Uptake and response time for The National Cervical Cancer Screening programme in England: Using the IQVIA Medical Research Database (IMRD) to identify associated factors

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Background and rationale

- Although the primary purpose of electronic health records (EHRs) is the management of clinical care, these longitudinal data can also be used for population health studies such as outcomes research, comparative effectiveness, pharmacoepidemiology and epidemiology.

- The IQVIA Medical Research Database (IMRD) contains non-identified EHRs from primary care GP practices for over 2.3 million patients in England, including over 3.75 million consultation records, over 1.2 billion observation records and over 4.2 million prescription records. EHRs held within IMRD can provide useful insights that can guide healthcare systems in developing strategies to improve public health and allocate resources effectively.

- The National Cervical Cancer Screening programme in England is a government-funded initiative aimed at reducing the incidence and mortality rates associated with cervical cancer. The programme provides regular screening or "smear tests" for women between the ages of 25 and 64 years. Women are notified to attend screenings at regular intervals, typically every three to five years depending on their age. These data are recorded in IMRD.

- Improvements in prognosis for cervical cancer since the inception of the programme in 2003 have been attributed to early detection via screening, but research has identified barriers in accessing the service for some groups of women, including those from ethnic minorities. The aim of this study was to identify factors that may be associated with the uptake and response rates of The National Cervical Cancer Screening programme.

Methods

- This study uses time-to-event analysis to explore response times to cervical cancer screenings, and how this is affected by factors such as:
  > patient age, patient ethnicity, patient/practice location, registered time at GP practice;
  > type of invitation (telephone, email, verbal or text), total number of invitations;
  > existing morbidities (cervical cancer, diabetes, chronic kidney disease, hypertension, depression); and
  > COVID-19.

- Data from patient observation records related to the screening programme were identified and extracted using clinical code lists based on SNOMED CT codes. Data were extracted for observations taking place between 1 January 2015 and 16 March 2021. The study was limited to women aged 24 to 49 years, i.e. the group eligible for screening every three years. An overview of patient selection criteria is presented in *Figure 1*.

- Cox and Weibull models were fitted to assess relationship between response times and other variables of interest.

Results

- The multivariate Weibull model provided best predictive power. Response time to screening invitation was affected by:
  > patient ethnicity *(Figure 2; top panel)*
  > patient/practice location
  > type of invitation *(Figure 2; bottom panel)*
  > COVID-19

- A patient was 69% more likely to respond to a cervical cancer screening invitation since the COVID-19 pandemic compared with before the pandemic.

- A patient who received a 'verbal' invitation for screening was three times more likely to attend their appointment than a patient who received an invitation by email.
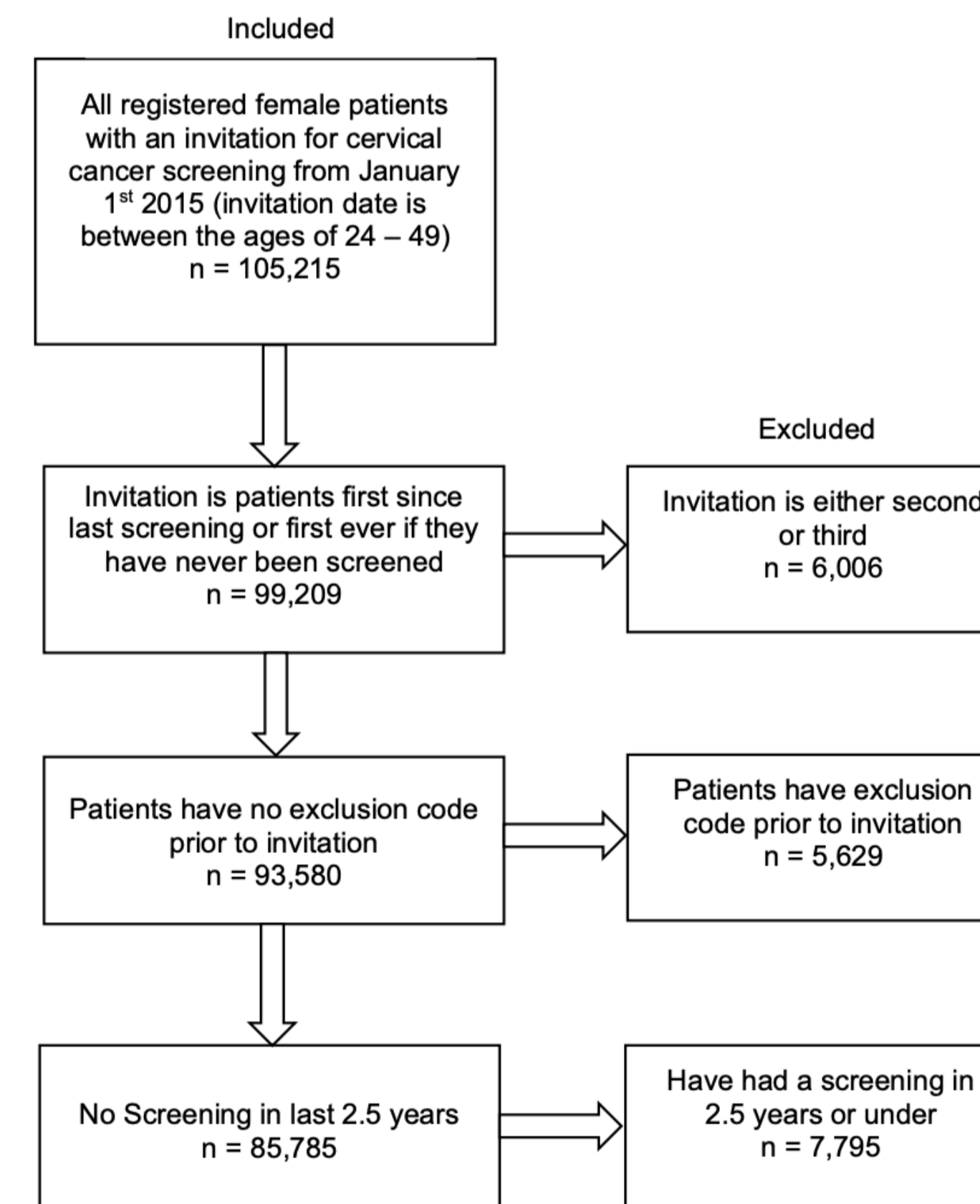

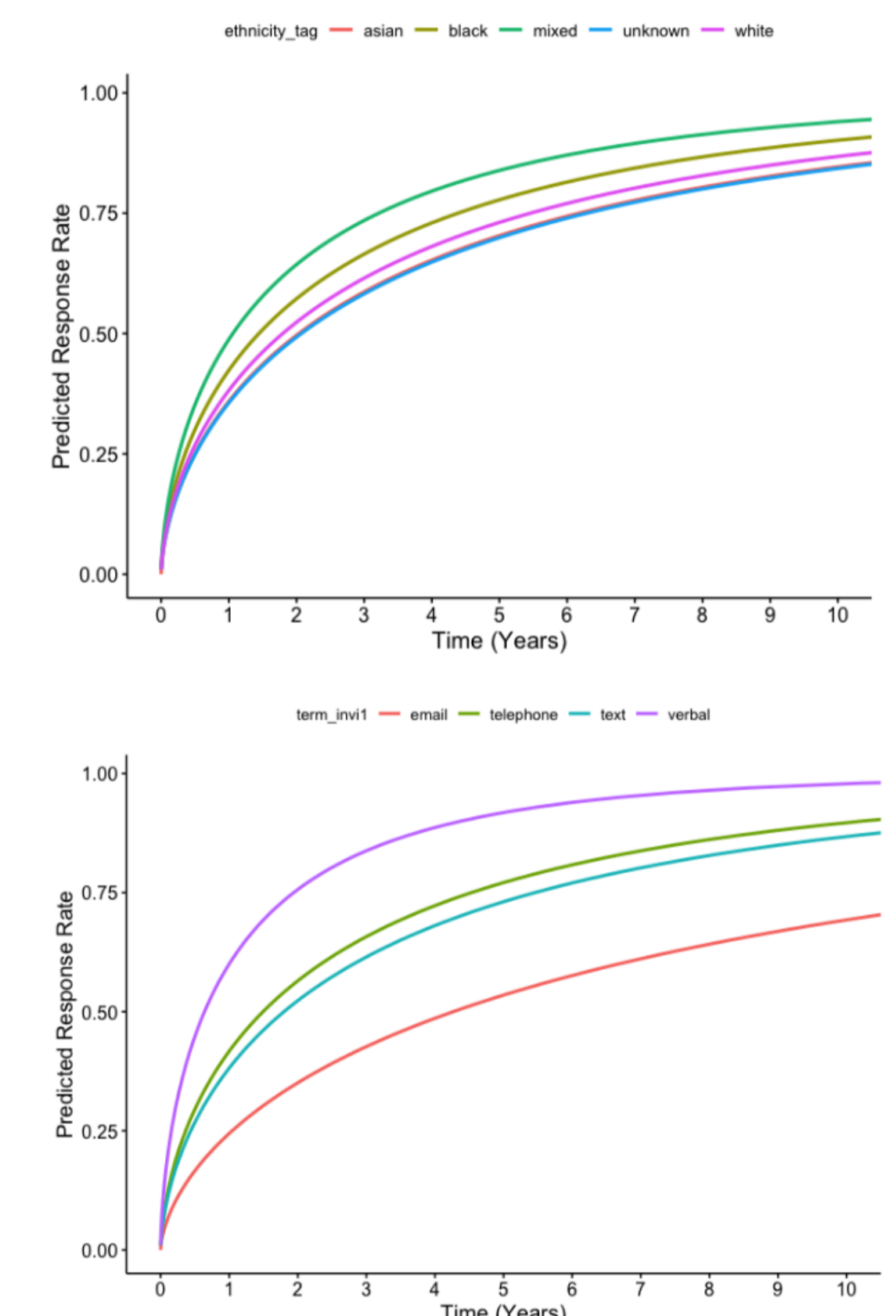Figure 1. Criteria for patient selection in IMRD

Figure 2. Estimated response rate curve for ethnicity category (top panel) and type of invitation (bottom panel)

Conclusions

- Insights from IMRD can be used to inform policy and improve health services, for example, by identifying factors that are associated with barriers to access to services.

- For The National Cervical Cancer Screening programme, patient characteristics (such as patient ethnicity) and service characteristics (such as type of invitation) are predictive of response time and can be targeted for service improvement.

- However, further research is needed to assess the generalisability and validity of these results. Limitations include missing ethnicity codes for some patients and overrepresentation in some geographic regions.

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