Socioeconomic Deprivation, Genetic Risk and Incident Dementia
Data Documentation - Matthias Klee 2021-11-13

Contents

Intro

This notebook includes the data documentation to the manuscript *Socioeconomic Deprivation, Genetic Risk and Incident Dementia.*

Folder structure

Folders contained in the project are the following: * ./data should contain prepared data files after fetching, imputing and preprocessing (e.g. genetic risk score computation) * ./plots will contain main figures after running the markdown code * ./code contains scripts including function definitions

Instructions

You have two options to use this data documentation: You can either, * read the already knitted pdf document including all graphs and tables of the main document, * or run the markdown code chunks, thereby retrieving graphs and tables in place.

In the latter case, you need to fetch and preprocess the data yourself. Preprocessing steps involve, amongst other things, application of eligibility criteria, computation of survival times, identification of dementia cases, imputation of missing data, computation of the genetic risk and healthy lifestyle score as well as computation and classification of individual- and area-level socioeconomic deprivation groups. These steps result in 5 equally sized imputed data files (for which results will be pooled) and 1 complete case data file. The 6 files should be stored in ./data. You can then continue to open the markdown file ./20210104_Deprivation_x_Genetics.Rmd and run single chunks consecutively or knit the document at once. Please note the required packages listed below.

- tidyverse
- knitr
- survival
- broom
- mice
- scales
- ggplot2
- datawizard
- haven
- epiR
- ipw
- survey
- cobalt

You can then either load your data following the naming conventions that are illustrated in the code chunk below or adapt the markdown file to match your naming with regard to data files and column names.

Variable	Definition	Type	Scale
f.eid	unique identifier	numeric	continuous
inc.dem2	incident all-cause dementia	numeric	0 / 1
duryears	survival time	numeric	continuous
age	age	numeric	continuous
sex	sex	factor	0 / 1
edu_new	education	factor	high / medium / low / prefer not to answer, none of the above
marital_status	living situation	factor	partner, wife, husband / other
employment_status	retirement status	factor	retired / employed / other
n_ppl_in_hh	number of people living in the household	numeric	continuous
cwlife2	healthy lifestyle	character	favorable / intermediate / unfavorable / prefer not to answer
depress2	depressive symptoms in the last two weeks	factor	never / other
pc1 - 20	principal components of ancestry	numeric	continuous
cnt1	number of SNPs included to compute the polygenic risk score	numeric	continuous
degree3	degree 3 relatedness	factor	0 / 1
Sprs	polygenic risk score	numeric	continuous
score_accommodation_asset	household ownership	factor	0 / 1
score_vehicles	car ownership	factor	0 / 1
score_accommodation_type	household type / living in a house	factor	0 / 1
wwealth	individual socioeconomic deprivation	numeric	continuous
cwwealth_inc	individual socioeconomic deprivation	factor	low deprivation / intermediate deprivation / high deprivation

Variable	Definition	Type	Scale
wealth_Sprs	combined individual socioeconomic deprivation and genetic risk	factor	Q1 (low risk) Q5 (high deprivation) / Q1 (low risk) Q2-4 (intermediate deprivation) / Q1 (low risk) Q1 (low deprivation) / Q2-4 (intermediate risk) Q5 (high deprivation) / Q2-4 (intermediate risk) Q2-4 (intermediate deprivation) / Q2-4 (intermediate risk) Q1 (low deprivation) / Q5 (high risk) Q1 (high deprivation) / Q5 (high risk) Q2-4 (intermediate deprivation) / Q5 (high risk) Q1 (low deprivation))
tdi	Townsend Deprivation Index	numeric	continuous
tdi_bin	area socioeconomic deprivation	factor	Q1-4 / Q5
tdi_Sprs	combined area socioeconomic deprivation and genetic risk	factor	Q1 (low risk) Q1-4 (low-to-moderate deprivation) / Q1 (low risk) Q5 (high deprivation) / Q2-4 (intermediate risk) Q1-4 (low-to-moderate deprivation) / Q2-4 (intermediate risk) Q5 (high deprivation) / Q5 (high risk) Q1-4 (low-to-moderate deprivation) / Q5 (high risk) Q5 (high deprivation))
f.54.2.0	visit location at T2	numeric	11025 / 11026 / 11027 / 11028
f.53.0.0 / f.53.2.0	visit date at T0 (baseline) and T2	date	NA
f.25781.2.0	WMH burden	numeric	continuous
f.25020.2.0	volume of Hippocampus (r)	numeric	continuous
f.25019.2.0	volume of Hippocampus (l)	numeric	continuous
f.25006.2.0	volume of Grey Matter	numeric	continuous
f.25008.2.0	volume of White Matter	numeric	continuous
f.25010.2.0	volume of Whole Brain	numeric	continuous

Analyses

Table 1. Baseline Characteristics of Participants.

Characteristic	Incident Dementia (N = 1769)	No Incident Dementia (N = 194599)
Age (SD)	**65.8 (2.7)**	**64.1 (2.8)**
Sex		
Female	790 (44.7)	102644 (52.8)
Male	979 (55.3)	91955 (47.2)
Education		
High	317 (17.9)	49493 (25.4)
Medium	472 (26.7)	59160 (30.4)
Low	255 (14.4)	30939 (15.9)
Other	725 (41.0)	55007 (28.3)
Married or in a relationship	**1586 (89.7)**	**179256 (92.1)**
Healthy Lifestyle categories		
Favorable	251 (14.2)	39022 (20.1)
Intermediate	1049 (59.3)	116772 (60.0)
Unfavorable	469 (26.5)	38805 (19.9)
Depressive symptoms in last 2 weeks	**411 (23.2)**	**32942 (16.9)**
Individual deprivation quintile		
1 (low)	174 (9.8)	39100 (20.1)
2-4	1037 (58.6)	116784 (60.0)
5 (high)	558 (31.6)	38715 (19.9)
Area deprivation quintile		
1-4 (low-to-moderate)	1266 (71.6)	155829 (80.1)
5 (high)	503 (28.4)	38770 (19.9)
Genetic risk category		
1 (low)	247 (14.0)	39027 (20.1)
2-4	1038 (58.7)	116783 (60.0)
5 (high)	484 (27.4)	38789 (19.9)

Table 2. Risk of Incident Dementia by Area-Level Socioeconomic Deprivation Category

Area-Level Socioeconomic Deprivation	Total No.	No. of dementia cases/person-years	HR (95% CI)	P value
Model 1				
low-to-moderate deprivation	157095	1266 / 1240516	1 [Reference]	
high deprivation	39273	503 / 304799	1.47 (1.32-1.63)	<.001
Model 2				
low-to-moderate deprivation	157095	1266 / 1240516	1 [Reference]	
high deprivation	39273	503 / 304799	1.47 (1.32-1.64)	<.001
Model 3				
low-to-moderate deprivation	157095	1266 / 1240516	1 [Reference]	
high deprivation	39273	503 / 304799	1.28 (1.14-1.43)	<.001

Table 3. Risk of Incident Dementia by Individual-Level Socioeconomic Deprivation Category

Individual-Level Socioeconomic Deprivation	Total No.	No. of dementia cases/person-years	HR (95% CI)	P value	P value for trend
Model 1					
low deprivation	39274	174 / 309221	1 [Reference]		
intermediate deprivation	117821	1042 / 929551	1.63 (1.38-1.93)	<.001	
high deprivation	39273	553 / 306541	2.57 (2.14-3.08)	<.001	<.001
Model 2					
low deprivation	39274	174 / 309221	1 [Reference]		
intermediate deprivation	117821	1042 / 929551	1.63 (1.38-1.93)	<.001	
high deprivation	39273	553 / 306541	2.57 (2.14-3.09)	<.001	<.001
Model 3					
low deprivation	39274	174 / 309221	1 [Reference]		
intermediate deprivation	117821	1042 / 929551	1.62 (1.37-1.92)	<.001	
high deprivation	39273	553 / 306541	2.38 (1.98-2.87)	<.001	<.001

Figure 1. Risk of Incident Dementia for A Area-Level and B Individual-Level Socioeconomic Deprivation with Genetic Risk

Results Table for A

Deprivation and Genetic Risk	Total No. of participants	No. of dementia cases/person-years	HR (95% CI)	Lower CI	Upper CI	P Value
(low risk) (low-to-moderate deprivation)	31648	177 / 249647	1 [Reference]			
(low risk) (high deprivation)	7626	70 / 59124	1.305	0.986	1.729	0.063
(intermediate risk) (low-to-moderate deprivation)	94316	744 / 744724	1.393	1.182	1.642	<.001
(intermediate risk) (high deprivation)	23505	294 / 182389	1.715	1.413	2.08	<.001
(high risk) (low-to-moderate deprivation)	31131	345 / 246144	1.961	1.634	2.352	<.001
(high risk) (high deprivation)	8142	139 / 63285	2.31	1.836	2.907	<.001

Plot for A
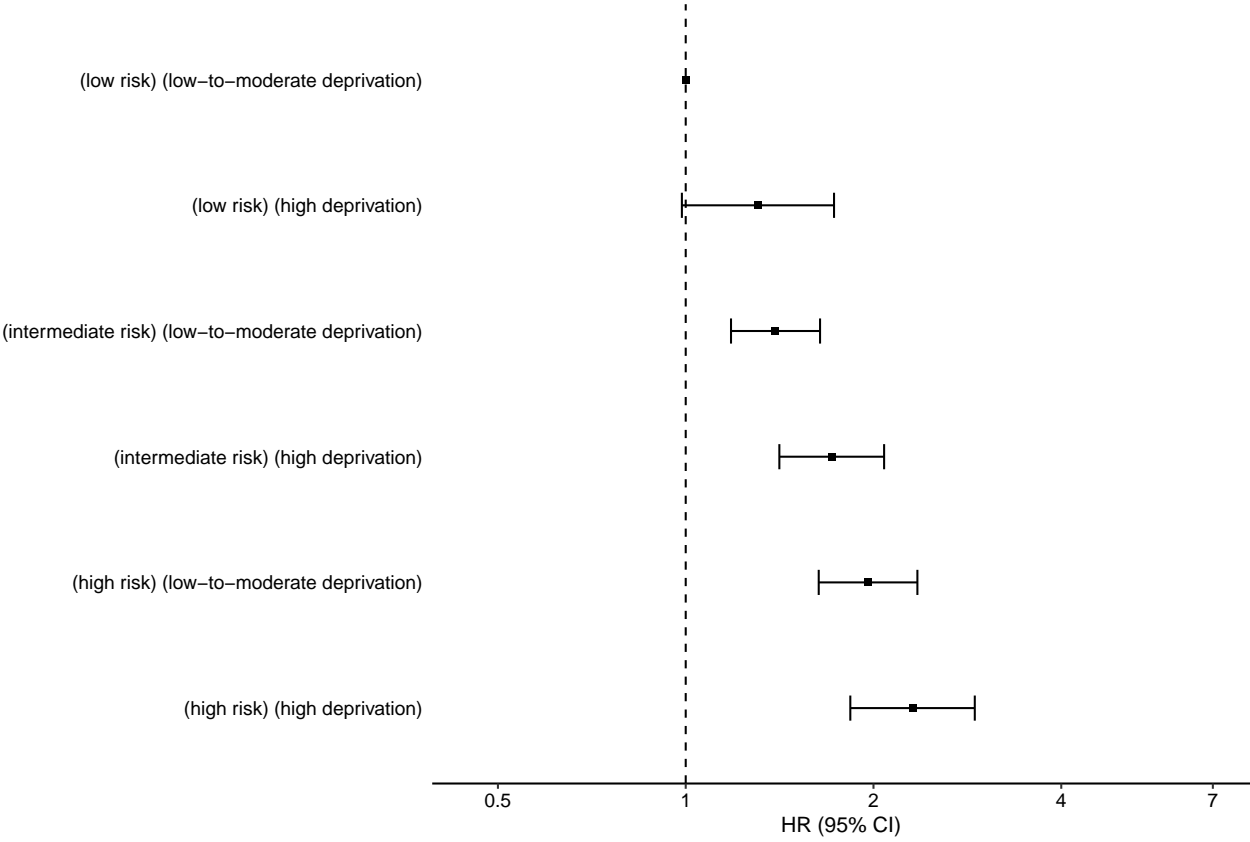
Results Table for B

Deprivation and Genetic Risk	Total No. of participants	No. of dementia cases/person-years	HR (95% CI)	Lower CI	Upper CI	P Value
(low risk) (low deprivation)	8110	25 / 63790	NA	NA	NA	NA
(low risk) (intermediate deprivation)	23624	134 / 186093	1.497	0.973	2.303	0.066
(low risk) (high deprivation)	7540	88 / 58887	2.692	1.709	4.241	<.001
(intermediate risk) (low deprivation)	23417	103 / 184307	1.419	0.916	2.197	0.117
(intermediate risk) (intermediate deprivation)	70774	614 / 558529	2.243	1.499	3.356	<.001
(intermediate risk) (high deprivation)	23630	321 / 184276	3.124	2.06	4.737	<.001
(high risk) (low deprivation)	7747	46 / 61124	1.949	1.197	3.174	0.007
(high risk) (intermediate deprivation)	23423	294 / 184928	3.237	2.144	4.887	<.001
(high risk) (high deprivation)	8103	144 / 63377	4.057	2.631	6.257	<.001

Plot for B
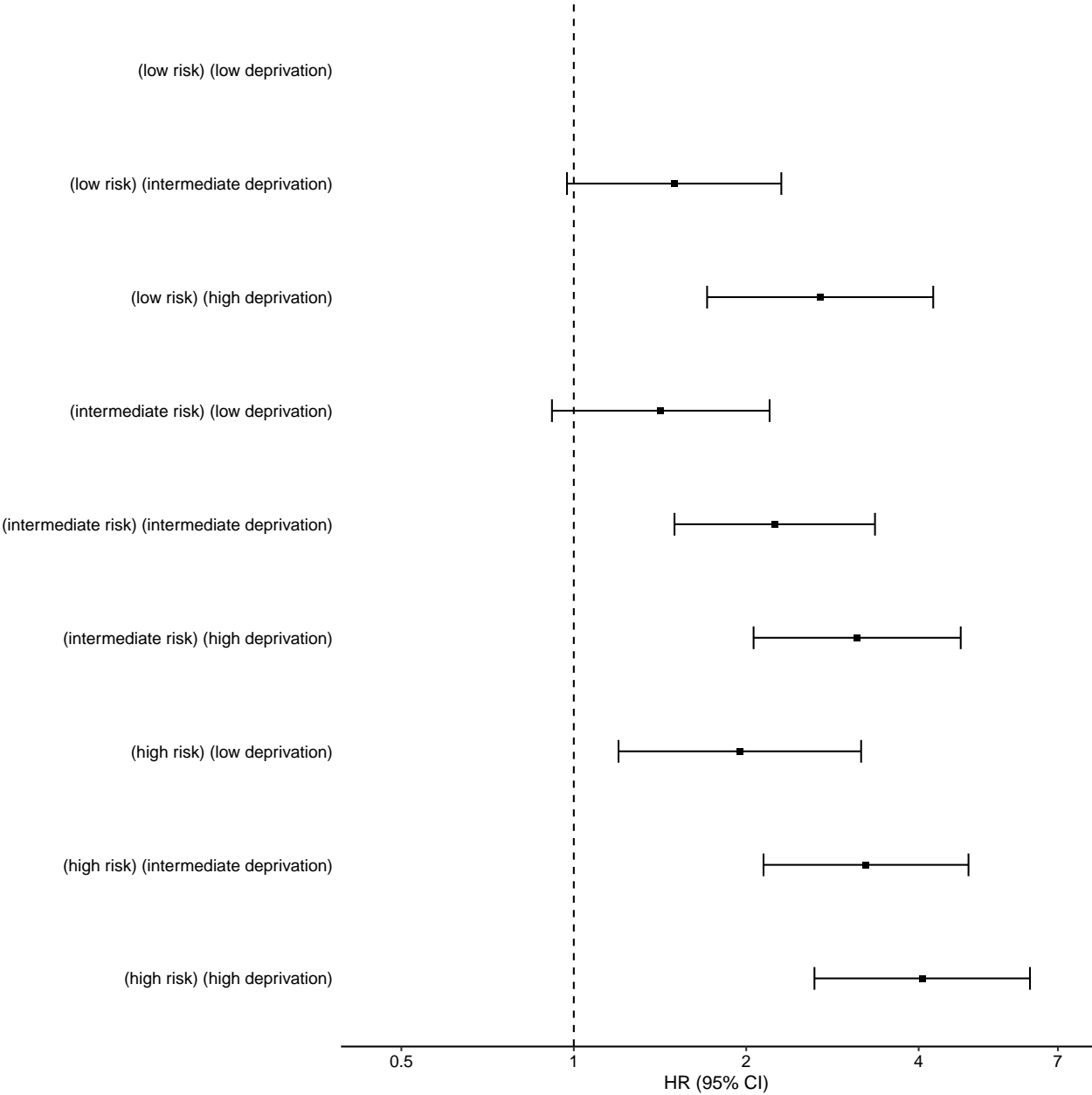
Appendix

eTable 1. Coefficients of Cox Proportional-Hazards Regressions Used for Weighting of the Individual-Level Socioeconomic Deprivation Score

```
## Non-disclosed socioeconomic information included in
##     'other' or as a separate category (for income only)
```

Term	Coefficient (95% CI)	P value	Total
Income			
income greater 31,000	0 [Reference]		53346
income up to 30,999	0.34 (0.18-0.50)	<.001	52834
income up to 18,000	0.48 (0.31-0.65)	<.001	54866
income not disclosed	0.67 (0.50-0.85)	<.001	35322
Housing Type			
house or flat	0 [Reference]		194542
other	0.45 (0.11-0.78)	0.009	1826
Home Ownership			
own outright	0 [Reference]		151971
other	0.35 (0.24-0.46)	<.001	44397
Car Ownership			
one or more	0 [Reference]		179091
other	0.32 (0.18-0.46)	<.001	17277

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## Non-disclosed socioeconomic information excluded
```

Term	Coefficient (95% CI)	P value	Total
Income			
income greater 31,000	0 [Reference]		53146
income up to 30,999	0.38 (0.21-0.54)	<.001	52572
income up to 18,000	0.54 (0.36-0.71)	<.001	54339
Housing Type			
house or flat	0 [Reference]		159059
other	0.74 (0.33-1.14)	<.001	998
Home Ownership			
own outright	0 [Reference]		123790
other	0.39 (0.26-0.52)	<.001	36267
Car Ownership			
one or more	0 [Reference]		146778
other	0.29 (0.12-0.45)	<.001	13279

eTable 2. Total Participants and Incident Dementia Cases in Area-Level Socioeconomic Deprivation Groups

Area-Level Socioeconomic Deprivation	No. of Dementia Cases	Total No.	Absolute Risk	CI Lower	CI Upper	Incidence Rates per 1,000 Person-Years	CI lower	CI upper
low-to-moderate deprivation	1266	157095	0.81	0.76	0.85	1.02	0.97	1.08
high deprivation	503	39273	1.28	1.17	1.40	1.65	1.51	1.80

eTable 3. Total Participants and Incident Dementia Cases in Individual-Level Socioeconomic Deprivation Groups

Individual-Level Socioeconomic Deprivation	No. of Dementia Cases	Total No.	Absolute Risk	CI Lower	CI Upper	Incidence Rates per 1,000 Person-Years	CI lower	CI upper
low deprivation	174	39274	0.44	0.38	0.51	0.56	0.48	0.65
intermediate deprivation	1042	117821	0.88	0.83	0.94	1.12	1.05	1.19
high deprivation	553	39273	1.41	1.29	1.53	1.80	1.66	1.96

eTable 4. Total Participants and Incident Dementia Cases According to Area-Level Socioeconomic Deprivation within Each Genetic Risk Category

Area-Level Socioeconomic Deprivation	Genetic Risk	No. of Dementia Cases	Total No.	Absolute Risk	CI Lower	CI Upper	Incidence Rates per 1,000 Person-Years	CI lower	CI upper
low-to-moderate deprivation	high	345	31131	0.56	0.48	0.65	0.71	0.61	0.82
low-to-moderate deprivation	intermediate	744	94316	0.79	0.73	0.85	1.00	0.93	1.07
low-to-moderate deprivation	low	177	31648	1.11	0.99	1.23	1.40	1.26	1.56
high deprivation	high	139	8142	0.92	0.72	1.16	1.18	0.92	1.50
high deprivation	intermediate	294	23505	1.25	1.11	1.40	1.61	1.43	1.81
high deprivation	low	70	7626	1.71	1.44	2.01	2.20	1.85	2.59

eTable 5. Total Participants and Incident Dementia Cases According to Individual-Level Socioeconomic Deprivation within Each Genetic Risk Category

Individual-Level Socioeconomic Deprivation	Genetic Risk	No. of Dementia Cases	Total No.	Absolute Risk	CI Lower	CI Upper	Incidence Rates per 1,000 Person-Years	CI lower	CI upper
low deprivation	high	46	7747	0.31	0.20	0.45	0.39	0.25	0.58
low deprivation	intermediate	103	23417	0.44	0.36	0.53	0.56	0.46	0.68
low deprivation	low	25	8110	0.59	0.44	0.79	0.75	0.55	1.00
intermediate deprivation	high	294	23423	0.57	0.48	0.67	0.72	0.60	0.85
intermediate deprivation	intermediate	614	70774	0.87	0.80	0.94	1.10	1.01	1.19
intermediate deprivation	low	134	23624	1.26	1.12	1.41	1.59	1.41	1.78
high deprivation	high	144	8103	1.17	0.94	1.44	1.49	1.20	1.84
high deprivation	intermediate	321	23630	1.36	1.21	1.51	1.74	1.56	1.94
high deprivation	low	88	7540	1.78	1.50	2.09	2.27	1.92	2.67

eTables 6-11. Coefficients for Multivariable Linear Regressions of Grey Matter Volume in Imputed and Complete-Case Data with Full and Reduced Deconfounding Set

Imputed Data

Log-transformed WMH burden

Variable = f.25781.2.0 (Total No. = 11035)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	0.04 (-0.01-0.09)	0.03	0.085
	Individual deprivation high	0.10 (0.01-0.19)	0.04	0.033
	Area deprivation high	0.07 (0.01-0.14)	0.04	0.032
SIMPLE Confounders	Individual deprivation intermediate	0.05 (0.00-0.10)	0.03	0.044
	Individual deprivation high	0.10 (0.01-0.19)	0.04	0.031
	Area deprivation high	0.08 (0.01-0.15)	0.04	0.031

Right hippocampus volume

Variable = f.25020.2.0 (Total No. = 10838)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.04 (-0.09-0.01)	0.03	0.148
	Individual deprivation high	-0.01 (-0.10-0.08)	0.05	0.877
	Area deprivation high	-0.04 (-0.11-0.03)	0.04	0.266
SIMPLE Confounders	Individual deprivation intermediate	-0.03 (-0.09-0.02)	0.03	0.182
	Individual deprivation high	-0.00 (-0.09-0.09)	0.05	0.935
	Area deprivation high	-0.04 (-0.11-0.03)	0.04	0.260

Left hippocampus volume

Variable = f.25019.2.0 (Total No. = 10920)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.05 (-0.10-0.00)	0.03	0.055
	Individual deprivation high	-0.01 (-0.10-0.09)	0.04	0.912
	Area deprivation high	-0.06 (-0.13-0.01)	0.04	0.078
SIMPLE Confounders	Individual deprivation intermediate	-0.05 (-0.10-0.00)	0.03	0.059
	Individual deprivation high	-0.01 (-0.09-0.08)	0.04	0.908
	Area deprivation high	-0.06 (-0.13-0.01)	0.04	0.074

Whole brain volume

Variable = f.25010.2.0 (Total No. = 11035)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.03 (-0.08-0.02)	0.03	0.300
	Individual deprivation high	-0.03 (-0.12-0.06)	0.05	0.493
	Area deprivation high	-0.05 (-0.12-0.02)	0.04	0.187
SIMPLE Confounders	Individual deprivation intermediate	-0.03 (-0.08-0.02)	0.03	0.250
	Individual deprivation high	-0.03 (-0.12-0.06)	0.04	0.464
	Area deprivation high	-0.05 (-0.12-0.02)	0.04	0.168

White matter volume

Variable = f.25008.2.0 (Total No. = 11039)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	0.01 (-0.04-0.06)	0.03	0.821
	Individual deprivation high	-0.02 (-0.10-0.07)	0.04	0.670
	Area deprivation high	0.02 (-0.05-0.09)	0.04	0.589
SIMPLE Confounders	Individual deprivation intermediate	-0.00 (-0.05-0.05)	0.03	0.914
	Individual deprivation high	-0.02 (-0.10-0.06)	0.04	0.596
	Area deprivation high	0.02 (-0.05-0.09)	0.04	0.633

Grey matter volume

Variable = f.25006.2.0 (Total No. = 11018)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.05 (-0.10–0.00)	0.03	0.043
	Individual deprivation high	-0.04 (-0.14-0.05)	0.05	0.347
	Area deprivation high	-0.11 (-0.18–0.03)	0.04	0.004
SIMPLE Confounders	Individual deprivation intermediate	-0.05 (-0.10-0.00)	0.03	0.066
	Individual deprivation high	-0.04 (-0.14-0.05)	0.05	0.387
	Area deprivation high	-0.11 (-0.18–0.04)	0.04	0.004

Complete Cases

Log-transformed WMH burden

```
## Variable = f.25781.2.0 (Total No. = 8131)
```

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	0.05 (-0.01-0.10)	0.03	0.083
	Individual deprivation high	0.06 (-0.06-0.17)	0.06	0.343
	Area deprivation high	0.07 (-0.03-0.16)	0.05	0.173
SIMPLE Confounders	Individual deprivation intermediate	0.06 (0.00-0.12)	0.03	0.038
	Individual deprivation high	0.06 (-0.06-0.17)	0.06	0.327
	Area deprivation high	0.07 (-0.03-0.17)	0.05	0.155

Right hippocampus volume

Variable = f.25020.2.0 (Total No. = 7999)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.04 (-0.10-0.02)	0.03	0.163
	Individual deprivation high	0.03 (-0.08-0.15)	0.06	0.554
	Area deprivation high	-0.00 (-0.09-0.09)	0.04	0.997
SIMPLE Confounders	Individual deprivation intermediate	-0.04 (-0.09-0.02)	0.03	0.199
	Individual deprivation high	0.04 (-0.07-0.15)	0.06	0.496
	Area deprivation high	0.00 (-0.09-0.09)	0.04	0.982

Left hippocampus volume

Variable = f.25019.2.0 (Total No. = 8056)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.03 (-0.08-0.03)	0.03	0.321
	Individual deprivation high	0.07 (-0.04-0.18)	0.06	0.217
	Area deprivation high	-0.05 (-0.14-0.04)	0.05	0.287
SIMPLE Confounders	Individual deprivation intermediate	-0.03 (-0.08-0.03)	0.03	0.368
	Individual deprivation high	0.07 (-0.04-0.18)	0.06	0.216
	Area deprivation high	-0.05 (-0.14-0.04)	0.05	0.260

Whole brain volume

`## Variable = f.25010.2.0 (Total No. = 8139)`

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.02 (-0.08-0.03)	0.03	0.391
	Individual deprivation high	0.08 (-0.03-0.18)	0.05	0.151
	Area deprivation high	-0.00 (-0.09-0.09)	0.04	0.937
SIMPLE Confounders	Individual deprivation intermediate	-0.03 (-0.08-0.03)	0.03	0.312
	Individual deprivation high	0.07 (-0.03-0.18)	0.05	0.165
	Area deprivation high	0.00 (-0.09-0.09)	0.04	0.990

White matter volume

Variable = f.25008.2.0 (Total No. = 8140)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	0.02 (-0.04-0.07)	0.03	0.496
	Individual deprivation high	0.06 (-0.04-0.17)	0.05	0.256
	Area deprivation high	0.02 (-0.08-0.11)	0.05	0.738
SIMPLE Confounders	Individual deprivation intermediate	0.01 (-0.04-0.06)	0.03	0.750
	Individual deprivation high	0.06 (-0.05-0.16)	0.05	0.301
	Area deprivation high	0.02 (-0.07-0.12)	0.05	0.648

Grey matter volume

Variable = f.25006.2.0 (Total No. = 8128)

Set	Term	Coefficient (95% CI)	SE	P value
Basic Confounders	Individual deprivation intermediate	-0.06 (-0.12–0.01)	0.03	0.031
	Individual deprivation high	0.03 (-0.07-0.14)	0.05	0.546
	Area deprivation high	-0.04 (-0.13-0.06)	0.05	0.430
SIMPLE Confounders	Individual deprivation intermediate	-0.06 (-0.12–0.00)	0.03	0.046
	Individual deprivation high	0.04 (-0.07-0.14)	0.05	0.496
	Area deprivation high	-0.04 (-0.13-0.06)	0.05	0.431

eTable 12. Risk of Incident Dementia According to Combined Area-Level Socioeconomic Deprivation and Genetic Risk in Complete-Case Data

Genetic risk and deprivation	Total No. of participants	No. of dementia cases/person-years	HR (95% CI)	P value
(low risk) (low-to-moderate deprivation)	22154	120 / 173636	1 [Reference]	
(low risk) (high deprivation)	3875	31 / 29809	1.26 (0.85-1.88)	0.249
(intermediate risk) (low-to-moderate deprivation)	66516	488 / 521545	1.34 (1.10-1.64)	0.004
(intermediate risk) (high deprivation)	11927	138 / 92019	1.76 (1.37-2.25)	<.001
(high risk) (low-to-moderate deprivation)	21778	215 / 171055	1.81 (1.45-2.27)	<.001
(high risk) (high deprivation)	4055	50 / 31449	1.80 (1.29-2.52)	<.001

eTable 13. Risk of Incident Dementia According to Combined Individual-Level Socioeconomic Deprivation and Genetic Risk in Complete-Case Data

Genetic risk and deprivation	Total No. of participants	No. of dementia cases/person-years	HR (95% CI)	P value
(low risk) (low deprivation)	6849	23 / 53656	1 [Reference]	
(low risk) (intermediate deprivation)	15696	89 / 122655	1.37 (0.86-2.17)	0.184
(low risk) (high deprivation)	3484	39 / 27133	2.29 (1.36-3.86)	0.002
(intermediate risk) (low deprivation)	19790	84 / 155026	1.26 (0.79-2.00)	0.328
(intermediate risk) (intermediate deprivation)	47819	399 / 374404	1.97 (1.29-3.01)	0.002
(intermediate risk) (high deprivation)	10834	143 / 84132	2.75 (1.75-4.31)	<.001
(high risk) (low deprivation)	6554	39 / 51460	1.80 (1.07-3.01)	0.026
(high risk) (intermediate deprivation)	15593	174 / 122193	2.63 (1.69-4.08)	<.001
(high risk) (high deprivation)	3686	52 / 28852	2.89 (1.75-4.76)	<.001

eTable 14. Risk of Dementia According to Area-Level Socioeconomic Deprivation in Subgroups Stratified by Genetic Risk

Area-Level Socioeconomic Deprivation	Total No.	No. of dementia cases/person-years	HR (95% CI)	P value
Model Low risk				
low-to-moderate deprivation	31648	177 / 249647	1 [Reference]	
high deprivation	7626	70 / 59124	1.18 (0.87-1.61)	0.287
Model Intermediate risk				
low-to-moderate deprivation	94316	744 / 744724	1 [Reference]	
high deprivation	23505	294 / 182389	1.29 (1.11-1.50)	<.001
Model High risk				
low-to-moderate deprivation	31131	345 / 246144	1 [Reference]	
high deprivation	8142	139 / 63285	1.32 (1.06-1.64)	0.014

eTable 15. Risk of Dementia According to Individual-Level Socioeconomic Deprivation in Subgroups Stratified by Genetic Risk

Individual-Level Socioeconomic Deprivation	Total No.	No. of dementia cases/person-years	HR (95% CI)	P value	P value for trend
Model Low risk					
low deprivation	8110	25 / 63790	1 [Reference]		
intermediate deprivation	23624	134 / 186093	1.50 (0.96-2.35)	0.074	
high deprivation	7540	88 / 58887	2.73 (1.66-4.50)	<.001	<.001
Model Intermediate risk					
low deprivation	23417	103 / 184307	1 [Reference]		
intermediate deprivation	70774	614 / 558529	1.61 (1.29-2.00)	<.001	
high deprivation	23630	321 / 184276	2.34 (1.83-2.99)	<.001	<.001
Model High risk					
low deprivation	7747	46 / 61124	1 [Reference]		
intermediate deprivation	23423	294 / 184928	1.72 (1.25-2.38)	<.001	
high deprivation	8103	144 / 63377	2.31 (1.61-3.32)	<.001	<.001

eTable 16. Risk of Dementia According to Area-Level Socioeconomic Deprivation in Subgroups Stratified by Sex

Area-Level Socioeconomic Deprivation	Total No.	No. of dementia cases/person-years	HR (95% CI)	P value
Model Female				
low-to-moderate deprivation	82938	569 / 659247	1 [Reference]	
high deprivation	20496	221 / 161207	1.25 (1.05-1.48)	0.011
Model Male				
low-to-moderate deprivation	74157	697 / 581268	1 [Reference]	
high deprivation	18777	282 / 143591	1.31 (1.12-1.53)	<.001

eTable 17. Risk of Dementia According to Individual-Level Socioeconomic Deprivation in Subgroups Stratified by Sex

Individual-Level Socioeconomic Deprivation	Total No.	No. of dementia cases/person-years	HR (95% CI)	P value	P value for trend
Model Female					
low deprivation	16617	57 / 131217	1 [Reference]		
intermediate deprivation	65137	467 / 517550	1.51 (1.14-2.00)	0.004	
high deprivation	21680	266 / 171687	2.29 (1.68-3.13)	<.001	<.001
Model Male					
low deprivation	22657	117 / 178004	1 [Reference]		
intermediate deprivation	52684	575 / 412001	1.71 (1.39-2.10)	<.001	
high deprivation	17593	287 / 134854	2.44 (1.92-3.11)	<.001	<.001

eTable 18. Proportion of Individual-Level Socioeconomic Deprivation Across Lifestyle Categories in Complete-Case Data and Imputed Data for the Full Sample and Imaging Subsample

Full Sample

Complete Cases

Lifestyle	Total	High deprivation	Low deprivation	Intermediate deprivation
Favorable	32761	20.08	19.79	60.13
Intermediate	98104	15.99	22.94	61.06
Unfavorable	32559	22.19	20.94	56.87
NA	31914	30.00	10.21	59.79

Imputed Data

Lifestyle	Total	High deprivation	Low deprivation	Intermediate deprivation
Favorable	39273	17.69	17.44	64.87
Intermediate	117821	18.84	20.90	60.26
Unfavorable	39274	25.78	19.88	54.35

Imaging Subset

Complete Cases

Lifestyle	Total	High deprivation	Low deprivation	Intermediate deprivation
Favorable	2033	12.20	29.27	58.53
Intermediate	6123	7.92	33.68	58.40
Unfavorable	1626	8.30	37.70	54.00
NA	1248	15.14	19.39	65.46

Imputed Data

| Lifestyle	Total	High deprivation	Low deprivation	Intermediate deprivation
Favorable	2244	11.54	26.52	61.94
Intermediate	6898	10.42	32.53	57.05
Unfavorable	1941	11.44	36.32	52.24

eFigure 1. Risk of Incident Dementia According to Area-Level Socioeconomic Deprivation Quintiles
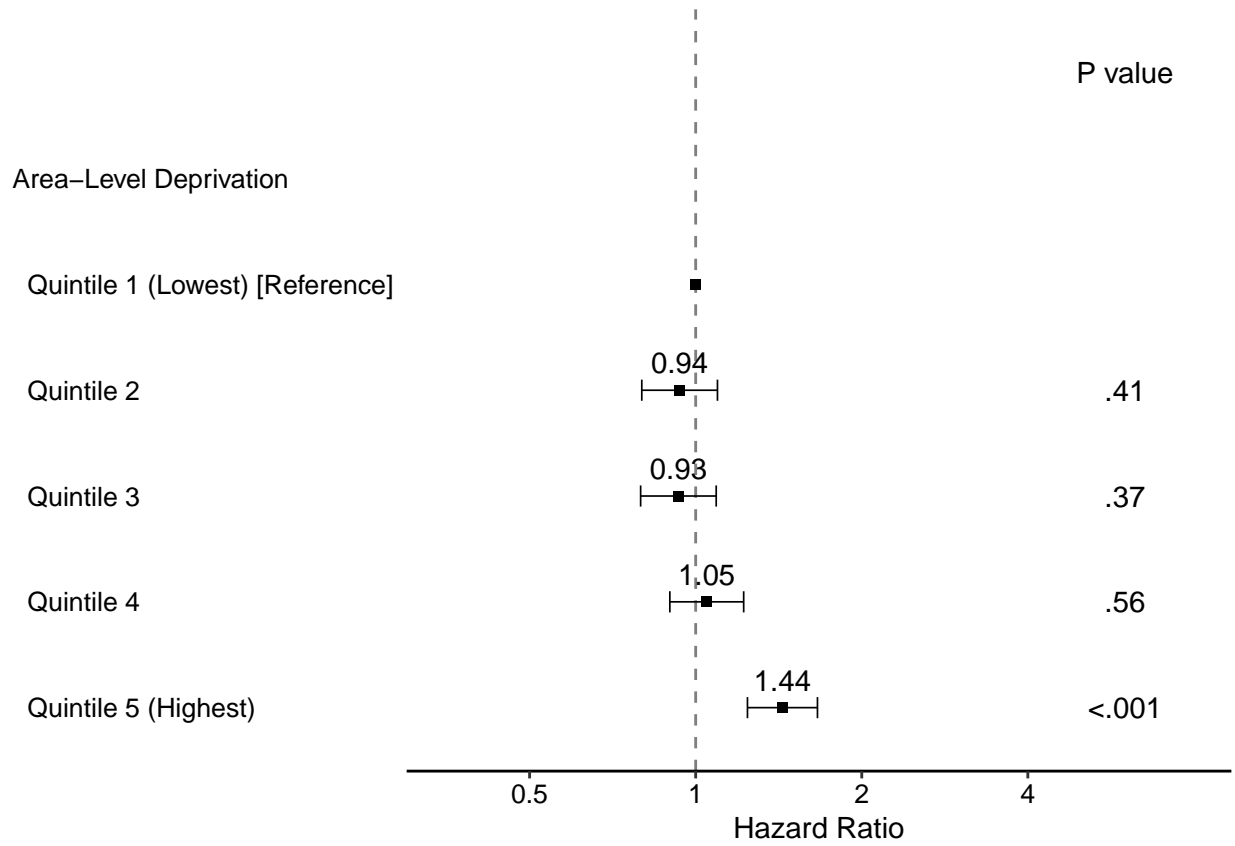
eFigure 2. Proportion of Missing Data Prior to Imputation
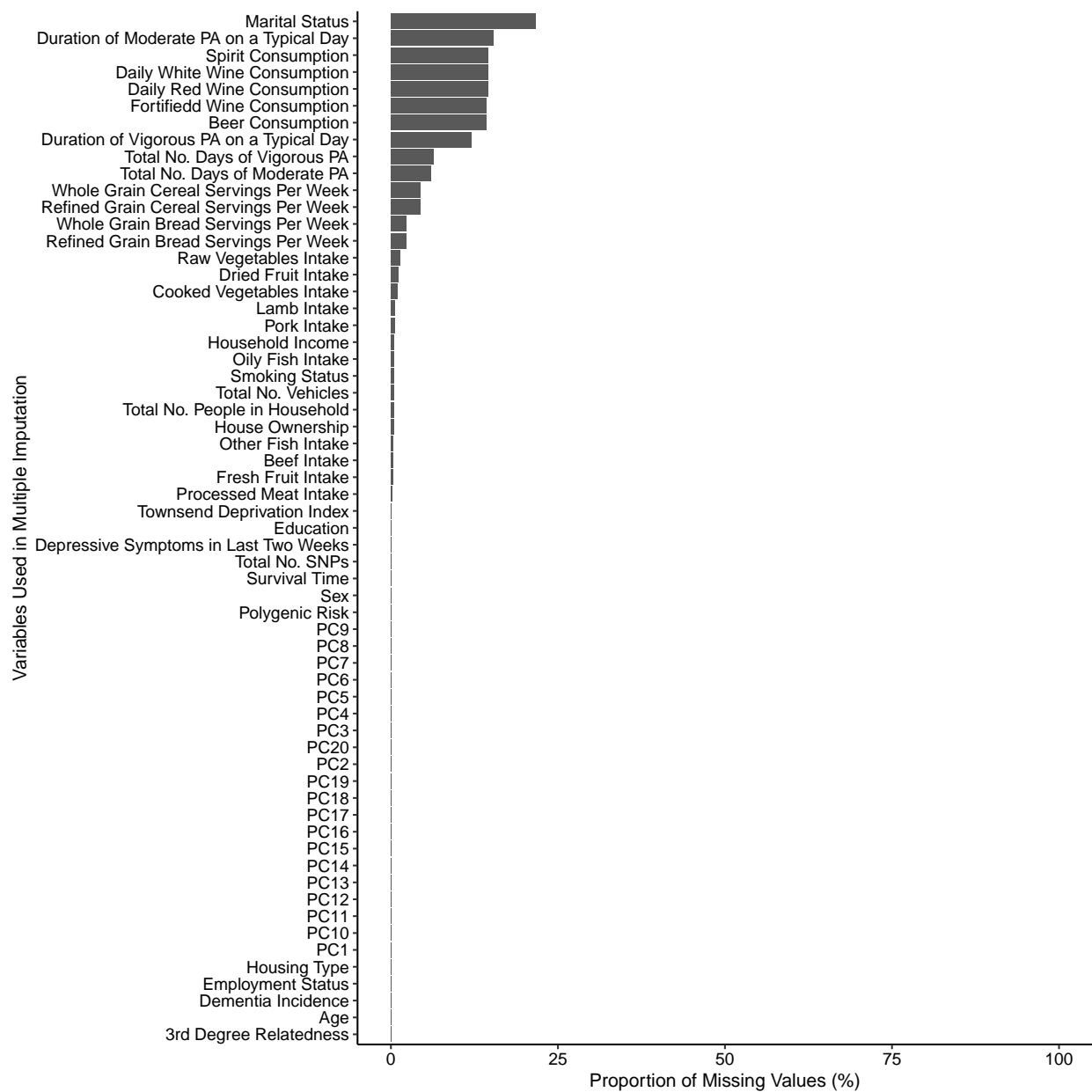
eFigure 3. Risk of Incident Dementia by Area-Level Socioeconomic Deprivation and Genetic Risk Including Interaction Terms
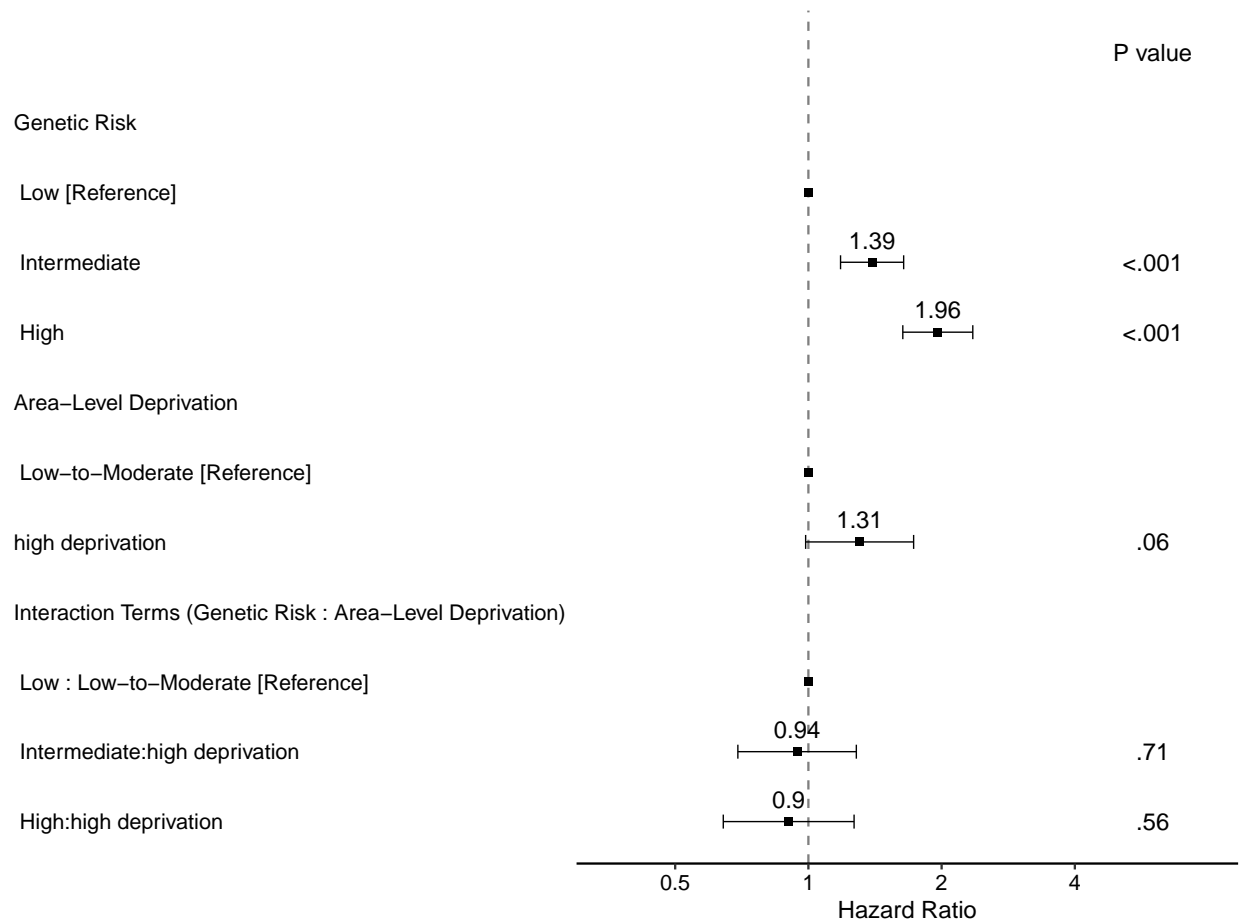
eFigure 4. Risk of Incident Dementia by Individual-Level Socioeconomic Deprivation and Genetic Risk Including Interaction Terms