

Challenges of Cancer Screening

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The goal of cancer screening is to detect presymptomatic disease and commence treatment sooner, thereby reducing the incidence of advanced disease and the associated morbidity and mortality¹.

Challenges exist around designing, managing and evaluating national screening strategies. Programs require clear governance, reporting structures, accountability and regular appraisal of staff. The Scally report highlighted the vital role Public health expertise should play in delivering and integrating these services along with managing the flow of patient information between the National Cancer Control Programme and the National Cancer Registry². All screening programmes must have a robust Quality Assurance (QA) process and be able to conduct audit effectively¹.

The decision to screen is based on disease burden, the natural history of the disease, effectiveness of treatment, effectiveness and acceptability of the screening test and the benefits versus harms of screening¹. The validation of a screening test should be established with a prospective randomised controlled trial (RCT). A degree of inaccuracy in screening is inevitable, although high sensitivity and high specificity are desirable¹. The inherent nondiagnostic features of a screening test mean that false positive test results are an expected cost of testing the many to find the few¹. Current data supports regular screening for breast, colorectal and cervical cancer and shared decision-making regards for lung

and prostate cancer screening.

Breast cancer screening is associated with a 40% reduction in cancer mortality however specificity and sensitivity of mammography are decreased in younger women (73% versus 83.3% and 87.7% versus 93.3% respectively)¹. Ultrasound as an adjunct to screening mammography increases the cancer detection rate, however, there is an associated increase in the false positive rate¹. Harms associated with breast cancer include; false negatives, recall for additional imaging, biopsy for benign changes and anxiety. In the United States(US) 10% of screening mammograms require additional investigation, and in over 90% of cases, the findings are benign¹. Other risks include, false positive and overdiagnosis which represents significant harm since women will undergo unnecessary treatment. From a system perspective, 10.7% (95% CI 9.3-12.2%) of all breast cancers among women invited to participate in screening represent overdiagnosis³.

Colorectal cancer(CRC) screening is associated with a mortality reduction of 22-32% at 30 year follow up and may account for 53% of the observed reduction in CRC mortality⁴. Colonoscopic polypectomy is associated with 53% fewer colorectal cancer deaths compared with the expected rate in the general population¹. The sensitivity of colonoscopy for CRC per lesion can range from 50% to 100% and is influenced by multiple quality assurance measures related to the examination and the examiner¹. Harms associated with flexible sigmoidoscopy and colonoscopy include perforations or bleeding. The risk is higher for colonoscopy with a major complication rate of 1 per 1,000 procedures⁵.

The introduction of the Papanicolaou (Pap) test is associated with decreased incidence and higher cure rates for invasive cervical cancer and cervical cancer mortality reductions of up to 73%¹. An adequate Pap test requires optimal sample collection, which depends both on patient preparation, and the collection and preparation of the specimen. Even under the best of circumstances, the Pap smear has a significant error rate. Sampling error is estimated to account for about two-thirds of false-negative tests whereas errors in interpretation account for the remaining third⁶. A technology assessment of cervical cytology by the Duke University Center for Clinical Health Policy Research concluded that conventional smear screening had a specificity of 98% but a sensitivity of only 51%⁴. Co-testing with HPV and cervical cytology improves sensitivity, but at the cost of diminished specificity. Consequences of cervical cancer screening, colposcopy and biopsy can include anxiety, pain, bleeding, infection and weakening of the cervix leading to increased risk of preterm birth¹. There are also issues around adequate uptake of cervical cancer screening with studies showing that over 50% of women who develop cervical cancer have not had appropriate screening⁶.

Disparate findings from two large RCTs of prostate cancer screening have not led to a consensus about whether prostate cancer screening is efficacious in reducing prostate cancer mortality¹. Shared decision-making regarding PSA-based screening about overdiagnosis and overtreatment of prostate

cancer is needed, especially given the uncertainty about whether the disease truly is life-threatening. This can be complex to communicate and may require multiple consultations over time. A large study of 138,492 men found that less than a third were involved in shared decision making prior to enrolment in prostate cancer screening⁹. Complications associated with a prostate biopsy include haematuria, rectal bleeding, hematospermia, urinary tract infection, and acute urinary retention, although the overall, serious complication rate is very low¹.

In Ireland, free screening for breast, cervical and colorectal cancer is available to all. Currently, in the US there is no formalised, national, care delivery system that provides cancer screening¹. This is despite that fact that the American Cancer Society believes that all people should have access to cancer screenings regardless of health insurance coverage. Both systems demonstrate challenges in accessing cancer screening. Public engagement is essential, as the efficacy of screening relies on a minimum threshold uptake.

Disparities in rates of cancer screening are observed in the US amongst racial and ethnic minorities, immigrants, low-income, and low-education populations. Screening varies significantly with health insurance status and type of coverage⁷. Other barriers to successful engagement with cancer screening include language, occupational status, cultural, and financial concerns, religious beliefs, lack of awareness, fear/mistrust, having lost contact with the system, transportation and lack of time⁸.

Accurate understanding by Doctors and patients of the real benefits, limitations and harms of screening is required to facilitate appropriate adherence. One study found that of 5000 women 92% overestimated the reduction of breast cancer mortality and of 5000 men 89% overestimated the reduction of prostate cancer mortality with PSA screening⁹.

Potential solutions to access to cancer screening are; culturally-tailored screening, health education, multilingual healthcare workers, provision of transport, scheduling appointments, stepped reminders, patient navigators and providing additional training and incentives to primary care providers¹⁰.

In conclusion, cancer screening requires organised systems that can deliver appropriate risk assessment, communicate expectations of screening, ensure screening at recommended intervals, appropriate workup, prompt diagnosis, and treatment. Screening programmes require maintenance of cancer registries and competent QA analysis. Cancer screening should be accessible to all as it plays a vital role in reducing morbidity and mortality and both healthcare workers and patients need to be educated on the actual benefits, limits and potential harms of screening in order to engage with these programmes effectively.

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