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Supplementary appendix

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Modelling the utility of polygenic risk scores in UK cancer screening

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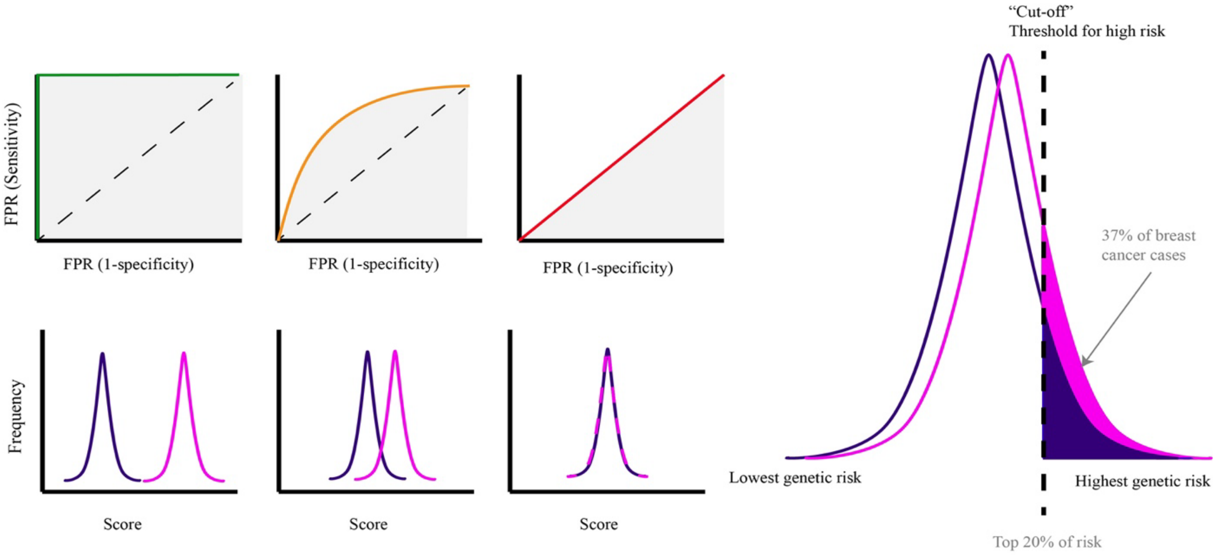
SUPPLEMENTARY INFORMATION BOXES

BOX 1: Polygenic Risk Scores: factors to consider in relation to cancer screening

1) **Predictive value:** The performance of a PRS-tool (model, SNP-set) in distinguishing between those who will develop cancer (cases) from those who will remain unaffected can be quantified by plotting the true positive rate (sensitivity) against the false positive rate (1-specificty) to generate an AUC (area under the curve). More simply, the AUC equates to the likelihood of correctly ascribing an individual as a (future) case versus remaining unaffected, within a population comprising equal proportions of the two. AUC=0.5: no predictive discrimination, AUC=1.0: perfect prediction. Current PRS-tools for common cancers have AUCs of up to 0.70. For an AUC of 0.64, for a threshold that includes 20% of the population, 37% of those who will develop cancer (cases) are included in this "high-risk" group (see below).



Other metrics frequently presented to represent predictive performance of PRS include:

- OR for disease occurrence in PRS-defined top 1%/10% compared to population average
- OR for disease occurrence in PRS-defined top 1%/10% compared to bottom 1%/10%
- the OR for disease per one standard deviation of population PRS distribution

2) **Genetic ancestry:** SNP-sets for current PRS-tools are largely derived from GWAS of European populations. Individuals from non-European populations would be disproportionately misclassified by PRS derived from European populations. To properly redress the ancestral inequity of PRS-tools would require (i) for each different ancestral group a sufficiently large case-control GWAS to generate a PRS which captures a proportionally equivalent heritable cancer risk when compared to that of European populations and (ii) each participant undergoing PRS estimation to undergo an individualised weighting of the different ancestry-specific SNP-sets to reflect their individual ancestry admixture.

3) **Multimodal PRS-tools:** Some PRS-tools incorporate additional 'individual-level' risk factors (family history, breast density, body mass index, lifestyle/physiological factors).(1) In analyses by which PRS-tool predictions are validated against 5 or 10-year cancer incidence in longitudinal cohort data, the AUC presented may also reflect the predictive contribution of age of cancer incidence. Age is a 'population-level' rather than 'individual-level' risk factor, reflected in screening/interventions being offered to pre-specified age-groups.

4) **Future improvements in PRS:** The predictive performance of a PRS-tool is (i) ultimately constrained by the heritability of the disease, which is often comparatively low for many common complex diseases of late onset, (ii) determined by how much of the total heritable risk is captured by the SNPs contributing to the PRS-tool.

BOX 2: Cancer screening: factors to consider regarding PRS-based stratification

Polygenic risk scores are constructed from SNPs exhibiting association with disease in GWAS of disease cases unselected in regard of outcome/lethality (i.e. the PRS will predict cancer incidence but not disease outcome). Risk stratification would potentially differentiate aggressive/lethal cancers only if the underlying GWAS had been restricted to aggressive/lethal cases of disease.(2) It is thus anticipated that stratification using the GWAS-derived PRS will only impact the numeric distribution of cancers across the quantiles; the cancers will not differ systematically between PRS-defined quantiles in their biology, clinical characteristics or clinical behaviour.

1) **Overdiagnosis (overdetection)**: Screening detects cancers that otherwise would never have come to medical attention during the person's lifetime (cancers the patient would have "died with" rather than "died from").(3) For example, it is estimated that 11% of breast cancers detected on breast mammography and 42% of prostate cancers detected on PSA screening are "overdiagnoses".(4,5) Aside from substantial costs, if there is concomitant "overtreatment", this can cause harms such as incontinence and impotence. Furthermore, increased rates of suicide and cardiovascular death have been reported immediately after a diagnosis of prostate cancer.(6) As per above, although some studies have reported small differences in overdiagnosis rates, the *proportion* of detected cancers that are overdiagnoses would be predicted to be consistent across PRS-defined strata, i.e. at a rate the same as in unstratified population-based screening.(7,8)
2) **The impact of cancer screening on survival:** Survival benefit from screening is a function of (i) improving stage at diagnosis compared to symptomatic presentation, (ii) this "downstaging" translating into improvement in long-term survival (iii) lead-time bias, where true outcomes are unchanged but appear improved purely on account of earlier detection. For breast cancer, symptomatic presentation is typically at early stage and long-term survival rates are high for stages 1-3 (in part due to improvements in adjuvant therapies) and increasingly stage 4. There is thus limited 'headroom' by which screening might improve survival for such a "good prognosis" cancer. Conversely, over 80% of those diagnosed with stage 1 pancreatic cancer die from their disease within 10 years. For poor-outcome cancers the headroom for improving survival may also be narrow if (i) cancer-specific mortality is high across all disease stages (like pancreatic cancer) and/or (ii) screening only leads to minimal downstaging-related survival improvement (as recently demonstrated in trials of ovarian cancer screening).(9) There is no rationale to suggest PRS-based risk stratification would influence the impact of a given cancer-screening tool on cancer survival or impact on lead-time bias. Cancer-specific mortality will only account for deaths directly due to the cancer. All-cause mortality is more meaningful evaluation metric, factoring in the deaths consequent from screening, treatment and concurrent morbidities, but requires very substantial power and thus duration of follow-up.
3) **Sensitivity and specificity:** Tools screening for presence *today* of a particular cancer must be low-cost, low-harm, convenient, and scalable. Sensitivity is the proportion of all people with cancer that have a positive screening test (true positive rate). Specificity is the proportion of all people without cancer who have a negative result (1- false positive rate). The threshold for defining a cancer screening result as 'positive' will be selected to provide most acceptable balance between sensitivity and specificity. Sensitivity and specificity are essentially innate to the screening tool (when applied to cancers in a specified patient group). Whilst it has been proposed that sensitivity/specificity of some types of tests may differ for contexts in which where disease prevalence varies widely, performance of cancer screening tools is unlikely to differ in meaningful fashion between PRS-defined quantiles. (10)
4) **Diagnostic tests:** Individuals with a positive screening result require a follow-up diagnostic (confirmatory) test, typically involving imaging, endoscopy, and/or biopsy. These diagnostic tests are usually more expensive, invasive, and/or inconvenient than the initial screening test. Limited capacity for these modalities is a key factor in design of screening programs. Some screening protocols involve more complex algorithms of multistage or tiered follow-up. For example, free-to-total prostate-specific antigen (PSA) ratio may be used for follow-up of moderately elevated PSA before proceeding to biopsy.(11)
5) **Interval cancers:** Some cancers will present symptomatically between screens. The periodicity of a screening program (e.g. one-yearly versus two-yearly versus three-yearly) will influence the proportion of cancers diagnosed as interval cancers versus as screen-detected. In the current NHS breast-screening program of 3-yearly mammography aged 50-69, for every 10 breast cancers picked-up on screening, 3 genuine interval breast cancers

arise in screened women.(12) Distinction between imperfect screening sensitivity and interval cancers can be complex.

6) **Age-specific cancer incidence**: For each cancer type the total lifetime likelihood of developing that cancer (e.g. ~1.7% for pancreatic cancer) is unequally distributed across the decades of life. The age window for which screening is offered requires balancing of age-specific cancer incidence versus the life-years gained from a death averted (with UK median life expectancy being ~81 years currently).(13) Most common cancers are diseases predominantly of older age, when life years gained are fewest (>47% of pancreatic and >43% colorectal cancers arise after the age of 75). Risk stratification does nothing to solve this "age paradox".

7) **Uptake**: For current national screening programs, uptake in the UK is typically 65-70%, with variation by region, socio-economic status, and other parameters.(5) Uptake of PRS-profiling when offered as part of a study within the UK NHSBSP (NHS Breast Screening Program) was <20%, but will likely be highly context- and population-specific.(14)

SUPPLEMENTARY METHODS

Cancer Types

Eight solid tumours were selected for inclusion in this analysis based on (i) availability from data generated by Fritsche et al. (2020) of AUC (area under the curve) for validation against UKBiobank of a "PRS-only" risk prediction tool (i.e. AUC without inclusion of age in the prediction) (ii) availability of data generated by Zhang et al. (2020) for projected AUC of "PRS-only" tools based on larger GWAS and totality of common variation (iii) availability of screening tools for which published data on sensitivity/specificity could be identified.

Polygenic Risk Scores

Fritsche et al. (2020) identified from literature and databases, sets of SNPs associated with specified cancers, for which they undertook up to seven approaches to construction of PRS comprising fixed p-value thresholding, LD pruning and thresholding and lassosum. The AUC of the best performing approach on validation against UKBiobank was taken forward for the subsequent analyses and ascribed as the "current" PRS. Zhang et al. used summary-level data from GWAS of European ancestry across multiple cancer sites to estimate the total underlying number of common susceptibility variants (polygenicity) and effect-size distribution. From these they calculate the AUC if the totality of variance due to common variants were captured: this we ascribe as our "optimised" PRS-tool. They also present estimation of AUC for a hypothetical GWAS comprising 4-fold the sample number of the largest GWAS meta-analysis reported to date: this we ascribe as our "future" PRS-tool.

We use the AUC values for the "current, "future" and "optimised" PRS-tools for each cancer type to then derive the related performance metrics inherent to the AUC, which comprise odds ratios (comparing the odds of cancer in the top 50%, 20%, 10%, 5%, and 1% of the PRS to the middle quintile), and the percent of cancers in the population captured by the top 50%, 20%, 10%, 5%, and 1% of the PRS. These metrics are estimated using the assumptions and methods described in detail by Wald and Hingorani *et al*., and summarised briefly in Supplementary Table 1.(15,16) In brief, these methods rely on the conceptualization of Polygenic Risk Score distributions across a population as two normal distribution curves: one representing those with (or who will develop) cancer (affected), and one representing those without (unaffected).(15) The areas under these curves, represented by the cumulative distribution function (CDF), were used to estimate relative proportions of cases captured at different PRS thresholds, allowing calculation of Odds Ratios (ORs). Calculation of the CDFs for these curves required three parameters: μ_A (the mean of the distribution of the PRS among those affected by cancer), μ_U (the mean of the distribution of the PRS among those unaffected by cancer, and $SD(\sigma)$ (the standard deviation of each curve). $SD(\sigma)$ was assumed to be 1 for both curves, μ_U was assumed to be 0, and μ_A was determined from the AUC of the PRS as per methods and equations further detailed in the supplementary methods of Hingorani et al.(15)

Lifetime Risks

We then estimated lifetime risk of cancer using a 'current probability' method and period approach.(17,18) This approach accounts for deaths from cancer *and* all other causes and utilises the methods of Cancer Research UK used in their lifetime risk calculations.(18) In brief, for each cancer, we constructed a life table dividing the population into 5-year age bands. To estimate lifetime risks, we started by dividing the population into two groups: the top $n\%$ (as represented by the top 50%/20%/10%/5%/1% of the PRS) and the remainder. We estimated the cancer incidence rate in the top $n\%$ of the population by splitting the average incidence into two parts (scaled by the relative population size and the OR of the top $n\%$ compared to the remainder). We estimated the death rate in top $n\%$ by up scaling the average death rate in the total population according to a ratio of death to incidence rate. Finally, we exposed a 'hypothetical cohort' to the cancer incidence rate in the top $n\%$ of the PRS. From each age band to the next, we reduced the cohort size in accordance with competing and cancer risks. We estimated an overall lifetime risk by summing the number of events expected in each age group of the cohort.

Cancers detected by screening

We estimated the number of cancers occurring in the top $n\%$ (50%, 20%, 10%, 5%, and 1%) of the PRS, based on our "current", "future", and "optimised" PRS-tools, by application of the percentage of cancers captured within the PRS-defined high risk quantile (Table 1) to CRUK/NDRS data on the number of cancers arising in 5-year age bands. From this, we estimated the number of cancers that would be detected by a hypothetical stratified screening programme using published sensitivity metrics for the cancer-specific "real world" screening tool (Supplementary Table 3, Supplementary Tables 6A-C). To account for potential emergence of improved cancer screening tools, especially for "underserved" cancers, we then repeated the analysis using hypothetical "idealised" screening tool, which we arbitrarily assigned as having a sensitivity of 80% for specificity of 95% (Supplementary Tables 7A-C).

Survival

We modelled the change in 10-year survival that would result from offering various screening programmes to age groups currently falling outside of population screening programmes: women aged 40-49 for breast cancer, men aged 60-69 for prostate cancer, and men and women aged 50 to 59 for colorectal cancer. The approaches evaluated comprised screening within these age-bands i) without restriction (ii) of the PRS-defined high risk 20% (quintile), (iii) of the oldest 20% (iv) of a random 20%.

In brief, these analyses involved re-allocation of cancers across from the routine, urgent (2 week wait) and emergency "routes-to-diagnosis" over to screening. The accordant stage-specific distributions were then re-applied for the updated numbers in each route. The accordant 10-year age-specific, stage-specific net cancer survival figures were then applied.

Within the routes-to-diagnosis datasets utilised, for breast and colorectal cancers small numbers of individuals in these age groups have received screening via age-extension studies. To model 'baseline' survival to there being no screening, we re-allocated these cancers proportionally between the three remaining routes to diagnosis (two week wait, routine and emergency), adjusting baseline figures for survival accordingly. For prostate cancer, where no screening is offered, we used the routes-to-diagnosis data with no changes.

We estimated the proportion of cancers that would be detected by screening by applying published sensitivity and specificity metrics to the expected number of cancers in each pre-specified section of the population (total age band, random quantile of age band, top $n\%$ of the PRS, top two years of age band).

- For the total age band, the expected number of cancers was that shown in the CRUK data (Supplementary table 1)
- For the random quintile, it was a scaled version of this total (i.e., we would expect 20% of cancers in 20% of the population).
- For the PRS-defined high-risk 20%, we applied the percentage of cancers captured within the PRS-defined high risk quintile (as per Supplementary Table 4) to CRUK data on the number of cancers arising in respective 5-year age bands (Supplementary Table 1).
- To estimate the number of expected cancers in the top two years of each relevant age band (48-49 for breast, 58-59 for colorectal, and both 58-59 and 60-69 for prostate), we used linear

interpolation across adjacent 5-year age bands to estimate the age-specific incidence rates for each individual year. We then used the age-specific incidence rates for these new 'one-year age bands' in conjunction with population size estimates derived from ONS data to calculate the number of cancers expected across the two years (Supplementary Table 1).

Any remaining cancers (expected to occur in the age band, but not detected by screening) were allocated between three routes of detection (routine, urgent and emergency presentation) in proportion to the distribution shown in the baseline NCRAS routes-to-diagnosis data.

We then estimated the stage distribution of cancers in each age band in proportion to the stage distribution of tumours detected by each route to diagnosis in the NCRAS data. Finally, we estimated the proportion surviving 10-years using 10-year age-specific, stage-specific net survival, using the stage distributions amended on account of addition of screening. We then calculated the annual difference in the number of people surviving 10-years with no screening (baseline) and our modelled screening programmes.

The code and raw data underling these models can be downloaded from GitLab here. https://git.icr.ac.uk/chuntley/modelling-the-utility-of-polygenic-risk-scores-in-uk-cancer-screening

SUPPLEMENTARY TABLES

Supplementary Table 1: Data Sources utilised in analyses

Data Item	Details	Reference/Source
Analysis: Polygenic Risk Scores (Table 1, Sup Table 4)		
Area under the Curve (AUC) for 'current' polygenic risk scores (PRS) for 8 cancers	PRS constructed using SNPs and GWAS summary statistics from multiple sources via up to seven approaches; AUCs from validation in UKBiobank (best AUC retained)	Fritsche et al., American Journal of Human Genetics(19)
AUC for 'future' PRS for 8 cancers	Projected AUC for a PRS constructed from underlying GWAS with a 4x increased sample size compared to largest published metanalysis	Zhang et al., Nature Communications(20)
AUC for 'perfect' PRS for 8 cancers	Estimate of maximum AUC achievable for PRS capturing variance attributable to all common genetic variants	Zhang et al., Nature Communications(20)
Analysis: Lifetime Cancer Risks, overall and PRS-defined strata (Table 2, Sup Table 5)		
Age-specific all-cause mortality rates	Estimates for England and Wales, 2018	Office for National Statistics(21)
Age- and sex- specific incidence rates	Estimates for the UK, 2016-2018. Derived by Cancer Research UK (CRUK) from data provided by the National Cancer Registration and Analysis Service (NCRAS), ISD Scotland, the Welsh Cancer Intelligence and Surveillance Unit, Health Intelligence Division, Public Health Wales, and the Northern Ireland Cancer Registry. *Invasive breast cancers (C50) only	Cancer Research UK(22)
Age- and sex- cancer-specific mortality rates for 8 cancers	Estimates for the UK, 2017-2019. Derived by Cancer Research UK (CRUK) from data provided by Nomis mortality statistics, ISD Scotland, the Northern Ireland Cancer Registry, and the Office for National Statistics. *Invasive breast cancers (C50) only	Cancer Research UK(22)
Odds Ratios comparing risk of cancer in top n% of PRS vs. remainder	Derived from the AUCs for current, future, and optimised PRS for 8 cancers (as described in Polygenic Risk Score section of this table, above)	Fritsche et al., American Journal of Human Genetics(19), Zhang et al., Nature Communications(20)
Analysis: Cancers Detected by Screening PRS-defined strata or age band overall using current or idealised screening tools (Table 3, Supplementary Tables 6A-D, 7A-D)		
Cancers arising in 5-year age bands	Number of cancers recorded in the UK for each 5-year age band in 2016-2018. Derived by Cancer Research UK (CRUK) from data provided by the National Cancer Registration and Analysis Service (NCRAS), ISD Scotland, the Welsh Cancer Intelligence and Surveillance Unit, Health Intelligence Division, Public Health Wales, and the Northern Ireland Cancer Registry. *Invasive breast cancers (C50) only	Cancer Research UK(22)
Age-specific annual incidence rates per 100,000 for 8 cancers	Estimates for the UK in 2016-2018. Derived by Cancer Research UK (CRUK) from data provided by the National Cancer Registration and Analysis Service (NCRAS), ISD Scotland, the Welsh Cancer Intelligence and Surveillance Unit, Health Intelligence Division, Public Health Wales, and the Northern Ireland Cancer Registry. *Invasive breast cancers (C50) only	Cancer Research UK(22)
Reference size population for each 5-year age band	Average of estimates for the UK for the years 2016-2018. Analysis of population estimates tool, the Office for National Statistics.	Office for National Statistics(23)
Sensitivity estimates for 'real-world' screening tools	Breast cancer (digital mammography),(24) prostate cancer (PSA, 4ng/mL threshold(25) and mpMRI(26)), colorectal cancer (FIT, 20-50 µg/g threshold),(27) pancreatic cancer (CA19-9 20 U/mL threshold),(28) ovarian cancer (MMS (CA-125 + TVU),(9) kidney cancer (USS),(29) lung cancer (low dose CT),(30) and testicular cancer (semen assay).(31)	Published estimates from clinical trials(9,24,25,30,31) and meta-analyses.(26–29)
Sensitivity/sensitivity estimates for hypothetical 'idealised' screening tool	Standard estimate applied across all cancers of sensitivity 80% (for sensitivity 95%).	Hypothetical estimate
Survival analysis (Table 4, Supplementary Tables 8A-E)		
Route-to-diagnosis for breast, prostate, and colorectal cancers in England.	Proportions of cancer diagnoses from (i) screening*, (ii) routine detection**, (iii) urgent symptomatic (two-week wait) and (iv) emergency presentation. Data for England from 2018. Derived by the National Cancer Registration and Analysis Service on request, from the National Cancer Registration Dataset.	National Cancer Registration and Analysis Service (NHSD)(32)

	*National screening programs included small numbers of younger subjects from age-extension trials (e.g. AgeX) **Includes some routine follow-up of high-risk individuals (e.g., those with family history and/or pathogenic variants)	
Stage distribution of breast, prostate, and colorectal cancers according to route of diagnosis in England.	Proportion of cancers of each stage as determined by route to diagnosis. Prostate cancer estimates include routine, urgent symptomatic and emergency routes to diagnosis only. Data for England from 2018. Derived by the National Cancer Registration and Analysis Service on request, from the National Cancer Registration Dataset.	National Cancer Registration and Analysis Service (NHSD)(32)
Stage distribution of prostate cancers diagnosed via screening.	Stage distribution of cancers identified in the screening arm of the European Randomized Study of Screening for Prostate Cancer (ERSPC), conducted across multiple European countries during the 1990s and early 2000s.(33) T and M staging data from the ERSPC trial were mapped onto the '1-4' staging described by CRUK and used by NCRAS.(34)	ERSPC trial(33)
Net 10-year age-specific, stage-specific survival rates for breast, colorectal, and prostate cancers in England.	Estimates for England, 2008-2017 (net 10-year age-specific, all-stage mortality) and 2013-2017 (net 5-year age-specific, stage-specific mortality). Net 10-year age-specific, stage-specific survival was derived from age, site, and stage-specific net 5-year cancer survival, provided by the National Cancer Registration and Analysis Service on request, from the National Cancer Registration Dataset. Overall survival has been adjusted for background age-specific death rates to reflect net cancer-specific mortality.	National Cancer Registration and Analysis Service (NCRAS)(32)
Overdiagnosis rates	Proportion of total cancers detected on screening that would not have been detected without screening on long-term follow-up. Breast cancer: 11%,(5) Colorectal cancer 3.8% (midpoint of reported estimate range),(35) Prostate cancer (PSA screening) 42%.(4,36,37)	Publishes estimates from follow up of national screening programme trials(5).(4,35–37)

Supplementary Table 2: Assumptions utilised in analyses

Assumption	Justification, source, and implications
Polygenic Risk Scores	
Polygenic risk scores show a Gaussian distribution in populations	Support from central limit theorem(15,38)
Polygenic risk score distributions have the same standard deviation in affected and unaffected individuals	Empirical support from previously published scores and mathematical relationships(15,39)
Polygenic risk scores select for disease incidence, not biology or outcome	Polygenic risk scores are constructed from SNP-associations for GWAS of disease cases unselected in regard of outcome/lethality (i.e. the PRS predict cancer incidence). There is minimal evidence to suggest that SNPs associated with cancer incidence will, on case-only GWAS, be associated with disease outcome. Hence, we assume that disease mortality and overdiagnosis rates will not vary by PRS-defined risk quantile.
Lifetime Risks	
A period approach can be applied for the calculation of lifetime risks.	Lifetime risks are calculated through the application of a cross-section of the age-specific incidence and mortality rates in the UK for 2018. These risks represent the risk that would be incurred to a theoretical population living through the cross-section of rates from 2018. This approach is limited by the fact that it does not account for changes in incidence and mortality over time.
Cancer-specific mortality in the top n% of the PRS is increased in proportion to the change in incidence between the top n% of the PRS and the remainder.	Cancer-specific mortality in the top n% of the PRS is expected to increase in comparison to the average mortality, due to the presence of a higher number of cancers in this group. The OR for death in the top n% of the PRS is unknown, so the average mortality rate can be scaled in proportion to the increase in incidence that occurs in the top n% of the PRS.
Cancers Arising	
The proportion of cancers expected in the nth percentile of the PRS is equal to the cumulative distribution function at point n of the Gaussian curve describing the distribution of polygenic risk scores in cancer cases.	This is inherent from assumptions and justifications described in Polygenic Risk Scores section above.
Cancers Detected by Screening	
All cancers that are expected to occur within the screening period are present at the time of screening	We model screening programs using a modality of given sensitivity. We assume that all cancers that will develop in that period have already developed at the time of the screen, regardless of screening periodicity. Thus, we over-estimate the impact of the screening, as we discount occurrence of 'interval' cancers (which would not exhibit the shifted stage distribution). We do not explicitly specify screening periodicity; we indicate the capacity requirements of screening two-yearly in regard of screening and diagnostic tests. The assumption is progressively more favourable for longer periodicity of screening.
The sensitivity and specificity of screening tools is constant across PRS-defined risk quantiles.	The sensitivity and specificity of a test is innate to the combination of test, disease, and patient population. It is assumed cancers will not differ systematically in their biology, clinical characteristics or clinical behaviour between the different risk quantiles on account of the underlying GWAS having identified SNP associations from comparison to controls of broad cancer case series, which have been ascertained agnostic to biology and clinical outcome.(10,40)
The sensitivity and specificity of screening tools is constant across age groups	The sensitivity and specificity calculated from screening data in older populations has been applied in our hypothetical analyses of screening in younger populations. In practice it is likely that test performance may be poorer, for example digital mammography in younger women may have poorer sensitivity and specificity on account of higher breast density. In this event, our analyses will overestimate the detection rate and survival benefit for these younger populations.
The cancers detected when screening is introduced are displaced proportionately from the other 3 routes to diagnosis	When modelling introduction of screening, we modelled proportionate shift into screening from across the current routes to diagnosis. In practice, those attending screening are possibly more likely to otherwise present as routine or urgent symptomatic (GP referral routes) than emergency. Accordingly, the predicted survival gain from introduction of screening may be over-emphasised.
The proportion of cancers that are overdiagnoses is constant across PRS-defined risk quantiles.	It is assumed cancers will not differ systematically in their biology, clinical characteristics or clinical behaviour between the different risk quantiles on account of the underlying GWAS having identified SNP associations from comparison to controls of broad cancer case series, which have been

	ascertained agnostic to biology or clinical outcome.(10,40). Accordingly, if trials demonstrate that 42% of cancers detected on unselected population screening are overdiagnoses, we have assumed that 42% of cancers diagnosed in any risk quartile will be overdiagnoses.
Uptake	
There is 100% uptake for SNP-genotyping and screening	This is a deliberate simplification to illustrate maximal theoretical impact for PRS-risk-based screening. In practice, uptake of national screening programs is typically ≤ 70% with bias away from population groups at highest cancer risk (relating to their socio-economic and lifestyle factors). Uptake of PRS-SNP genotyping will likely be context- and population-specific; reported uptake of PRS-based stratification when offered as part of a study within the UK NHSBSP (NHS Breast Screening Program) was <20%.(14)
Survival	
Cancer-specific survival has remained static since 2008.	Application of survival data for 2008-2017 for future predictions around screening assumes no change in stage-specific survival. Improvements in stage-specific survival since 2008 will likely mean that survival gains from stage-shift are over-estimated (but would depend on any stage-specific patterns)
The age-stage-specific 10-year survival can be approximated from the age-specific 10-year survival adjusted for the ratio of 5-year stage-specific survival.	For most solid tumours, survival at 10 years post diagnosis typically equates to long-term survival. NCRAS only routinely generated stage-specific survival from 2013. Hence, to obtain stage-specific 10-year survival, we applied established methods of applying the ratio of stage-specific to all stage survival at 5 years (2013-17) to all-stage survival at 10-years (2008-2017).
One-year age specific incidence rates can be estimated from adjacent 5-year age-specific incidence rates using linear interpolation	5-year age-specific incidence rates rise with age across all cancers, but do so in a variable format. Simple linear interpolation allows estimation of one-year age-specific incidence rates within age-bands.
Cancers currently detected by screening in the target age groups would be proportionally detected by other routes to diagnosis in the absence of screening	For breast cancers aged 40-49 and colorectal cancers aged 40-59, a small proportion are currently diagnosed by screening. This is predominantly due to inclusion via an age extension trial (e.g., Age X)*. We model these groups of individuals who are currently having breast screening age 40-49 or colorectal screening age 40-59 as being redistributed into other routes of diagnosis in proportion to the rest of the population. Screening uptake may be higher in individuals of higher socio-economic status, and these individuals may also be less likely to be diagnosed via an emergency presentation. Thus, when redistributing screen-diagnosed individuals proportionally into other routes of diagnosis, we may over-estimate the number of individuals presenting by the emergency route as the baseline. Thus, we are establishing a favourable baseline for comparison in regard of there being absolutely no screening to start, and may even be further lowering the survival rates for this baseline group. *Annual mammography 40-49 for women who carry a high penetrance germline gene mutation (e.g., BRCA1) or early-life mantle radiotherapy have only been migrated to NHSBSP in 2018, and thus will not distort these figures. Women who are eligible for annual mammography aged 40-49 via the NICE moderate-risk pathway are included in the 'Routine' diagnosis route as these mammograms are not conducted via NHSBSP
Proportion of cancers of each stage in each route to diagnosis remains constant despite reduction for cancers detected by screening.	It is assumed that subtraction of a group of cancers for detection by screening does not alter the distribution of stage of detection for each of the other three other routes to diagnosis.

Supplementary Table 3. Screening tool characteristics. Description of currently available "real world" screening tools for cancer and their characteristics including sensitivity and specificity.

Cancer Site	Screening Tool	Sensitivity	Specificity	Detail	Trial/Source	Reference
Colorectal	FIT 20 µg/g threshold (CRC)	89	91	20 µg/g threshold (CRC)	Systematic review and meta-analysis	Lee J.K. et al. *Ann. Intern. Med.* (2014).
	FIT 20-50 µg/g threshold (CRC)	70	95	20-50 µg/g threshold (CRC)	Systematic review and meta-analysis	
	FIT >50 µg/g threshold (CRC)	67	96	>50 µg/g threshold (CRC)	Systematic review and meta-analysis	
Pancreas	CA19-9_20U/mL cut-off	67·8	83	20 U/mL cut-off	Meta-analysis	Zhang Y. et al. *Int. J. Clin. Exp. Med.* (2015).
	CA19-9_37U/mL cut-off	76·4	72·9	37 U/mL cut-off	Meta-analysis	
Lung	Low dose CT	84·6	98·6	Three rounds of low-dose CT	NELSON Trial	Herwig N. et al. *Lancet Oncol.* (2014).
Breast	Film mammography	66	92	All women, with use of BIRADS Score	DMIST Trial	Pisano E.D. et al. *N. Engl. J. Med.* (2005).
	Digital mammography	70	92	All women, with use of BIRADS Score	DMIST Trial	
Ovary	MMS (CA-125 + TVU)	84	99	First line screening with CA-125 interpreted via ROCA and second-line screening via TVU	UKCTOCS Trial	Jacobs I.J. et al. *Lancet* (2015).
	USS	72·9	96·8	First and second line screening via TVU	UKCTOCS Trial	
Prostate	PSA_4ng/mL cut-off	21	91	4ng/mL cut-off	Prostate Cancer Prevention Trial (USA)	Wolf A.M.D. et al. *Cancer J Clin.* (2010).
	PSA_3ng/mL cut-off	32	85	3ng/mL cut-off	Prostate Cancer Prevention Trial (USA)	
	mpMRI	89	73	Mend suspected or diagnosed with prostate cancer, with use of PI-RADSv2 score	Meta-analysis	Woo S. et al. *Eur. Urol.* (2017).
Testis	Semen assay	67	98	automated immunocytochemical staining, scanning microscopy and in silico image analysis	Single Study	Amstrad K. et al. *Int. J. Andros.* (2011).
Kidney	USS	82	98	Renal ultrasound scan	Literature Review	Rossi S.H. et al. *World J. Urol.* (2018).

Supplementary Table 4. Summary of PRS Characteristics

PRS Characteristics				Odds Ratios of quartile versus average (middle quintile)					Percentage of cancers captured within the PRS-defined high risk quintile				
Cancer Site		Number of Variants	AUC	Top 50%	Top 20%	Top 10%	Top 5%	Top 1%	Top 50%	Top 20%	Top 10%	Top 5%	Top 1%
Current PRS	Breast	286,144	0·64	1·59	2·13	2·54	2·96	4·03	70%	37%	22%	13%	4%
	Prostate	178,259	0·70	2·01	2·99	3·83	4·75	7·32	77%	46%	29%	18%	6%
	Colorectal	87	0·62	1·45	1·84	2·12	2·41	3·09	66%	34%	19%	11%	3%
	Pancreas	10	0·58	1·27	1·50	1·65	1·80	2·13	61%	29%	16%	9%	2%
	Ovary	12	0·56	1·19	1·34	1·44	1·53	1·74	58%	26%	14%	8%	2%
	Kidney	12	0·52	1·05	1·09	1·11	1·13	1·17	52%	22%	11%	6%	1%
	Lung	19	0·55	1·17	1·30	1·39	1·47	1·64	57%	26%	14%	7%	2%
	Testis	44	0·70	2·05	3·07	3·95	4·93	7·65	77%	47%	30%	19%	6%
Future PRS	Breast	..	0·69	1·91	2·79	3·52	4·32	6·48	76%	44%	28%	17%	5%
	Prostate	..	0·72	2·16	3·32	4·34	5·49	8·76	79%	48%	32%	20%	6%
	Colorectal	..	0·64	1·58	2·10	2·50	2·92	3·94	70%	37%	22%	13%	3%
	Pancreas	..	0·65	1·64	2·22	2·67	3·14	4·33	71%	38%	23%	14%	4%
	Ovary	..	0·61	1·43	1·81	2·08	2·35	3·00	66%	33%	19%	11%	3%
	Kidney	..	0·65	1·60	2·15	2·58	3·01	4·11	70%	38%	22%	13%	4%
	Lung	..	0·61	1·41	1·76	2·01	2·26	2·86	65%	33%	19%	11%	3%
	Testis	..	0·84	4·76	9·20	14·13	20·80	45·55	92%	71%	55%	40%	18%
Optimised PRS	Breast	7,599	0·71	2·11	3·22	4·17	5·24	8·28	78%	48%	31%	19%	6%
	Prostate	4,530	0·73	2·33	3·68	4·90	6·30	10·43	81%	51%	34%	22%	7%
	Colorectal	1,484	0·68	1·85	2·65	3·31	4·03	5·94	75%	43%	27%	16%	5%
	Pancreas	1,757	0·71	2·11	3·22	4·17	5·24	8·28	78%	48%	31%	19%	6%
	Ovary	1,015	0·64	1·57	2·09	2·49	2·89	3·90	69%	37%	22%	13%	3%
	Kidney	2,220	0·70	2·02	3·01	3·86	4·80	7·40	77%	46%	29%	18%	6%
	Lung	6,096	0·67	1·77	2·50	3·08	3·70	5·34	73%	41%	25%	15%	4%
	Testis	2,598	0·88	7·35	15·33	25·04	39·15	97·79	95%	79%	65%	51%	25%

Supplementary Table 5. Lifetime risk of eight cancers for the general population, and for the top 50%, 20%, 10%, 5%, and 1% of current, future, and optimised PRS. Lifetime risk is calculated using the current probability method and a period approach, which takes into account competing risks.

PRS	**Cancer Site**	**PRS AUC**	**Absolute lifetime risk (%)**											
			Population average		**top 50% of PRS**		**top 20% of PRS**		**top 10% of PRS**		**top 5% of PRS**		**top 1% of PRS**	
			Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current PRS	Breast	0·64	-	14·3	-	19·5	-	25·3	-	29·5	-	33·7	-	43·4
	Prostate	0·70	15·2	-	22·6	-	31·9	-	39·1	-	46·4	-	63·2	-
	Colorectal	0·62	7·6	5·9	10·0	7·7	12·6	9·8	14·4	11·2	16·2	12·7	20·5	16·0
	Pancreas	0·58	1·8	1·6	2·2	2·0	2·6	2·3	2·8	2·6	3·1	2·8	3·7	3·3
	Ovary	0·56	-	2·1	-	2·4	-	2·7	-	3·0	-	3·1	-	3·5
	Kidney	0·52	2·6	1·5	2·7	1·5	2·8	1·6	2·8	1·6	2·9	1·7	3·0	1·7
	Lung	0·55	8·4	7·1	9·6	8·2	10·7	9·1	11·4	9·7	12·0	10·2	13·4	11·4
	Testis	0·70	0·5	-	0·8	-	1·3	-	1·6	-	2·0	-	3·1	-
Future PRS	Breast	0·69	-	14·3	-	20·9	-	29·3	-	35·7	-	42·2	-	57·6
	Prostate	0·72	15·2	-	23·1	-	33·5	-	41·6	-	49·8	-	66·8	-
	Colorectal	0·64	7·6	5·9	10·5	8·1	13·7	10·7	16·2	12·6	18·7	14·6	24·7	19·4
	Pancreas	0·65	1·8	1·6	2·5	2·3	3·4	3·1	4·1	3·8	4·9	4·4	6·7	6·1
	Ovary	0·61	-	2·1	-	2·8	-	3·5	-	4·0	-	4·5	-	5·7
	Kidney	0·65	2·6	1·5	3·6	2·1	4·8	2·8	5·7	3·3	6·6	3·8	8·9	5·2
	Lung	0·61	8·4	7·1	10·9	9·3	13·5	11·5	15·4	13·2	17·3	14·8	21·7	18·5
	Testis	0·84	0·5	-	1·0	-	1·9	-	2·9	-	4·3	-	9·2	-
Optimised PRS	Breast	0·71	-	14·3	-	21·6	-	31·3	-	39·0	-	46·8	-	65·3
	Prostate	0·73	15·2	-	23·6	-	34·9	-	43·9	-	53·1	-	74·0	-
	Colorectal	0·68	7·6	5·9	11·2	8·7	15·8	12·3	19·4	15·2	23·3	18·3	32·9	26·1
	Pancreas	0·71	1·8	1·6	2·8	2·6	4·3	3·9	5·5	5·0	6·9	6·3	10·9	9·9
	Ovary	0·64	-	2·1	-	2·9	-	3·8	-	4·6	-	5·3	-	7·1
	Kidney	0·70	2·6	1·5	3·9	2·3	5·8	3·4	7·4	4·3	9·1	5·3	13·8	8·1
	Lung	0·67	8·4	7·1	12·2	10·4	17·0	14·5	20·9	17·8	24·8	21·3	35·4	30·2
	Testis	0·88	0·5	-	1·0	-	2·1	-	3·5	-	5·4	-	13·0	-

Supplementary Table 6a(i). Cancers detected by offering risk stratified screening according to current PRS using sensitivity of current "real world" cancer-screening tools (Cancers of the Breast, Prostate, Colorectum and Pancreas)

Cancer Type	Screening tool	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
			Male	Female	Population Size	Cancers arising per year	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Breast																																				
Breast	Digital mammography	40 to 44	0.0	124.6	2,054,223	2,559	1,027,112	1,786	773	536	1,250	49	410,845	955	1,604	287	669	26	205,422	570	1,989	171	399	16	102,711	333	2,226	100	233	9	20,542	90	2,469	27	63	2
Breast		45 to 49	0.0	214.8	2,315,479	4,974	1,157,740	3,471	1,503	1,041	2,430	49	463,096	1,856	3,118	557	1,299	26	231,548	1,107	3,867	332	775	16	115,774	646	4,328	194	453	9	23,155	176	4,798	53	123	2
Breast		50 to 54	0.0	279.8	2,364,638	6,616	1,182,319	4,617	1,999	1,385	3,232	49	472,928	2,469	4,147	741	1,728	26	236,464	1,473	5,143	442	1,031	16	118,232	860	5,756	258	602	9	23,646	234	6,382	70	163	2
Breast		55 to 59	0.0	285.5	2,119,687	6,052	1,059,844	4,224	1,828	1,267	2,956	49	423,937	2,259	3,793	678	1,581	26	211,969	1,348	4,704	404	943	16	105,984	787	5,265	236	551	9	21,197	214	5,838	64	150	2
Breast		60 to 64	0.0	338.0	1,837,174	6,209	918,587	4,333	1,876	1,300	3,033	49	367,435	2,317	3,892	695	1,622	26	183,717	1,382	4,827	415	968	16	91,859	807	5,402	242	565	9	18,372	219	5,990	66	153	2
Breast		65 to 69	0.0	412.3	1,805,190	7,443	902,595	5,194	2,249	1,558	3,636	49	361,038	2,778	4,665	833	1,945	26	180,519	1,657	5,786	497	1,160	16	90,260	967	6,476	290	677	9	18,052	263	7,180	79	184	2
Breast		70 to 74	0.0	372.7	1,603,610	5,977	801,805	4,171	1,806	1,251	2,920	49	320,722	2,231	3,746	669	1,562	26	160,361	1,331	4,646	399	932	16	80,180	777	5,200	233	544	9	16,036	211	5,766	63	148	2
Breast		75 to 79	0.0	403.0	1,181,645	4,762	590,823	3,323	1,439	997	2,326	49	236,329	1,777	2,985	533	1,244	26	118,165	1,060	3,702	318	742	16	59,082	619	4,143	186	433	9	11,816	168	4,594	50	118	2
Breast		Total 40-69	0.0	270.9	12,496,392	33,853	6,248,196	23,625	10,228	7,088	16,538	49	2,499,278	12,635	21,218	3,790	8,844	26	1,249,639	7,538	26,315	2,261	5,276	16	624,820	4,400	29,453	1,320	3,080	9	124,964	1,195	32,658	358	836	2
Breast		Total 40-49	0.0	172.4	4,369,703	7,533	2,184,851	5,257	2,276	1,577	3,680	49	873,941	2,811	4,722	843	1,968	26	436,970	1,677	5,856	503	1,174	16	218,485	979	6,554	294	685	9	43,697	266	7,267	80	186	2
Breast		Total 50-59	0.0	282.5	4,484,325	12,668	2,242,163	8,841	3,827	2,652	6,188	49	896,865	4,728	7,940	1,418	3,310	26	448,433	2,821	9,847	846	1,974	16	224,216	1,646	11,022	494	1,152	9	44,843	447	12,221	134	313	2
Breast		Total 50-69	0.0	323.9	8,126,689	26,320	4,063,345	18,368	7,952	5,510	12,858	49	1,625,338	9,823	16,497	2,947	6,876	26	812,669	5,860	20,460	1,758	4,102	16	406,334	3,421	22,899	1,026	2,394	9	81,267	929	25,391	279	650	2
Breast		Total 60-74	0.0	374.2	5,245,974	19,629	2,622,987	13,699	5,930	4,110	9,589	49	1,049,195	7,326	12,303	2,198	5,128	26	524,597	4,370	15,259	1,311	3,059	16	262,299	2,551	17,078	765	1,786	9	52,460	693	18,936	208	485	2
Breast		Total 40-79	0.0	291.8	15,281,647	44,592	7,640,824	31,120	13,472	9,336	21,784	49	3,056,329	16,643	27,949	4,993	11,650	26	1,528,165	9,929	34,663	2,979	6,950	16	764,082	5,795	38,797	1,739	4,057	9	152,816	1,574	43,018	472	1,102	2
Breast		Total (all ages)	0.0	166.0	33,458,052	55,545																														
Prostate																																				
Prostate	PSA_3ng/mL cut-off	40 to 44	4.3	0.0	2,021,385	88	1,010,692	68	20	46	22	25	404,277	40	48	27	13	15	202,138	26	62	18	8	9	101,069	16	72	11	5	6	20,214	5	83	3	2	2
Prostate		45 to 49	20.5	0.0	2,251,680	461	1,125,840	355	106	241	114	25	450,336	211	250	144	68	15	225,168	135	326	92	43	9	112,584	84	377	57	27	6	22,517	26	435	18	8	2
Prostate		50 to 54	75.7	0.0	2,293,473	1,737	1,146,736	1,337	400	909	428	25	458,695	797	940	542	255	15	229,347	509	1,228	346	163	9	114,674	316	1,421	215	101	6	22,935	97	1,640	66	31	2
Prostate		55 to 59	201.8	0.0	2,061,919	4,160	1,030,959	3,202	958	2,177	1,024	25	412,384	1,908	2,252	1,297	610	15	206,192	1,220	2,940	829	390	9	103,096	758	3,402	515	242	6	20,619	233	3,927	159	75	2
Prostate		60 to 64	356.1	0.0	1,764,828	6,285	882,414	4,837	1,448	3,289	1,548	25	352,966	2,882	3,403	1,960	922	15	176,483	1,843	4,442	1,253	590	9	88,241	1,145	5,140	778	366	6	17,648	352	5,933	240	113	2
Prostate		65 to 69	622.7	0.0	1,696,993	10,568	848,497	8,133	2,435	5,531	2,603	25	339,399	4,846	5,722	3,295	1,551	15	169,699	3,099	7,469	2,107	992	9	84,850	1,925	8,643	1,309	616	6	16,970	592	9,976	403	190	2
Prostate		70 to 74	759.8	0.0	1,467,965	11,153	733,983	8,583	2,570	5,837	2,747	25	293,593	5,114	6,039	3,478	1,637	15	146,797	3,270	7,883	2,224	1,046	9	73,398	2,031	9,122	1,381	650	6	14,680	625	10,528	425	200	2
Prostate		75 to 79	867.2	0.0	1,007,365	8,736	503,683	6,723	2,013	4,572	2,151	25	201,473	4,006	4,730	2,724	1,282	15	100,737	2,562	6,174	1,742	820	9	50,368	1,591	7,145	1,082	509	6	10,074	490	8,246	333	157	2
Prostate		Total 40-69	192.7	0.0	12,090,277	23,299	6,045,139	17,931	5,368	12,193	5,738	25	2,418,055	10,684	12,615	7,265	3,419	15	1,209,028	6,832	16,467	4,646	2,186	9	604,514	4,243	19,056	2,885	1,358	6	120,903	1,306	21,993	888	418	2
Prostate		Total 40-49	12.8	0.0	4,273,065	549	2,136,532	423	126	287	135	25	854,613	252	297	171	81	15	427,306	161	388	109	52	9	213,653	100	449	68	32	6	42,731	31	518	21	10	2
Prostate		Total 50-59	135.4	0.0	4,355,391	5,897	2,177,696	4,538	1,359	3,086	1,452	25	871,078	2,704	3,193	1,839	865	15	435,539	1,729	4,168	1,176	553	9	217,770	1,074	4,823	730	344	6	43,554	331	5,566	225	106	2
Prostate		Total 60-69	486.8	0.0	3,461,821	16,853	1,730,911	12,970	3,883	8,820	4,150	25	692,364	7,728	9,125	5,255	2,473	15	346,182	4,942	11,911	3,360	1,581	9	173,091	3,069	13,784	2,087	982	6	34,618	945	15,908	642	302	2
Prostate		Total 50-69	291.0	0.0	7,817,219	22,750	3,908,606	17,509	5,241	11,906	5,603	25	1,563,443	10,432	12,318	7,094	3,338	15	781,721	6,671	16,079	4,536	2,135	9	390,861	4,143	18,607	2,817	1,326	6	78,172	1,275	21,475	867	408	2
Prostate		Total 60-74	568.1	0.0	4,929,786	28,006	2,464,893	21,554	6,452	14,656	6,897	25	985,957	12,842	15,164	8,733	4,110	15	492,979	8,212	19,794	5,584	2,628	9	246,489	5,101	22,905	3,468	1,632	6	49,298	1,570	26,436	1,067	502	2
Prostate		Total 40-79	296.5	0.0	14,565,608	43,188	7,282,804	33,238	9,950	22,602	10,636	25	2,913,122	19,804	23,384	13,467	6,337	15	1,456,561	12,664	30,524	8,611	4,052	9	728,280	7,866	35,322	5,349	2,517	6	145,656	2,421	40,767	1,646	775	2
Prostate		Total (all ages)	183.8	0.0	32,583,226	52,254																														
Colorectal																																				
Colorectal	FIT 20-50 µg/g threshold (CRC)	40 to 44	14.5	13.5	4,075,608	570	2,037,804	378	192	113	265	46	815,122	192	378	58	134	24	407,561	111	459	33	78	14	203,780	63	507	19	44	8	40,756	16	554	5	11	2
Colorectal		45 to 49	24.4	21.6	4,567,159	1,047	2,283,580	694	353	208	486	46	913,432	353	694	106	247	24	456,716	204	843	61	143	14	228,358	116	931	35	81	8	45,672	30	1,017	9	21	2
Colorectal		50 to 54	47.1	37.1	4,658,111	1,958	2,329,055	1,298	660	389	909	46	931,622	660	1,298	198	462	24	465,811	381	1,577	114	267	14	232,906	216	1,742	65	151	8	46,581	56	1,902	17	39	2
Colorectal		55 to 59	87.7	60.6	4,181,606	3,094	2,090,803	2,052	1,042	615	1,436	46	836,321	1,043	2,051	313	730	24	418,161	602	2,492	181	422	14	209,080	342	2,752	103	239	8	41,816	88	3,006	26	61	2
Colorectal		60 to 64	151.4	91.0	3,602,002	4,345	1,801,001	2,881	1,464	864	2,017	46	720,400	1,464	2,881	439	1,025	24	360,200	846	3,499	254	592	14	180,100	480	3,865	144	336	8	36,020	123	4,222	37	86	2
Colorectal		65 to 69	198.3	119.1	3,502,183	5,516	1,751,092	3,658	1,858	1,097	2,560	46	700,437	1,859	3,657	558	1,301	24	350,218	1,074	4,442	322	752	14	175,109	609	4,907	183	427	8	35,022	156	5,360	47	110	2
Colorectal		70 to 74	273.5	171.2	3,071,575	6,760	1,535,787	4,482	2,278	1,345	3,138	46	614,315	2,278	4,482	683	1,595	24	307,157	1,316	5,444	395	921	14	153,579	747	6,013	224	523	8	30,716	192	6,568	58	134	2
Colorectal		75 to 79	351.7	234.8	2,189,011	6,318	1,094,505	4,189	2,129	1,257	2,933	46	437,802	2,129	4,189	639	1,490	24	218,901	1,230	5,088	369	861	14	109,451	698	5,620	209	489	8	21,890	179	6,139	54	125	2
Colorectal		Total 40-69	80.8	54.1	24,586,669	16,530	12,293,335	10,961	5,569	3,288	7,673	46	4,917,334	5,570	10,960	1,671	3,899	24	2,458,667	3,219	13,311	966	2,253	14	1,229,333	1,826	14,704	548	1,278	8	245,867	469	16,061	141	328	2
Colorectal		Total 40-49	19.7	17.7	8,642,767	1,617	4,321,384	1,072	545	322	751	46	1,728,553	545	1,072	163	381	24	864,277	315	1,302	94	220	14	432,138	179	1,438	54	125	8	86,428	46	1,571	14	32	2
Colorectal		Total 50-59	66.4	48.2	8,839,717	5,052	4,419,858	3,350	1,702	1,005	2,345	46	1,767,943	1,702	3,350	511	1,192	24	883,972	984	4,068	295	689	14	441,986	558	4,494	167	391	8	88,397	143	4,909	43	100	2
Colorectal		Total 50-69	114.2	73.6	15,943,902	14,913	7,971,951	9,889	5,024	2,967	6,922	46	3,188,780	5,025	9,888	1,508	3,518	24	1,594,390	2,904	12,009	871	2,033	14	797,195	1,648	13,265	494	1,153	8	159,439	423	14,490	127	296	2
Colorectal		Total 60-74	203.9	125.2	10,175,760	16,621	5,087,880	11,021	5,600	3,306	7,715	46	2,035,152	5,601	11,020	1,680	3,921	24	1,017,576	3,236	13,385	971	2,265	14	508,788	1,836	14,785	551	1,285	8	101,758	471	16,150	141	330	2
Colorectal		Total 40-79	119.0	80.4	29,847,255	29,608	14,923,627	19,632	9,976	5,890	13,743	46	5,969,451	9,977	19,631	2,993	6,984	24	2,984,725	5,765	23,843	1,730	4,036	14	1,492,963	3,271	26,337	981	2,290	8	298,473	840	28,768	252	588	2
Colorectal		Total (all ages)	84.5	56.5	66,041,278	42,885																														
Pancreas																																				
Pancreas	CA19-9_20U/mL cutoff	40 to 44	2.6	2.0	4,075,608	94	2,037,804	57	37	18	39	41	815,122	27	67	9	18	20	407,561	15	79	5	10	11	203,780	8	86	3	6	6	40,756	2	92	1	1	1
Pancreas		45 to 49	5.6	3.9	4,567,159	215	2,283,580	131	84	42	89	41	913,432	62	153	20	42	20	456,716	34	181	11	23	11	228,358	19	196	6	13	6	45,672	4	211	1	3	1
Pancreas		50 to 54	10.2	7.3	4,658,111	409	2,329,055	250	159	80	169	41	931,622	118	291	38	80	20	465,811	65	344	21	44	11	232,906	35	374	11	24	6	46,581	8	401	3	6	1
Pancreas		55 to 59	18.3	13.6	4,181,606	666	2,090,803	407	259	131	276	41	836,321	192	474	62	130	20	418,161	106	560	34	72	11	209,080	58	608	19	39	6	41,816	14	652	4	9	1
Pancreas		60 to 64	29.2	22.4	3,602,002	926	1,801,001	566	360	182	384	41	720,400	267	659	86	181	20	360,200	147	779	47	100	11	180,100	80	846	26	54	6	36,020	19	907	6	13	1
Pancreas		65 to 69	47.2	34.1	3,502,183	1,417	1,751,092	866	551	279	587	41	700,437	408	1,009	131	277	20	350,218	225	1,192	72	153	11	175,109	122	1,295	39	83	6	35,022	29	1,388	9	20	1
Pancreas		70 to 74	66.4	48.8	3,071,575	1,757	1,535,787	1,074	683	346	728	41	614,315	506	1,251	163	343	20	307,157	279	1,478	90	189	11	153,579	152	1,605	49	103	6	30,716	36	1,721	12	24	1
Pancreas		75 to 79	86.0	70.8	2,189,011	1,702	1,094,505	1,040	662	335	705	41	437,802	490	1,212	158	332	20	218,901	270	1,432	87	183	11	109,451	147	1,555	47	100	6	21,890	35	1,667	11	24	1
Pancreas		Total 40-69	17.4	13.0	24,586,669	3,727	12,293,335	2,277	1,450	733	1,544	41	4,917,334	1,073	2,654	345	727	20	2,458,667	592	3,135	191	401	11	1,229,333	322	3,405	104	218	6	245,867	76	3,651	25	52	1
Pancreas		Total 40-49	4.2	3.0	8,642,767	309	4,321,384	189	120	61	128	41	1,728,553	89	220	29	60	20	864,277	49	260	16	33	11	432,138	27	282	9	18	6	86,428	6	303	2	4	1
Pancreas		Total 50-59	14.1	10.3	8,839,717	1,075	4,419,858	657	418	211	445	41	1,767,943	309	766	100	210	20	883,972	171	904	55	116	11	441,986	93	982	30	63	6	88,397	22	1,053	7	15	1
Pancreas		Total 50-69	24.7	18.3	15,943,902	3,418	7,971,951	2,088	1,330	672	1,416	41	3,188,780	984	2,434	317	667	20	1,594,390	543	2,875	175	368	11	797,195	295	3,123	95	200	6	159,439	70	3,348	23	47	1
Pancreas		Total 60-74	46.5	34.5	10,175,760	4,100	5,087,880	2,505	1,595	807	1,698	41	2,035,152	1,180	2,920	380	800	20	1,017,576	651	3,449	210	441	11	508,788	354	3,746	114	240	6	101,758	84	4,016	27	57	1
Pancreas		Total 40-79	27.1	21.2	29,847,255	7,186	14,923,627	4,391	2,795	1,414	2,977	41	5,969,451	2,068	5,118	666	1,402	20	2,984,725	1,141	6,045	367	773	11	1,492,963	621	6,565	200	421	6	298,473	147	7,039	47	100	1
Pancreas		Total (all ages)	19.3	15.0	66,041,278	10,452																														

Supplementary Table 6a(ii). Cancers detected by offering risk stratified screening according to current PRS using sensitivity of current "real world" cancer-screening tools (Cancers of the Ovary, Kidney, Lung, Testis)

Cancer Type	Screening tool	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
			Male	Female	Population Size	Cancers arising per year	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Ovary																																				
Ovary	MMS (CA-125 + TVU)	40 to 44	0.0	13.2	2,054,223	270	1,027,112	157	113	25	132	49	410,845	71	199	11	60	22	205,422	38	232	6	32	12	102,711	20	250	3	17	6	20,542	5	265	1	4	1
Ovary		45 to 49	0.0	19.4	2,315,479	448	1,157,740	261	187	42	219	49	463,096	118	330	19	99	22	231,548	63	385	10	53	12	115,774	34	414	5	28	6	23,155	8	440	1	6	1
Ovary		50 to 54	0.0	27.1	2,364,638	640	1,182,319	372	268	60	313	49	472,928	168	472	27	141	22	236,464	90	550	14	76	12	118,232	48	592	8	40	6	23,646	11	629	2	9	1
Ovary		55 to 59	0.0	34.8	2,119,687	738	1,059,844	429	309	69	361	49	423,937	194	544	31	163	22	211,969	104	634	17	87	12	105,984	55	683	9	47	6	21,197	13	725	2	11	1
Ovary		60 to 64	0.0	41.6	1,837,174	764	918,587	444	320	71	373	49	367,435	201	563	32	169	22	183,717	108	656	17	91	12	91,859	57	707	9	48	6	18,372	13	751	2	11	1
Ovary		65 to 69	0.0	52.3	1,805,190	944	902,595	549	395	88	461	49	361,038	248	696	40	208	22	180,519	133	811	21	112	12	90,260	71	873	11	60	6	18,052	16	928	3	13	1
Ovary		70 to 74	0.0	60.8	1,603,610	975	801,805	567	408	91	476	49	320,722	256	719	41	215	22	160,361	138	837	22	116	12	80,180	73	902	12	62	6	16,036	17	958	3	14	1
Ovary		75 to 79	0.0	73.8	1,181,645	872	590,823	507	365	81	426	49	236,329	229	643	37	192	22	118,165	123	749	20	103	12	59,082	66	806	10	55	6	11,816	15	857	2	12	1
Ovary		Total 40-69	0.0	30.4	12,496,392	3,804	6,248,196	2,213	1,591	354	1,859	49	2,499,278	999	2,805	160	839	22	1,249,639	537	3,267	86	451	12	624,820	286	3,518	46	240	6	124,964	65	3,739	10	54	1
Ovary		Total 40-49	0.0	16.4	4,369,703	718	2,184,851	418	300	67	351	49	873,941	189	529	30	158	22	436,970	101	617	16	85	12	218,485	54	664	9	45	6	43,697	12	706	2	10	1
Ovary		Total 50-59	0.0	30.7	4,484,325	1,378	2,242,163	802	576	128	673	49	896,865	362	1,016	58	304	22	448,433	194	1,184	31	163	12	224,216	104	1,274	17	87	6	44,843	23	1,355	4	20	1
Ovary		Total 50-69	0.0	38.0	8,126,689	3,086	4,063,345	1,795	1,291	287	1,508	49	1,625,338	810	2,276	130	681	22	812,669	436	2,650	70	366	12	406,334	232	2,854	37	195	6	81,267	52	3,034	8	44	1
Ovary		Total 60-74	0.0	51.1	5,245,974	2,683	2,622,987	1,561	1,122	250	1,311	49	1,049,195	705	1,978	113	592	22	524,597	379	2,304	61	318	12	262,299	202	2,481	32	169	6	52,460	46	2,637	7	38	1
Ovary		Total 40-79	0.0	37.0	15,281,647	5,651	7,640,824	3,287	2,364	526	2,761	49	3,056,329	1,484	4,167	237	1,247	22	1,528,165	798	4,853	128	670	12	764,082	425	5,226	68	357	6	152,816	96	5,555	15	81	1
Ovary		Total (all ages)	0.0	22.8	33,458,052	7,495																														
Kidney																																				
Kidney	USS	40 to 44	10.1	5.0	4,075,608	307	2,037,804	161	146	44	117	38	815,122	67	240	18	49	16	407,561	34	273	9	25	8	203,780	17	290	5	13	4	40,756	4	303	1	3	1
Kidney		45 to 49	17.7	7.8	4,567,159	580	2,283,580	304	276	82	222	38	913,432	126	454	34	92	16	456,716	64	516	17	47	8	228,358	33	547	9	24	4	45,672	7	573	2	5	1
Kidney		50 to 54	26.8	12.7	4,658,111	915	2,329,055	479	436	130	350	38	931,622	199	716	54	145	16	465,811	102	813	28	74	8	232,906	52	863	14	38	4	46,581	11	904	3	8	1
Kidney		55 to 59	37.1	18.6	4,181,606	1,160	2,090,803	608	552	165	443	38	836,321	252	908	68	184	16	418,161	129	1,031	35	94	8	209,080	66	1,094	18	48	4	41,816	14	1,146	4	10	1
Kidney		60 to 64	53.7	26.2	3,602,002	1,429	1,801,001	749	680	203	546	38	720,400	311	1,118	84	226	16	360,200	159	1,270	43	116	8	180,100	81	1,348	22	59	4	36,020	17	1,412	5	12	1
Kidney		65 to 69	73.9	36.4	3,502,183	1,911	1,751,092	1,001	910	271	730	38	700,437	415	1,496	113	303	16	350,218	212	1,699	57	155	8	175,109	108	1,803	29	79	4	35,022	22	1,889	6	16	1
Kidney		70 to 74	91.2	45.1	3,071,575	2,063	1,535,787	1,081	982	293	788	38	614,315	448	1,615	121	327	16	307,157	229	1,834	62	167	8	153,579	117	1,946	32	85	4	30,716	24	2,039	7	18	1
Kidney		75 to 79	110.1	57.2	2,189,011	1,785	1,094,505	935	850	253	682	38	437,802	388	1,397	105	283	16	218,901	198	1,587	54	144	8	109,451	101	1,684	27	74	4	21,890	21	1,764	6	15	1
Kidney		Total 40-69	34.6	16.9	24,586,669	6,302	12,293,335	3,302	3,000	895	2,407	38	4,917,334	1,369	4,933	371	998	16	2,458,667	699	5,603	190	510	8	1,229,333	356	5,946	97	260	4	245,867	74	6,228	20	54	1
Kidney		Total 40-49	14.1	6.5	8,642,767	887	4,321,384	465	422	126	339	38	1,728,553	193	694	52	141	16	864,277	98	789	27	72	8	432,138	50	837	14	37	4	86,428	10	877	3	8	1
Kidney		Total 50-59	31.7	15.5	8,839,717	2,075	4,419,858	1,087	988	295	793	38	1,767,943	451	1,624	122	329	16	883,972	230	1,845	62	168	8	441,986	117	1,958	32	86	4	88,397	24	2,051	7	18	1
Kidney		Total 50-69	45.8	22.6	15,943,902	5,415	7,971,951	2,838	2,577	769	2,069	38	3,188,780	1,177	4,238	319	858	16	1,594,390	601	4,814	163	438	8	797,195	306	5,109	83	223	4	159,439	63	5,352	17	46	1
Kidney		Total 60-74	71.8	35.5	10,175,760	5,403	5,087,880	2,831	2,572	767	2,064	38	2,035,152	1,174	4,229	318	856	16	1,017,576	600	4,803	163	437	8	508,788	305	5,098	83	223	4	101,758	63	5,340	17	46	1
Kidney		Total 40-79	45.5	23.0	29,847,255	10,150	14,923,627	5,319	4,831	1,441	3,878	38	5,969,451	2,206	7,944	598	1,608	16	2,984,725	1,127	9,023	305	821	8	1,492,963	574	9,576	155	418	4	298,473	119	10,031	32	87	1
Kidney		Total (all ages)	29.2	14.8	66,041,278	19,323																														
Lung																																				
Lung	Low dose CT	40 to 44	6.0	5.8	4,075,608	240	2,037,804	138	102	21	116	49	815,122	61	179	9	52	22	407,561	33	207	5	28	12	203,780	17	223	3	15	6	40,756	4	236	1	3	1
Lung		45 to 49	16.3	14.7	4,567,159	706	2,283,580	405	301	62	342	49	913,432	181	525	28	153	22	456,716	96	610	15	81	12	228,358	51	655	8	43	6	45,672	11	695	2	10	1
Lung		50 to 54	33.4	31.5	4,658,111	1,512	2,329,055	867	645	133	733	49	931,622	387	1,125	60	327	22	465,811	206	1,306	32	174	12	232,906	109	1,403	17	92	6	46,581	24	1,488	4	21	1
Lung		55 to 59	71.4	67.1	4,181,606	2,896	2,090,803	1,660	1,236	256	1,405	49	836,321	740	2,156	114	626	22	418,161	395	2,501	61	334	12	209,080	209	2,687	32	177	6	41,816	47	2,849	7	39	1
Lung		60 to 64	137.0	124.9	3,602,002	4,711	1,801,001	2,701	2,010	416	2,285	49	720,400	1,204	3,507	185	1,019	22	360,200	643	4,068	99	544	12	180,100	340	4,371	52	288	6	36,020	76	4,635	12	64	1
Lung		65 to 69	229.5	197.8	3,502,183	7,466	1,751,092	4,280	3,186	659	3,621	49	700,437	1,909	5,557	294	1,615	22	350,218	1,018	6,448	157	861	12	175,109	539	6,927	83	456	6	35,022	120	7,346	19	102	1
Lung		70 to 74	335.0	278.1	3,071,575	9,378	1,535,787	5,377	4,001	828	4,549	49	614,315	2,398	6,980	369	2,028	22	307,157	1,279	8,099	197	1,082	12	153,579	677	8,701	104	572	6	30,716	151	9,227	23	128	1
Lung		75 to 79	462.2	340.5	2,189,011	8,680	1,094,505	4,977	3,703	766	4,210	49	437,802	2,219	6,461	342	1,877	22	218,901	1,184	7,496	182	1,002	12	109,451	626	8,054	96	530	6	21,890	140	8,540	22	118	1
Lung		Total 40-69	74.8	68.0	24,586,669	17,531	12,293,335	10,051	7,480	1,548	8,503	49	4,917,334	4,482	13,049	690	3,792	22	2,458,667	2,391	15,140	368	2,023	12	1,229,333	1,265	16,266	195	1,070	6	245,867	283	17,248	44	239	1
Lung		Total 40-49	11.4	10.5	8,642,767	946	4,321,384	542	404	84	459	49	1,728,553	242	704	37	205	22	864,277	129	817	20	109	12	432,138	68	878	11	58	6	86,428	15	931	2	13	1
Lung		Total 50-59	51.4	48.4	8,839,717	4,408	4,419,858	2,527	1,881	389	2,138	49	1,767,943	1,127	3,281	174	953	22	883,972	601	3,807	93	509	12	441,986	318	4,090	49	269	6	88,397	71	4,337	11	60	1
Lung		Total 50-69	109.4	98.9	15,943,902	16,585	7,971,951	9,509	7,076	1,464	8,044	49	3,188,780	4,240	12,345	653	3,587	22	1,594,390	2,262	14,323	348	1,914	12	797,195	1,197	15,388	184	1,012	6	159,439	267	16,318	41	226	1
Lung		Total 60-74	227.8	196.8	10,175,760	21,555	5,087,880	12,358	9,197	1,903	10,455	49	2,035,152	5,511	16,044	849	4,662	22	1,017,576	2,940	18,615	453	2,487	12	508,788	1,555	20,000	239	1,316	6	101,758	347	21,208	54	294	1
Lung		Total 40-79	127.8	111.1	29,847,255	35,589	14,923,627	20,404	15,185	3,142	17,262	49	5,969,451	9,099	26,490	1,401	7,698	22	2,984,725	4,854	30,735	748	4,106	12	1,492,963	2,568	33,021	395	2,172	6	298,473	574	35,015	88	485	1
Lung		Total (all ages)	90.6	70.1	66,041,278	48,549																														
Testis																																				
Testis	Semen assay	40 to 44	12.3	0.0	2,021,385	248	1,010,692	192	56	63	129	52	404,277	115	133	38	77	31	202,138	74	174	24	50	20	101,069	46	202	15	31	12	20,214	14	234	5	10	4
Testis		45 to 49	9.4	0.0	2,251,680	211	1,125,840	163	48	54	109	52	450,336	98	113	32	66	31	225,168	63	148	21	42	20	112,584	39	172	13	26	12	22,517	12	199	4	8	4
Testis		50 to 54	7.0	0.0	2,293,473	160	1,146,736	124	36	41	83	52	458,695	74	86	25	50	31	229,347	48	112	16	32	20	114,674	30	130	10	20	12	22,935	9	151	3	6	4
Testis		55 to 59	5.2	0.0	2,061,919	108	1,030,959	84	24	28	56	52	412,384	50	58	17	34	31	206,192	32	76	11	22	20	103,096	20	88	7	13	12	20,619	6	102	2	4	4
Testis		60 to 64	3.0	0.0	1,764,828	52	882,414	40	12	13	27	52	352,966	24	28	8	16	31	176,483	16	36	5	10	20	88,241	10	42	3	6	12	17,648	3	49	1	2	4
Testis		65 to 69	2.4	0.0	1,696,993	41	848,497	32	9	10	21	52	339,399	19	22	6	13	31	169,699	12	29	4	8	20	84,850	8	33	3	5	12	16,970	2	39	1	2	4
Testis		70 to 74	2.4	0.0	1,467,965	35	733,983	27	8	9	18	52	293,593	16	19	5	11	31	146,797	10	25	3	7	20	73,398	7	28	2	4	12	14,680	2	33	1	1	4
Testis		75 to 79	1.4	0.0	1,007,965	14	503,683	11	3	4	7	52	201,479	7	7	2	4	31	100,797	4	10	1	3	20	50,368	3	11	1	2	12	10,074	1	13	0	1	4
Testis		Total 20-39	16.0	0.0	8,782,738	1,406	4,391,369	1,089	317	359	730	52	1,756,548	654	752	216	438	31	878,274	420	986	139	282	20	439,137	262	1,144	87	176	12	87,827	81	1,325	27	55	4
Testis		Total 40-69	6.8	0.0	12,090,277	820	6,045,139	635	185	210	426	52	2,418,055	381	439	126	255	31	1,209,028	245	575	81	164	20	604,514	153	667	50	102	12	120,903	47	773	16	32	4
Testis		Total 40-49	10.7	0.0	4,273,065	459	2,136,532	356	103	117	238	52	854,613	213	246	70	143	31	427,306	137	322	45	92	20	213,653	86	373	28	57	12	42,731	27	432	9	18	4
Testis		Total 50-59	6.2	0.0	4,355,391	268	2,177,696	208	60	68	139	52	871,078	125	143	41	84	31	435,539	80	188	26	54	20	217,770	50	218	16	33	12	43,554	16	252	5	10	4
Testis		Total 50-69	4.6	0.0	7,817,213	361	3,908,606	280	81	92	187	52	1,563,443	168	193	55	112	31	781,721	108	253	36	72	20	390,861	67	294	22	45	12	78,172	21	340	7	14	4
Testis		Total 60-74	2.6	0.0	4,929,786	128	2,464,893	99	29	33	66	52	985,957	60	68	20	40	31	492,979	38	90	13	26	20	246,489	24	104	8	16	12	49,298	7	121	2	5	4
Testis		Total 40-79	6.0	0.0	14,565,608	869	7,282,804	673	196	222	451	52	2,913,122	404	465	133	271	31	1,456,561	260	609	86	174	20	728,280	162	707	53	109	12	145,656	50	819	17	34	4
Testis		Total (all ages)	7.2	0.0	32,583,226	2,354																														

Supplementary Table 6b(i). Cancers detected by offering risk stratified screening according to future PRS using sensitivity of current "real world" cancer-screening tools (Cancers of the Breast, Prostate, Colorectum and Pancreas)

Cancer Type	Screening sensitivity	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
			Male	Female	Population Size	Cancers arising per year	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Breast																																				
Breast	Digital mammography	40 to 44	0.0	124.6	2,054,223	2,559	1,027,112	1,934	625	580	1,354	53	410,845	1,129	1,430	339	790	31	205,422	712	1,847	214	498	19	102,711	437	2,122	131	306	12	20,542	131	2,428	39	92	4
Breast	Digital mammography	45 to 49	0.0	214.8	2,315,479	4,974	1,157,740	3,760	1,214	1,128	2,632	53	463,096	2,194	2,780	658	1,536	31	231,548	1,384	3,590	415	968	19	115,774	849	4,125	255	594	12	23,155	255	4,719	76	178	4
Breast	Digital mammography	50 to 54	0.0	279.8	2,364,638	6,616	1,182,319	5,001	1,615	1,500	3,501	53	472,928	2,918	3,698	875	2,042	31	236,464	1,840	4,776	552	1,288	19	118,232	1,129	5,487	339	790	12	23,646	339	6,277	102	237	4
Breast	Digital mammography	55 to 59	0.0	285.5	2,119,687	6,052	1,059,844	4,575	1,477	1,372	3,202	53	423,937	2,669	3,383	801	1,868	31	211,969	1,683	4,369	505	1,178	19	105,984	1,033	5,019	310	723	12	21,197	310	5,742	93	217	4
Breast	Digital mammography	60 to 64	0.0	338.0	1,837,174	6,209	918,587	4,693	1,516	1,408	3,285	53	367,435	2,738	3,471	821	1,917	31	183,717	1,727	4,482	518	1,209	19	91,859	1,060	5,149	318	742	12	18,372	318	5,891	95	223	4
Breast	Digital mammography	65 to 69	0.0	412.3	1,805,190	7,443	902,595	5,626	1,817	1,688	3,938	53	361,038	3,282	4,161	985	2,298	31	180,519	2,070	5,373	621	1,449	19	90,260	1,270	6,173	381	889	12	18,052	381	7,062	114	267	4
Breast	Digital mammography	70 to 74	0.0	372.7	1,603,610	5,977	801,805	4,518	1,459	1,355	3,163	53	320,722	2,636	3,341	791	1,845	31	160,361	1,663	4,314	499	1,164	19	80,180	1,020	4,957	306	714	12	16,036	306	5,671	92	214	4
Breast	Digital mammography	75 to 79	0.0	403.0	1,181,645	4,762	590,823	3,600	1,162	1,080	2,520	53	236,329	2,100	2,662	630	1,470	31	118,165	1,325	3,437	397	927	19	59,082	813	3,949	244	569	12	11,816	244	4,518	73	171	4
Breast	Digital mammography	Total 40-69	0.0	270.9	12,496,392	33,853	6,248,196	25,590	8,263	7,677	17,913	53	2,499,278	14,930	18,923	4,479	10,451	31	1,249,639	9,417	24,436	2,825	6,592	19	624,820	5,777	28,076	1,733	4,044	12	124,964	1,734	32,119	520	1,214	4
Breast	Digital mammography	Total 40-49	0.0	172.4	4,369,703	7,533	2,184,851	5,694	1,839	1,708	3,986	53	873,941	3,322	4,211	997	2,326	31	436,970	2,095	5,438	629	1,467	19	218,485	1,285	6,248	386	900	12	43,697	386	7,147	116	270	4
Breast	Digital mammography	Total 50-59	0.0	282.5	4,484,325	12,668	2,242,163	9,576	3,092	2,873	6,703	53	896,865	5,587	7,081	1,676	3,911	31	448,433	3,524	9,144	1,057	2,467	19	224,216	2,162	10,506	649	1,513	12	44,843	649	12,019	195	454	4
Breast	Digital mammography	Total 50-69	0.0	323.9	8,126,689	26,320	4,063,345	19,896	6,424	5,969	13,927	53	1,625,338	11,608	14,712	3,482	8,125	31	812,669	7,321	18,999	2,196	5,125	19	406,334	4,491	21,829	1,347	3,144	12	81,267	1,348	24,972	404	944	4
Breast	Digital mammography	Total 60-74	0.0	374.2	5,245,974	19,629	2,622,987	14,838	4,791	4,451	10,387	53	1,049,195	8,657	10,972	2,597	6,060	31	524,597	5,460	14,169	1,638	3,822	19	262,299	3,350	16,279	1,005	2,345	12	52,460	1,005	18,624	302	704	4
Breast	Digital mammography	Total 40-79	0.0	291.8	15,281,647	44,592	7,640,824	33,708	10,884	10,112	23,596	53	3,056,329	19,666	24,926	5,900	13,766	31	1,528,165	12,404	32,188	3,721	8,683	19	764,082	7,609	36,983	2,283	5,327	12	152,816	2,284	42,308	685	1,599	4
Breast	Digital mammography	Total (all ages)	0.0	166.0	33,458,052	55,545																														
Prostate																																				
Prostate	PSA_3ng/mL cut-off	40 to 44	4.3	0.0	2,021,385	88	1,010,692	69	19	47	22	25	404,277	43	45	29	14	16	202,138	28	60	19	9	10	101,069	18	70	12	6	6	20,214	6	82	4	2	2
Prostate	PSA_3ng/mL cut-off	45 to 49	20.5	0.0	2,251,680	461	1,125,840	364	97	247	116	25	450,336	223	238	152	72	16	225,168	146	315	99	47	10	112,584	92	369	63	30	6	22,517	29	432	20	9	2
Prostate	PSA_3ng/mL cut-off	50 to 54	75.7	0.0	2,293,473	1,737	1,146,736	1,371	366	932	439	25	458,695	842	895	573	269	16	229,347	549	1,188	374	176	10	114,674	347	1,390	236	111	6	22,935	111	1,626	75	36	2
Prostate	PSA_3ng/mL cut-off	55 to 59	201.8	0.0	2,061,919	4,160	1,030,959	3,283	877	2,232	1,050	25	412,384	2,016	2,144	1,371	645	16	206,192	1,316	2,844	895	421	10	103,096	832	3,328	566	266	6	20,619	266	3,894	181	85	2
Prostate	PSA_3ng/mL cut-off	60 to 64	356.1	0.0	1,764,828	6,285	882,414	4,960	1,325	3,373	1,587	25	352,966	3,047	3,238	2,072	975	16	176,483	1,988	4,297	1,352	636	10	88,241	1,257	5,028	855	402	6	17,648	401	5,884	273	128	2
Prostate	PSA_3ng/mL cut-off	65 to 69	622.7	0.0	1,696,993	10,568	848,497	8,339	2,229	5,671	2,669	25	339,399	5,123	5,445	3,483	1,639	16	169,699	3,342	7,226	2,273	1,069	10	84,850	2,114	8,454	1,437	676	6	16,970	675	9,893	459	216	2
Prostate	PSA_3ng/mL cut-off	70 to 74	759.8	0.0	1,467,965	11,153	733,983	8,801	2,352	5,985	2,816	25	293,593	5,406	5,747	3,676	1,730	16	146,797	3,527	7,626	2,398	1,129	10	73,398	2,231	8,922	1,517	714	6	14,680	712	10,441	484	228	2
Prostate	PSA_3ng/mL cut-off	75 to 79	867.2	0.0	1,007,365	8,736	503,683	6,894	1,842	4,688	2,206	25	201,473	4,235	4,501	2,880	1,355	16	100,737	2,763	5,973	1,879	884	10	50,368	1,747	6,989	1,188	559	6	10,074	558	8,178	379	179	2
Prostate	PSA_3ng/mL cut-off	Total 40-69	192.7	0.0	12,090,277	23,299	6,045,139	18,386	4,913	12,502	5,883	25	2,418,055	11,294	12,005	7,680	3,614	16	1,209,028	7,368	15,931	5,010	2,358	10	604,514	4,661	18,638	3,169	1,491	6	120,903	1,488	21,811	1,012	476	2
Prostate	PSA_3ng/mL cut-off	Total 40-49	12.8	0.0	4,273,065	549	2,136,532	433	116	295	139	25	854,613	266	283	181	85	16	427,306	174	375	118	56	10	213,653	110	439	75	35	6	42,731	35	514	24	11	2
Prostate	PSA_3ng/mL cut-off	Total 50-59	135.4	0.0	4,355,391	5,897	2,177,696	4,653	1,244	3,164	1,489	25	871,078	2,858	3,039	1,944	915	16	435,539	1,865	4,032	1,268	597	10	217,770	1,180	4,717	802	377	6	43,554	377	5,520	256	121	2
Prostate	PSA_3ng/mL cut-off	Total 60-69	486.8	0.0	3,461,821	16,853	1,730,911	13,299	3,554	9,043	4,256	25	692,364	8,169	8,684	5,555	2,614	16	346,182	5,330	11,523	3,624	1,706	10	173,091	3,371	13,482	2,292	1,079	6	34,618	1,077	15,776	732	344	2
Prostate	PSA_3ng/mL cut-off	Total 50-69	291.0	0.0	7,817,213	22,750	3,908,606	17,952	4,798	12,208	5,745	25	1,563,443	11,028	11,722	7,499	3,529	16	781,721	7,195	15,555	4,892	2,302	10	390,861	4,551	18,199	3,094	1,456	6	78,172	1,453	21,297	988	465	2
Prostate	PSA_3ng/mL cut-off	Total 60-74	568.1	0.0	4,929,786	28,006	2,464,893	22,100	5,906	15,028	7,072	25	985,957	13,575	14,431	9,231	4,344	16	492,979	8,857	19,149	6,023	2,834	10	246,489	5,602	22,404	3,809	1,793	6	49,298	1,789	26,217	1,217	572	2
Prostate	PSA_3ng/mL cut-off	Total 40-79	296.5	0.0	14,565,608	43,188	7,282,804	34,080	9,108	23,175	10,906	25	2,913,122	20,935	22,253	14,236	6,699	16	1,456,561	13,658	29,530	9,288	4,371	10	728,280	8,639	34,549	5,875	2,764	6	145,656	2,759	40,429	1,876	883	2
Prostate	PSA_3ng/mL cut-off	Total (all ages)	183.8	0.0	32,583,226	52,254																														
Colorectal																																				
Colorectal	FIT 20-50 μg/g threshold (CR	40 to 44	14.5	13.5	4,075,608	570	2,037,804	396	174	119	277	49	815,122	211	359	63	148	26	407,561	126	444	38	88	15	203,780	73	497	22	51	9	40,756	20	550	6	14	2
Colorectal	FIT 20-50 μg/g threshold (CR	45 to 49	24.4	21.6	4,567,159	1,047	2,283,580	728	319	218	510	49	913,432	388	659	116	271	26	456,716	231	816	69	162	15	228,358	134	913	40	94	9	45,672	36	1,011	11	25	2
Colorectal	FIT 20-50 μg/g threshold (CR	50 to 54	47.1	37.1	4,658,111	1,958	2,329,055	1,361	597	408	953	49	931,622	725	1,233	218	508	26	465,811	432	1,526	129	302	15	232,906	251	1,707	75	176	9	46,581	68	1,890	20	48	2
Colorectal	FIT 20-50 μg/g threshold (CR	55 to 59	87.7	60.6	4,181,606	3,094	2,090,803	2,151	943	645	1,506	49	836,321	1,146	1,948	344	802	26	418,161	682	2,412	205	477	15	209,080	397	2,697	119	278	9	41,816	107	2,987	32	75	2
Colorectal	FIT 20-50 μg/g threshold (CR	60 to 64	151.4	91.0	3,602,002	4,345	1,801,001	3,021	1,324	906	2,115	49	720,400	1,609	2,736	483	1,126	26	360,200	958	3,387	287	670	15	180,100	558	3,787	167	390	9	36,020	151	4,194	45	106	2
Colorectal	FIT 20-50 μg/g threshold (CR	65 to 69	198.3	119.1	3,502,183	5,516	1,751,092	3,835	1,681	1,150	2,684	49	700,437	2,043	3,473	613	1,430	26	350,218	1,216	4,300	365	851	15	175,109	708	4,808	212	496	9	35,022	191	5,325	57	134	2
Colorectal	FIT 20-50 μg/g threshold (CR	70 to 74	273.5	171.2	3,071,575	6,760	1,535,787	4,700	2,060	1,410	3,290	49	614,315	2,504	4,256	751	1,753	26	307,157	1,490	5,270	447	1,043	15	153,579	868	5,892	260	607	9	30,716	235	6,525	70	164	2
Colorectal	FIT 20-50 μg/g threshold (CR	75 to 79	351.7	234.8	2,189,011	6,318	1,094,505	4,392	1,926	1,318	3,075	49	437,802	2,340	3,978	702	1,638	26	218,901	1,393	4,925	418	975	15	109,451	811	5,507	243	568	9	21,890	219	6,099	66	154	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total 40-69	80.8	54.1	24,586,669	16,530	12,293,335	11,492	5,038	3,448	8,044	49	4,917,334	6,122	10,408	1,837	4,285	26	2,458,667	3,643	12,887	1,093	2,550	15	1,229,333	2,122	14,408	637	1,485	9	245,867	574	15,956	172	402	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total 40-49	19.7	17.7	8,642,767	1,617	4,321,384	1,124	493	337	787	49	1,728,553	599	1,018	180	419	26	864,277	356	1,261	107	249	15	432,138	208	1,409	62	145	9	86,428	56	1,561	17	39	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total 50-59	66.4	48.2	8,839,717	5,052	4,419,858	3,512	1,540	1,054	2,459	49	1,767,943	1,871	3,181	561	1,310	26	883,972	1,113	3,939	334	779	15	441,986	649	4,403	195	454	9	88,397	175	4,877	53	123	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total 50-69	114.2	73.6	15,943,902	14,913	7,971,951	10,368	4,545	3,110	7,258	49	3,188,780	5,523	9,390	1,657	3,866	26	1,594,390	3,287	11,626	986	2,301	15	797,195	1,914	12,999	574	1,340	9	159,439	518	14,395	155	362	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total 60-74	203.9	125.2	10,175,760	16,621	5,087,880	11,555	5,066	3,467	8,089	49	2,035,152	6,156	10,465	1,847	4,309	26	1,017,576	3,663	12,958	1,099	2,564	15	508,788	2,134	14,487	640	1,494	9	101,758	577	16,044	173	404	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total 40-79	119.0	80.4	29,847,255	29,608	14,923,627	20,584	9,024	6,175	14,409	49	5,969,451	10,966	18,642	3,290	7,676	26	2,984,725	6,526	23,082	1,958	4,568	15	1,492,363	3,801	25,807	1,140	2,661	9	298,473	1,028	28,580	308	719	2
Colorectal	FIT 20-50 μg/g threshold (CR	Total (all ages)	84.5	56.5	66,041,278	42,885																														
Pancreas																																				
Pancreas	CA19-9_20U/mL cutoff	40 to 44	2.6	2.0	4,075,608	94	2,037,804	66	28	21	45	48	815,122	36	58	12	24	26	407,561	22	72	7	15	16	203,780	13	81	4	9	9	40,756	4	90	1	2	3
Pancreas	CA19-9_20U/mL cutoff	45 to 49	5.6	3.9	4,567,159	215	2,283,580	152	63	49	103	48	913,432	82	133	27	56	26	456,716	50	165	16	34	16	228,358	29	186	9	20	9	45,672	8	207	3	5	3
Pancreas	CA19-9_20U/mL cutoff	50 to 54	10.2	7.3	4,658,111	409	2,329,055	289	120	93	196	48	931,622	157	252	50	106	26	465,811	94	315	30	64	16	232,906	55	354	18	38	9	46,581	15	394	5	10	3
Pancreas	CA19-9_20U/mL cutoff	55 to 59	18.3	13.6	4,181,606	666	2,090,803	471	195	152	319	48	836,321	255	411	82	173	26	418,161	154	512	49	104	16	209,080	90	576	29	61	9	41,816	25	641	8	17	3
Pancreas	CA19-9_20U/mL cutoff	60 to 64	29.2	22.4	3,602,002	926	1,801,001	655	271	211	444	48	720,400	355	571	114	241	26	360,200	214	712	69	145	16	180,100	126	800	40	85	9	36,020	35	891	11	23	3
Pancreas	CA19-9_20U/mL cutoff	65 to 69	47.2	34.1	3,502,183	1,417	1,751,092	1,002	415	323	679	48	700,437	543	874	175	368	26	350,218	327	1,090	105	222	16	175,109	192	1,225	62	130	9	35,022	53	1,364	17	36	3
Pancreas	CA19-9_20U/mL cutoff	70 to 74	66.4	48.8	3,071,575	1,757	1,535,787	1,242	515	400	842	48	614,315	674	1,083	217	457	26	307,157	405	1,352	131	275	16	153,579	238	1,519	77	162	9	30,716	66	1,691	21	45	3
Pancreas	CA19-9_20U/mL cutoff	75 to 79	86.0	70.8	2,189,011	1,702	1,094,505	1,203	499	388	816	48	437,802	652	1,050	210	442	26	218,901	393	1,309	126	266	16	109,451	231	1,471	74	157	9	21,890	64	1,638	21	43	3
Pancreas	CA19-9_20U/mL cutoff	Total 40-69	17.4	13.0	24,586,669	3,727	12,293,335	2,635	1,092	849	1,787	48	4,917,334	1,429	2,298	460	969	26	2,458,667	860	2,867	277	583	16	1,229,333	506	3,221	163	343	9	245,867	139	3,588	45	95	3
Pancreas	CA19-9_20U/mL cutoff	Total 40-49	4.2	3.0	8,642,767	309	4,321,384	218	91	70	148	48	1,728,553	118	191	38	80	26	864,277	71	238	23	48	16	432,138	42	267	14	28	9	86,428	12	297	4	8	3
Pancreas	CA19-9_20U/mL cutoff	Total 50-59	14.1	10.3	8,839,717	1,075	4,419,858	760	315	245	515	48	1,767,943	412	663	133	279	26	883,972	248	827	80	168	16	441,986	146	929	47	99	9	88,397	40	1,035	13	27	3
Pancreas	CA19-9_20U/mL cutoff	Total 50-69	24.7	18.3	15,943,902	3,418	7,971,951	2,417	1,001	778	1,639	48	3,188,780	1,310	2,108	422	888	26	1,594,390	788	2,630	254	535	16	797,195	464	2,954	149	314	9	159,439	128	3,290	41	87	3
Pancreas	CA19-9_20U/mL cutoff	Total 60-74	46.5	34.5	10,175,760	4,100	5,087,880	2,899	1,201	934	1,966	48	2,035,152	1,572	2,528	506	1,066	26	1,017,576	946	3,154	305	641	16	508,788	556	3,544	179	377	9	101,758	153	3,947	49	104	3
Pancreas	CA19-9_20U/mL cutoff	Total 40-79	27.1	21.2	29,847,255	7,186	14,923,627	5,081	2,105	1,636	3,445	48	5,969,451	2,755	4,431	887	1,868	26	2,984,725	1,658	5,528	534	1,124	16	1,492,363	975	6,211	314	661	9	298,473	269	6,917	87	182	3
Pancreas	CA19-9_20U/mL cutoff	Total (all ages)	19.3	15.0	66,041,278	10,452																														

Supplementary Table 6b(ii). Cancers detected by offering risk stratified screening according to future PRS using sensitivity of current "real world" cancer-screening tools (Cancers of the Ovary, Kidney, Lung, Testis)

Cancer Type	Screening sensitivity	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
			Male	Female	Population Size	Cancers arising per year	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Ovary																																				
Ovary	MMS (CA-125 + TVU)	40 to 44	0.0	13.2	2,054,223	270	1,027,112	178	92	28	149	55	410,845	90	180	14	76	28	205,422	52	218	8	43	16	102,711	29	241	5	25	9	20,542	7	263	1	6	2
Ovary	MMS (CA-125 + TVU)	45 to 49	0.0	19.4	2,315,479	448	1,157,740	295	153	47	248	55	463,096	149	299	24	125	28	231,548	86	362	14	72	16	115,774	49	399	8	41	9	23,155	12	436	2	10	2
Ovary	MMS (CA-125 + TVU)	50 to 54	0.0	27.1	2,364,638	640	1,182,319	422	218	67	354	55	472,928	213	427	34	179	28	236,464	123	517	20	103	16	118,232	69	571	11	58	9	23,646	18	622	3	15	2
Ovary	MMS (CA-125 + TVU)	55 to 59	0.0	34.8	2,119,687	738	1,059,844	486	252	78	409	55	423,937	246	492	39	206	28	211,969	141	597	23	119	16	105,984	80	658	13	67	9	21,197	20	718	3	17	2
Ovary	MMS (CA-125 + TVU)	60 to 64	0.0	41.6	1,837,174	764	918,587	503	261	81	423	55	367,435	254	510	41	214	28	183,717	146	618	23	123	16	91,859	83	681	13	70	9	18,372	21	743	3	18	2
Ovary	MMS (CA-125 + TVU)	65 to 69	0.0	52.3	1,805,190	944	902,595	622	322	100	523	55	361,038	314	630	50	264	28	180,519	181	763	29	152	16	90,260	102	842	16	86	9	18,052	26	918	4	22	2
Ovary	MMS (CA-125 + TVU)	70 to 74	0.0	60.8	1,603,610	975	801,805	643	332	103	540	55	320,722	325	650	52	273	28	160,361	187	788	30	157	16	80,180	106	869	17	89	9	16,036	27	948	4	23	2
Ovary	MMS (CA-125 + TVU)	75 to 79	0.0	73.8	1,181,645	872	590,823	575	297	92	483	55	236,329	290	582	46	244	28	118,165	167	705	27	140	16	59,082	95	777	15	79	9	11,816	24	848	4	20	2
Ovary	MMS (CA-125 + TVU)	Total 40-69	0.0	30.4	12,496,392	3,804	6,248,196	2,507	1,297	401	2,106	55	2,499,278	1,266	2,538	203	1,064	28	1,249,639	729	3,075	117	612	16	624,820	412	3,392	66	346	9	124,964	105	3,699	17	88	2
Ovary	MMS (CA-125 + TVU)	Total 40-49	0.0	16.4	4,369,703	718	2,184,851	473	245	76	397	55	873,941	239	479	38	201	28	436,970	138	580	22	116	16	218,485	78	640	12	65	9	43,697	20	698	3	17	2
Ovary	MMS (CA-125 + TVU)	Total 50-59	0.0	30.7	4,484,325	1,378	2,242,163	908	470	145	763	55	896,865	459	919	73	385	28	448,433	264	1,114	42	222	16	224,216	149	1,229	24	125	9	44,843	38	1,340	6	32	2
Ovary	MMS (CA-125 + TVU)	Total 50-69	0.0	38.0	8,126,689	3,086	4,063,345	2,034	1,052	325	1,708	55	1,625,338	1,027	2,059	164	863	28	812,669	591	2,495	95	497	16	406,334	335	2,751	54	281	9	81,267	85	3,001	14	72	2
Ovary	MMS (CA-125 + TVU)	Total 60-74	0.0	51.1	5,245,974	2,683	2,622,987	1,768	915	283	1,485	55	1,049,195	893	1,790	143	750	28	524,597	514	2,169	82	432	16	262,299	291	2,392	47	244	9	52,460	74	2,609	12	62	2
Ovary	MMS (CA-125 + TVU)	Total 40-79	0.0	37.0	15,281,647	5,651	7,640,824	3,724	1,927	596	3,128	55	3,056,329	1,881	3,770	301	1,580	28	1,528,165	1,083	4,568	173	910	16	764,082	613	5,038	98	515	9	152,816	156	5,495	25	131	2
Ovary	MMS (CA-125 + TVU)	Total (all ages)	0.0	22.8	33,458,052	7,495																														
Kidney																																				
Kidney	USS	40 to 44	10.1	5.0	4,075,608	307	2,037,804	215	92	58	157	51	815,122	115	192	31	84	27	407,561	69	238	19	50	16	203,780	40	267	11	29	10	40,756	11	296	3	8	3
Kidney	USS	45 to 49	17.7	7.8	4,567,159	580	2,283,580	406	174	110	296	51	913,432	218	362	59	159	27	456,716	130	450	35	95	16	228,358	76	504	21	56	10	45,672	21	559	6	15	3
Kidney	USS	50 to 54	26.8	12.7	4,658,111	915	2,329,055	641	274	174	467	51	931,622	344	571	93	251	27	465,811	206	709	56	150	16	232,906	120	795	33	88	10	46,581	33	882	9	24	3
Kidney	USS	55 to 59	37.1	18.6	4,181,606	1,160	2,090,803	813	347	220	592	51	836,321	436	724	118	318	27	418,161	261	899	71	190	16	209,080	153	1,007	41	111	10	41,816	42	1,118	11	30	3
Kidney	USS	60 to 64	53.7	26.2	3,602,002	1,429	1,801,001	1,001	428	271	730	51	720,400	537	892	146	392	27	360,200	321	1,108	87	234	16	180,100	188	1,241	51	137	10	36,020	51	1,378	14	37	3
Kidney	USS	65 to 69	73.9	36.4	3,502,183	1,911	1,751,092	1,339	572	363	976	51	700,437	719	1,192	195	524	27	350,218	430	1,481	116	313	16	175,109	251	1,660	68	183	10	35,022	69	1,842	19	50	3
Kidney	USS	70 to 74	91.2	45.1	3,071,575	2,063	1,535,787	1,445	618	392	1,054	51	614,315	776	1,287	210	566	27	307,157	464	1,599	126	338	16	153,579	271	1,792	74	198	10	30,716	74	1,989	20	54	3
Kidney	USS	75 to 79	110.1	57.2	2,189,011	1,785	1,094,505	1,250	535	339	912	51	437,802	671	1,114	182	489	27	218,901	401	1,384	109	293	16	109,451	235	1,550	64	171	10	21,890	64	1,721	17	47	3
Kidney	USS	Total 40-69	34.6	16.9	24,586,669	6,302	12,293,335	4,415	1,887	1,196	3,218	51	4,917,334	2,370	3,932	642	1,728	27	2,458,667	1,417	4,885	384	1,033	16	1,229,333	829	5,473	225	604	10	245,867	226	6,076	61	165	3
Kidney	USS	Total 40-49	14.1	6.5	8,642,767	887	4,321,384	621	266	168	453	51	1,728,553	334	553	90	243	27	864,277	200	687	54	145	16	432,138	117	770	32	85	10	86,428	32	855	9	23	3
Kidney	USS	Total 50-59	31.7	15.5	8,839,717	2,075	4,419,858	1,454	621	394	1,060	51	1,767,943	780	1,295	211	569	27	883,972	467	1,608	126	340	16	441,986	273	1,802	74	199	10	88,397	74	2,001	20	54	3
Kidney	USS	Total 50-69	45.8	22.6	15,943,902	5,415	7,971,951	3,793	1,622	1,028	2,765	51	3,188,780	2,037	3,378	552	1,485	27	1,594,390	1,218	4,197	330	888	16	797,195	712	4,703	193	519	10	159,439	194	5,221	53	142	3
Kidney	USS	Total 60-74	71.8	35.5	10,175,760	5,403	5,087,880	3,785	1,618	1,026	2,759	51	2,035,152	2,032	3,371	551	1,481	27	1,017,576	1,215	4,188	329	886	16	508,788	711	4,692	193	518	10	101,758	194	5,209	53	141	3
Kidney	USS	Total 40-79	45.5	23.0	29,847,255	10,150	14,923,627	7,110	3,040	1,927	5,183	51	5,969,451	3,817	6,333	1,035	2,783	27	2,984,725	2,283	7,867	619	1,664	16	1,492,363	1,336	8,814	362	974	10	298,473	364	9,786	99	266	3
Kidney	USS	Total (all ages)	29.2	14.8	66,041,278	13,323																														
Lung																																				
Lung	Low dose CT	40 to 44	6.0	5.8	4,075,608	240	2,037,804	157	83	24	132	55	815,122	78	162	12	66	28	407,561	45	195	7	38	16	203,780	25	215	4	21	9	40,756	6	234	1	5	2
Lung	Low dose CT	45 to 49	16.3	14.7	4,567,159	706	2,283,580	460	246	71	390	55	913,432	230	476	35	195	28	456,716	132	574	20	111	16	228,358	74	632	11	63	9	45,672	19	687	3	16	2
Lung	Low dose CT	50 to 54	33.4	31.5	4,658,111	1,512	2,329,055	986	526	152	834	55	931,622	493	1,019	76	417	28	465,811	282	1,230	43	239	16	232,906	159	1,353	24	134	9	46,581	40	1,472	6	34	2
Lung	Low dose CT	55 to 59	71.4	67.1	4,181,606	2,896	2,090,803	1,889	1,007	291	1,598	55	836,321	945	1,951	146	799	28	418,161	541	2,355	83	457	16	209,080	304	2,592	47	257	9	41,816	77	2,819	12	65	2
Lung	Low dose CT	60 to 64	137.0	124.9	3,602,002	4,711	1,801,001	3,073	1,638	473	2,599	55	720,400	1,537	3,174	237	1,300	28	360,200	879	3,832	135	744	16	180,100	495	4,216	76	419	9	36,020	125	4,586	19	106	2
Lung	Low dose CT	65 to 69	229.5	197.8	3,502,183	7,466	1,751,092	4,870	2,596	750	4,120	55	700,437	2,436	5,030	375	2,061	28	350,218	1,394	6,072	215	1,179	16	175,109	784	6,682	121	663	9	35,022	198	7,268	30	167	2
Lung	Low dose CT	70 to 74	335.0	278.1	3,071,575	9,378	1,535,787	6,117	3,261	942	5,175	55	614,315	3,060	6,318	471	2,588	28	307,157	1,751	7,627	270	1,481	16	153,579	985	8,393	152	833	9	30,716	248	9,130	38	210	2
Lung	Low dose CT	75 to 79	462.2	340.5	2,189,011	8,680	1,094,505	5,661	3,019	872	4,789	55	437,802	2,832	5,848	436	2,396	28	218,901	1,620	7,060	250	1,371	16	109,451	911	7,769	140	771	9	21,890	230	8,450	35	195	2
Lung	Low dose CT	Total 40-69	74.8	68.0	24,586,669	17,531	12,293,335	11,434	6,097	1,761	9,673	55	4,917,334	5,720	11,811	881	4,839	28	2,458,667	3,273	14,258	504	2,769	16	1,229,333	1,841	15,690	283	1,557	9	245,867	464	17,067	72	393	2
Lung	Low dose CT	Total 40-49	11.4	10.5	8,642,767	946	4,321,384	617	329	95	522	55	1,728,553	309	637	48	261	28	864,277	177	769	27	149	16	432,138	99	847	15	84	9	86,428	25	921	4	21	2
Lung	Low dose CT	Total 50-59	51.4	48.4	8,839,717	4,408	4,419,858	2,875	1,533	443	2,432	55	1,767,943	1,438	2,970	221	1,217	28	883,972	823	3,585	127	696	16	441,986	463	3,945	71	392	9	88,397	117	4,291	18	99	2
Lung	Low dose CT	Total 50-69	109.4	98.9	15,943,902	16,585	7,971,951	10,817	5,768	1,666	9,151	55	3,188,780	5,411	11,174	833	4,578	28	1,594,390	3,096	13,489	477	2,619	16	797,195	1,742	14,843	268	1,473	9	159,439	439	16,146	68	372	2
Lung	Low dose CT	Total 60-74	227.8	196.8	10,175,760	21,555	5,087,880	14,059	7,496	2,165	11,894	55	2,035,152	7,032	14,523	1,083	5,949	28	1,017,576	4,024	17,531	620	3,404	16	508,788	2,263	19,292	349	1,915	9	101,758	571	20,984	88	483	2
Lung	Low dose CT	Total 40-79	127.8	111.1	29,847,255	35,589	14,923,627	23,212	12,377	3,575	19,637	55	5,969,451	11,611	23,978	1,788	9,823	28	2,984,725	6,644	28,945	1,023	5,620	16	1,492,363	3,737	31,852	576	3,162	9	298,473	943	34,646	145	798	2
Lung	Low dose CT	Total (all ages)	90.6	70.1	66,041,278	48,549																														
Testis																																				
Testis	Semen assay	40 to 44	12.3	0.0	2,021,385	248	1,010,692	228	20	75	153	62	404,277	176	72	58	118	48	202,138	135	113	45	91	37	101,069	100	148	33	67	27	20,214	44	204	14	29	12
Testis	Semen assay	45 to 49	9.4	0.0	2,251,680	211	1,125,840	194	17	64	130	62	450,336	150	61	49	100	48	225,168	115	96	38	77	37	112,584	85	126	28	57	27	22,517	37	174	12	25	12
Testis	Semen assay	50 to 54	7.0	0.0	2,293,473	160	1,146,736	147	13	48	98	62	458,695	114	46	37	76	48	229,347	87	73	29	58	37	114,674	64	96	21	43	27	22,935	28	132	9	19	12
Testis	Semen assay	55 to 59	5.2	0.0	2,061,919	108	1,030,959	99	9	33	66	62	412,384	77	31	25	51	48	206,192	59	49	19	39	37	103,096	43	65	14	29	27	20,619	19	89	6	13	12
Testis	Semen assay	60 to 64	3.0	0.0	1,764,828	52	882,414	48	4	16	32	62	352,966	37	15	12	25	48	176,483	28	24	9	19	37	88,241	21	31	7	14	27	17,648	9	43	3	6	12
Testis	Semen assay	65 to 69	2.4	0.0	1,696,993	41	848,497	38	3	12	25	62	339,399	29	12	10	20	48	169,699	22	19	7	15	37	84,850	16	25	5	11	27	16,970	7	34	2	5	12
Testis	Semen assay	70 to 74	2.4	0.0	1,467,965	35	733,983	32	3	11	22	62	293,593	25	10	8	17	48	146,797	19	16	6	13	37	73,398	14	21	5	9	27	14,680	6	29	2	4	12
Testis	Semen assay	75 to 79	1.4	0.0	1,007,365	14	503,683	13	1	4	9	62	201,473	10	4	3	7	48	100,737	8	6	3	5	37	50,368	6	8	2	4	27	10,074	2	12	1	2	12
Testis	Semen assay	Total 20-39	16.0	0.0	8,782,738	1,406	4,391,369	1,291	115	426	865	62	1,756,548	998	408	329	669	48	878,274	766	640	253	513	37	439,137	564	842	186	378	27	87,827	247	1,159	82	166	12
Testis	Semen assay	Total 40-69	6.8	0.0	12,090,277	820	6,045,139	753	67	249	505	62	2,418,055	582	238	192	390	48	1,209,028	447	373	147	299	37	604,514	329	491	109	220	27	120,903	144	676	48	97	12
Testis	Semen assay	Total 40-49	10.7	0.0	4,273,065	459	2,136,532	422	37	139	282	62	854,613	326	133	108	218	48	427,306	250	209	83	168	37	213,653	184	275	61	123	27	42,731	81	378	27	54	12
Testis	Semen assay	Total 50-59	6.2	0.0	4,355,391	268	2,177,696	246	22	81	165	62	871,078	190	78	63	127	48	435,539	146	122	48	98	37	217,770	108	160	35	72	27	43,554	47	221	16	32	12
Testis	Semen assay	Total 50-69	4.6	0.0	7,817,213	361	3,908,606	332	29	109	222	62	1,563,443	256	105	85	172	48	781,721	197	164	65	132	37	390,861	145	216	48	97	27	78,172	63	298	21	43	12
Testis	Semen assay	Total 60-74	2.6	0.0	4,929,786	128	2,464,893	118	10	39	79	62	985,957	91	37	30	61	48	492,979	70	58	23	47	37	246,489	51	77	17	34	27	49,298	23	105	7	15	12
Testis	Semen assay	Total 40-79	6.0	0.0	14,565,608	869	7,282,804	798	71	263	535	62	2,913,122	617	252	204	413	48	1,456,561	474	395	156	317	37	728,280	349	520	115	234	27	145,656	153	716	50	102	12
Testis	Semen assay	Total (all ages)	7.2	0.0	32,583,226	2,354																														

Supplementary Table 6c(i). Cancers detected by offering risk stratified screening according to optimised PRS using sensitivity of currently available "real world" screening tools (Cancers of the Breast, Prostate, Colorectum and Pancreas)

Cancer Type	Screening sensitivity	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
			Male	Female	Population Size	Cancers arising per year	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Breast																																				
Breast	Digital mammography	40 to 44	0.0	124.6	2,054,223	2,559	1,027,112	2,004	555	601	1,403	55	410,845	1,219	1,340	366	853	33	205,422	790	1,769	237	553	22	102,711	497	2,062	149	348	14	20,542	157	2,402	47	110	4
Breast	Digital mammography	45 to 49	0.0	214.8	2,315,479	4,974	1,157,740	3,895	1,079	1,168	2,726	55	463,096	2,370	2,604	711	1,659	33	231,548	1,537	3,437	461	1,076	22	115,774	966	4,008	290	676	14	23,155	305	4,669	92	214	4
Breast	Digital mammography	50 to 54	0.0	279.8	2,364,638	6,616	1,182,319	5,181	1,435	1,554	3,627	55	472,928	3,152	3,464	946	2,207	33	236,464	2,044	4,572	613	1,431	22	118,232	1,285	5,331	386	900	14	23,646	406	6,210	122	284	4
Breast	Digital mammography	55 to 59	0.0	285.5	2,119,687	6,052	1,059,844	4,739	1,313	1,422	3,317	55	423,937	2,884	3,168	865	2,019	33	211,969	1,870	4,182	561	1,309	22	105,984	1,176	4,876	353	823	14	21,197	371	5,681	111	260	4
Breast	Digital mammography	60 to 64	0.0	338.0	1,837,174	6,209	918,587	4,862	1,347	1,459	3,403	55	367,435	2,958	3,251	888	2,071	33	183,717	1,918	4,291	575	1,343	22	91,859	1,206	5,003	362	844	14	18,372	381	5,828	114	267	4
Breast	Digital mammography	65 to 69	0.0	412.3	1,805,190	7,443	902,595	5,828	1,615	1,749	4,080	55	361,038	3,546	3,897	1,064	2,482	33	180,519	2,299	5,144	690	1,609	22	90,260	1,446	5,997	434	1,012	14	18,052	456	6,987	137	320	4
Breast	Digital mammography	70 to 74	0.0	372.7	1,603,610	5,977	801,805	4,680	1,297	1,404	3,276	55	320,722	2,848	3,129	854	1,993	33	160,361	1,846	4,131	554	1,292	22	80,180	1,161	4,816	348	813	14	16,036	367	5,610	110	257	4
Breast	Digital mammography	75 to 79	0.0	403.0	1,181,645	4,762	590,823	3,729	1,033	1,119	2,610	55	236,329	2,269	2,493	681	1,588	33	118,165	1,471	3,291	441	1,030	22	59,082	925	3,837	278	648	14	11,816	292	4,470	88	204	4
Breast	Digital mammography	Total 40-69	0.0	270.9	12,496,392	33,853	6,248,196	26,509	7,344	7,953	18,556	55	2,499,278	16,130	17,723	4,839	11,291	33	1,249,639	10,457	23,396	3,137	7,320	22	624,820	6,577	27,276	1,973	4,604	14	124,964	2,076	31,777	623	1,453	4
Breast	Digital mammography	Total 40-49	0.0	172.4	4,369,703	7,533	2,184,851	5,899	1,634	1,770	4,129	55	873,941	3,589	3,944	1,077	2,512	33	436,970	2,327	5,206	698	1,629	22	218,485	1,463	6,070	439	1,024	14	43,697	462	7,071	139	323	4
Breast	Digital mammography	Total 50-59	0.0	282.5	4,484,325	12,668	2,242,163	9,920	2,748	2,976	6,944	55	896,865	6,036	6,632	1,811	4,225	33	448,433	3,913	8,755	1,174	2,739	22	224,216	2,461	10,207	738	1,723	14	44,843	777	11,891	233	544	4
Breast	Digital mammography	Total 50-69	0.0	323.9	8,126,689	26,320	4,063,345	20,610	5,710	6,183	14,427	55	1,625,338	12,541	13,779	3,762	8,778	33	812,669	8,130	18,190	2,439	5,691	22	406,334	5,113	21,207	1,534	3,579	14	81,267	1,614	24,706	484	1,130	4
Breast	Digital mammography	Total 60-74	0.0	374.2	5,245,974	19,629	2,622,987	15,371	4,258	4,611	10,760	55	1,049,195	9,353	10,276	2,806	6,547	33	524,597	6,064	13,565	1,819	4,244	22	262,299	3,813	15,816	1,144	2,669	14	52,460	1,204	18,425	361	843	4
Breast	Digital mammography	Total 40-79	0.0	291.8	15,281,647	44,592	7,640,824	34,919	9,673	10,476	24,443	55	3,056,329	21,247	23,345	6,374	14,873	33	1,528,165	13,775	30,817	4,132	9,642	22	764,082	8,663	35,929	2,599	6,064	14	152,816	2,735	41,857	820	1,914	4
Breast	Digital mammography	Total (all ages)	0.0	166.0	33,458,052	55,545																														
Prostate																																				
Prostate	PSA_3ng/mL cut-off	40 to 44	4.3	0.0	2,021,385	88	1,010,692	71	17	48	23	26	404,277	45	43	31	14	16	202,138	30	58	20	10	11	101,069	19	69	13	6	7	20,214	6	82	4	2	2
Prostate	PSA_3ng/mL cut-off	45 to 49	20.5	0.0	2,251,680	461	1,125,840	372	89	253	119	26	450,336	235	226	160	75	16	225,168	156	305	106	50	11	112,584	101	360	68	32	7	22,517	33	428	23	11	2
Prostate	PSA_3ng/mL cut-off	50 to 54	75.7	0.0	2,293,473	1,737	1,146,736	1,402	335	953	449	26	458,695	886	851	602	283	16	229,347	589	1,148	401	188	11	114,674	379	1,358	258	121	7	22,935	125	1,612	85	40	2
Prostate	PSA_3ng/mL cut-off	55 to 59	201.8	0.0	2,061,919	4,160	1,030,959	3,357	803	2,283	1,074	26	412,384	2,122	2,038	1,443	679	16	206,192	1,411	2,749	959	451	11	103,096	908	3,252	617	290	7	20,619	300	3,860	204	96	2
Prostate	PSA_3ng/mL cut-off	60 to 64	356.1	0.0	1,764,828	6,285	882,414	5,072	1,213	3,449	1,623	26	352,966	3,205	3,080	2,180	1,026	16	176,483	2,131	4,154	1,449	682	11	88,241	1,372	4,913	933	439	7	17,648	454	5,831	309	145	2
Prostate	PSA_3ng/mL cut-off	65 to 69	622.7	0.0	1,696,993	10,568	848,497	8,528	2,040	5,799	2,729	26	339,399	5,390	5,178	3,665	1,725	16	169,699	3,584	6,984	2,437	1,147	11	84,850	2,306	8,262	1,568	738	7	16,970	763	9,805	519	244	2
Prostate	PSA_3ng/mL cut-off	70 to 74	759.8	0.0	1,467,965	11,153	733,983	9,000	2,153	6,120	2,880	26	293,593	5,688	5,465	3,868	1,820	16	146,797	3,782	7,371	2,572	1,210	11	73,398	2,434	8,719	1,655	779	7	14,680	805	10,348	547	258	2
Prostate	PSA_3ng/mL cut-off	75 to 79	867.2	0.0	1,007,365	8,736	503,683	7,049	1,687	4,794	2,256	26	201,473	4,455	4,281	3,030	1,426	16	100,737	2,962	5,774	2,014	948	11	50,368	1,906	6,830	1,296	610	7	10,074	631	8,105	429	202	2
Prostate	PSA_3ng/mL cut-off	Total 40-69	192.7	0.0	12,090,277	23,299	6,045,139	18,801	4,498	12,784	6,016	26	2,418,055	11,882	11,417	8,080	3,802	16	1,209,028	7,901	15,398	5,373	2,528	11	604,514	5,084	18,215	3,457	1,627	7	120,903	1,682	21,617	1,144	538	2
Prostate	PSA_3ng/mL cut-off	Total 40-49	12.8	0.0	4,273,065	549	2,136,532	443	106	301	142	26	854,613	280	269	190	90	16	427,306	186	363	127	60	11	213,653	120	429	81	38	7	42,731	40	509	27	13	2
Prostate	PSA_3ng/mL cut-off	Total 50-59	135.4	0.0	4,355,391	5,897	2,177,696	4,758	1,139	3,236	1,523	26	871,078	3,007	2,890	2,045	962	16	435,539	2,000	3,897	1,360	640	11	217,770	1,287	4,610	875	412	7	43,554	426	5,471	289	136	2
Prostate	PSA_3ng/mL cut-off	Total 60-69	486.8	0.0	3,461,821	16,853	1,730,911	13,599	3,254	9,247	4,352	26	692,364	8,595	8,258	5,844	2,750	16	346,182	5,715	11,138	3,886	1,829	11	173,091	3,678	13,175	2,501	1,177	7	34,618	1,217	15,636	827	389	2
Prostate	PSA_3ng/mL cut-off	Total 50-69	291.0	0.0	7,817,213	22,750	3,908,606	18,358	4,392	12,483	5,874	26	1,563,443	11,602	11,148	7,889	3,713	16	781,721	7,715	15,035	5,246	2,469	11	390,861	4,965	17,785	3,376	1,589	7	78,172	1,642	21,108	1,117	526	2
Prostate	PSA_3ng/mL cut-off	Total 60-74	568.1	0.0	4,929,786	28,006	2,464,893	22,599	5,407	15,367	7,232	26	985,957	14,283	13,723	9,712	4,570	16	492,979	9,497	18,509	6,458	3,039	11	246,489	6,112	21,894	4,156	1,956	7	49,298	2,022	25,984	1,375	647	2
Prostate	PSA_3ng/mL cut-off	Total 40-79	296.5	0.0	14,565,608	43,188	7,282,804	34,850	8,338	23,698	11,152	26	2,913,122	22,025	21,163	14,977	7,048	16	1,456,561	14,645	28,543	9,959	4,687	11	728,280	9,425	33,763	6,409	3,016	7	145,656	3,118	40,070	2,120	998	2
Prostate	PSA_3ng/mL cut-off	Total (all ages)	183.8	0.0	32,583,226	52,254																														
Colorectal																																				
Colorectal	FIT 20-50 µg/g threshold (CR	40 to 44	14.5	13.5	4,075,608	570	2,037,804	425	145	128	298	52	815,122	244	326	73	171	30	407,561	153	417	46	107	19	203,780	93	477	28	65	11	40,756	27	543	8	19	3
Colorectal	FIT 20-50 µg/g threshold (CR	45 to 49	24.4	21.6	4,567,159	1,047	2,283,580	781	266	234	547	52	913,432	449	598	135	314	30	456,716	280	767	84	196	19	228,358	170	877	51	119	11	45,672	50	997	15	35	3
Colorectal	FIT 20-50 µg/g threshold (CR	50 to 54	47.1	37.1	4,658,111	1,958	2,329,055	1,460	498	438	1,022	52	931,622	839	1,119	252	587	30	465,811	524	1,434	157	367	19	232,906	319	1,639	96	223	11	46,581	94	1,864	28	66	3
Colorectal	FIT 20-50 µg/g threshold (CR	55 to 59	87.7	60.6	4,181,606	3,094	2,090,803	2,308	786	692	1,615	52	836,321	1,326	1,768	398	928	30	418,161	828	2,266	248	580	19	209,080	503	2,591	151	352	11	41,816	148	2,946	45	104	3
Colorectal	FIT 20-50 µg/g threshold (CR	60 to 64	151.4	91.0	3,602,002	4,345	1,801,001	3,241	1,104	972	2,268	52	720,400	1,862	2,483	559	1,303	30	360,200	1,163	3,182	349	814	19	180,100	707	3,638	212	495	11	36,020	208	4,137	63	146	3
Colorectal	FIT 20-50 µg/g threshold (CR	65 to 69	198.3	119.1	3,502,183	5,516	1,751,092	4,114	1,402	1,234	2,880	52	700,437	2,364	3,152	709	1,655	30	350,218	1,476	4,040	443	1,033	19	175,109	897	4,619	269	628	11	35,022	265	5,251	79	185	3
Colorectal	FIT 20-50 µg/g threshold (CR	70 to 74	273.5	171.2	3,071,575	6,760	1,535,787	5,042	1,718	1,513	3,529	52	614,315	2,897	3,863	869	2,028	30	307,157	1,809	4,951	543	1,266	19	153,579	1,100	5,660	330	770	11	30,716	324	6,436	97	227	3
Colorectal	FIT 20-50 µg/g threshold (CR	75 to 79	351.7	234.8	2,189,011	6,318	1,094,505	4,712	1,606	1,414	3,299	52	437,802	2,707	3,611	812	1,895	30	218,901	1,691	4,627	507	1,183	19	109,451	1,028	5,290	308	720	11	21,890	303	6,015	91	212	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total 40-69	80.8	54.1	24,586,669	16,530	12,293,335	12,329	4,201	3,699	8,630	52	4,917,334	7,083	9,447	2,125	4,958	30	2,458,667	4,423	12,107	1,327	3,096	19	1,229,333	2,689	13,841	807	1,883	11	245,867	793	15,737	238	555	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total 40-49	19.7	17.7	8,642,767	1,617	4,321,384	1,206	411	362	844	52	1,728,553	693	924	208	485	30	864,277	433	1,184	130	303	19	432,138	263	1,354	79	184	11	86,428	78	1,539	23	54	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total 50-59	66.4	48.2	8,839,717	5,052	4,419,858	3,768	1,284	1,130	2,638	52	1,767,943	2,165	2,887	649	1,515	30	883,972	1,352	3,700	406	946	19	441,986	822	4,230	247	575	11	88,397	242	4,810	73	170	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total 50-69	114.2	73.6	15,943,902	14,913	7,971,951	11,123	3,790	3,337	7,786	52	3,188,780	6,390	8,523	1,917	4,473	30	1,594,390	3,991	10,922	1,197	2,793	19	797,195	2,426	12,487	728	1,698	11	159,439	715	14,198	215	501	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total 60-74	203.9	125.2	10,175,760	16,621	5,087,880	12,396	4,225	3,719	8,678	52	2,035,152	7,122	9,499	2,137	4,985	30	1,017,576	4,448	12,173	1,334	3,113	19	508,788	2,704	13,917	811	1,893	11	101,758	797	15,824	239	558	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total 40-79	119.0	80.4	29,847,255	29,608	14,923,627	22,083	7,525	6,625	15,458	52	5,969,451	12,687	16,921	3,806	8,881	30	2,984,725	7,923	21,685	2,377	5,546	19	1,492,363	4,817	24,791	1,445	3,372	11	298,473	1,420	28,188	426	994	3
Colorectal	FIT 20-50 µg/g threshold (CR	Total (all ages)	84.5	56.5	66,041,278	42,885																														
Pancreas																																				
Pancreas	CA19-9_20U/mL cutoff	40 to 44	2.6	2.0	4,075,608	94	2,037,804	74	20	24	50	53	815,122	45	49	14	30	32	407,561	29	65	9	20	21	203,780	18	76	6	12	13	40,756	6	88	2	4	4
Pancreas	CA19-9_20U/mL cutoff	45 to 49	5.6	3.9	4,567,159	215	2,283,580	168	47	54	114	53	913,432	102	113	33	69	32	456,716	66	149	21	45	21	228,358	42	173	13	28	13	45,672	13	202	4	9	4
Pancreas	CA19-9_20U/mL cutoff	50 to 54	10.2	7.3	4,658,111	409	2,329,055	320	89	103	217	53	931,622	195	214	63	132	32	465,811	126	283	41	86	21	232,906	79	330	26	54	13	46,581	25	384	8	17	4
Pancreas	CA19-9_20U/mL cutoff	55 to 59	18.3	13.6	4,181,606	666	2,090,803	522	144	168	354	53	836,321	317	349	102	215	32	418,161	206	460	66	139	21	209,080	129	537	42	88	13	41,816	41	625	13	28	4
Pancreas	CA19-9_20U/mL cutoff	60 to 64	29.2	22.4	3,602,002	926	1,801,001	725	201	233	492	53	720,400	441	485	142	299	32	360,200	286	640	92	194	21	180,100	180	746	58	122	13	36,020	57	869	18	39	4
Pancreas	CA19-9_20U/mL cutoff	65 to 69	47.2	34.1	3,502,183	1,417	1,751,092	1,110	307	357	752	53	700,437	675	742	217	458	32	350,218	438	979	141	297	21	175,109	275	1,142	89	187	13	35,022	87	1,330	28	59	4
Pancreas	CA19-9_20U/mL cutoff	70 to 74	66.4	48.8	3,071,575	1,757	1,535,787	1,376	381	443	933	53	614,315	837	920	270	568	32	307,157	543	1,214	175	368	21	153,579	341	1,416	110	231	13	30,716	108	1,649	35	73	4
Pancreas	CA19-9_20U/mL cutoff	75 to 79	86.0	70.8	2,189,011	1,702	1,094,505	1,333	369	429	904	53	437,802	811	891	261	550	32	218,901	526	1,176	169	356	21	109,451	331	1,371	106	224	13	21,890	104	1,598	34	71	4
Pancreas	CA19-9_20U/mL cutoff	Total 40-69	17.4	13.0	24,586,669	3,727	12,293,335	2,919	808	940	1,979	53	4,917,334	1,776	1,951	572	1,204	32	2,458,667	1,151	2,576	371	781	21	1,229,333	724	3,003	233	491	13	245,867	229	3,498	74	155	4
Pancreas	CA19-9_20U/mL cutoff	Total 40-49	4.2	3.0	8,642,767	309	4,321,384	242	67	78	164	53	1,728,553	147	162	47	100	32	864,277	95	214	31	65	21	432,138	60	249	19	41	13	86,428	19	290	6	13	4
Pancreas	CA19-9_20U/mL cutoff	Total 50-59	14.1	10.3	8,839,717	1,075	4,419,858	842	233	271	571	53	1,767,943	512	563	165	347	32	883,972	332	743	107	225	21	441,986	209	866	67	142	13	88,397	66	1,009	21	45	4
Pancreas	CA19-9_20U/mL cutoff	Total 50-69	24.7	18.3	15,943,902	3,418	7,971,951	2,677	741	862	1,815	53	3,188,780	1,629	1,789	524	1,104	32	1,594,390	1,056	2,362	340	716	21	797,195	664	2,754	214	450	13	159,439	210	3,208	67	142	4
Pancreas	CA19-9_20U/mL cutoff	Total 60-74	46.5	34.5	10,175,760	4,100	5,087,880	3,211	889	1,034	2,177	53	2,035,152	1,954	2,146	629	1,324	32	1,017,576	1,267	2,833	408	859	21	508,788	797	3,303	256	540	13	101,758	251	3,849	81	170	4
Pancreas	CA19-9_20U/mL cutoff	Total 40-79	27.1	21.2	29,847,255	7,186	14,923,627	5,627	1,559	1,812	3,815	53	5,969,451	3,424	3,762	1,102	2,321	32	2,984,725	2,220	4,966	715	1,505	21	1,492,363	1,396	5,790	450	947	13	298,473	441	6,745	142	299	4
Pancreas	CA19-9_20U/mL cutoff	Total (all ages)	19.3	15.0	66,041,278	10,452																														

Supplementary Table 6c(ii). Cancers detected by offering risk stratified screening according to optimised PRS using sensitivity of currently available "real world" screening tools (Cancers of the Ovary, Kidney, Lung, Testis)

Cancer Type	Screening sensitivity	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
			Male	Female	Population Size	Cancers arising per year	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Ovary																																				
Ovary	MMS (CA-125 + TVU)	40 to 44	0.0	13.2	2,054,223	270	1,027,112	187	83	30	157	58	410,845	100	170	16	84	31	205,422	59	211	9	50	18	102,711	34	236	6	29	11	20,542	9	261	1	8	3
Ovary	MMS (CA-125 + TVU)	45 to 49	0.0	19.4	2,315,479	448	1,157,740	311	137	50	261	58	463,096	165	283	26	139	31	231,548	98	350	16	83	18	115,774	57	391	9	48	11	23,155	15	433	2	13	3
Ovary	MMS (CA-125 + TVU)	50 to 54	0.0	27.1	2,364,638	640	1,182,319	444	196	71	373	58	472,928	236	404	38	198	31	236,464	140	500	22	118	18	118,232	82	558	13	69	11	23,646	22	618	4	19	3
Ovary	MMS (CA-125 + TVU)	55 to 59	0.0	34.8	2,119,687	738	1,059,844	512	226	82	430	58	423,937	272	466	44	229	31	211,969	162	576	26	136	18	105,984	94	644	15	79	11	21,197	25	713	4	21	3
Ovary	MMS (CA-125 + TVU)	60 to 64	0.0	41.6	1,837,174	764	918,587	530	234	85	445	58	367,435	282	482	45	237	31	183,717	168	596	27	141	18	91,859	97	667	16	82	11	18,372	26	738	4	22	3
Ovary	MMS (CA-125 + TVU)	65 to 69	0.0	52.3	1,805,190	944	902,595	655	289	105	550	58	361,038	348	596	56	293	31	180,519	207	737	33	174	18	90,260	120	824	19	101	11	18,052	32	912	5	27	3
Ovary	MMS (CA-125 + TVU)	70 to 74	0.0	60.8	1,603,610	975	801,805	677	298	108	568	58	320,722	360	615	58	302	31	160,361	214	761	34	180	18	80,180	124	851	20	104	11	16,036	34	941	5	28	3
Ovary	MMS (CA-125 + TVU)	75 to 79	0.0	73.8	1,181,645	872	590,823	605	267	97	508	58	236,329	322	550	51	270	31	118,165	191	681	31	161	18	59,082	111	761	18	93	11	11,816	30	842	5	25	3
Ovary	MMS (CA-125 + TVU)	Total 40-69	0.0	30.4	12,496,392	3,804	6,248,196	2,640	1,164	422	2,217	58	2,499,278	1,403	2,401	225	1,179	31	1,249,639	834	2,970	133	701	18	624,820	485	3,319	78	408	11	124,964	131	3,673	21	110	3
Ovary	MMS (CA-125 + TVU)	Total 40-49	0.0	16.4	4,369,703	718	2,184,851	498	220	80	419	58	873,941	265	453	42	223	31	436,970	157	561	25	132	18	218,485	92	626	15	77	11	43,697	25	693	4	21	3
Ovary	MMS (CA-125 + TVU)	Total 50-59	0.0	30.7	4,484,325	1,378	2,242,163	956	422	153	803	58	896,865	508	870	81	427	31	448,433	302	1,076	48	254	18	224,216	176	1,202	28	148	11	44,843	47	1,331	8	40	3
Ovary	MMS (CA-125 + TVU)	Total 50-69	0.0	38.0	8,126,689	3,086	4,063,345	2,141	945	343	1,799	58	1,625,338	1,139	1,947	182	956	31	812,669	677	2,409	108	568	18	406,334	394	2,692	63	331	11	81,267	106	2,980	17	89	3
Ovary	MMS (CA-125 + TVU)	Total 60-74	0.0	51.1	5,245,974	2,683	2,622,987	1,862	821	298	1,564	58	1,049,195	990	1,693	158	831	31	524,597	588	2,095	94	494	18	262,299	342	2,341	55	288	11	52,460	92	2,591	15	78	3
Ovary	MMS (CA-125 + TVU)	Total 40-79	0.0	37.0	15,281,647	5,651	7,640,824	3,921	1,730	627	3,294	58	3,056,329	2,085	3,566	334	1,751	31	1,528,165	1,239	4,412	198	1,041	18	764,082	721	4,930	115	606	11	152,816	195	5,456	31	163	3
Ovary	MMS (CA-125 + TVU)	Total (all ages)	0.0	22.8	33,458,052	7,495																														
Kidney																																				
Kidney	USS	40 to 44	10.1	5.0	4,075,608	307	2,037,804	237	70	64	173	56	815,122	141	166	38	103	34	407,561	90	217	25	66	21	203,780	56	251	15	41	19	40,756	17	290	5	13	4
Kidney	USS	45 to 49	17.7	7.8	4,567,159	580	2,283,580	447	133	121	326	56	913,432	267	313	72	195	34	456,716	171	409	46	125	21	228,358	106	474	29	77	19	45,672	33	547	9	24	4
Kidney	USS	50 to 54	26.8	12.7	4,658,111	915	2,329,055	705	210	191	514	56	931,622	421	494	114	307	34	465,811	270	645	73	197	21	232,906	168	747	45	122	19	46,581	52	863	14	38	4
Kidney	USS	55 to 59	37.1	18.6	4,181,606	1,160	2,090,803	894	266	242	652	56	836,321	534	626	145	389	34	418,161	342	818	93	249	21	209,080	213	947	58	155	19	41,816	66	1,094	18	48	4
Kidney	USS	60 to 64	53.7	26.2	3,602,002	1,429	1,801,001	1,102	327	299	803	56	720,400	658	771	178	479	34	360,200	421	1,008	114	307	21	180,100	262	1,167	71	191	19	36,020	81	1,348	22	59	4
Kidney	USS	65 to 69	73.9	36.4	3,502,183	1,911	1,751,092	1,473	438	399	1,074	56	700,437	879	1,032	238	641	34	350,218	563	1,348	153	410	21	175,109	350	1,561	95	255	19	35,022	108	1,803	29	79	4
Kidney	USS	70 to 74	91.2	45.1	3,071,575	2,063	1,535,787	1,590	473	431	1,159	56	614,315	949	1,114	257	692	34	307,157	608	1,455	165	443	21	153,579	378	1,685	102	276	19	30,716	117	1,946	32	85	4
Kidney	USS	75 to 79	110.1	57.2	2,189,011	1,785	1,094,505	1,376	409	373	1,003	56	437,802	821	964	223	599	34	218,901	526	1,259	143	383	21	109,451	327	1,458	89	238	19	21,890	101	1,684	27	74	4
Kidney	USS	Total 40-69	34.6	16.9	24,586,669	6,302	12,293,335	4,858	1,444	1,316	3,541	56	4,917,334	2,900	3,402	786	2,114	34	2,458,667	1,857	4,445	503	1,354	21	1,229,333	1,155	5,147	313	842	19	245,867	356	5,946	97	260	4
Kidney	USS	Total 40-49	14.1	6.5	8,642,767	887	4,321,384	684	203	185	498	56	1,728,553	408	479	111	298	34	864,277	261	626	71	191	21	432,138	162	725	44	118	19	86,428	50	837	14	37	4
Kidney	USS	Total 50-59	31.7	15.5	8,839,717	2,075	4,419,858	1,599	476	433	1,166	56	1,767,943	955	1,120	259	696	34	883,972	611	1,464	166	446	21	441,986	380	1,695	103	277	19	88,397	117	1,958	32	85	4
Kidney	USS	Total 50-69	45.8	22.6	15,943,902	5,415	7,971,951	4,174	1,241	1,131	3,043	56	3,188,780	2,492	2,923	675	1,817	34	1,594,390	1,595	3,820	432	1,163	21	797,195	992	4,423	269	723	19	159,439	306	5,109	83	223	4
Kidney	USS	Total 60-74	71.8	35.5	10,175,760	5,403	5,087,880	4,165	1,238	1,129	3,036	56	2,035,152	2,486	2,917	674	1,813	34	1,017,576	1,592	3,811	431	1,160	21	508,788	990	4,413	268	722	19	101,758	305	5,098	83	223	4
Kidney	USS	Total 40-79	45.5	23.0	29,847,255	10,150	14,923,627	7,824	2,326	2,120	5,704	56	5,969,451	4,671	5,479	1,266	3,405	34	2,984,725	2,990	7,160	810	2,180	21	1,492,363	1,859	8,291	504	1,356	19	298,473	574	9,576	155	418	4
Kidney	USS	Total (all ages)	29.2	14.8	66,041,278	13,323																														
Lung																																				
Lung	Low dose CT	40 to 44	6.0	5.8	4,075,608	240	2,037,804	176	64	27	149	62	815,122	99	141	15	84	35	407,561	61	179	9	52	22	203,780	37	203	6	31	19	40,756	11	229	2	9	4
Lung	Low dose CT	45 to 49	16.3	14.7	4,567,159	706	2,283,580	518	188	80	438	62	913,432	292	414	45	247	35	456,716	180	526	28	152	22	228,358	108	598	17	92	19	45,672	31	675	5	26	4
Lung	Low dose CT	50 to 54	33.4	31.5	4,658,111	1,512	2,329,055	1,108	404	171	938	62	931,622	625	887	96	528	35	465,811	385	1,127	59	326	22	232,906	232	1,280	36	196	19	46,581	67	1,445	10	57	4
Lung	Low dose CT	55 to 59	71.4	67.1	4,181,606	2,896	2,090,803	2,123	773	327	1,796	62	836,321	1,196	1,700	184	1,012	35	418,161	738	2,158	114	624	22	209,080	444	2,452	68	375	19	41,816	128	2,768	20	108	4
Lung	Low dose CT	60 to 64	137.0	124.9	3,602,002	4,711	1,801,001	3,454	1,257	532	2,922	62	720,400	1,946	2,765	300	1,647	35	360,200	1,200	3,511	185	1,016	22	180,100	722	3,989	111	611	19	36,020	208	4,503	32	176	4
Lung	Low dose CT	65 to 69	229.5	197.8	3,502,183	7,466	1,751,092	5,473	1,993	843	4,630	62	700,437	3,084	4,382	475	2,609	35	350,218	1,902	5,564	293	1,609	22	175,109	1,144	6,322	176	968	19	35,022	330	7,136	51	279	4
Lung	Low dose CT	70 to 74	335.0	278.1	3,071,575	9,378	1,535,787	6,875	2,503	1,059	5,816	62	614,315	3,874	5,504	597	3,278	35	307,157	2,390	6,988	368	2,022	22	153,579	1,437	7,941	221	1,216	19	30,716	414	8,964	64	350	4
Lung	Low dose CT	75 to 79	462.2	340.5	2,189,011	8,680	1,094,505	6,363	2,317	980	5,383	62	437,802	3,586	5,094	552	3,034	35	218,901	2,212	6,468	341	1,871	22	109,451	1,330	7,350	205	1,125	19	21,890	383	8,297	59	324	4
Lung	Low dose CT	Total 40-69	74.8	68.0	24,586,669	17,531	12,293,335	12,851	4,680	1,979	10,872	62	4,917,334	7,243	10,288	1,115	6,127	35	2,458,667	4,467	13,064	688	3,779	22	1,229,333	2,686	14,845	414	2,272	19	245,867	774	16,757	119	655	4
Lung	Low dose CT	Total 40-49	11.4	10.5	8,642,767	946	4,321,384	693	253	107	587	62	1,728,553	391	555	60	331	35	864,277	241	705	37	204	22	432,138	145	801	22	123	19	86,428	42	904	6	35	4
Lung	Low dose CT	Total 50-59	51.4	48.4	8,839,717	4,408	4,419,858	3,231	1,177	498	2,734	62	1,767,943	1,821	2,587	280	1,541	35	883,972	1,123	3,285	173	950	22	441,986	675	3,733	104	571	19	88,397	195	4,213	30	165	4
Lung	Low dose CT	Total 50-69	109.4	98.9	15,943,902	16,585	7,971,951	12,158	4,427	1,872	10,286	62	3,188,780	6,852	9,733	1,055	5,797	35	1,594,390	4,226	12,359	651	3,575	22	797,195	2,541	14,044	391	2,150	19	159,439	733	15,852	113	620	4
Lung	Low dose CT	Total 60-74	227.8	196.8	10,175,760	21,555	5,087,880	15,801	5,754	2,433	13,368	62	2,035,152	8,905	12,650	1,371	7,534	35	1,017,576	5,492	16,063	846	4,647	22	508,788	3,303	18,252	509	2,794	19	101,758	952	20,603	147	805	4
Lung	Low dose CT	Total 40-79	127.8	111.1	29,847,255	35,589	14,923,627	26,089	9,500	4,018	22,072	62	5,969,451	14,703	20,886	2,264	12,439	35	2,984,725	9,069	26,520	1,397	7,672	22	1,492,363	5,453	30,136	840	4,613	19	298,473	1,572	34,017	242	1,330	4
Lung	Low dose CT	Total (all ages)	90.6	70.1	66,041,278	48,549																														
Testis																																				
Testis	Semen assay	40 to 44	12.3	0.0	2,021,385	248	1,010,692	236	12	78	158	64	404,277	197	51	65	132	53	202,138	161	87	53	108	43	101,069	126	122	41	84	34	20,214	63	185	21	42	17
Testis	Semen assay	45 to 49	9.4	0.0	2,251,680	211	1,125,840	201	10	66	135	64	450,336	168	43	55	112	53	225,168	137	74	45	92	43	112,584	107	104	35	72	34	22,517	53	158	18	36	17
Testis	Semen assay	50 to 54	7.0	0.0	2,293,473	160	1,146,736	152	8	50	102	64	458,695	127	33	42	85	53	229,347	104	56	34	69	43	114,674	81	79	27	54	34	22,935	41	119	13	27	17
Testis	Semen assay	55 to 59	5.2	0.0	2,061,919	108	1,030,959	103	5	34	69	64	412,384	86	22	28	57	53	206,192	70	38	23	47	43	103,096	55	53	18	37	34	20,619	27	81	9	18	17
Testis	Semen assay	60 to 64	3.0	0.0	1,764,828	52	882,414	49	3	16	33	64	352,966	41	11	14	28	53	176,483	34	18	11	23	43	88,241	26	26	9	18	34	17,648	13	39	4	9	17
Testis	Semen assay	65 to 69	2.4	0.0	1,696,993	41	848,497	39	2	13	26	64	339,399	33	8	11	22	53	169,699	27	14	9	18	43	84,850	21	20	7	14	34	16,970	10	31	3	7	17
Testis	Semen assay	70 to 74	2.4	0.0	1,467,965	35	733,983	33	2	11	22	64	293,593	28	7	9	19	53	146,797	23	12	7	15	43	73,398	18	17	6	12	34	14,680	9	26	3	6	17
Testis	Semen assay	75 to 79	1.4	0.0	1,007,365	14	503,683	13	1	4	9	64	201,473	11	3	4	7	53	100,737	9	5	3	6	43	50,368	7	7	2	5	34	10,074	4	10	1	2	17
Testis	Semen assay	Total 20-39	16.0	0.0	8,782,738	1,406	4,391,369	1,338	68	442	897	64	1,756,548	1,116	290	368	748	53	878,274	911	495	301	611	43	439,137	712	694	235	477	34	87,827	356	1,050	117	238	17
Testis	Semen assay	Total 40-69	6.8	0.0	12,090,277	820	6,045,139	780	40	258	523	64	2,418,055	651	169	215	436	53	1,209,028	531	289	175	356	43	604,514	416	404	137	278	34	120,903	208	612	68	139	17
Testis	Semen assay	Total 40-49	10.7	0.0	4,273,065	459	2,136,532	437	22	144	293	64	854,613	364	95	120	244	53	427,306	297	162	98	199	43	213,653	233	226	77	156	34	42,731	116	343	38	78	17
Testis	Semen assay	Total 50-59	6.2	0.0	4,355,391	268	2,177,696	255	13	84	171	64	871,078	213	55	70	143	53	435,539	174	94	57	116	43	217,770	136	132	45	91	34	43,554	68	200	22	45	17
Testis	Semen assay	Total 50-69	4.6	0.0	7,817,213	361	3,908,606	344	17	113	230	64	1,563,443	287	74	95	192	53	781,721	234	127	77	157	43	390,861	183	178	60	123	34	78,172	91	270	30	61	17
Testis	Semen assay	Total 60-74	2.6	0.0	4,929,786	128	2,464,893	122	6	40	82	64	985,957	102	26	34	68	53	492,979	83	45	27	56	43	246,489	65	63	21	43	34	49,298	32	96	11	22	17
Testis	Semen assay	Total 40-79	6.0	0.0	14,565,608	869	7,282,804	827	42	273	554	64	2,913,122	690	179	228	462	53	1,456,561	563	306	186	377	43	728,280	440	429	145	295	34	145,656	220	649	73	147	17
Testis	Semen assay	Total (all ages)	7.2	0.0	32,583,226	2,354																														

Supplementary Table 7a(i). Cancers detected by offering risk stratified screening according to current PRS using an idealised screening tool with a sensitivity of 0.8 (Cancers of the Breast, Prostate, Colorectum and Pancreas)

Cancer Type	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
		Male	Female	Population Size	Cancers arising	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Breast																																			
Breast	40 to 44	0.0	124.6	2,054,223	2,559	1,027,112	1,786	773	357	1,429	56	410,845	955	1,604	191	764	30	205,422	570	1,989	114	456	18	102,711	333	2,226	67	266	10	20,542	90	2,469	18	72	3
Breast	45 to 49	0.0	214.8	2,315,479	4,974	1,157,740	3,471	1,503	694	2,777	56	463,096	1,856	3,118	371	1,485	30	231,548	1,107	3,867	221	886	18	115,774	646	4,328	129	517	10	23,155	176	4,798	35	140	3
Breast	50 to 54	0.0	279.8	2,364,638	6,616	1,182,319	4,617	1,999	923	3,694	56	472,928	2,469	4,147	494	1,975	30	236,464	1,473	5,143	295	1,178	18	118,232	860	5,756	172	688	10	23,646	234	6,382	47	187	3
Breast	55 to 59	0.0	285.5	2,119,687	6,052	1,059,844	4,224	1,828	845	3,379	56	423,937	2,259	3,793	452	1,807	30	211,969	1,348	4,704	270	1,078	18	105,984	787	5,265	157	629	10	21,197	214	5,838	43	171	3
Breast	60 to 64	0.0	338.0	1,837,174	6,209	918,587	4,333	1,876	867	3,466	56	367,435	2,317	3,892	463	1,854	30	183,717	1,382	4,827	276	1,106	18	91,859	807	5,402	161	646	10	18,372	219	5,990	44	175	3
Breast	65 to 69	0.0	412.3	1,805,190	7,443	902,595	5,194	2,249	1,039	4,155	56	361,038	2,778	4,665	556	2,222	30	180,519	1,657	5,786	331	1,326	18	90,260	967	6,476	193	774	10	18,052	263	7,180	53	210	3
Breast	70 to 74	0.0	372.7	1,603,610	5,977	801,805	4,171	1,806	834	3,337	56	320,722	2,231	3,746	446	1,785	30	160,361	1,331	4,646	266	1,065	18	80,180	777	5,200	155	621	10	16,036	211	5,766	42	169	3
Breast	75 to 79	0.0	403.0	1,181,645	4,762	590,823	3,323	1,439	665	2,659	56	236,329	1,777	2,985	355	1,422	30	118,165	1,060	3,702	212	848	18	59,082	619	4,143	124	495	10	11,816	168	4,594	34	134	3
Breast	Total 40-69	0.0	270.9	12,496,392	33,853	6,248,196	23,625	10,228	4,725	18,900	56	2,499,278	12,635	21,218	2,527	10,108	30	1,249,639	7,538	26,315	1,508	6,030	18	624,820	4,400	29,453	880	3,520	10	124,964	1,195	32,658	239	956	3
Breast	Total 40-49	0.0	172.4	4,369,703	7,533	2,184,851	5,257	2,276	1,051	4,206	56	873,941	2,811	4,722	562	2,249	30	436,970	1,677	5,856	335	1,342	18	218,485	979	6,554	196	783	10	43,697	266	7,267	53	213	3
Breast	Total 50-59	0.0	282.5	4,484,325	12,668	2,242,163	8,841	3,827	1,768	7,073	56	896,865	4,728	7,940	946	3,782	30	448,433	2,821	9,847	564	2,256	18	224,216	1,646	11,022	329	1,317	10	44,843	447	12,221	89	358	3
Breast	Total 50-69	0.0	323.9	8,126,689	26,320	4,063,345	18,368	7,952	3,674	14,694	56	1,625,338	9,823	16,497	1,965	7,859	30	812,669	5,860	20,460	1,172	4,688	18	406,334	3,421	22,899	684	2,737	10	81,267	929	25,391	186	743	3
Breast	Total 60-74	0.0	374.2	5,245,974	19,629	2,622,987	13,699	5,930	2,740	10,959	56	1,049,195	7,326	12,303	1,465	5,861	30	524,597	4,370	15,259	874	3,496	18	262,299	2,551	17,078	510	2,041	10	52,460	693	18,936	139	554	3
Breast	Total 40-79	0.0	291.8	15,281,647	44,592	7,640,824	31,120	13,472	6,224	24,896	56	3,056,329	16,643	27,949	3,329	13,314	30	1,528,165	9,929	34,663	1,986	7,943	18	764,082	5,795	38,797	1,159	4,636	10	152,816	1,574	43,018	315	1,259	3
Breast	Total (all ages)	0.0	166.0	33,458,052	55,545																														
Prostate																																			
Prostate	40 to 44	4.3	0.0	2,021,385	88	1,010,692	68	20	14	54	62	404,277	40	48	8	32	37	202,138	26	62	5	21	23	101,069	16	72	3	13	15	20,214	5	83	1	4	4
Prostate	45 to 49	20.5	0.0	2,251,680	461	1,125,840	355	106	71	284	62	450,336	211	250	42	169	37	225,168	135	326	27	108	23	112,584	84	377	17	67	15	22,517	26	435	5	21	4
Prostate	50 to 54	75.7	0.0	2,293,473	1,737	1,146,736	1,337	400	267	1,069	62	458,695	797	940	159	637	37	229,347	509	1,228	102	407	23	114,674	316	1,421	63	253	15	22,935	97	1,640	19	78	4
Prostate	55 to 59	201.8	0.0	2,061,919	4,160	1,030,959	3,202	958	640	2,561	62	412,384	1,908	2,252	382	1,526	37	206,192	1,220	2,940	244	976	23	103,096	758	3,402	152	606	15	20,619	233	3,927	47	187	4
Prostate	60 to 64	356.1	0.0	1,764,828	6,285	882,414	4,837	1,448	967	3,870	62	352,966	2,882	3,403	576	2,306	37	176,483	1,843	4,442	369	1,474	23	88,241	1,145	5,140	229	916	15	17,648	352	5,933	70	282	4
Prostate	65 to 69	622.7	0.0	1,696,993	10,568	848,497	8,133	2,435	1,627	6,507	62	339,399	4,846	5,722	969	3,877	37	169,699	3,099	7,469	620	2,479	23	84,850	1,925	8,643	385	1,540	15	16,970	592	9,976	118	474	4
Prostate	70 to 74	759.8	0.0	1,467,965	11,153	733,983	8,583	2,570	1,717	6,867	62	293,593	5,114	6,039	1,023	4,091	37	146,797	3,270	7,883	654	2,616	23	73,398	2,031	9,122	406	1,625	15	14,680	625	10,528	125	500	4
Prostate	75 to 79	867.2	0.0	1,007,365	8,736	503,683	6,723	2,013	1,345	5,379	62	201,473	4,006	4,730	801	3,205	37	100,737	2,562	6,174	512	2,049	23	50,368	1,591	7,145	318	1,273	15	10,074	490	8,246	98	392	4
Prostate	Total 40-69	192.7	0.0	12,090,277	23,299	6,045,139	17,931	5,368	3,586	14,345	62	2,418,055	10,684	12,615	2,137	8,547	37	1,209,028	6,832	16,467	1,366	5,465	23	604,514	4,243	19,056	849	3,395	15	120,903	1,306	21,993	261	1,045	4
Prostate	Total 40-49	12.8	0.0	4,273,065	549	2,136,532	423	126	85	338	62	854,613	252	297	50	201	37	427,306	161	388	32	129	23	213,653	100	449	20	80	15	42,731	31	518	6	25	4
Prostate	Total 50-59	135.4	0.0	4,355,391	5,897	2,177,696	4,538	1,359	908	3,631	62	871,078	2,704	3,193	541	2,163	37	435,539	1,729	4,168	346	1,383	23	217,770	1,074	4,823	215	859	15	43,554	331	5,566	66	264	4
Prostate	Total 60-69	486.8	0.0	3,461,821	16,853	1,730,911	12,970	3,883	2,594	10,376	62	692,364	7,728	9,125	1,546	6,182	37	346,182	4,942	11,911	988	3,953	23	173,091	3,069	13,784	614	2,455	15	34,618	945	15,908	189	756	4
Prostate	Total 50-69	291.0	0.0	7,817,213	22,750	3,908,606	17,509	5,241	3,502	14,007	62	1,563,443	10,432	12,318	2,086	8,346	37	781,721	6,671	16,079	1,334	5,337	23	390,861	4,143	18,607	829	3,315	15	78,172	1,275	21,475	255	1,020	4
Prostate	Total 60-74	568.1	0.0	4,929,786	28,006	2,464,893	21,554	6,452	4,311	17,243	62	985,957	12,842	15,164	2,568	10,274	37	492,979	8,212	19,794	1,642	6,570	23	246,489	5,101	22,905	1,020	4,080	15	49,298	1,570	26,436	314	1,256	4
Prostate	Total 40-79	296.5	0.0	14,565,608	43,188	7,282,804	33,238	9,950	6,648	26,590	62	2,913,122	19,804	23,384	3,961	15,843	37	1,456,561	12,664	30,524	2,533	10,131	23	728,280	7,866	35,322	1,573	6,292	15	145,656	2,421	40,767	484	1,937	4
Prostate	Total (all ages)	183.8	0.0	32,583,226	52,254																														
Colorectal																																			
Colorectal	40 to 44	14.5	13.5	4,075,608	570	2,037,804	378	192	76	302	53	815,122	192	378	38	154	27	407,561	111	459	22	89	16	203,780	63	507	13	50	9	40,756	16	554	3	13	2
Colorectal	45 to 49	24.4	21.6	4,567,159	1,047	2,283,580	694	353	139	555	53	913,432	353	694	71	282	27	456,716	204	843	41	163	16	228,358	116	931	23	93	9	45,672	30	1,017	6	24	2
Colorectal	50 to 54	47.1	37.1	4,658,111	1,958	2,329,055	1,298	660	260	1,039	53	931,622	660	1,298	132	528	27	465,811	381	1,577	76	305	16	232,906	216	1,742	43	173	9	46,581	56	1,902	11	44	2
Colorectal	55 to 59	87.7	60.6	4,181,606	3,094	2,090,803	2,052	1,042	410	1,641	53	836,321	1,043	2,051	209	834	27	418,161	602	2,492	120	482	16	209,080	342	2,752	68	273	9	41,816	88	3,006	18	70	2
Colorectal	60 to 64	151.4	91.0	3,602,002	4,345	1,801,001	2,881	1,464	576	2,305	53	720,400	1,464	2,881	293	1,171	27	360,200	846	3,499	169	677	16	180,100	480	3,865	96	384	9	36,020	123	4,222	25	99	2
Colorectal	65 to 69	198.3	119.1	3,502,183	5,516	1,751,092	3,658	1,858	732	2,926	53	700,437	1,859	3,657	372	1,487	27	350,218	1,074	4,442	215	859	16	175,109	609	4,907	122	488	9	35,022	156	5,360	31	125	2
Colorectal	70 to 74	273.5	171.2	3,071,575	6,760	1,535,787	4,482	2,278	896	3,586	53	614,315	2,278	4,482	456	1,822	27	307,157	1,316	5,444	263	1,053	16	153,579	747	6,013	149	597	9	30,716	192	6,568	38	153	2
Colorectal	75 to 79	351.7	234.8	2,189,011	6,318	1,094,505	4,189	2,129	838	3,351	53	437,802	2,129	4,189	426	1,703	27	218,901	1,230	5,088	246	984	16	109,451	698	5,620	140	558	9	21,890	179	6,139	36	143	2
Colorectal	Total 40-69	80.8	54.1	24,586,669	16,530	##########	10,961	5,569	2,192	8,769	53	4,917,334	5,570	10,960	1,114	4,456	27	2,458,667	3,219	13,311	644	2,575	16	1,229,333	1,826	14,704	365	1,461	9	245,867	469	16,061	94	375	2
Colorectal	Total 40-49	19.7	17.7	8,642,767	1,617	4,321,384	1,072	545	214	858	53	1,728,553	545	1,072	109	436	27	864,277	315	1,302	63	252	16	432,138	179	1,438	36	143	9	86,428	46	1,571	9	37	2
Colorectal	Total 50-59	66.4	48.2	8,839,717	5,052	4,419,858	3,350	1,702	670	2,680	53	1,767,943	1,702	3,350	340	1,362	27	883,972	984	4,068	197	787	16	441,986	558	4,494	112	447	9	88,397	143	4,909	29	115	2
Colorectal	Total 50-69	114.2	73.6	15,943,902	14,913	7,971,951	9,889	5,024	1,978	7,911	53	3,188,780	5,025	9,888	1,005	4,020	27	1,594,390	2,904	12,009	581	2,323	16	797,195	1,648	13,265	330	1,318	9	159,439	423	14,490	85	338	2
Colorectal	Total 60-74	203.9	125.2	10,175,760	16,621	5,087,880	11,021	5,600	2,204	8,817	53	2,035,152	5,601	11,020	1,120	4,481	27	1,017,576	3,236	13,385	647	2,589	16	508,788	1,836	14,785	367	1,469	9	101,758	471	16,150	94	377	2
Colorectal	Total 40-79	119.0	80.4	29,847,255	29,608	##########	19,632	9,976	3,926	15,706	53	5,969,451	9,977	19,631	1,995	7,982	27	2,984,725	5,765	23,843	1,153	4,612	16	1,492,363	3,271	26,337	654	2,617	9	298,473	840	28,768	168	672	2
Colorectal	Total (all ages)	84.5	56.5	66,041,278	42,885																														
Pancreas																																			
Pancreas	40 to 44	2.6	2.0	4,075,608	94	2,037,804	57	37	11	46	49	815,122	27	67	5	22	23	407,561	15	79	3	12	13	203,780	8	86	2	7	7	40,756	2	92	0	2	2
Pancreas	45 to 49	5.6	3.9	4,567,159	215	2,283,580	131	84	26	105	49	913,432	62	153	12	50	23	456,716	34	181	7	27	13	228,358	19	196	4	15	7	45,672	4	211	1	4	2
Pancreas	50 to 54	10.2	7.3	4,658,111	409	2,329,055	250	159	50	200	49	931,622	118	291	24	94	23	465,811	65	344	13	52	13	232,906	35	374	7	28	7	46,581	8	401	2	7	2
Pancreas	55 to 59	18.3	13.6	4,181,606	666	2,090,803	407	259	81	326	49	836,321	192	474	38	153	23	418,161	106	560	21	85	13	209,080	58	608	12	46	7	41,816	14	652	3	11	2
Pancreas	60 to 64	29.2	22.4	3,602,002	926	1,801,001	566	360	113	453	49	720,400	267	659	53	213	23	360,200	147	779	29	118	13	180,100	80	846	16	64	7	36,020	19	907	4	15	2
Pancreas	65 to 69	47.2	34.1	3,502,183	1,417	1,751,092	866	551	173	693	49	700,437	408	1,009	82	326	23	350,218	225	1,192	45	180	13	175,109	122	1,295	24	98	7	35,022	29	1,388	6	23	2
Pancreas	70 to 74	66.4	48.8	3,071,575	1,757	1,535,787	1,074	683	215	859	49	614,315	506	1,251	101	405	23	307,157	279	1,478	56	223	13	153,579	152	1,605	30	122	7	30,716	36	1,721	7	29	2
Pancreas	75 to 79	86.0	70.8	2,189,011	1,702	1,094,505	1,040	662	208	832	49	437,802	490	1,212	98	392	23	218,901	270	1,432	54	216	13	109,451	147	1,555	29	118	7	21,890	35	1,667	7	28	2
Pancreas	Total 40-69	17.4	13.0	24,586,669	3,727	##########	2,277	1,450	455	1,822	49	4,917,334	1,073	2,654	215	858	23	2,458,667	592	3,135	118	473	13	1,229,333	322	3,405	64	258	7	245,867	76	3,651	15	61	2
Pancreas	Total 40-49	4.2	3.0	8,642,767	309	4,321,384	189	120	38	151	49	1,728,553	89	220	18	71	23	864,277	49	260	10	39	13	432,138	27	282	5	21	7	86,428	6	303	1	5	2
Pancreas	Total 50-59	14.1	10.3	8,839,717	1,075	4,419,858	657	418	131	525	49	1,767,943	309	766	62	248	23	883,972	171	904	34	137	13	441,986	93	982	19	74	7	88,397	22	1,053	4	18	2
Pancreas	Total 50-69	24.7	18.3	15,943,902	3,418	7,971,951	2,088	1,330	418	1,671	49	3,188,780	984	2,434	197	787	23	1,594,390	543	2,875	109	434	13	797,195	295	3,123	59	236	7	159,439	70	3,348	14	56	2
Pancreas	Total 60-74	46.5	34.5	10,175,760	4,100	5,087,880	2,505	1,595	501	2,004	49	2,035,152	1,180	2,920	236	944	23	1,017,576	651	3,449	130	521	13	508,788	354	3,746	71	284	7	101,758	84	4,016	17	67	2
Pancreas	Total 40-79	27.1	21.2	29,847,255	7,186	##########	4,391	2,795	878	3,512	49	5,969,451	2,068	5,118	414	1,655	23	2,984,725	1,141	6,045	228	913	13	1,492,363	621	6,565	124	497	7	298,473	147	7,039	29	118	2
Pancreas	Total (all ages)	19.3	15.0	66,041,278	10,452																														

Supplementary Table 7a(ii). Cancers detected by offering risk stratified screening according to current PRS using an idealised screening tool with a sensitivity of 0.8 (Cancers of the Ovary, Kidney, Lung, Testis)

Cancer Type	Age Groups	Annual Incidence (per 100,000) for age-band: Male	Annual Incidence (per 100,000) for age-band: Female	Population: Population Size	Population: Cancers arising	Screening offered to top 50% of PRS: Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Screening offered to top 20% of PRS: Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Screening offered to top 10% of PRS: Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Screening offered to top 5% of PRS: Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Screening offered to top 1% of PRS: Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Ovary																																			
Ovary	40 to 44	0.0	13.2	2,054,223	270	1,027,112	157	113	31	126	47	410,845	71	199	14	57	21	205,422	38	232	8	30	11	102,711	20	250	4	16	6	20,542	5	265	1	4	1
Ovary	45 to 49	0.0	19.4	2,315,479	448	1,157,740	261	187	52	208	47	463,096	118	330	24	94	21	231,548	63	385	13	51	11	115,774	34	414	7	27	6	23,155	8	440	2	6	1
Ovary	50 to 54	0.0	27.1	2,364,638	640	1,182,319	372	268	74	298	47	472,928	168	472	34	134	21	236,464	90	550	18	72	11	118,232	48	592	10	38	6	23,646	11	629	2	9	1
Ovary	55 to 59	0.0	34.8	2,119,687	738	1,059,844	429	309	86	343	47	423,937	194	544	39	155	21	211,969	104	634	21	83	11	105,984	55	683	11	44	6	21,197	13	725	3	10	1
Ovary	60 to 64	0.0	41.6	1,837,174	764	918,587	444	320	89	356	47	367,435	201	563	40	161	21	183,717	108	656	22	86	11	91,859	57	707	11	46	6	18,372	13	751	3	10	1
Ovary	65 to 69	0.0	52.3	1,805,190	944	902,595	549	395	110	439	47	361,038	248	696	50	198	21	180,519	133	811	27	107	11	90,260	71	873	14	57	6	18,052	16	928	3	13	1
Ovary	70 to 74	0.0	60.8	1,603,610	975	801,805	567	408	113	454	47	320,722	256	719	51	205	21	160,361	138	837	28	110	11	80,180	73	902	15	59	6	16,036	17	958	3	13	1
Ovary	75 to 79	0.0	73.8	1,181,645	872	590,823	507	365	101	406	47	236,329	229	643	46	183	21	118,165	123	749	25	98	11	59,082	66	806	13	52	6	11,816	15	857	3	12	1
Ovary	Total 40-69	0.0	30.4	12,496,392	3,804	6,248,196	2,213	1,591	443	1,770	47	2,499,278	999	2,805	200	799	21	1,249,639	537	3,267	107	430	11	624,820	286	3,518	57	229	6	124,964	65	3,739	13	52	1
Ovary	Total 40-49	0.0	16.4	4,369,703	718	2,184,851	418	300	84	334	47	873,941	189	529	38	151	21	436,970	101	617	20	81	11	218,485	54	664	11	43	6	43,697	12	706	2	10	1
Ovary	Total 50-59	0.0	30.7	4,484,325	1,378	2,242,163	802	576	160	641	47	896,865	362	1,016	72	290	21	448,433	194	1,184	39	156	11	224,216	104	1,274	21	83	6	44,843	23	1,355	5	19	1
Ovary	Total 50-69	0.0	38.0	8,126,689	3,086	4,063,345	1,795	1,291	359	1,436	47	1,625,338	810	2,276	162	648	21	812,669	436	2,650	87	348	11	406,334	232	2,854	46	186	6	81,267	52	3,034	10	42	1
Ovary	Total 60-74	0.0	51.1	5,245,974	2,683	2,622,987	1,561	1,122	312	1,249	47	1,049,195	705	1,978	141	564	21	524,597	379	2,304	76	303	11	262,299	202	2,481	40	161	6	52,460	46	2,637	9	36	1
Ovary	Total 40-79	0.0	37.0	15,281,647	5,651	7,640,824	3,287	2,364	657	2,630	47	3,056,329	1,484	4,167	297	1,187	21	1,528,165	798	4,853	160	638	11	764,082	425	5,226	85	340	6	152,816	96	5,555	19	77	1
Ovary	Total (all ages)	0.0	22.8	33,458,052	7,495																														
Kidney																																			
Kidney	40 to 44	10.1	5.0	4,075,608	307	2,037,804	161	146	32	129	42	815,122	67	240	13	53	17	407,561	34	273	7	27	9	203,780	17	290	3	14	5	40,756	4	303	1	3	1
Kidney	45 to 49	17.7	7.8	4,567,159	580	2,283,580	304	276	61	243	42	913,432	126	454	25	101	17	456,716	64	516	13	52	9	228,358	33	547	7	26	5	45,672	7	573	1	5	1
Kidney	50 to 54	26.8	12.7	4,658,111	915	2,329,055	479	436	96	384	42	931,622	199	716	40	159	17	465,811	102	813	20	81	9	232,906	52	863	10	41	5	46,581	11	904	2	9	1
Kidney	55 to 59	37.1	18.6	4,181,606	1,160	2,090,803	608	552	122	486	42	836,321	252	908	50	202	17	418,161	129	1,031	26	103	9	209,080	66	1,094	13	52	5	41,816	14	1,146	3	11	1
Kidney	60 to 64	53.7	26.2	3,602,002	1,429	1,801,001	749	680	150	599	42	720,400	311	1,118	62	248	17	360,200	159	1,270	32	127	9	180,100	81	1,348	16	65	5	36,020	17	1,412	3	13	1
Kidney	65 to 69	73.9	36.4	3,502,183	1,911	1,751,092	1,001	910	200	801	42	700,437	415	1,496	83	332	17	350,218	212	1,699	42	170	9	175,109	108	1,803	22	86	5	35,022	22	1,889	4	18	1
Kidney	70 to 74	91.2	45.1	3,071,575	2,063	1,535,787	1,081	982	216	865	42	614,315	448	1,615	90	359	17	307,157	229	1,834	46	183	9	153,579	117	1,946	23	93	5	30,716	24	2,039	5	19	1
Kidney	75 to 79	110.1	57.2	2,189,011	1,785	1,094,505	935	850	187	748	42	437,802	388	1,397	78	310	17	218,901	198	1,587	40	158	9	109,451	101	1,684	20	81	5	21,890	21	1,764	4	17	1
Kidney	Total 40-69	34.6	16.9	24,586,669	6,302	########	3,302	3,000	660	2,642	42	4,917,334	1,369	4,933	274	1,096	17	2,458,667	699	5,603	140	560	9	1,229,333	356	5,946	71	285	5	245,867	74	6,228	15	59	1
Kidney	Total 40-49	14.1	6.5	8,642,767	887	4,321,384	465	422	93	372	42	1,728,553	193	694	39	154	17	864,277	98	789	20	79	9	432,138	50	837	10	40	5	86,428	10	877	2	8	1
Kidney	Total 50-59	31.7	15.5	8,839,717	2,075	4,419,858	1,087	988	217	870	42	1,767,943	451	1,624	90	361	17	883,972	230	1,845	46	184	9	441,986	117	1,958	23	94	5	88,397	24	2,051	5	19	1
Kidney	Total 50-69	45.8	22.6	15,943,902	5,415	7,971,951	2,838	2,577	568	2,270	42	3,188,780	1,177	4,238	235	941	17	1,594,390	601	4,814	120	481	9	797,195	306	5,109	61	245	5	159,439	63	5,352	13	51	1
Kidney	Total 60-74	71.8	35.5	10,175,760	5,403	5,087,880	2,831	2,572	566	2,265	42	2,035,152	1,174	4,229	235	939	17	1,017,576	600	4,803	120	480	9	508,788	305	5,098	61	244	5	101,758	63	5,340	13	51	1
Kidney	Total 40-79	45.5	23.0	29,847,255	10,150	########	5,319	4,831	1,064	4,255	42	5,969,451	2,206	7,944	441	1,764	17	2,984,725	1,127	9,023	225	901	9	1,492,363	574	9,576	115	459	5	298,473	119	10,031	24	95	1
Kidney	Total (all ages)	29.2	14.8	66,041,278	13,929																														
Lung																																			
Lung	40 to 44	6.0	5.8	4,075,608	240	2,037,804	138	102	28	110	46	815,122	61	179	12	49	20	407,561	33	207	7	26	11	203,780	17	223	3	14	6	40,756	4	236	1	3	1
Lung	45 to 49	16.3	14.7	4,567,159	706	2,283,580	405	301	81	324	46	913,432	181	525	36	144	20	456,716	96	610	19	77	11	228,358	51	655	10	41	6	45,672	11	695	2	9	1
Lung	50 to 54	33.4	31.5	4,658,111	1,512	2,329,055	867	645	173	694	46	931,622	387	1,125	77	309	20	465,811	206	1,306	41	165	11	232,906	109	1,403	22	87	6	46,581	24	1,488	5	19	1
Lung	55 to 59	71.4	67.1	4,181,606	2,896	2,090,803	1,660	1,236	332	1,328	46	836,321	740	2,156	148	592	20	418,161	395	2,501	79	316	11	209,080	209	2,687	42	167	6	41,816	47	2,849	9	37	1
Lung	60 to 64	137.0	124.9	3,602,002	4,711	1,801,001	2,701	2,010	540	2,161	46	720,400	1,204	3,507	241	964	20	360,200	643	4,068	129	514	11	180,100	340	4,371	68	272	6	36,020	76	4,635	15	61	1
Lung	65 to 69	229.5	197.8	3,502,183	7,466	1,751,092	4,280	3,186	856	3,424	46	700,437	1,909	5,557	382	1,527	20	350,218	1,018	6,448	204	815	11	175,109	539	6,927	108	431	6	35,022	120	7,346	24	96	1
Lung	70 to 74	335.0	278.1	3,071,575	9,378	1,535,787	5,377	4,001	1,075	4,301	46	614,315	2,398	6,980	480	1,918	20	307,157	1,279	8,099	256	1,023	11	153,579	677	8,701	135	541	6	30,716	151	9,227	30	121	1
Lung	75 to 79	462.2	340.5	2,189,011	8,680	1,094,505	4,977	3,703	995	3,981	46	437,802	2,219	6,461	444	1,775	20	218,901	1,184	7,496	237	947	11	109,451	626	8,054	125	501	6	21,890	140	8,540	28	112	1
Lung	Total 40-69	74.8	68.0	24,586,669	17,531	########	10,051	7,480	2,010	8,041	46	4,917,334	4,482	13,049	896	3,586	20	2,458,667	2,391	15,140	478	1,913	11	1,229,333	1,265	16,266	253	1,012	6	245,867	283	17,248	57	226	1
Lung	Total 40-49	11.4	10.5	8,642,767	946	4,321,384	542	404	108	434	46	1,728,553	242	704	48	193	20	864,277	129	817	26	103	11	432,138	68	878	14	55	6	86,428	15	931	3	12	1
Lung	Total 50-59	51.4	48.4	8,839,717	4,408	4,419,858	2,527	1,881	505	2,022	46	1,767,943	1,127	3,281	225	902	20	883,972	601	3,807	120	481	11	441,986	318	4,090	64	254	6	88,397	71	4,337	14	57	1
Lung	Total 50-69	109.4	98.9	15,943,902	16,585	7,971,951	9,509	7,076	1,902	7,607	46	3,188,780	4,240	12,345	848	3,392	20	1,594,390	2,262	14,323	452	1,810	11	797,195	1,197	15,388	239	957	6	159,439	267	16,318	53	214	1
Lung	Total 60-74	227.8	196.8	10,175,760	21,555	5,087,880	12,358	9,197	2,472	9,887	46	2,035,152	5,511	16,044	1,102	4,409	20	1,017,576	2,940	18,615	588	2,352	11	508,788	1,555	20,000	311	1,244	6	101,758	347	21,208	69	278	1
Lung	Total 40-79	127.8	111.1	29,847,255	35,589	########	20,404	15,185	4,081	16,323	46	5,969,451	9,099	26,490	1,820	7,279	20	2,984,725	4,854	30,735	971	3,883	11	1,492,363	2,568	33,021	514	2,054	6	298,473	574	35,015	115	459	1
Lung	Total (all ages)	90.6	70.1	66,041,278	48,549																														
Testis																																			
Testis	40 to 44	12.3	0.0	2,021,385	248	1,010,692	192	56	38	154	62	404,277	115	133	23	92	37	202,138	74	174	15	59	24	101,069	46	202	9	37	15	20,214	14	234	3	11	5
Testis	45 to 49	9.4	0.0	2,251,680	211	1,125,840	163	48	33	131	62	450,336	98	113	20	78	37	225,168	63	148	13	50	24	112,584	39	172	8	31	15	22,517	12	199	2	10	5
Testis	50 to 54	7.0	0.0	2,293,473	160	1,146,736	124	36	25	99	62	458,695	74	86	15	60	37	229,347	48	112	10	38	24	114,674	30	130	6	24	15	22,935	9	151	2	7	5
Testis	55 to 59	5.2	0.0	2,061,919	108	1,030,959	84	24	17	67	62	412,384	50	58	10	40	37	206,192	32	76	6	26	24	103,096	20	88	4	16	15	20,619	6	102	1	5	5
Testis	60 to 64	3.0	0.0	1,764,828	52	882,414	40	12	8	32	62	352,966	24	28	5	19	37	176,483	16	36	3	12	24	88,241	10	42	2	8	15	17,648	3	49	1	2	5
Testis	65 to 69	2.4	0.0	1,696,993	41	848,497	32	9	6	25	62	339,399	19	22	4	15	37	169,699	12	29	2	10	24	84,850	8	33	2	6	15	16,970	2	39	0	2	5
Testis	70 to 74	2.4	0.0	1,467,965	35	733,983	27	8	5	22	62	293,593	16	19	3	13	37	146,797	10	25	2	8	24	73,398	7	28	1	5	15	14,680	2	33	0	2	5
Testis	75 to 79	1.4	0.0	1,007,365	14	503,683	11	3	2	9	62	201,473	7	7	1	5	37	100,737	4	10	1	3	24	50,368	3	11	1	2	15	10,074	1	13	0	1	5
Testis	Total 20-39	16.0	0.0	8,782,738	1,406	4,391,369	1,089	317	218	871	62	1,756,548	654	752	131	523	37	878,274	420	986	84	336	24	439,137	262	1,144	52	210	15	87,827	81	1,325	16	65	5
Testis	Total 40-69	6.8	0.0	12,090,277	820	6,045,139	635	185	127	508	62	2,418,055	381	439	76	305	37	1,209,028	245	575	49	196	24	604,514	153	667	31	122	15	120,903	47	773	9	38	5
Testis	Total 40-49	10.7	0.0	4,273,065	459	2,136,532	356	103	71	284	62	854,613	213	246	43	171	37	427,306	137	322	27	110	24	213,653	86	373	17	68	15	42,731	27	432	5	21	5
Testis	Total 50-59	6.2	0.0	4,355,391	268	2,177,696	208	60	42	166	62	871,078	125	143	25	100	37	435,539	80	188	16	64	24	217,770	50	218	10	40	15	43,554	16	252	3	12	5
Testis	Total 50-69	4.6	0.0	7,817,213	361	3,908,606	280	81	56	224	62	1,563,443	168	193	34	134	37	781,721	108	253	22	86	24	390,861	67	294	13	54	15	78,172	21	340	4	17	5
Testis	Total 60-74	2.6	0.0	4,929,786	128	2,464,893	99	29	20	79	62	985,957	60	68	12	48	37	492,979	38	90	8	31	24	246,489	24	104	5	19	15	49,298	7	121	1	6	5
Testis	Total 40-79	6.0	0.0	14,565,608	869	7,282,804	673	196	135	538	62	2,913,122	404	465	81	323	37	1,456,561	260	609	52	208	24	728,280	162	707	32	130	15	145,656	50	819	10	40	5
Testis	Total (all ages)	7.2	0.0	32,583,226	2,354																														

Supplementary Table 7b(i). Cancers detected by offering risk stratified screening according to future PRS using an idealised screening tool with a sensitivity of 0.8 (Cancers of the Breast, Prostate, Colorectum and Pancreas)

Cancer Type	Age Group	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
		Male	Female	Population Size	Cancers arising	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Breast																																			
Breast	40 to 44	0	125	2,054,223	2,559	1,027,112	1,934	625	387	1,548	60	410,845	1,129	1,430	226	903	35	205,422	712	1,847	142	569	22	102,711	437	2,122	87	349	14	20,542	131	2,428	26	105	4
Breast	45 to 49	0	215	2,315,479	4,974	1,157,740	3,760	1,214	752	3,008	60	463,096	2,194	2,780	439	1,755	35	231,548	1,384	3,590	277	1,107	22	115,774	849	4,125	170	679	14	23,155	255	4,719	51	204	4
Breast	50 to 54	0	280	2,364,638	6,616	1,182,319	5,001	1,615	1,000	4,001	60	472,928	2,918	3,698	584	2,334	35	236,464	1,840	4,776	368	1,472	22	118,232	1,129	5,487	226	903	14	23,646	339	6,277	68	271	4
Breast	55 to 59	0	286	2,119,687	6,052	1,059,844	4,575	1,477	915	3,660	60	423,937	2,669	3,383	534	2,135	35	211,969	1,683	4,369	337	1,347	22	105,984	1,033	5,019	207	826	14	21,197	310	5,742	62	248	4
Breast	60 to 64	0	338	1,837,174	6,209	918,587	4,693	1,516	939	3,755	60	367,435	2,738	3,471	548	2,191	35	183,717	1,727	4,482	345	1,382	22	91,859	1,060	5,149	212	848	14	18,372	318	5,891	64	254	4
Breast	65 to 69	0	412	1,805,190	7,443	902,595	5,626	1,817	1,125	4,501	60	361,038	3,282	4,161	656	2,626	35	180,519	2,070	5,373	414	1,656	22	90,260	1,270	6,173	254	1,016	14	18,052	381	7,062	76	305	4
Breast	70 to 74	0	373	1,603,610	5,977	801,805	4,518	1,459	904	3,614	60	320,722	2,636	3,341	527	2,109	35	160,361	1,663	4,314	333	1,330	22	80,180	1,020	4,957	204	816	14	16,036	306	5,671	61	245	4
Breast	75 to 79	0	403	1,181,645	4,762	590,823	3,600	1,162	720	2,880	60	236,329	2,100	2,662	420	1,680	35	118,165	1,325	3,437	265	1,060	22	59,082	813	3,949	163	650	14	11,816	244	4,518	49	195	4
Breast	Total 40-69	0	271	12,496,392	33,853	6,248,196	25,590	8,263	5,118	20,472	60	2,499,278	14,930	18,923	2,986	11,944	35	1,249,639	9,417	24,436	1,883	7,533	22	624,820	5,777	28,076	1,155	4,621	14	124,964	1,734	32,119	347	1,387	4
Breast	Total 40-49	0	172	4,369,703	7,533	2,184,851	5,694	1,839	1,139	4,555	60	873,941	3,322	4,211	664	2,658	35	436,970	2,095	5,438	419	1,676	22	218,485	1,285	6,248	257	1,028	14	43,697	386	7,147	77	309	4
Breast	Total 50-59	0	282	4,484,325	12,668	2,242,163	9,576	3,092	1,915	7,661	60	896,865	5,587	7,081	1,117	4,469	35	448,433	3,524	9,144	705	2,819	22	224,216	2,162	10,506	432	1,729	14	44,843	649	12,019	130	519	4
Breast	Total 50-69	0	324	8,126,689	26,320	4,063,345	19,896	6,424	3,979	15,917	60	1,625,338	11,608	14,712	2,322	9,286	35	812,669	7,321	18,999	1,464	5,857	22	406,334	4,491	21,829	898	3,593	14	81,267	1,348	24,972	270	1,079	4
Breast	Total 60-74	0	374	5,245,974	19,629	2,622,987	14,838	4,791	2,968	11,870	60	1,049,195	8,657	10,972	1,731	6,925	35	524,597	5,460	14,169	1,092	4,368	22	262,299	3,350	16,279	670	2,680	14	52,460	1,005	18,624	201	804	4
Breast	Total 40-79	0	292	15,281,647	44,592	7,640,824	33,708	10,884	6,742	26,966	60	3,056,329	19,666	24,926	3,933	15,733	35	1,528,165	12,404	32,188	2,481	9,923	22	764,082	7,609	36,983	1,522	6,088	14	152,816	2,284	42,308	457	1,827	4
Breast	Total (all ages)	0	166	33,458,052	55,545																														
Prostate																																			
Prostate	40 to 44	4	0	2,021,385	88	1,010,692	69	19	14	56	63	404,277	43	45	9	34	39	202,138	28	60	6	22	25	101,069	18	70	4	14	16	20,214	6	82	1	4	5
Prostate	45 to 49	21	0	2,251,680	461	1,125,840	364	97	73	291	63	450,336	223	238	45	179	39	225,168	146	315	29	117	25	112,584	92	369	18	74	16	22,517	29	432	6	24	5
Prostate	50 to 54	76	0	2,293,473	1,737	1,146,736	1,371	366	274	1,097	63	458,695	842	895	168	674	39	229,347	549	1,188	110	439	25	114,674	347	1,390	69	278	16	22,935	111	1,626	22	89	5
Prostate	55 to 59	202	0	2,061,919	4,160	1,030,959	3,283	877	657	2,626	63	412,384	2,016	2,144	403	1,613	39	206,192	1,316	2,844	263	1,052	25	103,096	832	3,328	166	666	16	20,619	266	3,894	53	213	5
Prostate	60 to 64	356	0	1,764,828	6,285	882,414	4,960	1,325	992	3,968	63	352,966	3,047	3,238	609	2,437	39	176,483	1,988	4,297	398	1,590	25	88,241	1,257	5,028	251	1,006	16	17,648	401	5,884	80	321	5
Prostate	65 to 69	623	0	1,696,993	10,568	848,497	8,339	2,229	1,668	6,671	63	339,399	5,123	5,445	1,025	4,098	39	169,699	3,342	7,226	668	2,674	25	84,850	2,114	8,454	423	1,691	16	16,970	675	9,893	135	540	5
Prostate	70 to 74	760	0	1,467,965	11,153	733,983	8,801	2,352	1,760	7,041	63	293,593	5,406	5,747	1,081	4,325	39	146,797	3,527	7,626	705	2,822	25	73,398	2,231	8,922	446	1,785	16	14,680	712	10,441	142	570	5
Prostate	75 to 79	867	0	1,007,365	8,736	503,683	6,894	1,842	1,379	5,515	63	201,473	4,235	4,501	847	3,388	39	100,737	2,763	5,973	553	2,210	25	50,368	1,747	6,989	349	1,398	16	10,074	558	8,178	112	446	5
Prostate	Total 40-69	193	0	12,090,277	23,299	6,045,139	18,386	4,913	3,677	14,708	63	2,418,055	11,294	12,005	2,259	9,035	39	1,209,028	7,368	15,931	1,474	5,895	25	604,514	4,661	18,638	932	3,728	16	120,903	1,488	21,811	298	1,191	5
Prostate	Total 40-49	13	0	4,273,065	549	2,136,532	433	116	87	347	63	854,613	266	283	53	213	39	427,306	174	375	35	139	25	213,653	110	439	22	88	16	42,731	35	514	7	28	5
Prostate	Total 50-59	135	0	4,355,391	5,897	2,177,696	4,653	1,244	931	3,723	63	871,078	2,858	3,039	572	2,287	39	435,539	1,865	4,032	373	1,492	25	217,770	1,180	4,717	236	944	16	43,554	377	5,520	75	301	5
Prostate	Total 60-69	487	0	3,461,821	16,853	1,730,911	13,299	3,554	2,660	10,639	63	692,364	8,169	8,684	1,634	6,535	39	346,182	5,330	11,523	1,066	4,264	25	173,091	3,371	13,482	674	2,697	16	34,618	1,077	15,776	215	861	5
Prostate	Total 50-69	291	0	7,817,213	22,750	3,908,606	17,952	4,798	3,590	14,362	63	1,563,443	11,028	11,722	2,206	8,822	39	781,721	7,195	15,555	1,439	5,756	25	390,861	4,551	18,199	910	3,641	16	78,172	1,453	21,297	291	1,163	5
Prostate	Total 60-74	568	0	4,929,786	28,006	2,464,893	22,100	5,906	4,420	17,680	63	985,957	13,575	14,431	2,715	10,860	39	492,979	8,857	19,149	1,771	7,086	25	246,489	5,602	22,404	1,120	4,482	16	49,298	1,789	26,217	358	1,431	5
Prostate	Total 40-79	297	0	14,565,608	43,188	7,282,804	34,080	9,108	6,816	27,264	63	2,913,122	20,935	22,253	4,187	16,748	39	1,456,561	13,658	29,530	2,732	10,927	25	728,280	8,639	34,549	1,728	6,911	16	145,656	2,759	40,429	552	2,207	5
Prostate	Total (all ages)	184	0	32,583,226	52,254																														
Colorectal																																			
Colorectal	40 to 44	15	14	4,075,608	570	2,037,804	396	174	79	317	56	815,122	211	359	42	169	30	407,561	126	444	25	101	18	203,780	73	497	15	59	10	40,756	20	550	4	16	3
Colorectal	45 to 49	24	22	4,567,159	1,047	2,283,580	728	319	146	582	56	913,432	388	659	78	310	30	456,716	231	816	46	185	18	228,358	134	913	27	108	10	45,672	36	1,011	7	29	3
Colorectal	50 to 54	47	37	4,658,111	1,958	2,329,055	1,361	597	272	1,089	56	931,622	725	1,233	145	580	30	465,811	432	1,526	86	345	18	232,906	251	1,707	50	201	10	46,581	68	1,890	14	54	3
Colorectal	55 to 59	88	61	4,181,606	3,094	2,090,803	2,151	943	430	1,721	56	836,321	1,146	1,948	229	917	30	418,161	682	2,412	136	546	18	209,080	397	2,697	79	318	10	41,816	107	2,987	21	86	3
Colorectal	60 to 64	151	91	3,602,002	4,345	1,801,001	3,021	1,324	604	2,417	56	720,400	1,609	2,736	322	1,287	30	360,200	958	3,387	192	766	18	180,100	558	3,787	112	446	10	36,020	151	4,194	30	121	3
Colorectal	65 to 69	198	119	3,502,183	5,516	1,751,092	3,835	1,681	767	3,068	56	700,437	2,043	3,473	409	1,634	30	350,218	1,216	4,300	243	973	18	175,109	708	4,808	142	566	10	35,022	191	5,325	38	153	3
Colorectal	70 to 74	274	171	3,071,575	6,760	1,535,787	4,700	2,060	940	3,760	56	614,315	2,504	4,256	501	2,003	30	307,157	1,490	5,270	298	1,192	18	153,579	868	5,892	174	694	10	30,716	235	6,525	47	188	3
Colorectal	75 to 79	352	295	2,189,011	6,318	1,094,505	4,392	1,926	878	3,514	56	437,802	2,340	3,978	468	1,872	30	218,901	1,393	4,925	279	1,114	18	109,451	811	5,507	162	649	10	21,890	219	6,099	44	175	3
Colorectal	Total 40-69	81	54	24,586,669	16,530	12,293,335	11,492	5,038	2,298	9,194	56	4,917,334	6,122	10,408	1,224	4,898	30	2,458,667	3,643	12,887	729	2,915	18	1,229,333	2,122	14,408	424	1,698	10	245,867	574	15,956	115	459	3
Colorectal	Total 40-49	20	18	8,642,767	1,617	4,321,384	1,124	493	225	899	56	1,728,553	599	1,018	120	479	30	864,277	356	1,261	71	285	18	432,138	208	1,409	42	166	10	86,428	56	1,561	11	45	3
Colorectal	Total 50-59	66	48	8,839,717	5,052	4,419,858	3,512	1,540	702	2,810	56	1,767,943	1,871	3,181	374	1,497	30	883,972	1,113	3,939	223	891	18	441,986	649	4,403	130	519	10	88,397	175	4,877	35	140	3
Colorectal	Total 50-69	114	74	15,943,902	14,913	7,971,951	10,368	4,545	2,074	8,294	56	3,188,780	5,523	9,390	1,105	4,419	30	1,594,390	3,287	11,626	657	2,629	18	797,195	1,914	12,999	383	1,531	10	159,439	518	14,395	104	414	3
Colorectal	Total 60-74	204	125	8,881,257	16,621	4,440,628	11,555	5,066	2,311	9,244	56	1,776,251	6,156	10,465	1,231	4,925	30	888,126	3,663	12,958	733	2,931	18	444,063	2,134	14,487	427	1,707	10	88,813	577	16,044	115	462	3
Colorectal	Total 40-79	119	80	29,847,255	29,608	14,923,627	20,584	9,024	4,117	16,467	56	5,969,451	10,966	18,642	2,193	8,772	30	2,984,725	6,526	23,082	1,305	5,221	18	1,492,363	3,801	25,807	760	3,041	10	298,473	1,028	28,580	206	822	3
Colorectal	Total (all ages)	85	57	66,041,278	42,885																														
Pancreas																																			
Pancreas	40 to 44	3	2	4,075,608	94	2,037,804	66	28	13	53	57	815,122	36	58	7	29	31	407,561	22	72	4	17	18	203,780	13	81	3	10	11	40,756	4	90	1	3	3
Pancreas	45 to 49	6	4	4,567,159	215	2,283,580	152	63	30	122	57	913,432	82	133	16	66	31	456,716	50	165	10	40	18	228,358	29	186	6	23	11	45,672	8	207	2	6	3
Pancreas	50 to 54	10	7	4,658,111	409	2,329,055	289	120	58	231	57	931,622	157	252	31	125	31	465,811	94	315	19	75	18	232,906	55	354	11	44	11	46,581	15	394	3	12	3
Pancreas	55 to 59	18	14	4,181,606	666	2,090,803	471	195	94	377	57	836,321	255	411	51	204	31	418,161	154	512	31	123	18	209,080	90	576	18	72	11	41,816	25	641	5	20	3
Pancreas	60 to 64	29	22	3,602,002	926	1,801,001	655	271	131	524	57	720,400	355	571	71	284	31	360,200	214	712	43	171	18	180,100	126	800	25	101	11	36,020	35	891	7	28	3
Pancreas	65 to 69	47	34	3,502,183	1,417	1,751,092	1,002	415	200	802	57	700,437	543	874	109	435	31	350,218	327	1,090	65	261	18	175,109	192	1,225	38	154	11	35,022	53	1,364	11	42	3
Pancreas	70 to 74	66	49	3,071,575	1,757	1,535,787	1,242	515	248	994	57	614,315	674	1,083	135	539	31	307,157	405	1,352	81	324	18	153,579	238	1,519	48	191	11	30,716	66	1,691	13	53	3
Pancreas	75 to 79	86	71	2,189,011	1,702	1,094,505	1,203	499	241	963	57	437,802	652	1,050	130	522	31	218,901	393	1,309	79	314	18	109,451	231	1,471	46	185	11	21,890	64	1,638	13	51	3
Pancreas	Total 40-69	17	13	24,586,669	3,727	12,293,335	2,635	1,092	527	2,108	57	4,917,334	1,429	2,298	286	1,143	31	2,458,667	860	2,867	172	688	18	1,229,333	506	3,221	101	405	11	245,867	139	3,588	28	112	3
Pancreas	Total 40-49	4	3	8,642,767	309	4,321,384	218	91	44	175	57	1,728,553	118	191	24	95	31	864,277	71	238	14	57	18	432,138	42	267	8	34	11	86,428	12	297	2	9	3
Pancreas	Total 50-59	14	10	8,839,717	1,075	4,419,858	760	315	152	608	57	1,767,943	412	663	82	330	31	883,972	248	827	50	198	18	441,986	146	929	29	117	11	88,397	40	1,035	8	32	3
Pancreas	Total 50-69	25	18	15,943,902	3,418	7,971,951	2,417	1,001	483	1,933	57	3,188,780	1,310	2,108	262	1,048	31	1,594,390	788	2,630	158	631	18	797,195	464	2,954	93	371	11	159,439	128	3,290	26	102	3
Pancreas	Total 60-74	46	34	8,881,257	4,100	4,440,628	2,899	1,201	580	2,319	57	1,776,251	1,572	2,528	314	1,257	31	888,126	946	3,154	189	757	18	444,063	556	3,544	111	445	11	88,813	153	3,947	31	123	3
Pancreas	Total 40-79	27	21	29,847,255	7,186	14,923,627	5,081	2,105	1,016	4,065	57	5,969,451	2,755	4,431	551	2,204	31	2,984,725	1,658	5,528	332	1,326	18	1,492,363	975	6,211	195	780	11	298,473	269	6,917	54	215	3
Pancreas	Total (all ages)	19	15	66,041,278	10,452																														

Supplementary Table 7b(ii). Cancers detected by offering risk stratified screening according to future PRS using an idealised screening tool with a sensitivity of 0.8 (Cancers of the Ovary, Kidney, Lung, Testis)

Cancer Type	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
		Male	Female	Population Size	Cancers arising	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified	Number requiring screening in 'high risk' group	Cancers arising in 'high risk' group	Missed cancers arising in unscreened 'low risk' group	Cancers missed on screening in 'high-risk' group	Cancers detected on screening in 'high-risk' group	Percent of cancers identified
Ovary																																			
Ovary	40 to 44	0.0	13.2	2,054,223	270	1,027,112	178	92	36	142	53	410,845	90	180	18	72	27	205,422	52	218	10	41	15	102,711	29	241	6	23	9	20,542	7	263	1	6	2
Ovary	45 to 49	0.0	19.4	2,315,479	448	1,157,740	295	153	59	236	53	463,096	149	299	30	119	27	231,548	86	362	17	69	15	115,774	49	399	10	39	9	23,155	12	436	2	10	2
Ovary	50 to 54	0.0	27.1	2,364,638	640	1,182,319	422	218	84	337	53	472,928	213	427	43	170	27	236,464	123	517	25	98	15	118,232	69	571	14	56	9	23,646	18	622	4	14	2
Ovary	55 to 59	0.0	34.8	2,119,687	738	1,059,844	486	252	97	389	53	423,937	246	492	49	197	27	211,969	141	597	28	113	15	105,984	80	658	16	64	9	21,197	20	718	4	16	2
Ovary	60 to 64	0.0	41.6	1,837,174	764	918,587	503	261	101	403	53	367,435	254	510	51	203	27	183,717	146	618	29	117	15	91,859	83	681	17	66	9	18,372	21	743	4	17	2
Ovary	65 to 69	0.0	52.3	1,805,190	944	902,595	622	322	124	498	53	361,038	314	630	63	251	27	180,519	181	763	36	145	15	90,260	102	842	20	82	9	18,052	26	918	5	21	2
Ovary	70 to 74	0.0	60.8	1,603,610	975	801,805	643	332	129	514	53	320,722	325	650	65	260	27	160,361	187	788	37	150	15	80,180	106	869	21	85	9	16,036	27	948	5	22	2
Ovary	75 to 79	0.0	73.8	1,181,645	872	590,823	575	297	115	460	53	236,329	290	582	58	232	27	118,165	167	705	33	134	15	59,082	95	777	19	76	9	11,816	24	848	5	19	2
Ovary	Total 40-69	0.0	30.4	12,496,392	3,804	6,248,196	2,507	1,297	501	2,006	53	2,499,278	1,266	2,538	253	1,013	27	1,249,639	729	3,075	146	583	15	624,820	412	3,392	82	330	9	124,964	105	3,699	21	84	2
Ovary	Total 40-49	0.0	16.4	4,369,703	718	2,184,851	473	245	95	379	53	873,941	239	479	48	191	27	436,970	138	580	28	110	15	218,485	78	640	16	62	9	43,697	20	698	4	16	2
Ovary	Total 50-59	0.0	30.7	4,484,325	1,378	2,242,163	908	470	182	727	53	896,865	459	919	92	367	27	448,433	264	1,114	53	211	15	224,216	149	1,229	30	120	9	44,843	38	1,340	8	30	2
Ovary	Total 50-69	0.0	38.0	8,126,689	3,086	4,063,345	2,034	1,052	407	1,627	53	1,625,338	1,027	2,059	205	822	27	812,669	591	2,495	118	473	15	406,334	335	2,751	67	268	9	81,267	85	3,001	17	68	2
Ovary	Total 60-74	0.0	51.1	5,245,974	2,683	2,622,987	1,768	915	354	1,415	53	1,049,195	893	1,790	179	715	27	524,597	514	2,169	103	411	15	262,299	291	2,392	58	233	9	52,460	74	2,609	15	59	2
Ovary	Total 40-79	0.0	37.0	15,281,647	5,651	7,640,824	3,724	1,927	745	2,979	53	3,056,329	1,881	3,770	376	1,505	27	1,528,165	1,083	4,568	217	866	15	764,082	613	5,038	123	490	9	152,816	156	5,495	31	125	2
Ovary	Total (all ages)	0.0	22.8	33,458,052	7,495																														
Kidney																																			
Kidney	40 to 44	10.1	5.0	4,075,608	307	2,037,804	215	92	43	172	56	815,122	115	192	23	92	30	407,561	69	238	14	55	18	203,780	40	267	8	32	11	40,756	11	296	2	9	3
Kidney	45 to 49	17.7	7.8	4,567,159	580	2,283,580	406	174	81	325	56	913,432	218	362	44	175	30	456,716	130	450	26	104	18	228,358	76	504	15	61	11	45,672	21	559	4	17	3
Kidney	50 to 54	26.8	12.7	4,658,111	915	2,329,055	641	274	128	513	56	931,622	344	571	69	275	30	465,811	206	709	41	165	18	232,906	120	795	24	96	11	46,581	33	882	7	26	3
Kidney	55 to 59	37.1	18.6	4,181,606	1,160	2,090,803	813	347	163	650	56	836,321	436	724	87	349	30	418,161	261	899	52	209	18	209,080	153	1,007	31	122	11	41,816	42	1,118	8	33	3
Kidney	60 to 64	53.7	26.2	3,602,002	1,429	1,801,001	1,001	428	200	801	56	720,400	537	892	107	430	30	360,200	321	1,108	64	257	18	180,100	188	1,241	38	150	11	36,020	51	1,378	10	41	3
Kidney	65 to 69	73.9	36.4	3,502,183	1,911	1,751,092	1,339	572	268	1,071	56	700,437	719	1,192	144	575	30	350,218	430	1,481	86	344	18	175,109	251	1,660	50	201	11	35,022	69	1,842	14	55	3
Kidney	70 to 74	91.2	45.1	3,071,575	2,063	1,535,787	1,445	618	289	1,156	56	614,315	776	1,287	155	621	30	307,157	464	1,599	93	371	18	153,579	271	1,792	54	217	11	30,716	74	1,989	15	59	3
Kidney	75 to 79	110.1	57.2	2,189,011	1,785	1,094,505	1,250	535	250	1,000	56	437,802	671	1,114	134	537	30	218,901	401	1,384	80	321	18	109,451	235	1,550	47	188	11	21,890	64	1,721	13	51	3
Kidney	Total 40-69	34.6	16.9	24,586,669	6,302	12,293,335	4,415	1,887	883	3,532	56	4,917,334	2,370	3,932	474	1,896	30	2,458,667	1,417	4,885	283	1,134	18	1,229,333	829	5,473	166	663	11	245,867	226	6,076	45	181	3
Kidney	Total 40-49	14.1	6.5	8,642,767	887	4,321,384	621	266	124	497	56	1,728,553	334	553	67	267	30	864,277	200	687	40	160	18	432,138	117	770	23	93	11	86,428	32	855	6	25	3
Kidney	Total 50-59	31.7	15.5	8,839,717	2,075	4,419,858	1,454	621	291	1,163	56	1,767,943	780	1,295	156	624	30	883,972	467	1,608	93	373	18	441,986	273	1,802	55	218	11	88,397	74	2,001	15	60	3
Kidney	Total 50-69	45.8	22.6	15,943,902	5,415	7,971,951	3,793	1,622	759	3,035	56	3,188,780	2,037	3,378	407	1,629	30	1,594,390	1,218	4,197	244	974	18	797,195	712	4,703	142	570	11	159,439	194	5,221	39	155	3
Kidney	Total 60-74	71.8	35.5	10,175,760	5,403	5,087,880	3,785	1,618	757	3,028	56	2,035,152	2,032	3,371	406	1,626	30	1,017,576	1,215	4,188	243	972	18	508,788	711	4,692	142	569	11	101,758	194	5,209	39	155	3
Kidney	Total 40-79	45.5	23.0	29,847,255	10,150	14,923,627	7,110	3,040	1,422	5,688	56	5,969,451	3,817	6,333	763	3,054	30	2,984,725	2,283	7,867	457	1,826	18	1,492,363	1,336	8,814	267	1,068	11	298,473	364	9,786	73	291	3
Kidney	Total (all ages)	29.2	14.8	66,041,278	13,323																														
Lung																																			
Lung	40 to 44	6.0	5.8	4,075,608	240	2,037,804	157	83	31	125	52	815,122	78	162	16	63	26	407,561	45	195	9	36	15	203,780	25	215	5	20	8	40,756	6	234	1	5	2
Lung	45 to 49	16.3	14.7	4,567,159	706	2,283,580	460	246	92	368	52	913,432	230	476	46	184	26	456,716	132	574	26	105	15	228,358	74	632	15	59	8	45,672	19	687	4	15	2
Lung	50 to 54	33.4	31.5	4,658,111	1,512	2,329,055	986	526	197	789	52	931,622	493	1,019	99	395	26	465,811	282	1,230	56	226	15	232,906	159	1,353	32	127	8	46,581	40	1,472	8	32	2
Lung	55 to 59	71.4	67.1	4,181,606	2,896	2,090,803	1,889	1,007	378	1,511	52	836,321	945	1,951	189	756	26	418,161	541	2,355	108	432	15	209,080	304	2,592	61	243	8	41,816	77	2,819	15	61	2
Lung	60 to 64	137.0	124.9	3,602,002	4,711	1,801,001	3,073	1,638	615	2,458	52	720,400	1,537	3,174	307	1,230	26	360,200	879	3,832	176	704	15	180,100	495	4,216	99	396	8	36,020	125	4,586	25	100	2
Lung	65 to 69	229.5	197.8	3,502,183	7,466	1,751,092	4,870	2,596	974	3,896	52	700,437	2,436	5,030	487	1,949	26	350,218	1,394	6,072	279	1,115	15	175,109	784	6,682	157	627	8	35,022	198	7,268	40	158	2
Lung	70 to 74	335.0	278.1	3,071,575	9,378	1,535,787	6,117	3,261	1,223	4,893	52	614,315	3,060	6,318	612	2,448	26	307,157	1,751	7,627	350	1,401	15	153,579	985	8,393	197	788	8	30,716	248	9,130	50	199	2
Lung	75 to 79	462.2	340.5	2,189,011	8,680	1,094,505	5,661	3,019	1,132	4,529	52	437,802	2,832	5,848	566	2,265	26	218,901	1,620	7,060	324	1,296	15	109,451	911	7,769	182	729	8	21,890	230	8,450	46	184	2
Lung	Total 40-69	74.8	68.0	24,586,669	17,531	12,293,335	11,434	6,097	2,287	9,147	52	4,917,334	5,720	11,811	1,144	4,576	26	2,458,667	3,273	14,258	655	2,618	15	1,229,333	1,841	15,690	368	1,473	8	245,867	464	17,067	93	372	2
Lung	Total 40-49	11.4	10.5	8,642,767	946	4,321,384	617	329	123	494	52	1,728,553	309	637	62	247	26	864,277	177	769	35	141	15	432,138	99	847	20	79	8	86,428	25	921	5	20	2
Lung	Total 50-59	51.4	48.4	8,839,717	4,408	4,419,858	2,875	1,533	575	2,300	52	1,767,943	1,438	2,970	288	1,150	26	883,972	823	3,585	165	658	15	441,986	463	3,945	93	370	8	88,397	117	4,291	23	93	2
Lung	Total 50-69	109.4	98.9	15,943,902	16,585	7,971,951	10,817	5,768	2,163	8,654	52	3,188,780	5,411	11,174	1,082	4,329	26	1,594,390	3,096	13,489	619	2,477	15	797,195	1,742	14,843	348	1,393	8	159,439	439	16,146	88	352	2
Lung	Total 60-74	227.8	196.8	10,175,760	21,555	5,087,880	14,059	7,496	2,812	11,247	52	2,035,152	7,032	14,523	1,406	5,626	26	1,017,576	4,024	17,531	805	3,219	15	508,788	2,263	19,292	453	1,811	8	101,758	571	20,984	114	457	2
Lung	Total 40-79	127.8	111.1	29,847,255	35,589	14,923,627	23,212	12,377	4,642	18,570	52	5,969,451	11,611	23,978	2,322	9,289	26	2,984,725	6,644	28,945	1,329	5,315	15	1,492,363	3,737	31,852	747	2,990	8	298,473	943	34,646	189	754	2
Lung	Total (all ages)	90.6	70.1	66,041,278	48,549																														
Testis																																			
Testis	40 to 44	12.3	0.0	2,021,385	248	1,010,692	228	20	46	182	73	404,277	176	72	35	141	57	202,138	135	113	27	108	44	101,069	100	148	20	80	32	20,214	44	204	9	35	14
Testis	45 to 49	9.4	0.0	2,251,680	211	1,125,840	194	17	39	155	73	450,336	150	61	30	120	57	225,168	115	96	23	92	44	112,584	85	126	17	68	32	22,517	37	174	7	30	14
Testis	50 to 54	7.0	0.0	2,293,473	160	1,146,736	147	13	29	118	73	458,695	114	46	23	91	57	229,347	87	73	17	70	44	114,674	64	96	13	51	32	22,935	28	132	6	23	14
Testis	55 to 59	5.2	0.0	2,061,919	108	1,030,959	99	9	20	79	73	412,384	77	31	15	61	57	206,192	59	49	12	47	44	103,096	43	65	9	35	32	20,619	19	89	4	15	14
Testis	60 to 64	3.0	0.0	1,764,828	52	882,414	48	4	10	38	73	352,966	37	15	7	30	57	176,483	28	34	6	23	44	88,241	21	31	4	17	32	17,648	9	43	2	7	14
Testis	65 to 69	2.4	0.0	1,696,993	41	848,497	38	3	8	30	73	339,399	29	12	6	23	57	169,699	22	19	4	18	44	84,850	16	25	3	13	32	16,970	7	34	1	6	14
Testis	70 to 74	2.4	0.0	1,467,965	35	733,983	32	3	6	26	73	293,593	25	10	5	20	57	146,797	19	16	4	15	44	73,398	14	21	3	11	32	14,680	6	29	1	5	14
Testis	75 to 79	1.4	0.0	1,007,365	14	503,683	13	1	3	10	73	201,473	10	4	2	8	57	100,737	8	6	2	6	44	50,368	6	8	1	4	32	10,074	2	12	0	2	14
Testis	Total 20-39	16.0	0.0	8,782,738	1,406	4,391,369	1,291	115	258	1,033	73	1,756,548	998	408	200	799	57	878,274	766	640	153	613	44	439,137	564	842	113	451	32	87,827	247	1,159	49	198	14
Testis	Total 40-69	6.8	0.0	12,090,277	820	6,045,139	753	67	151	603	73	2,418,055	582	238	116	466	57	1,209,028	447	373	89	358	44	604,514	329	491	66	263	32	120,903	144	676	29	115	14
Testis	Total 40-49	10.7	0.0	4,273,065	459	2,136,532	422	37	84	337	73	854,613	326	133	65	261	57	427,306	250	209	50	200	44	213,653	184	275	37	147	32	42,731	81	378	16	65	14
Testis	Total 50-59	6.2	0.0	4,355,391	268	2,177,696	246	22	49	197	73	871,078	190	78	38	152	57	435,539	146	122	29	117	44	217,770	108	160	22	86	32	43,554	47	221	9	38	14
Testis	Total 50-69	4.6	0.0	7,817,213	361	3,908,606	332	29	66	265	73	1,563,443	256	105	51	205	57	781,721	197	164	39	157	44	390,861	145	216	29	116	32	78,172	63	298	13	51	14
Testis	Total 60-74	2.6	0.0	4,929,786	128	2,464,893	118	10	24	94	73	985,957	91	37	18	73	57	492,979	70	58	14	56	44	246,489	51	77	10	41	32	49,298	23	105	5	18	14
Testis	Total 40-79	6.0	0.0	14,565,608	869	7,282,804	798	71	160	639	73	2,913,122	617	252	123	494	57	1,456,561	474	395	95	379	44	728,280	349	520	70	279	32	145,656	153	716	31	122	14
Testis	Total (all ages)	7.2	0.0	32,583,226	2,354																														

Supplementary Table 7c(i). Cancers detected by offering risk stratified screening according to optimised PRS using an idealised screening tool with a sensitivity of 0.8 (Cancers of the Breast, Prostate, Colorectum and Pancreas)

Cancer Type	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
		Male	Female	Population Size	Cancers arising	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected
Breast																																			
Breast	40 to 44	0.0	124.6	2,054,223	2,559	1,027,112	2,004	555	401	1,603	63	410,845	1,219	1,340	244	975	38	205,422	790	1,769	158	632	25	102,711	497	2,062	99	398	16	20,542	157	2,402	31	126	5
Breast	45 to 49	0.0	214.8	2,315,479	4,974	1,157,740	3,895	1,079	779	3,116	63	463,096	2,370	2,604	474	1,896	38	231,548	1,537	3,437	307	1,229	25	115,774	966	4,008	193	773	16	23,155	305	4,669	61	244	5
Breast	50 to 54	0.0	279.8	2,364,638	6,616	1,182,319	5,181	1,435	1,036	4,145	63	472,928	3,152	3,464	630	2,522	38	236,464	2,044	4,572	409	1,635	25	118,232	1,285	5,331	257	1,028	16	23,646	406	6,210	81	325	5
Breast	55 to 59	0.0	285.5	2,119,687	6,052	1,059,844	4,739	1,313	948	3,791	63	423,937	2,884	3,168	577	2,307	38	211,969	1,870	4,182	374	1,496	25	105,984	1,176	4,876	235	941	16	21,197	371	5,681	74	297	5
Breast	60 to 64	0.0	338.0	1,837,174	6,209	918,587	4,862	1,347	972	3,890	63	367,435	2,958	3,251	592	2,367	38	183,717	1,918	4,291	384	1,534	25	91,859	1,206	5,003	241	965	16	18,372	381	5,828	76	305	5
Breast	65 to 69	0.0	412.3	1,805,190	7,443	902,595	5,828	1,615	1,166	4,663	63	361,038	3,546	3,897	709	2,837	38	180,519	2,299	5,144	460	1,839	25	90,260	1,446	5,997	289	1,157	16	18,052	456	6,987	91	365	5
Breast	70 to 74	0.0	372.7	1,603,610	5,977	801,805	4,680	1,297	936	3,744	63	320,722	2,848	3,129	570	2,278	38	160,361	1,846	4,131	369	1,477	25	80,180	1,161	4,816	232	929	16	16,036	367	5,610	73	293	5
Breast	75 to 79	0.0	403.0	1,181,645	4,762	590,823	3,729	1,033	746	2,983	63	236,329	2,269	2,493	454	1,815	38	118,165	1,471	3,291	294	1,177	25	59,082	925	3,837	185	740	16	11,816	292	4,470	58	234	5
Breast	Total 40-69	0.0	270.9	12,496,392	33,853	6,248,196	26,509	7,344	5,302	21,207	63	2,499,278	16,130	17,723	3,226	12,904	38	1,249,639	10,457	23,396	2,091	8,366	25	624,820	6,577	27,276	1,315	5,261	16	124,964	2,076	31,777	415	1,661	5
Breast	Total 40-49	0.0	172.4	4,369,703	7,533	2,184,851	5,899	1,634	1,180	4,719	63	873,941	3,589	3,944	718	2,871	38	436,970	2,327	5,206	465	1,862	25	218,485	1,463	6,070	293	1,171	16	43,697	462	7,071	92	370	5
Breast	Total 50-59	0.0	282.5	4,484,325	12,668	2,242,163	9,920	2,748	1,984	7,936	63	896,865	6,036	6,632	1,207	4,829	38	448,433	3,913	8,755	783	3,131	25	224,216	2,461	10,207	492	1,969	16	44,843	777	11,891	155	621	5
Breast	Total 50-69	0.0	323.9	8,126,689	26,320	4,063,345	20,610	5,710	4,122	16,488	63	1,625,338	12,541	13,779	2,508	10,033	38	812,669	8,130	18,190	1,626	6,504	25	406,334	5,113	21,207	1,023	4,091	16	81,267	1,614	24,706	323	1,291	5
Breast	Total 60-74	0.0	374.2	5,245,974	19,629	2,622,987	15,371	4,258	3,074	12,297	63	1,049,195	9,353	10,276	1,871	7,482	38	524,597	6,064	13,565	1,213	4,851	25	262,299	3,813	15,816	763	3,051	16	52,460	1,204	18,425	241	963	5
Breast	Total 40-79	0.0	291.8	15,281,647	44,592	7,640,824	34,919	9,673	6,984	27,935	63	3,056,329	21,247	23,345	4,249	16,997	38	1,528,165	13,775	30,817	2,755	11,020	25	764,082	8,663	35,929	1,733	6,930	16	152,816	2,735	41,857	547	2,188	5
Breast	Total (all ages)	0.0	166.0	33,458,052	55,545																														
Prostate																																			
Prostate	40 to 44	4.3	0.0	2,021,385	88	1,010,692	71	17	14	57	65	404,277	45	43	9	36	41	202,138	30	58	6	24	27	101,069	19	69	4	15	17	20,214	6	82	1	5	6
Prostate	45 to 49	20.5	0.0	2,251,680	461	1,125,840	372	89	74	298	65	450,336	235	226	47	188	41	225,168	156	305	31	125	27	112,584	101	360	20	80	17	22,517	33	428	7	27	6
Prostate	50 to 54	75.7	0.0	2,293,473	1,737	1,146,736	1,402	335	280	1,121	65	458,695	886	851	177	709	41	229,347	589	1,148	118	471	27	114,674	379	1,358	76	303	17	22,935	125	1,612	25	100	6
Prostate	55 to 59	201.8	0.0	2,061,919	4,160	1,030,959	3,357	803	671	2,685	65	412,384	2,122	2,038	424	1,697	41	206,192	1,411	2,749	282	1,129	27	103,096	908	3,252	182	726	17	20,619	300	3,860	60	240	6
Prostate	60 to 64	356.1	0.0	1,764,828	6,285	882,414	5,072	1,213	1,014	4,057	65	352,966	3,205	3,080	641	2,564	41	176,483	2,131	4,154	426	1,705	27	88,241	1,372	4,913	274	1,097	17	17,648	454	5,831	91	363	6
Prostate	65 to 69	622.7	0.0	1,696,993	10,568	848,497	8,528	2,040	1,706	6,822	65	339,399	5,390	5,178	1,078	4,312	41	169,699	3,584	6,984	717	2,867	27	84,850	2,306	8,262	461	1,845	17	16,970	763	9,805	153	610	6
Prostate	70 to 74	759.8	0.0	1,467,965	11,153	733,983	9,000	2,153	1,800	7,200	65	293,593	5,688	5,465	1,138	4,550	41	146,797	3,782	7,371	756	3,026	27	73,398	2,434	8,719	487	1,947	17	14,680	805	10,348	161	644	6
Prostate	75 to 79	867.2	0.0	1,007,365	8,736	503,683	7,049	1,687	1,410	5,639	65	201,473	4,455	4,281	891	3,564	41	100,737	2,962	5,774	592	2,370	27	50,368	1,906	6,830	381	1,525	17	10,074	631	8,105	126	504	6
Prostate	Total 40-69	192.7	0.0	12,090,277	23,299	6,045,139	18,801	4,498	3,760	15,041	65	2,418,055	11,882	11,417	2,376	9,506	41	1,209,028	7,901	15,398	1,580	6,321	27	604,514	5,084	18,215	1,017	4,068	17	120,903	1,682	21,617	336	1,345	6
Prostate	Total 40-49	12.8	0.0	4,273,065	549	2,136,532	443	106	89	354	65	854,613	280	269	56	224	41	427,306	186	363	37	149	27	213,653	120	429	24	96	17	42,731	40	509	8	32	6
Prostate	Total 50-59	135.4	0.0	4,355,391	5,897	2,177,696	4,758	1,139	952	3,807	65	871,078	3,007	2,890	601	2,406	41	435,539	2,000	3,897	400	1,600	27	217,770	1,287	4,610	257	1,029	17	43,554	426	5,471	85	341	6
Prostate	Total 60-69	486.8	0.0	3,461,821	16,853	1,730,911	13,599	3,254	2,720	10,879	65	692,364	8,595	8,258	1,719	6,876	41	346,182	5,715	11,138	1,143	4,572	27	173,091	3,678	13,175	736	2,942	17	34,618	1,217	15,636	243	973	6
Prostate	Total 50-69	291.0	0.0	7,817,213	22,750	3,908,606	18,358	4,392	3,672	14,686	65	1,563,443	11,602	11,148	2,320	9,282	41	781,721	7,715	15,035	1,543	6,172	27	390,861	4,965	17,785	993	3,972	17	78,172	1,642	21,108	328	1,314	6
Prostate	Total 60-74	568.1	0.0	4,929,786	28,006	2,464,893	22,599	5,407	4,520	18,079	65	985,957	14,283	13,723	2,857	11,426	41	492,979	9,497	18,509	1,899	7,598	27	246,489	6,112	21,894	1,222	4,889	17	49,298	2,022	25,984	404	1,617	6
Prostate	Total 40-79	296.5	0.0	14,565,608	43,188	7,282,804	34,850	8,338	6,970	27,880	65	2,913,122	22,025	21,163	4,405	17,620	41	1,456,561	14,645	28,543	2,929	11,716	27	728,280	9,425	33,763	1,885	7,540	17	145,656	3,118	40,070	624	2,494	6
Prostate	Total (all ages)	183.8	0.0	32,583,226	52,254																														
Colorectal																																			
Colorectal	40 to 44	14.5	13.5	4,075,608	570	2,037,804	425	145	85	340	60	815,122	244	326	49	195	34	407,561	153	417	31	122	21	203,780	93	477	19	74	13	40,756	27	543	5	22	4
Colorectal	45 to 49	24.4	21.6	4,567,159	1,047	2,283,580	781	266	156	625	60	913,432	449	598	90	359	34	456,716	280	767	56	224	21	228,358	170	877	34	136	13	45,672	50	997	10	40	4
Colorectal	50 to 54	47.1	37.1	4,658,111	1,958	2,329,055	1,460	498	292	1,168	60	931,622	839	1,119	168	671	34	465,811	524	1,434	105	419	21	232,906	319	1,639	64	255	13	46,581	94	1,864	19	75	4
Colorectal	55 to 59	87.7	60.6	4,181,606	3,094	2,090,803	2,308	786	462	1,846	60	836,321	1,326	1,768	265	1,061	34	418,161	828	2,266	166	662	21	209,080	503	2,591	101	403	13	41,816	148	2,946	30	119	4
Colorectal	60 to 64	151.4	91.0	3,602,002	4,345	1,801,001	3,241	1,104	648	2,593	60	720,400	1,862	2,483	372	1,489	34	360,200	1,163	3,182	233	930	21	180,100	707	3,638	141	566	13	36,020	208	4,137	42	167	4
Colorectal	65 to 69	198.3	119.1	3,502,183	5,516	1,751,092	4,114	1,402	823	3,291	60	700,437	2,364	3,152	473	1,891	34	350,218	1,476	4,040	295	1,181	21	175,109	897	4,619	179	718	13	35,022	265	5,251	53	212	4
Colorectal	70 to 74	273.5	171.2	3,071,575	6,760	1,535,787	5,042	1,718	1,008	4,033	60	614,315	2,897	3,863	579	2,317	34	307,157	1,809	4,951	362	1,447	21	153,579	1,100	5,660	220	880	13	30,716	324	6,436	65	259	4
Colorectal	75 to 79	351.7	234.8	2,189,011	6,318	1,094,505	4,712	1,606	942	3,770	60	437,802	2,707	3,611	541	2,166	34	218,901	1,691	4,627	338	1,352	21	109,451	1,028	5,290	206	822	13	21,890	303	6,015	61	242	4
Colorectal	Total 40-69	80.8	54.1	24,586,669	16,530	12,293,335	12,329	4,201	2,466	9,863	60	4,917,334	7,083	9,447	1,417	5,666	34	2,458,667	4,423	12,107	885	3,539	21	1,229,333	2,689	13,841	538	2,152	13	245,867	793	15,737	159	634	4
Colorectal	Total 40-49	19.7	17.7	8,642,767	1,617	4,321,384	1,206	411	241	965	60	1,728,553	693	924	139	554	34	864,277	433	1,184	87	346	21	432,138	263	1,354	53	210	13	86,428	78	1,539	16	62	4
Colorectal	Total 50-59	66.4	48.2	8,839,717	5,052	4,419,858	3,768	1,284	754	3,014	60	1,767,943	2,165	2,887	433	1,732	34	883,972	1,352	3,700	270	1,081	21	441,986	822	4,230	164	658	13	88,397	242	4,810	48	194	4
Colorectal	Total 50-69	114.2	73.6	15,943,902	14,913	7,971,951	11,123	3,790	2,225	8,898	60	3,188,780	6,390	8,523	1,278	5,112	34	1,594,390	3,991	10,922	798	3,192	21	797,195	2,426	12,487	485	1,941	13	159,439	715	14,198	143	572	4
Colorectal	Total 60-74	203.9	125.2	10,175,760	16,621	5,087,880	12,396	4,225	2,479	9,917	60	2,035,152	7,122	9,499	1,424	5,698	34	1,017,576	4,448	12,173	890	3,558	21	508,788	2,704	13,917	541	2,163	13	101,758	797	15,824	159	638	4
Colorectal	Total 40-79	119.0	80.4	29,847,255	29,608	14,923,627	22,083	7,525	4,417	17,666	60	5,969,451	12,687	16,921	2,537	10,150	34	2,984,725	7,923	21,685	1,585	6,338	21	1,492,363	4,817	24,791	963	3,854	13	298,473	1,420	28,188	284	1,136	4
Colorectal	Total (all ages)	84.5	56.5	66,041,278	42,885																														
Pancreas																																			
Pancreas	40 to 44	2.6	2.0	4,075,608	94	2,037,804	74	20	15	59	63	815,122	45	49	9	36	38	407,561	29	65	6	23	25	203,780	18	76	4	15	16	40,756	6	88	1	5	5
Pancreas	45 to 49	5.6	3.9	4,567,159	215	2,283,580	168	47	34	135	63	913,432	102	113	20	82	38	456,716	66	149	13	53	25	228,358	42	173	8	33	16	45,672	13	202	3	11	5
Pancreas	50 to 54	10.2	7.3	4,658,111	409	2,329,055	320	89	64	256	63	931,622	195	214	39	156	38	465,811	126	283	25	101	25	232,906	79	330	16	64	16	46,581	25	384	5	20	5
Pancreas	55 to 59	18.3	13.6	4,181,606	666	2,090,803	522	144	104	417	63	836,321	317	349	63	254	38	418,161	206	460	41	165	25	209,080	129	537	26	104	16	41,816	41	625	8	33	5
Pancreas	60 to 64	29.2	22.4	3,602,002	926	1,801,001	725	201	145	580	63	720,400	441	485	88	353	38	360,200	286	640	57	229	25	180,100	180	746	36	144	16	36,020	57	869	11	45	5
Pancreas	65 to 69	47.2	34.1	3,502,183	1,417	1,751,092	1,110	307	222	888	63	700,437	675	742	135	540	38	350,218	438	979	88	350	25	175,109	275	1,142	55	220	16	35,022	87	1,330	17	70	5
Pancreas	70 to 74	66.4	48.8	3,071,575	1,757	1,535,787	1,376	381	275	1,101	63	614,315	837	920	167	670	38	307,157	543	1,214	109	434	25	153,579	341	1,416	68	273	16	30,716	108	1,649	22	86	5
Pancreas	75 to 79	86.0	70.8	2,189,011	1,702	1,094,505	1,333	369	267	1,066	63	437,802	811	891	162	649	38	218,901	526	1,176	105	421	25	109,451	331	1,371	66	265	16	21,890	104	1,598	21	84	5
Pancreas	Total 40-69	17.4	13.0	24,586,669	3,727	12,293,335	2,919	808	584	2,335	63	4,917,334	1,776	1,951	355	1,421	38	2,458,667	1,151	2,576	230	921	25	1,229,333	724	3,003	145	579	16	245,867	229	3,498	46	183	5
Pancreas	Total 40-49	4.2	3.0	8,642,767	309	4,321,384	242	67	48	194	63	1,728,553	147	162	29	118	38	864,277	95	214	19	76	25	432,138	60	249	12	48	16	86,428	19	290	4	15	5
Pancreas	Total 50-59	14.1	10.3	8,839,717	1,075	4,419,858	842	233	168	673	63	1,767,943	512	563	102	410	38	883,972	332	743	66	266	25	441,986	209	866	42	167	16	88,397	66	1,009	13	53	5
Pancreas	Total 50-69	24.7	18.3	15,943,902	3,418	7,971,951	2,677	741	535	2,141	63	3,188,780	1,629	1,789	326	1,303	38	1,594,390	1,056	2,362	211	845	25	797,195	664	2,754	133	531	16	159,439	210	3,208	42	168	5
Pancreas	Total 60-74	46.5	34.5	10,175,760	4,100	5,087,880	3,211	889	642	2,568	63	2,035,152	1,954	2,146	391	1,563	38	1,017,576	1,267	2,833	253	1,013	25	508,788	797	3,303	159	637	16	101,758	251	3,849	50	201	5
Pancreas	Total 40-79	27.1	21.2	29,847,255	7,186	14,923,627	5,627	1,559	1,125	4,502	63	5,969,451	3,424	3,762	685	2,739	38	2,984,725	2,220	4,966	444	1,776	25	1,492,363	1,396	5,790	279	1,117	16	298,473	441	6,745	88	353	5
Pancreas	Total (all ages)	19.3	15.0	66,041,278	10,452																														

Supplementary Table 7c(ii). Cancers detected by offering risk stratified screening according to optimised PRS using an idealised screening tool with a sensitivity of 0.8 (Cancers of the Ovary, Kidney, Lung, Testis)

Cancer Type	Age Groups	Annual Incidence (per 100,000) for age-band		Population		Screening offered to top 50% of PRS						Screening offered to top 20% of PRS						Screening offered to top 10% of PRS						Screening offered to top 5% of PRS						Screening offered to top 1% of PRS					
		Male	Female	Population Size	Cancers arising	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected	Number in 'high risk' screening group	Cancers arising in high risk group	PRS false negative (missed cancers arising in 'low' risk	screening false negatives	Total detected by screening	Percent of cancers detected
Ovary																																			
Ovary	40 to 44	0.0	13.2	2,054,223	270	1,027,112	187	83	37	150	56	410,845	100	170	20	80	30	205,422	59	211	12	47	18	102,711	34	236	7	28	10	20,542	9	261	2	7	3
Ovary	45 to 49	0.0	19.4	2,315,479	448	1,157,740	311	137	62	249	56	463,096	165	283	33	132	30	231,548	98	350	20	79	18	115,774	57	391	11	46	10	23,155	15	433	3	12	3
Ovary	50 to 54	0.0	27.1	2,364,638	640	1,182,319	444	196	89	355	56	472,928	236	404	47	189	30	236,464	140	500	28	112	18	118,232	82	558	16	65	10	23,646	22	618	4	18	3
Ovary	55 to 59	0.0	34.8	2,119,687	738	1,059,844	512	226	102	410	56	423,937	272	466	54	218	30	211,969	162	576	32	129	18	105,984	94	644	19	75	10	21,197	25	713	5	20	3
Ovary	60 to 64	0.0	41.6	1,837,174	764	918,587	530	234	106	424	56	367,435	282	482	56	225	30	183,717	168	596	34	134	18	91,859	97	667	19	78	10	18,372	26	738	5	21	3
Ovary	65 to 69	0.0	52.3	1,805,190	944	902,595	655	289	131	524	56	361,038	348	596	70	279	30	180,519	207	737	41	166	18	90,260	120	824	24	96	10	18,052	32	912	6	26	3
Ovary	70 to 74	0.0	60.8	1,603,610	975	801,805	677	298	135	541	56	320,722	360	615	72	288	30	160,361	214	761	43	171	18	80,180	124	851	25	100	10	16,036	34	941	7	27	3
Ovary	75 to 79	0.0	73.8	1,181,645	872	590,823	605	267	121	484	56	236,329	322	550	64	257	30	118,165	191	681	38	153	18	59,082	111	761	22	89	10	11,816	30	842	6	24	3
Ovary	Total 40-69	0.0	30.4	12,496,392	3,804	6,248,196	2,640	1,164	528	2,112	56	2,499,278	1,403	2,401	281	1,123	30	1,249,639	834	2,970	167	667	18	624,820	485	3,319	97	388	10	124,964	131	3,673	26	105	3
Ovary	Total 40-49	0.0	16.4	4,369,703	718	2,184,851	498	220	100	399	56	873,941	265	453	53	212	30	436,970	157	561	31	126	18	218,485	92	626	18	73	10	43,697	25	693	5	20	3
Ovary	Total 50-59	0.0	30.7	4,484,325	1,378	2,242,163	956	422	191	765	56	896,865	508	870	102	407	30	448,433	302	1,076	60	242	18	224,216	176	1,202	35	141	10	44,843	47	1,331	9	38	3
Ovary	Total 50-69	0.0	38.0	8,126,689	3,086	4,063,345	2,141	945	428	1,713	56	1,625,338	1,139	1,947	228	911	30	812,669	677	2,409	135	541	18	406,334	394	2,692	79	315	10	81,267	106	2,980	21	85	3
Ovary	Total 60-74	0.0	51.1	5,245,974	2,683	2,622,987	1,862	821	372	1,489	56	1,049,195	990	1,693	198	792	30	524,597	588	2,095	118	471	18	262,299	342	2,341	68	274	10	52,460	92	2,591	18	74	3
Ovary	Total 40-79	0.0	37.0	15,281,647	5,651	7,640,824	3,921	1,730	784	3,137	56	3,056,329	2,085	3,566	417	1,668	30	1,528,165	1,239	4,412	248	991	18	764,082	721	4,930	144	577	10	152,816	195	5,456	39	156	3
Ovary	Total (all ages)	0.0	22.8	33,458,052	7,495																														
Kidney																																			
Kidney	40 to 44	10.1	5.0	4,075,608	307	2,037,804	237	70	47	189	62	815,122	141	166	28	113	37	407,561	90	217	18	72	24	203,780	56	251	11	45	15	40,756	17	290	3	14	5
Kidney	45 to 49	17.7	7.8	4,567,159	580	2,283,580	447	133	89	358	62	913,432	267	313	53	214	37	456,716	171	409	34	137	24	228,358	106	474	21	85	15	45,672	33	547	7	26	5
Kidney	50 to 54	26.8	12.7	4,658,111	915	2,329,055	705	210	141	564	62	931,622	421	494	84	337	37	465,811	270	645	54	216	24	232,906	168	747	34	134	15	46,581	52	863	10	41	5
Kidney	55 to 59	37.1	18.6	4,181,606	1,160	2,090,803	894	266	179	715	62	836,321	534	626	107	427	37	418,161	342	818	68	273	24	209,080	213	947	43	170	15	41,816	66	1,094	13	52	5
Kidney	60 to 64	53.7	26.2	3,602,002	1,429	1,801,001	1,102	327	220	881	62	720,400	658	771	132	526	37	360,200	421	1,008	84	337	24	180,100	262	1,167	52	209	15	36,020	81	1,348	16	65	5
Kidney	65 to 69	73.9	36.4	3,502,183	1,911	1,751,092	1,473	438	295	1,178	62	700,437	879	1,032	176	704	37	350,218	563	1,348	113	450	24	175,109	350	1,561	70	280	15	35,022	108	1,803	22	86	5
Kidney	70 to 74	91.2	45.1	3,071,575	2,063	1,535,787	1,590	473	318	1,272	62	614,315	949	1,114	190	759	37	307,157	608	1,455	122	486	24	153,579	378	1,685	76	302	15	30,716	117	1,946	23	93	5
Kidney	75 to 79	110.1	57.2	2,189,011	1,785	1,094,505	1,376	409	275	1,101	62	437,802	821	964	164	657	37	218,901	526	1,259	105	421	24	109,451	327	1,458	65	262	15	21,890	101	1,684	20	81	5
Kidney	Total 40-69	34.6	16.9	24,586,669	6,302	12,293,335	4,858	1,444	972	3,886	62	4,917,334	2,900	3,402	580	2,320	37	2,458,667	1,857	4,445	371	1,485	24	1,229,333	1,155	5,147	231	924	15	245,867	356	5,946	71	285	5
Kidney	Total 40-49	14.1	6.5	8,642,767	887	4,321,384	684	203	137	547	62	1,728,553	408	479	82	327	37	864,277	261	626	52	209	24	432,138	162	725	32	130	15	86,428	50	837	10	40	5
Kidney	Total 50-59	31.7	15.5	8,839,717	2,075	4,419,858	1,599	476	320	1,280	62	1,767,943	955	1,120	191	764	37	883,972	611	1,464	122	489	24	441,986	380	1,695	76	304	15	88,397	117	1,958	23	94	5
Kidney	Total 50-69	45.8	22.6	15,943,902	5,415	7,971,951	4,174	1,241	835	3,339	62	3,188,780	2,492	2,923	498	1,993	37	1,594,390	1,595	3,820	319	1,276	24	797,195	992	4,423	198	794	15	159,439	306	5,109	61	245	5
Kidney	Total 60-74	71.8	35.5	10,175,760	5,403	5,087,880	4,165	1,238	833	3,332	62	2,035,152	2,486	2,917	497	1,989	37	1,017,576	1,592	3,811	318	1,273	24	508,788	990	4,413	198	792	15	101,758	305	5,098	61	244	5
Kidney	Total 40-79	45.5	23.0	29,847,255	10,150	14,923,627	7,824	2,326	1,565	6,259	62	5,969,451	4,671	5,479	934	3,737	37	2,984,725	2,990	7,160	598	2,392	24	1,492,363	1,859	8,291	372	1,488	15	298,473	574	9,576	115	459	5
Kidney	Total (all ages)	29.2	14.8	66,041,278	13,323																														
Lung																																			
Lung	40 to 44	6.0	5.8	4,075,608	240	2,037,804	176	64	35	141	59	815,122	99	141	20	79	33	407,561	61	179	12	49	20	203,780	37	203	7	29	12	40,756	11	229	2	8	4
Lung	45 to 49	16.3	14.7	4,567,159	706	2,283,580	518	188	104	414	59	913,432	292	414	58	233	33	456,716	180	526	36	144	20	228,358	108	598	22	87	12	45,672	31	675	6	25	4
Lung	50 to 54	33.4	31.5	4,658,111	1,512	2,329,055	1,108	404	222	887	59	931,622	625	887	125	500	33	465,811	385	1,127	77	308	20	232,906	232	1,280	46	185	12	46,581	67	1,445	13	53	4
Lung	55 to 59	71.4	67.1	4,181,606	2,896	2,090,803	2,123	773	425	1,698	59	836,321	1,196	1,700	239	957	33	418,161	738	2,158	148	590	20	209,080	444	2,452	89	355	12	41,816	128	2,768	26	102	4
Lung	60 to 64	137.0	124.9	3,602,002	4,711	1,801,001	3,454	1,257	691	2,763	59	720,400	1,946	2,765	389	1,557	33	360,200	1,200	3,511	240	960	20	180,100	722	3,989	144	577	12	36,020	208	4,503	42	166	4
Lung	65 to 69	229.5	197.8	3,502,183	7,466	1,751,092	5,473	1,993	1,095	4,378	59	700,437	3,084	4,382	617	2,468	33	350,218	1,902	5,564	380	1,522	20	175,109	1,144	6,322	229	915	12	35,022	330	7,136	66	264	4
Lung	70 to 74	335.0	278.1	3,071,575	9,378	1,535,787	6,875	2,503	1,375	5,500	59	614,315	3,874	5,504	775	3,099	33	307,157	2,390	6,988	478	1,912	20	153,579	1,437	7,941	287	1,150	12	30,716	414	8,964	83	331	4
Lung	75 to 79	462.2	340.5	2,189,011	8,680	1,094,505	6,363	2,317	1,273	5,090	59	437,802	3,586	5,094	717	2,869	33	218,901	2,212	6,468	442	1,769	20	109,451	1,330	7,350	266	1,064	12	21,890	383	8,297	77	307	4
Lung	Total 40-69	74.8	68.0	24,586,669	17,531	12,293,335	12,851	4,680	2,570	10,281	59	4,917,334	7,243	10,288	1,449	5,794	33	2,458,667	4,467	13,064	893	3,574	20	1,229,333	2,686	14,845	537	2,149	12	245,867	774	16,757	155	619	4
Lung	Total 40-49	11.4	10.5	8,642,767	946	4,321,384	693	253	139	555	59	1,728,553	391	555	78	313	33	864,277	241	705	48	193	20	432,138	145	801	29	116	12	86,428	42	904	8	33	4
Lung	Total 50-59	51.4	48.4	8,839,717	4,408	4,419,858	3,231	1,177	646	2,585	59	1,767,943	1,821	2,587	364	1,457	33	883,972	1,123	3,285	225	899	20	441,986	675	3,733	135	540	12	88,397	195	4,213	39	156	4
Lung	Total 50-69	109.4	98.9	15,943,902	16,585	7,971,951	12,158	4,427	2,432	9,726	59	3,188,780	6,852	9,733	1,370	5,481	33	1,594,390	4,226	12,359	845	3,381	20	797,195	2,541	14,044	508	2,033	12	159,439	733	15,852	147	586	4
Lung	Total 60-74	227.8	196.8	10,175,760	21,555	5,087,880	15,801	5,754	3,160	12,641	59	2,035,152	8,905	12,650	1,781	7,124	33	1,017,576	5,492	16,063	1,098	4,394	20	508,788	3,303	18,252	661	2,642	12	101,758	952	20,603	190	762	4
Lung	Total 40-79	127.8	111.1	29,847,255	35,589	14,923,627	26,089	9,500	5,218	20,871	59	5,969,451	14,703	20,886	2,941	11,762	33	2,984,725	9,069	26,520	1,814	7,255	20	1,492,363	5,453	30,136	1,091	4,362	12	298,473	1,572	34,017	314	1,258	4
Lung	Total (all ages)	90.6	70.1	66,041,278	48,549																														
Testis																																			
Testis	40 to 44	12.3	0.0	2,021,385	248	1,010,692	236	12	47	189	76	404,277	197	51	39	158	64	202,138	161	87	32	129	52	101,069	126	122	25	101	41	20,214	63	185	13	50	20
Testis	45 to 49	9.4	0.0	2,251,680	211	1,125,840	201	10	40	161	76	450,336	168	43	34	134	64	225,168	137	74	27	109	52	112,584	107	104	21	86	41	22,517	53	158	11	43	20
Testis	50 to 54	7.0	0.0	2,293,473	160	1,146,736	152	8	30	122	76	458,695	127	33	25	102	64	229,347	104	56	21	83	52	114,674	81	79	16	65	41	22,935	41	119	8	32	20
Testis	55 to 59	5.2	0.0	2,061,919	108	1,030,959	103	5	21	82	76	412,384	86	22	17	69	64	206,192	70	38	14	56	52	103,096	55	53	11	44	41	20,619	27	81	5	22	20
Testis	60 to 64	3.0	0.0	1,764,828	52	882,414	49	3	10	40	76	352,966	41	11	8	33	64	176,483	34	18	7	27	52	88,241	26	26	5	21	41	17,648	13	39	3	11	20
Testis	65 to 69	2.4	0.0	1,696,993	41	848,497	39	2	8	31	76	339,399	33	8	7	26	64	169,699	27	14	5	21	52	84,850	21	20	4	17	41	16,970	10	31	2	8	20
Testis	70 to 74	2.4	0.0	1,467,965	35	733,983	33	2	7	27	76	293,593	28	7	6	22	64	146,797	23	12	5	18	52	73,398	18	17	4	14	41	14,680	9	26	2	7	20
Testis	75 to 79	1.4	0.0	1,007,365	14	503,683	13	1	3	11	76	201,473	11	3	2	9	64	100,737	9	5	2	7	52	50,368	7	7	1	6	41	10,074	4	10	1	3	20
Testis	Total 20-39	16.0	0.0	8,782,738	1,406	4,391,369	1,338	68	268	1,070	76	1,756,548	1,116	290	223	893	64	878,274	911	495	182	729	52	439,137	712	694	142	570	41	87,827	356	1,050	71	285	20
Testis	Total 40-69	6.8	0.0	12,090,277	820	6,045,139	780	40	156	624	76	2,418,055	651	169	130	521	64	1,209,028	531	289	106	425	52	604,514	416	404	83	332	41	120,903	208	612	42	166	20
Testis	Total 40-49	10.7	0.0	4,273,065	459	2,136,532	437	22	87	349	76	854,613	364	95	73	292	64	427,306	297	162	59	238	52	213,653	233	226	47	186	41	42,731	116	343	23	93	20
Testis	Total 50-59	6.2	0.0	4,355,391	268	2,177,696	255	13	51	204	76	871,078	213	55	43	170	64	435,539	174	94	35	139	52	217,770	136	132	27	109	41	43,554	68	200	14	54	20
Testis	Total 50-69	4.6	0.0	7,817,213	361	3,908,606	344	17	69	275	76	1,563,443	287	74	57	229	64	781,721	234	127	47	187	52	390,861	183	178	37	146	41	78,172	91	270	18	73	20
Testis	Total 60-74	2.6	0.0	4,929,786	128	2,464,893	122	6	24	97	76	985,957	102	26	20	81	64	492,979	83	45	17	66	52	246,489	65	63	13	52	41	49,298	32	96	6	26	20
Testis	Total 40-79	6.0	0.0	14,565,608	869	7,282,804	827	42	165	662	76	2,913,122	690	179	138	552	64	1,456,561	563	306	113	451	52	728,280	440	429	88	352	41	145,656	220	649	44	176	20
Testis	Total (all ages)	7.2	0.0	32,583,226	2,354																														

Supplementary Table 8. Outcomes including 10-year survival from screening offered to PRS-defined high risk 20% (current and future), oldest 20% and random 20%.

Impact of screening for cancers of the breast (40-49 years), colorectum (50-59 years) and prostate (50-59, 60-69 years). Presented are modelled outcomes for screening of the full population, a PRS-defined high-risk quintile (20%), the oldest quintile (20%), a randomly-selected fifth of the population and the full population. Metrics presented are modelled for the UK population (~66 million) for annual cancers arising and deaths averted. These are maximal estimates based on several favourable assumptions, which include (i) that all cancers arising in the screening interval are present at time of screen (i.e. no interval cancers) (ii) full population uptake for PRS and for screening (see methods).

	Cancer Type	Screening modlaity	Age -band	**Population**			10 year survival		Ten year survival (%)	Survival Improvement (%)	Reduction in deaths (%)	Individuals screened for 10 years per one death averted
				Population size	Cancers arising annually	Size of screened Group	Total	Deaths averted				
No screening (baseline)	Breast		40 to 49	4,369,703	7,533		6,839		90.8%			
	Prostate		50 to 59	4,355,391	5,897		5,385		91.3%			
	Prostate		60 to 69	3,461,821	16,853		15,591		92.5%			
	Colorectal		50 to 59	8,839,717	5,052		3,337		66.1%			
Screening Top 20% (current PRS)	Breast	Digital mammography	40 to 49	4,369,703	7,533	873,941	6,941	102	92.1%	1.4%	14.7%	854
	Prostate	PSA_3ng/mL cut-off	50 to 59	4,355,391	5,897	871,078	5,443	58	92.3%	1.0%	11.4%	1,495
	Prostate	PSA_3ng/mL cut-off	60 to 69	3,461,821	16,853	692,364	15,748	158	93.4%	0.9%	12.5%	439
	Prostate	mpMRI	50 to 59	4,355,391	5,897	871,078	5,547	162	94.1%	2.7%	31.7%	537
	Prostate	mpMRI	60 to 69	3,461,821	16,853	692,364	16,029	438	95.1%	2.6%	34.7%	158
	Colorectal	FIT 20-50 µg/g threshold (CRC)	50 to 59	8,839,717	5,052	1,767,943	3,525	188	69.8%	3.7%	11.0%	940
Screening Top 20% (future PRS)	Breast	Digital mammography	40 to 49	4,369,703	7,533	873,941	6,959	121	92.4%	1.6%	17.4%	723
	Prostate	PSA_3ng/mL cut-off	50 to 59	4,355,391	5,897	871,078	5,447	62	92.4%	1.0%	12.0%	1,414
	Prostate	PSA_3ng/mL cut-off	60 to 69	3,461,821	16,853	692,364	15,757	167	93.5%	1.0%	13.2%	416
	Prostate	mpMRI	50 to 59	4,355,391	5,897	871,078	5,556	171	94.2%	2.9%	33.5%	508
	Prostate	mpMRI	60 to 69	3,461,821	16,853	692,364	16,054	463	95.3%	2.7%	36.7%	149
	Colorectal	FIT 20-50 µg/g threshold (CRC)	50 to 59	8,839,717	5,052	1,767,943	3,544	207	70.1%	4.1%	12.0%	856
Screening oldest 20% in age group	Breast	Digital mammography	40 to 49	4,369,703	7,533	937,850	6,919	80	91.8%	1.1%	11.6%	1,166
	Prostate	PSA_3ng/mL cut-off	50 to 59	4,355,391	5,897	786,032	5,427	42	92.0%	0.7%	8.2%	1,872
	Prostate	PSA_3ng/mL cut-off	60 to 69	3,461,821	16,853	702,786	15,686	95	93.1%	0.6%	7.5%	738
	Prostate	mpMRI	50 to 59	4,355,391	5,897	786,032	5,502	117	93.3%	2.0%	22.8%	673
	Prostate	mpMRI	60 to 69	3,461,821	16,853	702,786	15,855	265	94.1%	1.6%	21.0%	265
	Colorectal	FIT 20-50 µg/g threshold (CRC)	50 to 59	8,839,717	5,052	1,596,060	3,492	155	69.1%	3.1%	9.0%	1,030
Screen randomly-selected 20%	Breast	Digital mammography	40 to 49	4,369,703	7,533	873,941	6,893	55	91.5%	0.7%	7.9%	1,594
	Prostate	PSA_3ng/mL cut-off	50 to 59	4,355,391	5,897	871,078	5,410	25	91.7%	0.4%	5.0%	3,427
	Prostate	PSA_3ng/mL cut-off	60 to 69	3,461,821	16,853	692,364	15,659	69	92.9%	0.4%	5.4%	1,007
	Prostate	mpMRI	50 to 59	4,355,391	5,897	871,078	5,456	71	92.5%	1.2%	13.8%	1,232
	Prostate	mpMRI	60 to 69	3,461,821	16,853	692,364	15,782	191	93.6%	1.1%	15.1%	362
	Colorectal	FIT 20-50 µg/g threshold (CRC)	50 to 59	8,839,717	5,052	1,767,943	3,449	112	68.3%	2.2%	6.5%	1,584
Full population	Breast	Digital mammography	40 to 49	4,369,703	7,533	4,369,703	7,113	274	94.4%	3.6%	39.5%	1,594
	Prostate	PSA_3ng/mL cut-off	50 to 59	4,355,391	5,897	4,355,391	5,512	127	93.5%	2.2%	24.8%	3,427
	Prostate	PSA_3ng/mL cut-off	60 to 69	3,461,821	16,853	3,461,821	15,934	344	94.5%	2.0%	27.2%	1,007
	Prostate	mpMRI	50 to 59	4,355,391	5,897	4,355,391	5,738	353	97.3%	6.0%	69.0%	1,232
	Prostate	mpMRI	60 to 69	3,461,821	16,853	3,461,821	16,546	956	98.2%	5.7%	75.7%	362
	Colorectal	FIT 20-50 µg/g threshold (CRC)	50 to 59	8,839,717	5,052	8,839,717	3,895	558	77.1%	11.0%	32.5%	1,584

Supplementary Table 9: Impact on AUC of incorporation of multimodal parameters into risk prediction model.

Adapted from Kachuri et al, Nature Communications 2020 Nov 27;11(1):6084. PRS_{IV} are calculated from inverse variance (IV) weights. AUC values were estimated at 5 years of follow-up using UKBiobank. Sex is only included in the predictive model for cancers of the colon/rectum, lung, kidney, and pancreas. Family history and other predictors are included where on univariate analysis they have been demonstrated to improve the model for prediction of cancer incidence.

Cancer site	Cases in UK-Biobank	Variants in PRS	AUC for predictive model including							
			(A) Age [+ sex]	(B) Age [+ sex] + family history	(C) Age [+ sex] + PRS_{IV} (instead of family history)	(D) Age [+ sex] + other predictors	(E) Age [+ sex] + family history + other predictors	(F) Age [+ sex] + family history + PRS_{IV}	(G) Age [+ sex] +other predictors + PRS_{IV}	(H) Age [+ sex] + family history + other predictors + PRS_{IV}
Prostate	4740	161	0·713	0·720	0·766			0·769		
Testis	52	52	0·658		0·787					
Breast	4760	162	0·548	0·562	0·626		0·573			0·637
Ovary	445	36	0·620	0·622			0·643			0·660
Colon/rectum	2725	103	0·680	0·681	0·708		0·688			0·716
Lung	1541	109	0·704	0·714	0·710		0·843			0·846
Kidney	612	19	0·687			0·713			0·722	
Pancreas	493	22	0·695				0·715	0·745		

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