

```

1
2
3 *****
4 *****
5 **///FZ - JUN 2023 - R1 DIABETES CARE**
6 *****
7 *****
8
9 *****People between 40-74 [screening diabetes NHS]****
10 cap use "...incidence_db1.dta", replace
11 egen float agec = cut(agein), at(0 40 75 150) icodes label
12 tabstat agein, statistics(N min max) by(agec)
13 tab agec, nolab
14
15
16 *****Number of certain cancers****
17 cap use "...incidence_db0.dta", replace
18 keep patid liver pancreas endometrial
19 tempfile somec
20 save `somec', replace
21 cap use "...incidence_db1.dta", replace
22 merge 1:1 patid using `somec', update
23 keep patid gender bmirel all liver pancreas endometrial
24 groups bmirel-endometrial, missing
25 foreach var of varlist bmirel-endometrial {
26     tab `var', m
27 }
28 keep if all == 1
29 foreach var of varlist bmirel-endometrial {
30     tab `var' gender, m
31 }
32
33
34 *****Sensitivity analyses excluding BMI<18.5 & follow-up first 2 years -- All and 4 most-common, by sex****
35 cap log close
36 cap use "...incidence_db1.dta", replace
37 rename agein ageatt
38
39 /*
40 stset t_all, f(all == 1) id(patid) origin(time 2)
41 strate, per(1000)
42 */
43
44 drop if t_all<2
45 replace t_all = t_all-2
46
47 mdesc
48 tab bmig, m
49 drop if bmi == .
50 drop if bmig == 0 /*removed very few subjects with BMI<18.5*/
51
52 preserve
53 keep if gender == 1
54 tempfile db1_Men
55 save `db1_Men', replace
56 restore
57
58 preserve
59 keep if gender == 2
60 tempfile db1_Women
61 save `db1_Women', replace
62 restore
63
64 foreach nm in Men Women {
65     foreach type in lung breast prostate colorectal all {
66
67

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68 di "-----"
69 di "SEX -- `nm' || TYPE -- `type' -- $S_TIME $S_DATE"
70 di "-----"
71
72 if (``nm'" == "Men" & ``type'" == "breast") | (``nm'" == "Women" & ``type'" == "prostate") {
73     di "Few events"
74 }
75
76 else {
77
78     qui use `db1_`nm'', clear
79
80     stset t_`type', f(`type' == 1) id(patid)
81     qui stmt, time1(df(4)) time2(df(4) start(ageatt)) timeint(t1:t2 4:4)
82
83     preserve
84     forvalues j = 0(0.1)20.1 {
85         qui clear
86         qui set obs 1201
87         qui generate time1 = `j'
88         qui range time2 0 120 1201
89         qui tempfile temppred`n'
90         qui save `temppred`n'
91         local datalist `datalist' `temppred`n'
92         local n = `n' + 1
93     }
94     qui clear
95     qui set obs 0
96     qui append using `datalist'
97     qui tempfile timedata
98     qui save `timedata'
99     restore
100
101     qui merge 1:1 _n using `timedata', nogen
102
103     preserve
104     qui predict rate, hazard time1var(time1) time2var(time2) ci
105     qui gen agedd_p = time2 - time1
106     qui renames time1 time2 \ diabdur_p ageatt_p
107     qui order agedd_p, before(diabdur_p)
108     qui keep agedd_p-ageatt_p rate*
109     qui cap drop if time1 == .
110     qui gen gender = ``nm'"
111     qui gen type = ``type'"
112     qui tempfile rates_`nm'_`type'
113     qui save `rates_`nm'_`type'
114     restore
115
116     qui drop time1 time2
117     qui egen float time2 = seq() in 1/6, from(5) to(10) block(1)
118     qui replace time2 = time2*10
119     qui gen time1_5 = 5 if time2 !=.
120     qui gen time1_20 = 20 if time2 !=.
121     qui predictnl lnhr = ln(predict(hazard time1var(time1_20) time2var(time2))) - ln(predict(hazard time1var(time1_5) time2var(time2))), ci(lnhr_lci lnhr_uci)
122     qui keep time2 time1_5 time1_20 lnhr*
123     qui cap drop if time2 == .
124     qui gen gender = ``nm'"
125     qui gen type = ``type'"
126     qui tempfile ratesratio_`nm'_`type'
127     qui save `ratesratio_`nm'_`type'
128     }
129 }
130 }
131
132 clear
133 foreach nm in Men Women {
134     foreach type in lung breast prostate colorectal all {

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135     cap append using `rates_`nm' `_type'
136   }
137 }
138 foreach var of varlist rate* {
139   replace `var' = `var'*1000
140 }
141 foreach var of varlist agedd_p diabdur_p ageatt_p {
142   tostring `var', replace force format(%5.1f)
143 }
144 foreach var of varlist agedd_p diabdur_p ageatt_p {
145   destring `var', replace
146 }
147 cap drop if rate == .
148 duplicates drop
149 cap save "...R1_Predictedrates_cancers", replace
150
151 clear
152 foreach nm in Men Women {
153   foreach type in lung breast prostate colorectal all {
154     cap append using `ratesratio_`nm' `_type'
155   }
156 }
157 cap save "...R1_Predictedratesratio_cancers.dta", replace
158 log close
159
160
161 *****Sensitivity analyses excluding BMI<18.5 & follow-up first 2 years -- BMI-related, by sex and BMI****
162 cap log close
163 cap log using "...R1_BMIcancers_log", text replace
164 cap use "...incidence_db1.dta", replace
165 rename agein ageatt
166 drop if bmi == .
167 drop if bmig == 0 /*removed very few subjects with BMI<18.5*/
168 tab bmig, gen(dbmi)
169 tabstat bmi if dbmi1 == 1, statistics(min max)
170
171 drop if t_all<2
172 replace t_all = t_all-2
173
174 preserve
175 keep if gender == 1
176 tempfile db1_Men
177 save `db1_Men', replace
178 restore
179
180 preserve
181 keep if gender == 2
182 tempfile db1_Women
183 save `db1_Women', replace
184 restore
185
186 foreach nm in Men Women {
187
188     di "SEX -- `nm' -- $S_TIME $S_DATE"
189
190     qui use `db1_`nm'', clear
191
192     stset t_bmi1, f(bmi1 == 1) id(patid)
193     stset dbmi2 dbmi3 dbmi4 dbmi5, ///
194     time1(df(4) tvc(dbmi2 dbmi3 dbmi4 dbmi5) dftvc(4)) ///
195     time2(df(4) tvc(dbmi2 dbmi3 dbmi4 dbmi5) dftvc(4) start(ageatt)) ///
196     timeint(t1:t2 4:4)
197
198     preserve
199     forvalues j = 0(0.1)20.1 {
200       /*time since diagnosis/duration, i.e. timeinc*/
201       qui clear
202       qui set obs 1201

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202     qui generate time1 = `j'
203     qui range time2 0 120 1201                /*attained age*/
204     qui tempfile temppred`n'
205     qui save `temppred`n'
206     local datalist `datalist' `temppred`n'
207     local n = `n' + 1
208 }
209 qui clear
210 qui set obs 0
211 qui append using `datalist'
212 qui tempfile timedata
213 qui save `timedata'
214 restore
215
216 qui merge 1:1 _n using `timedata', nogen
217
218 preserve
219 qui predict rbmi1, hazard time1var(time1) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 0 dbmi5 0) ci
220 qui predict rbmi2, hazard time1var(time1) time2var(time2) at(dbmi2 1 dbmi3 0 dbmi4 0 dbmi5 0) ci
221 qui predict rbmi3, hazard time1var(time1) time2var(time2) at(dbmi2 0 dbmi3 1 dbmi4 0 dbmi5 0) ci
222 qui predict rbmi4, hazard time1var(time1) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 1 dbmi5 0) ci
223 qui predict rbmi5, hazard time1var(time1) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 0 dbmi5 1) ci
224 qui gen agedd_p = time2 - time1
225 qui renames time1 time2 \ diabdur_p ageatt_p
226 qui order agedd_p, before(diabdur_p)
227 qui keep agedd_p-ageatt_p rbmi*
228 qui cap drop if time1 == .
229 qui gen gender = "`nm'"
230 qui gen type = "bmirel"
231 qui tempfile rates_`nm'_bmirel
232 qui save `rates_`nm'_bmirel'
233 restore
234
235 qui drop time1 time2
236 qui egen float time2 = seq() in 1/6, from(5) to(10) block(1)
237 qui replace time2 = time2*10
238 qui gen time1_5 = 5 if time2 !=.
239 qui gen time1_20 = 20 if time2 !=.
240 qui predictnl lnhr_bmi1 = ln(predict(hazard time1var(time1_20) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 0 dbmi5 0))) /*
241 */ - ln(predict(hazard time1var(time1_5) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 0 dbmi5 0))), ci(lnhr_bmi1_lci lnhr_bmi1_uci)
242 qui predictnl lnhr_bmi2 = ln(predict(hazard time1var(time1_20) time2var(time2) at(dbmi2 1 dbmi3 0 dbmi4 0 dbmi5 0))) /*
243 */ - ln(predict(hazard time1var(time1_5) time2var(time2) at(dbmi2 1 dbmi3 0 dbmi4 0 dbmi5 0))), ci(lnhr_bmi2_lci lnhr_bmi2_uci)
244 qui predictnl lnhr_bmi3 = ln(predict(hazard time1var(time1_20) time2var(time2) at(dbmi2 0 dbmi3 1 dbmi4 0 dbmi5 0))) /*
245 */ - ln(predict(hazard time1var(time1_5) time2var(time2) at(dbmi2 0 dbmi3 1 dbmi4 0 dbmi5 0))), ci(lnhr_bmi3_lci lnhr_bmi3_uci)
246 qui predictnl lnhr_bmi4 = ln(predict(hazard time1var(time1_20) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 1 dbmi5 0))) /*
247 */ - ln(predict(hazard time1var(time1_5) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 1 dbmi5 0))), ci(lnhr_bmi4_lci lnhr_bmi4_uci)
248 qui predictnl lnhr_bmi5 = ln(predict(hazard time1var(time1_20) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 0 dbmi5 1))) /*
249 */ - ln(predict(hazard time1var(time1_5) time2var(time2) at(dbmi2 0 dbmi3 0 dbmi4 0 dbmi5 1))), ci(lnhr_bmi5_lci lnhr_bmi5_uci)
250 qui keep time2 time1_5 time1_20 lnhr*
251 qui cap drop if time2 == .
252 qui gen gender = "`nm'"
253 qui gen type = "bmirel"
254 qui tempfile ratesratio_`nm'_bmirel
255 qui save `ratesratio_`nm'_bmirel'
256 }
257
258 clear
259 foreach nm in Men Women {
260     append using `rates_`nm'_bmirel'
261 }
262 foreach var of varlist rbmi* {
263     replace `var' = `var'*1000
264 }
265 foreach var of varlist agedd_p diabdur_p ageatt_p {
266     tostring `var', replace force format(%5.1f)
267 }
268 foreach var of varlist agedd_p diabdur_p ageatt_p {

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269     destring `var', replace
270 }
271 cap drop if rbmi1 == .
272 duplicates drop
273 save "...R1_PredictedratesBMI_cancers.dta", replace
274
275 clear
276 foreach nm in Men Women {
277     append using `ratesratio_`nm'_bmirel'
278 }
279 cap save "...R1_PredictedratesratioBMI_cancers.dta", replace
280 cap log close
281
282
283 *****
284 **#****[R1 FIG 1 & 2] Line plots | All cancers, by sex*****
285 *****
286 set scheme white_tableau
287 use "...Predictedrates_cancers.dta", replace
288 tab gender type, m
289
290 preserve
291 keep if gender == "Men" & type == "all"
292
293 /*[1/2]*/
294 twoway (line rate ageatt_p          if agedd_p == 50, sort lcolor("247 104 161")) ///
295        (line rate ageatt_p          if agedd_p == 60, sort lcolor("221 52 151")) ///
296        (line rate ageatt_p          if agedd_p == 70, sort lcolor("174 1 126")) ///
297        (line rate ageatt_p          if agedd_p == 80, sort lcolor("122 1 119")) ///
298        (line rate_lci rate_uci ageatt_p if agedd_p == 50, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
299        (line rate_lci rate_uci ageatt_p if agedd_p == 60, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
300        (line rate_lci rate_uci ageatt_p if agedd_p == 70, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
301        (line rate_lci rate_uci ageatt_p if agedd_p == 80, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
302        , yscale(log) ylabel(2 4 8 16 32 64 128) xlabel(50(5)100, gmax) ///
303        ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Attained age, years") ///
304        legend(rows(1) position(6) ring(0) order(1 "50 y" 2 "60 y" 3 "70 y" 4 "80 y") ///
305        nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
306        title("[D] Rates by attained age and age at diagnosis", size(small)) ///
307        name("FigD", replace) nodraw
308
309 /*[1/3]*/
310 twoway (line rate ageatt_p          if diabdur_p == 5, sort lcolor("247 104 161")) ///
311        (line rate ageatt_p          if diabdur_p == 10, sort lcolor("221 52 151")) ///
312        (line rate ageatt_p          if diabdur_p == 15, sort lcolor("174 1 126")) ///
313        (line rate ageatt_p          if diabdur_p == 20, sort lcolor("122 1 119")) ///
314        (line rate_lci rate_uci ageatt_p if diabdur_p == 5, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
315        (line rate_lci rate_uci ageatt_p if diabdur_p == 10, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
316        (line rate_lci rate_uci ageatt_p if diabdur_p == 15, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
317        (line rate_lci rate_uci ageatt_p if diabdur_p == 20, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
318        if ageatt_p>=50 & ageatt_p<=100 ///
319        , yscale(log) ylabel(1 2 4 8 16 32 64 128, gmin) xlabel(50(5)100, gmax) ///
320        ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Attained age, years") ///
321        legend(rows(1) position(6) ring(0) order(1 "5 y" 2 "10 y" 3 "15 y" 4 "20 y") ///
322        nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
323        title("[B] Rates by attained age and diabetes duration", size(small)) ///
324        name("FigB", replace) nodraw
325
326 /*[3/1]*/
327 twoway (line rate diabdur_p          if ageatt_p == 50, sort lcolor("247 104 161")) ///
328        (line rate diabdur_p          if ageatt_p == 60, sort lcolor("221 52 151")) ///
329        (line rate diabdur_p          if ageatt_p == 70, sort lcolor("174 1 126")) ///
330        (line rate diabdur_p          if ageatt_p == 80, sort lcolor("122 1 119")) ///
331        (line rate diabdur_p          if ageatt_p == 90, sort lcolor("73 0 106")) ///
332        (line rate_lci rate_uci diabdur_p if ageatt_p == 50, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
333        (line rate_lci rate_uci diabdur_p if ageatt_p == 60, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
334        (line rate_lci rate_uci diabdur_p if ageatt_p == 70, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
335        (line rate_lci rate_uci diabdur_p if ageatt_p == 80, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///

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336     (line rate_lci rate_uci diabdur_p if ageatt_p == 90, sort lcolor("73 0 106" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
337     , yscale(log) ylabel(1 2 4 8 16 32 64 128, gmin) xlabel(0(1)20, gmax) ///
338     ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Duration of diabetes, years") ///
339     legend(rows(1) position(6) ring(0) order(1 "50 y" 2 "60 y" 3 "70 y" 4 "80 y" 5 "90 y")) ///
340     nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
341     title("[C] Rates by diabetes duration and attained age", size(small)) ///
342     name("FigC", replace) nodraw
343
344 /*[3/2]*/
345 twoway (line rate diabdur_p if agedd_p == 50, sort lcolor("247 104 161")) ///
346        (line rate diabdur_p if agedd_p == 60, sort lcolor("221 52 151")) ///
347        (line rate diabdur_p if agedd_p == 70, sort lcolor("174 1 126")) ///
348        (line rate diabdur_p if agedd_p == 80, sort lcolor("122 1 119")) ///
349        (line rate_lci rate_uci diabdur_p if agedd_p == 50, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
350        (line rate_lci rate_uci diabdur_p if agedd_p == 60, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
351        (line rate_lci rate_uci diabdur_p if agedd_p == 70, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
352        (line rate_lci rate_uci diabdur_p if agedd_p == 80, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
353        , yscale(log) ylabel(2 4 8 16 32 64 128) xlabel(0(1)20) ///
354        ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Duration of diabetes, years") ///
355        legend(rows(1) position(6) ring(0) order(1 "50 y" 2 "60 y" 3 "70 y" 4 "80 y")) ///
356        nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
357        title("[A] Rates by diabetes duration and age at diagnosis", size(small)) ///
358        name("FigA", replace) nodraw
359
360 graph combine FigA FigB FigC FigD, cols(2) scale(0.9) xsize(6) ysize(4) name("Rates", replace) nocopies nodraw
361 graph save "Rates" "...R1_Fig1.gph", replace /*R1_Fig1*/
362 restore
363
364 *****
365
366 preserve
367 keep if gender == "Women" & type == "all"
368
369 /*[1/2]*/
370 twoway (line rate ageatt_p if agedd_p == 50, sort lcolor("247 104 161")) ///
371        (line rate ageatt_p if agedd_p == 60, sort lcolor("221 52 151")) ///
372        (line rate ageatt_p if agedd_p == 70, sort lcolor("174 1 126")) ///
373        (line rate ageatt_p if agedd_p == 80, sort lcolor("122 1 119")) ///
374        (line rate_lci rate_uci ageatt_p if agedd_p == 50, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
375        (line rate_lci rate_uci ageatt_p if agedd_p == 60, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
376        (line rate_lci rate_uci ageatt_p if agedd_p == 70, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
377        (line rate_lci rate_uci ageatt_p if agedd_p == 80, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
378        , yscale(log) ylabel(4 8 16 32 64) xlabel(50(5)100, gmax) ///
379        ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Attained age, years") ///
380        legend(rows(1) position(6) ring(0) order(1 "50 y" 2 "60 y" 3 "70 y" 4 "80 y")) ///
381        nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
382        title("[D] Rates by attained age and age at diagnosis", size(small)) ///
383        name("FigD", replace) nodraw
384
385 /*[1/3]*/
386 twoway (line rate ageatt_p if diabdur_p == 5, sort lcolor("247 104 161")) ///
387        (line rate ageatt_p if diabdur_p == 10, sort lcolor("221 52 151")) ///
388        (line rate ageatt_p if diabdur_p == 15, sort lcolor("174 1 126")) ///
389        (line rate ageatt_p if diabdur_p == 20, sort lcolor("122 1 119")) ///
390        (line rate_lci rate_uci ageatt_p if diabdur_p == 5, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
391        (line rate_lci rate_uci ageatt_p if diabdur_p == 10, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
392        (line rate_lci rate_uci ageatt_p if diabdur_p == 15, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
393        (line rate_lci rate_uci ageatt_p if diabdur_p == 20, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
394        if ageatt_p>=50 & ageatt_p<=100 ///
395        , yscale(log) ylabel(2 4 8 16 32 64, gmin) xlabel(50(5)100, gmax) ///
396        ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Attained age, years") ///
397        legend(rows(1) position(6) ring(0) order(1 "5 y" 2 "10 y" 3 "15 y" 4 "20 y")) ///
398        nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
399        title("[B] Rates by attained age and diabetes duration", size(small)) ///
400        name("FigB", replace) nodraw
401
402 /*[3/1]*/

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403 twoway (line rate diabdur_p if ageatt_p == 50, sort lcolor("247 104 161")) ///
404 (line rate diabdur_p if ageatt_p == 60, sort lcolor("221 52 151")) ///
405 (line rate diabdur_p if ageatt_p == 70, sort lcolor("174 1 126")) ///
406 (line rate diabdur_p if ageatt_p == 80, sort lcolor("122 1 119")) ///
407 (line rate diabdur_p if ageatt_p == 90, sort lcolor("73 0 106")) ///
408 (line rate_lci rate_uci diabdur_p if ageatt_p == 50, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
409 (line rate_lci rate_uci diabdur_p if ageatt_p == 60, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
410 (line rate_lci rate_uci diabdur_p if ageatt_p == 70, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
411 (line rate_lci rate_uci diabdur_p if ageatt_p == 80, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
412 (line rate_lci rate_uci diabdur_p if ageatt_p == 90, sort lcolor("73 0 106" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
413 , yscale(log) ylabel(2 4 8 16 32 64, gmin) xlabel(0(1)20, gmax) ///
414 ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Duration of diabetes, years") ///
415 legend(rows(1) position(6) ring(0) order(1 "50 y" 2 "60 y" 3 "70 y" 4 "80 y" 5 "90 y")) ///
416 nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
417 title("[C] Rates by diabetes duration and attained age", size(small)) ///
418 name("FigC", replace) nodraw
419
420 /*[3/2]*/
421 twoway (line rate diabdur_p if agedd_p == 50, sort lcolor("247 104 161")) ///
422 (line rate diabdur_p if agedd_p == 60, sort lcolor("221 52 151")) ///
423 (line rate diabdur_p if agedd_p == 70, sort lcolor("174 1 126")) ///
424 (line rate diabdur_p if agedd_p == 80, sort lcolor("122 1 119")) ///
425 (line rate_lci rate_uci diabdur_p if agedd_p == 50, sort lcolor("247 104 161" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
426 (line rate_lci rate_uci diabdur_p if agedd_p == 60, sort lcolor("221 52 151" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
427 (line rate_lci rate_uci diabdur_p if agedd_p == 70, sort lcolor("174 1 126" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
428 (line rate_lci rate_uci diabdur_p if agedd_p == 80, sort lcolor("122 1 119" ..) lpattern(vshortdash ..) lwidth(vthin ..)) ///
429 , yscale(log) ylabel(4 8 16 32 64) xlabel(0(1)20) ///
430 ytitle("Cancer incidence rate, per 1,000 person-years") xtitle("Duration of diabetes, years") ///
431 legend(rows(1) position(6) ring(0) order(1 "50 y" 2 "60 y" 3 "70 y" 4 "80 y")) ///
432 nobox region(fcolor(none)) keygap(0.5) symxsize(4)) scale(0.8) ///
433 title("[A] Rates by diabetes duration and age at diagnosis", size(small)) ///
434 name("FigA", replace) nodraw
435
436 graph combine FigA FigB FigC FigD, cols(2) scale(0.9) xsize(6) ysize(4) name("Rates", replace) nocopies nodraw
437 graph save "Rates" "...R1_Fig2.gph", replace
438 restore
439
440
441 *****
442 ***Sensitivity analyses*****
443 *****
444
445 *Fig S7 | Absolute rates at 5 & 20 years - all comparing main vs sensitivity*
446 set scheme white_tableau
447 use "...R1_Predictedrates_cancers", clear
448 replace diabdur_p = diabdur_p + 2
449 gen analysis = "sens"
450 append using "...Predictedrates_cancers.dta"
451 replace analysis = "main" if analysis == ""
452 drop if diabdur_p>20
453 keep if inlist(ageatt_p, 50, 60, 70, 80, 90, 100)
454 keep if inlist(diabdur_p, 5, 20)
455 drop agedd_p
456 gsort gender type diabdur_p ageatt_p analysis
457 label variable ageatt_p "Age (years)"
458 label variable diabdur_p "Diabetes duration (years)"
459 order diabdur_p ageatt_p
460
461 preserve
462 replace diabdur_p = . if ageatt_p != 50
463 replace diabdur_p = . if analysis != "main"
464 replace ageatt_p = . if analysis != "main"
465
466 forestplot rate rate_lci rate_uci if gender == "Men" & type == "all", effect("Rate") lcols(diabdur_p ageatt_p) ///
467 nonull nonames noov nosu nowt dp(1) classic boxscale(60) astext(40) textsize(105) xlabel(0(10)180, labsize(6pt) nogrid) ///
468 spacing(2) yline(2.5(2)22.5, lwidth(vthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(9pt)) ///
469 leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///

```

```

470     box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
471     title("All cancers, Men", size(small)) name("sens_men", replace) xsize(6) ysize(4) scale(0.8) nodraw
472
473 forestplot rate_lci rate_uci if gender == "Women" & type == "all", effect("Rate") lcols(diabdur_p ageatt_p) ///
474     nonull nonames noov nosu nowt dp(1) classic boxscale(60) astext(40) textsize(105) xlabel(0(10)90, labsize(6pt) nogrid) ///
475     spacing(2) yline(2.5(2)22.5, lwidth(vthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(9pt)) ///
476     leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
477     box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
478     title("All cancers, Women", size(small)) name("sens_women", replace) xsize(6) ysize(4) scale(0.8) nodraw
479
480 graph combine sens_men sens_women, ycommon cols(2) xsize(8) ysize(6) nocopies scale(1.2) name("FigS7", replace)
481 graph save "FigS7" "...R1_FigS7.gph", replace
482 restore
483
484 *Fig S8 | Absolute rates at 5 & 20 years - most common comparing main vs sensitivity*
485 drop if type == "all"
486 replace type = proper(type)
487 label variable type "Cancer"
488 gen ord = 1 if type == "Colorectal"
489 replace ord = 2 if type == "Lung"
490 replace ord = 3 if type == "Prostate"
491 replace ord = 4 if type == "Breast"
492 gsort gender ord diabdur_p ageatt_p analysis
493
494 order type diabdur_p ageatt_p
495 replace type = "" if ageatt_p != 50
496 replace type = "" if analysis != "main"
497 replace type = "" if diabdur_p == 20
498 replace diabdur_p = . if ageatt_p != 50
499 replace diabdur_p = . if analysis != "main"
500 replace ageatt_p = . if analysis != "main"
501
502 forestplot rate_lci rate_uci if gender == "Men", effect("Rate") lcols(type diabdur_p ageatt_p) ///
503     nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(115) xlabel(0(4)40, labsize(5pt) nogrid) ///
504     spacing(2.8) yline(2.5(2)70.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
505     yline(24.5 48.5, lwidth(thin) lpattern(solid)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
506     leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
507     box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
508     title("Four commonest cancers, Men", size(9pt)) name("C4_men", replace) xsize(6.5) ysize(8) scale(1.1) range(0 40) nodraw
509
510 forestplot rate_lci rate_uci if gender == "Women", effect("Rate") rcols(type diabdur_p ageatt_p) ///
511     nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(115) xlabel(0(2)14, labsize(5pt) nogrid) ///
512     spacing(2.8) yline(2.5(2)70.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
513     yline(24.5 48.5, lwidth(thin) lpattern(solid)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
514     leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
515     box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
516     title("Four commonest cancers, Women", size(9pt)) name("C4_women", replace) xsize(6.5) ysize(8) scale(1.1) range(0 14) nodraw
517
518 graph combine C4_men C4_women, ycommon cols(2) xsize(8) ysize(6) nocopies scale(1.05) name("FigS8", replace)
519 graph save "FigS8" "...R1_FigS8.gph", replace
520
521 *Fig S9 | Absolute rates at 5 & 20 years - BMI-related comparing main vs sensitivity*
522 use "...R1_PredictedratesBMI_cancers.dta", replace
523 replace diabdur_p = diabdur_p + 2
524 gen analysis = "sens"
525 append using "...PredictedratesBMI_cancers.dta"
526 replace analysis = "main" if analysis == ""
527 drop if diabdur_p > 20
528 keep if inlist(ageatt_p, 50, 60, 70, 80, 90, 100)
529 keep if inlist(diabdur_p, 5, 20)
530 drop agedd_p
531 gsort gender type diabdur_p ageatt_p analysis
532 label variable ageatt_p "Age (years)"
533 label variable diabdur_p "Diabetes duration (years)"
534
535 drop type
536 gsort gender diabdur_p ageatt_p analysis

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```

537
538   forvalues j = 1/5 {
539       renames rbmi`j' rbmi`j'_lci rbmi`j'_uci \ rbmi_est`j' rbmi_lci`j' rbmi_uci`j'
540   }
541
542   reshape long rbmi_est rbmi_lci rbmi_uci, i(gender diabdur_p ageatt_p analysis) j(bmig)
543   order diabdur_p ageatt_p rbmi_est rbmi_lci rbmi_uci bmig gender analysis
544   gen BMI = ""
545   replace BMI = ">18.5-<25" if bmig == 1
546   replace BMI = ">25-<30"   if bmig == 2
547   replace BMI = ">30-<35"   if bmig == 3
548   replace BMI = ">35-<40"   if bmig == 4
549   replace BMI = ">40"       if bmig == 5
550   gsort gender bmig diabdur_p ageatt_p analysis
551
552   replace diabdur_p = . if ageatt_p != 50
553   replace diabdur_p = . if analysis != "main"
554   replace ageatt_p = . if analysis != "main"
555
556   *Men*
557   forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Men" & bmig == 1, effect("Rate") lcols(diabdur_p ageatt_p) ///
558       nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid) ///
559       spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
560       xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
561       leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
562       box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
563       title("BMI ≥18.5-<25 kg/m{superscript:2}, Men", size(9pt)) name("bmig1_men", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
564
565   forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Men" & bmig == 2, effect("Rate") lcols(diabdur_p ageatt_p) ///
566       nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid) ///
567       spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
568       xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
569       leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
570       box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
571       title("BMI ≥25-<30 kg/m{superscript:2}, Men", size(9pt)) name("bmig2_men", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
572
573   forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Men" & bmig == 3, effect("Rate") lcols(diabdur_p ageatt_p) ///
574       nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid) ///
575       spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
576       xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
577       leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
578       box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
579       title("BMI ≥30-<35 kg/m{superscript:2}, Men", size(9pt)) name("bmig3_men", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
580
581   forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Men" & bmig == 4, effect("Rate") lcols(diabdur_p ageatt_p) ///
582       nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid) ///
583       spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
584       xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
585       leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
586       box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
587       title("BMI ≥35-<40 kg/m{superscript:2}, Men", size(9pt)) name("bmig4_men", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
588
589   forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Men" & bmig == 5, effect("Rate") lcols(diabdur_p ageatt_p) ///
590       nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid) ///
591       spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
592       xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
593       leftjustify ciopts(lwidth(vthin)) plotid(analysis) ///
594       box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue)) ///
595       title("BMI ≥40 kg/m{superscript:2}, Men", size(9pt)) name("bmig5_men", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
596
597   graph combine bmig1_men bmig2_men bmig3_men bmig4_men bmig5_men, ycommon cols(5) xsize(8) ysize(6) nocopies scale(1.05) name("FigS9_men", replace)
598
599   *Women*
600   forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Women" & bmig == 1, effect("Rate") lcols(diabdur_p ageatt_p) ///
601       nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid) ///
602       spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt)) ///
603       xtitle("Rate (per 1,000 person-years)", size(7pt)) ///

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604     leftjustify ciopts(lwidth(vthin)) plotid(analysis)          ///
605     box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue))  ///
606     title("BMI ≥18.5-<25 kg/m{superscript:2}, Women", size(9pt)) name("bmig1_women", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
607
608 forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Women" & bmig == 2, effect("Rate") lcols(diabdur_p ageatt_p)          ///
609 nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid)      ///
610 spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt))  ///
611 xtitle("Rate (per 1,000 person-years)", size(7pt))              ///
612 leftjustify ciopts(lwidth(vthin)) plotid(analysis)            ///
613 box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue))      ///
614 title("BMI ≥25-<30 kg/m{superscript:2}, Women", size(9pt)) name("bmig2_women", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
615
616 forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Women" & bmig == 3, effect("Rate") lcols(diabdur_p ageatt_p)          ///
617 nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid)      ///
618 spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt))  ///
619 xtitle("Rate (per 1,000 person-years)", size(7pt))              ///
620 leftjustify ciopts(lwidth(vthin)) plotid(analysis)            ///
621 box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue))      ///
622 title("BMI ≥30-<35 kg/m{superscript:2}, Women", size(9pt)) name("bmig3_women", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
623
624 forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Women" & bmig == 4, effect("Rate") lcols(diabdur_p ageatt_p)          ///
625 nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid)      ///
626 spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt))  ///
627 xtitle("Rate (per 1,000 person-years)", size(7pt))              ///
628 leftjustify ciopts(lwidth(vthin)) plotid(analysis)            ///
629 box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue))      ///
630 title("BMI ≥35-<40 kg/m{superscript:2}, Women", size(9pt)) name("bmig4_women", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
631
632 forestplot rbmi_est rbmi_lci rbmi_uci if gender == "Women" & bmig == 5, effect("Rate") lcols(diabdur_p ageatt_p)          ///
633 nonull nonames noov nosu nowt dp(1) classic boxscale(35) astext(45) textsize(85) xlabel(0(4)40, labsize(7pt) nogrid)      ///
634 spacing(2.2) yline(2.5(2)22.5, lwidth(vvthin) lpattern(vshortdash)) xtitle("Rate (per 1,000 person-years)", size(7pt))  ///
635 xtitle("Rate (per 1,000 person-years)", size(7pt))              ///
636 leftjustify ciopts(lwidth(vthin)) plotid(analysis)            ///
637 box1opts(mcolor(red)) ci1opts(lcolor(red)) box2opts(mcolor(blue)) ci2opts(lcolor(blue))      ///
638 title("BMI ≥40 kg/m{superscript:2}, Women", size(9pt)) name("bmig5_women", replace) xsize(6.5) ysize(8) scale(0.7) range(0 40) nodraw
639
640 graph combine bmig1_women bmig2_women bmig3_women bmig4_women bmig5_women, ycommon cols(5) xsize(8) ysize(6) nocopies scale(1.05) name("FigS9_women", replace)
641
642 graph combine FigS9_men FigS9_women, ycommon rows(2) xsize(8) ysize(6) nocopies scale(1.05) name("FigS9", replace)
643 graph save "FigS9" "...R1_FigS9.gph", replace
644 graph close _all

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