Tabakprävention und Covid-19

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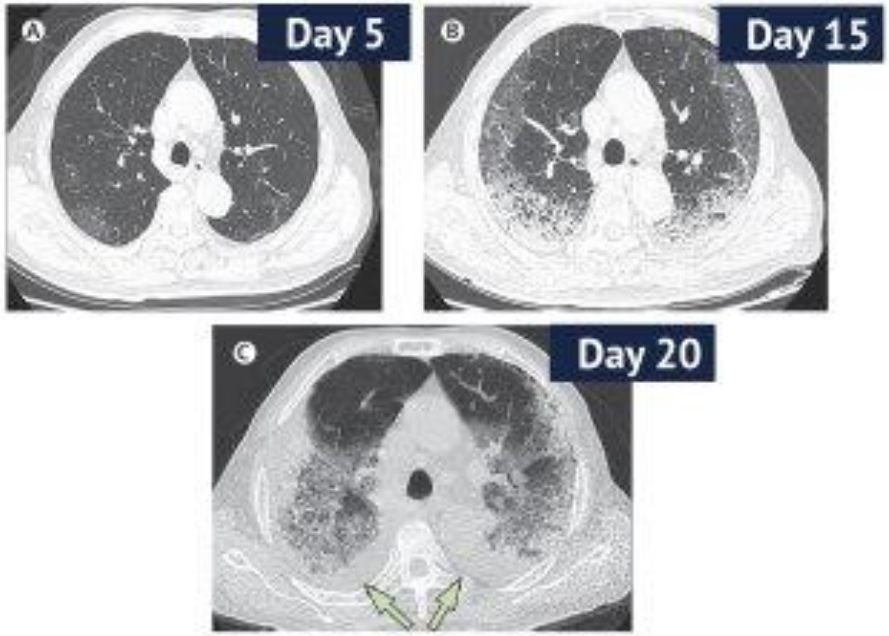
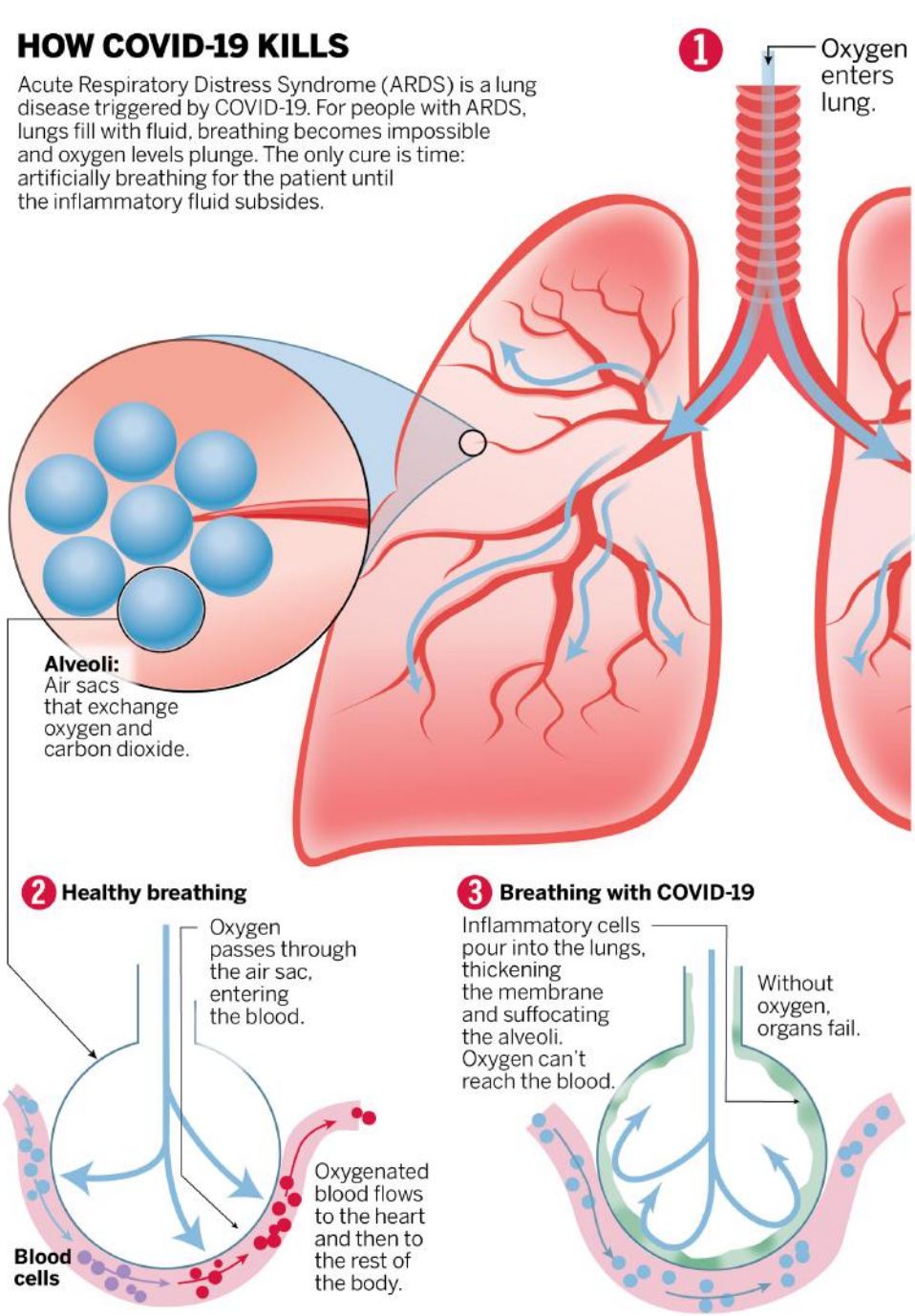
University Hospital and University of Zürich

Covid 19 und Lungen





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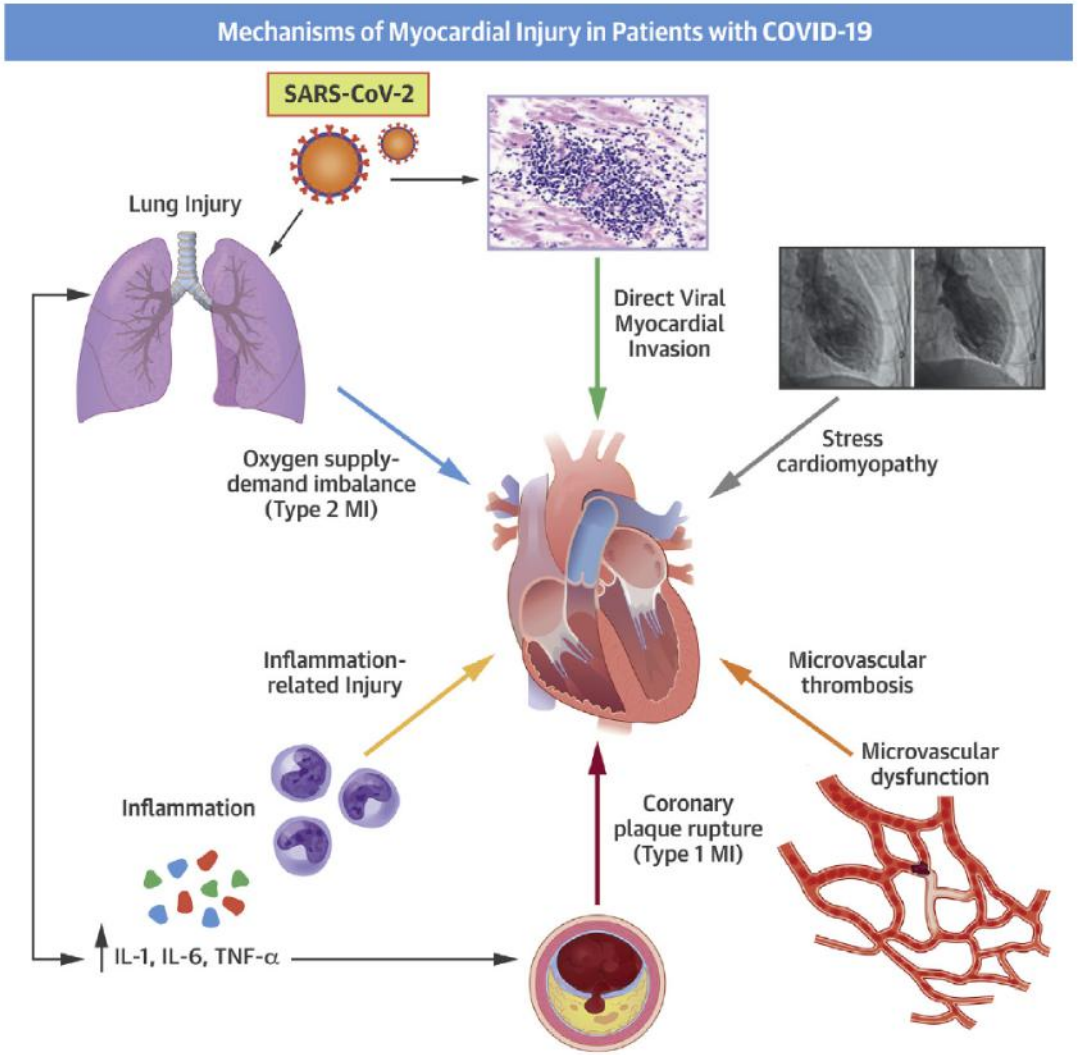
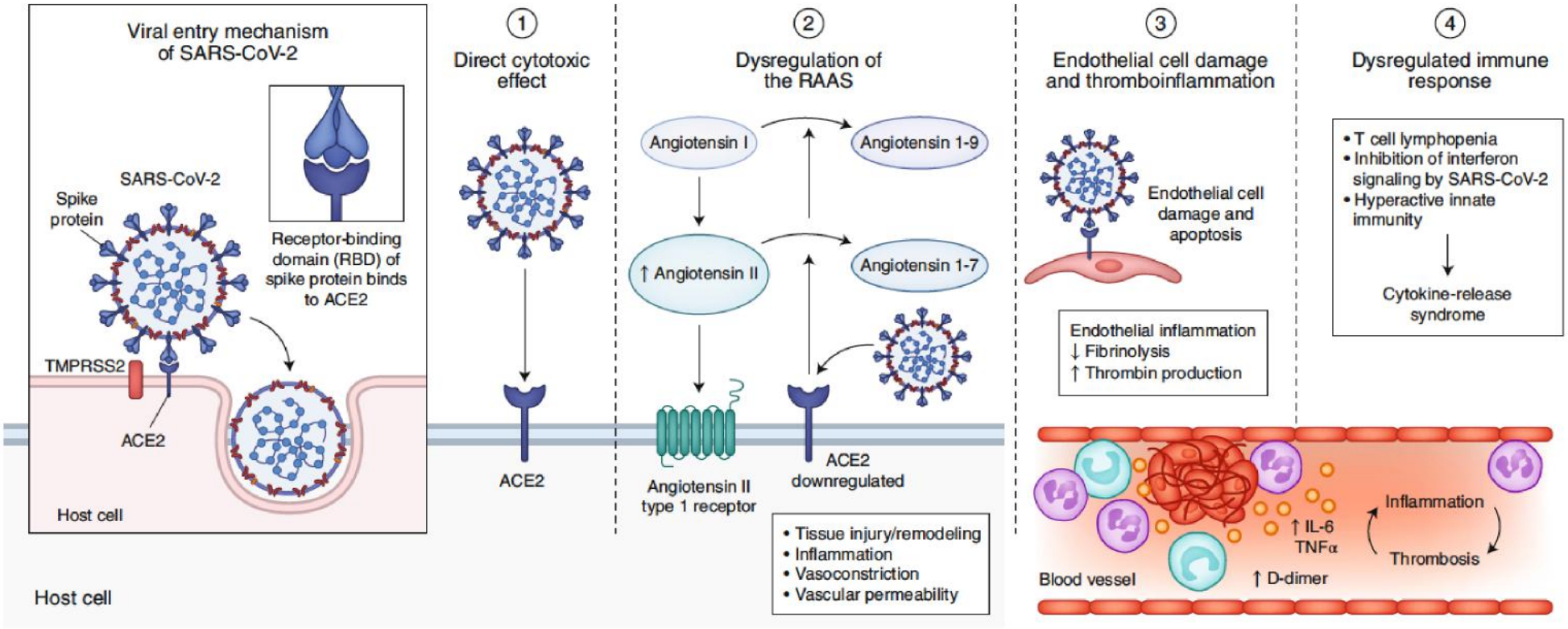
Vaping-associated lung injury

CENTRAL ILLUSTRATION **Overview of the Mechanisms of Myocardial Injury in Patients With Coronavirus Disease 2019**

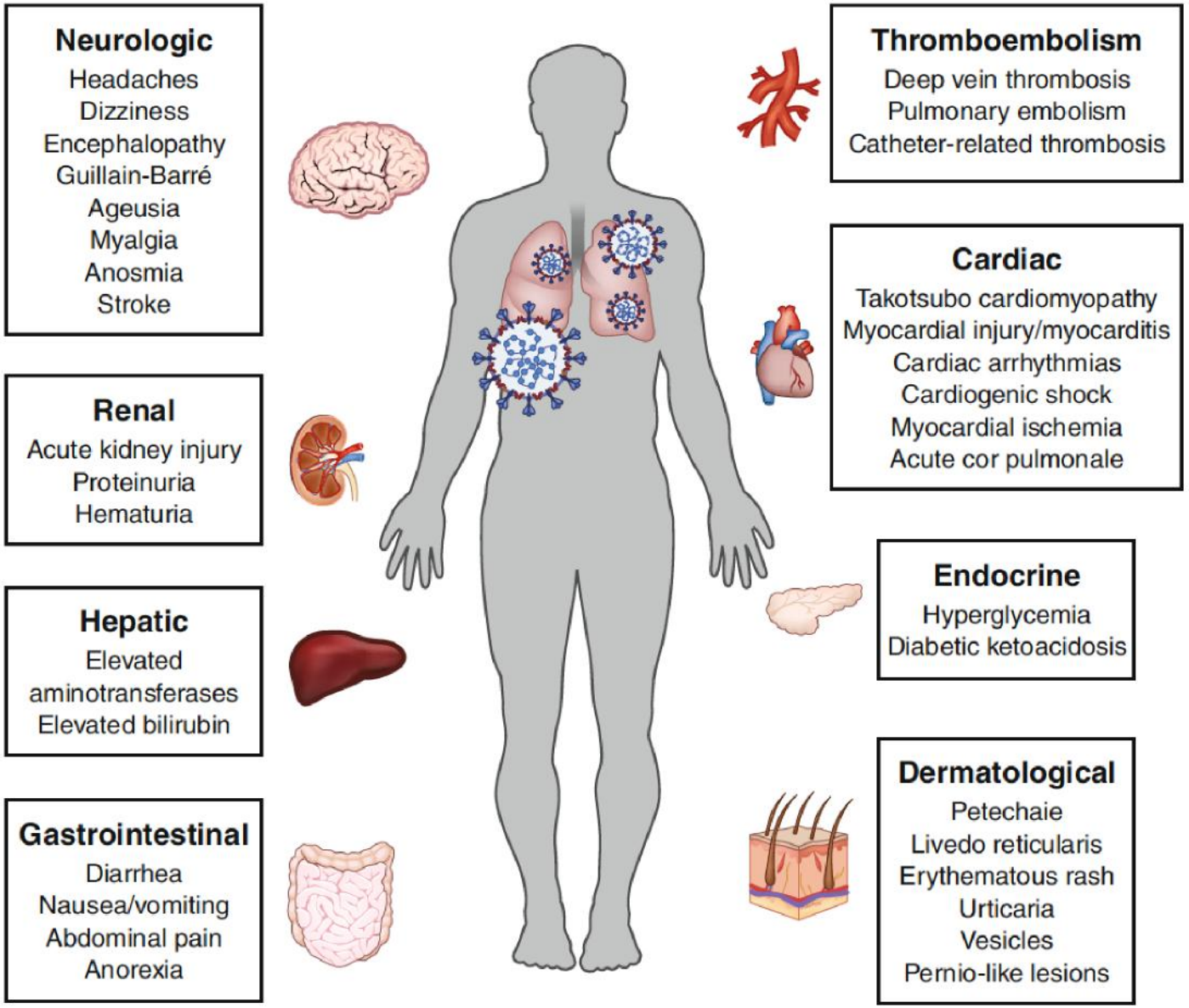


Giustino, G. et al. J Am Coll Cardiol. 2020;76(17):2011-23.

Covid 19 und Herzkreislauf

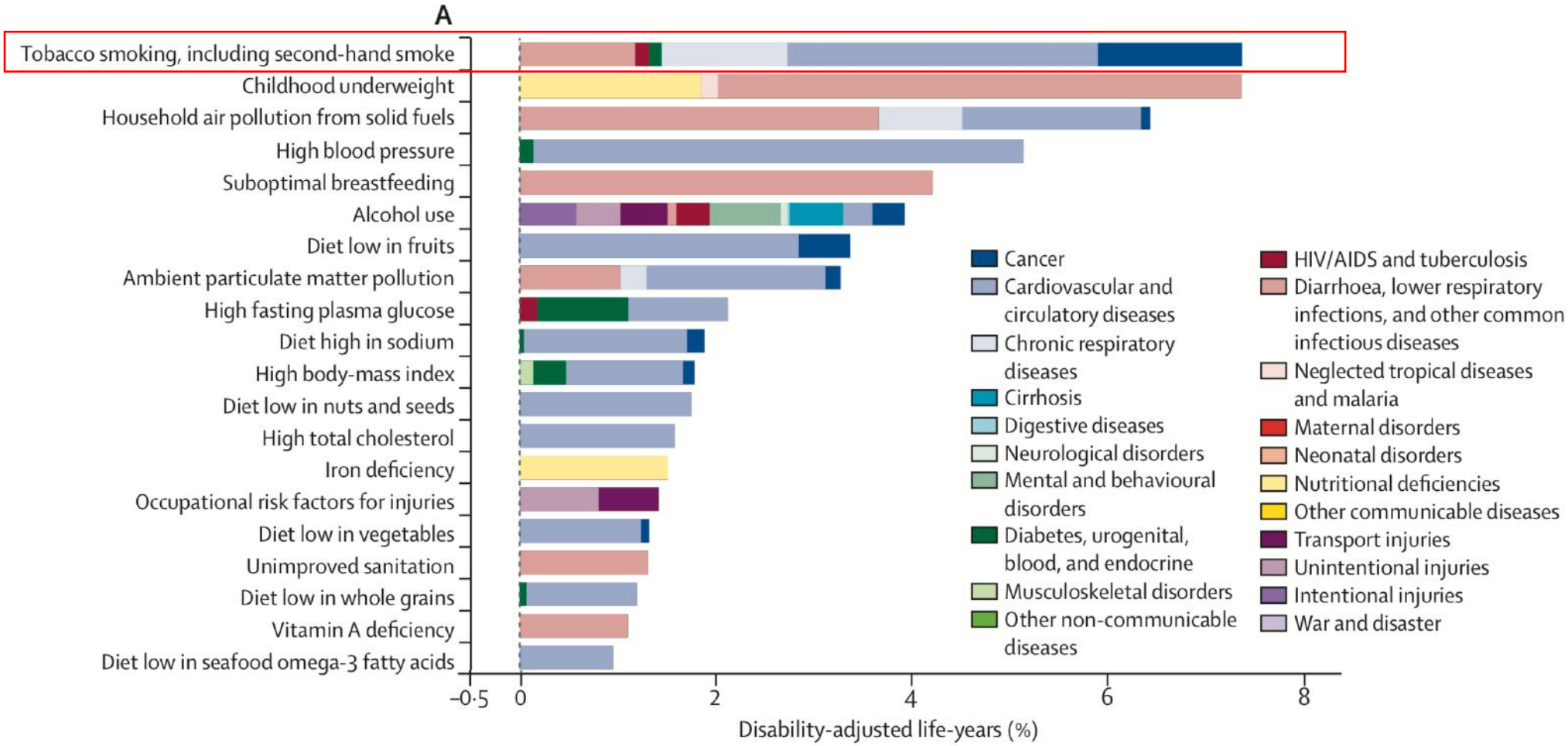


Gupta A. et al, Nature Medicine 2020, 26: 1017–1032



Gupta A. et al, Nature Medicine 2020, 26: 1017–1032

Tabak, Nikotin und Infekte



Tabak, Nikotin und Infekte

Large epidemiologic studies support the association between smoking and the prevalence of colds and lower respiratory tract symptoms.

Several studies have confirmed the relationship between cigarette smoking and the risk of influenza infections. Influenza infections are more severe, with more cough, acute and chronic phlegm production, breathlessness, and wheezing in smokers.

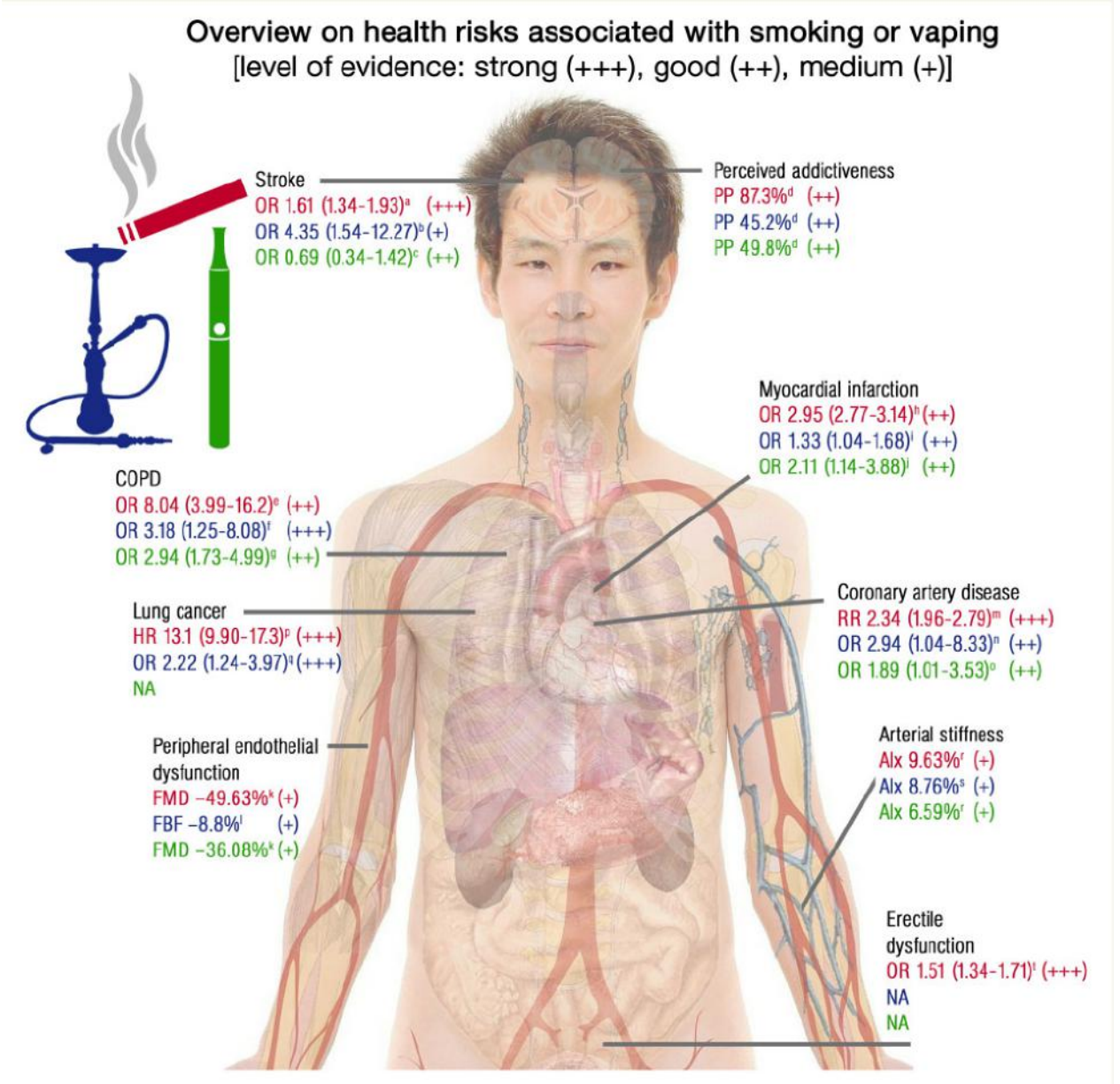
Arcavi L and Benowitz N. Arch Intern Med. 2004;164:2206-2216

Table 2. Severity of Influenza, According to Smoking Status.*

Severity of Influenza	Nonsmokers	Smokers	All Subjects	Odds Ratio
	no. (%)	*no. (%)*	*total no. (% smokers)*	
Unaffected	86 (52.8)	53 (31.5)	139 (38.1)	1.00
Mildly affected	28 (17.2)	30 (17.9)	58 (51.7)	1.74
Severly affected	49 (30.1)	85 (50.6)	134 (63.4)	2.81
Total	163 (100)	168 (100)	331 †	

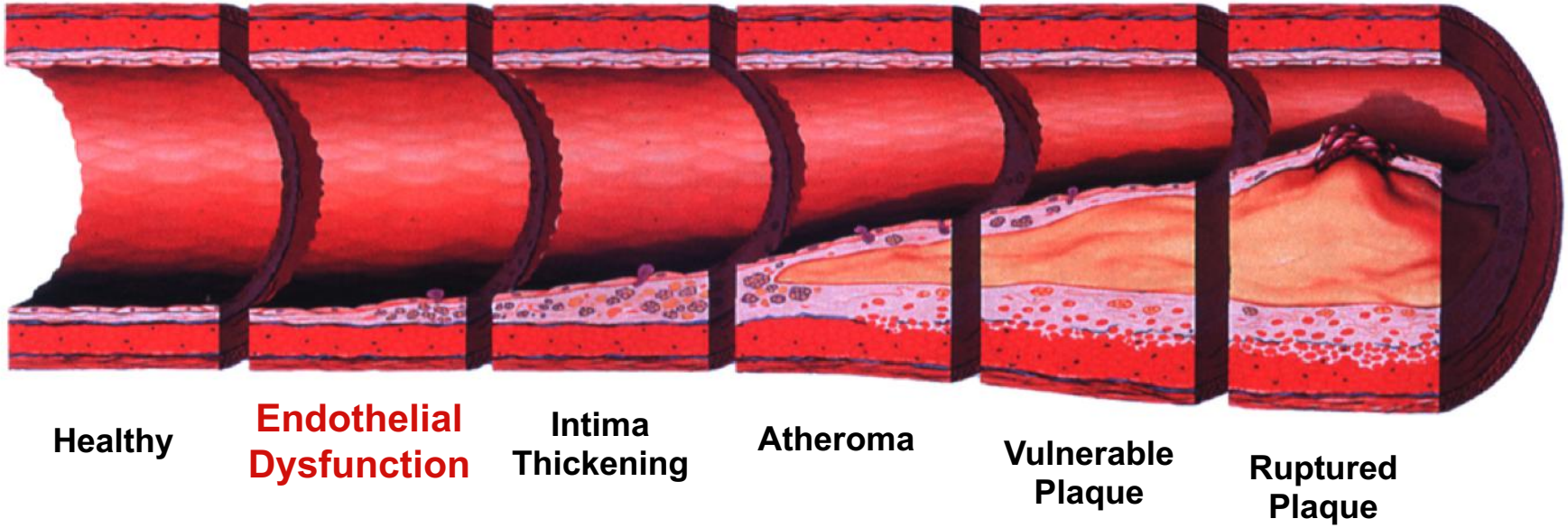
Kark J et al, NEJM 1982 307: 1042-6

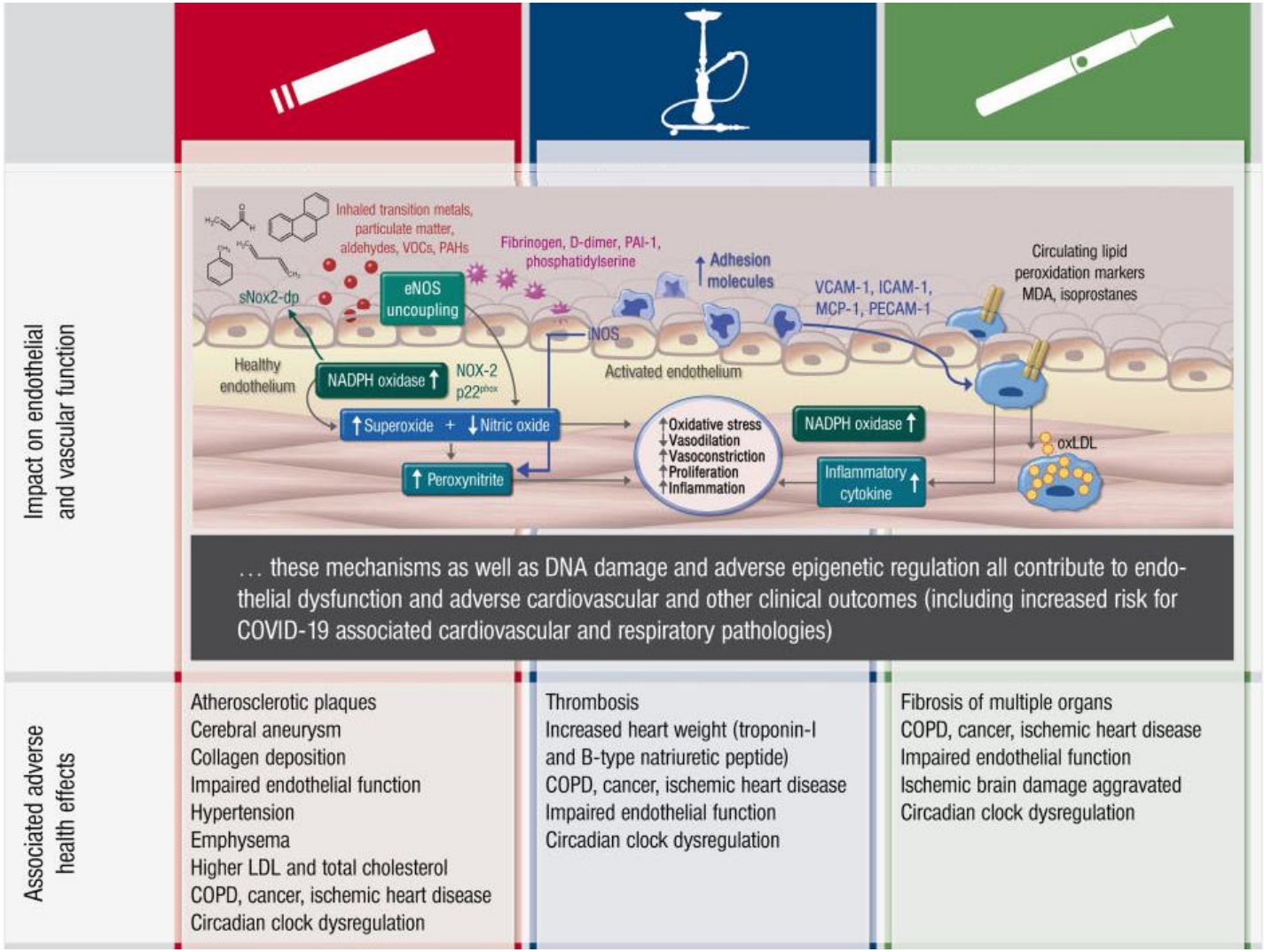
Tabak, Nikotin und Herzkreislauf



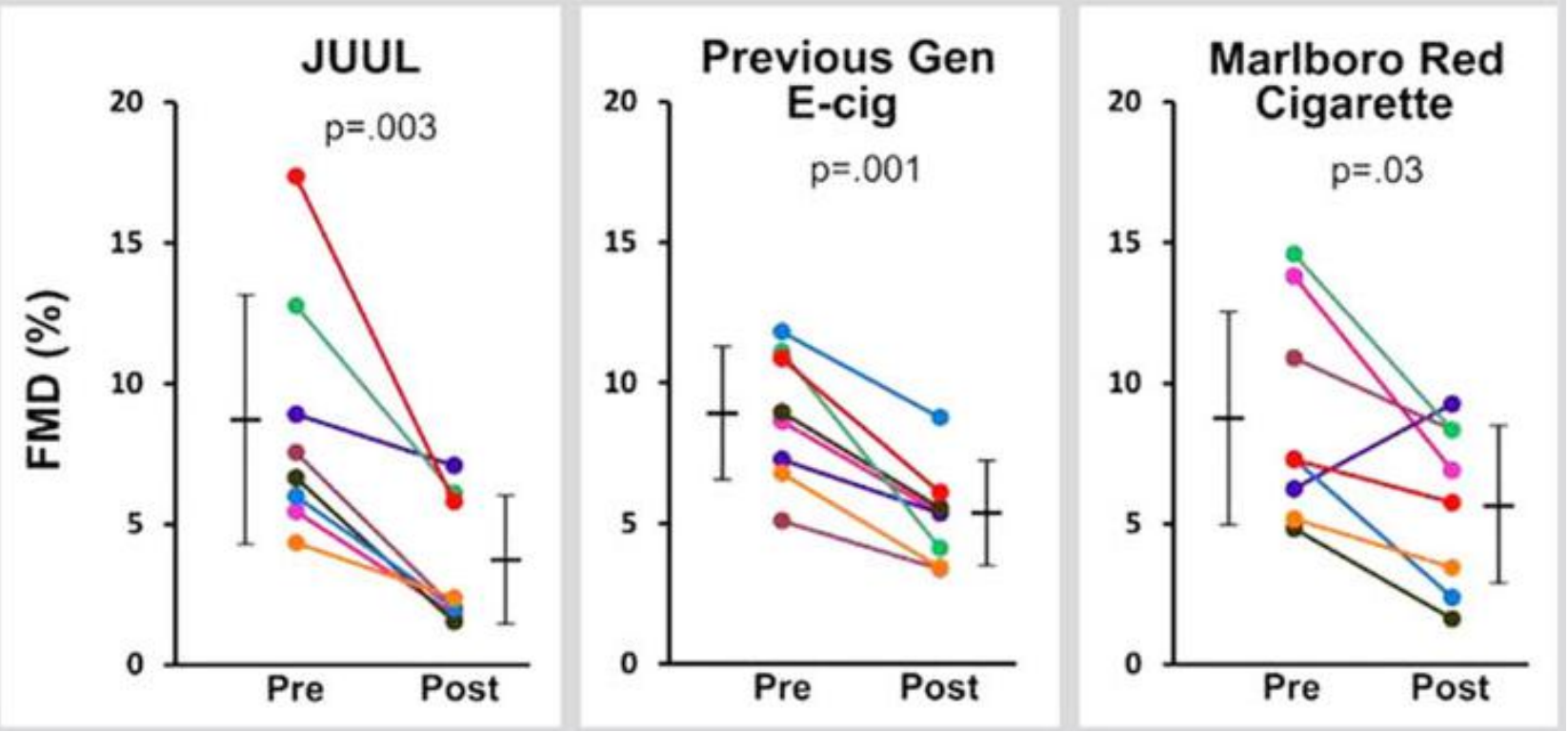
Münzel T et al, European Heart Journal (2020)

Tabak, Nikotin Covid 19 und Endothelfunktion

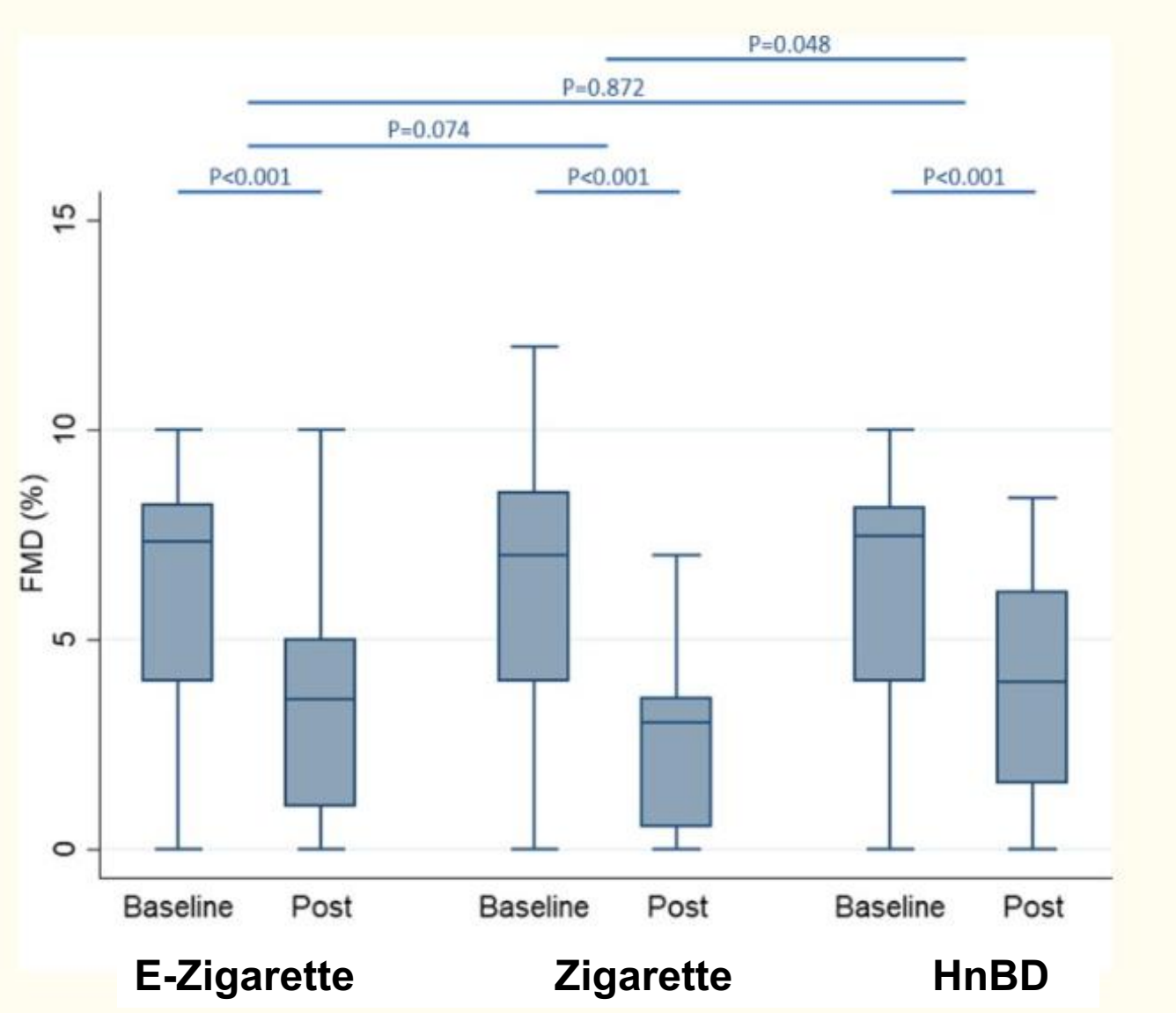




Münzel T et al, European Heart Journal (2020)

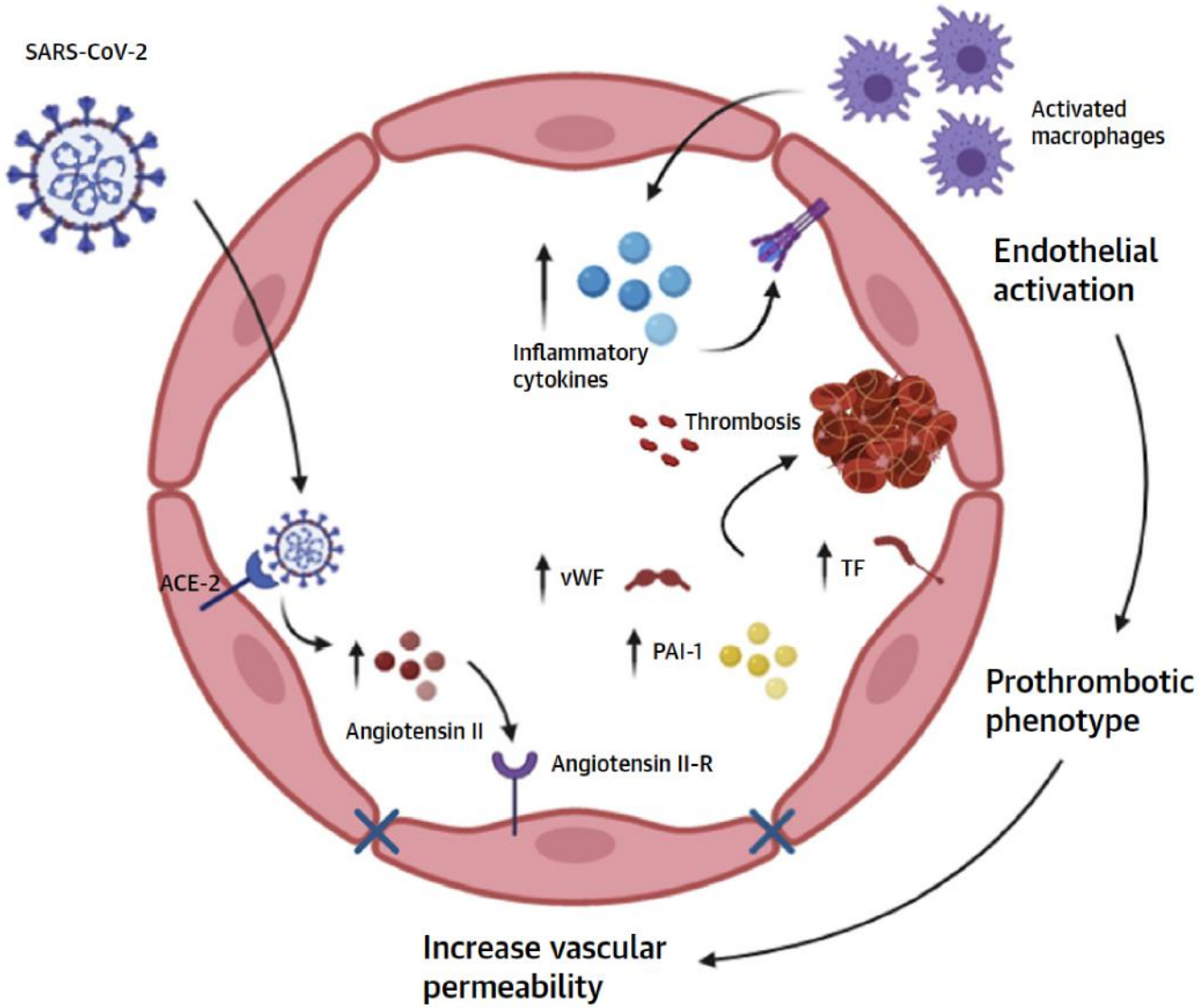


Münzel T et al, European Heart Journal (2020)

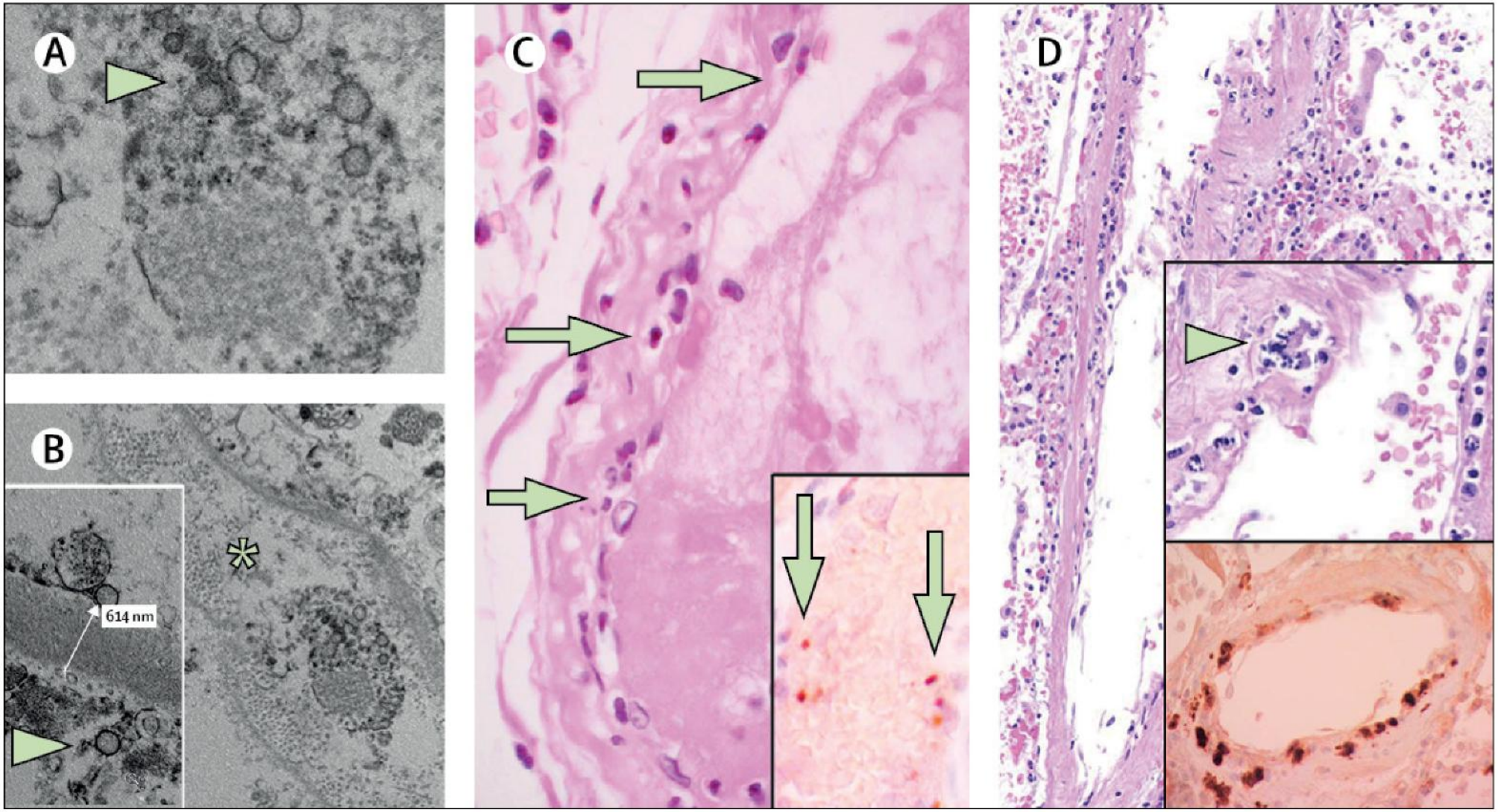


Biondi-Zoccai et al, J Am Heart Assoc. 2019

FIGURE 2 Endothelial Activation, Inflammation, and Thrombosis in COVID-19



Giustino G et al, JACC 2020

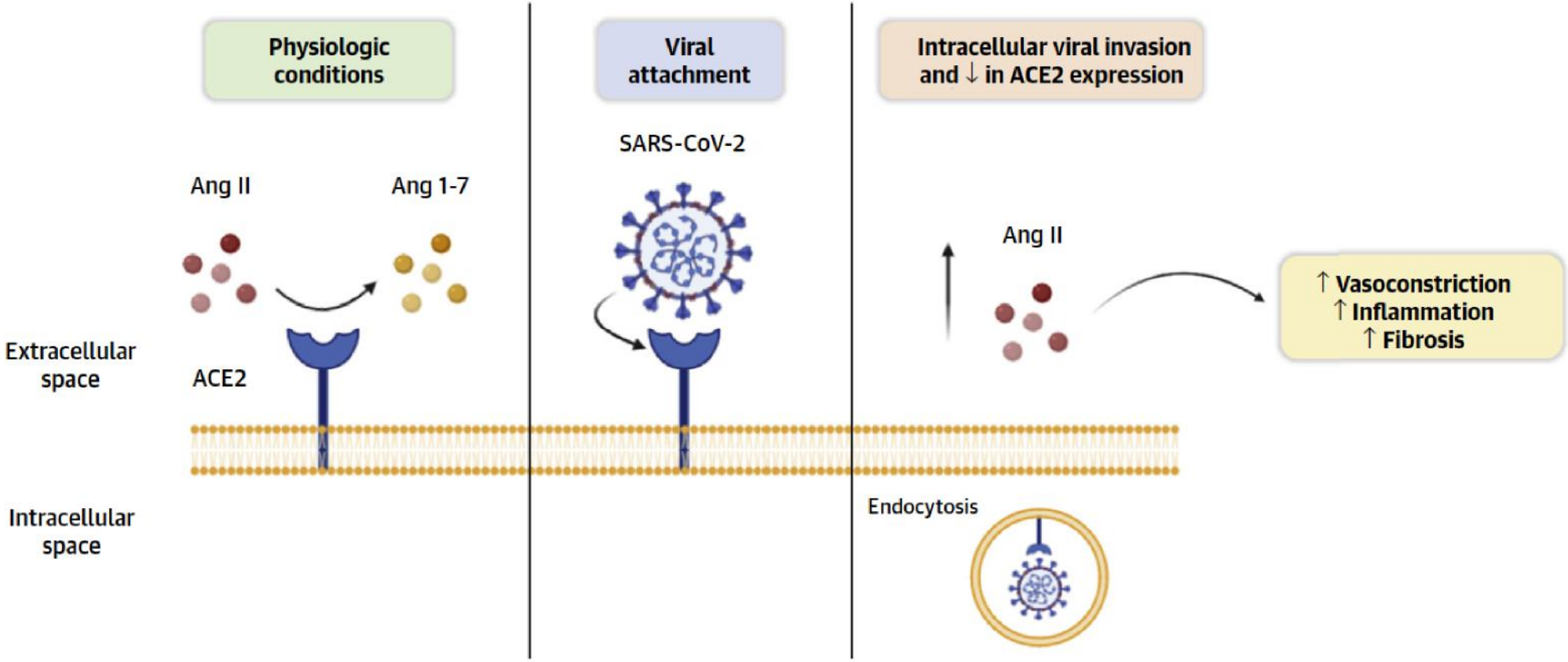


Varga Z et al, Lancet 2020

Möglichen Zusammenhang zwischen Tabak/Nikotin und Covid19 Infektion

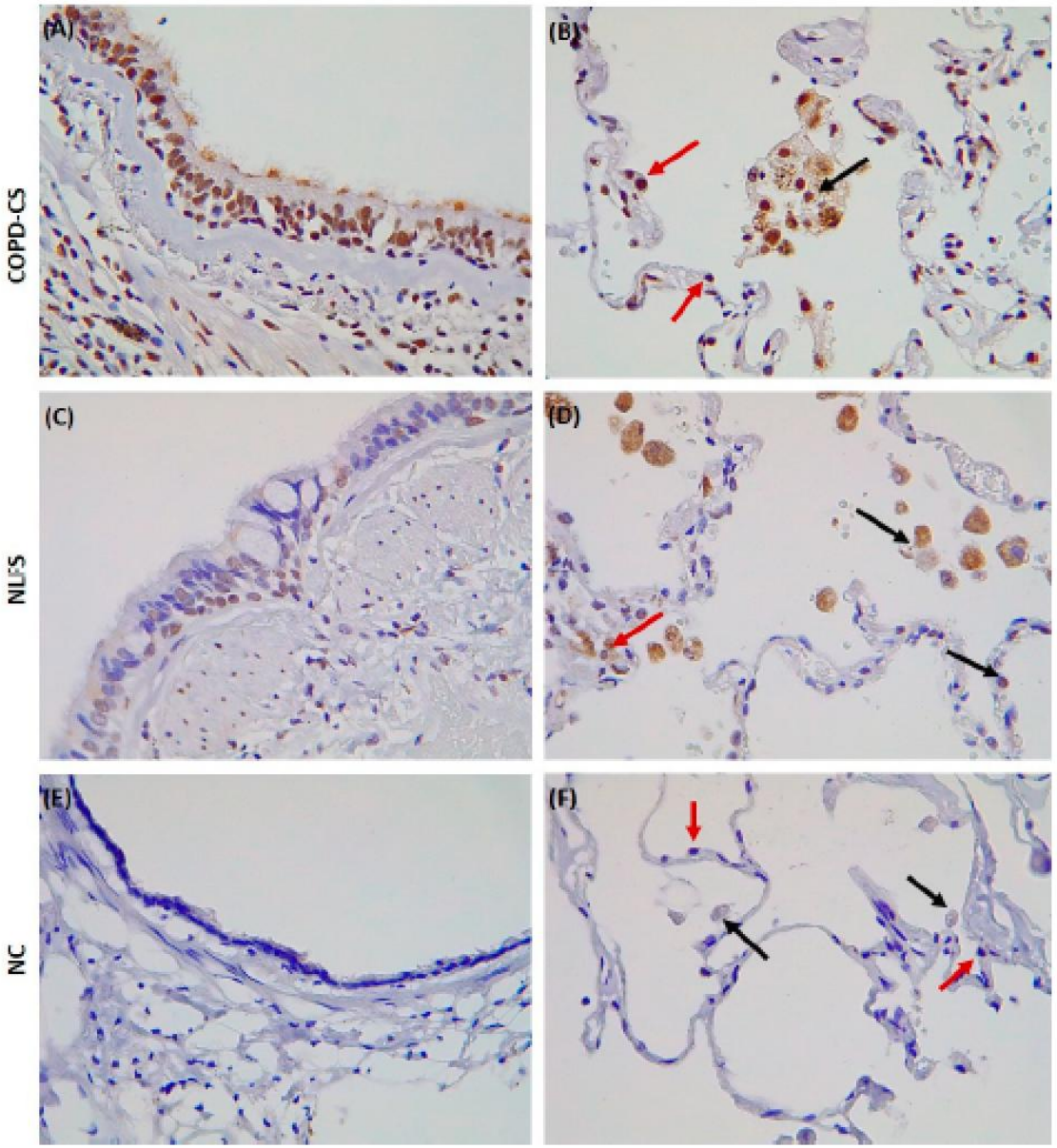
Tobacco smoking is recognized to increase the susceptibility to infections in a multifactorial way, including the alteration of the host's mechanical (muco-ciliary) and immunological defenses and the likely increased virulence of virus and bacteria. In addition, tobacco smoking has a significant impact on the immune system and activates inflammation; moreover the smoke-related structural and immunological alterations found in chronic bronchitis, COPD and emphysema patients represent ideal attachment areas for bacterial and viral infections.

Cattarruzza M et al, Acta Biomed 2020; Vol. 91, N. 2: 106-112



Giustino G et al, JACC 2020

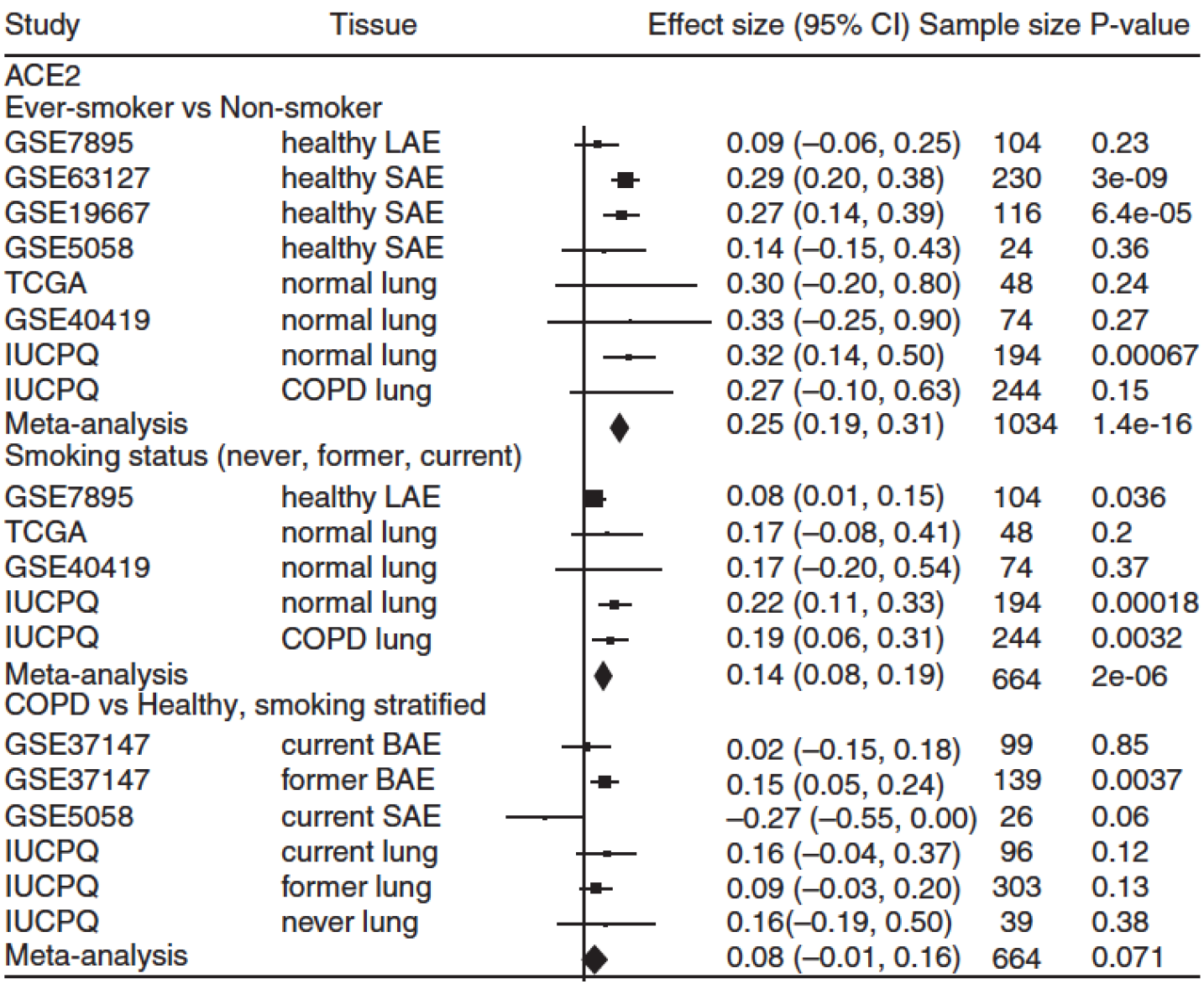
Patienten mit CODP und Raucher haben mehr ACE-2 Rezeptoren als Nichtraucher



Nicotine upregulates ACE2, which is suggested as a potential mechanism to increase susceptibility and severity of COVID-19

Brake SJ et al, J. Clin. Med. 2020, 9, 841

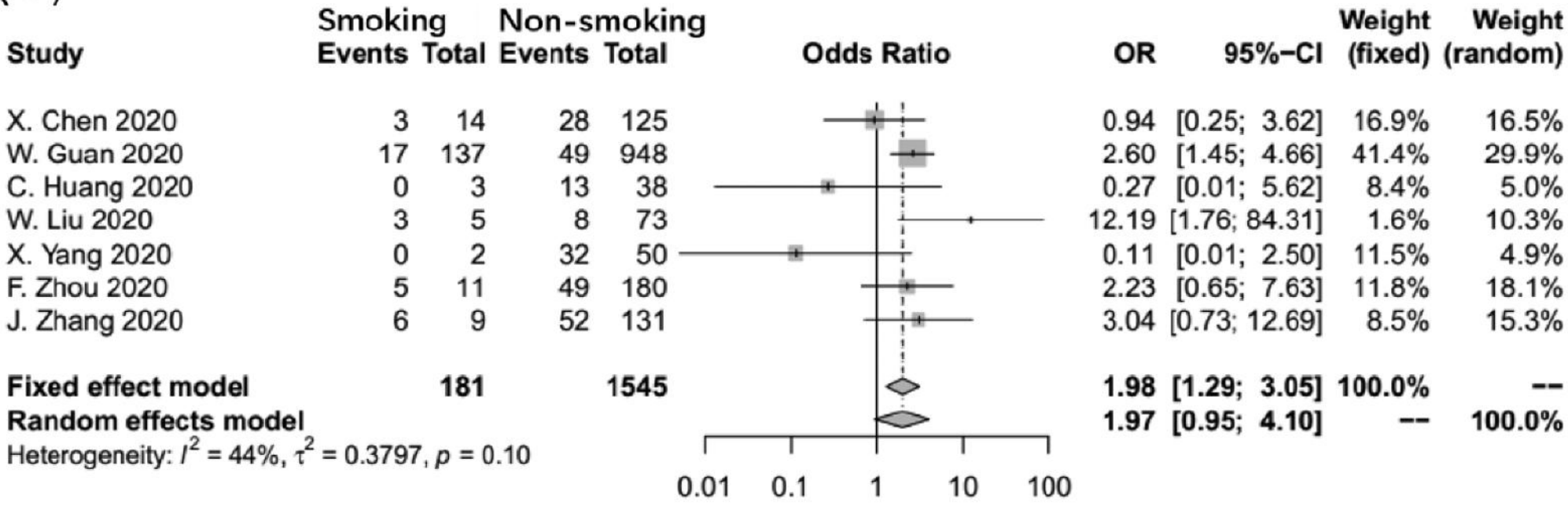
Patienten mit CODP und Raucher haben mehr ACE-2 Rezeptoren als Nichtraucher



Study	Tissue	Effect size (95% CI)	Sample size	P-value
ACE2				
Ever-smoker vs Non-smoker				
GSE7895	healthy LAE	0.09 (–0.06, 0.25)	104	0.23
GSE63127	healthy SAE	0.29 (0.20, 0.38)	230	3e-09
GSE19667	healthy SAE	0.27 (0.14, 0.39)	116	6.4e-05
GSE5058	healthy SAE	0.14 (–0.15, 0.43)	24	0.36
TCGA	normal lung	0.30 (–0.20, 0.80)	48	0.24
GSE40419	normal lung	0.33 (–0.25, 0.90)	74	0.27
IUCPQ	normal lung	0.32 (0.14, 0.50)	194	0.00067
IUCPQ	COPD lung	0.27 (–0.10, 0.63)	244	0.15
Meta-analysis		0.25 (0.19, 0.31)	1034	1.4e-16
Smoking status (never, former, current)				
GSE7895	healthy LAE	0.08 (0.01, 0.15)	104	0.036
TCGA	normal lung	0.17 (–0.08, 0.41)	48	0.2
GSE40419	normal lung	0.17 (–0.20, 0.54)	74	0.37
IUCPQ	normal lung	0.22 (0.11, 0.33)	194	0.00018
IUCPQ	COPD lung	0.19 (0.06, 0.31)	244	0.0032
Meta-analysis		0.14 (0.08, 0.19)	664	2e-06
COPD vs Healthy, smoking stratified				
GSE37147	current BAE	0.02 (–0.15, 0.18)	99	0.85
GSE37147	former BAE	0.15 (0.05, 0.24)	139	0.0037
GSE5058	current SAE	–0.27 (–0.55, 0.00)	26	0.06
IUCPQ	current lung	0.16 (–0.04, 0.37)	96	0.12
IUCPQ	former lung	0.09 (–0.03, 0.20)	303	0.13
IUCPQ	never lung	0.16(–0.19, 0.50)	39	0.38
Meta-analysis		0.08 (–0.01, 0.16)	664	0.071

American Journal of Respiratory and Critical Care Medicine 2020

(C)


Smoking
Non-smoking
Study
Events Total Events Total
Odds Ratio
OR 95%−CI
Weight (fixed)
Weight (random)
X. Chen 2020 3 14 28 125 0.94 [0.25; 3.62] 16.9% 16.5%
W. Guan 2020 17 137 49 948 2.60 [1.45; 4.66] 41.4% 29.9%
C. Huang 2020 0 3 13 38 0.27 [0.01; 5.62] 8.4% 5.0%
W. Liu 2020 3 5 8 73 12.19 [1.76; 84.31] 1.6% 10.3%
X. Yang 2020 0 2 32 50 0.11 [0.01; 2.50] 11.5% 4.9%
F. Zhou 2020 5 11 49 180 2.23 [0.65; 7.63] 11.8% 18.1%
J. Zhang 2020 6 9 52 131 3.04 [0.73; 12.69] 8.5% 15.3%
Fixed effect model 181 1545 1.98 [1.29; 3.05] 100.0% --
Random effects model 1.97 [0.95; 4.10] -- 100.0%
Heterogeneity: I^2 = 44%, τ^2 = 0.3797, p = 0.10
0.01
0.1
1
10
100

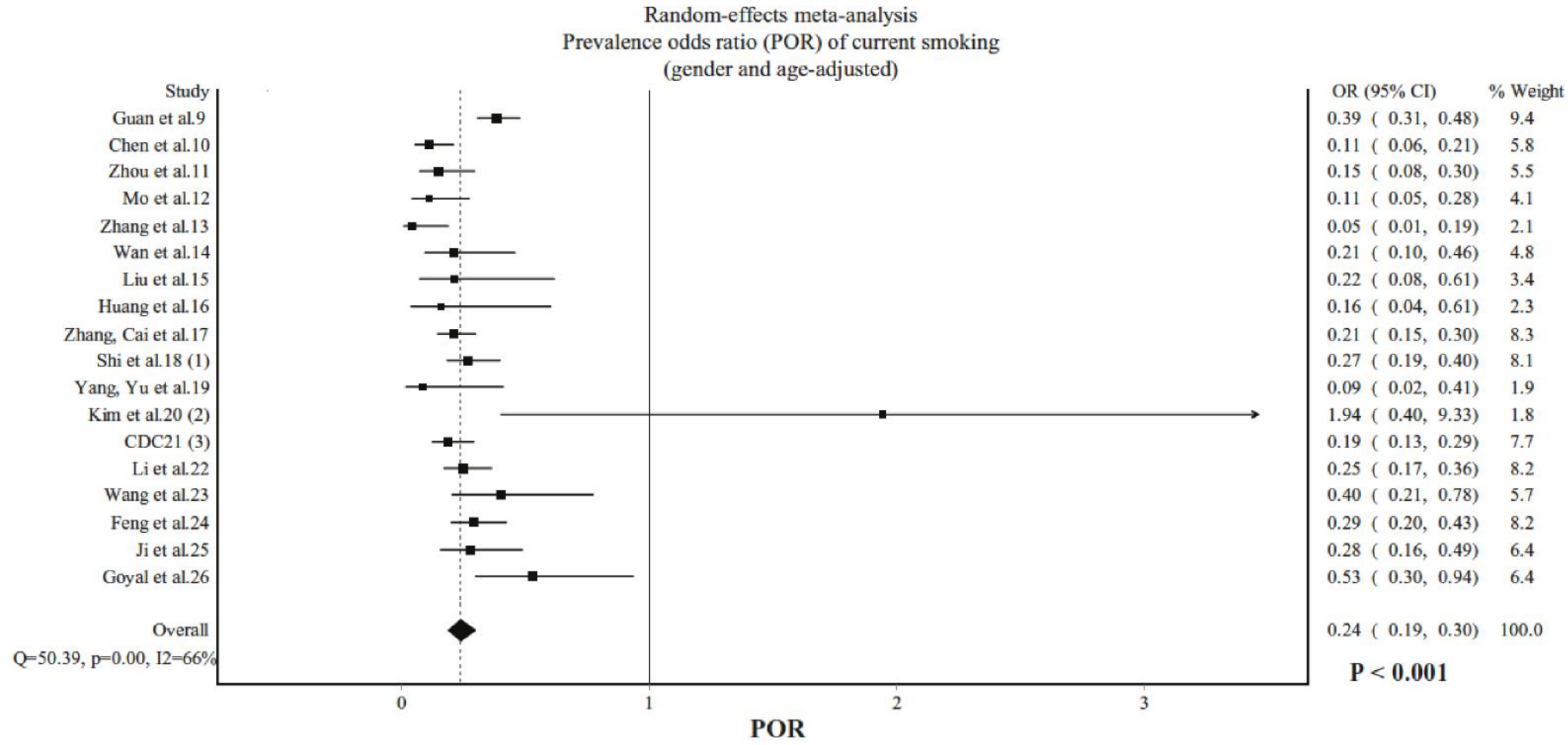
Sind Raucher mehr auffällig für eine Covid19 Infekt?

Table 3 Subgroup analyses showing hazard ratio for mortality, according to age classes. Multiple imputation analysis, N = 3894 patients and N = 712 deaths.

	Age classes		
	18–64 years	65–74 years	≥75 years
Patient at risk	1761	808	1315
Death	81	145	486
Person-days	26,417	15,437	22,032
Death Rate, x1,000 PD	3.1	9.4	22.1
	HR (95% CI)	HR (95% CI)	HR (95% CI)
Gender			
Female	-1-	-1-	-1-
Male	1.43 (0.69–2.96)	1.87 (1.33–2.64)	1.31 (1.07–1.61)
Hypertension			
No	-1-	-1-	-1-
Yes	0.85 (0.54–1.33)	0.92 (0.61–1.39)	0.87 (0.67–1.14)
Diabetes			
No	-1-	-1-	-1-
Yes	2.00 (1.15–3.50)	0.86 (0.59–1.25)	0.96 (0.78–1.19)
Myocardial infarction			
No	-1-	-1-	-1-
Yes	1.19 (0.43–3.28)	1.28 (0.75–2.20)	1.06 (0.82–1.39)
Heart Failure			
No	-1-	-1-	-1-
Yes	1.38 (0.56–3.37)	1.12 (0.66–1.92)	0.95 (0.74–1.23)
Cancer			
No	-1-	-1-	-1-
Yes	4.76 (2.46–9.21)	1.65 (0.95–2.86)	1.10 (0.86–1.40)
Lung disease			
No	-1-	-1-	-1-
Yes	1.09 (0.41–2.88)	1.76 (1.16–2.67)	1.11 (0.89–1.39)
Obesity, BMI ≥30 kg/m^2			
No	-1-	-1-	-1-
Yes	1.36 (0.75–2.46)	1.50 (0.92–2.45)	1.05 (0.73–1.52)
Smoking			
Non-smoker	-1-	-1-	-1-
Current Smoker	1.09 (0.47–2.49)	0.66 (0.39–1.11)	1.02 (0.71–1.46)
CRP, mg/L			
≤3	-1-	-1-	-1-
3–10	3.87 (1.74–8.60)	1.50 (0.81–2.78)	3.04 (2.19–4.22)
≥10	3.75 (1.92–7.34)	1.19 (0.68–2.08)	2.66 (1.62–4.35)
eGFR, CKD stage,mL/min/1.73 m^2			
≥90	-1-	-1-	-1-
60–89	1.76 (0.94–3.32)	1.49 (0.86–2.59)	1.10 (0.61–2.01)
45–59	3.30 (1.46–7.46)	1.93 (1.11–3.37)	1.84 (1.02–3.32)
30–44	3.24 (1.41–7.45)	3.33 (1.78–6.23)	2.36 (1.38–4.02)
15–29	13.89 (3.09–62.5)	4.86 (2.18–10.82)	3.00 (1.62–5.54)
<15	6.65 (1.66–26.73)	4.77 (1.63–13.9)	3.65 (1.92–6.96)

Controlling for gender, diabetes, hypertension, history of myocardial infarction, heart failure, chronic pulmonary disease, chronic kidney disease, CRP, obesity, smoking habit and anti-COVID19 drugs during hospitalization as fixed effects and repeated measures within hospital.
Abbreviation. BMI: body mass index; CKD: chronic kidney disease; CRP: C-reactive protein; eGFR: glomerular filtration rate; PD: person-days.

Weniger Raucher hospitalisiert für Covid-19 Infektion



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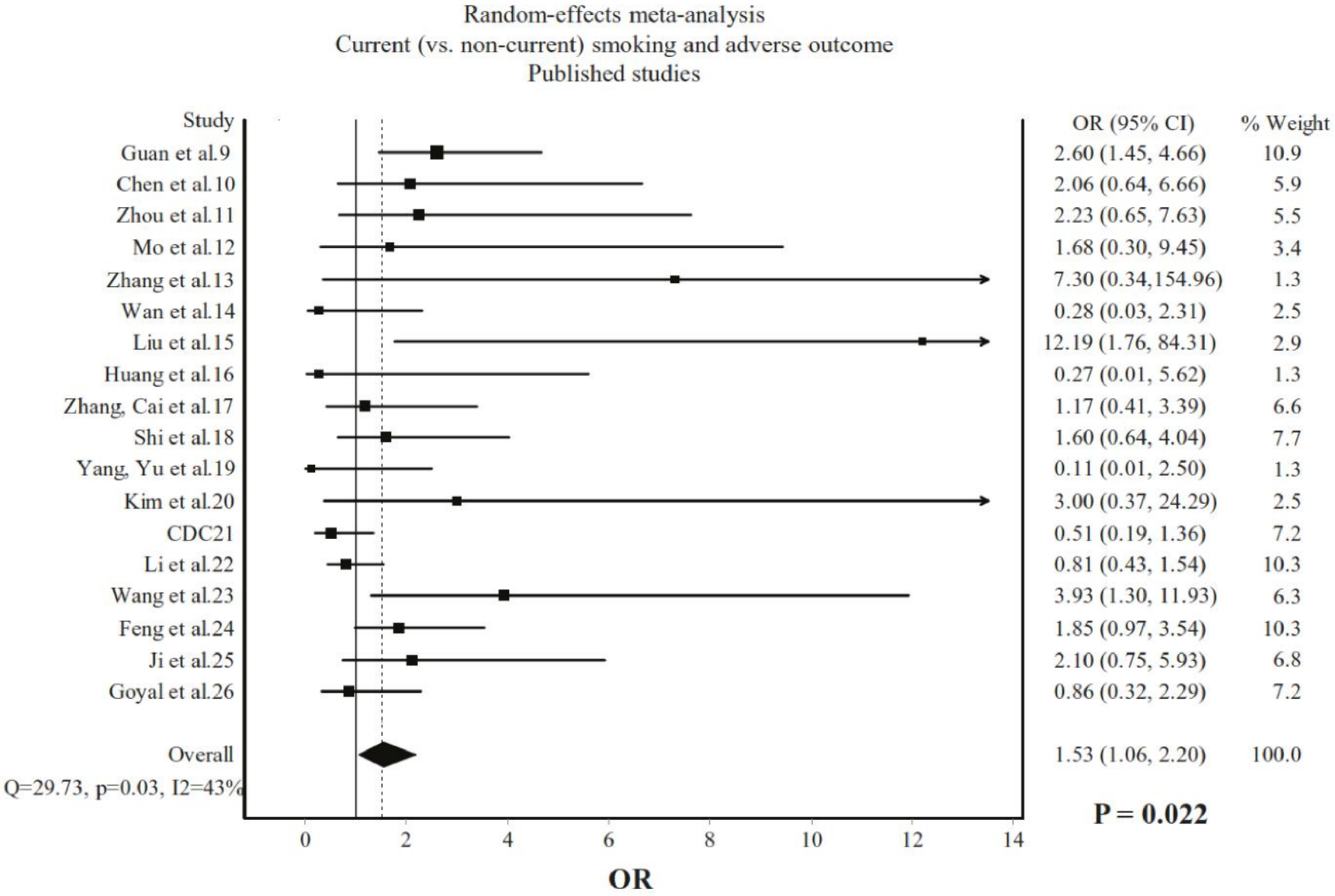
Farsalinos K et al, Ther Adv Chronic Dis 2020, Vol. 11: 1–14

Haben Raucher eine schlechtere Prognose bei eine Covid19 Infekt?

Raucher haben eine schlechte Prognose bei Covid-19 Infektion



Farsalinos K et al, Ther Adv Chronic Dis 2020, Vol. 11: 1–14

Hoher Mortalität Risiko bei Raucher mit Covid-Infektion

Table 3
Model 2 logistic regression with adjusted odds ratios, model summary, and model comparison statistics ($N = 440$).

Coefficient	B	SE	Wald	RR	95% RR Odds CI	AOR	95% AOR Odds CI
Age	0.06	0.01	5.80	1.66***,!	[1.55, 2.24]!	1.75***,!	[1.46, 2.12]!
Gender	−1.41	0.54	−2.60	0.26**	[0.08, 0.68]	0.25**	[0.08, 0.66]
Race	−0.09	0.28	−0.34	0.91	[0.54, 1.52]	0.91	[0.53, 1.58]
BMI	−0.01	0.02	−0.81	0.94&	[0.80, 1.10]&	0.94&	[0.81, 1.09]&
Immunodeficiency Syndromes	1.49	0.36	4.13	3.67***	[2.06, 5.88]	4.42***	[2.24, 9.28]
Pulmonary Diseases	0.76	0.31	2.49	2.00*	[1.18, 3.29]	2.14*	[1.19, 3.98]
Oncologic Diseases	−0.03	0.23	−0.13	0.97	[0.64, 1.46]	0.97	[0.62, 1.52]
Gastrointestinal Diseases	−0.21	0.28	−0.76	0.82	[0.49, 1.35]	0.81	[0.47, 1.39]
Renal Diseases	0.39	0.24	1.62	1.45	[0.93, 2.18]	1.48	[0.92, 2.39]
Hematologic Diseases	0.06	0.21	0.27	1.06	[0.72, 1.53]	1.06	[0.70, 1.59]
Endocrine Diseases	0.60	0.19	3.09	1.77**	[1.23, 2.40]	1.83**	[1.25, 2.69]
Cardiovascular Diseases	−0.10	0.33	−0.31	0.91	[0.49, 1.64]	0.90	[0.47, 1.73]
Neurologic Problems	0.20	0.22	0.91	1.21	[0.80, 1.79]	1.22	[0.79, 1.90]
Lifetime Tobacco User	0.82	0.24	3.42	2.25***	[1.39, 3.10]	2.28***	[1.43, 3.68]

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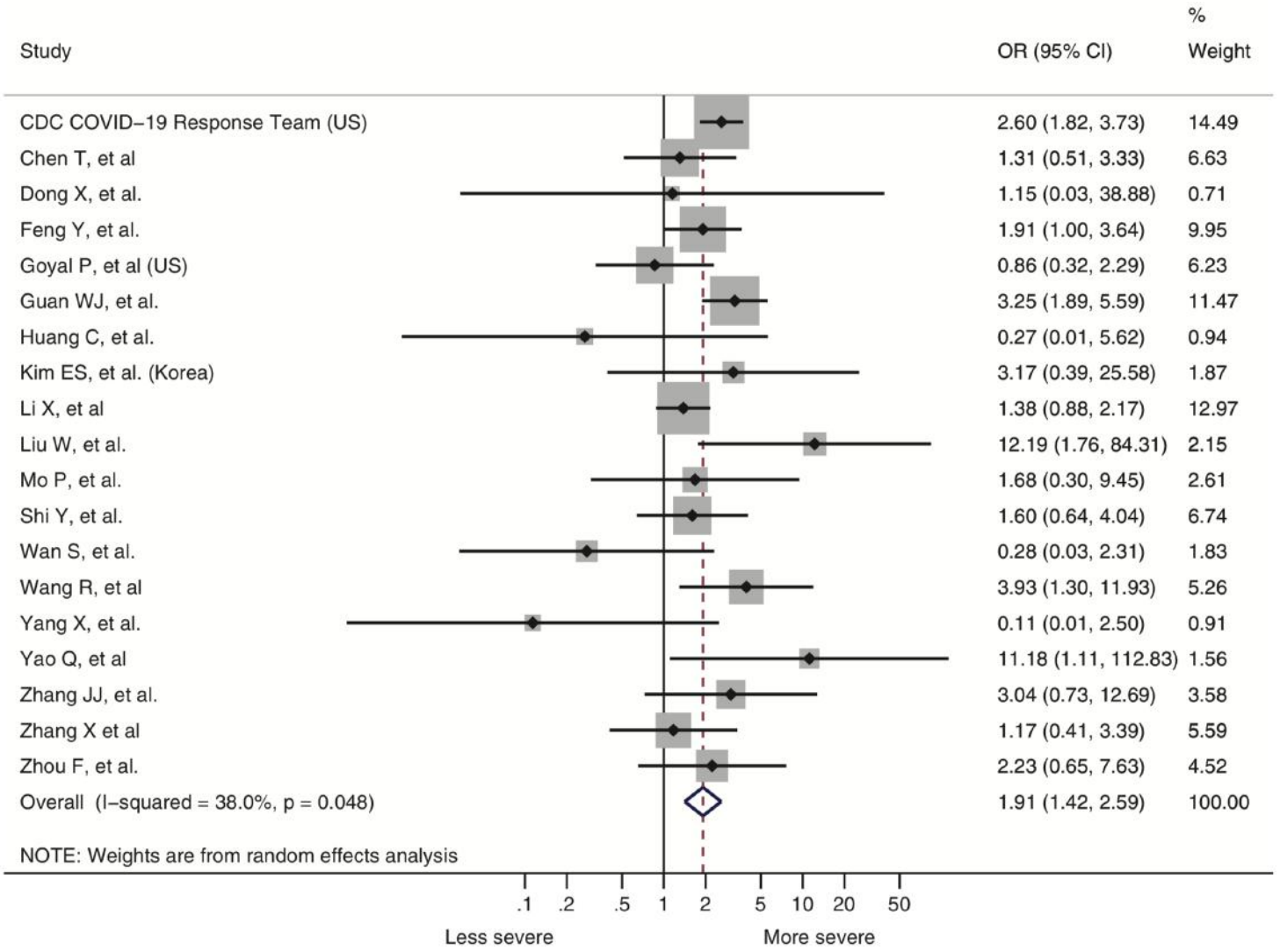
Addictive Behaviors 113 (2021)

Smoking and COVID–19 Disease Progression



Patanavanich R and Glantz SA, *Nicotine & Tobacco Research*, 2020, 1–4

Risiko für einen schweren Verlauf bei Covid19 Infekt

I. Personen ab 65 Jahren

II. Schwangere Frauen

III. Erwachsene mit folgenden Vorerkrankungen:

1. Bluthochdruck

- Arterielle Hypertonie mit Endorganschaden
- Therapie-resistente arterielle Hypertonie

2. Herz-Kreislauf-Erkrankungen

2.1 Generelle Kriterien

- Patient/innen mit Dyspnoe funktionelle Klasse NYHA II–IV und NT-Pro BNP > 125 pg/ml
- Patient/innen mit mindestens 2 kardiovaskulären Risikofaktoren (einer davon Diabetes oder arterielle Hypertonie)
- Vorgängiger Schlaganfall und/oder symptomatische Vaskulopathie
- Chronische Niereninsuffizienz (Stadium 3, GFR <60ml/min)

2.2 Andere Kriterien

2.2.1 Koronare Herzkrankheit

- Myokardinfarkt (STEMI und NSTEMI) in den letzten 12 Monaten
- Symptomatisches chronisches Koronarsyndrom trotz medizinischer Therapie (unabhängig von allfälliger vorheriger Revaskularisierung)

2.2.2 Erkrankung der Herzklappen

- Mittelschwere oder schwere Stenose und/oder Regurgitation zusätzlich zu mindestens einem generellen Kriterium
- Jeglicher chirurgischer oder perkutaner Klappenersatz zusätzlich zu mindestens einem generellen Kriterium

2.2.3 Herzinsuffizienz

- Patient/innen mit Dyspnoe funktionelle Klasse NYHA II–IV oder NT-Pro BNP > 125pg/ml trotz medizinischer Therapie jeglicher LVEF (HFpEF, HFmrEF, HFrEF)
- Kardiomyopathie jeglicher Ursache
- Pulmonalarterielle Hypertonie

BAG website

Covid19 und Tabakkonsum

»It is possible that the period of self-isolation and lockdown restrictions during this pandemic could be used by some as an opportunity to quit smoking, but realistically only a minority of people will achieve cessation.

For the majority, the increased stress of a potentially fatal disease, possibility of loss of employment, feelings of insecurity, confinement, and boredom, could increase the desire to smoke.

During the financial collapse of 2008, tobacco shares were one of the only shares to increase.»

van Zyl-Smit R et al, Lancet Respiratory 2020

TAKE HOME MESSAGES

Tabak/Nikotin Konsum sind Risikofaktoren für Infekt, ob das auch für Covid19 wahr ist, ist nicht klar
Es gibt aber keine Daten dass Rauchen einen Schutzfaktor ist.

Tabak/Nikotin Konsumenten haben häufiger schweren Verläufe bei Covid19-Infekt

In eine Ausnahme-Situationen ist für viele Personen schwieriger ein Entwöhnung wahrzunehmen.
Desto wichtig ist die Tabak/Nikotin Konsumenten zu helfen!

Vielen Dank für die Aufmerksamkeit!

Prof Dr. med. Isabella Sudano
Universitäres Herzzentrum Kardiologie USZ
isabella.sudano@usz.ch