

Supplemental Table 1: Descriptions and International Classification of Diseases (ICD) codes for dementia and risk factors

Condition/risk factor	Description
Dementia	ICD coded diagnoses: 331.0, 290.4x, 438.0, 331.82, 331.1x, 294.0, 294.1x, 294.8, 331.5-331.7, 331.8x, 781.8, 294.2x, 294.9, G30.x, F01.x, I69.x, G31.83, F02.80, G31.0x, F02.8x, F04, G31.85, G91.2, G94, R41.4, F03.9x, F01.Ax, F01.Bx, F01.Cx, F02.Ax, F02.Bx, F02.Cx, F03.Ax, F03.Bx, F03.Cx
Cardiovascular disease	ICD-coded diagnoses: 410x, 411x, 413x, 414x, 428x, I50x, I20x, I21x, I22x, I24x, I25x And/or cardiovascular disease-related procedure: Coronary Artery Bypass Grafting (CABG), Percutaneous Coronary Intervention (PCI).
Cerebrovascular disease	ICD-coded diagnoses: 430, 431, 432x-438x, I60x, I61x, I62x, I63x, I66x, I67x, I68x
Diabetes mellitus	ICD-coded diagnoses: 250.x, E10x, E11x, E13x
Dyslipidemia	ICD-coded diagnoses: 272x, E78x
Hypertension	ICD-coded diagnoses: 401x-405x, I10, I11, I11.0, I11.9, I12, I12.0, I12.9, I13, I13.0, I13.1, I13.10, I13.11, I13.2, I15, I15, I15.1, I15.2, I15.8, I15.9
Depression	ICD-coded diagnoses: 296.2x, 296.3x, 296.82, 298.0x, 300.4x, 301.12, 311x, F32x, F33x, F34x
Substance use disorder	ICD-coded diagnoses: 291x, 292x, 303x, 304x, 305.0x, 305.2-305.9, F10x, F11x-F19x
Smoking status	Patient-reported history of smoking.

Supplemental Table 2. Incidence of dementia by HIV status, overall, by race/ethnicity, and by sex: Kaiser Permanente, 2000-2023

	Age and sex standardized incidence rate^a (sIR, cases per 1,000 person-years)	
	People with HIV	People without HIV
Full cohort without dementia diagnosis at baseline	N=24,395	N=492,585
2000-2004	11.08 (9.34, 13.06)	2.53 (2.35, 2.73)
2005-2009	6.48 (5.45, 7.65)	2.33 (2.20, 2.47)
2010-2014	4.97 (4.26, 5.77)	2.15 (2.05, 2.25)
2015-2019	2.91 (2.49, 3.39)	1.70 (1.63, 1.77)
2020-2023	2.29 (1.89, 2.74)	1.54 (1.48, 1.62)
Average % change in sIR per period ^b	-7.68 (-8.82, -6.56)	-2.70 (-3.91, -1.24)
By race/ethnicity		
Black	N=5,627	N=113,505
2000-2004	11.32 (7.39, 16.65)	2.51 (2.09, 3.00)
2005-2009	5.86 (3.82, 8.55)	2.99 (2.66, 3.35)
2010-2014	5.38 (3.84, 7.28)	2.56 (2.32, 2.81)
2015-2019	4.05 (2.97, 5.36)	2.18 (2.00, 2.36)
2020-2023	2.76 (1.83, 3.94)	2.26 (2.06, 2.46)
Average % change in sIR per period ^b	-6.10 (-7.58, -4.46)	-1.41 (-3.73, 1.53)
Hispanic	N=4,971	N=100,217
2000-2004	13.02 (7.69, 20.79)	2.29 (1.83, 2.84)

2005-2009	4.92 (2.86, 7.97)	1.82 (1.52, 2.16)
2010-2014	3.68 (2.22, 5.77)	1.99 (1.74, 2.26)
2015-2019	2.08 (1.31, 3.15)	1.67 (1.50, 1.85)
2020-2023	2.37 (1.60, 3.38)	1.40 (1.26, 1.55)
Average % change in sIR per period ^b	-7.68 (-13.62, -0.29)	-2.28 (-3.51, -0.47)
White	N=11,068	N=224,070
2000-2004	10.67 (8.38, 13.41)	2.50 (2.25, 2.77)
2005-2009	6.48 (5.08, 8.13)	2.21 (2.03, 2.40)
2010-2014	5.12 (4.13, 6.28)	2.09 (1.95, 2.23)
2015-2019	2.91 (2.30, 3.62)	1.56 (1.47, 1.66)
2020-2023	2.25 (1.68, 2.95)	1.38 (1.28, 1.47)
Average % change in sIR per period ^b	-7.60 (-9.64, -5.58)	-3.18 (-4.22, -2.02)
By sex		
Men	N=21,202	N=428,033
2000-2004	11.32 (9.48, 13.43)	2.50 (2.30, 2.71)
2005-2009	6.44 (5.36, 7.68)	2.33 (2.19, 2.48)
2010-2014	4.84 (4.10, 5.68)	2.13 (2.02, 2.24)
2015-2019	2.90 (2.45, 3.42)	1.68 (1.60, 1.76)
2020-2023	2.23 (1.81, 2.71)	1.54 (1.46, 1.62)
Average % change in sIR per period ^b	-7.87 (-8.86, -6.91)	-2.70 (-4.17, -0.94)
Women	N=3,193	N=64,552
2000-2004	8.91 (4.26, 16.40)	2.87 (2.24, 3.62)
2005-2009	6.98 (3.99, 11.32)	2.29 (1.89, 2.74)
2010-2014	6.14 (3.97, 9.08)	2.32 (2.01, 2.65)

2015-2019	3.04 (1.88, 4.64)	1.88 (1.67, 2.12)
2020-2023	2.82 (1.70, 4.36)	1.61 (1.44, 1.81)
Average % change in sIR per period ^b	-6.32 (-8.74, -3.60)	-2.74 (-3.43, -1.84)

^a Incidence estimates were standardized to the overall age and sex distribution in the time period 2000-2004.

^b Average % change in sIR per period was calculated using Joinpoint regression (Joinpoint Regression Program, version 5.3.0).

Supplemental Table 3. Prevalence ratios comparing dementia by HIV status, race/ethnicity, and sex

	People with HIV N=24,762		People without HIV N=494,963		Unadjusted PR (95% CI)	Adjusted PR (95% CI)^a
	Cases	Total N	Cases	Total N		
Full cohort						
2000-2004	225	4667	1077	93299	4.18 (3.63-4.81)	3.27 (2.79-3.83)
2005-2009	345	7262	2241	145369	3.08 (2.76-3.44)	2.40 (2.11-2.73)
2010-2014	509	10879	3872	215778	2.61 (2.38-2.85)	2.13 (1.92-2.36)
2015-2019	593	15300	5818	300216	2.00 (1.84-2.17)	1.80 (1.65-1.97)
2020-2023	602	15715	7062	305701	1.66 (1.53-1.80)	1.59 (1.46-1.73)
All periods combined	1,186	24,762	11,806	494,963	2.01 (1.89-2.13)	1.71 (1.61-1.82)
By race/ethnicity						
Asian						
2000-2004	b	b	b	b	b	b
2005-2009						
2010-2014						
2015-2019						
2020-2023						
All periods combined	19	949	287	18,962	1.32 (0.84-2.09)	0.88 (0.52-1.46)
Black						
2000-2004	42	843	221	16860	3.80 (2.75-5.25)	3.47 (2.38-5.05)
2005-2009	72	1483	541	29751	2.67 (2.10-3.40)	2.38 (1.82-3.11)
2010-2014	118	2377	1040	47539	2.27 (1.88-2.73)	1.99 (1.62-2.45)

2015-2019	148	3566	1657	71052	1.78 (1.51-2.10)	1.73 (1.46-2.06)
2020-2023	159	3837	2175	75703	1.44 (1.23-1.69)	1.48 (1.26-1.72)
All periods combined	289	5,713	3,416	114,244	1.69 (1.50-1.90)	1.61 (1.43-1.80)
Hispanic						
2000-2004	39	664	135	13279	5.78 (4.08-8.18)	4.95 (3.37-7.29)
2005-2009	48	1183	270	23429	3.52 (2.60-4.76)	3.05 (2.23-4.18)
2010-2014	67	1992	514	38395	2.51 (1.96-3.23)	1.96 (1.50-2.58)
2015-2019	86	3249	867	61706	1.88 (1.51-2.34)	1.50 (1.19-1.90)
2020-2023	95	3539	1017	65978	1.74 (1.42-2.14)	1.52 (1.23-1.89)
All periods combined	173	5,029	1,611	100,579	2.15 (1.84-2.51)	1.72 (1.45-2.03)
White						
2000-2004	114	2388	563	47760	4.05 (3.33-4.93)	2.94 (2.37-3.65)
2005-2009	182	3654	1154	73617	3.18 (2.73-3.70)	2.31 (1.94-2.77)
2010-2014	276	5610	1982	111382	2.76 (2.44-3.13)	2.20 (1.92-2.53)
2015-2019	317	7320	2896	143909	2.15 (1.92-2.41)	1.93 (1.70-2.18)
2020-2023	312	6948	3390	136601	1.81 (1.62-2.03)	1.73 (1.54-1.95)
All periods combined	607	11,257	5,834	225,140	2.08 (1.92-2.26)	1.72 (1.58-1.87)
By sex						
Men						
2000-2004	209	4220	962	84359	4.34 (3.75-5.03)	3.49 (2.97-4.11)
2005-2009	314	6457	2004	129217	3.14 (2.79-3.52)	2.47 (2.17-2.83)
2010-2014	450	9630	3387	190466	2.63 (2.39-2.89)	2.11 (1.89-2.36)
2015-2019	513	13390	5018	261517	2.00 (1.83-2.18)	1.82 (1.66-2.00)
2020-2023	512	13539	5992	261688	1.65 (1.51-1.80)	1.60 (1.46-1.75)

All periods combined	1,031	21,513	10,212	430,021	2.02 (1.90-2.15)	1.70 (1.59-1.82)
Women						
2000-2004	16	447	115	8940	2.78 (1.66-4.65)	2.08 (1.16-3.75)
2005-2009	31	805	237	16152	2.62 (1.82-3.79)	1.87 (1.25-2.81)
2010-2014	59	1249	485	25312	2.47 (1.89-3.21)	2.24 (1.69-2.96)
2015-2019	80	1918	800	38699	2.03 (1.62-2.54)	1.69 (1.30-2.20)
2020-2023	90	2176	1070	44013	1.70 (1.38-2.10)	1.54 (1.22-1.96)
All periods combined	155	3,249	1,594	64,942	1.94 (1.65-2.28)	1.66 (1.40-1.97)

^a Adjusted for attained age, sex, race/ethnicity, neighborhood-level education, cardiovascular disease, cerebrovascular disease, diabetes, dyslipidemia, hypertension, depression, substance use disorders, ever smoking, KP region, insurance type, and number of healthcare encounters in the year before baseline.

^b Insufficient case counts to complete analyses by period

Supplemental Table 4. Sensitivity analyses of incidence rate ratios comparing dementia in people with and without HIV

	Incidence rate ratio (95% CI)			
	Excluding people with detectable HIV RNA or not on ART at baseline		Excluding people with nadir CD4 <200 cells/μl at baseline	
	Unadjusted	Adjusted^a	Unadjusted	Adjusted^a
2000-2004	2.96 (2.21-3.98)	2.72 (1.99-3.72)	3.79 (3.06-4.70)	3.31 (2.62-4.19)
2005-2009	2.10 (1.63-2.71)	2.16 (1.66-2.82)	2.20 (1.76-2.73)	2.06 (1.63-2.61)
2010-2014	1.54 (1.24-1.90)	1.82 (1.47-2.27)	1.80 (1.49-2.17)	1.76 (1.44-2.14)
2015-2019	1.14 (0.94-1.38)	1.60 (1.32-1.94)	1.28 (1.06-1.53)	1.44 (1.20-1.74)
2020-2023	0.88 (0.72-1.06)	1.23 (1.01-1.49)	0.96 (0.80-1.16)	1.04 (0.86-1.26)
All periods combined	1.30 (1.18-1.44)	1.45 (1.31-1.60)	1.55 (1.43-1.70)	1.53 (1.40-1.67)

^a Adjusted for attained age, sex, race/ethnicity, neighborhood-level education, cardiovascular disease, cerebrovascular disease, diabetes, dyslipidemia, hypertension, ever smoking, depression, substance use disorders, ever smoking, KP region, insurance type, and number of healthcare encounters in the year before baseline.

Supplemental Table 5. Sensitivity analyses of prevalence ratios comparing dementia in people with and without HIV

	Prevalence ratio (95% CI)			
	Excluding people with detectable HIV RNA or not on ART at baseline		Excluding people with nadir CD4 <200 cells/μl at baseline	
	Unadjusted	Adjusted ^a	Unadjusted	Adjusted ^a
2000-2004	3.74 (3.04-4.60)	2.81 (2.23-3.55)	3.37 (2.82-4.02)	2.72 (2.22-3.34)
2005-2009	2.86 (2.46-3.33)	2.47 (2.10-2.91)	2.72 (2.37-3.13)	2.17 (1.84-2.56)
2010-2014	2.32 (2.07-2.60)	2.22 (1.97-2.51)	2.22 (1.98-2.49)	1.84 (1.61-2.10)
2015-2019	1.77 (1.60-1.96)	1.88 (1.69-2.09)	1.63 (1.47-1.81)	1.52 (1.35-1.70)
2020-2023	1.44 (1.31-1.59)	1.68 (1.53-1.86)	1.38 (1.25-1.53)	1.37 (1.24-1.52)
All periods combined	1.64 (1.52-1.77)	1.48 (1.37-1.60)	1.65 (1.54-1.78)	1.44 (1.33-1.55)

^a Adjusted for attained age, sex, race/ethnicity, neighborhood-level education, cardiovascular disease, cerebrovascular disease, diabetes, dyslipidemia, hypertension, depression, substance use disorders, ever smoking, KP region, insurance type, and number of outpatient visits in the year before baseline.

Supplemental Table 6. Dementia types identified at incident dementia diagnosis and among prevalent cases in the most recent time period (2020-2023), by HIV status

Dementia type	Incident cases^a		Prevalent cases (2020-2023)^b	
	With HIV n (%)	Without HIV n (%)	With HIV n (%)	Without HIV n (%)
Alzheimer's disease	15 (1.7)	900 (8.5)	29 (3.7)	1,218 (11.4)
Vascular dementia	112 (12.9)	1,916 (18.1)	105 (13.3)	1,974 (18.5)
Parkinson's dementia	4 (0.5)	74 (0.7)	4 (0.5)	112 (1.1)
Dementia with Lewy bodies	4 (0.5)	74 (0.7)	1 (0.1)	86 (0.8)
Frontotemporal dementia	1 (0.1)	50 (0.5)	0 (0.0)	71 (0.7)
Other specified dementia	351 (40.3)	3,050 (28.8)	286 (36.3)	2,698 (25.3)
Unspecified dementia	383 (44.0)	4,543 (42.8)	363 (46.1)	4,500 (42.2)

^a Dementia type(s) recorded at incident diagnosis for 819 people with HIV and 9,428 people without HIV. Individuals could have more than one dementia type diagnosed; all diagnoses were counted.

^b Dementia type(s) among 602 people with HIV and 7,062 living with dementia in the most recent time period. Individuals could have more than one dementia type; all diagnoses were counted.