

Secondary prevention of cancer: an overview

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Secondary prevention of cancer (screening) involves the use of tests to detect a cancer before the appearance of signs or symptoms. Before starting such a programme, the available evidence should be analysed to estimate the effectiveness of the proposed activities. Essential requirements are an understanding of the natural history of the particular cancer, availability of a test that can detect it, effective treatment for it, good evidence that early detection reduces the incidence and/or mortality, and that the expected benefits of screening outweigh the risks and costs. A screening programme should be limited to significant cancers and applied selectively, and should be integrated into the total health care programme. Programmes should take into account the risks, costs and expected benefits; provide quality assurance as well as facilities to follow, diagnose, and treat people with positive test results; maintain all records; and keep costs to a minimum. Ideally the effectiveness of screening should be demonstrated by randomized controlled trials showing a reduction in mortality, but this type of evidence exists for few cancers. Often an estimate of the effectiveness of screening must rest on other types of evidence, such as observations that the tests can detect the cancer before the appearance of signs or symptoms; that the tests can find a greater proportion of cancers in early stages; and that the patients with cancers detected through screening have higher survival rates after diagnosis and treatment although it must be recognized that these observations may be biased. This article discusses the available evidence on the effectiveness of screening for eight cancers, and gives estimates of the potential impact of secondary prevention for the year 2000.

Secondary prevention of cancer, or screening, involves the use of examinations and tests to detect a cancer as early as possible, before signs and symptoms would cause a patient to seek care. In some cases, the disease can be detected in a premalignant state (e.g., leukoplakia of the mouth, dysplasia of the cervix, and adenomas of the colon). More commonly, the lesion has already developed into a cancer by the time it is discovered and the value of early detection lies in the possibility of detecting the cancer when it is still localized and more easily curable. Other benefits of secondary prevention are the possibility of simpler and less expensive treatment as well as less pain, disfigurement and disability.

CRITERIA FOR DESIGNING SECONDARY PREVENTION PROGRAMMES

The early detection of cancers,^a whether by individual practitioners in an office or clinic setting,

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^a "Early detection" refers to the detection of a cancer by a special examination or test before the patient seeks care for signs or symptoms. "Early detection" does not imply an early stage (e.g., *in situ* or local).

or through mass screening of large populations, can be risky and expensive; specially trained personnel and special facilities are often required. Since health care resources are precious, a secondary prevention programme should be initiated only when certain conditions like those given below, are satisfied.

1. A formal analysis should be performed to estimate the effectiveness, risks, and costs of screening the selected population.
2. The screening programme should be planned as part of an integrated health care programme. For example, if one has only US\$10 of health care resources to spend on a person, it would not make sense to screen him for colorectal cancer if he is dying of malnutrition or drinking from a polluted water supply.
3. Screening should be limited to circumstances in which (a) the disease is a significant cause of morbidity and mortality, (b) the natural history is well understood, (c) there is a test that can detect the disease prior to the onset of signs and symptoms, (d) there is an effective treatment, (e) there is good evidence that early detection and treatment reduce morbidity and mortality, and (f) the expected benefits of early detection exceed the risks and costs.
4. Screening should be applied selectively to those people most likely to benefit. Selection might be

based on a person's age, sex, medical history, occupation, family history, race, national origin, or other factors.

5. The risks as well as the expected benefits of screening should be explained to the prospective subjects. The risks include any possible complications of the examination procedures, and the possibility of false-positive and false-negative test results.

6. The programme should be organized to ensure the quality of the examinations, and to minimize costs.

7. Facilities should be available to follow, diagnose, and treat people who have positive examinations.

8. Records should be kept to monitor the programme's quality and success.

DOES SECONDARY PREVENTION REDUCE MORTALITY?

Randomized controlled trials (RCTs)

Of the criteria just listed, one of the most important and one of the most difficult to verify is that early detection and treatment will decrease mortality. Ideally, before recommending a cancer screening test one would like to have its effectiveness demonstrated by at least one randomized controlled trial that used mortality as an outcome measure (RCTM), and many observers demand that several RCTMs be done. Unfortunately, this type of evidence (that early detection reduces mortality) is available for extremely few cancers. More importantly, it will not be possible to obtain this type of evidence for most other cancers.

First, in an RCTM for even the more common cancers, tens of thousands of people have to be examined and followed for many years in order to detect enough cases to give statistically significant results. Costs exceeding one million (US) dollars a year should be anticipated, and the trials should continue for at least 10 years. Second, diagnostic and treatment technologies can change rapidly and it is quite possible that the particular screening test being examined in an RCTM will change before a 10- to 15-year study is completed. Third, ethical problems can arise if (1) a screening procedure is believed to be effective and it is not offered to the control group; or (2) a procedure is not believed to be effective, and it is recommended for the screened group. But the main problem is that RCTMs cannot be conducted for most cancers simply because of their low frequencies. The frequencies of most cancers are so low that RCTMs would require at least tens of thousands, and more likely hundreds of thousands of people. For example, in the USA an RCTM that resulted in a 30%

reduction in mortality from screening for breast cancer, which has an annual incidence rate of about 150 per 100 000 women, required a total sample size of 60 000 women and that still left a 50% chance that the RCT would fail to detect the 30% reduction (1). In most countries, the incidence and mortality for most cancers are much lower, and the sample size must be proportionately higher.

While theoretically the RCTM can provide the best evidence about the mortality benefits of early detection, this type of information simply will not be available for most cancers. If this type of evidence were strictly required, it would not be possible at present to justify screening for any cancers except cancer of the breast. Not even cancer of the cervix would pass this test.

Clinical observations and uncontrolled trials

Because of the above-mentioned limitations of randomized controlled trials, the justification of screening for most cancers must rest on other types of evidence. Three of the most obvious are the observations that (1) the tests are capable of detecting cancers before the appearance of signs or symptoms, (2) these tests appear to find a greater proportion of cancers in early stages, and (3) patients with cancers detected through screening have higher survival rates and tend to live longer after diagnosis and treatment. It is important to understand the value and the limitations of these types of evidence.

On the one hand, the mere observation that a test can detect some cancers before signs and symptoms appear, or that screening appears to find cancers in early stages and to deliver higher case-survival rates can be misleading. It is possible for these outcomes to occur in screening programmes even when screening has no actual effect on mortality. For example, a lead-time bias, a length bias, a patient selection bias, and overdiagnosis could all cause a screening programme to appear to prolong life, without the programme actually having any effect on how long the cancer patients actually live.^b It is because of these

^b The lead-time bias occurs because early detection advances the time of diagnosis which, by itself, makes it appear that patients live longer and have higher short-term survival probabilities. Cancers detected in an early detection programme tend to have longer intervals than average before clinical manifestation, which may imply slower growth rates, a lower grade of malignancy, and longer survival than average. The length bias can occur if only the survival of patients with cancers detected by early detection tests is examined, and cases that are discovered in the intervals between examinations are ignored. People who receive early detection tests may be different from those who do not, or may be different from the general population, in ways that could affect their survival from a disease such as cancer (patient selection bias). Because there is no sharp boundary between nonmalignant and malignant cells, it is possible to diagnose as a very early cancer a lesion that is not cancer and would never become cancer. This "overdiagnosis" can increase the number of "cancers" detected, inflate the number and proportion of cancers detected in early stages, and inflate survival statistics.

possible biases, and the fact that randomized controlled trials correct for these biases, that evidence of effectiveness should ideally come from RCTMs. Whenever the results of well-designed RCTMs are available, they should overrule secondary sources of evidence.

The critical point hypothesis

On the other hand, there are reasons to believe that, in general, the early detection of cancer decreases mortality, and that a shift in stage does imply a real reduction in mortality. The question is most easily approached through the critical point hypothesis. One model is that a cancer grows from a small group of cells to increase in size, remaining localized at first and then spreading to invade adjoining tissues, lymph nodes, and distant organs. The critical point hypothesis assumes that there are moments in that natural history before which the cancer can be treated more successfully (e.g., when it is limited to a small area and can be completely removed surgically). If this hypothesis is true, then screening can potentially move the time of diagnosis before a critical point and thereby increase the chances of a cure and prolong life.

There are some observations suggesting that the critical point hypothesis is at least in part true. First, there is the "evidence" provided by several decades of clinical and pathological observations—that cancers appear to behave according to the critical point hypothesis since they start as tiny lesions, grow in size locally, and then spread to distant organs. The entire concept of the TNM (tumor-node-metastases) and other cancer-staging systems is based on this hypothesis.

More tangible evidence comes from two randomized controlled trials. First, in the Health Insurance Plan of Greater New York randomized controlled trial of breast cancer screening, approximately half of the cancers in women over 50 years were detected by mammography or breast physical examinations before the appearance of signs and symptoms, and overall mortality was significantly reduced, despite the fact that only about one half of the study group received all the planned examinations (1). This study directly linked early detection to increased survival and presents very strong evidence that for breast cancer, at least, advancing the time of diagnosis decreases mortality, exactly as expected from the critical point hypothesis. The reduction of colorectal cancer mortality in a randomized controlled trial of multiphasic screening adds additional support to the critical point hypothesis (2).

The evidence provided by screening for cervical cancer is less strong than for breast and colorectal

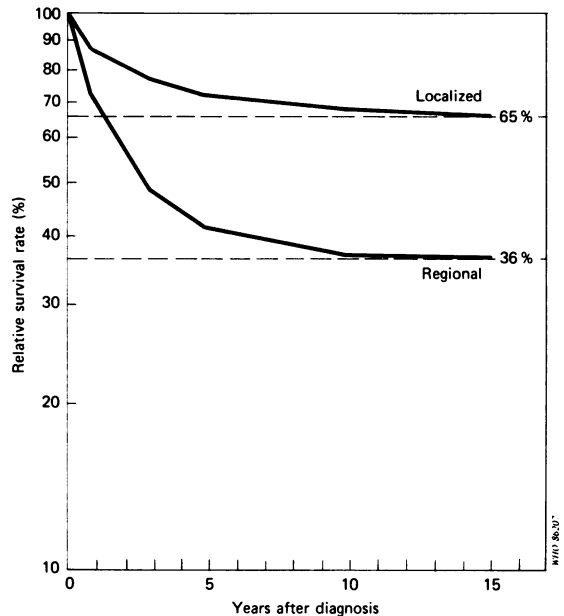


Fig. 1. Relative survival rates of patients with colon cancer detected in localized and regional stages; the two lines with dashes indicate the probabilities of a "cure" for each stage (based on data from YOUNG, J. L. JR ET AL., *Surveillance, epidemiology, and end results: incidence and mortality data, 1973-77* (National Cancer Institute Monograph 57), Bethesda, NCI, 1981).

cancers, but still compelling. There are no randomized controlled trials, but there is a large body of epidemiological evidence that after an early detection programme has been initiated, the incidence of carcinoma *in situ* increases and the incidence of invasive cancer decreases (a shift in stage), and that mortality from the disease decreases (3-7).^c These findings again indicate that making the diagnosis earlier decreases mortality for a particular cancer. It must be noted, however, that the results from three recent RCTMs of lung cancer screening did not show a reduction in mortality, even though they showed an apparent shift in stage and improved the case-survival rates (8-10). Thus, these trials do not support the critical point hypothesis for lung cancer, but they do not contradict it either.

A third type of evidence for the critical point hypothesis comes from data gathered in large pathology-based registries, which give the relative case-survival rates of cancers detected in local and

^c MILLER, A. B. Summary of United States and Canadian studies, presented at the National Institutes of Health Consensus Development Conference on Cervical Cancer Screening, The Pap Smear, Bethesda, MD, USA, 23-25 July 1980 (unpublished).

regional stages. For example, Fig. 1 shows the relative survival rates of patients with colon cancer detected in regional and local stages, in the USA. The relative survival data for each cancer and each stage are completely consistent with the hypothesis that after diagnosis and treatment, there are two distinct subgroups of patients: those who will never die of the disease (i.e., are cured), and those who will eventually succumb to it (if they do not die first from another cause). The data also imply that the annual mortality rate in the uncured group of patients is constant from year to year. The importance of this for the critical point hypothesis is that data from a wide variety of cancers show that patients with cancers detected when still localized have a higher probability of being cured and, if they are not cured, a lower chance of dying each year, compared with patients with cancers detected in late stages. These findings are not affected by lead-time bias, length bias, patient selection bias, or overdiagnosis. The effects of stage on the probability of a cure and the annual mortality rate of uncured patients are shown for several cancers in the USA in Table 1.

EVIDENCE OF SCREENING EFFECTIVENESS FOR EIGHT CANCERS

Stated briefly, there is some evidence that for cancers in general, early detection reduces mortality. With respect to specific evidence, the strongest case can be made for cancers of the breast and colorectum. The evidence is less strong but still quite good for cancer of the cervix. The argument is weakest for cancer of the lung, and for most of the other cancers the evidence is in between. The specific evidence of the effectiveness of large-scale screening programmes for eight cancers is presented below.

Cancer of the breast

A randomized controlled trial completed in New York City showed that screening with annual mammography and breast physical examinations reduced breast cancer mortality in women aged over 50 years by about 30% (1). A recent RCT (in Sweden) confirmed these results (11). The results from large uncontrolled trials show that these tests detect cancers in early stages in younger women as well and suggest that breast cancer screening may be effective in all age groups (e.g., ref. 12). Other randomized controlled trials are currently in progress (13, 14).

Cancer of the colorectum

A randomized controlled trial of multiphasic screening in Oakland, California, showed a statisti-

Table 1. Effect of stage (local and regional) on probability of cure and annual mortality rate in uncured cancer patients^a

Cancer	Probability of cure (%)		Annual mortality (%)	
	Local	Regional	Local	Regional
Stomach	35	11	62	85
Total colon	65	36	35	52
Pancreas	4	1	60	68
Lung and bronchus	20	6	63	100
Breast	60	26	11	22
Cervix uteri	70	38	30	43
Corpus uteri	70	38	30	43
Bladder	61	17	36	80
Bone	44	28	54	78

^a Source: estimated from data in reference 43.

cally significant reduction in colorectal cancer mortality in people offered digital rectal examinations and sigmoidoscopy (2). Two very large uncontrolled trials suggest a shift in stage and very high case-survival rates as a result of screening by sigmoidoscopy (15, 16).^{d, e} Two ongoing controlled studies of faecal occult blood tests indicate a shift in stage, but mortality data are not yet available (17-19).^f Three other randomized controlled trials of the faecal occult blood test were recently started in Denmark, England and Sweden. No results are yet available.

Cancer of the cervix

No randomized controlled trials have been conducted, but data from more than a dozen epidemiological studies and large population screening programmes indicate that screening with a cervical Pap smear can detect most cervical cancers in an *in situ* stage, that the frequency of invasive cancer is decreased, and that mortality is reduced (3-7).^g

^d GILBERTSEN, V. A. Unpublished data presented at the International Symposium on Colorectal Cancer, New York, March 1979.

^e HERTZ, R. E. Unpublished data presented at the International Symposium on Colorectal Cancer, New York, March 1979.

^f WINAWER, S. J. Unpublished data presented at the International Symposium on Colorectal Cancer, New York March 1979.

^g See footnote c on page 423.

Cancer of the bladder

No randomized controlled trials have been completed, but at least two tests (the detection of microscopic haematuria or abnormal cells in the urine) have been shown capable of detecting cancers in asymptomatic people, and several studies suggest a shift in stage and higher survival rates. For example, a 25-year trial in the United Kingdom found a higher than expected proportion of cancers in stage 1, and an increase in case-survival rates (20-22).

Cancer of the stomach

No randomized controlled trials have been completed. Uncontrolled mass screening programmes in Japan (more than three million people each year) have demonstrated a shift in stage with early detection, an increase in five-year survival, and a reduction in the risk of death in screened patients (23-26). A randomized trial was recently started but no results are available. A small study in Finland found a trend of increasing mortality in screened women.

Cancer of the liver

No randomized controlled trials have been completed. Population screening in China using alpha-fetoprotein detection has found many "subclinical" cases, a higher proportion of small cancers, a greater proportion of resectable cases, and improved three-year case-survival rates, compared with clinical cases (27, 28).

Cancer of the oral region

No randomized controlled trials have been completed. Numerous screening programmes have demonstrated that oral examinations can detect pre-cancerous lesions in asymptomatic people (29-32). Data on staging and case-survival rates have not been published.

Cancer of the oesophagus

No randomized controlled trials have been completed and no published data are available on case-survival rates. Endoscopy in Iran and Japan, and cytology in a large population study in China have been shown to detect oesophageal cancers in early stages, and to detect dysplasias that may be pre-malignant (33-37).

Even though it is one of the most common and serious of all cancers, cancer of the lung is not included in this list. At present, there is insufficient

evidence to justify large-scale screening for lung cancer. Three decades of controlled and uncontrolled studies have thus far failed to show that early detection reduces mortality from this disease (8-10, 38-42).

THE BURDEN OF CANCER

The incidence and mortality of the above-mentioned cancers vary tremendously from country to country. Generalizations are difficult to make but some highlights can be noted.

Cancer of the breast is more frequent in developed countries than in developing countries, more common in women with high socioeconomic status as well as Jews and Caucasians, and less common in Orientals and Blacks. Cancers of the colon and rectum are frequent in Ireland, Austria, New Zealand, Scotland, Denmark and Latin America; the disease tends to occur more frequently in economically developed areas that have diets high in fats and low in fibre.

Cervical cancer is more common in developing countries than in developed countries, an increased risk being associated with multiple sexual partners and first intercourse at an early age. Bladder cancer is very frequent in Egypt (it is the most frequent cancer in Egyptian males) and is related to schistosomiasis infection; this cancer is also more common in people exposed to asbestos and certain chemicals, such as aniline dyes. The incidence of cancer of the stomach is very high in Japan, Chile, Costa Rica, Hungary, and Austria. Frequency of this disease is low in the USA, many European countries, and Latin American countries other than Chile and Costa Rica. Liver cancer is frequently seen in some parts of Africa, Asia, and Central America, and is less common in the USA and most other Western countries. Incidence is particularly high among Chinese and African Blacks. Aflatoxins produced by moulds growing on food, and viral hepatitis infection may partly explain the high rates in Africa and Asia, as may dietary deficiencies leading to chronic malnutrition and protein deficiency.

Oral cancer is very common in India and Sri Lanka and many other areas where tobacco use (chewing) is high. The frequency is high in other parts of Asia also (e.g., Hong Kong, Singapore, Philippines), as well as France, Switzerland, and Uruguay. Nasopharyngeal cancer is relatively rare in North Americans and Europeans, but common in Chinese, Malays, Indonesians and Thais. Oesophageal cancer is common in Iran and north China, and in Bantu males in South Africa. It is the most frequent malignant neoplasm in the native population of Curaçao, but is comparatively infrequent in Cuba, Jamaica and Venezuela. In

Table 2. Estimated person-years of life lost due to six potentially preventable cancers, for the years 1977 and 2000 (in thousands)^a

Site	Developed countries		Developing countries		Worldwide	
	1977	2000	1977	2000	1977	2000
Oro-nasopharynx	87 971	93 718	210 988	293 679	298 959	387 397
Oesophagus	62 565	68 499	159 174	189 714	221 739	258 213
Stomach	404 461	445 128	997 140	1 419 707	1 401 601	1 864 835
Colorectum	340 561	372 520	264 290	382 450	604 851	754 970
Breast	225 734	247 225	179 802	253 809	405 536	501 034
Cervix	68 963	73 887	333 222	469 903	402 185	543 790
Above six cancers	1 190 255	1 300 977	2 144 616	3 009 262	3 334 871	4 310 239
All sites	3 036 739	3 322 045	4 267 677	6 103 034	7 304 415	9 425 079

^a Source: Kenneth Manton, Center for Demographic Studies, Duke University, Durham, NC, USA.

Central and East Africa, areas of high and low incidence are found in close proximity. In Europe, the incidence is highest in France.

THE POTENTIAL IMPACT OF SECONDARY PREVENTION

The above-mentioned cancers, which are potentially preventable, are responsible for much pain and suffering, as well as family disruption, economic cost, and personal loss throughout the world. Every year the number of cases of each cancer ranges from tens of thousands in small countries to more than a million in large countries. No region is protected, and in no country is cancer unimportant. The fact that cancer is the second largest killer in most developed countries is well known; less well known is that it is the third largest killer of people over five years of age in developing countries. Worldwide, each year, mortality from six cancers (the oral-nasopharyngeal region, oesophagus, stomach, colon and rectum, breast and cervix) are responsible for more than 3300 million person-years of life lost — about 1000 million person-years in developed countries and about 2000 million person-years in developing countries.^a If prevention activities are not undertaken, the worldwide loss of productive life will rise to more than 4000 million person-years by the year 2000 (Table 2). These estimates do not include cancers of the bladder

or liver; if these were added, the totals would be even higher.

It is impossible to predict precisely the effect that secondary prevention will have, but the impact could be very great. It is not correct to claim that without screening every cancer will have progressed to a late stage before symptoms develop, and every patient

Table 3. Proportions of patients^a with cancers detected in various stages^b

Site	Percentage of patients and the cancer stage at the time of detection			
	Local	Regional	Distant	Unknown
Breast	48	41	9	2
Total colon	41	26	28	4
Rectum	47	24	23	6
Cervix ^c	45	40	12	3
Oesophagus	27	18	33	23
Liver	26	11	47	16
Tongue	37	37	23	4
Lip	84	10	4	1
Bladder	82	9	6	3
Stomach	41	26	28	4

^a Whites, males and females combined.

^b Source: data from reference 43.

^c Does not include cases of carcinoma *in situ*.

^a A person-year of life is a unit for measuring the effect of a screening programme on the number of years lived by individuals in a population. It adds up the increase in the length of life of each individual caused by screening. One person-year can be achieved by having one person live one additional year, or two people live half an additional year, and so forth.

Table 4. Estimated effect of screening on mortality: reduction in person-years of life lost, for the years 1977 and 2000 (in thousands)^a

Site	Developed countries		Developing countries		Worldwide	
	1977	2000	1977	2000	1977	2000
Oro-nasopharynx	13 053	11 076	20 753	27 143	33 806	38 219
Oesophagus	5 404	5 358	30 484	13 601	35 888	18 959
Stomach	35 369	39 086	57 511	37 165	92 880	76 251
Colorectum	101 861	107 919	53 270	113 327	155 131	221 246
Breast	48 453	69 225	47 601	74 493	96 054	143 718
Cervix	62 580	61 695	273 267	355 158	335 847	416 853
Above six cancers	266 720	294 359	482 886	620 887	749 606	915 247

^a Source: Kenneth Manton, Center for Demographic Studies, Duke University, Durham, NC, USA.

will die. Nor is it true that screening will find every cancer in an early stage, and every patient will be cured. The effect of secondary prevention programmes is to increase the proportion of cancers found in early stages, the chances that a patient will live longer, and the chances of cure.

Some indication of the potential of secondary prevention in reducing mortality can be obtained by examining data on the survival of patients with cancers found in early versus late stages (e.g., Table 1), and the proportion of cancers that are currently not found until a late stage. Table 3 shows the stages of cancers at the time of detection among patients in the USA. The situation in many countries is worse since higher proportions of cancers are currently detected in late stages, and, stage for stage, the mortality is greater.

The best results currently available from screening trials indicate that screening can potentially reduce mortality from breast cancer by about 30%, from colon and rectal cancers in the order of 30%, and from cervical cancer by about 90%. Few data are available to estimate the effect of screening on mortality from cancers of the oral region, stomach,

oesophagus, bladder, or liver; but if only a 10% reduction is possible, the potential value of secondary prevention is that a screening programme in 1977 could have saved about 750 million person-years of life throughout the world, and by the year 2000 a screening programme would save almost 1000 million person-years of productive life, for each year of screening (Table 4).

CONCLUSION

Secondary prevention involves some risks, requires a special and concentrated effort, and consumes precious health care resources. Before any projects are undertaken, careful studies must be conducted to confirm that this is an efficient and effective way to improve the health of a population. As the magnitude of the cancer problem is so great, and the promise of secondary prevention is so strong, it is now time to conduct these studies, to identify the secondary prevention activities that are appropriate, and to begin these activities.

RÉSUMÉ

LA PRÉVENTION SECONDAIRE DU CANCER: UN TOUR D'HORIZON

La prévention secondaire (ou dépistage) du cancer suppose le recours à des examens et à des tests qui ont pour but de détecter le cancer le plus tôt possible, avant l'apparition de signes ou de symptômes. Mais avant tout programme de prévention secondaire, il convient d'analyser les données disponibles afin d'estimer l'efficacité des activités

que l'on se propose d'entreprendre. Il est indispensable, pour cela, de bien connaître l'histoire naturelle du cancer considéré et de disposer d'un test capable de dépister la maladie et d'un moyen de la traiter; il faut aussi qu'il soit suffisamment prouvé que le dépistage précoce réduit l'incidence de la maladie et/ou la mortalité et que les avantages

escomptés outrepassent les risques et les coûts.

Le programme de dépistage devrait se limiter aux cancers qui sont une cause appréciable de morbidité et de mortalité, être appliqué de manière sélective et être intégré au programme général de soins de santé. Dans ce type de programme, il faudrait tenir compte des risques, des coûts et des avantages anticipés, tout en s'efforçant de minimiser les dépenses, sans pour autant compromettre la qualité des prestations; il faudrait aussi disposer des moyens voulus pour suivre, diagnostiquer et traiter les individus chez qui les tests auraient donné des résultats positifs, et assurer la tenue à jour de tous les dossiers. Il est difficile toutefois de vérifier l'efficacité des activités. L'idéal serait de procéder à des essais contrôlés randomisés qui montrent que la mortalité a régressé, mais cela n'est fait que pour quelques cancers seulement. L'estimation de l'efficacité des programmes de dépistage précoce doit souvent s'appuyer sur d'autres types de preuves. Les plus évidentes sont les observations montrant que les tests peuvent déceler le cancer avant l'apparition de signes ou de symptômes, qu'ils permettent de diagnostiquer davantage de cancers dès les premiers stades et que les taux de survie, après diagnostic et traitement, sont plus élevés chez les patients dont le cancer a ainsi été dépisté. Ces informations peuvent toutefois être

biaisées.

On évoque ensuite l'hypothèse du point critique, qui veut qu'il y ait, dans l'histoire naturelle des cancers, des moments avant lesquels le mal peut être traité avec davantage de chances de succès. Trois types de preuves sont avancés à l'appui de cette hypothèse. On passe en revue les preuves disponibles de l'efficacité du dépistage des cancers du sein, du côlon et du rectum, du col de l'utérus, de la vessie, de l'estomac, du foie, de la bouche et de l'œsophage et l'on s'efforce d'apprécier l'impact possible de la prévention secondaire d'ici l'an 2000. D'après les meilleures estimations disponibles, il semblerait que le dépistage puisse réduire de 30% environ la mortalité par cancer du sein, d'environ 30% également la mortalité par cancer du côlon et du rectum et d'environ 90% la mortalité par cancer du col de l'utérus. En ce qui concerne les autres cancers, les données sont fort limitées mais, à supposer qu'une réduction de 10% seulement soit possible, il n'en reste pas moins que près de un milliard de personnes-années de vie, pour chaque année de dépistage, pourraient ainsi être sauvées d'ici l'an 2000. Compte tenu des grands espoirs que fait naître la prévention secondaire, le moment semble venu de procéder à des études soigneuses, de définir les activités appropriées et de se mettre à l'ouvrage.

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