COLOURS OF SEPSIS
FESTIVAL INTENZIVNÍ MEDICÍNY

BMI and body size in ICU

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Declaration of interest: none related to this analysis.

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EDITORIAL
Signa Vitae

SepsEast and COVID-19: Time to Make a Difference

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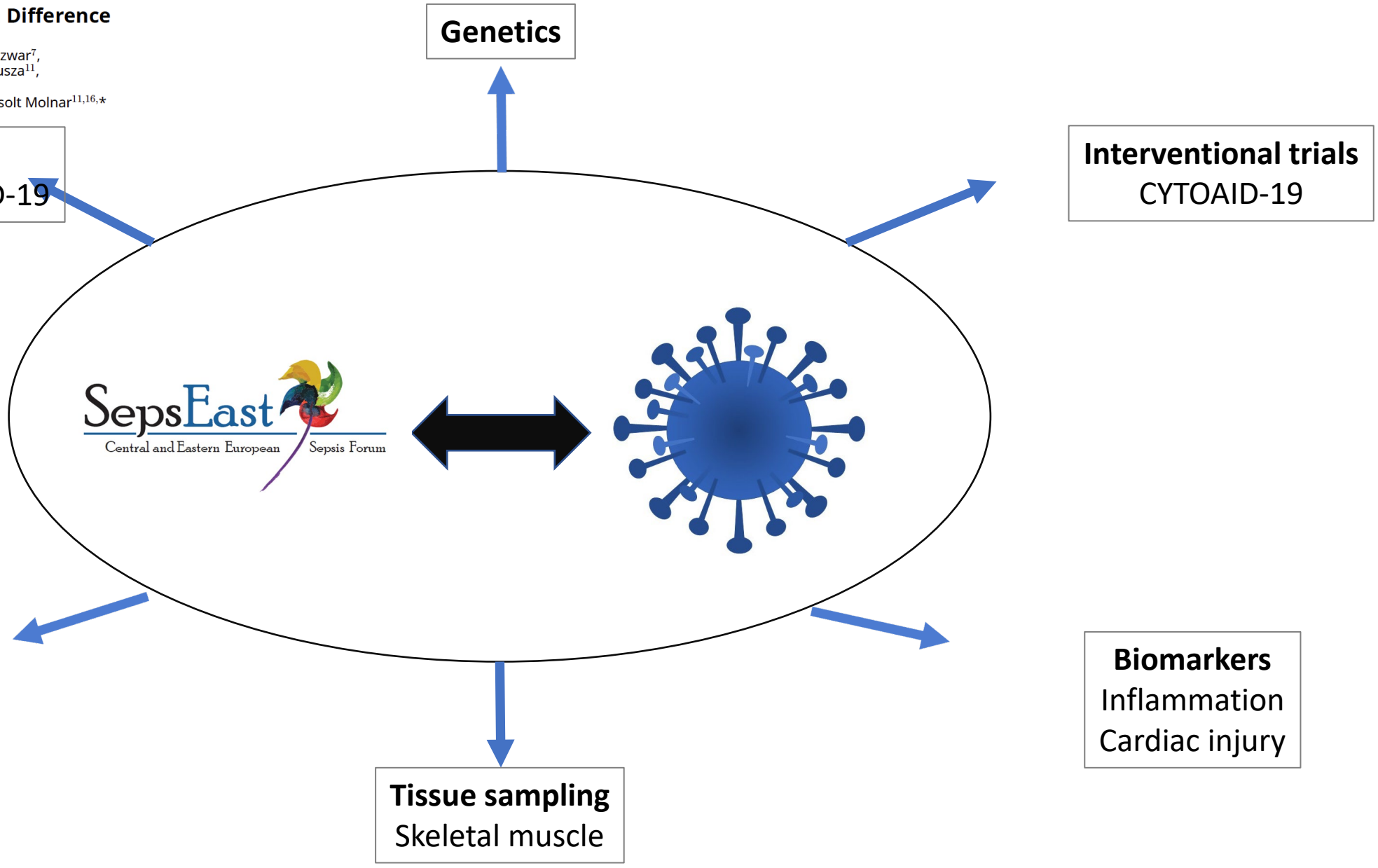
4. SepsEast and COVID-19: the future

In the most optimistic scenario, we will need at least 12 months before getting the stronger grip of the COVID-19 pandemic. Even when under control, seemingly the world will not be the same as we are used to. The current pandemic should be our lesson on how to manage the global threat of infectious disease and to develop strategies for effective diagnostic and therapeutic procedures. Hopefully, the SepsEast community will contribute to these developments and scientific advances in general.



scientific reports

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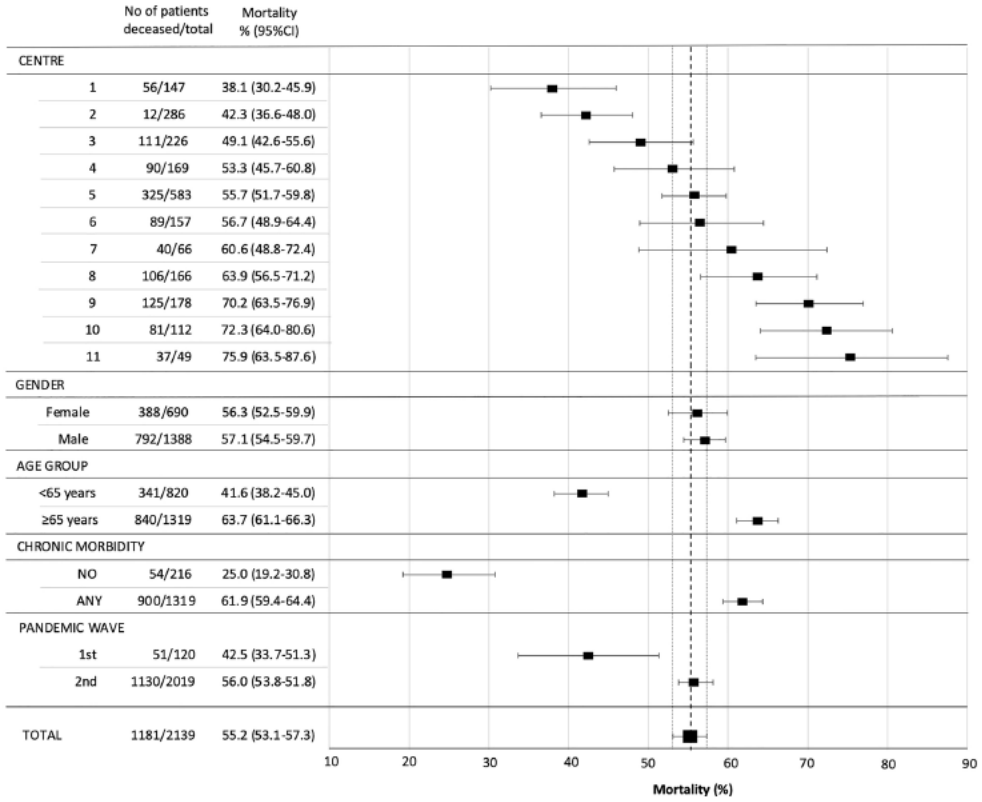
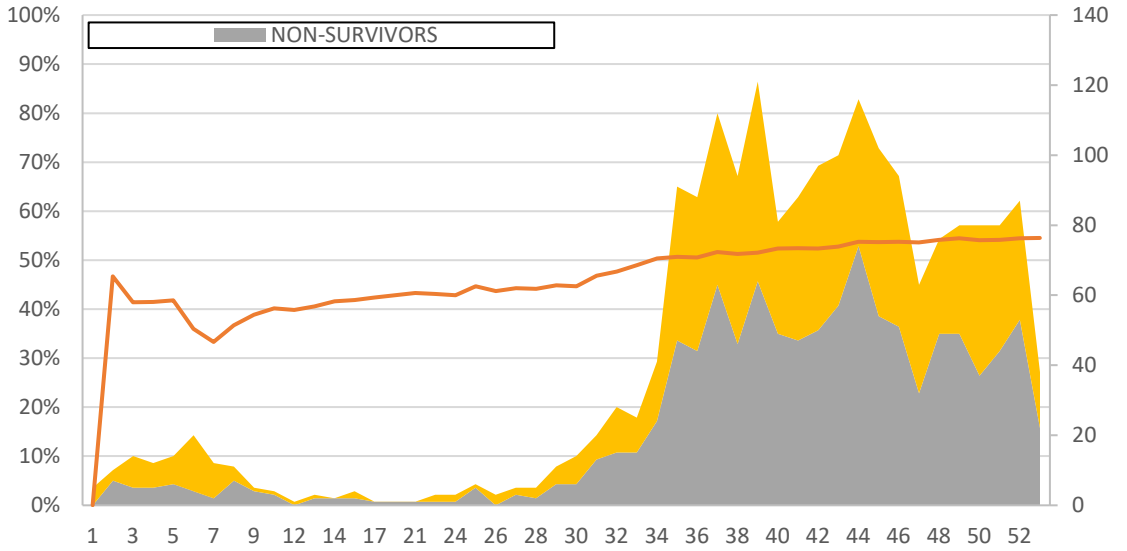
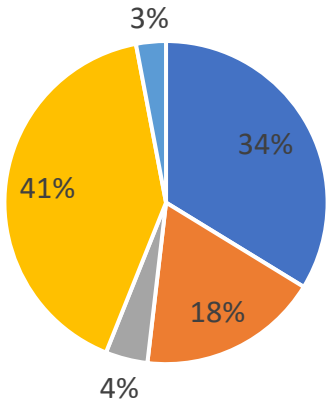
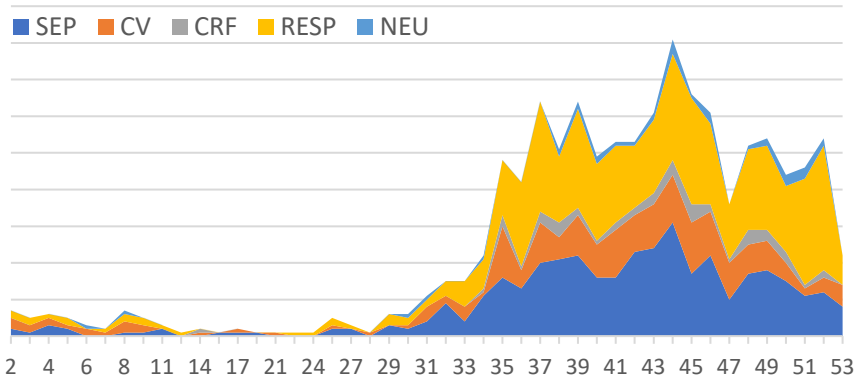
SepsEast Registry indicates high mortality associated with COVID-19 caused acute respiratory failure in Central-Eastern European intensive care units

Jan Benes[1,2,3,23], Miłosz Jankowski[4,5,23], Konstanty Szułdrzynski[4,5], Roman Zahorec[6], Mitja Lainscak[7,8], Zoltán Ruszkai[9], Matej Podbregar[8,10], Jan Zatloukal[1,2], Jakub Kletecka[1,2], Krzysztof Kusza[11], Jakub Szrama[11], Estera Ramic[12], Katarina Galkova[13], Stefan Krbila[14], Josef Valky[15], Jaka Ivanic[16], Marko Kurnik[10], Angéla Mikó[9], Tamás Kiss[17], Barbara Hetényi[17], Peter Hegyi[18,19,20], Alan Sustic[12,21]✉ & Zsolt Molnar[11,19,22]✉

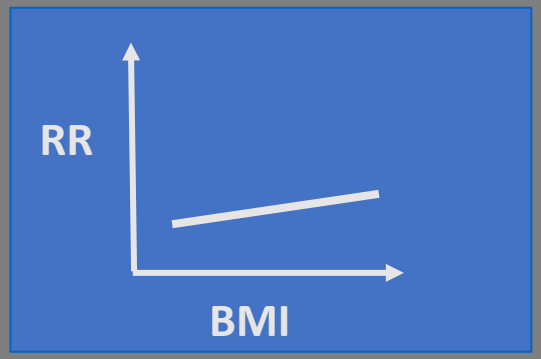




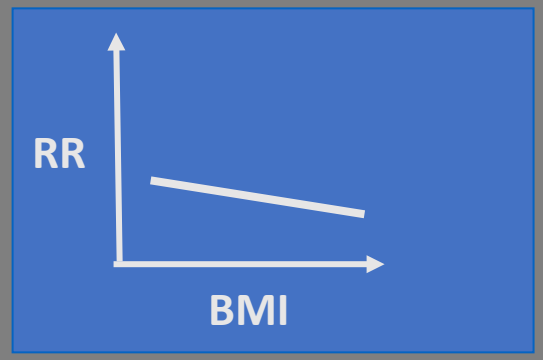




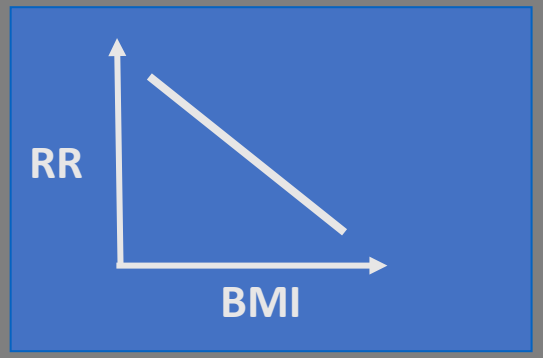
Aging → Risk Factor Reversal



> 65 years



65-75 years



>75 years

Obesity-related excess mortality declines with age at all levels of obesity!

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Original Article

Does there exist an obesity paradox in COVID-19? Insights of the international HOPE-COVID-19-registry

Mohammad Abumayyaleh[a,*,1], Iván J. Núñez Gil[b,1], Ibrahim El-Battrawy[a,1], Vicente Estrada[b], Víctor Manuel Becerra-Muñoz[c], Alvaro Aparisi[d], Inmaculada Fernández-Rozas[e], Gisela Feltes[f], Ramón Arroyo-Espliguero[g], Daniela Trabattoni[h], Javier López-País[i], Martino Pepe[j], Rodolfo Romero[k], Diego Raúl Villavicencio García[l], Carloalberto Biole[m], Thamar Capel Astrua[n], Charbel Maroun Eid[o], Emilio Alfonso[p], Lucia Fernandez-Presa[q], Carolina Espejo[r], Danilo Buonsenso[s], Sergio Raposeiras[t], Cristina Fernández[i,u], Carlos Macaya[b], Ibrahim Akin[a], on behalf of HOPE COVID-19 investigators

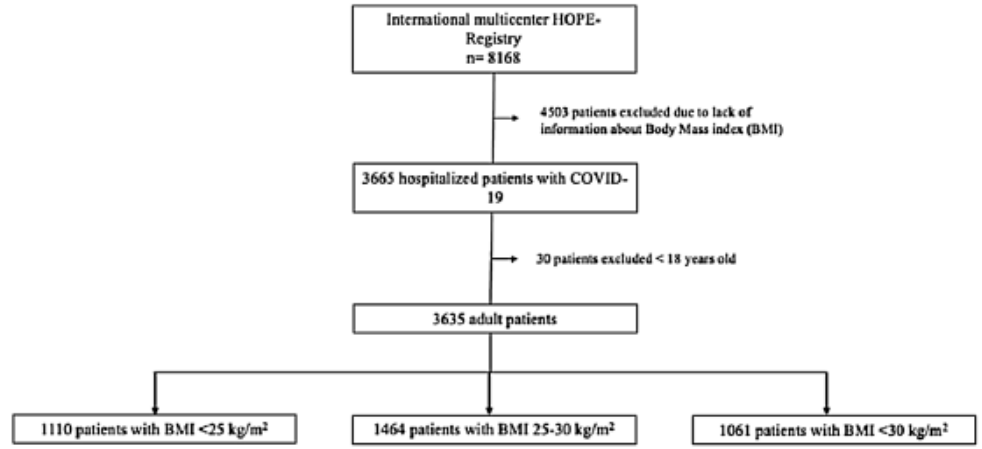

Fig. 1. Flow chart of study selection process.

Table 2
Complications and supporting procedures during the admission.

	All patients N = 3635	BMI (kg/m²) <25 N = 1110	25–30 N = 1464	>30 N = 1061	P[1] value	P[2] value
Complication — no. (%)						
Respiratory insufficiency	1690/3579 (46.8)	385 (22.8)	706 (41.8)	598 (35.4)	**<0.001**	**<0.001**
Heart failure	247/3565 (6.9)	62 (25.1)	92 (37.2)	93 (37.7)	0.43	**0.003**
Acute kidney injury	550/3572 (15.4)	117 (21.3)	224 (40.7)	209 (38)	**<0.001**	**<0.001**
Pneumonia	2995/3548 (84.4)	847 (28.3)	1198 (40)	949 (31.7)	**<0.001**	**<0.001**
Sepsis	459/3526 (13)	115 (25.1)	195 (42.5)	149 (32.5)	**0.02**	**0.009**
Any relevant bleeding ç	112/3517 (3.2)	34 (30.4)	53 (47.3)	25 (22.3)	0.42	0.32
Embolic event	115/3525 (3.3)	28 (24.3)	58 (50.4)	29 (25.2)	**0.04**	0.77
Oxygen therapy — no. (%)						
O_2 support at the admission	2552/3562 (71.6)	717 (28.1)	1015 (39.8)	819 (32.1)	**0.003**	**<0.001**
High flow nasal cannula	785/3513 (22.3)	192 (24.5)	333 (42.4)	260 (33.1)	**<0.001**	**<0.001**
Non-invasive mechanical ventilation	606/3538 (17.1)	162 (26.7)	279 (46)	165 (27.2)	**0.002**	0.49
Invasive mechanical ventilation	445/3513 (12.7)	92 (20.7)	191 (42.9)	162 (36.4)	**<0.001**	**<0.001**
Proning –– no. (%)	459/3513 (13.1)	90 (19.6)	202 (44)	167 (36.4)	**<0.001**	**<0.001**
ECMO* — no. (%)	302/3509 (8.6)	67 (22.2)	136 (45)	99 (32.8)	**0.002**	**0.004**
Death † –– no. (%)	674/3634 (18.5)	183 (27.2)	264 (39.2)	226 (33.5)	0.31	**0.004**

[1], BMI < 25 vs. BMI 25–30; [2], BMI < 25 vs. MBI > 30; Ç Rectorrhagia, hematuria, epistaxis, and popliteal aneurysm bleeding with relevant decreased hemoglobin >2 mg/l; *, extracorporeal membrane oxygenation, other extracorporeal life support devices, and vasoactive therapy.

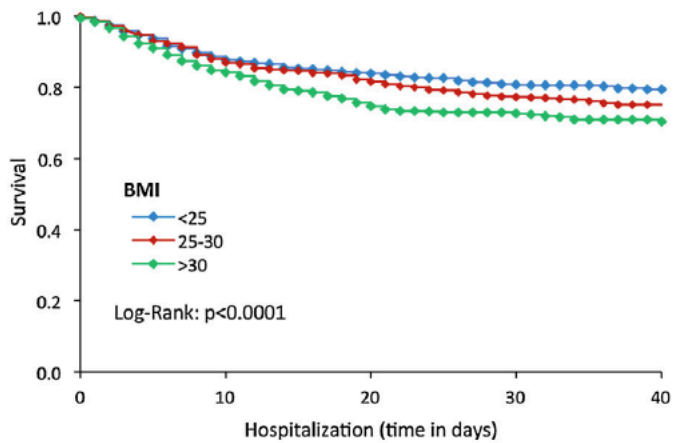

Fig. 2. Survival analysis in normal weight, overweight, and obese patients with COVID-19.

Body Mass Index and Mortality in Coronavirus Disease 2019 and Other Diseases: A Cohort Study in 35,506 ICU Patients

Emma J. Kooistra, MD[1,2]
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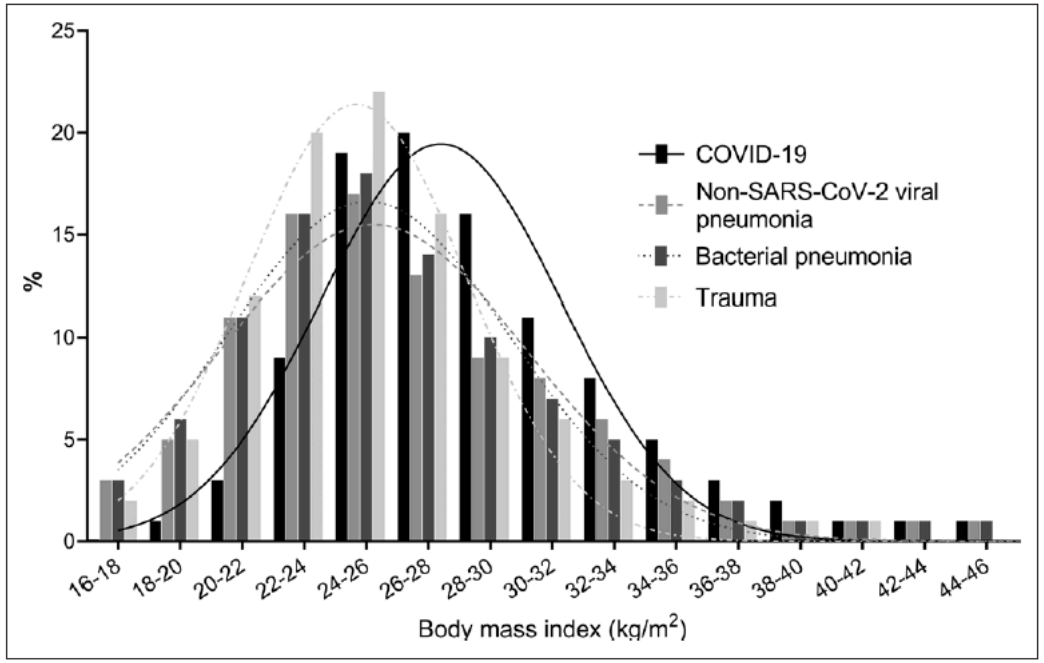
Peter H. J. van der Voort, PhD[5,6]
Nicolette F. de Keizer, PhD[3,4]
Dave A. Dongelmans, PhD[3,7]
Matthijs Kox, PhD[1,2]
Peter Pickkers, PhD[1,2]

OBJECTIVES: Obesity is a risk factor for severe coronavirus disease 2019 and might play a role in its pathophysiology. It is unknown whether body mass index is related to clinical outcome following ICU admission, as observed in various other categories of critically ill patients. We investigated the relationship between body mass index and inhospital mortality in critically ill coronavirus disease 2019 patients and in cohorts of ICU patients with non-severe acute respiratory syndrome coronavirus 2 viral pneumonia, bacterial pneumonia, and multiple trauma.

DESIGN: Multicenter observational cohort study.

SETTING: Eighty-two Dutch ICUs participating in the Dutch National Intensive Care Evaluation quality registry.



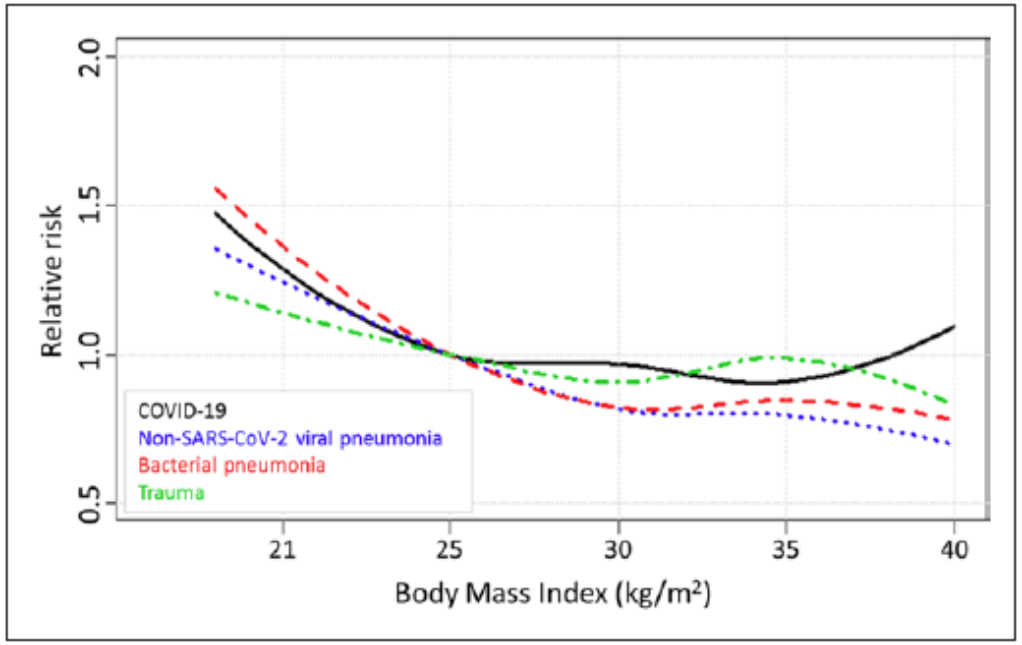


Figure 1. Distribution of body mass index for the coronavirus disease 2019 (COVID-19), nonsevere acute respiratory syndrome coronavirus 2 (SARS-CoV-2) viral pneumonia, bacterial pneumonia, and multiple trauma cohorts. The proportion of patients with overweight and obesity was notably higher in COVID-19 patients compared with the other cohorts.

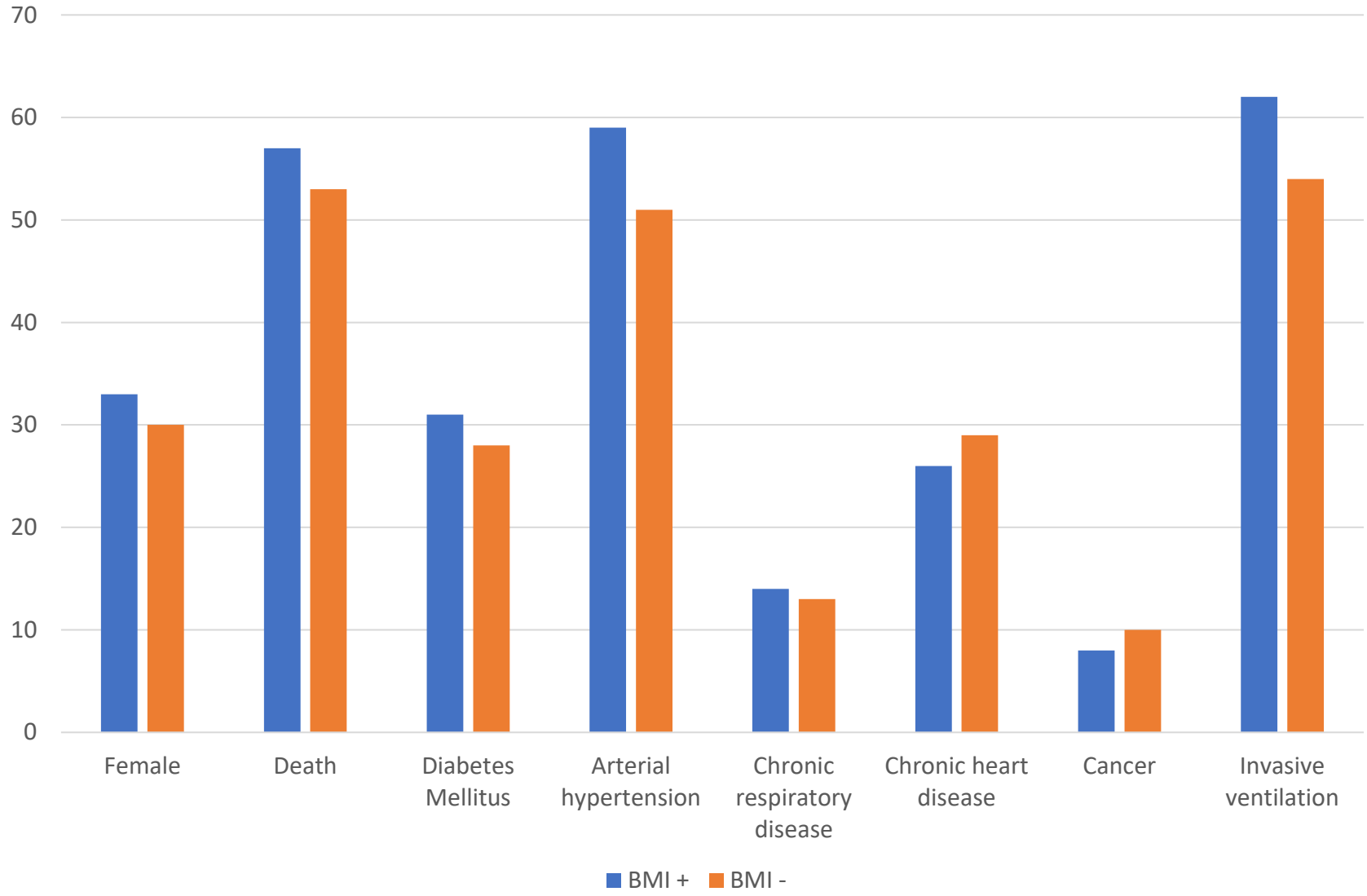
Patients with BMI
N=1353

68 years

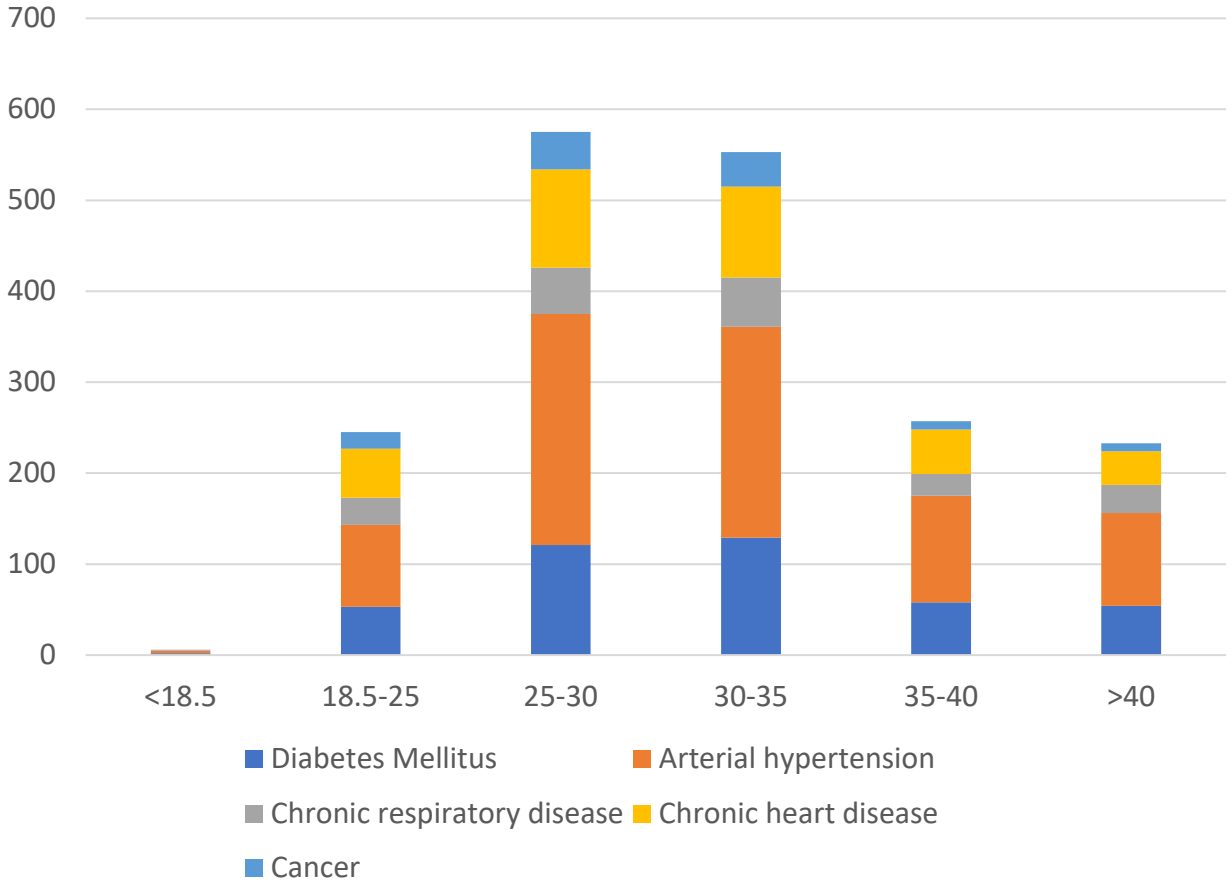
SEARCH database
N=2139

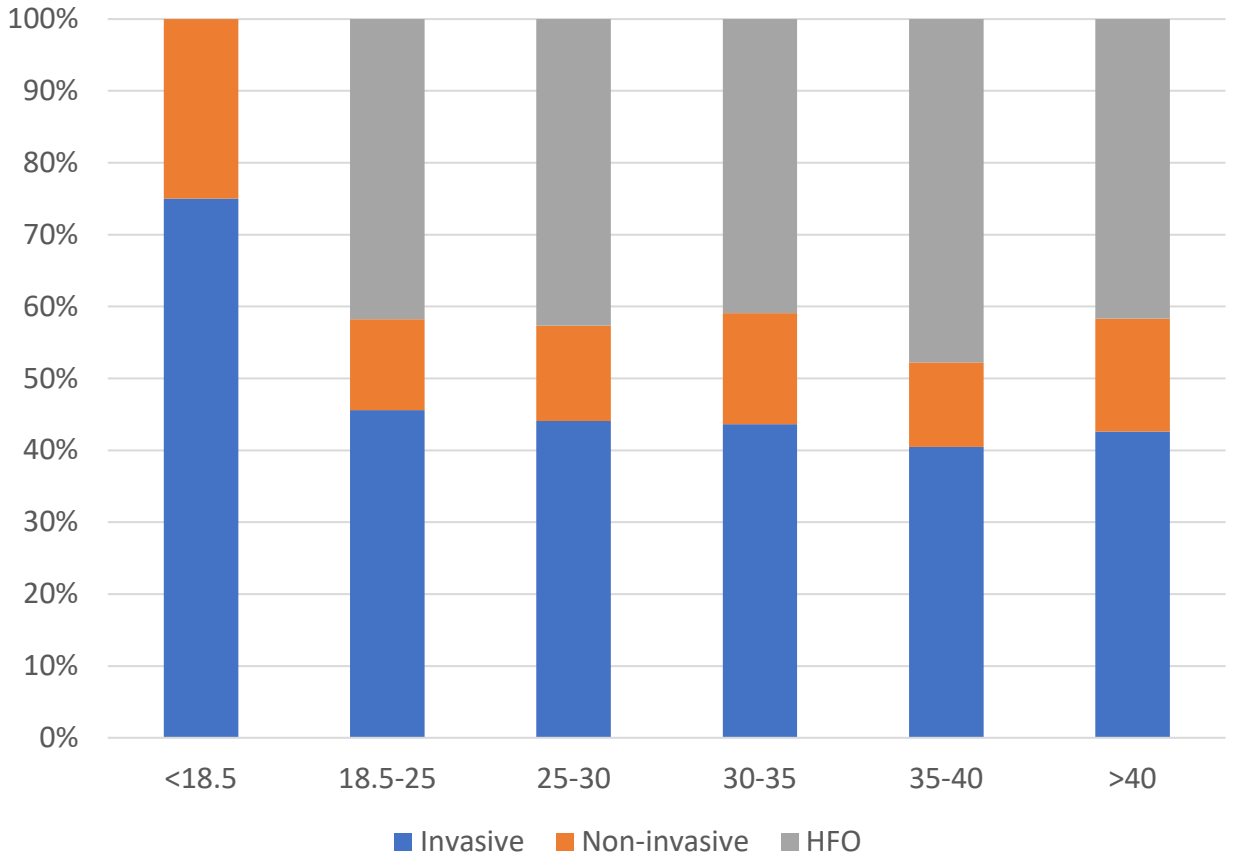
Patients w/o BMI
N=786

65 years

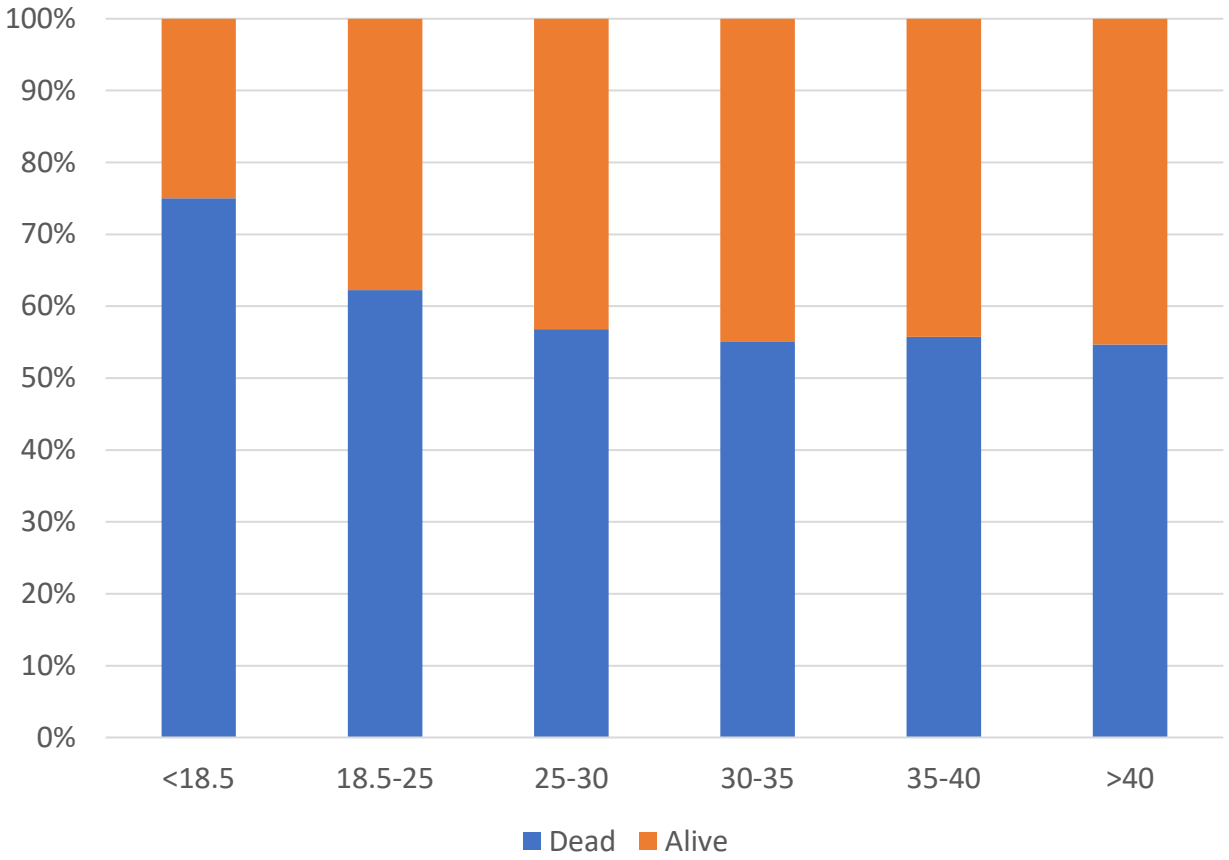


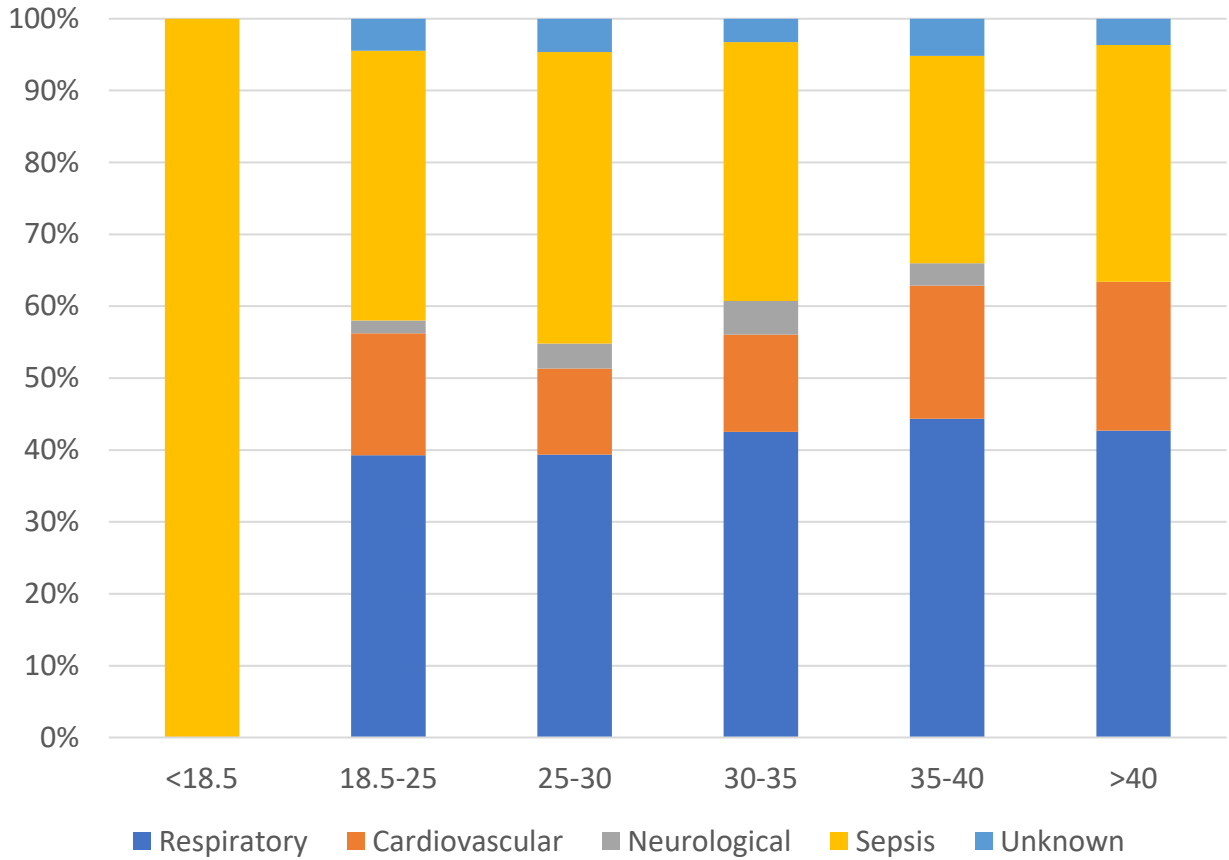
Patients with BMI
N=1353



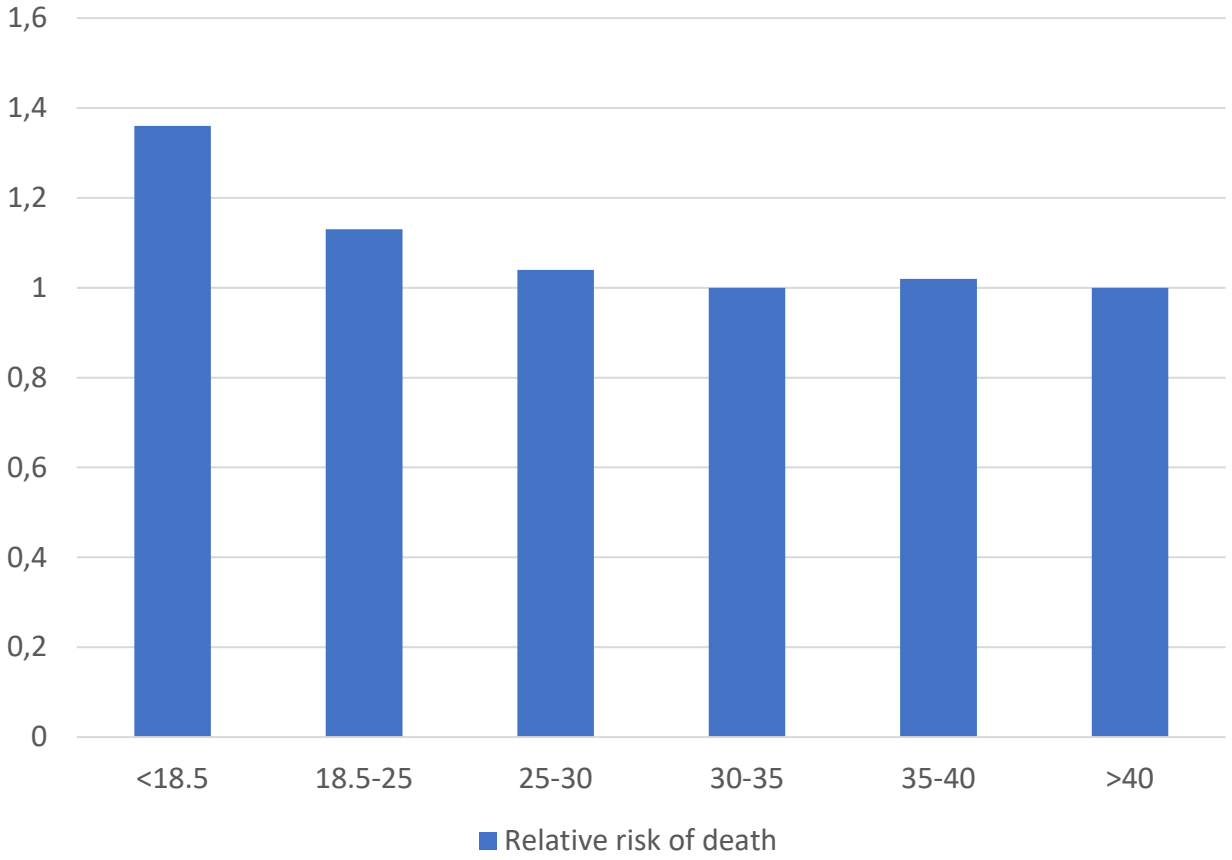


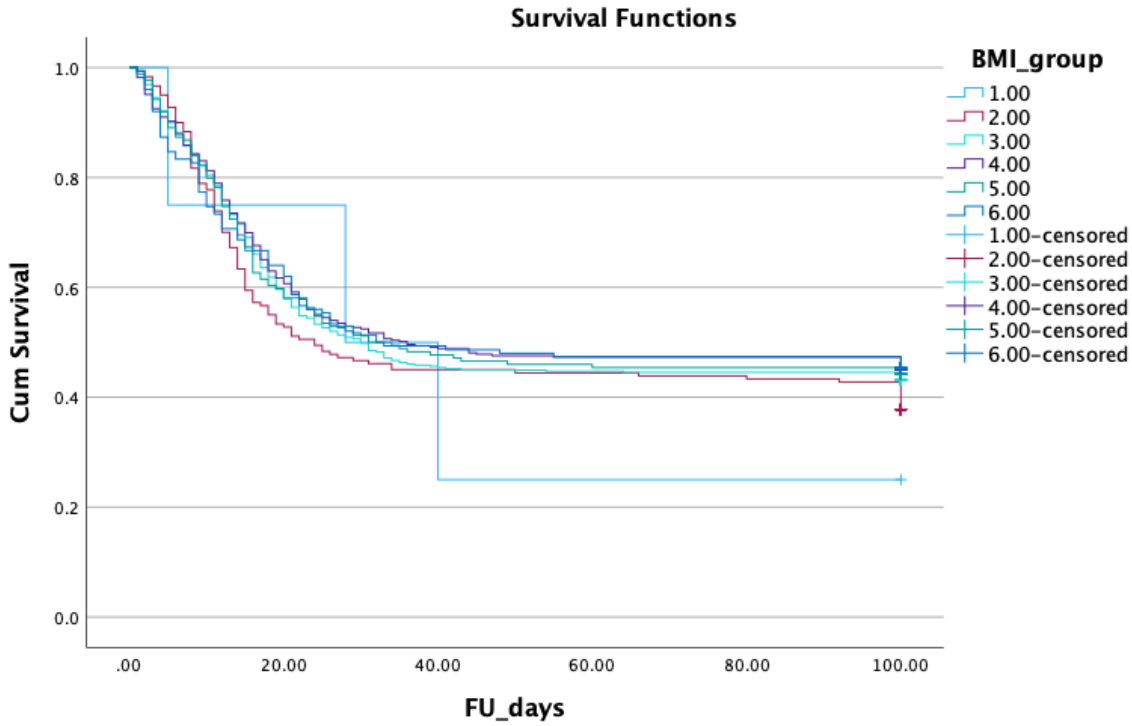
Patients with BMI
N=1353





Patients with BMI
N=1353





Interpretation

- (large) multinational registry
- Only few studies in ICU

- Retrospective
- Not all had BMI
- Nutritional status
- Body composition
- Fitness level
- Sarcopenia/cachexia

ESPEN endorsed recommendation

Diagnostic criteria for malnutrition – An ESPEN Consensus Statement

T. Cederholm [a,*], I. Bosaeus [b], R. Barazzoni [c], J. Bauer [d], A. Van Gossum [e], S. Klek [f], M. Muscaritoli [g], I. Nyulasi [h], J. Ockenga [i], S.M. Schneider [j], M.A.E. de van der Schueren [k,l], P. Singer [m]

Fact box: Two alternative ways to diagnose malnutrition. Before diagnosis of malnutrition is considered it is mandatory to fulfil criteria for being "at risk" of malnutrition by any validated risk screening tool.

Alternative 1:

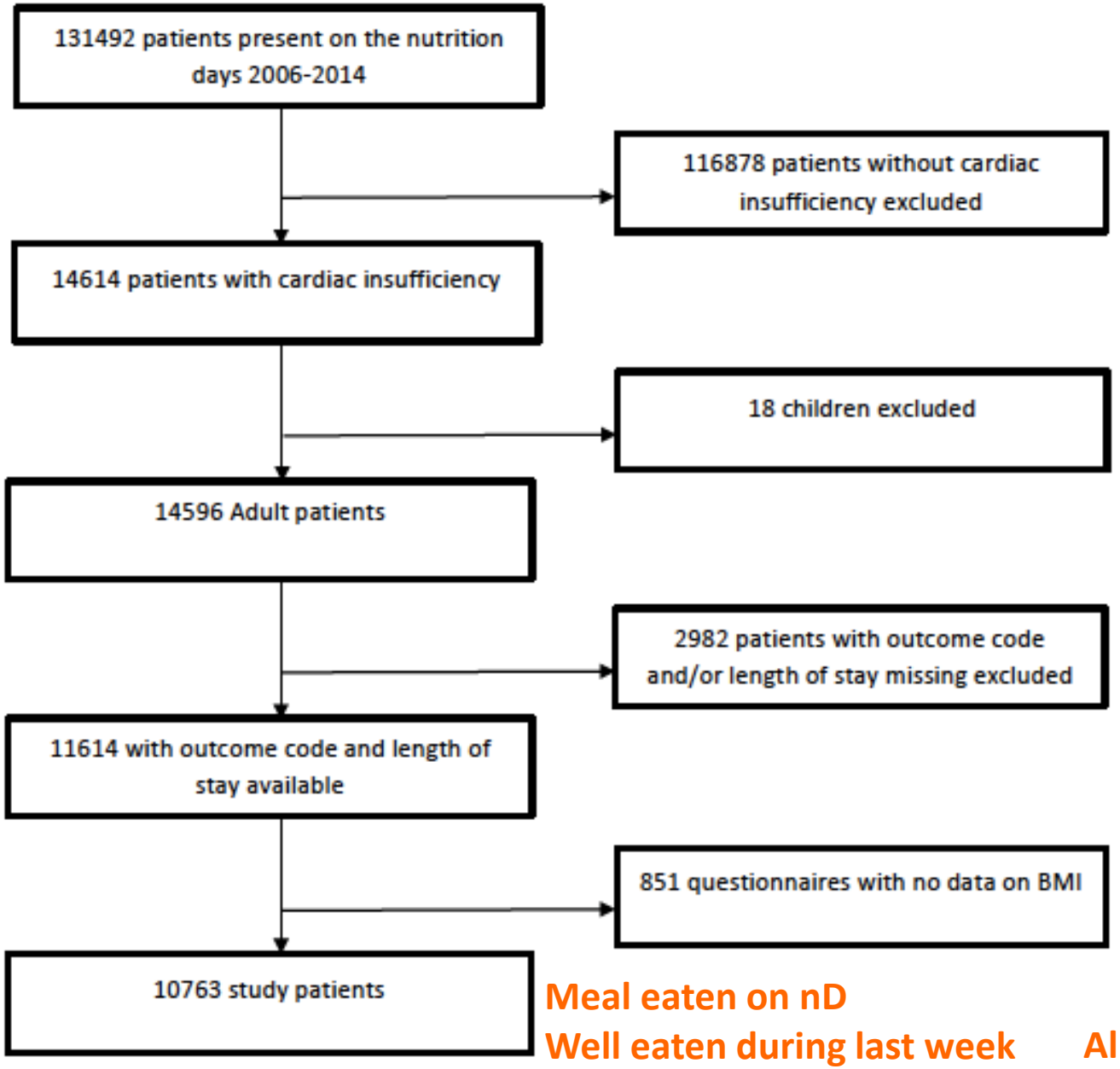
- BMI <18.5 kg/m^2

Alternative 2:

- Weight loss (unintentional) > 10% indefinite of time, or >5% over the last 3 months combined with either
- BMI <20 kg/m^2 if <70 years of age, or <22 kg/m^2 if ≥70 years of age or
- FFMI <15 and 17 kg/m^2 in women and men, respectively.

Clin Nutr 2015;34:335-40.

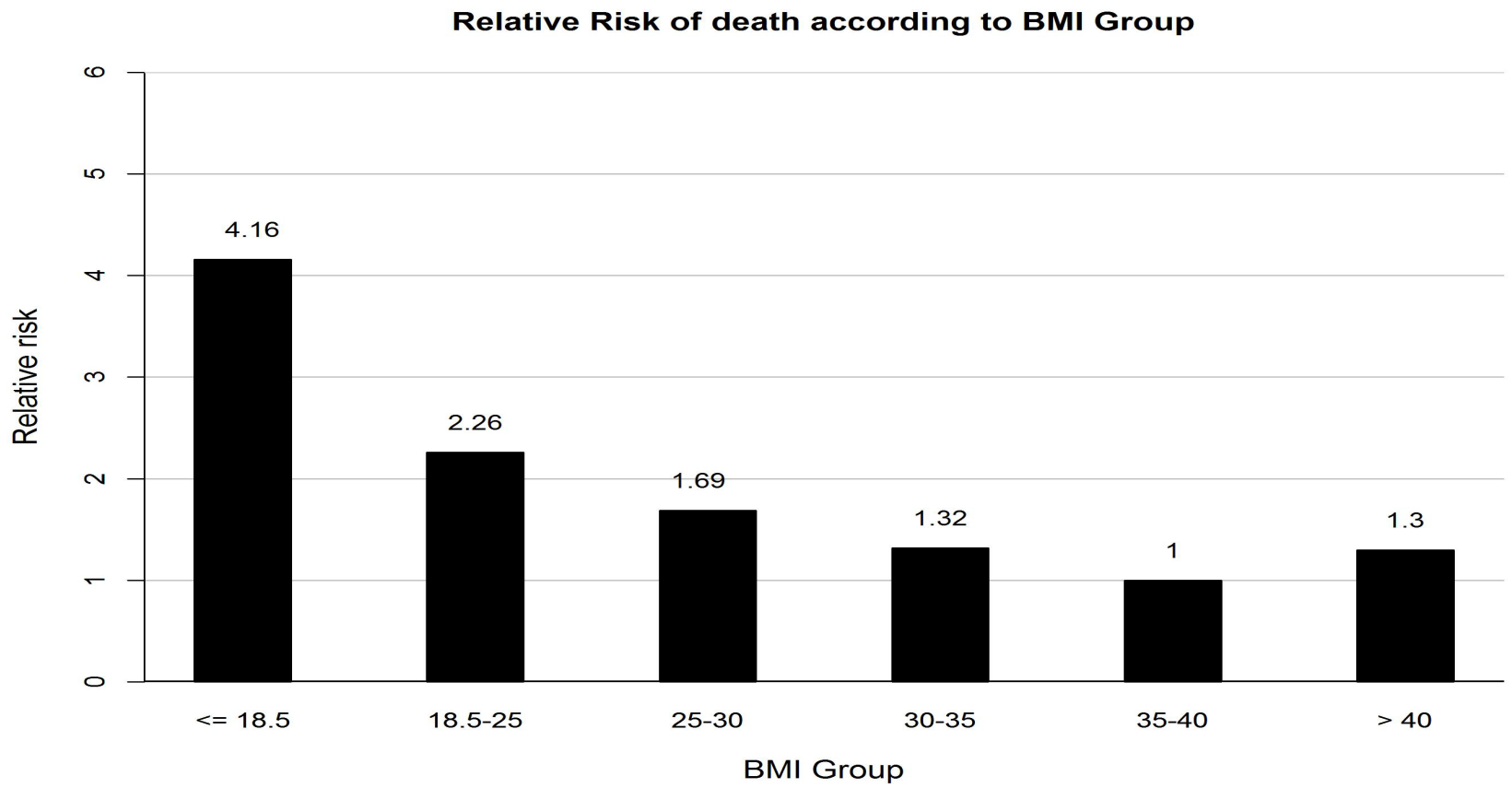
Lainscak et al, unpublished.



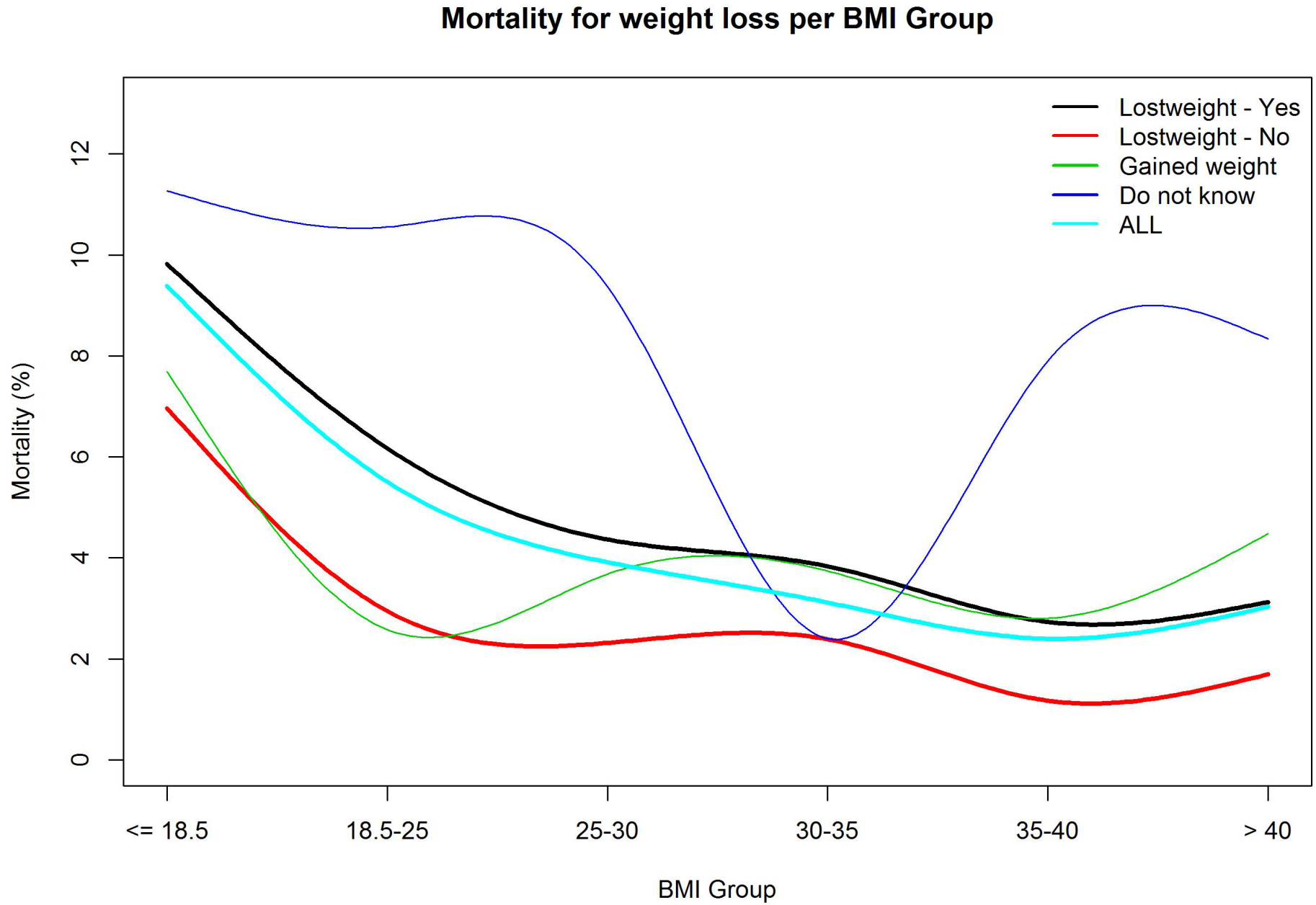
Meal eaten on nD
Well eaten during last week
Appetite
Weight loss

All-cause mortality at 30 days

Relative risk of death per BMI

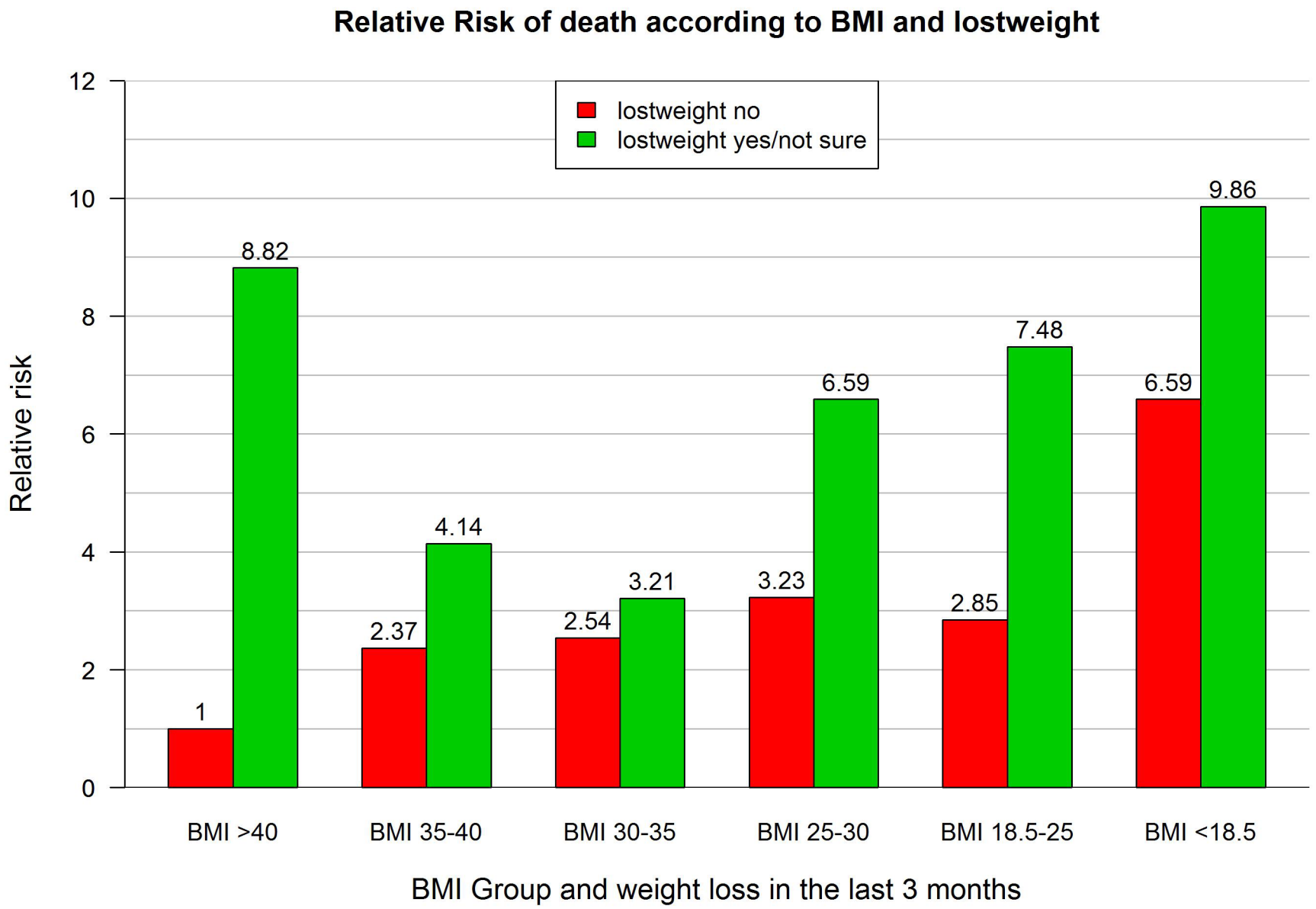


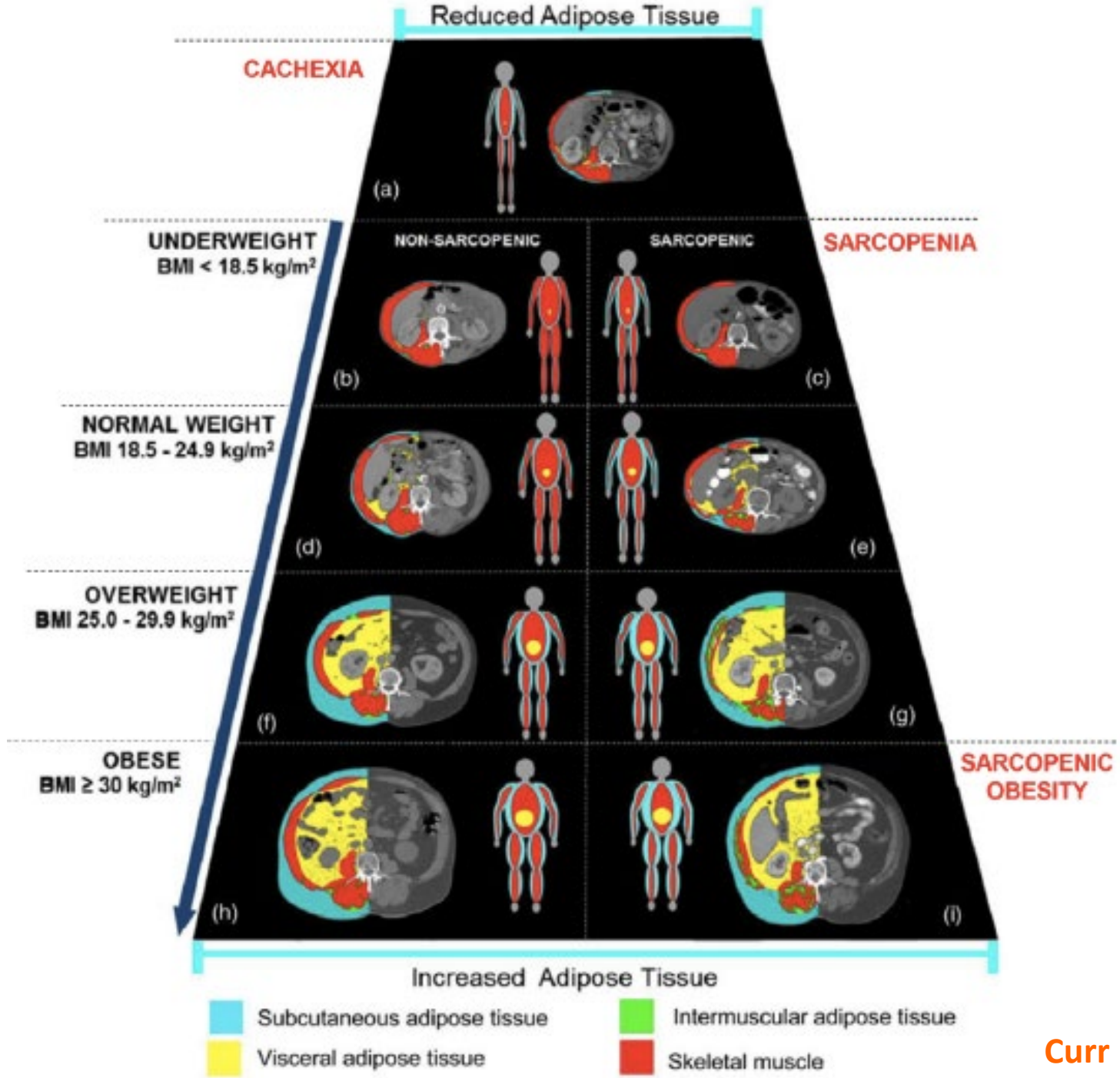
Lainscak et al, unpublished.



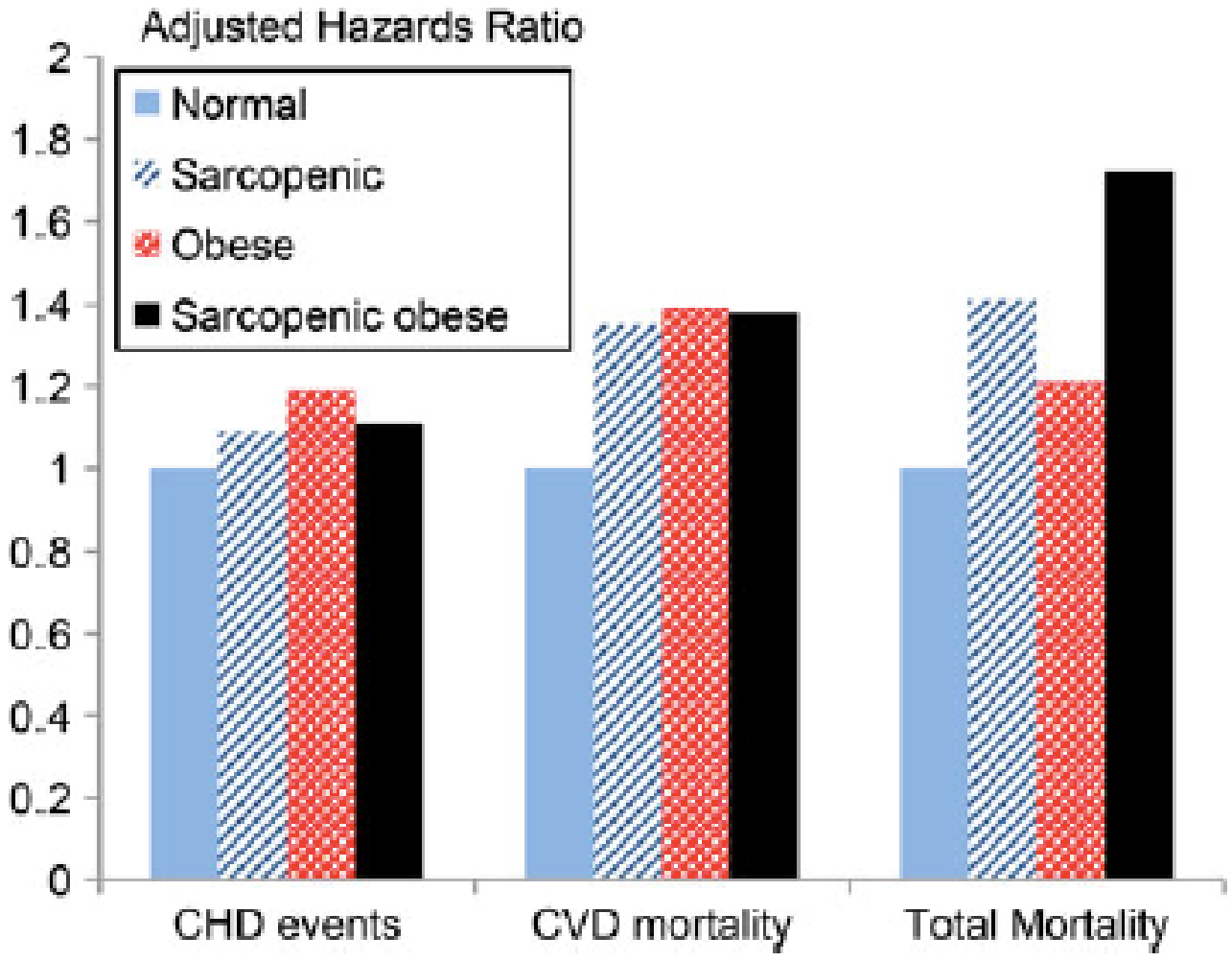
Lainscak et al, unpublished.

Lainscak et al. ERS 2016.





Curr Probl Cardiol 2019, in press.


Adjusted Hazards Ratio
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Normal
Sarcopenic
Obese
Sarcopenic obese
CHD events
CVD mortality
Total Mortality

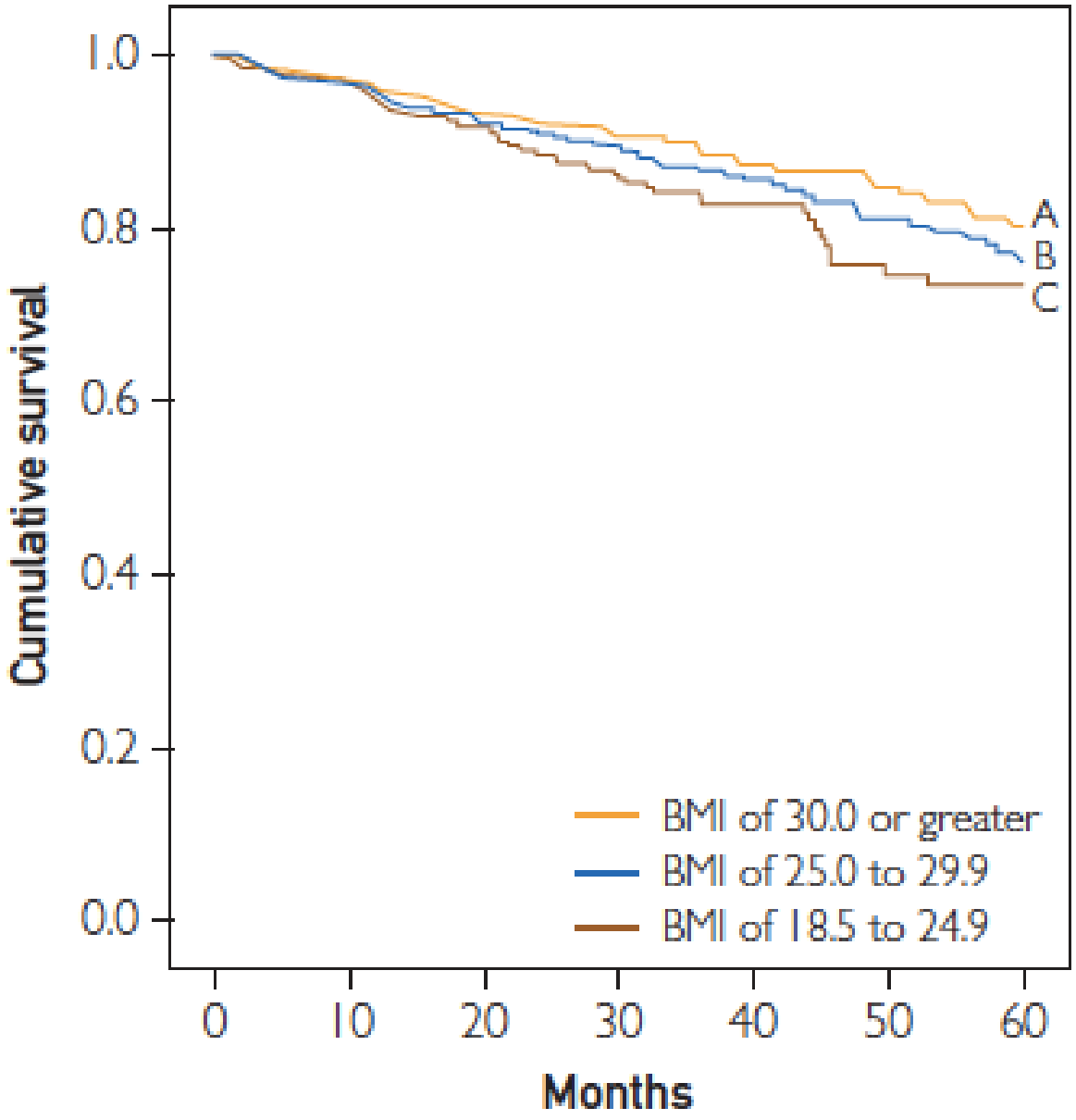
Impact of Cardiorespiratory Fitness on the Obesity Paradox in Patients With Heart Failure

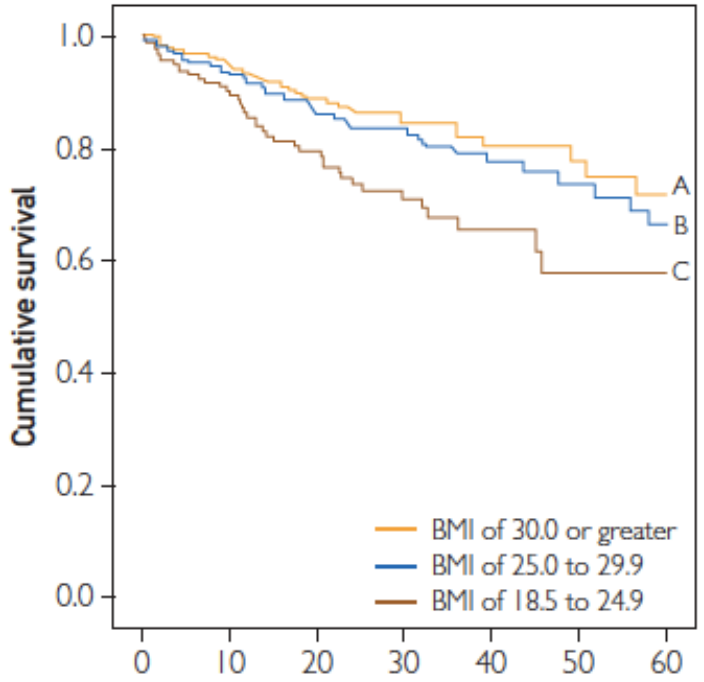
Carl J. Lavie, MD; Lawrence P. Cahalin, PhD, PT; Paul Chase, MEd; Jonathan Myers, PhD; Daniel Bensimhon, MD; Mary Ann Peberdy, MD; Euan Ashley, MD; Erin West, MS; Daniel E. Forman, MD; Marco Guazzi, MD, PhD; and Ross Arena, PhD, PT

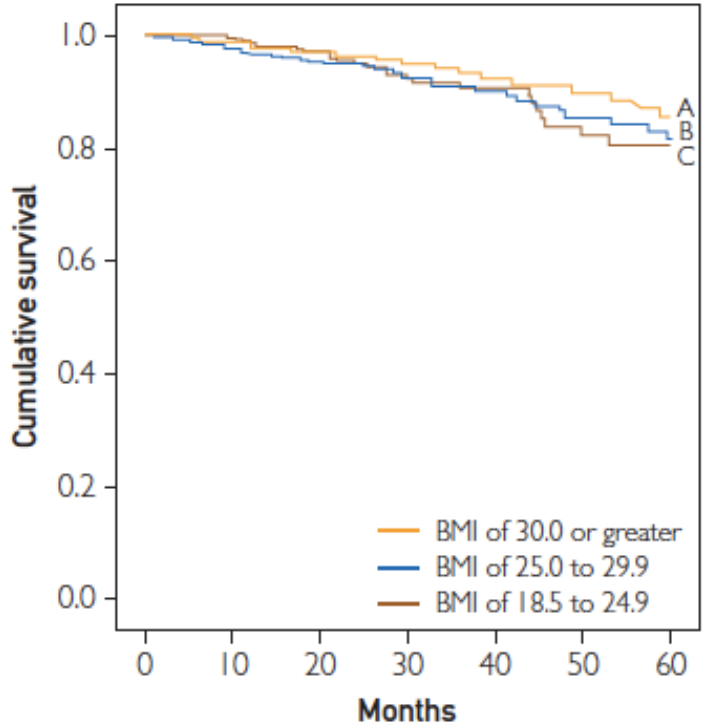
Mayo Clin Proc 2013;88:251-8.

TABLE 2. Differences in Key Baseline and CPX Variables According to BMI Classification in Aerobic Capacity Subgroups[a]

	Low FIT (n=801)			High FIT (n=1265)		
Variable	BMI 18.5-24.9 (n=192)	BMI 25.0-29.9 (n=275)	BMI ≥30.0 (n=334)	BMI 18.5-24.9 (n=378)	BMI 25.0-29.9 (n=493)	BMI ≥30.0 (n=394)
Age (y), mean ± SD	60.4±13.6	58.6±12.8	54.8±12.5[b]	55.3±16.5	56.9±14.0	54.3±13.1[c]
Male sex (%)	65	78[d]	70	72[e]	88	86
BMI, mean ± SD	22.6±1.7[f]	27.5±1.5[f]	35.8±5.6[f]	22.5±1.7[f]	27.4±1.4[f]	34.1±4.1[f]
NYHA class, mean ± SD	2.7±0.80	2.8±0.68	2.7±0.75	2.3±0.71	2.2±0.83	2.2±0.84
HF ischemic etiology, No. (%)	90 (47)	135 (49)	127 (38)[g]	132 (35)	207 (42)[h]	118 (30)
LVEF (%), mean ± SD	25.7±10.8	26.2±9.3	26.0±9.7	30.3±10.8	30.7±9.7	29.2±9.8
Prescribed ACE inhibitor, No. (%)	125 (65)	176 (64)	203 (61)	234 (62)	276 (56)[i]	244 (62)
Prescribed β-blocker, No. (%)	134 (70)	206 (75)	271 (81)[j]	241 (64)	315 (64)	272 (69)
Peak RER, mean ± SD	1.10±0.15	1.10±0.16	1.10±0.15	1.12±0.14	1.12±0.13	1.11±0.13
Peak $\dot{V}O_2$ (mL $O_2 \cdot kg^{-1} \cdot min^{-1}$), mean ± SD	10.9±2.3	11.5±2.1[k]	10.8±2.3	22.3±8.2[l]	21.1±6.4[m]	19.5±5.1
VE/VCO_2 slope, mean ± SD	43.7±12.3[n]	38.6±9.7	36.9±10.2	32.5±7.7[o]	30.9±6.6[p]	29.5±5.6





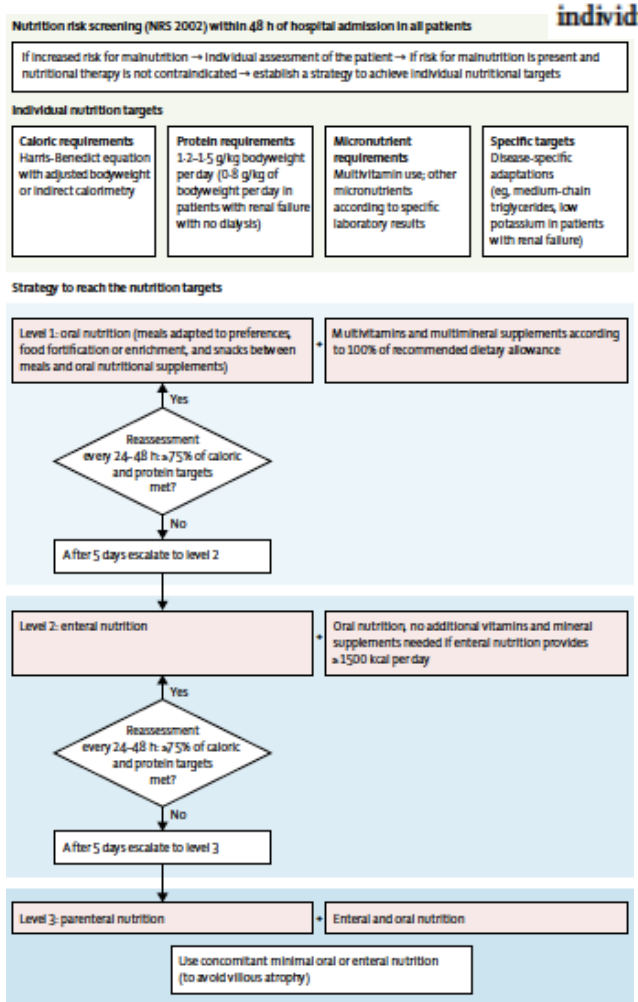


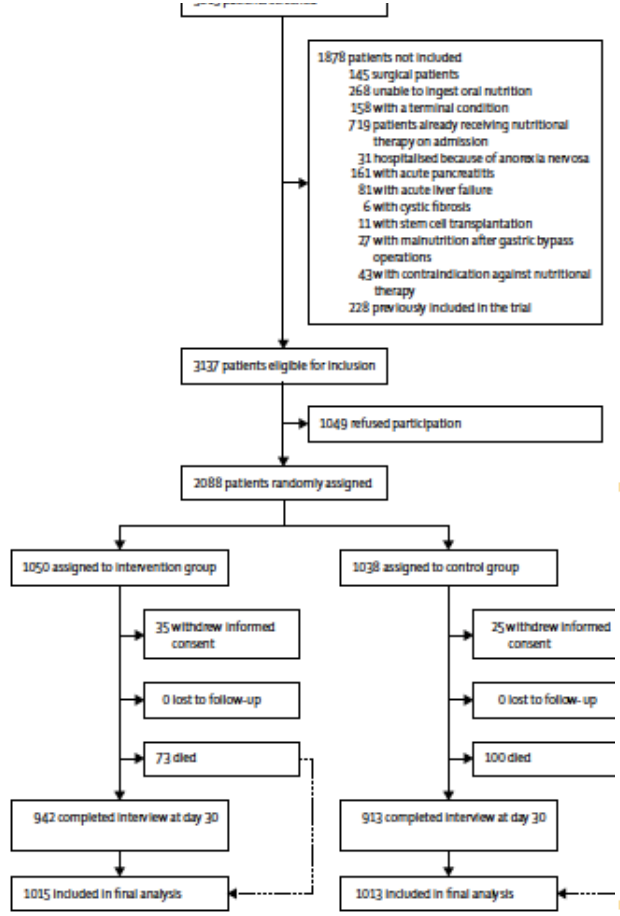
Mayo Clin Proc 2013;88:251-8.

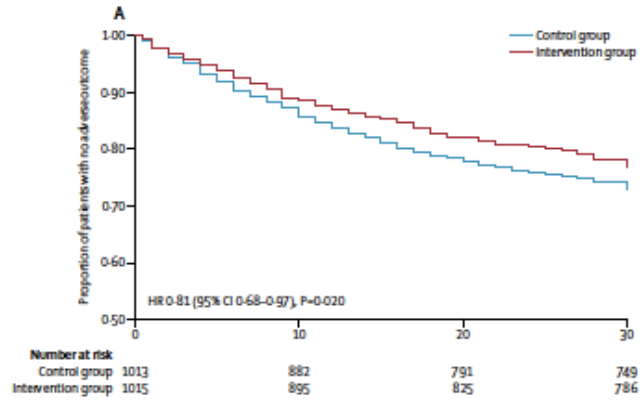
Individualised nutritional support in medical inpatients at nutritional risk: a randomised clinical trial

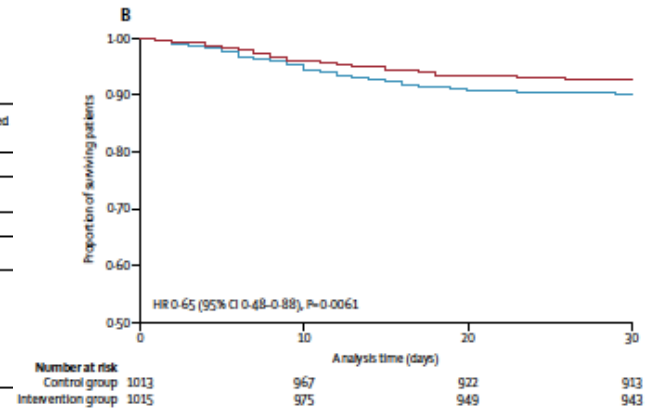
Philipp Schuetz, Rebecca Fehr, Valerie Baechli, Martina Geiser, Manuela Deiss, Filomena Gomes, Alexander Kutz, Pascal Tribolet, Thomas Bregenzer, Nina Braun, Claus Hoess, Vojtech Pavlicek, Sarah Schmid, Stefan Bilz, Sarah Sigrist, Michael Brändle, Carmen Benz, Christoph Henzen, Silvia Mattmann, Robert Thomann, Claudia Brand, Jonas Rutishauser, Drahomir Aujesky, Nicolas Rodondi, Jacques Donzé, Zeno Stanga, Beat Mueller**

Interpretation In medical inpatients at nutritional risk, the use of individualised nutritional support during the hospital stay improved important clinical outcomes, including survival, compared with standard hospital food. These findings strongly support the concept of systematically screening medical inpatients on hospital admission regarding nutritional risk, independent of their medical condition, followed by a nutritional assessment and introduction of individualised nutritional support in patients at risk.

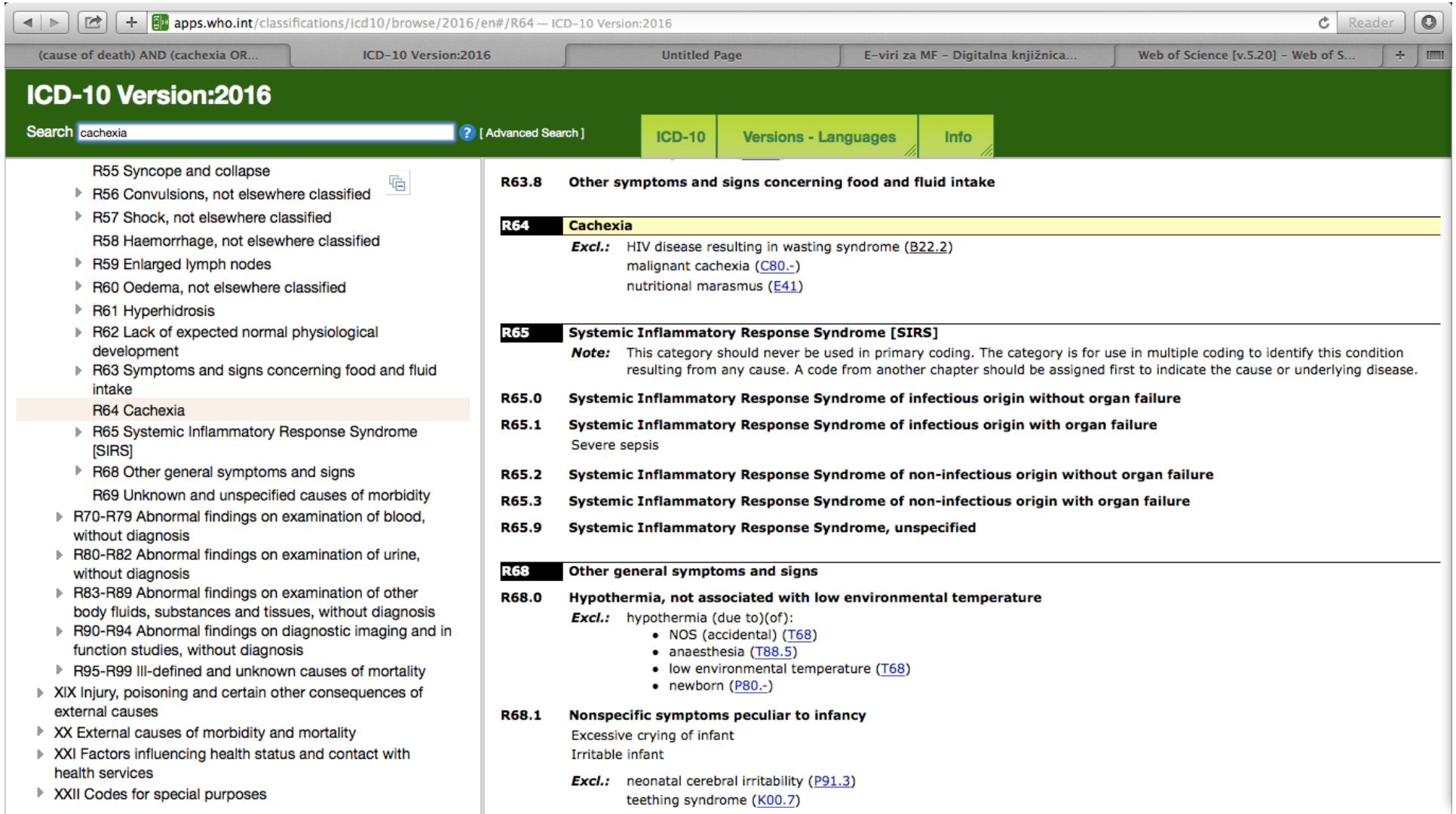




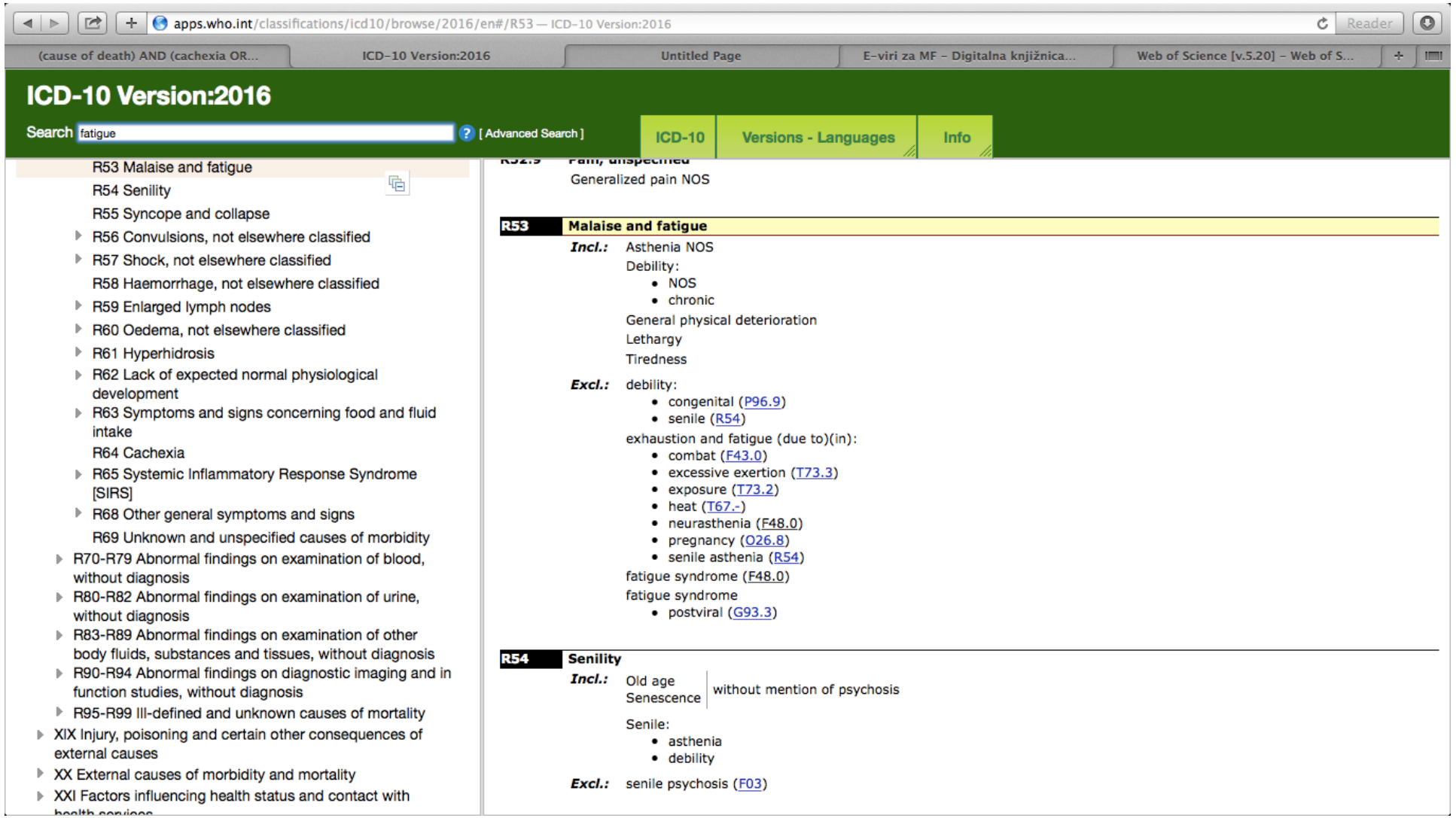




Cachexia R64
C80.9, B22.2



Sarcopenia


apps.who.int/classifications/icd10/browse/2016/en#/R53 — ICD-10 Version:2016
Reader
(cause of death) AND (cachexia OR...
ICD-10 Version:2016
Untitled Page
E-viri za MF – Digitalna knjižnica...
Web of Science [v.5.20] – Web of S...
ICD-10 Version:2016
Search
fatigue
[Advanced Search]
ICD-10
Versions - Languages
Info
R53 Malaise and fatigue
R54 Senility
R55 Syncope and collapse
R56 Convulsions, not elsewhere classified
R57 Shock, not elsewhere classified
R58 Haemorrhage, not elsewhere classified
R59 Enlarged lymph nodes
R60 Oedema, not elsewhere classified
R61 Hyperhidrosis
R62 Lack of expected normal physiological development
R63 Symptoms and signs concerning food and fluid intake
R64 Cachexia
R65 Systemic Inflammatory Response Syndrome [SIRS]
R68 Other general symptoms and signs
R69 Unknown and unspecified causes of morbidity
R70-R79 Abnormal findings on examination of blood, without diagnosis
R80-R82 Abnormal findings on examination of urine, without diagnosis
R83-R89 Abnormal findings on examination of other body fluids, substances and tissues, without diagnosis
R90-R94 Abnormal findings on diagnostic imaging and in function studies, without diagnosis
R95-R99 Ill-defined and unknown causes of mortality
XIX Injury, poisoning and certain other consequences of external causes
XX External causes of morbidity and mortality
XXI Factors influencing health status and contact with
Generalized pain NOS
R53 Malaise and fatigue
Incl.: Asthenia NOS
Debility:
NOS
chronic
General physical deterioration
Lethargy
Tiredness
Excl.: debility:
congenital (P96.9)
senile (R54)
exhaustion and fatigue (due to)(in):
combat (F43.0)
excessive exertion (T73.3)
exposure (T73.2)
heat (T67.-)
neurasthenia (F48.0)
pregnancy (O26.8)
senile asthenia (R54)
fatigue syndrome (F48.0)
fatigue syndrome
postviral (G93.3)
R54 Senility
Incl.: Old age
Senescence
without mention of psychosis
Senile:
asthenia
debility
Excl.: senile psychosis (F03)

Future steps

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EDITORIAL

Signa Vitae

SepsEast and COVID-19: Time to Make a Difference

Mitja Lainscak[1,2,*], Alan Sustic[3,4], Jan Benes[5,6], Miroslaw Czuczwar[7], Radmilo Jankovic[8], Mikhail Kirov[9], Roman Kula[10], Krzysztof Kusza[11], Matej Podbregar[2,12], Dorel Sandesc[13], Ovidiu Bedreag[13], Konstanty Szuldrzynski[14], Roman Zahorec[15], Peter Hegyi[16], Zsolt Molnar[11,16,*]

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SepsEast Registry indicates high mortality associated with COVID-19 caused acute respiratory failure in Central-Eastern European intensive care units

Jan Benes[1,2,3,23], Miłosz Jankowski[4,5,23], Konstanty Szułdrzynski[4,5], Roman Zahorec[6], Mitja Lainscak[7,8], Zoltán Ruszkai[9], Matej Podbregar[8,10], Jan Zatloukal[1,2], Jakub Kletecka[1,2], Krzysztof Kusza[11], Jakub Szrama[11], Estera Ramic[12], Katarina Galkova[13], Stefan Krbila[14], Josef Valky[15], Jaka Ivanic[16], Marko Kurnik[10], Angéla Mikó[9], Tamás Kiss[17], Barbara Hetényi[17], Peter Hegyi[18,19,20], Alan Sustic[12,21]✉ & Zsolt Molnar[11,19,22]✉

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