



IMPACT DU TABAGISME SUR L'ÉPIDÉMIOLOGIE DES AVC

APPORTS DU REGISTRE DIJONNAIS DES AVC

YANNICK BÉJOT
(DIJON)





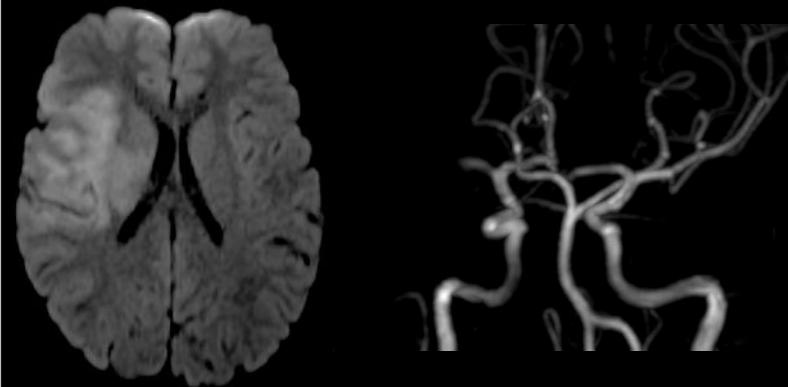
LIENS D'INTÉRÊT

CONSULTING FEES/HONORARIA: BMS, PFIZER, MEDTRONIC, AMGEN, SERVIER, NOVONORDISK

SANS LIEN DIRECT AVEC CETTE PRÉSENTATION

LES ACCIDENTS VASCULAIRES CÉRÉBRAUX ARTÉRIELS

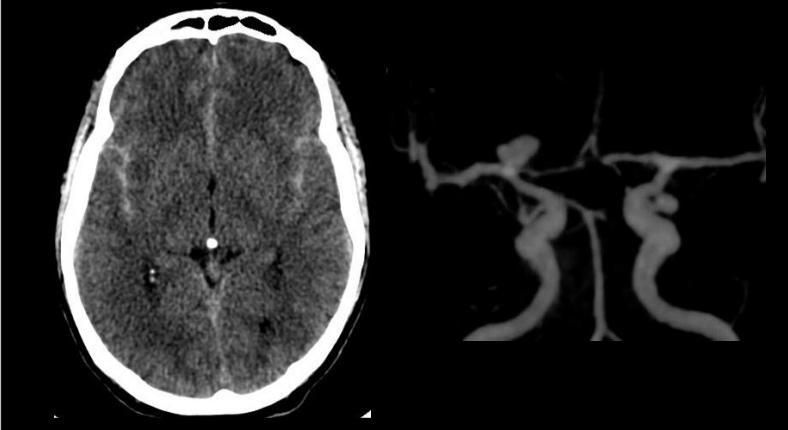
Infarctus cérébraux (80%)



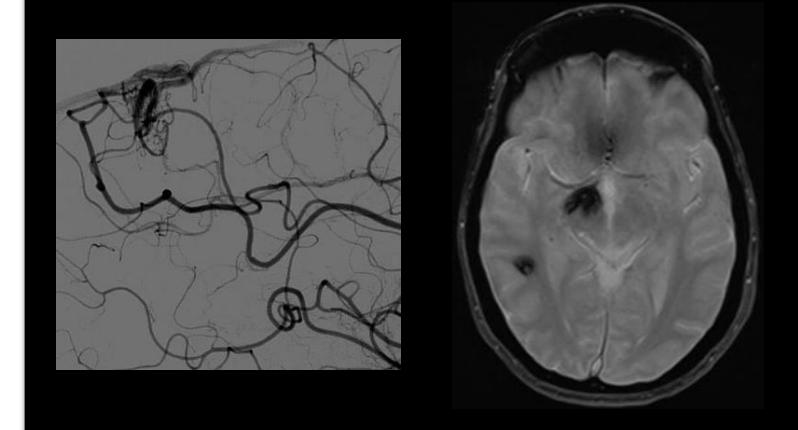
HIC spontanées (15%)



HSA (< 5%)



HIC liées à malformations (<5%)



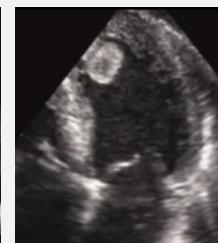
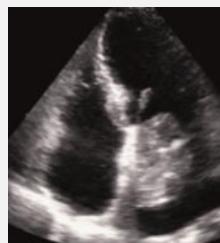
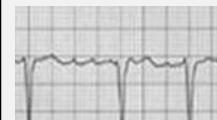
CLASSIFICATION ÉTIOLOGIQUE DES INFARCTUS CÉRÉBRAUX

TOAST classification

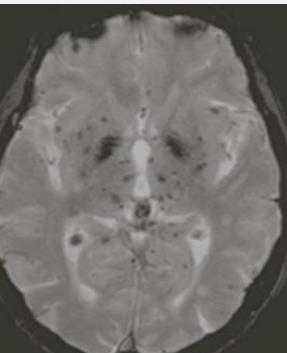
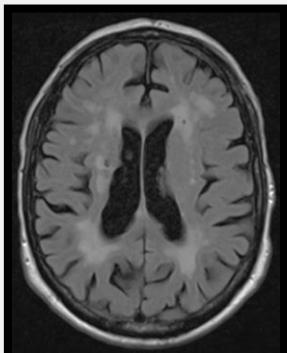
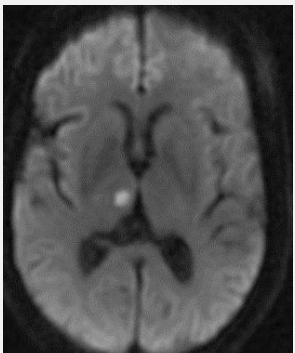
**Large artery atheroma with stenosis
> 50% or occlusion**



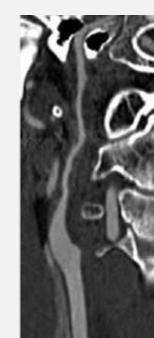
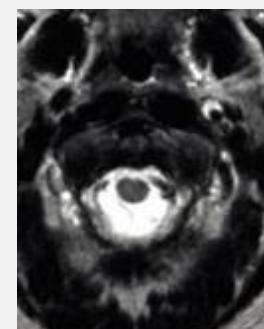
Cardiac embolism



Small vessel disease

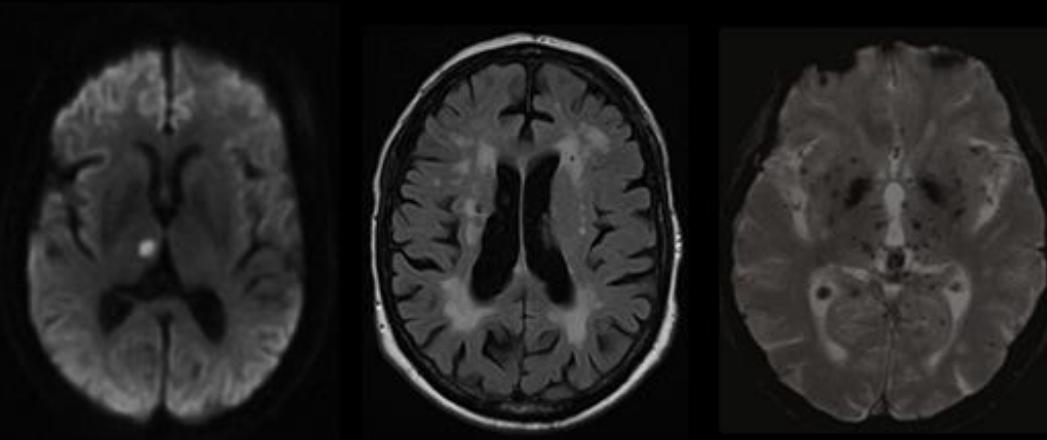


Other causes

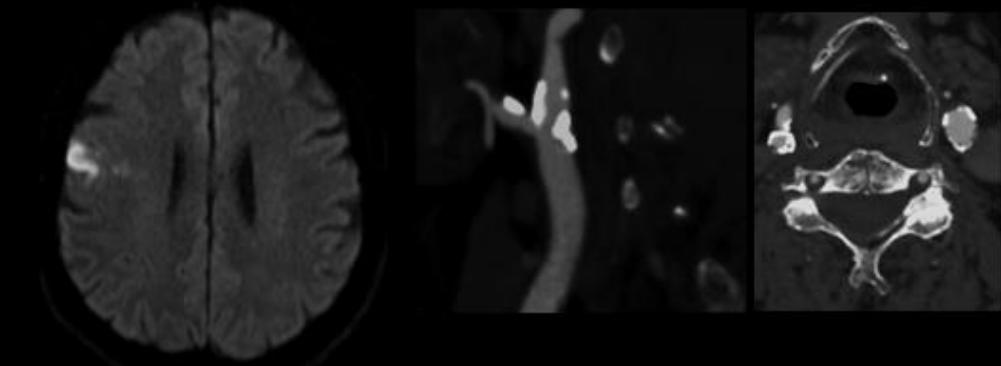


EXEMPLES D'INFARCTUS CÉRÉBRAUX

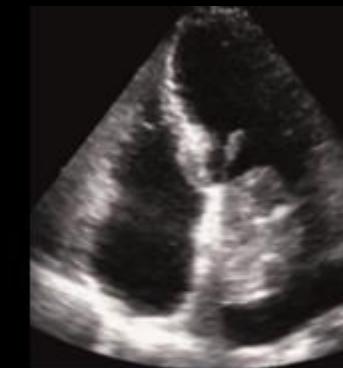
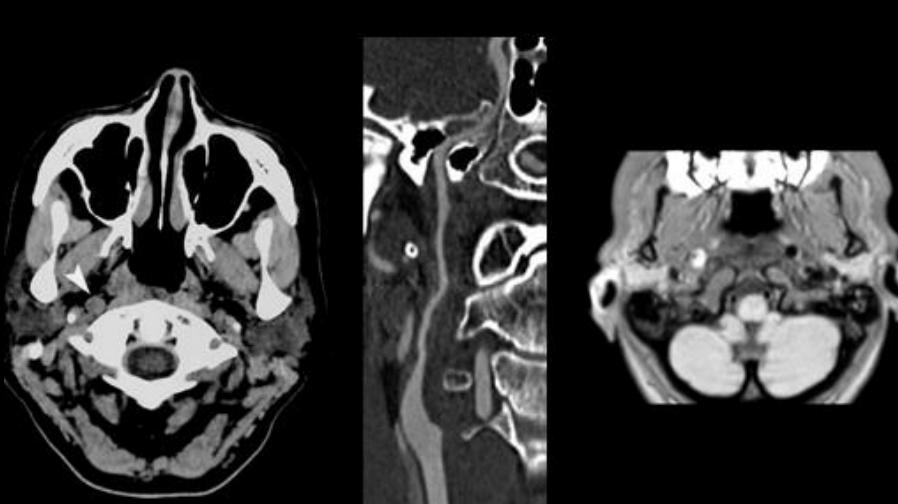
Lacunar stroke in a patient with small vessels disease



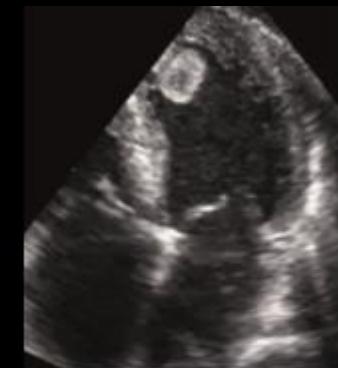
Ischemic stroke of the right MCA territory in a patient right ICA stenosis



Right ICA dissection



Atrial myxoma



LV thrombus



Infective endocarditis

TABAC ET RISQUE D'AVC

Méta-analyse de 26 études - 3,734,216 individus

Luo J. *Front. Neurol.* 2022;12:772373

Stroke risk compared to never smokers

OR= **1.45** (95% CI: 1.24–1.70) among ever smokers

OR= **1.90** (95% CI: 1.55–2.34) among current smokers

OR= 1.06 (95% CI: 0.99–1.2) among former smokers

Ischemic stroke, compared to never smokers

OR= **1.55** (95% CI: 1.26–1.91) among ever smokers

OR= **2.09** (95% CI: 1.74–2.50) among current smokers

OR= **1.05** (95% CI: 1.00–1.11) among former smokers



Subarachnoid hemorrhage, compared to never smokers

OR= **2.13** (95% CI: 1.60–2.85) among ever smokers

OR= **3.39** (95% CI: 2.59–4.45) among current smokers

OR= **1.23** (95% CI: 1.02–1.45) among former smokers



Intracerebral hemorrhage, compared to never smokers

OR= **1.25** (95% CI: 1.03–1.50) among ever smokers

OR= **1.61** (95% CI: 1.17–2.23) among current smokers

OR= 0.97 (95% CI: 0.84–1.13) among former smokers

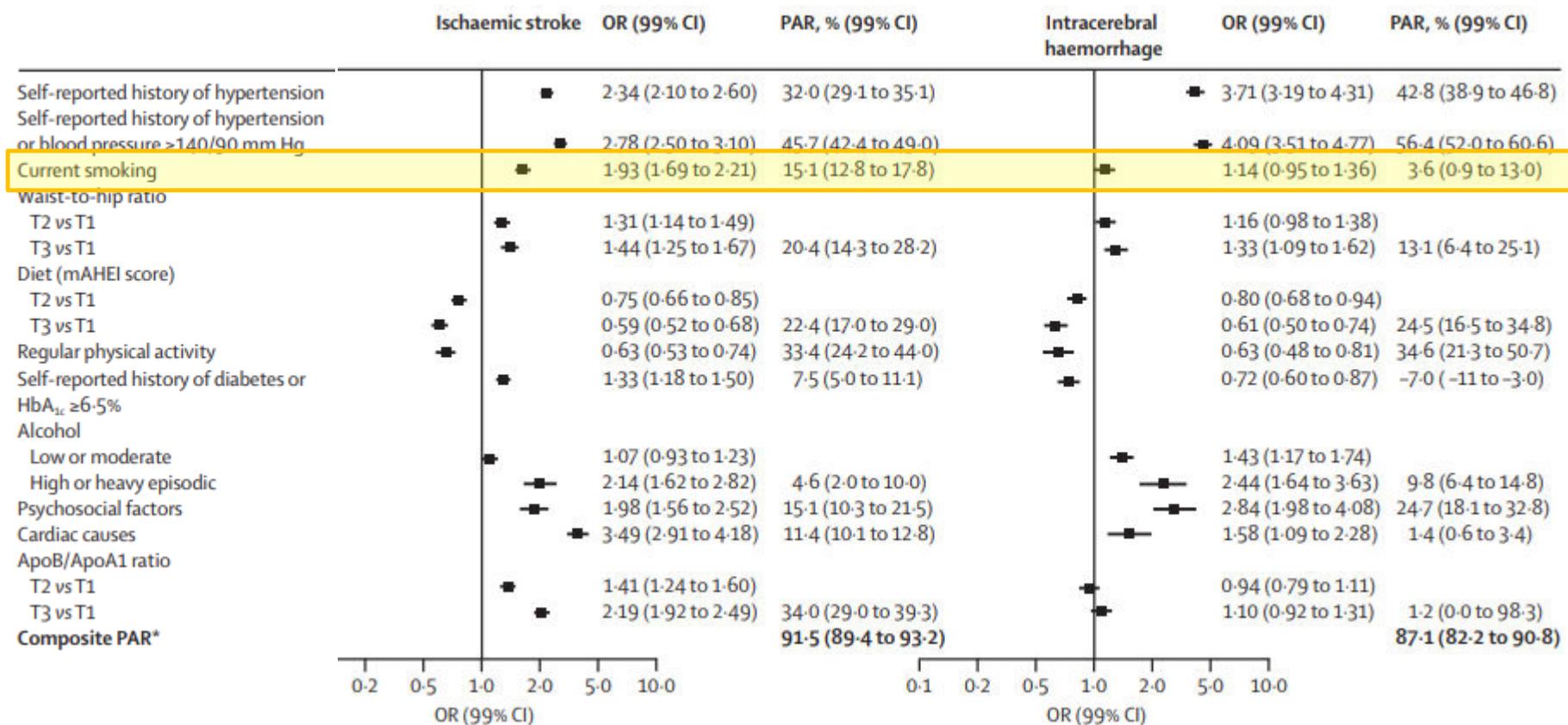


TABAC ET RISQUE D'AVC

INTERSTROKE Study

Etude Cas-contrôles; 26919 participants dans 32 pays

O'Donnell MJ. Lancet 2016;388: 761–75



TABAC ET RISQUE D'AVC

Global Burden of Disease Study

Feigin VL. Lancet Neurol 2016; 15: 913–24

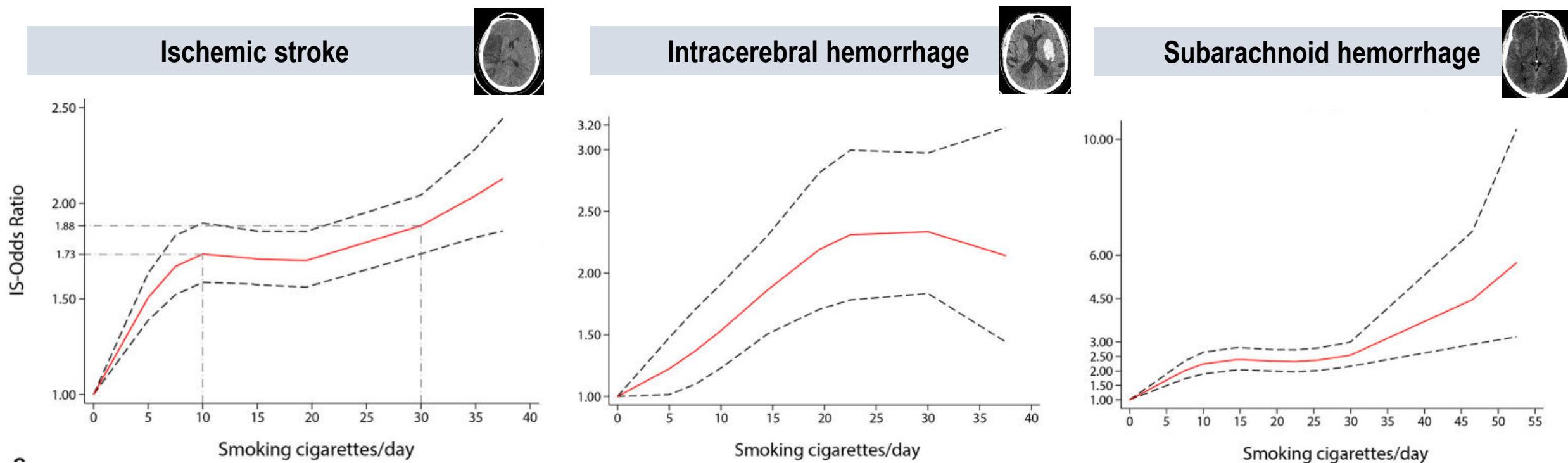
	Global	High-income Asia Pacific	Western Europe	Australasia	High-income North America	Central Europe	Southern Latin America	Eastern Europe	East Asia	Tropical Latin America	Central Latin America	Southeast Asia	Central Asia	Andean Latin America	North Africa and Middle East	Caribbean	South Asia	Oceania	Southern sub-Saharan Africa	Eastern sub-Saharan Africa	Central sub-Saharan Africa	Western sub-Saharan Africa
Rank	1–5	6–10	11–15	>15																		
Risk factor																						
High systolic blood pressure	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diet low in fruits	2	2	4	4	3	4	4	3	2	3	4	2	2	3	3	3	2	3	2	2	2	2
High body-mass index	3	6	2	2	2	2	2	2	6	2	2	6	3	2	2	2	8	2	3	5	5	4
Diet high in sodium	4	3	6	10	6	3	8	6	3	4	8	8	4	7	4	12	5	13	7	9	11	8
Smoking	5	4	5	5	5	6	5	5	4	6	6	4	6	6	8	5	7	5	5	8	10	12
Diet low in vegetables	6	5	3	3	4	5	3	4	11	5	3	3	5	4	5	4	4	4	4	4	4	5
Ambient particulate matter (2·5 µm) pollution	7	8	11	14	12	8	12	10	5	9	9	9	8	9	6	11	6	15	11	12	6	6
Household air pollution from solid fuels	8	..	..	..	..	..	15	..	7	14	12	5	12	11	14	7	3	6	8	3	3	3
Diet low in whole grains	9	7	9	8	9	7	6	7	8	7	5	7	7	5	7	6	10	7	10	10	7	9
High fasting plasma glucose	10	10	10	9	7	11	7	9	9	8	7	10	9	10	9	10	9	8	9	11	8	11
Low physical activity	11	9	8	6	8	10	11	11	13	11	13	11	13	12	10	8	12	9	13	14	12	10
Low glomerular filtration rate	12	12	7	7	13	9	10	12	14	10	10	14	10	8	11	9	11	12	6	7	9	7
Alcohol use	13	11	12	11	10	12	9	8	12	12	11	15	11	14	16	15	15	11	12	13	14	14
Lead exposure	14	14	14	13	15	14	16	15	10	15	16	12	14	15	13	13	13	14	14	6	13	13
High total cholesterol	15	13	13	12	11	13	13	13	16	13	14	13	15	13	12	14	14	10	15	15	15	15
Second-hand smoke	16	15	15	15	16	15	14	14	15	16	17	16	16	17	15	17	16	16	16	16	16	16
Diet high in sugar-sweetened beverages	17	16	16	16	14	16	17	16	17	17	15	17	17	16	17	16	17	17	17	17	17	17

TABAC ET RISQUE D'AVC

Méta-analyse de 26 études - 3,734,216 individus

Luo J. *Front. Neurol.* 2022;12:772373

Effet Dose

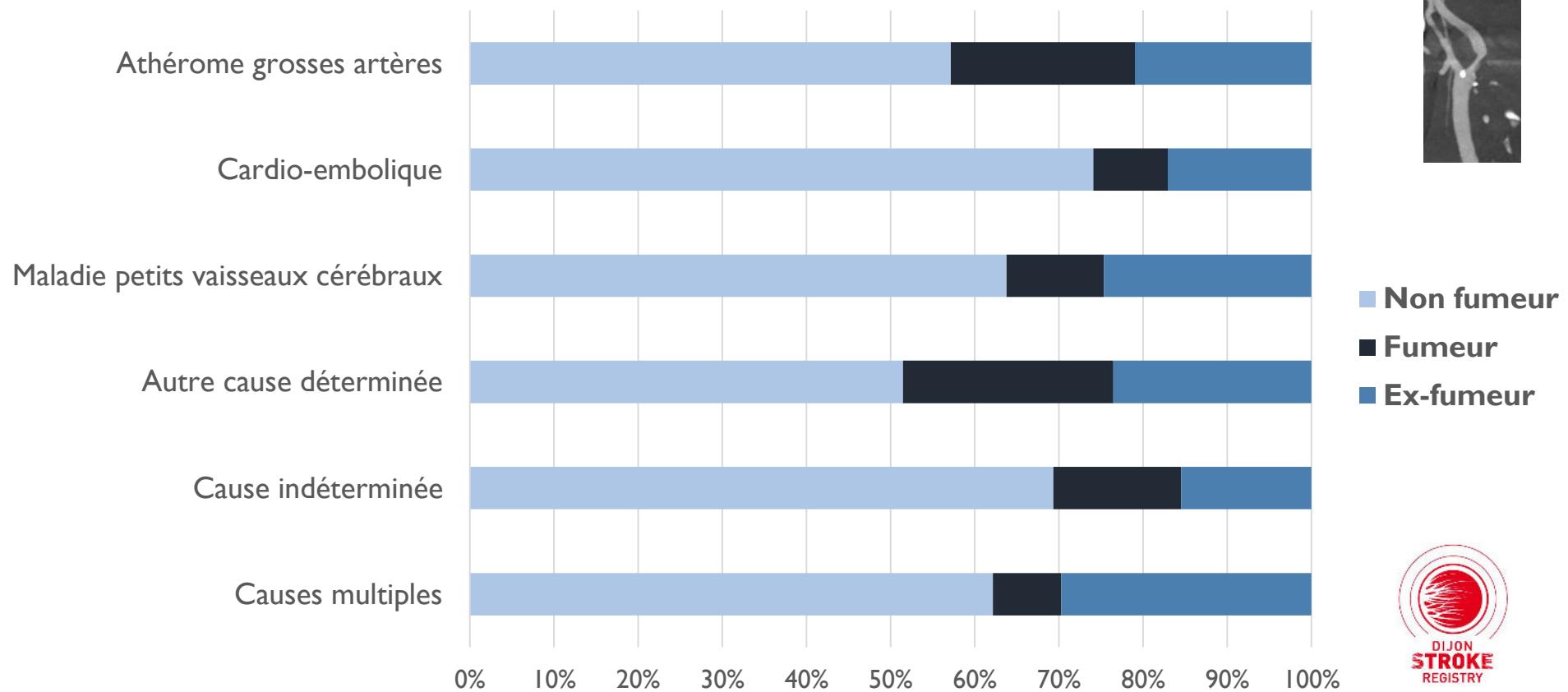


TABAGISME CHEZ LES PATIENTS AVEC INFARCTUS CEREBRAL

Registre Dijonnais des AVC
Période 2013-2017

Unpublished data

Distribution selon le mécanisme étiologique



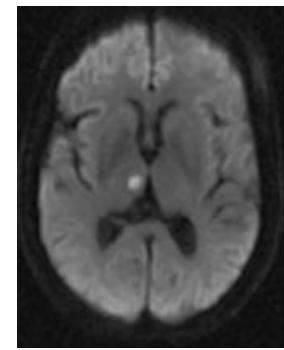
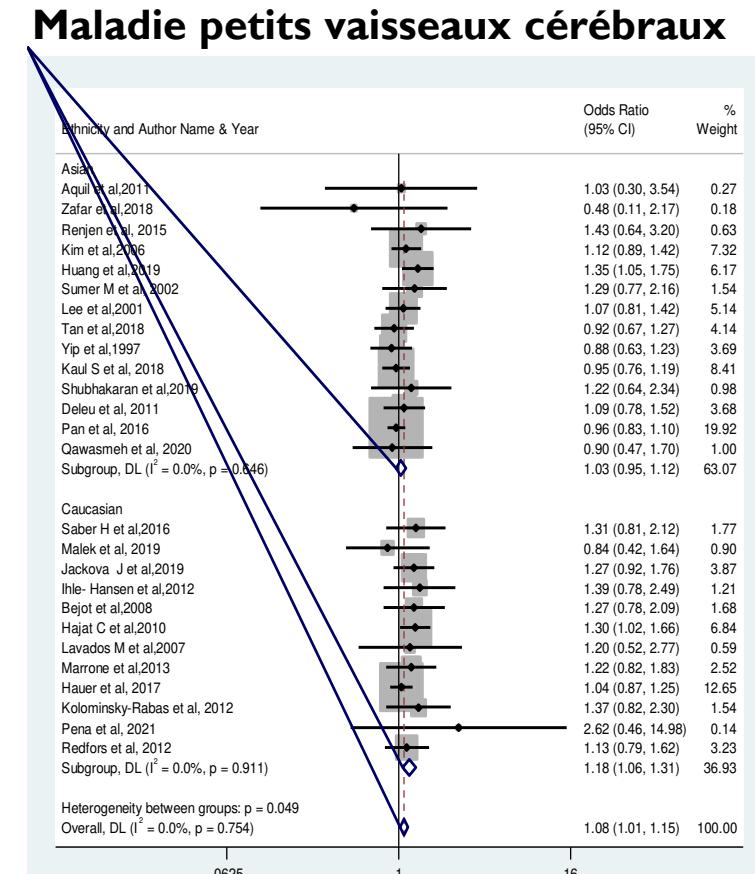
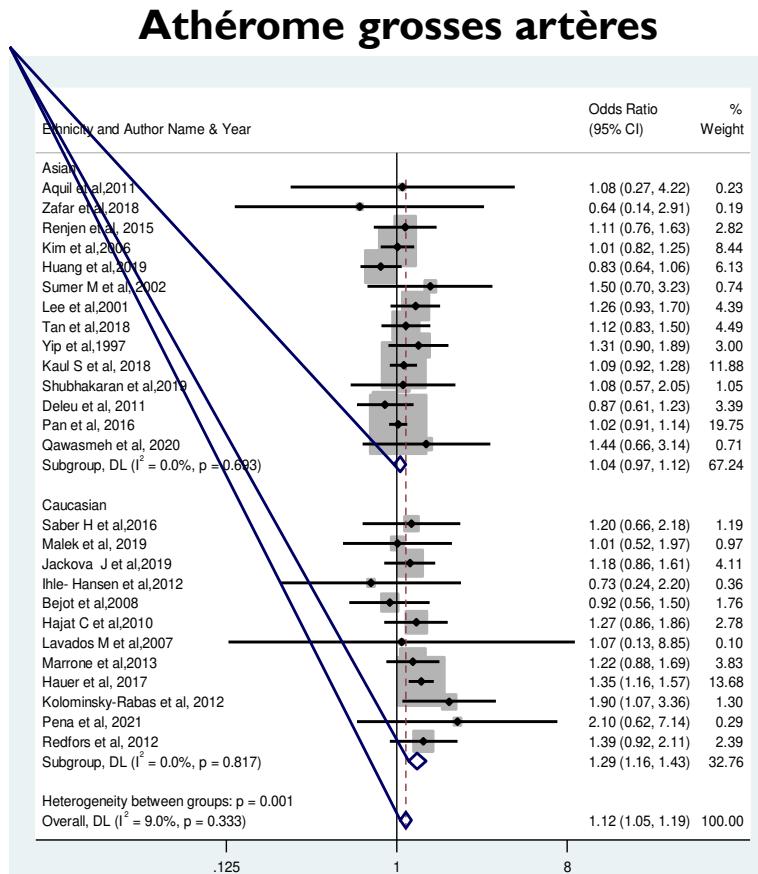
- Non fumeur
- Fumeur
- Ex-fumeur



TABAGISME CHEZ LES PATIENTS AVEC INFARCTUS CEREBRAL

Méta-analyse

32 études totalisant 23,404 infarctus cérébraux

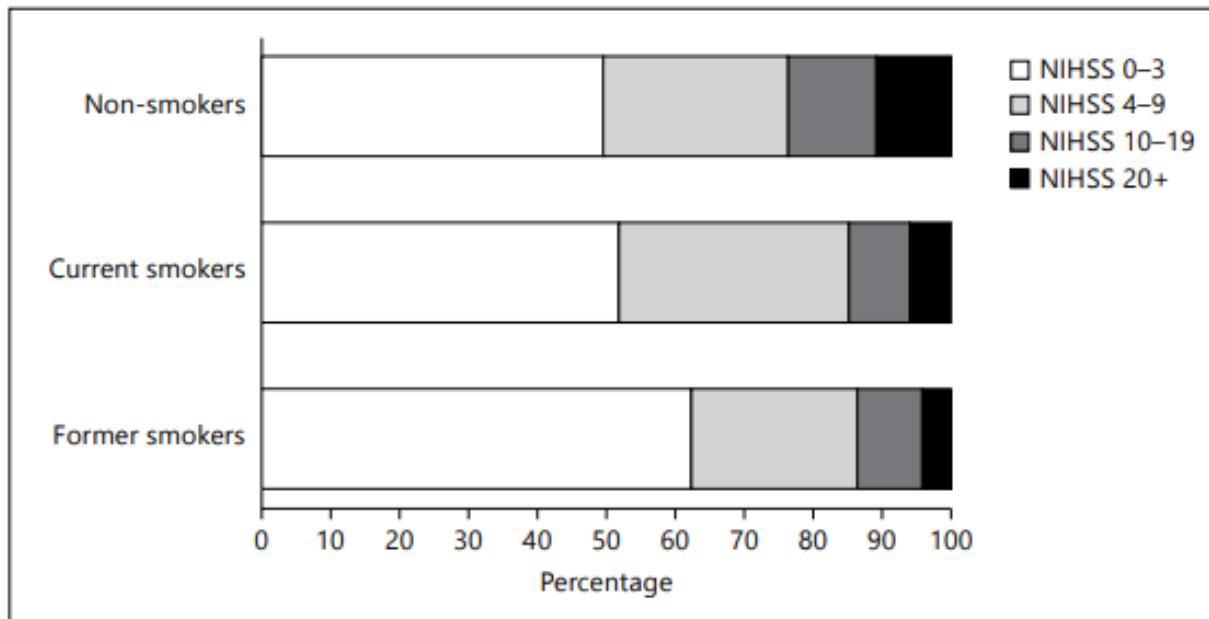


SEVERITE DES INFARCTUS CHEZ LES FUMEURS

Registre Dijonnais des AVC

Béjot Y, Eur Neurol 2014;71:59–64

Sévérité à la prise en charge initiale



	OR	95% CI	p
Smoking status			
Non-smokers	ref		
Current smokers	0.97	0.69–1.36	0.856
Former smokers	0.55	0.38–0.82	0.003
Age, per year	1.02	1.01–1.03	<0.001
Male gender	1.09	0.83–1.41	0.543
Hypercholesterolemia	0.66	0.52–0.85	0.001
Heart failure	1.69	1.21–2.38	0.002
IS mechanism			
Large artery	ref		
Cardioembolic	1.30	0.92–1.83	0.133
Lacunar	0.49	0.34–0.70	<0.001
Other	0.42	0.23–0.77	0.005
Undetermined	0.94	0.66–1.34	0.750
Multiple potential causes	1.05	0.54–2.03	0.884
Living in a nursing home	1.92	1.20–3.09	0.007

OR and p values were calculated using ordinal logistic regression and a backward elimination approach.

SEVERITE DES INFARCTUS CHEZ LES FUMEURS

Registre Dijonnais des AVC

Béjot Y, Eur Neurol 2014;71:59–64

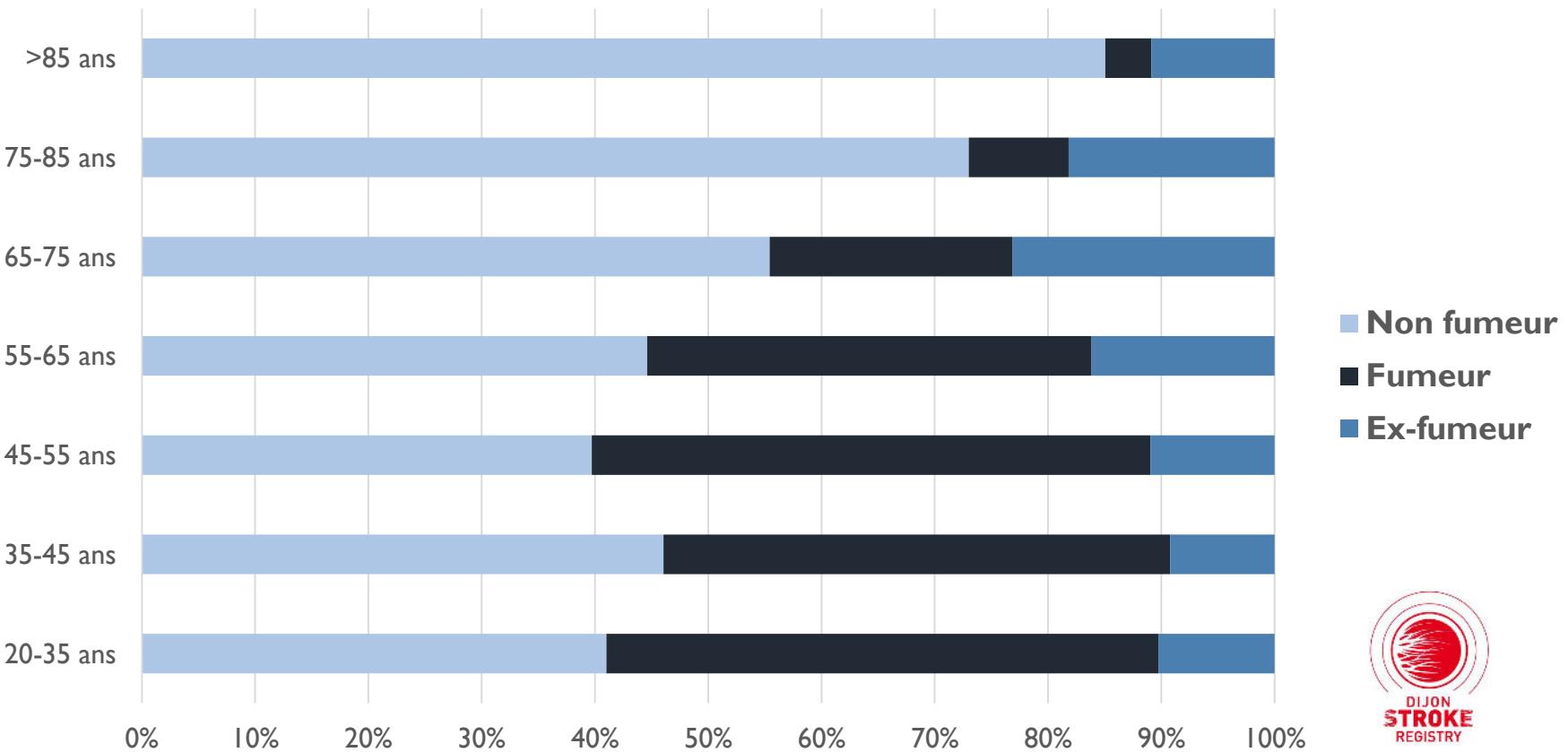
	Non-smokers (n = 658)			Current smokers (n = 187)			Former smokers (n = 128)			p value
	n	%	95% CI	n	%	95% CI	n	%	95% CI	
Age, mean ± SD	78.4±14.1			63.3±16.7			74.4±13.9			<0.001
Male gender	203	30.9		122	65.2		143	86.7		<0.001
Medical history										
Hypertension	469	71.3	67.8–74.7	114	60.9	53.9–68.0	97	75.8	68.2–83.3	<0.001
Diabetes	117	17.8	14.9–20.7	20	10.7	6.2–15.2	23	18.0	11.2–24.7	0.062
Hypercholesterolemia	217	33.0	29.4–36.6	84	44.9	37.7–52.1	57	44.5	35.8–53.3	0.002
Atrial fibrillation	130	19.8	16.7–22.8	15	8.0	4.1–12.0	29	22.7	15.3–30.0	<0.001
Alcohol intake	14	2.3	1.0–3.2	41	21.9	15.9–27.9	8	6.3	2.0–10.5	<0.001
Previous TIA	49	7.5	5.4–9.5	5	2.7	0.3–5.0	10	7.8	3.1–12.5	0.059
Peripheral artery disease	31	4.7	3.1–6.3	10	9.6	5.4–13.9	8	6.3	2.0–10.5	0.040
Heart failure	101	15.4	12.6–18.1	23	12.3	7.5–17.1	16	12.5	6.7–18.3	0.466
Coronary heart disease	81	12.3	9.8–14.8	30	16.0	10.7–21.3	27	21.1	13.9–28.3	0.024
Pre-stroke treatments										
Antiplatelet agents	174	26.4	23.1–29.8	41	21.9	15.9–27.9	43	33.6	25.3–41.9	0.070
Anticoagulants	54	8.2	6.1–10.3	7	3.7	1.0–6.4	14	10.9	5.4–16.4	0.044
Antihypertensive therapy	300	45.5	41.8–49.4	67	35.8	28.9–42.8	70	54.7	45.9–63.4	0.004
Statins	90	13.7	11.0–16.3	27	14.4	9.4–19.5	22	17.2	10.6–23.8	0.582
IS mechanism										<0.001
Large artery	128	19.5	16.4–22.5	45	24.1	17.9–30.2	34	26.6	18.8–34.3	
Cardioembolic	191	29.0	25.6–32.5	26	13.9	8.9–18.9	38	29.7	21.7–37.7	
Lacunar	113	17.2	14.3–20.1	50	26.7	20.3–33.1	20	15.6	9.8–22.0	
Other	38	5.8	4.0–7.6	15	8.0	4.1–12.0	6	4.7	0.1–8.4	
Undetermined	163	24.8	21.5–28.1	47	25.1	18.9–31.4	22	17.2	10.6–23.8	
Multiple potential causes	25	3.8	2.3–5.3	4	2.1	0.0–4.2	8	6.3	2.0–10.5	
NIHSS score at admission										<0.001
Mean ± SD	8.1±7.5			5.9±6.1			5.6±6.0			
Median (IQR)	5 (2–12)			4 (2–8)			4 (2–7)			

TABAGISME CHEZ LES PATIENTS AVEC INFARCTUS CEREBRAL

Registre Dijonnais des AVC
Période 2006-2017

Unpublished data

Distribution selon l'âge

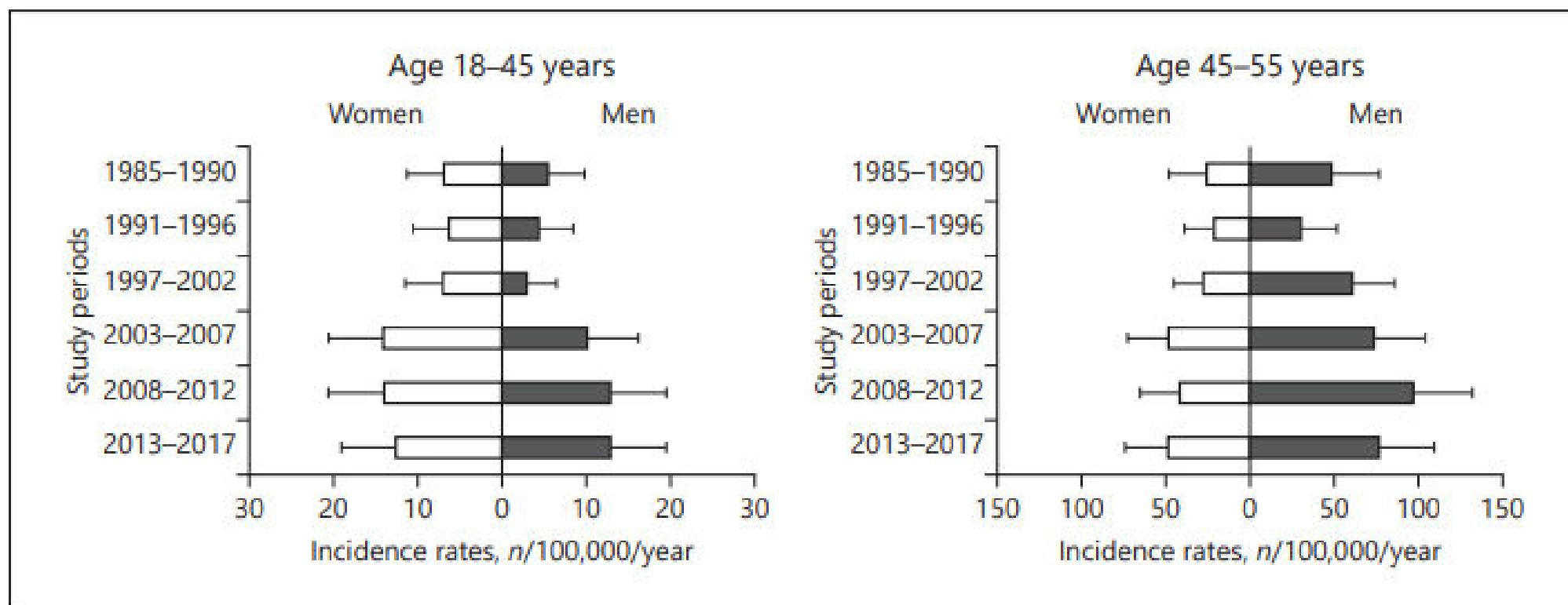


INFARCTUS CEREBRAL DU SUJET JEUNE

Registre Dijonnais des AVC

Béjot Y, Neuroepidemiology 2021;55:239–244

Evolution de l'incidence des infarctus cérébraux



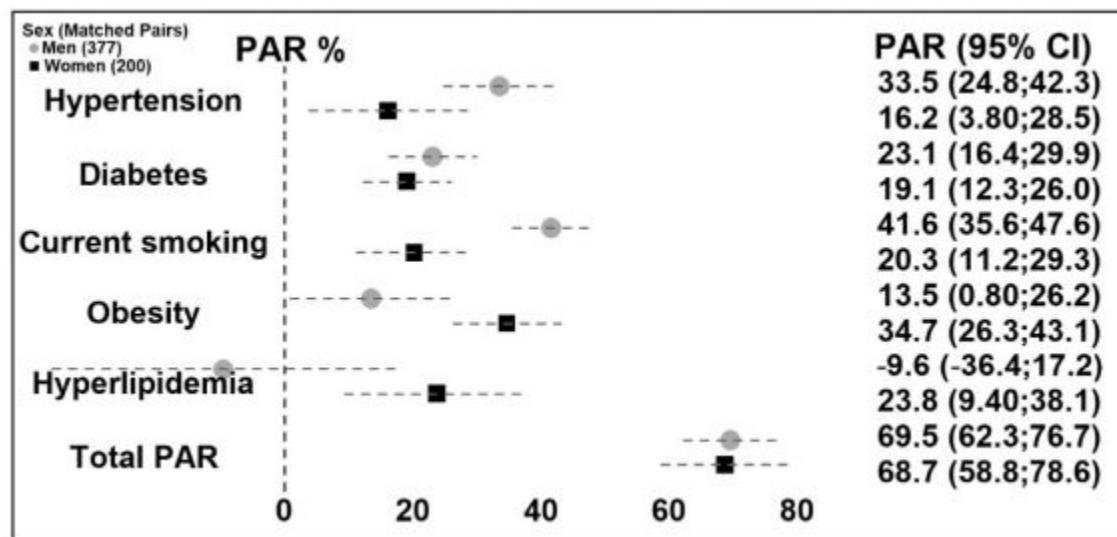
INFARCTUS CEREBRAL DU SUJET JEUNE

Libruder C, Prev Med 2022;155:106933

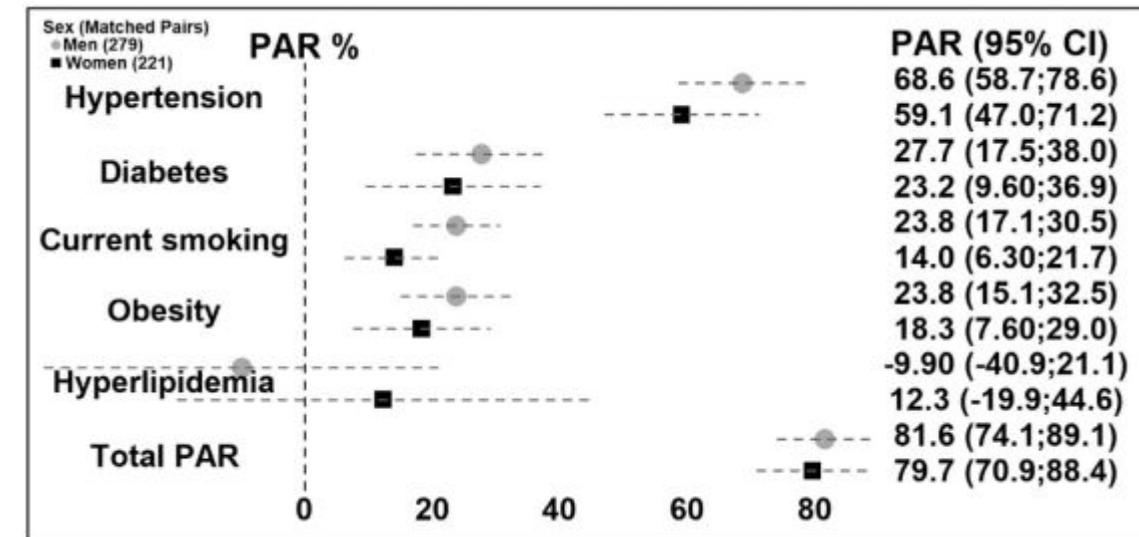
Contribution des facteurs de risque

Etude cas-témoin - Israeli National Stroke Registry 2014-2915

Patients < 55 ans



Patients > 55 ans



Adjusted population attributable risks (PARs) with 95% confidence intervals (CIs) for ischemic stroke by sex



E-CIGARETTE ET INFARCTUS CEREBRAL

NHANES database – US population

Etude transversale – 266.058 participants (2015-2018)

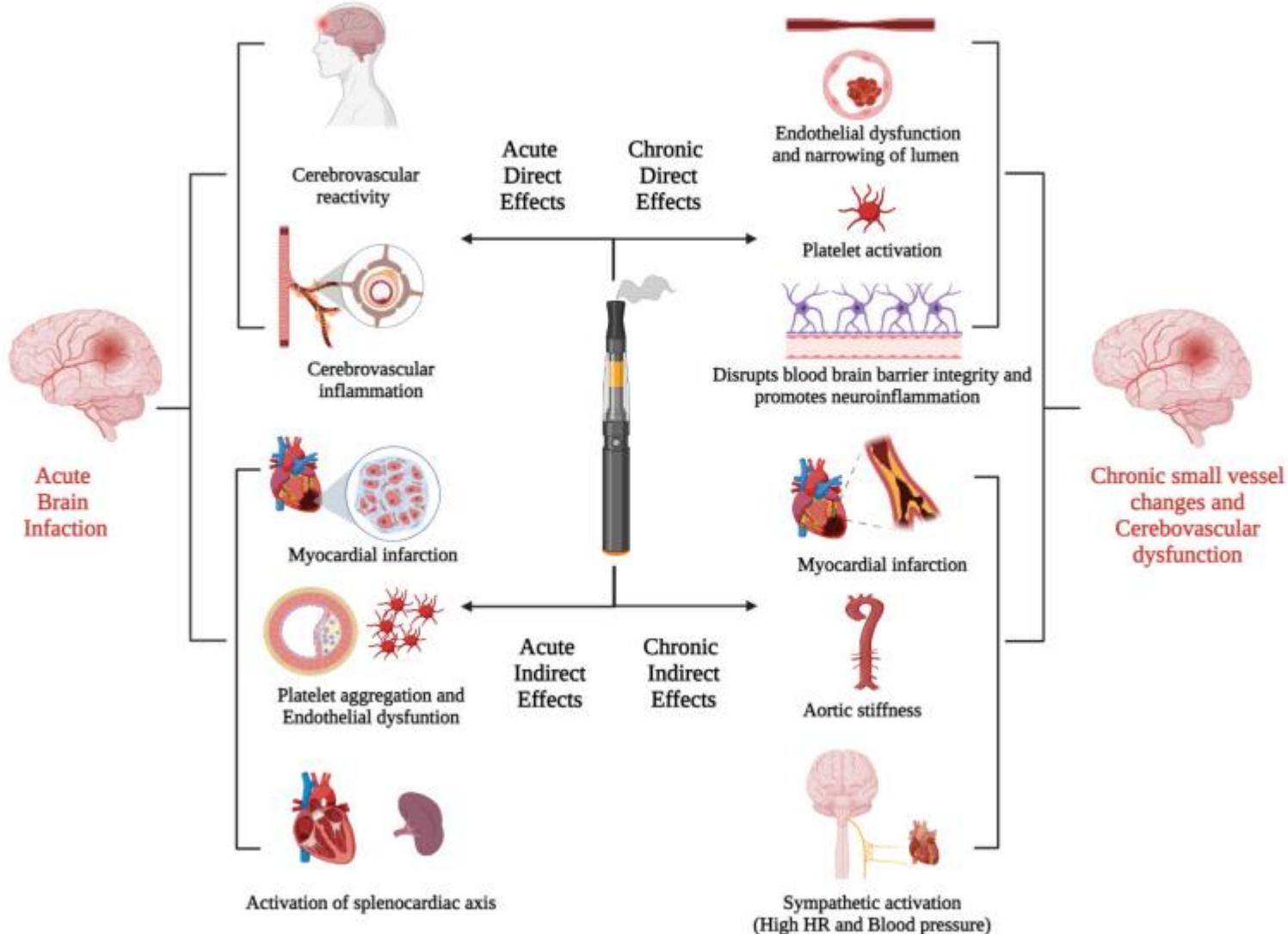
Patel U, Neurol Int. 2022;14:441-452

Total Fumeurs = 30%

	E-Cigarette Smokers <i>n</i> = 7756 (9.72%)	Dual E-Cigarette + Traditional Smokers <i>n</i> = 23,444 (29.37)	Traditional Smokers <i>n</i> = 48,625 (60.91%)	Total <i>n</i> = 79,825 (100)	<i>p</i> Values
Stroke (<i>n</i>) (Prevalence %) (Column % comparison between different smoking habits)	66 (1.57) (1.09)	855 (20.39) (3.72)	3273 (78.04) (6.75)	4194 (100) (5.41)	<0.0001
Age of onset of stroke in years (Median + IQR)	48 (42–58)	50 (40–58)	59 (50–69)		<0.0001

Variable	Multivariable Analysis *	
	Odds Ratio (95% Confidence Interval);	<i>p</i> Value
Possibility of having history of stroke = 1		
Non-smokers		Reference
E-cigarette smokers vs. Traditional smokers	1.15 (1.15–1.16); <i>p</i> < 0.0001	
Dual smokers vs. Traditional smokers	1.14 (1.14–1.15); <i>p</i> < 0.0001	
E-cigarette smoking in last 30-days vs. no-E-cigarette smoking in last 30-days	1.60 (1.60–1.61); <i>p</i> < 0.0001	

E-CIGARETTE ET INFARCTUS CEREBRAL

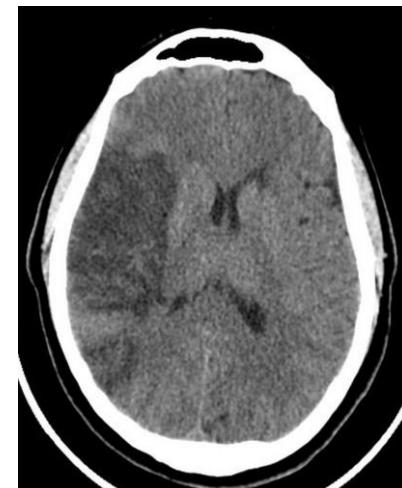
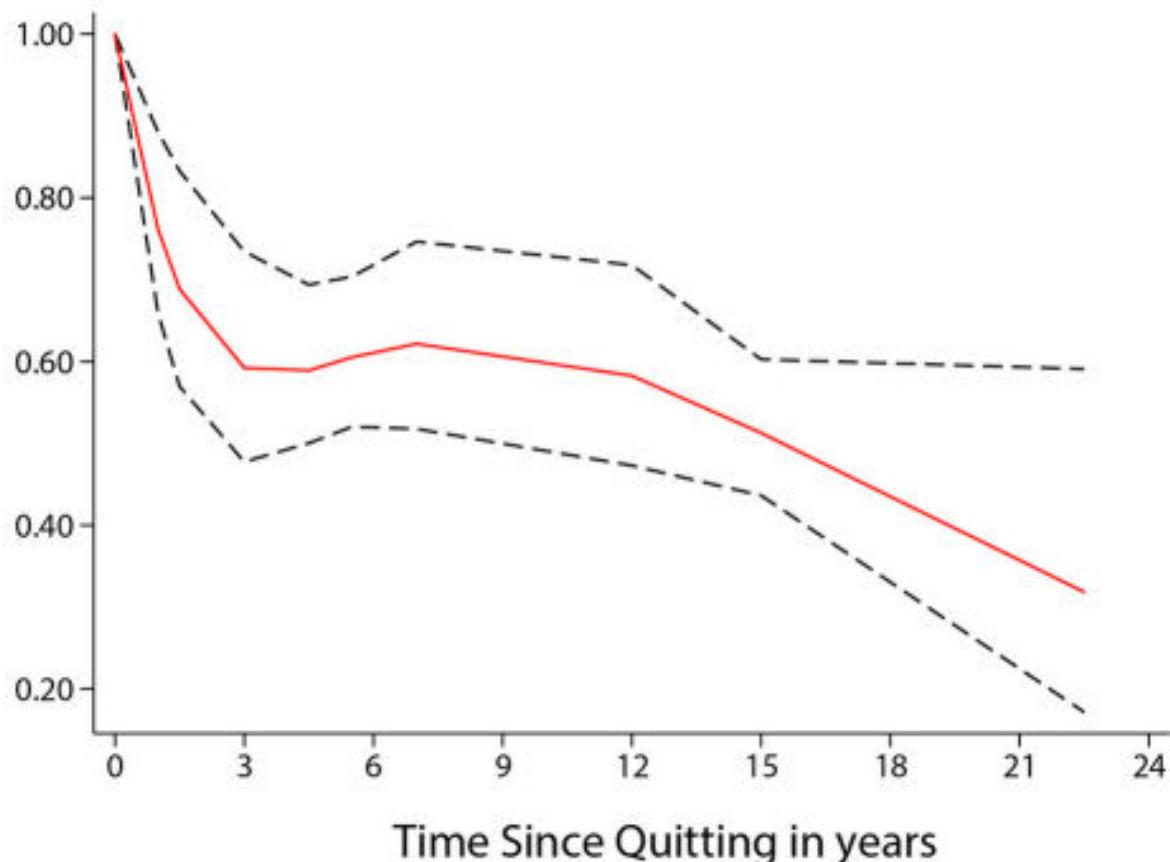


Patel U, Neurol Int. 2022;14:441-452

SEVRAGE TABAGIQUE ET RISQUE D'AVC

Méta-analyse de 26 études - 3,734,216 individus

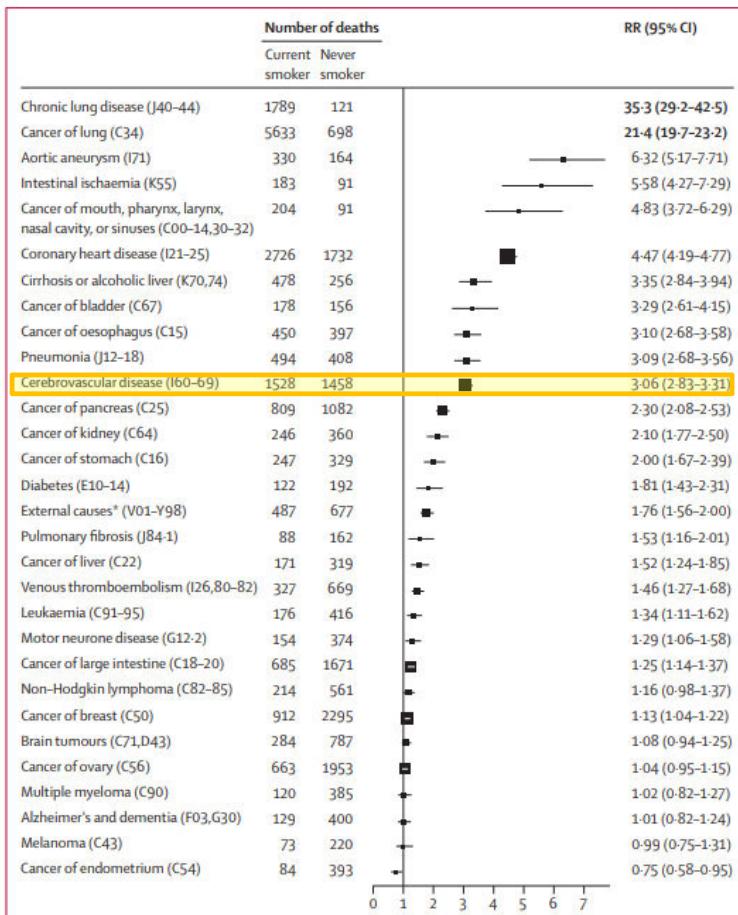
Luo J. *Front. Neurol.* 2022;12:772373



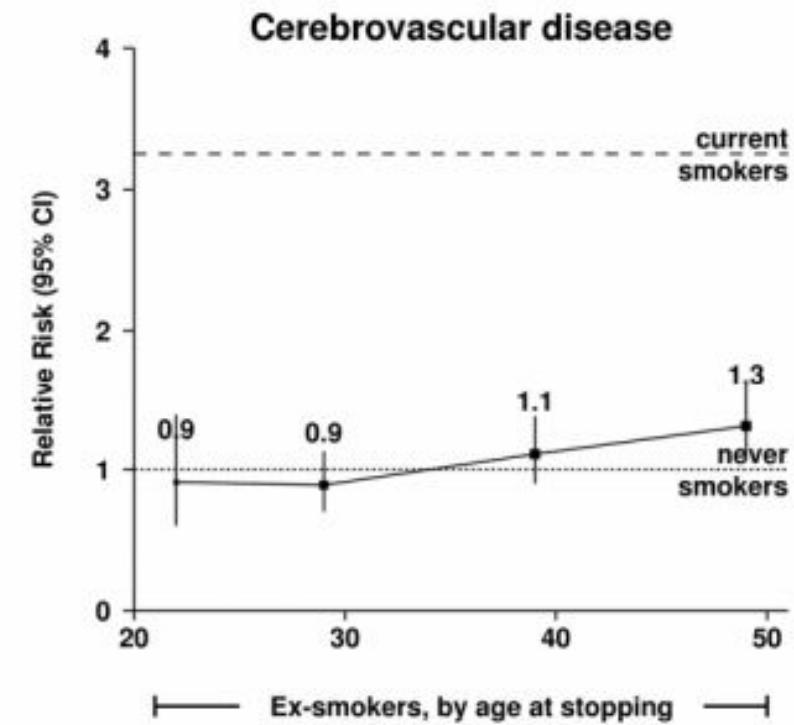
SEVRAGE TABAGIQUE ET RISQUE D'AVC

Etude observationnelle anglaise - 1,2 millions de femmes de 50 à 69 ans recrutées entre 1996 et 2001 – suivi 12 ans

Pirie K, Lancet 2013;381:133-41



Risque de décès d'origine cérébrovasculaire à 9 ans chez les ex-fumeuses en fonction de leur âge au moment du sevrage tabagique



SEVRAGE TABAGIQUE ET RISQUE D'AVC

BRFSS population-based survey

7,538,044 survivants AVC USA - 58.8% préalablement fumeurs

61% des survivants sevrés

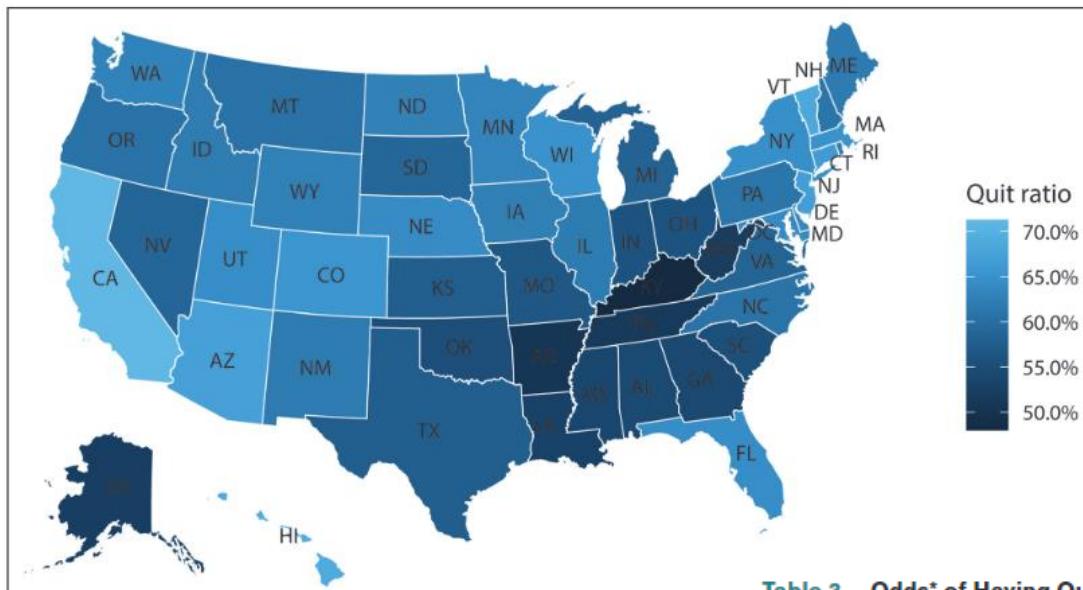


Table 3. Odds* of Having Quit Smoking Among Stroke Survivors Versus Cancer Survivors in the United States

Model	Odds ratio (95% CI)
Unadjusted	0.59 (0.56–0.61)
Adjusted for demographicst	0.72 (0.67–0.77)
Adjusted for demographics, comorbidities†	0.72 (0.67–0.79)

Factor	Quit ratio* (95% CI)	P value
Age		<0.0001
<60 years old	43.3 (42.0–44.6)	
≥60 years old	74.6 (73.8–75.4)	
Sex		<0.0001
Women	57.8 (56.7–58.8)	
Men	63.4 (62.3–64.4)	
Race and ethnicity†		<0.0001
Non-Hispanic White	63.4 (62.6–62.4)	
Non-Hispanic Black	51.8 (49.5–54.0)	
Hispanic	61.0 (57.3–64.7)	
Asian or Hawaiian or other Pacific Islander	72.5 (62.4–80.9)	
Alaskan Native or American Indian	45.7 (41.4–50.0)	
Multiracial or other	50.4 (46.1–54.7)	
Health insurance‡		<0.0001
Insured	62.9 (62.1–63.6)	
Uninsured	38.6 (35.7–41.5)	
Stroke belt§		<0.0001
Stroke belt residence	55.7 (54.2–57.1)	
Nonstroke belt residence	62.0 (61.2–62.9)	
Rurality§		<0.0001
Rural	62.7 (61.0–64.4)	
Nonrural	69.5 (68.4–70.5)	

