Background

• Cancer mortality in selected tumors can be improved by early detection at earlier stages of disease
• Multi-Cancer Early Detection (MCED) tests are developed, all based on single blood draws
• MCEDs (table 1) can detect 3-8 tumors, with one MCED (Galleri by GRAIL) testing for >50 cancers

In addition to clinical validation and utility, the objective of this qualitative study was to identify:
• For which cancers could MCEDs be relevant in four settings?
• What health system factors would be implementation?

Results

Qualitative exploration of MCED use scenarios
1. Over-the-counter:
   • Considered undesirable by all stakeholders as free availability to a low-risk, asymptomatic population will strain healthcare capacity.
2. Population screening:
   • As a primary screening test:
     - A broad MCED was questioned by most stakeholders due to low asymptomatic disease risk for many cancer types. A limited MCED is proposed potentially feasible.
   • As a complementary test to current population screening:
     - Considered by most stakeholders as a means to enhance screening specificity, reducing healthcare system strain by eliminating false positives.
3. Primary care:
   • No added value expected in this symptomatic population by many stakeholders due to the need for diagnostic imaging and pathology in cancer diagnosis
4. Hospital diagnosis
   • Limited value in initial diagnostics foreseen by many stakeholders. Potential value in differentiating indolent and aggressive cancers, reducing patient burden, healthcare capacity strain, and costs

The association between disease prevalence, sensitivity, and predictive value

Conclusions

• Distinguish tumor informative from tumor agnostic assays as they may have different uses and stage dependent test performance;
• Cancer prevalence excludes feasibility of screening in low prevalent cancers (although there is an unmet need);
• Proposed potentially implementation and use;
  • As a targeted test in population screening for prevalent cancers,
  • As a complementary test in current population screening,
  • In hospital settings, to distinguish between indolent and aggressive cancer types.

System factors affecting MCED feasibility

Critical health system factors regarding MCED implementation (fig 2) were found to be:
• Test characteristics
  • Test performance (cancer type and tumor stage-specific)
  • Tumor informative properties
  • Ability to distinguish indolent cancers
• Cost-effectiveness
• Healthcare system capacity

Methods

Approach

• Four scenarios of MCED use were considered:
  1) Over-the-counter
  2) Population screening
  3) Primary care
  4) Hospital screening
• Using cancer registries to determine population prevalence and positive predictive value
• 13 semi-structured interviews were conducted:
  • Selection using expert sampling, aiming for a broad representative group of individuals from different professional backgrounds.

Interview and analysis

• Identify determinants influencing viability and critical system factors of MCED use in these settings;
• Identifying key uncertainties related to the implementation of MCEDs in the Dutch healthcare system;
• Interviews were transcribed verbatim and analyzed using grounded theory and a thematic analysis approach (Gibbs, 2007);
• Findings were structured using a thematic networks approach (Attride-Stirling, 2001).

References


Figure 1: The association between disease prevalence, sensitivity, and predictive value for MCEDs

Figure 2: System map of factors affecting MCED feasibility across all scenarios

Table 1: Examples of MCED tests being developed and validated