

Available screening programs for the early identification of cancers: A targeted literature review

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Objectives

- To help diagnose certain cancers at an early stage and, in turn, assist to reduce the incidence of advanced/invasive cancers and subsequent mortality
- To understand the landscape of currently recommended screening programs across multiple tumors (criteria for screening, recommended frequency, and uptake) for the early identification of cancer across the following countries: Australia, Canada, France, Germany, Italy, Japan, LATAM (Argentina, Brazil, Mexico), Spain, UK, and the US

Methods

- A targeted literature review (TLR) was conducted on MEDLINE® and other publicly available sources, including up-to-date clinical guidelines (up to November 2022) to summarize currently recommended screening programs for the early detection of cancer
- The titles/abstracts of the identified literature (including relevant clinical guidelines) were first screened by a single reviewer to select potentially relevant studies, followed by full-text screening to define the final list for inclusion. At each stage, a sample of 20%-30% of the inclusion list was validated by an independent reviewer

Results

- Among the countries selected, population-based screening programs for breast (83%), cervical (83%), and colorectal cancer (83%) were the most commonly recommended across the included countries, followed by lung cancer (42%). Screening programs for gastric cancer and melanoma for general population; pancreatic and prostate cancer in high-risk population were only recommended in one country (8.3%) for each tumor type. Furthermore, no screening programs were identified for general or high-risk population for bladder, endometrial, ovarian, and renal cancer (**Table 1**)

Results

Table 1. National screening programs identified according to tumor type

										
Tumor type	Australia	Canada	France	Germany	Italy	Japan	LATAM	Spain	UK	US
Bladder	N	N	N	N	N	N	N	N	N	N
Breast	Y	Y	Y	Y	Y	Y	Y ^c	Y	Y	Y ^a
Cervical	Y	Y	Y	Y	Y	Y	Y ^c	Y	Y	Y
Colorectal	Y	Y	Y ^a	Y	Y	Y	Y ^c	Y	Y	Y ^a
Endometrial	N	N	N	N	N	N	N	N	N	N
Gastric	N	N	N	N	N	Y	N	N	N	N
Lung	Y ^a	N	N	Y ^a	N	Y	N	N	Y ^a	Y ^a
Melanoma	N	N	N	Y ^b	N	N	N	N	N	N
Ovarian	N	N	N	N	N	N	N	N	N	N
Pancreatic	N	N	N	N	N	N	N	N	N	Y ^a
Prostate	N	N	N	Y ^a	N	N	N	N	N	N
RCC	N	N	N	N	N	N	N	N	N	N

^aScreening program not for general population, only for specific individuals based on their risk profile (eg, hereditary susceptibility, lifestyle risk factors).
^bScreening program not recent; evidence lacking to show whether it is still in place.
^cScreening program in Brazil among LATAM countries.

Breast cancer screening

- Age range and patient eligibility: 50-75 years old (40+ in US and Japan)⁴
- Screening methods:
 - Mammography⁴
 - Clinical examination⁵
- Screening frequency:
Figure 1. Proportion of countries by reported screening frequency for breast cancer⁴

Not specified

Every 3 years

10%

10%

80%

Every 2 years
- Screening of younger patients (<50 years), or increased frequency was generally limited to high-risk patients (i.e., hereditary/genetic susceptibility, increased breast density)⁶
- Program uptake ranges (national estimates): 42.6% (France, 2021) to 55% (Australia, 2018-2019)

Cervical cancer screening

- Age range and patient eligibility: 20-79 years old; sexually active patients⁴
- Screening methods:
Cytology test, approx. every 3 years + HPV test (secondary screening method implemented in routine testing of patients 30+ years old), approx. every 5 years
- Variations were found between cervical screening regarding frequency of testing and the timing for initiation of HPV testing among younger patients (<30 years old)
- Program uptake (national estimates): 54%-56% (Australia 2016-2017)⁷; data not identified for other countries

Colorectal cancer screening

- Age range and patient eligibility: 50-74 years old (40+ in Japan, 60+ in UK)⁴
- Screening methods:
 - Fecal immunochemical/fecal occult blood test
 - Sigmoidoscopy/colonoscopy
- Programs recommended regular fecal immunochemical/occult blood tests among the specified patient population (every 1-2 years)⁴
- Sigmoidoscopy/colonoscopy often used less regularly or as a secondary screening method following a positive test result
- Program uptake (national estimates): 28.9% (France, timeframe N/A)⁸ to 43.5% (Australia 2018-2019).⁷ Data not identified for 8/10 programs

Lung cancer screening

- Age range and patient eligibility: National screening program only in Japan; limited to patients (50-80 years) perceived to be at high risk (i.e., heavy smokers)⁴
- Metrics used to define “heavy smoker” varied between screening programs
- Screening methods:
 - CT scan/low-dose CT scan
 - Chest x-ray and Sputum cytology (Japan only)⁹
- Frequency: Not reported in 3/5 countries (Australia: every 0.25-2 years based on risk; US: annually)¹⁰⁻¹²
- ESMO recommends that referral to smoking cessation program should follow low-dose CT scan for lung cancer screening¹³
- Program uptake (national estimates): 5.8% (US, 2022);¹⁴ data not identified for other countries

Conclusions

- Population-based screening programs have been implemented across countries to identify patients with breast, cervical, and colorectal cancers (who represent a large proportion of new cases). Variation exists regarding screening methods used, frequency of testing, and eligible patient populations
- The implementation of screening programs for other tumor types has been limited to specific countries (gastric, melanoma) or restricted to high-risk populations, as defined by lifestyle factors or hereditary susceptibility (i.e., lung, pancreatic, prostate). No population-based screening programs were identified for other cancer types

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