Multidisciplinary Cancer Investigation Letter to the Editor

April 2025, Volume 9, Issue 1e

Cancer overdiagnosis: The creation of disease in the modern world: A letter to the editor (Perspective)

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Submitted: 26 October 2025

Revised: 05 November 2025

Accepted: 08 November 2025

e-Published: 08 November 2025

Keywords:
Cancer
Overdiagnosis
Screening
Disease

One of the unavoidable harms of cancer screening is overdiagnosis, that is, the diagnosis and identification of a disease that will not lead to symptoms or death during the patient's lifetime. The critique of overdiagnosis is not just a critique of a scientific error, but a critique of a civilizational paradigm that has turned health into a commodity and humans into customers. The future of medicine depends on returning to a wise perspective that sees humans as (Transcendent beings in the process of transcendence) rather than as (potential diseases) commodities. Modern medicine, by relentlessly expanding the scope of disease and, under the pretext of early diagnosis, redefining normal life and natural phenomena as "disorder" and "disease," results in the deprivation of peace and transforms society into a "sick society". It is no secret that new technologies in medical science have the potential to revolutionize the way health care is provided, but to what extent can overdiagnosis and the use of advanced technology to diagnose diseases that do not need to be diagnosed because they will not cause problems for individuals in the future control the individual and social dimensions of the issues? Therefore, we suggest that health policymakers design and implement any future cancer screening program with the utmost care, emphasizing minimizing the harms of overdiagnosis.

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Dear Editor-in-Chief

Medical science has made significant advances in disease diagnosis technologies, enabling early detection of disease [1]. A new word has recently appeared in medical literature to describe one of the side effects of our technological advancements: "overdiagnosis." [2]. Overdiagnosis is the detection of a disease that does not cause harm to the patient over the patient's lifetime [3]. The consequences of overdiagnosis include unnecessary labeling of individuals with a lifelong diagnosis, as well as unnecessary treatments and monitoring that cause personal, social, and cultural harm. A patient who is overdiagnosed cannot benefit from diagnosis or treatment, but can only be harmed [4]. Recently, physicians have become increasingly interested in

overdiagnosis, which, in addition to its disadvantages, can also be a feature in some situations, such as in deprived communities. Overdiagnosis of cancer can be an undesirable consequence of screening, as the diagnosis and subsequent treatment of the disease are sometimes unnecessary and, in many cases, lead to unpleasant and debilitating complications for the patient and, in the worst case, can even lead to premature death [1]. Detecting asymptomatic cancers, whose treatment can increase life expectancy, is one of the goals of cancer screening. But cancer screening can also lead to overdiagnosis, meaning that cancers are detected that may not show symptoms until later in life, and their diagnosis and treatment may be unnecessary and even harmful [5]. For cancer screening to be successful, it must primarily detect potentially lethal cancers or their precursors at an early stage, leading to treatment that reduces mortality and morbidity. Screening programs for colorectal and cervical cancers have been successful, in which surgical removal of precursor lesions has resulted in reduced cancer incidence and mortality. However, many types of cancer exhibit a wide range of heterogeneous behaviors and variable probabilities of progression and death. As a result, screening for some cancers may have a minimal impact on mortality and may do more harm than good. Since the introduction of screening tests for certain cancers (e.g., breast and prostate cancers), there has been a sudden increase in the incidence of in situ and early-stage cancers, but the relationship to reduced cancer mortality has not been as clear. It is difficult to determine how much of this reduction in mortality is due to screening and how much is due to improved treatment of tumors [6].

It can be stated that the cancer never progresses (or, in fact, regresses) or the cancer progresses so slowly that the patient dies of other causes before symptoms of cancer appear [2]. Since screening began in 1983, the rate of detection of in situ cancers in women in the United States has increased dramatically from 1983 to 1997, which could indicate overdiagnosis. A study in the Netherlands, where there is 85% compliance with screening recommendations to screen every other year starting at age 49, demonstrates that, over time, the incidence of in situ cancers rises sharply at age 49 and stops at age 74, corresponding to the screening ages and further supporting the notion that screening leads to overdiagnosis. In overdiagnosis, we diagnose something that is not a disease [7]. Overdiagnosis, especially for older women, is increasingly recognized as a significant harm of breast cancer screening. A study aimed at estimating the risk of overdiagnosis linked to breast cancer screening among older women included 54,635 participants. The findings revealed that for women aged 70 to 74, 75 to 84, and 85 and older, the potential rates of overdiagnosis were 31%, 47%, and 54%, respectively. Notably, the study also found no statistically significant reduction in breast cancer deaths associated with screening in these age groups [8].

To provide a baseline comparative assessment of the main epidemiological characteristics of prostate cancer in 26 European countries in 1980–2017 from data from the Global Cancer Observatory of the International Agency for Research on Cancer and mortality data from the World Health Organization in men aged 35–84 years showed that over the past decades, prostate cancer incidence rates have increased significantly, peaking in the mid-2000s, with rates ranging from 46 (Ukraine) to 336 (France) per 100,000 men. Mortality rates were much lower and less variable than incidence rates over the years 1980–2020. Overall, a 20-fold change in prostate cancer incidence contrasts with a corresponding five-fold change in mortality rates, suggesting overdiagnosis [9-11].

Observational studies can also provide good evidence for overdiagnosis, particularly in cancer. In one notable example, researchers in Japan reported that after the first round of spiral CT screening, lung cancer was detected 10 times more often than with chest X-ray screening. After a 3-year screening program, lung cancer detection in smokers was almost the same as in nonsmokers, yielding a relative risk of nearly 1. Since many epidemiological studies have shown that smokers have a risk of dying from lung cancer that is at least 15 times higher than that of nonsmokers, the data from this study provide evidence that overdiagnosis can be a major problem in cancer screening [2]. Overdiagnosis has consequences for society, as outlined in Table 1.

As diagnostic technologies evolve, healthcare systems must adapt by implementing measures such as updated guidelines, equitable access, and public

Table 1. Consequences of Overdiagnosis.

Individual	Social	Cultural	Suggested solutions	Ref…
Creating psychological burden (anxiety, fear of illness, etc.), taking unnecessary medications, and side effects of inappropriate treatments.	Increased patient costs (increased economic burden), waste of limited health resources, and decreased public trust in medicine.	Increased thinking about being sick, society's psychological dependence on testing and technology, instead of a healthy lifestyle. Erosion of public confidence in cancer screening programs.	Increased information and awareness among professionals and patients. Standardize diagnostic protocols and review Cancer screening guidelines. Promoting adherence to clinical guidelines. Determining the framework and place of ethical issues of medical decision-making by artificial intelligence. Promoting the reduction of unnecessary interventions in diseases by physicians.	[10, 11]

education to ensure that cancer screening is both effective and low-harm for individuals. On the other hand, overdiagnosis can be prevented by incorporating biological and risk-based assessment into screening strategies, modifying pathological criteria for tumor classification, and refining the classification of precancerous lesions [7]. The question remains whether the potential benefits of overdiagnosis are worth the individual suffering, the harms of treatment, or the socio-cultural challenges that may result. To answer this question, the concepts of medicalization and overdiagnosis need to be analyzed within a broader social context. Contemporary analysts emphasize that medicalization is context-dependent, involving actors such as the pharmaceutical industry, the media, consumers, and/or biotechnology. Modern medicine, by relentlessly expanding the scope of disease and, under the pretext of early diagnosis, redefining normal life and natural phenomena as "disorder" and "disease," results in the deprivation of peace and transforms society into a "sick society". It is no secret that new technologies in medical science have the potential to revolutionize the way health care is provided, but to what extent can overdiagnosis and the use of advanced technology to diagnose diseases that do not need to be diagnosed because they will not cause problems for people in the future control the individual and social dimensions of the issues. It seems that health policymakers should, in addition to emphasizing the production and encouraging doctors to use new technologies in this field, redefine screening guidelines for cancer and pay special attention to its psychological dimensions. Therefore, we suggest that health policymakers design and implement any future cancer screening program with the utmost care, emphasizing minimizing the harms of overdiagnosis.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ETHICS APPROVAL

Not applicable.

Acknowledgement

As the corresponding author, I extend my gratitude to all the contributors for their insights and to the healthcare professionals who focus on overdiagnosis and its prevention.

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