

# CitiScreen Versus Government Moonshot Cancer Screening Program

Opinion Article  
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## Opinion

Moonshot Cancer Project and CitiScreen are both cancer screening initiatives. The Moonshot cancer project is a large, well-funded, federal program while CitiScreen is a small and privately funded program. While the two programs target different audiences, they have similar goals and may complement each other. The Moonshot Cancer Project was announced in 2016. The National Cancer Institute received and distributed over a billion dollars to 240 research institutions to advance cancer prevention, diagnosis, and treatment. The American Cancer Society (ACS) had stated that 42% of the cancers and 45% of cancer deaths are preventable.<sup>1</sup> The Association of Clinical Oncology's goal is to ensure that cancer patients have access to quality and equitable care; with federal funding for research prevention, screening, diagnosis, and treatment of various malignancies [1].

CitiScreen was established in 2020 as an innovative private cancer screening program and is based on computer algorithms and artificial intelligence [2,3]. The most important advantage of CitiScreen is that it includes all important research innovations in the field of cancer screening and detection. CitiScreen takes into consideration racial biology as well [4]. Review of the pertinent literature demonstrates the differences in tumor behavior and clinical outcomes in various racial groups. Thus, Black women have higher mortality rates from breast cancer and have a worse stage-for-stage survival when compared to White patients.<sup>5</sup> Among 256,174 cases, more Black women than White women who had lymph node-negative breast cancer had tumors more than 2.0 cm. Adjusting for tumor size, more Black women than White women had 1 or more positive lymph nodes [5].

A study of tumor characteristics from 703 cases of invasive colon cancer were evaluated by a gastrointestinal pathologist, who was blinded to the age, race, and sex of the patients. Blacks were less likely to have poorly differentiated tumors [95% confidence interval, 0.22-0.88] and lymphoid reaction [0.49;95% confidence interval, 0.26-0.90] when compared with Whites. These differences remained statistically significant after adjusting for age, sex, stage of disease, socioeconomic status, body mass index, and health care access. In addition, Blacks

were less likely to have high grade (grade 3) nuclear atypia and high mitotic activity [6]. These differences are taken into consideration in the development of CitiScreen program. Two new goals, among others, for Cancer Moonshot Government Program are:

- To diagnose cancer sooner, including expanding traditional screening.
- To take lessons from modern science, including in mRNA technology etc, [7].

The very need for such an initiative signifies the failures of previous government cancer screening initiatives. Privately funded smaller programs are more flexible, less bureaucratic, and are capable of incorporating new advances in the field much faster than cumbersome government programs. Meanwhile, CitiScreen is using open access publication since 2019 to avoid unnecessary delay in dissemination of new research findings.

Similar to CitiScreen researchers, the architects of the Moonshot Cancer Program also understood that the rationing of medical care affects cancer screening because treatment of malignancies is more expensive than its prevention. For example, increases in metastatic prostate cancer may be associated with recent changes in clinical protocols following U.S. Preventive Services Task Force recommendations, according to a study in JAMA Network Open. In 2012, the USPSTF recommended against routine PSA prostate cancer screening for all men. In 2008, it made the same recommendations for men older than 75 years. These recommendations could contribute to an increase in the incidence of metastatic prostate cancer [8,9]. The study examined this impact by analyzing trends in PSA testing among 404,122 men aged 40 to 74 years with no history of prostate cancer. The researchers acquired data from Behavioral Risk Factor Surveillance System and reported the proportion of men who self-reported receiving a routine PSA test during the past year. Survey showed a decline in the proportion of men who reported PSA testing in the past year, from 29.9% in 2012 to 20.4% (95% CI, 19.9-20.9) in 2018. At the same time, incidence rates of distant metastatic cancer



increased for all racial and ethnic groups since 2010, with a slower increase among Black men than in White men (annual percent change = 5.6; 95% CI, 4.6-6.7). The incidence rate ratio for all prostate cancers of Black men vs. White men also increased from 1.73 in 2011 to 1.87 in 2012 and continued to increase thereafter. The CitiScreen program contains recommendations of PSA testing after proper patients counseling despite a lack of insurance coverage.

Recently, cascade testing has been incorporated into cancer screening programs. Cascade testing refers to the performance of genetic counseling and testing in relatives of individuals with specific genetic mutations [10]. Twenty percent of women with ovarian, 10% with breast, 2% to 3% with endometrial, and 5% with colon cancer will have a germline mutation predisposing them to cancer [11-13]. Cascade testing in first-degree family members carries a 50% probability of the same mutation [14]. Evidence-based guidelines by mutation type and absolute risk of cancers can be found on the National Comprehensive Cancer Network (NCCN) [15]. With multiple genetic changes seen in each tumor, researchers are able to detect specific genetic alterations – so called “mutational signatures” – that may be key to cancers developing in the future. CitiScreen will utilize genomic medicine in the future as it becomes more available for practical use.

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