Evaluating the breadth of cancer diagnoses identified by the C the Signs clinical decision support platform in primary care

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M Payling[1], S Dadhania[2], M Lee[3], B Bakshi[1]

[1] C the Signs Limited
[2] Consultant Clinical Oncologist and Honorary Clinical Senior Lecturer, Institute for Global Health Innovation, Imperial College London
[3] NIHR Academic Clinical Fellow & Specialty Registrar in Clinical Oncology

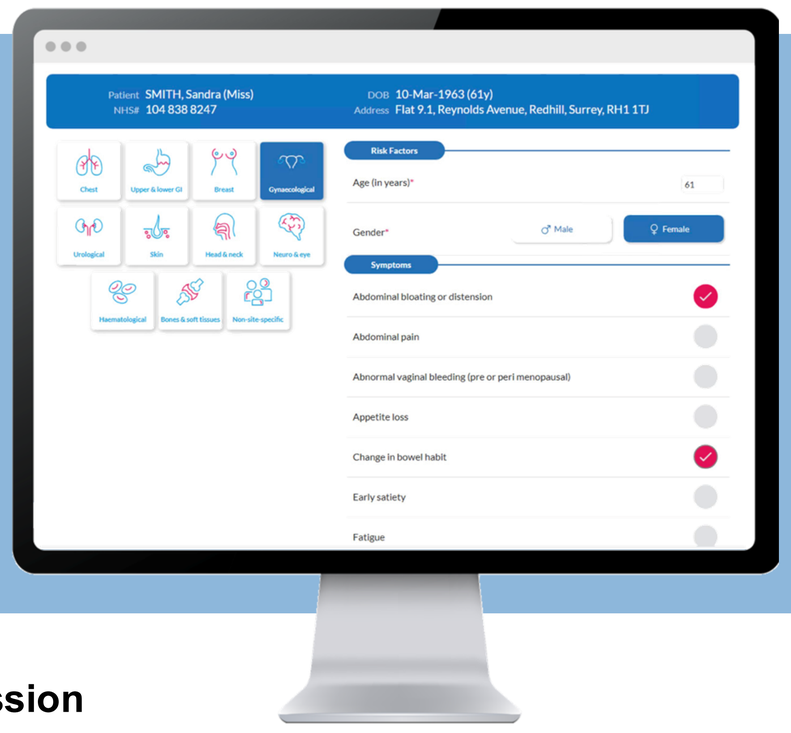
Background

Early cancer diagnosis in primary care is challenging due to the heterogeneous presentation of cancer and the overlap of symptoms with benign conditions.[1,2] Cancer is not a single disease but comprises over 100 distinct types, each with unique presentations that vary by age, sex, clinical signs, symptoms, and risk factors.[3] Unlike many other conditions, cancer is a “cradle-to-grave” disease, affecting patients at any age.[4,5] Previous studies have reported provider sensitivity in detecting cancer as low as 54%.[6]

Clinical decision support (CDS) platforms can enhance sensitivity and accuracy in identifying patients at risk across a broader spectrum of cancer types. *C the Signs* is a validated CDS platform with a reported sensitivity of 99%, negative predictive value (NPV) of 99%, and tumour site accuracy of 94%.[7] It is built on hierarchical tumour models using weighted, peer-reviewed, and validated data points for each cancer type. This study evaluated the platform’s effectiveness in identifying cancers across screenable, non-screenable, and harder-to-detect types.

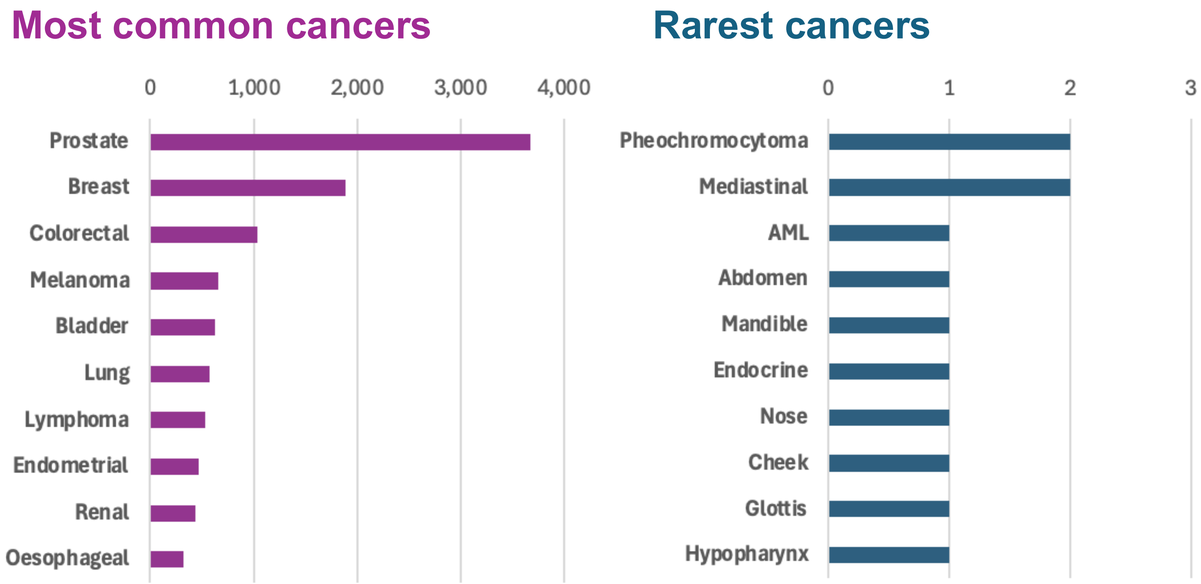
Methods

A retrospective analysis was performed between January 2022 and July 2025, where *C the Signs* was integrated into primary care workflows via the EMIS Electronic Healthcare Record system. Patients included were those who underwent a risk assessment in primary care and were subsequently diagnosed with cancer within six months, directly as a result of the platform’s recommendations. Diagnosed cancers were grouped by primary body location to assess the breadth of diagnostic coverage.



Results

A total of 16,106 patients were diagnosed with cancer following a *C the Signs* risk assessment during the study period. These diagnoses covered 107 distinct cancer types, categorised by organ system and anatomical region. The spectrum included high-incidence malignancies such as breast, lung, colorectal, and prostate cancers, as well as rarer cancers including sarcomas, haematological malignancies, and uncommon gastrointestinal and genitourinary tumours such as pancreatic, bladder, renal, and stomach cancers.



Collectively, the identified cancers accounted for 99% of all patients presenting with cancer during the study period, illustrating the platform’s capacity to detect both common and rare cancer types.

Conclusion

C the Signs demonstrated exceptional breadth, identifying over 100 distinct cancer types and capturing 99% of patients presenting with cancer in primary care. Its high sensitivity, strong tumour site accuracy, and comprehensive diagnostic reach underscore its value as a CDS tool for early cancer detection.

Discussion

This study demonstrates that platforms like *C the Signs* can play a transformative role in the early diagnosis of cancer in primary care. The platform identified over 100 distinct cancer types and detected more than 99% of patients presenting with cancer, highlighting exceptional breadth, sensitivity, and clinical reach.[7]

The platform’s performance suggests that integrating structured, evidence-based algorithms into everyday primary-care workflows can significantly enhance early detection—particularly for non-screenable and rarer cancers where symptom recognition is most challenging.[3] By supporting clinicians with data-driven insights, such tools can reduce diagnostic uncertainty and accelerate appropriate investigation and referral.

These findings align with national and international cancer strategies prioritising early diagnosis and the use of digital, data-enabled systems to improve outcomes.[8-12] High sensitivity, strong tumour-site accuracy, and comprehensive diagnostic coverage underscore the platform’s potential to complement clinical judgment, optimise diagnostic pathways, and ultimately improve patient survival.

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Contact: Dr Miles Payling, milespayling@cthesigns.com