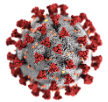
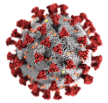


Influence of COVID -19 on endocarditis incidence

Raluca Dulgheru, MD, PhD

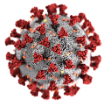
Liege, Belgium

Declaration of interest



I have nothing to declare regarding this presentation

IE deadly disease

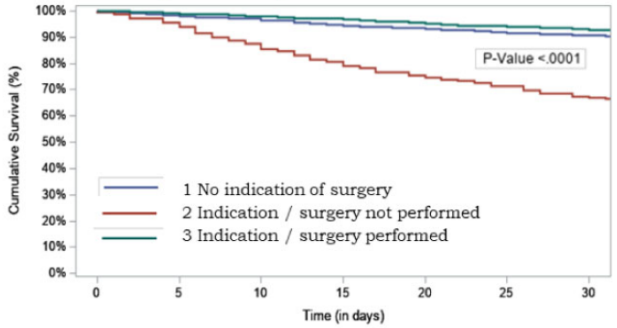


- IE associated with high morbidity and mortality (> 20%, > 50% if surgery indicated but not performed)

- IE increasing incidence during the past 2 decades

In-hospital mortality in EURO-ENDO

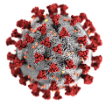
adjusted Kaplan-Meier curves



Highest one-month mortality in patients with failure to undertake surgery despite a guideline recommended indication

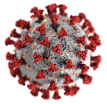
Habib et al. Eur Heart J 2015
Habib et al. Eur Heart J 2019

COVID 19 pandemic



- Unprecedented pandemic needing most medical resources (prevention + control of the pandemic)
- TOE is a class I indication for IE diagnosis
- Number of TOE was expected to decrease to lower the risk of intra-hospital transmission of COVID
- Overlap of risk factors for patients with IE and COVID 19
- Overlap of symptoms at presentation (fever, inflammation, dyspnoea…)

Hypothesis



Pandemia start

Fewer elective surgical procedures/hospitalizations

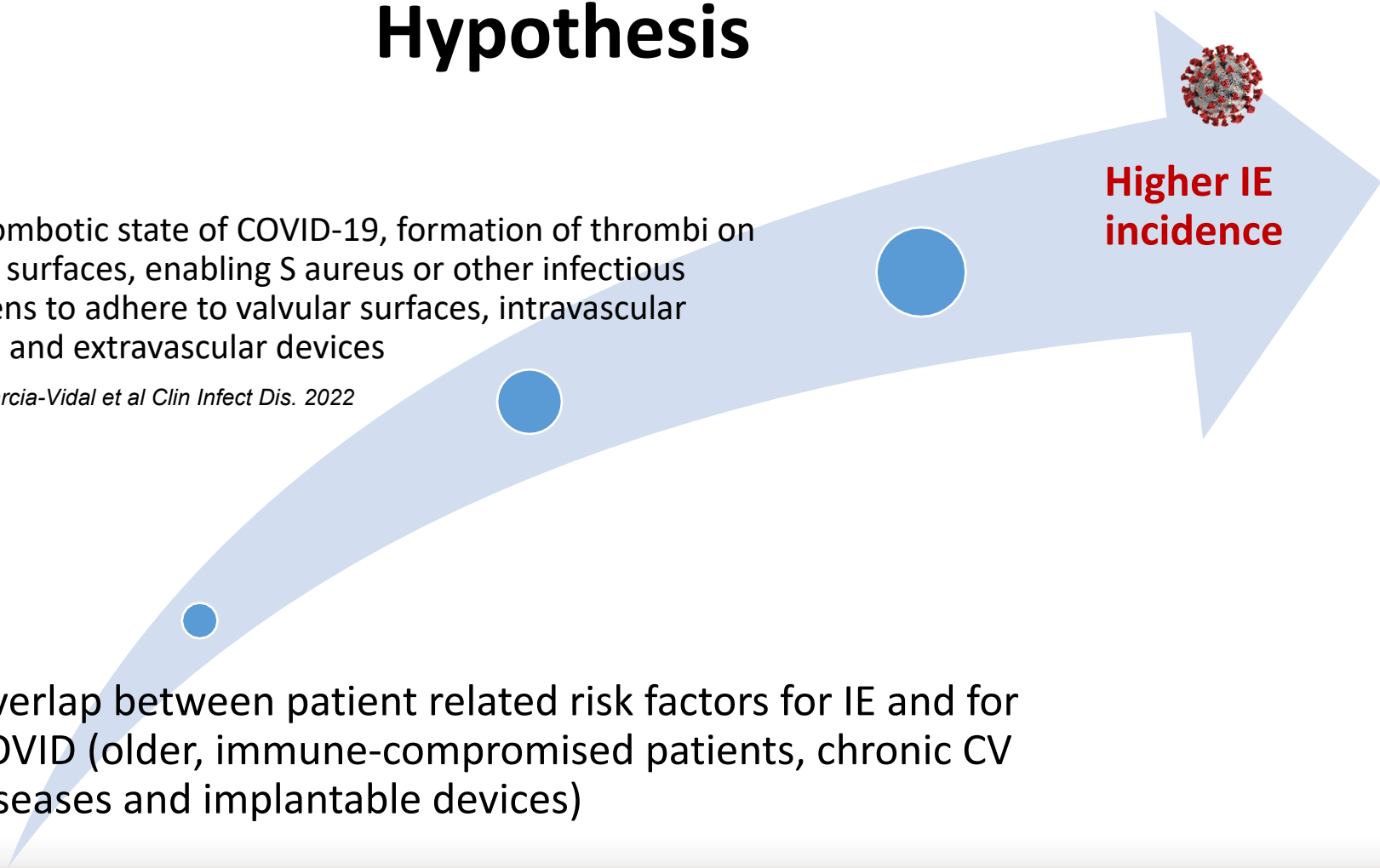
Fewer hospital acquired IE

Fewer dental procedure/elective device implants

High risk patients/fewer acquired IE

IE incidence

Hypothesis

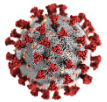


Pro-thrombotic state of COVID-19, formation of thrombi on valvular surfaces, enabling S aureus or other infectious pathogens to adhere to valvular surfaces, intravascular devices, and extravascular devices

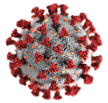
C Garcia-Vidal et al Clin Infect Dis. 2022

Higher IE incidence

Overlap between patient related risk factors for IE and for COVID (older, immune-compromised patients, chronic CV diseases and implantable devices)



Influence of COVID -19 on endocarditis incidence ?



Clinical Research in Cardiology (2020) 109:1573–1576
https://doi.org/10.1007/s00392-020-01686-x

LETTER TO THE EDITORS

Disturbing effect of lockdown for COVID-19 on the incidence of infective endocarditis: a word of caution

Guy Van Camp[1] · Hans De Beenhouwer[2] · Monika Beles[1] · Carlos Collet[1] · Riwa Nasser[1] · Dan Schelfaut[1] · Martin Penicka[1]

Received: 13 May 2020 / Accepted: 3 June 2020 / Published online: 10 June 2020

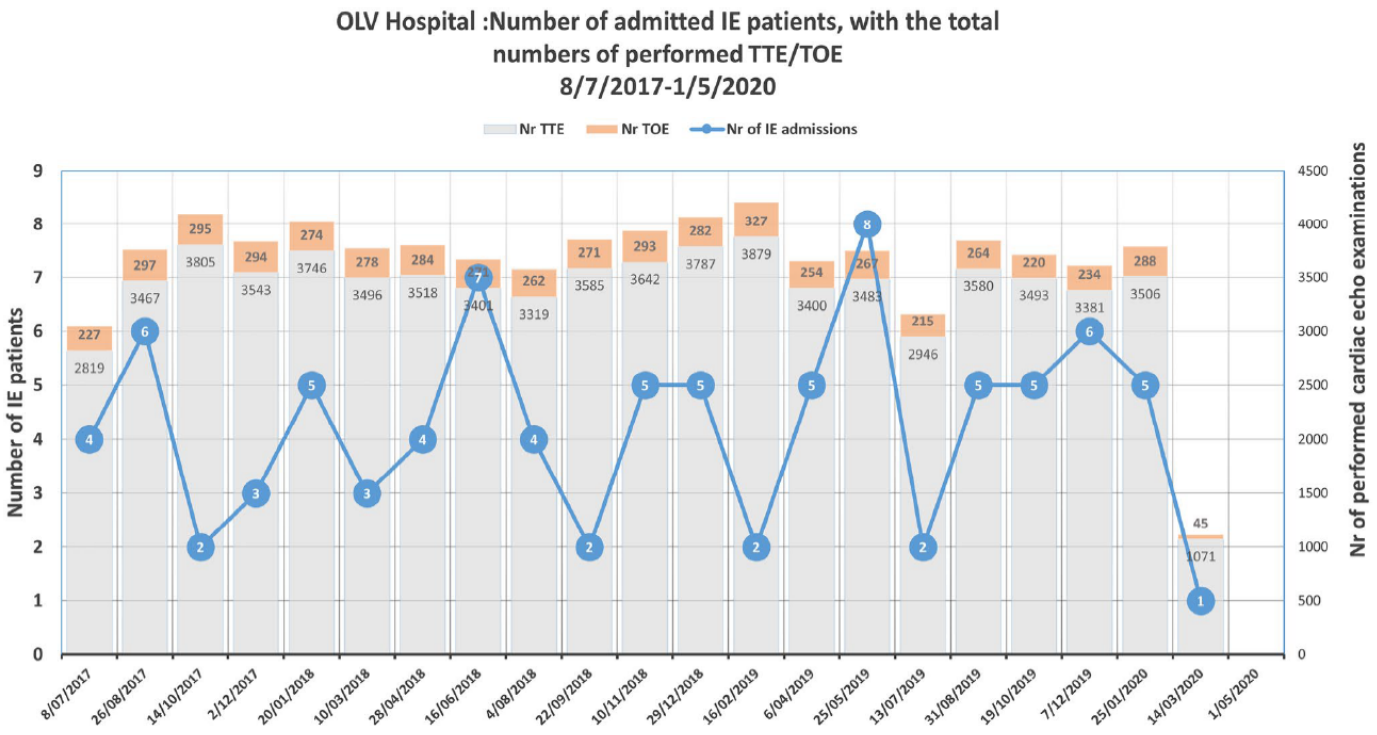


Fig. 1 Graphical representation of the number of patients with definite IE represented by clusters of 7 weeks period. Last cluster of 7 weeks represents the lockdown period in Belgium. Superimposed are the numbers of TTE's and TOE's for each time cluster

Van Camp et al Clinical Research In Cardiology. 2020

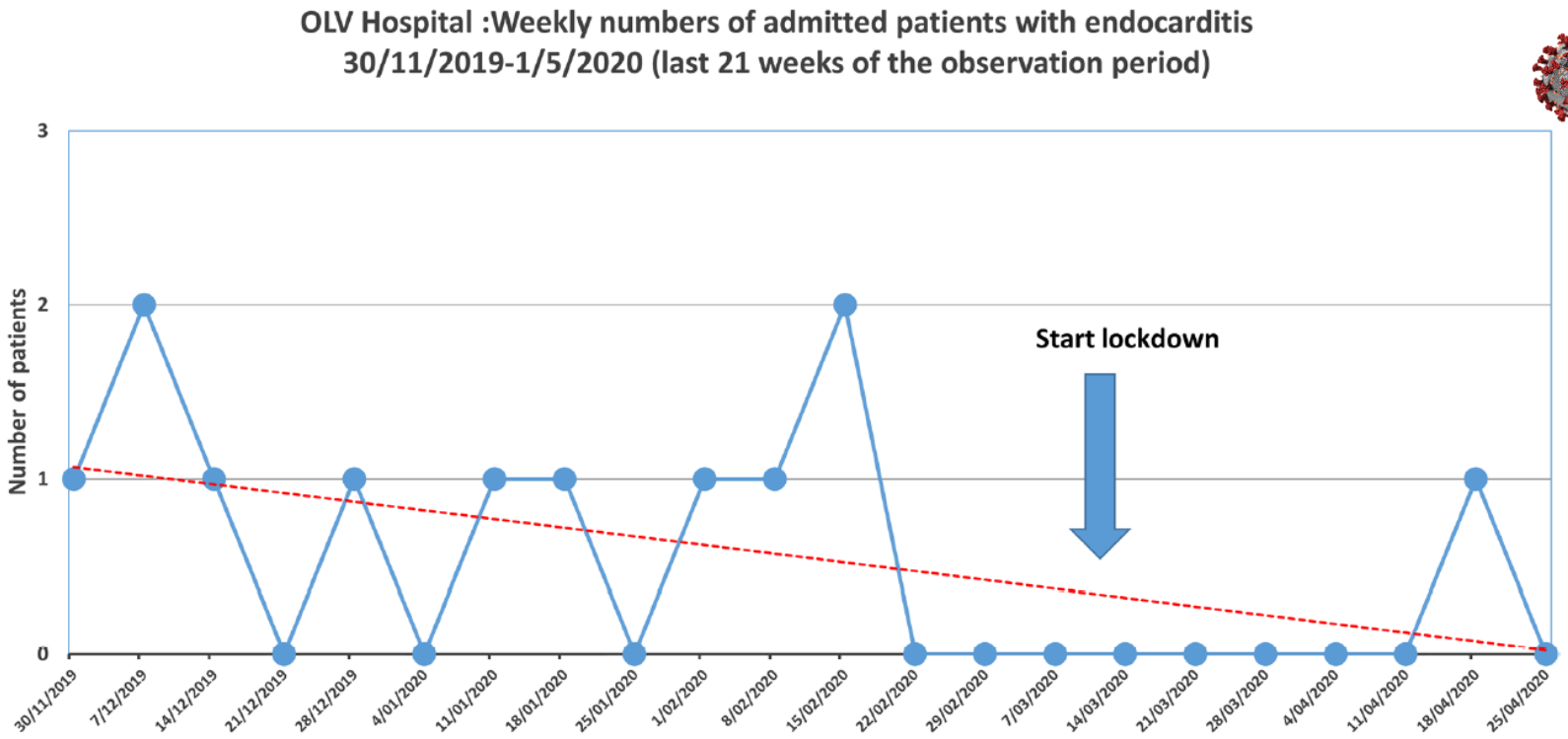
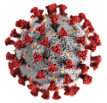


Fig. 2 Focus on the latest 21 weeks. Weekly numbers are shown

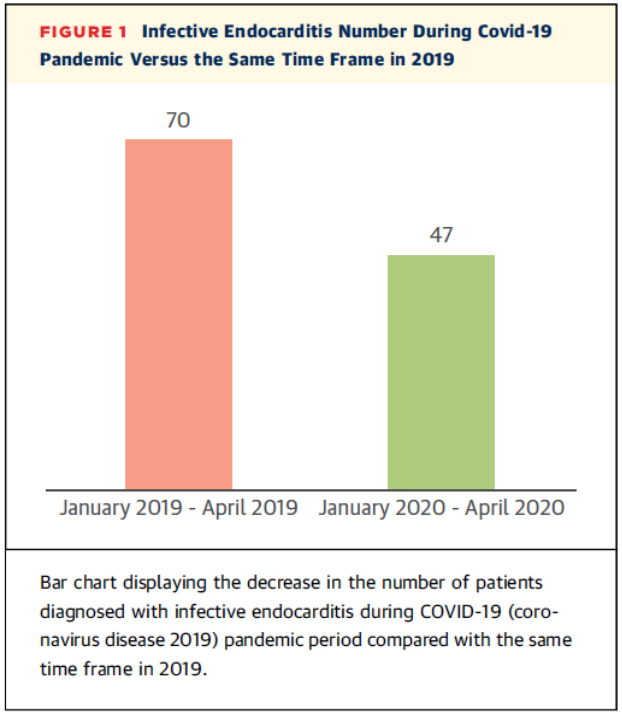
Van Camp et al Clinical Research In Cardiology. 2020



This report suggests a possible underdiagnosis of definite IE linked to lockdown measures imposed by the authorities in this COVID-19 pandemic. Even if numbers are small implicating a negative impact on strong statistical evidence, the paper gives enough elements to consider this problem and to increase our alertness for timely diagnosis and treatment of this deadly disease even in a COVID-19 pandemic.

Van Camp et al Clinical Research In Cardiology. 2020

And others…



Patients with IE during the pandemic : worse prognosis

	March – April 2020	March – April 2019
Cerebral embolism	56%	18.5%
In – hospital mortality	61%*	31%*

Courtesy prof Cosyns

- *Liu X et al J Cardi Surg*

B Cosyns, et al JACC: Cardiovascular Imaging, Volume 13, Issue 11,2

Potential explanations

- ✓ **Diagnosis not made – overdiagnosis of Covid 19**
  - ✓ Clinical presentation may be confusing – remote consultations
  - ✓ Less TTE and TOE due to the risk of contamination
  - ✓ Less complete work up (CT, PET CT)
- ✓ **Fear of hospitalisation – death at home/senior homes**
- ✓ **Less transfer to reference centers**
  - ✓ Risk of contamination
  - ✓ Logistic reasons (free beds at ICU – decreased availability personal)

L. Escola Vergé, et al Clin Microb Infect 2021

Courtesy prof Cosyns

IJC Heart & Vasculature 31 (2020) 100675

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Incidence of infective endocarditis during the coronavirus disease 2019 pandemic: A nationwide study ☆

Eva Havers-Borgersen [a,*], Emil L. Fosbøl [a], Jawad H. Butt [a], Jeppe K. Petersen [a], Andreas Dalsgaard [a], Frederik Kyhl [a], Morten Schou [b], Matthew Phelps [c], Kristian Kragholm [d], Gunnar H. Gislason [c,e], Christian Torp-Pedersen [f], Lars Køber [a], Lauge Østergaard [a]

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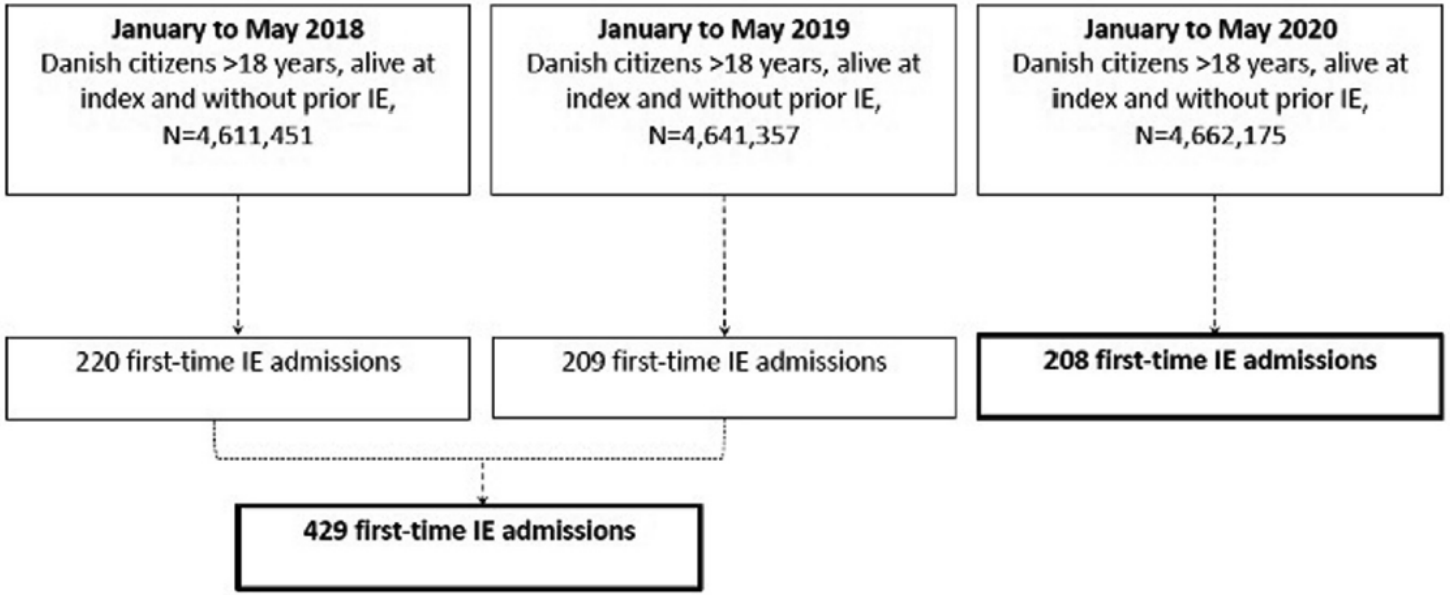


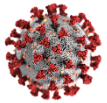
Fig. 1. Flowchart. The figure shows the selection process for the study population.

Borgersen et al IJC Heart and Vasculature 2020

Table 1
Baseline characteristics for patients admitted with IE.

	1 January to 7 May 2018/ 2019 N = 429	1 January to 6 May 2020 N = 208
Demographics		
Age (years), median (IQR)	72.7 (62.9–80.2)	74.1 (63.8–80.6)
Male, N (%)	275 (64.1%)	140 (67.3%)
Comorbidities, N (%)		
Stroke	49 (11.4%)	19 (9.1%)
Atrial flutter/fibrillation	103 (24.0%)	57 (27.4%)
Peripheral vascular disease	27 (6.3%)	20 (9.6%)
Chronic heart Failure	64 (14.9%)	36 (17.3%)
Chronic renal failure	69 (16.1%)	29 (13.9%)
Dialysis	40 (9.3%)	20 (9.6%)
Diabetes	106 (24.7%)	41 (19.7%)
COPD	46 (10.7%)	27 (13.0%)
Liver disease	27 (6.3%)	15 (7.2%)
Rheumatologic disease	35 (8.2%)	15 (7.2%)
Malignancy	95 (22.1%)	53 (25.5%)
CIED	80 (18.6%)	34 (16.3%)
Prosthetic heart valve	88 (20.5%)	45 (21.6%)
Hypertension	219 (51.0%)	119 (57.2%)
Pharmacotherapy, N (%)		
Beta blockers	169 (39.4%)	92 (44.2%)
Calcium channel blockers	99 (23.1%)	63 (30.3%)
RASi	182 (42.4%)	95 (45.7%)
Loop-diuretics	158 (36.8%)	87 (41.8%)
Statins	190 (44.3%)	92 (44.2%)
ASA	109 (25.4%)	38 (18.3%)
ADPi	52 (12.1%)	26 (12.5%)
OAC	147 (34.3%)	81 (38.9%)

IE: infective endocarditis, IQR: interquartile range, COPD: chronic obstructive pulmonary disease, CIED: cardiac implantable electronic device, RASi: renin angiotensin system inhibitor, ASA: aspirin, ADPi: adenosine-di-phosphate inhibitor, OAC: oral anticoagulant therapy



No differences in sex, age, or comorbidities

Borgersen et al IJC Heart and Vasculature 2020

No differences in sex, age, or comorbidities

Table 2
Baseline characteristics for patients admitted with IE.

	1 January to 11 March 2018/2019 N = 242	13 March to 7 May 2018/2019 N = 187	1 January to 11 March 2020 N = 127	12 March to 6 May 2020 N = 81
Demographics				
Age (years), median (IQR)	71.1 (61.0–79.5)	74.4 (65.5–81.8)	74.6 (62.7–80.6)	73.8 (63.9–80.8)
Male, N (%)	152 (62.8%)	123 (65.8%)	85 (66.9)	55 (67.9%)
Comorbidities, N (%)				
Stroke	28 (11.6%)	21 (11.2%)	15 (11.8%)	4 (4.9%)
Atrial flutter/fibrillation	52 (21.5%)	51 (27.3%)	35 (27.6%)	22 (27.2%)
Peripheral vascular disease	16 (6.6%)	11 (5.9%)	11 (8.7%)	9 (11.1%)
Chronic heart failure	35 (14.5%)	29 (15.5%)	25 (19.7%)	11 (13.6%)
Chronic renal failure	39 (16.1%)	30 (16.0%)	21 (16.5%)	8 (9.9%)
Dialysis	24 (9.9%)	16 (8.6%)	16 (12.6%)	4 (4.9%)
Diabetes	59 (24.4%)	47 (25.1%)	26 (20.5%)	15 (18.5%)
COPD	27 (11.2%)	19 (10.2%)	13 (10.2%)	14 (17.3%)
Liver disease	15 (6.2%)	12 (6.4%)	11 (8.7%)	4 (4.9%)
Rheumatologic disease	21 (8.7%)	14 (7.5%)	5 (3.9%)	10 (12.3%)
Malignancy	44 (18.2%)	51 (27.3%)	32 (25.2%)	21 (25.9%)
CIED	42 (17.4%)	38 (20.4%)	19 (15.0%)	15 (18.5%)
Prosthetic heart valve	54 (22.3%)	34 (18.2%)	25 (19.7%)	20 (24.7%)
Hypertension	122 (50.4%)	97 (51.9%)	74 (58.3%)	45 (55.6%)
Pharmacotherapy, N (%)				
Beta blockers	91 (37.6%)	78 (41.7%)	60 (47.2%)	32 (39.5%)
Calcium channel blockers	56 (23.1%)	43 (23.0%)	37 (29.1%)	26 (32.1%)
RASi	104 (43.0%)	78 (41.7%)	56 (44.1%)	39 (48.1%)
Loop-diuretics	87 (36.0%)	71 (38.0%)	56 (44.1%)	31 (38.3%)
Statins	103 (42.6%)	87 (46.5%)	60 (47.2%)	32 (39.5%)
ASA	63 (26.0%)	46 (24.6%)	23 (18.1%)	15 (18.5%)
ADPi	28 (11.6%)	24 (12.8%)	18 (14.2%)	8 (9.9%)
OAC	74 (30.6%)	73 (39.9%)	48 (37.8%)	33 (40.7%)

IE: infective endocarditis, IQR: interquartile range, COPD: chronic obstructive pulmonary disease, CIED: cardiac implantable electronic device, RASi: renin angiotensin system inhibitor, ASA: aspirin, ADPi: adenosine-di-phosphate inhibitor, OAC: oral anticoagulant therapy

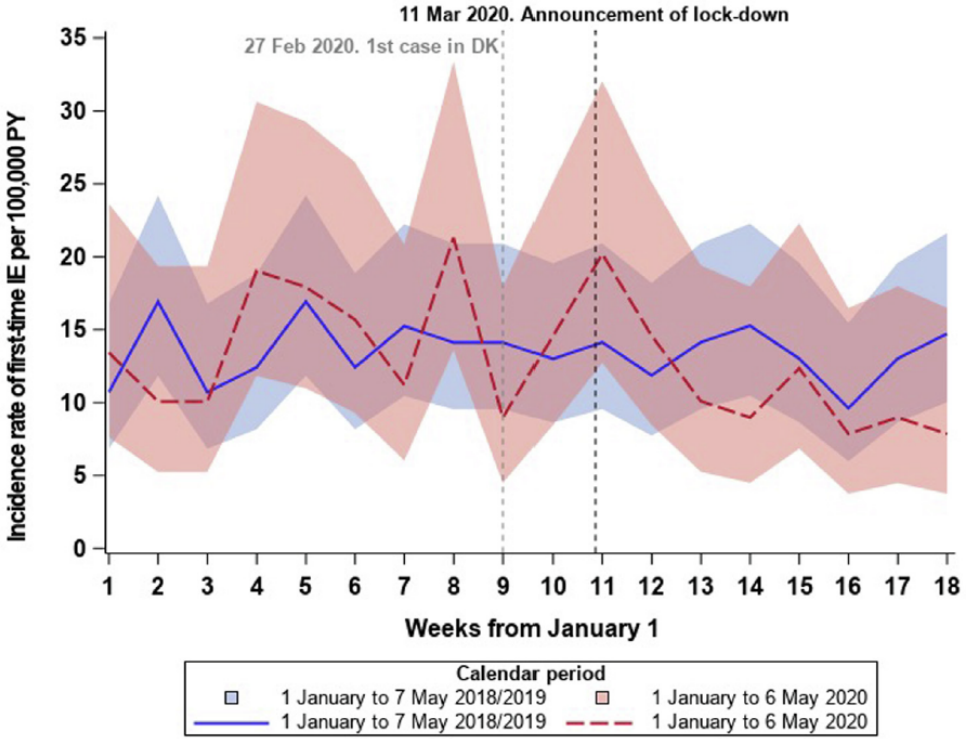


Fig. 2. Incidence rates of IE admissions with 95% CI bands in 2020 versus 2018/2019. The figure shows the incidence rates in 2020 as compared with 2018/2019. IE: Infective endocarditis.

- 3% decline comparing the average number of IE admissions

- **Slight but not significant decline after lockdown**
- **Overall incidence rate 13.5 cases/100.000 PY vs 13 cases/100.000 PY**

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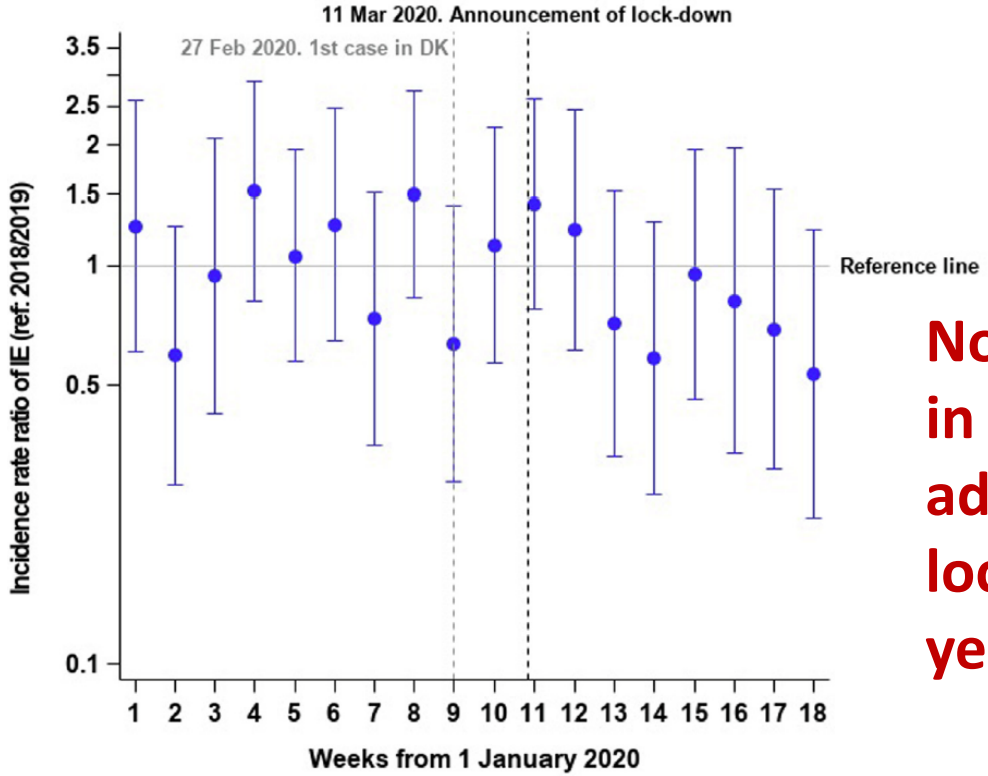

No significant difference in the incidence of IE admissions during lockdown vs. precedent years

Fig. 3. Incidence rate ratios of IE admissions in 2020 versus 2018/2019. The figure shows the incidence rate ratios per week (1–18) in 2020 as compared with week 1–18 in 2018/2019. IE: Infective endocarditis.

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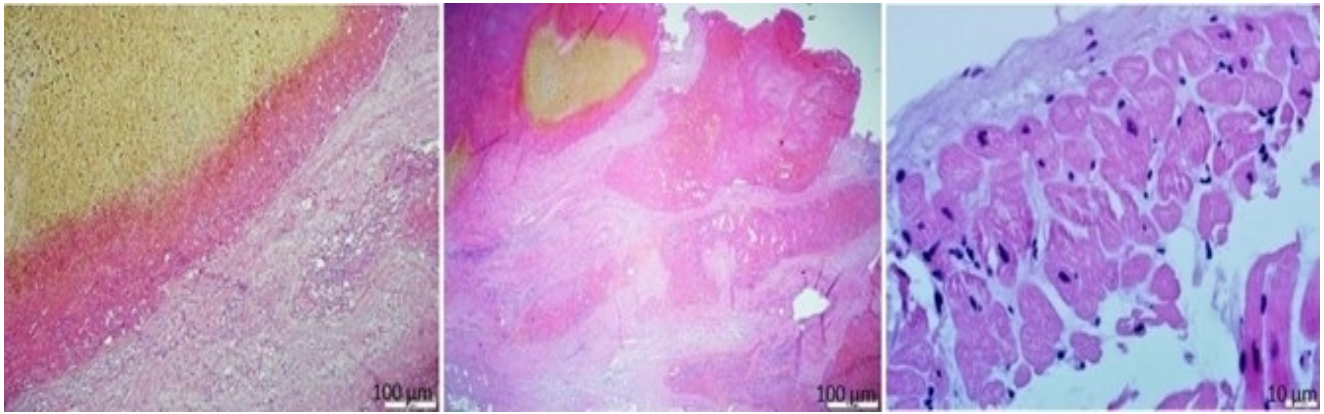
Non bacterial marantic endocarditis and Covid

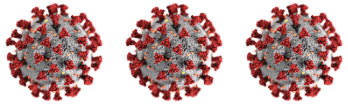
- ✓ Vegetation and negative blood cultures
- ✓ Context of suspicion of myocarditis with EBM
- ✓ Coronavirus in the endothelium
- ✓ Active deposition of immune complexes in the valvular endothelium



O Blagova et al EHJ Oct 2021

Courtesy prof Cosyns

Take home messages



- IE may have been underdiagnosed during Covid 19 pandemic ?
- Multifactorial explanations should be taken into consideration
- The prothrombotic effect of Sars-Cov2 may favor the occurrence of IE or be responsible for marantic IE (still an open question)
- An international registry collecting the data in this population is highly desirable
- The impact of the last waves, vaccination, and new strains is unknown