COVID-19

How to prepare an ICU for a pandemic

Prim. Univ. Prof. Dr. Walter Hasibeder

Abteilung für Anästhesie und Operative Intensivmedizin

Allg. öffentl. Krankenhaus St.Vinzenz Betriebs GmbH Zams

eine soziale Einrichtung der Barmherzigen Schwestern des Hl. Vinzenz von Paul, Zams

CARITAS CHRISTI URGET NOS

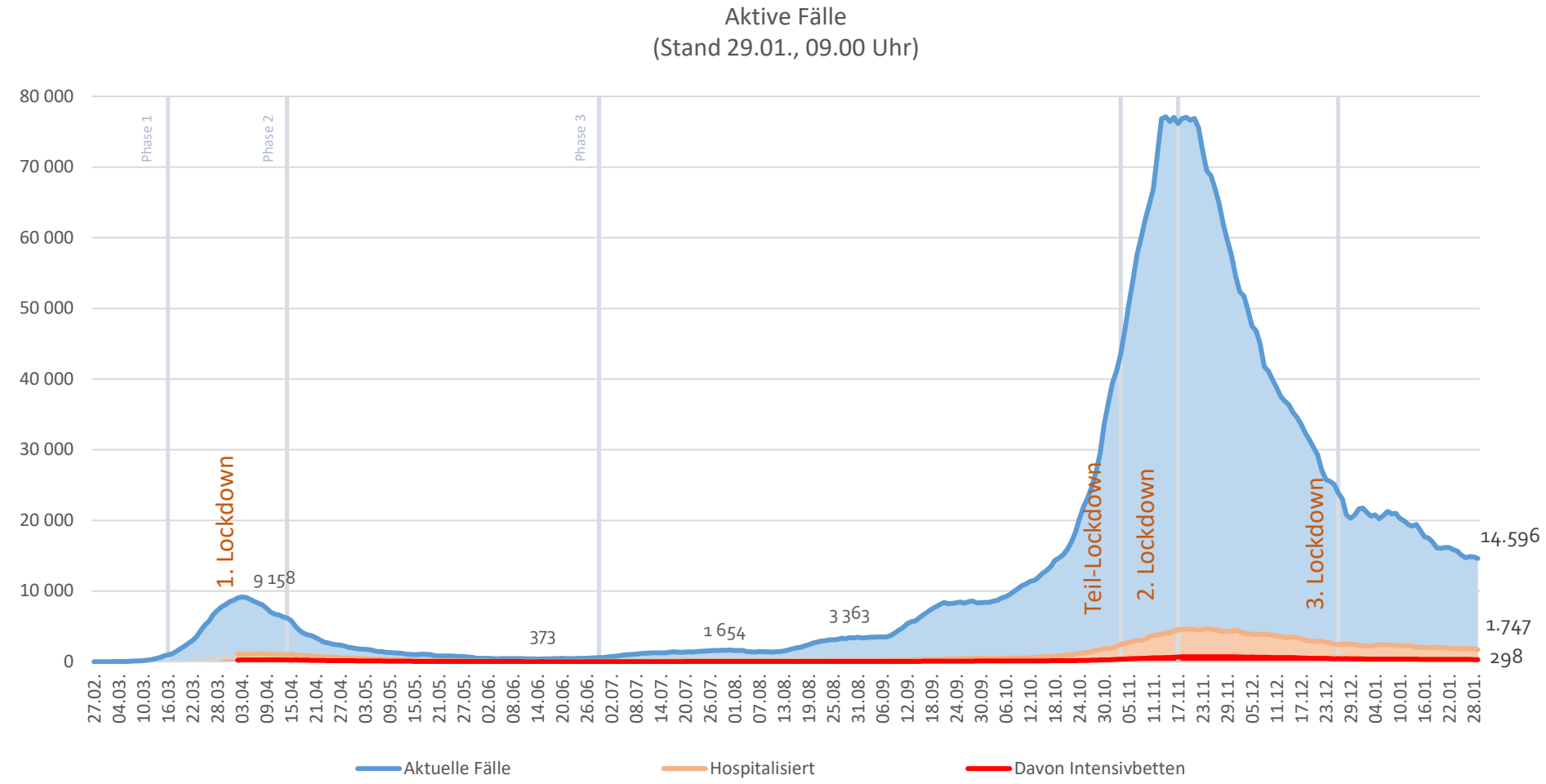
Spread of SARS-CoV2 in Tirol

DATE	EVENT
24th January 2020	First case of a German in the region of Kühtai. Transmission through a chinese instructor during a business seminar in a alpine hut
25th February 2020	A PCR-positive couple, working in a hotel in the midst of Innsbruck was detected. They have been returning from a trip to Italy (Lombardy). They suffered only from mild symptoms, were isolated at the university hospital and recovered rapidly
27th Februar 2020	First three infections with SARS-CoV 2 diagnosed in Vienna
6th March 2020	First cases detected in Ischgl (Paznauntal). 3 Erasmus students which have visited Italy (Lombardy) before starting skiing holydays in Ischgl. At that time only 5 cases were already detected in Tirol (3 Ischgl; 1 Pettneu; 1 Kitzbühel)
12th March 2020	First COVID-19 fatality of a vienna citizen after partizipating in a cruise
March 7th to 17th 2020	145 PCR proven infections in the region of Ischgl
10th March through April 30 2020	Rapid spread of SARS-CoV-2 in the region of Landeck: Incidence Landeck: 2250 cases/100.000 inhabitants Incidence Tirol: 440 cases/100.000 inhabitants

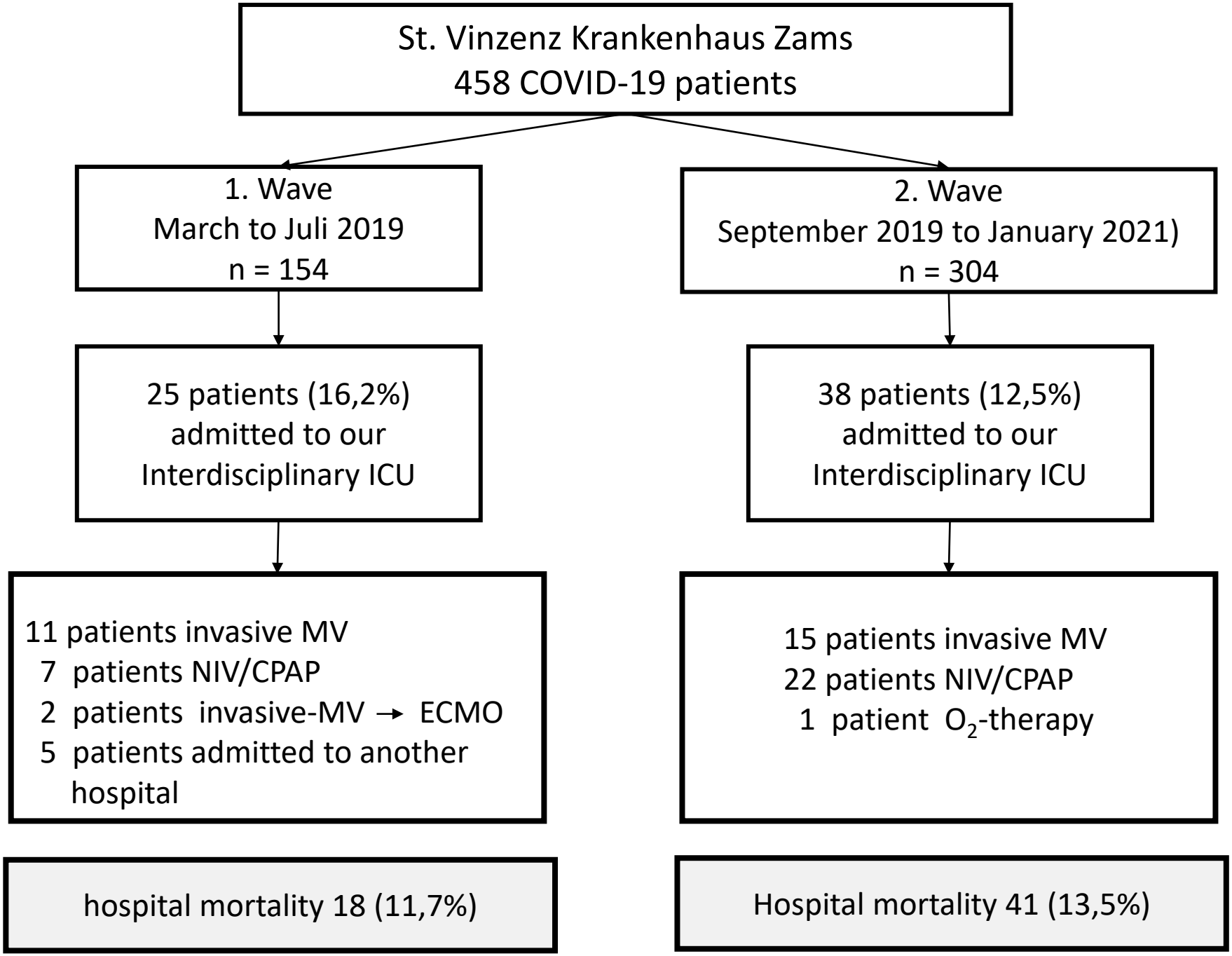
Emergence of Coronavirus disease 2019 (COVID-19) in Austria

Kreidl P, Schmid D, Maritschnik S, et al. WiKliWo Preprint

EVOLUTION OF THE SARS-CoV-2 PANDEMIC IN AUSTRIA



Quellen: aktuelle Fälle - kumulativ bis inkl. 01.04.: EMS; Hospitalisierungen vor 2.4.: interpoliert; alle anderen Daten: Dateneinmeldung der Bundesländer an BMI und BMSGPK; Berechnung BMSGPK


St. Vinzenz Krankenhaus Zams
458 COVID-19 patients
1. Wave
March to Juli 2019
n = 154
2. Wave
September 2019 to January 2021)
n = 304
25 patients (16,2%)
admitted to our
Interdisciplinary ICU
38 patients (12,5%)
admitted to our
Interdisciplinary ICU
11 patients invasive MV
7 patients NIV/CPAP
2 patients invasive-MV → ECMO
5 patients admitted to another hospital
15 patients invasive MV
22 patients NIV/CPAP
1 patient O_2-therapy
hospital mortality 18 (11,7%)
Hospital mortality 41 (13,5%)

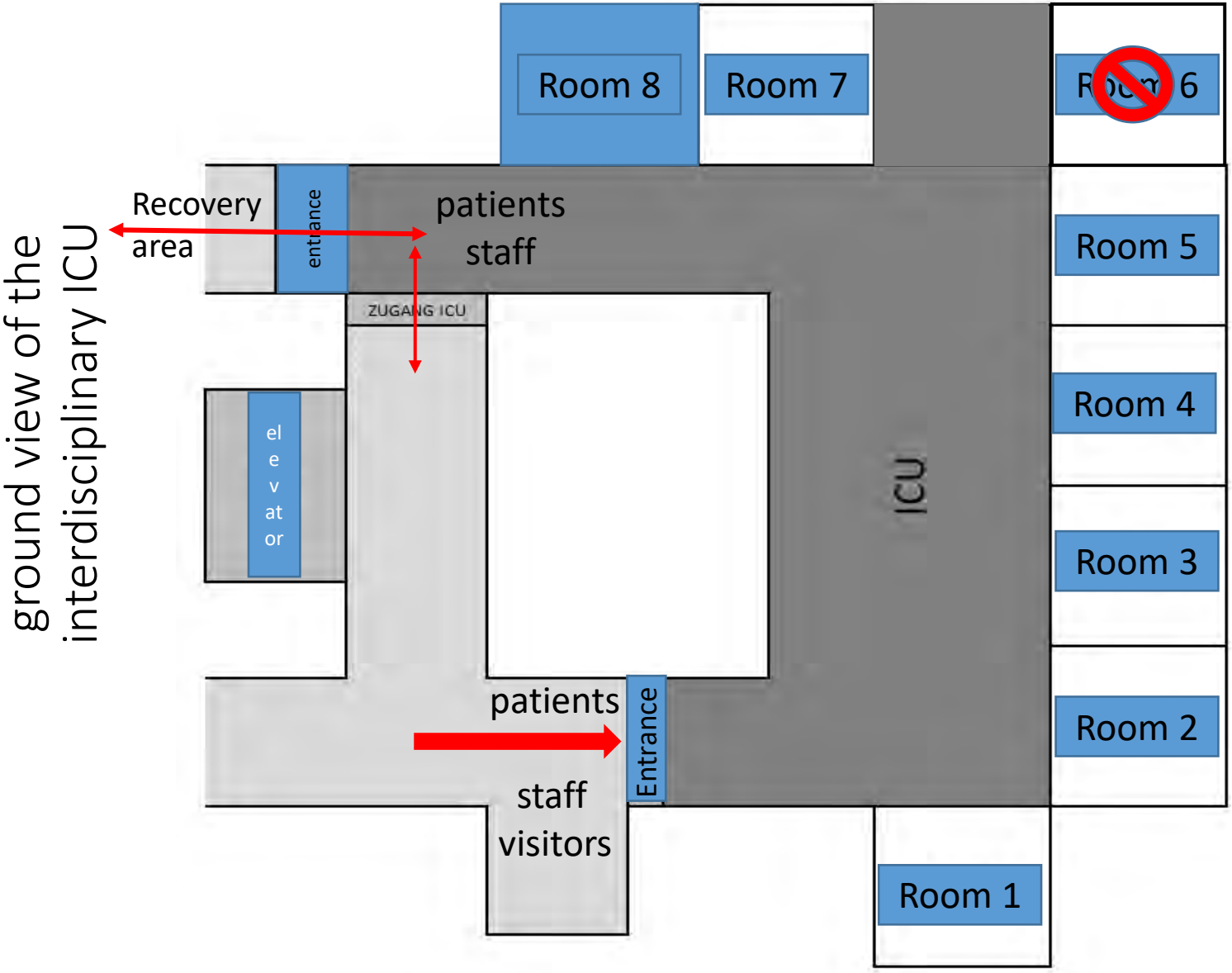
INITIAL CONSIDERATIONS

- Few scientific reports on infectivity and pathogenicity
- Few reports on personal protection and hygienic measures to protect ICU-personal

FAST DEVELOPMENT OF A PRAGMATIC BARRIER CONCEPT BETWEEN ICU STAFF AND THE VIRUS

- barriers between rooms
- barriers between patients and staff by means of adequate personal protective equipment
- barriers regarding logistics and organisation
- general hygienic measures

RAPID AND SUFFICIENT TRAINING OF ICU STUFF



10 approved ICU-beds of category II
4 IMCU beds

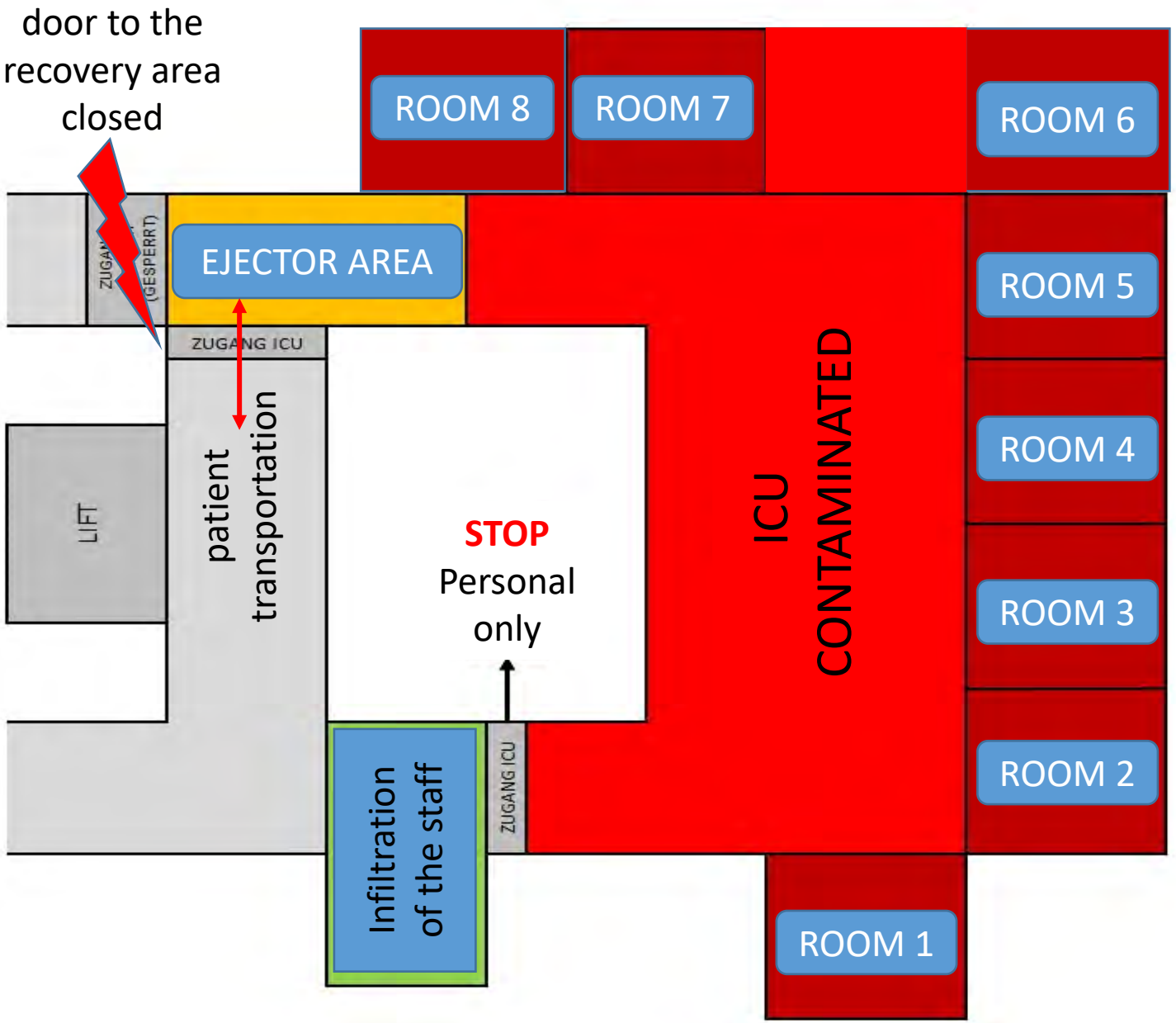
BARRIERS BETWEEN ROOMS

- 1. Barrier - patient room
  - all logistic equipment during the pandemic is left in the patient room (patient charts, medication, electronic equipment, pens…)

- 2. Barrier – working area and recreation room
  - closure of ICU kitchen, recreation room, doctors- and leading nurse office in the ICU area

- 3. Barrier – strict adherence to labeled routes
  - marked entrance and exit routes for staff and suppliers
  - one-way patient transportation

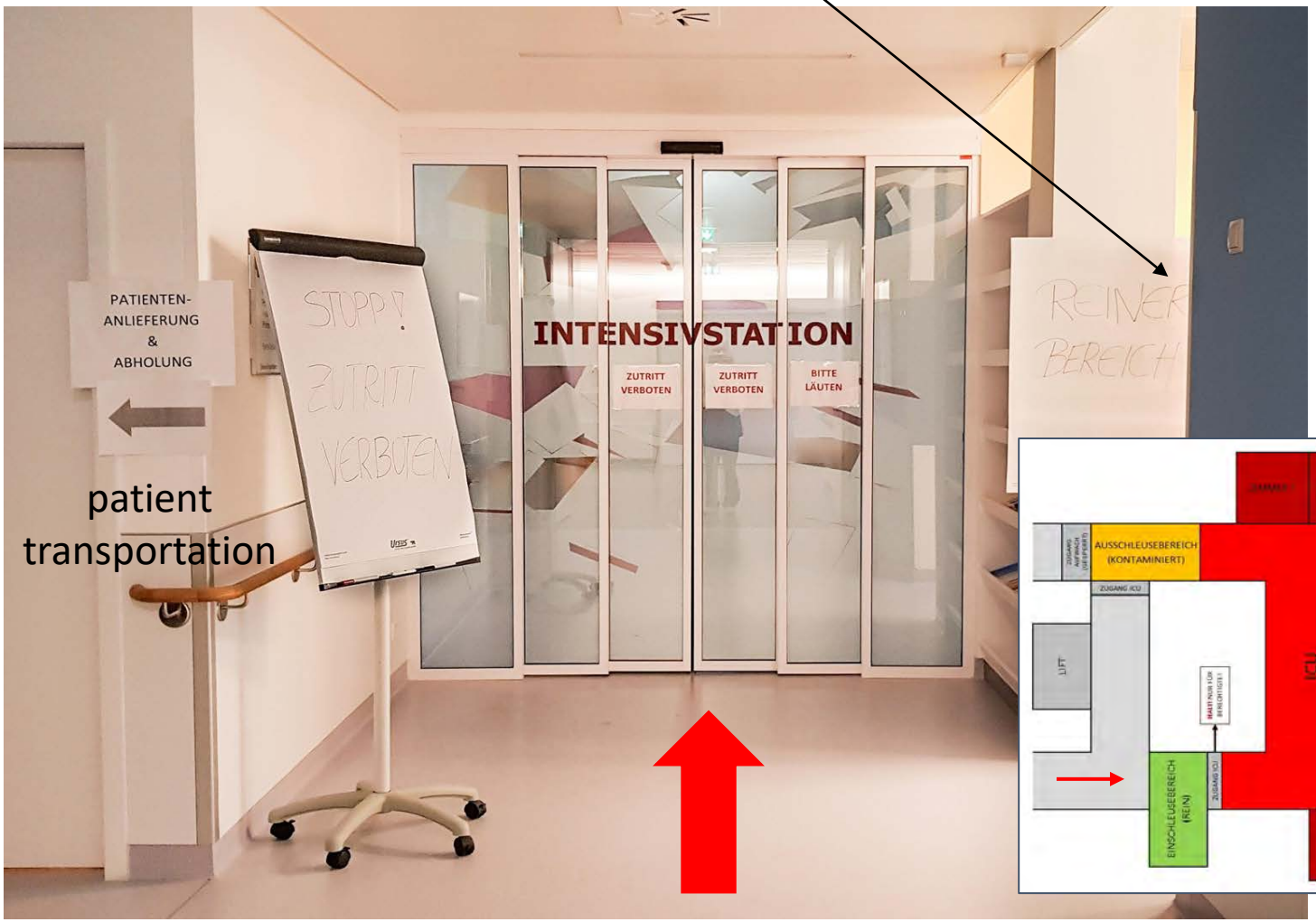
Barriers within the ICU



14 ICU beds for COVID-19

BARRIER AT THE ENTRANCE

personal protective equipment



patient
transportation

infiltration of staff
after dressing up with PPE

PERSONNEL TRAINING

Fast and pragmatic!

- at the beginning several short training sessions at the morning meeting (dressing and undressing PPE; logistics and new organisation within the ICU)
- supervised training on entry and exit by members of the hygiene team

Step by step instructions

- at the entrance and exit in the form of photos explained by a short text

Elaboration of a script describing all hygienic SOP`s regarding the ICU

Training videos in the Intranet (dressing; undressing PPE)

Information videos in the Intranet (hospital patient occupancy; material procurement; material stock)

ORGANIZATIONAL

Same teams with the same patients

- No team mixing between patient rooms – continuity of care and medical treatment

Regular breaks (2-3 times per 12h shift)

- high workloads in a stressful protective equipment
- shifting personal from the anesthesia and recovery area into the ICU
- four intensivists during the dayshift
- two intensivists during the night
- increasing availability of physiotherapists in the ICU

Recycling of PPE

- stream sterilization of FFP-2 and FFP-3 masks

Reuse of FFP-3 masks

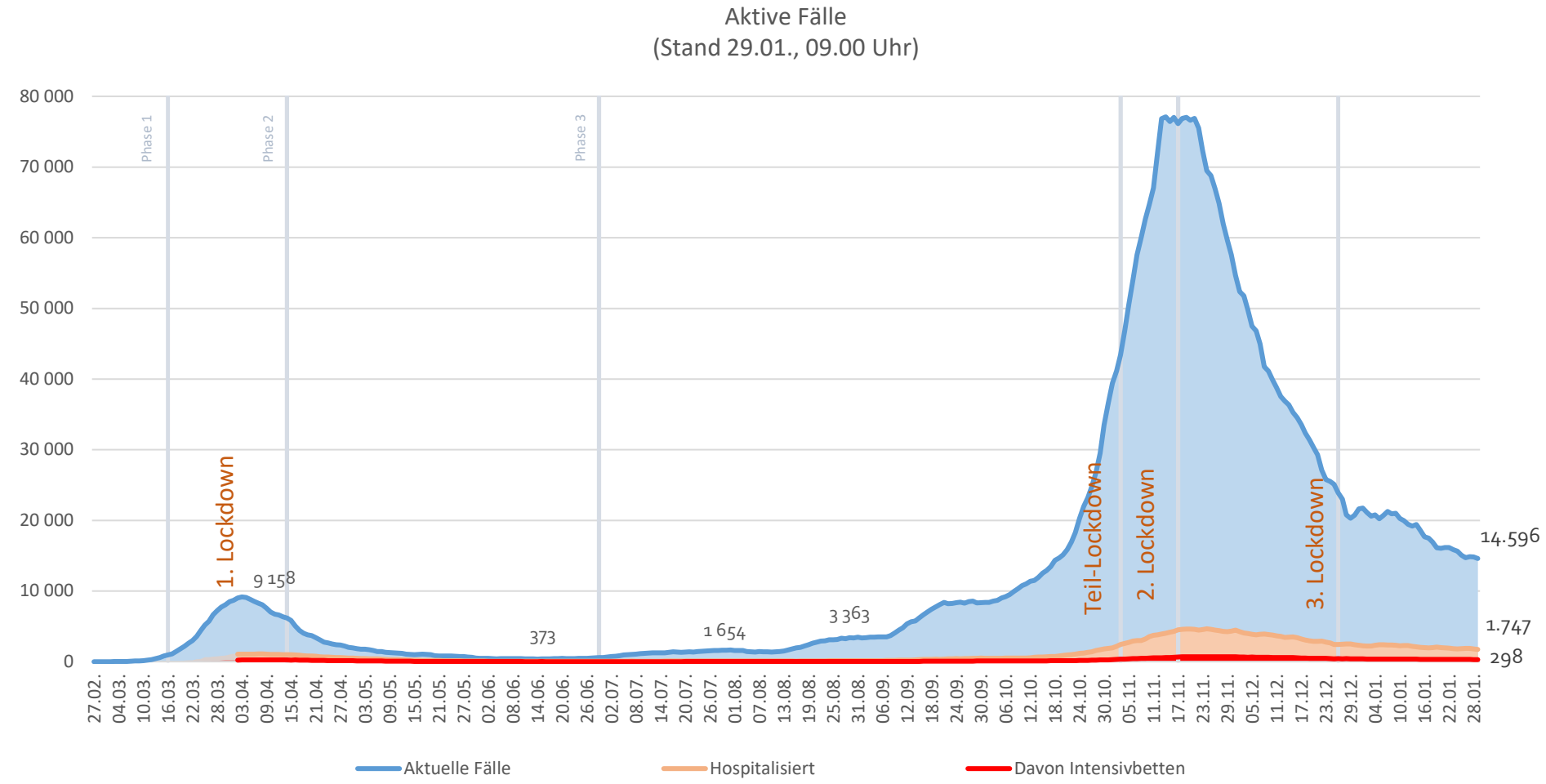
PROBLEMS WITH THE PERSONAL PROTECTIVE CLOTHING

Waterproof plastic suits cause heat stress and massive fluid losses through sweating. In addition they are disposable products and end up as special mill after single use

OUR SOLUTION

WE SWITCHED TO COTTON GOWNS AND USE PLASTIC APRONS FOR EVERY PATIENT CONTACT

EVOLUTION OF THE SARS-CoV-2 PANDEMIC IN AUSTRIA



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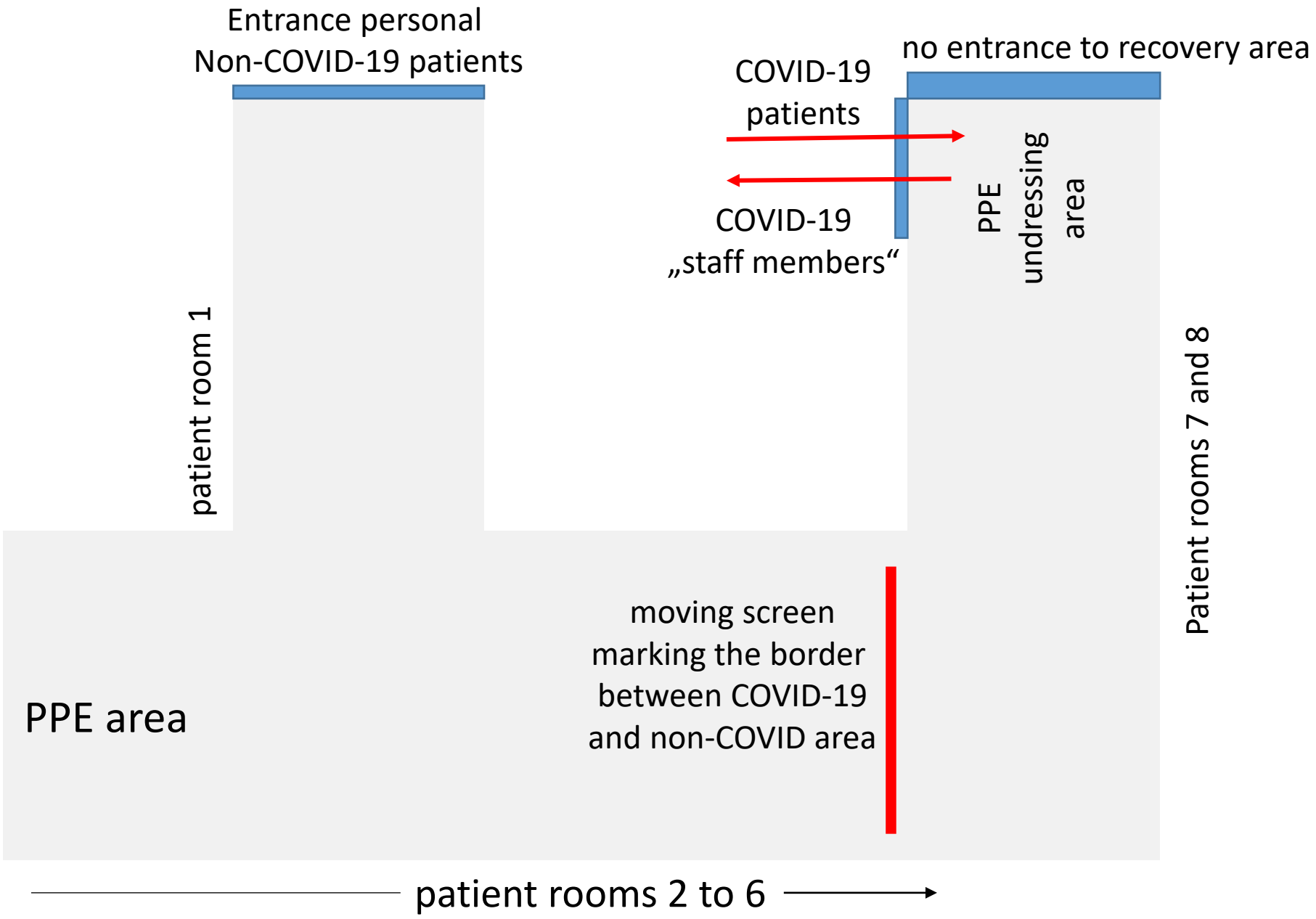
THE SECOND WAVE – WHAT HAVE WE LEARNED

- ✓ Infectivity of SARS-CoV-2 is low as long as hygiene standards are strictly observed
- ✓ An infection via contaminated surfaces seems to be very rare
- ✓ PPE using cotton coats and plastic aprons, FFP-3 masks, eye protection and two pair of gloves gives sufficent protection against SARS-CoV-2 infection
- ✓ Outside the ICU, e.g. the operating room and recovery area an FFP-2 mask seem to be sufficiently save
- ✓ During the 2nd wave of the pandemic, we ran the ICU as flexible hybrid ward
- ✓ In case of an overload of the ICU we move with ICU patients to the recovery area

Interdisciplinary ICU St. Vinzenz KH Zams as a „Hybrid-ICU“




COVID-19 area
flexible screen
non COVID-19 area
3

ORGANIZATIONAL

Same teams with the same patients

- No team mixing between non-COVID-19 and COVID-19 areas
- Only the intensivist on duty switches between areas after changing the personal protective equipment

- PPE for the COVID-19 area: Cotton coats; plastic aprons, FFP-3 masks, eye protection and two pair of gloves

- FFP-2 masks for the non-COVID-19 area

- two intensivists during the dayshift
- two intensivists during the night
- increasing availability of physiotherapists in the ICU

COVID-19 – ALL ICU PATIENTS

Allg. öffentl. Krankenhaus St.Vinzenz Betriebs GmbH Zams

	WAVE 1 (n = 24)					WAVE 2 (n = 36)					
	n (%)	Median	IQR	Min	Max	n (%)	Median	IQR	Min	Max	P-Wert
DEMOGRAPHY											
age		63	53-72	29	84		73	65-80	53	87	0,002
male sex	15 (63)					13 (36)					0,258
BMI	24	26,3	25-28	20,2	43	35	27	25-31	21	46	0,422
Incubation period	23	7	6-8	1	33		7	3,5-9	1	14	0,61
COMORBIDITY											
hypertension	10 (42)					26 (72)					0,031
CHD	8 (33)					13 (36)					1
COPD	4 (17)					5 (14)					1
Chronic renal failure	2 (8)					10 (28)					0,1
Diabetes mellitus	3 (13)					14 (38)					0,04
CV-disease	0					3 (8)					0,268
ICU Data											
SAPS 3		55	49-65	44	81		59	52-68	33	105	0,387
SOFA max		10	5-13	3	18		7	4-10	3	14	0,189
ICU days		8	4-33	1	53		10	7-16	2	50	0,871
IMV days	17	17	4-22	1	39	14	10	4-22	2	49	0,57
NIV-days	20	4	2-7	1	34	31	6	3-9	1	14	0,05
vvHF days	6 (25)					1 (3)					0,013
ICU- Mortality	3 (12,5)					13 (36)					0,015

	COVID-19 (n=60)					SEPTISCHER SCHOCK (n=159) Jahre 2014-2019				
	n (%)	**Median**	**IQR**	**Min**	**Max**	**n (%)**	**Median**	**IQR**	**Min**	**Max**
Age		70	29-87	29	87		77	68-108	20	108
Male sex	**42 (70)**					**71 (45)**				
COMORBIDITY										
hypertension	36 (60)					99 /62)				
CHD	21 (35)					78 (49)				
COPD	9 (15)					55 (34)				
Chronic renal failure	12 (20)					65 (40)				
Diabetes mellitus	17 (28)					29 (18)				
CV-disease	1 (2)					30 (19)				
ICU-data										
SAPS 3		57	51-65	33	109		63	52-72	30	112
SOFA max		9	5-12	3	18		10	7-13	3	23
ICU days		9	6-24	1	53		9	5-15	1	115
MV days	31 (52)	**18**	**5-21**	**1**	**49**	126 (79)	**4**	**2-8**	**0**	**65**
NIV-days	41 (68)	5	3-8	1	34	78 (49)	5	2-7	0	34
vvHF days	7 (12)	19	12-29	6	37	77 (48)	7	4-11	0	45
ICU- Mortalität	15 (25)					32 (20)				


You know that I am the wolf! Don´t you run away?
Only the very old and very sick are biten!
A healthy sheep has no problems, when biten by a woolf !
We believe in herd immunity
Wolfs dont exist!
ARGHXSEL 2020