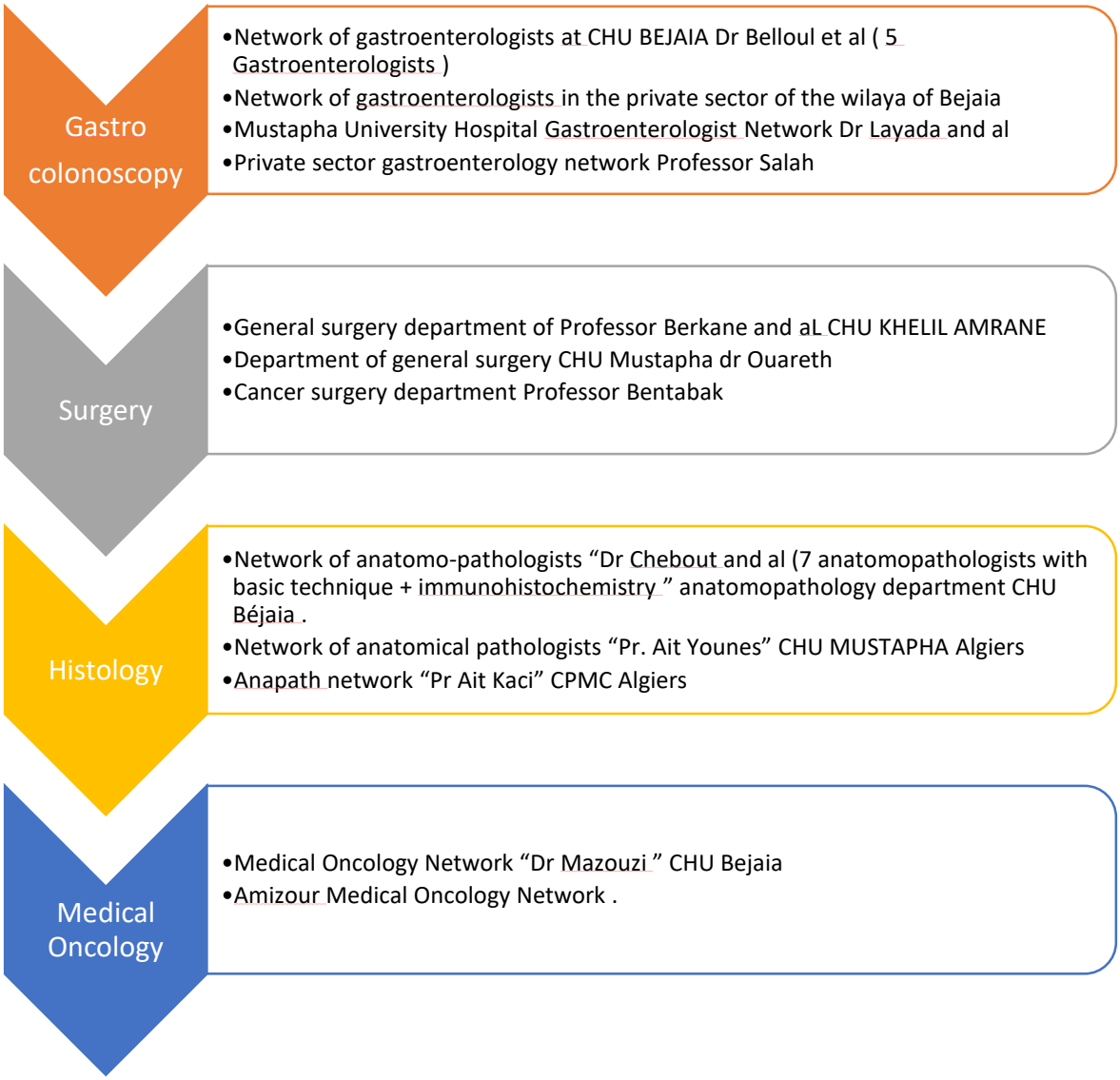

Figure 4: Diagnostic and therapeutic network for colorectal cancer in the wilaya of Bejaïa

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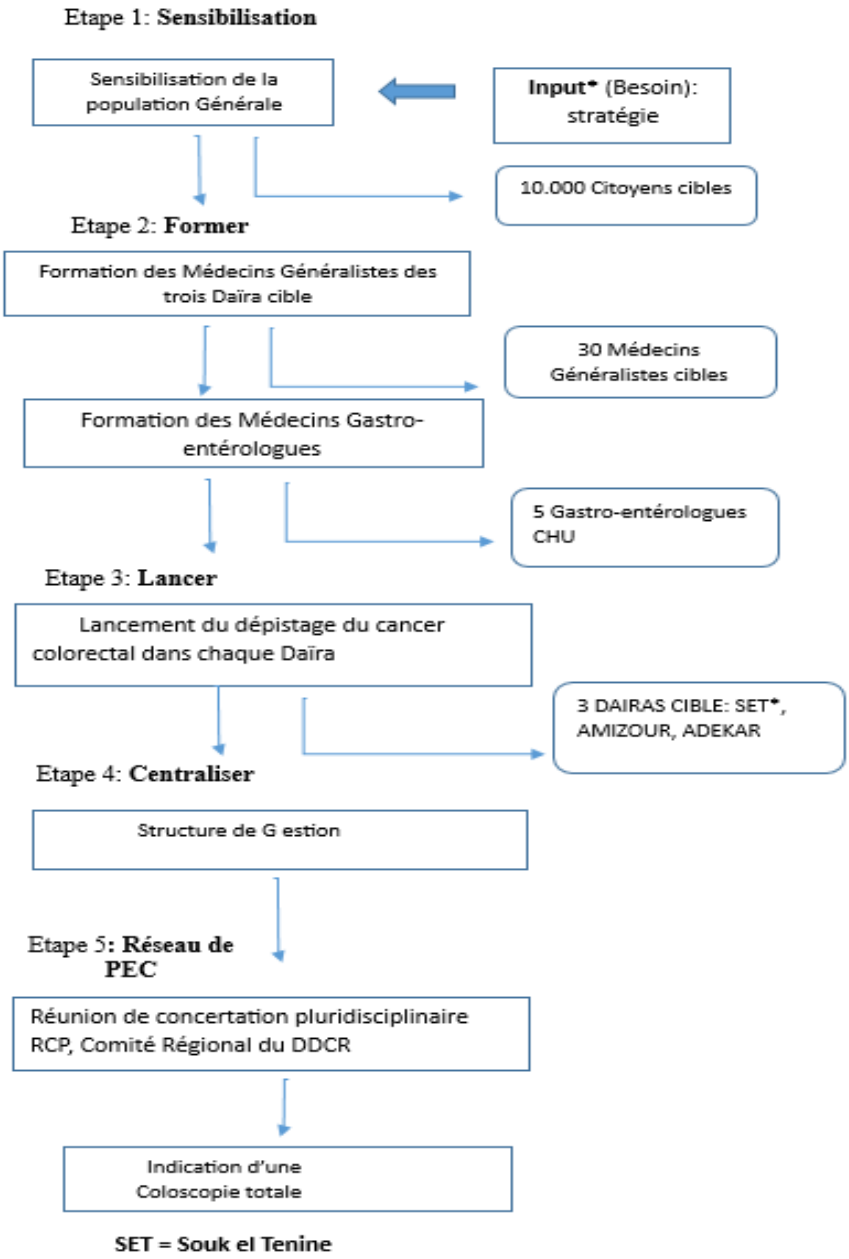
RESULTS

I.Definition of the stages of colorectal cancer screening



1. Definition of the colorectal cancer screening strategy in the wilaya of Bejaia:

This step concerns the choice of our strategy which will direct the program throughout the period of study recruitment, the selection of screening and treatment methods, determining the frequency of screening, the target age group and the coverage rate.

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Our colorectal cancer screening strategy is aimed at women or men aged over 50 living in the daïras of the wilaya of Bejaïa. This mass screening takes place every 2 years until the age of 74 using the qualitative immunological test designated and indicated in the means and materials chapter above.

2. Definition of the parties concerned by the screening process: The following diagram illustrates the different parties concerned by the development and implementation of the colorectal cancer screening process in the wilaya of Bejaia, in cartography Figure **5.6** process approach is distinguished by the simplicity of identifying the “input” need and the “output” production and the complex interactions between the different stakeholders in the colorectal cancer screening process.

In our case the need expressed by our work is to develop and implement an organized screening program for colorectal cancer, the output would be to recover a strategy demonstrated by its effectiveness and quality based on the famous **wheel of** continuous improvement.

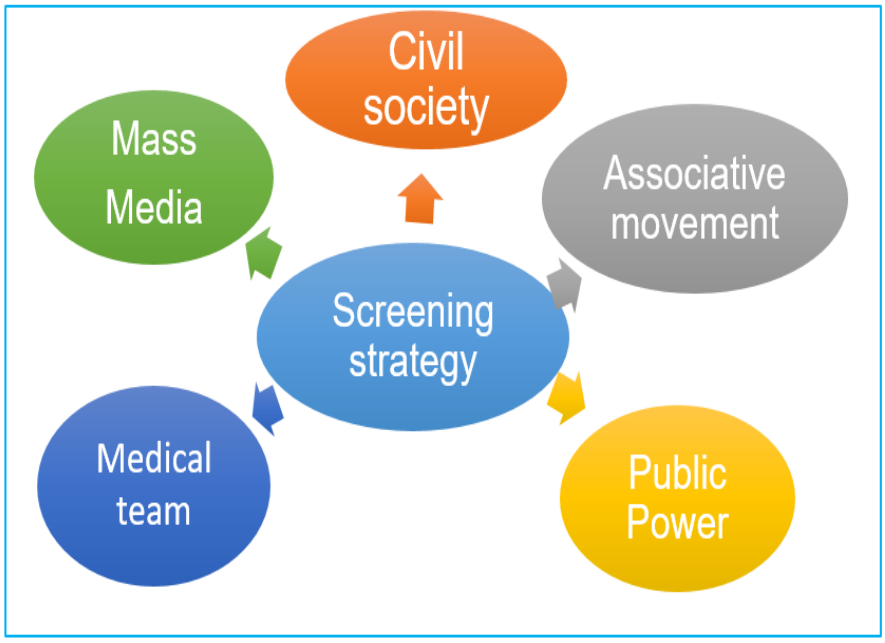

Figure 5: Illustrative diagram of the Parties concerned by the colorectal cancer screening strategy in the wilaya of Bejaïa

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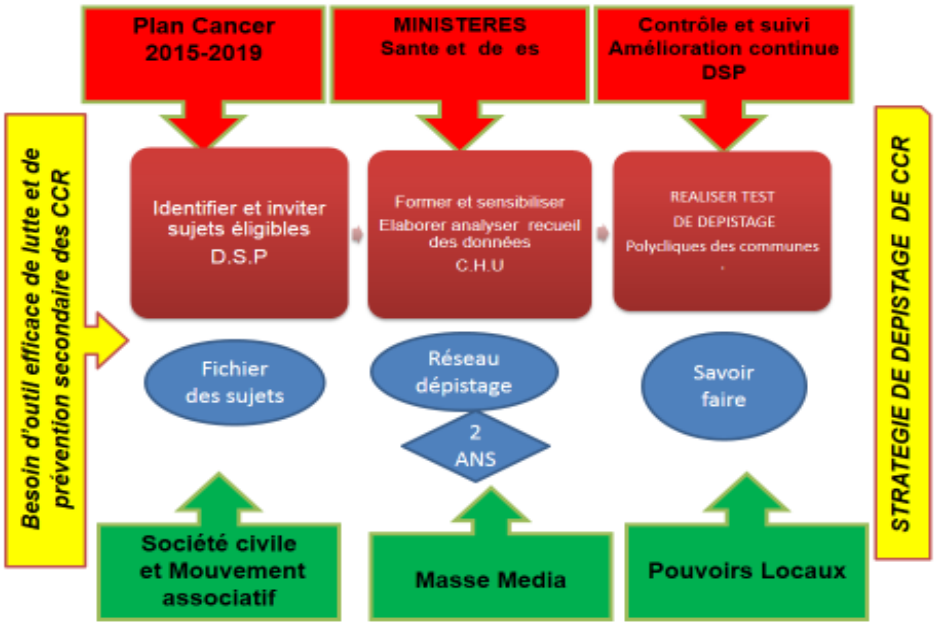

Figure 6: Mapping of the colorectal cancer screening process in the wilaya of Bejaia

Figure 7: Principle of the Deming Wheel (Image taken from the site www.piloter)

3. Training:

At the level of each component of our developed program, all types of personnel involved must be qualified and competent in their respective functions. To do this, we started by defining the knowledge, behaviors and skills necessary to carry out the tasks entrusted to them.

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It was also necessary to offer them training, as needed, so that they could perform their role to the required quality level. This concerned those who work in the field, providing health information and education to the population, non-medical hospital staff, and medical staff responsible for screening, diagnosis and treatment. The training of general practitioners was the first occupation of our regional committee, a course program was studied and planned over a period of one month for each health structure in the daïra concerned, the training was aimed at all doctors willing and voluntary general practitioners, from the two health sectors in the wilaya of Bejaia (public, liberal), every Monday of the week.

Referral doctors have been designated to manage the screening activity in each pilot daïra. Information and awareness meetings were also planned and carried out in the three daïras concerned with civil society represented by cancer associations but also village associations. The objectives of the meetings were to raise awareness not only of the colorectal cancer screening project, but also of the risk factors for the development of colorectal cancer.

The training was also aimed at doctors specializing in gastroendoscopy. Expert specialists were invited to train the 5 gastroendoscopist doctors in the resection of polyps and adenomas for a period of one year from January 2017 to January 2018. The general practitioner of the management structure has benefited from multidisciplinary training, namely: handling of colorectal cancer screening software, digestive oncology, and epidemiology. The paramedical staff concerned in the pilot daïras received training on the handling of the qualitative immunological test and on the method of storing stool collections.

4. Raising awareness among the target population

Informing the target population about the prevention of colorectal cancer is essential for them to attend screening services and agree to follow-up. This is why information and education methods and materials are important. The needs assessment already carried out before this radical step must take into consideration the tools potentially usable to reach the target population concerned in their community and in local healthcare structures.

The aim was to examine, among other things, the information strategies used in other chronic disease screenings in clinics and within the population. We had carefully established information supports (poster type) taking into account the rapid visualization of the object of the proposed project, its validity in time and space; it was important to make a choice on the relevance of the message they convey. It is also important to take into account the opinions and needs of the population (men and women), their level of information on cancer in general and colorectal cancer specifically and their expectations in terms of care, to carry out campaigns information that answers their questions and concerns.

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The community health workers and mobile teams that the regional committee created were essentially composed of medical student volunteers or volunteers who had received prior training, in direct contact with members of the community. They notably checked their understanding of the concept of prevention, their level of information on colorectal cancer, their knowledge of the existence of the prevention project in the wilaya of Bejaïa. They were also able to inform us of their perception of screening and their attitude towards the local healthcare system and shed light on possible obstacles to the introduction of screening.

Multiple campaigns were carried out throughout the duration of the screening, but at different rates from one period to another and from one daïra to another. The first contact with the population of Bejaïa occurred via communicative audio services (Radio Soummam) during the month of Ramadan 2016 with a broadcast hosted by different specialists on a well-defined program studied by the regional committee. The communicative audio broadcasts were continued throughout the period of colorectal cancer screening in the wilaya of Bejaia.

Other awareness activities were also carried out (namely the organization of communicative caravans to the most isolated regions, particularly in the Adekar region, awareness campaigns in schools and public communities) in collaboration with associations of each daïra concerned (see **Table 3).** Visual supports, such as posters, were distributed and displayed in the public spaces of the daïras announcing the trigger dates for each daïra and the criteria of the population invited to this mass screening under the slogan “2nd deadliest cancer but 90% of cure if detected early.

5. Invitation of the target population: In our study, the invitation did not take place by mail, the target population was invited mainly through awareness campaigns carried out in each daïra and especially by means of audiovisual information through Radio Soummam which is characterized in the region by a large audience in the wilaya, The choice fell on a health program directed by a general practitioner who knows the region, transmitted every Monday on Soummam radio from 5 p.m. until 6 p.m. (Visit the site web to listen to the content of the broadcasts: http://www.radioalgerie.dz/player/fr/live/06-Bejaia). Radio Soummam was not the only means of information, but we contacted other national channels: channel 3 (French language), channel 4 (Amazigh language), and channel 1 (Arabic language). Other methods of invitation were used such as the written press; articles published on written press numbers frequented by the population of Bejaia, but also on the written press.

Algerian television was asked to broadcast information via a health program followed by many Algerian viewers, the idea was above all to transmit the dates of the initiation of colorectal cancer screening in the wilaya of Bejaia See website of the show is broadcast by the A3 channel on: https://www.youtube.com/watch?v=tjpi_IC-LZY . Table 3 shows the awareness actions that were planned and carried out during the study period.

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Table 3: Awareness actions carried out

Actions	Objectives pursued	Attendees	Date and place
Organization of the 1st national conference on CRC screening 2nd congress – 3rd congress	- Launch a debate and reflection on the problem of mass screening in Algeria - Establish recommendations on the issue of CRC screening in Algeria	- Gastroenterologists - Epidemiologies - Surgeons - Oncologists - DSP (Wilaya of Bejaia) - Faculty of Medicine (University of Bejaia)	- Bejaia January 29 and 30, 2016 - Bejaia January 3, 2017 - Bejaïa on August 31, 2019
Creation of the regional CRC screening steering committee	- Create a ccr screening management strategy - Monitoring of planned actions - Continuous improvement of the ccr screening process	- Prof. K. BOUZID - Pr. M. HAMDI CHERIF - Pr. S. BERKAN - Prof. F. BOUALI - Dr. C. MAZOUZI - Dr. M. BELOUL - Dr. M. LAOUSATI	Bejaia Feb. /2016
Actions	**Objectives pursued**	**Attendees**	**Date and place**
Coordination meeting with local officials	- Integrate the population's expectations into the CRC screening process - Ensure support and assistance from local authorities	- Mr. DSP Wilaya of Béjaïa - Director of Prevention for the Wilaya of Bejaia	Bejaia March. /2016 April. /2016 June. /2016 Sept./2016 Oct. /20126
Coordination meeting with the national CRC Cree screening committee in March 2016	-Project display	- Pr. ZITOUNI - Prof. K. BOUZID - Pr. ABID - Pr. FERAOUN	INESP April. / 2016 June. /2016 Oct./20016
Organization of media awareness campaign	- Raise awareness among citizens about CRC screening	- Radio SOUMAM Bejaia - Written press - Regional ccr screening committee	June to September 2016
Meeting with civil society and associative movement	Involve society and the associative movement in the project	Association “TUDERT” “Souk el Tenine” Association “Erahma” Boumerdes Association Algerian Red Crescent Association of Bethalasimique Bejaia	June to Oct. 2016- December 2016

Colorectal cancer screening in the wilaya of Bejaïa 2017/2018

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II The initiation of colorectal cancer screening in the wilaya of Bejaia:

A scientific event was planned and carried out in collaboration with the parties concerned, the scientific community and healthcare personnel, to announce and inaugurate the program on January 2, 2107. This inaugural demonstration took place after checking. To present the program, members of the regional and national committee team, representatives of the health sector of the wilaya, this event brought together decision-makers, main partners, community representatives and the media. Members of the regional and national committee team, representatives of the wilaya health sector. This organized event aimed to draw up the broad outlines of the program and to arouse the enthusiasm and motivation of the partners and the population of the wilaya of Bejaia.

1) Practical organization of colorectal cancer screening in the wilaya of Bejaia

The Daïra of Souk el Tenine:

The main peripheral health structure of the daïra located in the capital of the daïra, the Souk el Tenine polyclinic began organized screening for colorectal cancer in its locality on January 2, 2017 in parallel with the peripheral health structure of Melbou, located 5 kilometers from the capital. The practical organization for this polyclinic is to provide specialized consultation for citizens aged over 50 and under 74.

The population is therefore sorted at reception by health workers who direct citizens to the doctor responsible for the colorectal cancer screening consultation, in the same way as the citizen who presents for care services. Once the orientations have been made, two offices are set up: one receives citizens presenting for colorectal cancer screening, the other takes care of citizens initially presenting for a consultation with the general practitioner who invites them to get tested.

The general practitioner questions the citizen according to the questionnaire and notes the answers on the questionnaire, which aims to identify the eligible population at average risk of developing colorectal cancer. The general practitioner emphasizes at the end the complications that can arise during the different phases of the diagnosis, in particular the risks of colonoscopy in the event of a positive test and surgery in the event of cancerous lesions, specifying that the positivity of the immunological test could have other etiologies (polyps, hemorrhoidal lesions).

Finally, compulsory consent through a signature of the citizen is requested. The general practitioner must ensure good understanding of the questions and good transmission of the message. Once this step has been completed, the general practitioner gives the citizen eligible for the immunological test a new clean collection box and asks him to bring the box back to him. Filled with freshly passed stools. On the box are mentioned his contact details and a code similar to the questionnaire. The next day, the citizen returns with his collection box and the immunological test is then carried out on site by a laboratory technician who mentions the result on the questionnaire form.

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In the case of a negative test: the citizen is invited to repeat the screening consultation in two years from the date of their first consultation and the questionnaire document is then sent to the screening structure at the Khellil Amrane University Hospital by a vehicle put into service for this purpose once a month **figure 8**.

Figure 8: Negative qualitative immunological test (polyclinic of Souk el Tenine)

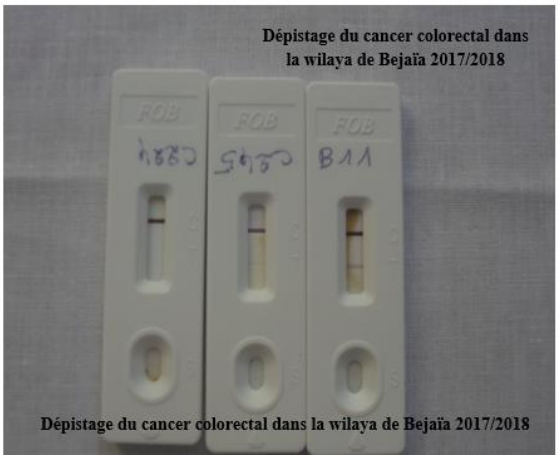

Figure 9: Positive and negative qualitative immunoassay

In the case of an ineligible citizen: the population which is not eligible for the immunological test to be carried out, that is to say people with symptoms which may be related to colorectal cancer, or a personal history of colorectal cancer or a first-degree family history of colorectal cancer. These people are referred to the management structure at Khellil Amrane University Hospital for targeted support (targeted screening) by a typical letter. In the case of a positive test: the citizen is sent to the colorectal cancer screening structure at the Khellil Amrane University Hospital by a typical letter specifying the reason: “Positive test”.

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The Commune of Amizour: The polyclinic of the commune of Amizour started colorectal cancer screening on February 26, 2017, the strategy of this pilot Daïra was to organize a specialized daily consultation for colorectal cancer screening outside of consultations medical. Civil society represented by the "Tudert" association agreed with the referring doctor to schedule the citizens who traveled in collaboration with the organizers of the association by utility buses with a nominative list of volunteers from the most isolated areas. Once the citizens are in place, the same procedure is then followed as in the health structures of the daïra of Souk el Tenine except that coded boxes are re-addressed to the referring doctor by the organizer of the "Tudert" association for the areas landlocked. Concerning citizens who live near the screening structure, the transport of collection boxes is provided by the citizens themselves to the doctor at the polyclinic.

The Daïra of Adekar: Colorectal cancer screening in the Daïra of Adekar began on March 26, 2017 with an attractive ceremony whose main objective is to invite the target population of Adekar to participate in the project. The ceremony was organized by the associative movement of the villages of Daïra in collaboration with the health structure of Daïra in the presence of the coordinator of the 2015-2019 cancer plan and the President of the Algerian Society of Medical Oncology. The referring general practitioner of the daïra implemented a strategy similar to that used in the commune of Amizour but above all introducing the movement of medical caravans towards mountainous areas and isolated villages to carry out the screening in its entirety for a few days, in collaboration with volunteer doctors from other Daïras and this while avoiding winter periods of the year (snow and rain, low or high temperature). The rest of the process remains identical to that used by the other two pilot daïras.

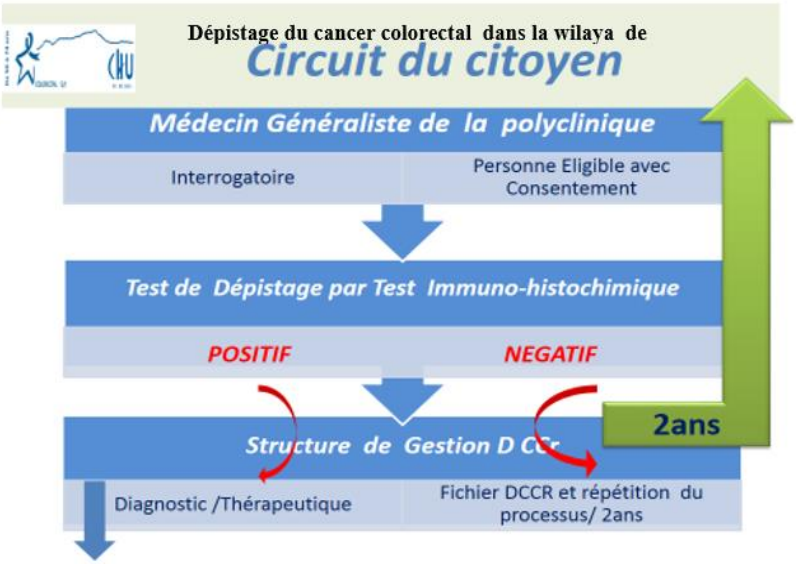

Figure 10: Organization chart of the colorectal cancer screening process in the wilaya of Bejaia

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2) The colorectal cancer screening management structure in the wilaya of Bejaia:

The citizen is received by the general practitioner of the colorectal cancer screening management structure through a liaison form, he opens a medical file for monitoring and taking in charge, repeats the questionnaire then explains the modality and preparation for colonoscopy, provides a document explaining unauthorized and authorized foods during preparation and an appointment for its completion. He also takes care of entering questionnaire responses from all citizens who present themselves to the three peripheral screening structures in the pilot daïras. The general practitioner of the management structure organizes with the regional steering committee multidisciplinary consultation meetings (RCP) for patients' therapeutic decisions and retrieves the results of the histological study of resections carried out during diagnostic and therapeutic procedures.

3) Carrying out colonoscopy to screen for colorectal cancer at the Khellil Amrane University Hospital

The composition of an endoscopy unit is important to ensure quality services for patients (safety, comfort, competence), whether hospitalized or external. Citizens with a positive test carry out their colonoscopy at the digestive endoscopy unit as part of mass screening for colorectal cancer. The endoscopy unit is located at the Khellil Amrane University Hospital, ensuring its proper functioning. Since January 2017, the CRC screening activity has been an important part of the daily exercise of digestive endoscopy.

In order to ensure quality care and the proper functioning of an endoscopy unit, it was important to ensure optimal working conditions for endoscopists, resuscitators and the paramedical team: • Maintenance of equipment: cleaning, disinfection, maintenance, storage, sterilization • Endoscopy platform • Secretariat (reception, appointment, report) • Endoscopists /nurses / stretcher transport • Hospital hygiene • Continuing training for doctors and paramedical staff • Accreditation, quality control. • Biomedical Suppliers Pharmacy • anesthetists/pathologists • Equipment / Washing machine, endoscope
• Correspondents from the endoscopy service to the anatomy pathology service provided by the management structure.

The medical and paramedical staff of the endoscopy department at the Khellil AMRANE University Hospital are made up of different bodies: - main endoscopist operators from the Bejaïa University Hospital ensuring organized colorectal cancer screening shifts - expert operators and supervisors.

- A nurse responsible for maintaining digestive endoscopy equipment and assisting with interventional endoscopy procedures.
- A maintenance agent. The digestive endoscopy unit is composed as follows:
- A waiting room for patients.
- A digestive endoscopy room including:

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- A “Fujinon” type 4,450 high definition digestive endoscopy column with “Fice” type electronic chromo endoscopy;
- Two high definition colonoscopes, one short 1m30 and one long 1m60; • “Erbe” type 200 d electric scalpel with “Endocup Q” option • A mobile vacuum cleaner; • Typical disinfection bench with two washing pumps; • Digestive endoscopy consumables Diathermic loops, cold loops, basket loops, injection needles, clips; • Emergency equipment emergency trolley equipped with intubation probes, suction probes, laryngoscope, adrenaline suction probe, oxygen tank. At the end of the total colonoscopy, the gastroendoscopist doctor gives the patient a medical report. In the event of a biopsy or resection of polyps or adenomas, the fragment is sent to the management structure in order to take it to the anatomopathology department.

4) Pathological analysis

The histological study of the biopsy fragments was carried out at the anatomopathology department of Bejaia University Hospital. In the event of a lack of reagents for histological analysis or paramedical personnel, the blocks were sent to the pathology services.

5) Surgery

Cases of cancer or deep lesions which do not require endoscopic treatment are operated on at the general surgery department of Bejaia University Hospital.

6) Radiotherapy

Cases with indication for radiotherapy in cancer of the lower and middle rectum are referred to the radiotherapy department of the CAC of Sétif.

DISCUSSION

This is a national pilot project initiated in the wilaya of Bejaïa, and it concerns all women and men aged 50 -74 living in the three designated pilot daïras, namely the daïra of Souk el Tenine, commune of Amizour, daïra of Adekar. Which makes a total target population of 10,000 citizens. The choice of the Daïra mentioned was based on the geographical variations which characterize each of them. It should be noted that this geographical difference is representative of the majority of Algerian wilayas with a high popular concentration. The wilaya of Bejaia offers us this advantage in its geographical architecture. We chose that the study be carried out on the entire target population aged 50 to 74, i.e. the 4000 inhabitants of the daïra of Souk el Tenine, the 2000 inhabitants of the daïra of Adekar, and the 4000 inhabitants of the commune of Amizour according to the population register of the wilaya of Bejaïa from 2015. To ensure representability, mass screening targets the target population in an exhaustive manner with the aim of being able to extrapolate the strategy, and reproduce the methodology in order to have the same results throughout the wilaya, and on the national territory.

The main objective of the study is to determine the mass screening strategy for colorectal cancer and especially its feasibility in the Algerian field. This project aims to plan the

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precursor steps to triggering the screening process, which have been clearly identified, namely:

Awareness raising also made it possible to discover the importance of integrating the stakeholders of this project and these beneficiaries, firstly civil society and local authorities, but also to constitute the nominative list of citizens concerned by this mass screening... One of the major problems encountered in the execution of the strategy in the field is the difficulty of locating the people concerned by a daïra or wilaya file, specifying personal contact details which are non-existent, compared to pilot studies in other countries. other countries where the list of possible participants could be retrieved from a regional or national file, with a specialized study of possible variations based on population projections communicated by INSEE (National Institute of Statistics and Economic Studies) **[3 -4]** for example in the pilot study carried out in the Iles de France in its last report 2018 examining precisely the number of the target population in 2007/2008 projected in 2016 **,** the target population is invited by post including the test and its practical modality. This procedure could not be applied in our study not only because of the non-existence of the contact details of the population concerned but also because of the failures observed in the postal system. Raising awareness among the target population, using existing audio-visual communication tools, in particular audio communication by transmitting the message and inviting mass screening for colorectal cancer, is the only way for the success of this stage [**5 -6]**

The objective of information, with regard to screening, is not to blindly convince people to be screened, but to allow everyone to understand their own situation, to understand the collective aspect of the process and to make an autonomous and informed choice. The difficulty of providing information in this context deserves in-depth reflection: how can we encourage screening while respecting the right not to participate? A first consequence of this problem is the need for people delivering information to the population to be sufficiently “enlightened or trained” themselves.

2 Training

At the level of each component of the program developed, all types of personnel involved must be qualified and competent in their respective functions. To do this, we started by defining the knowledge, behaviors and skills necessary to carry out the tasks entrusted to them. It was also necessary to offer them training, as needed, so that they could perform their role at the required level of quality. This concerned those who work in the field to inform and educate the population, non-medical hospital staff, medical staff responsible for screening, diagnosis and treatment. The training of general practitioners was the first occupation of our regional committee, a course program was studied and planned over a period of one month for each health structure in the Daïra concerned. The training was aimed at all general practitioners, whether in the private or public sector, willing and willing, every Monday of the week. Referral doctors have been designated to manage the screening activity in each pilot daïra.

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The training was also aimed at doctors specializing in gastro-endoscopy, expert specialists were invited to train the 5 gastro-endoscopist doctors in the resection of polyps and adenomas for a period of one year from January 2017 to month of January 2018. The general practitioner of the management structure has benefited from multidisciplinary training, namely: handling of colorectal cancer screening software, digestive oncology, epidemiology. The paramedical staff concerned in the pilot daïras received training on the handling of the qualitative immunological test and the method of storing stool collections**. [7-8-9]**

CONCLUSION

Over the coming decades, the field of screening will see its importance grow further, with new proposals for pathologies to be screened for, new easily accessible tests (genetic tests for example), or new decision-making techniques (that of the decision shared by example). The incidence of colorectal cancers in Algeria is on the rise with an annual increase of 7%, we have exposed the methodology in planning the strategy implemented for mass screening of colorectal cancer in the wilaya of Bejaïa during the period of 'study.

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