

RECOVER Closing Conference

Observational studies in Hospital Care: the MERMAIDS-ARI base

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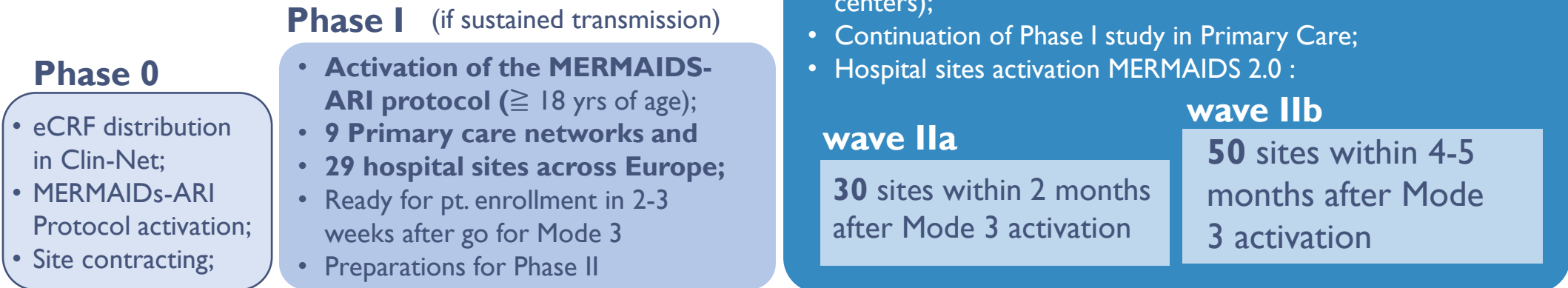
Objectives

1. To establish the prevalence, disease spectrum and severity, clinical features, management, risk factors, spread and outcomes of novel 2019 coronavirus infection (SARS-CoV-2) in Hospital Care in selected European countries;
2. To determine the risk of hospital-acquired SARS-CoV-2 infection during the COVID-19 epidemic in Europe.
3. To determine the long-term sequelae of COVID-19 requiring hospital care.
4. To collect the appropriate clinical samples for the study of host-pathogen interactions (WP5)

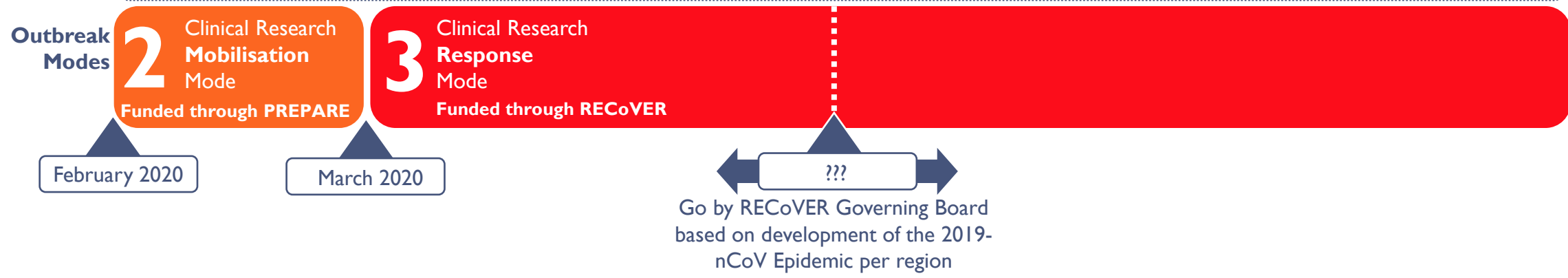
**Detailed clinical
and biological
characterization**



Hospital care study



Optional and partially funded through PREPARE until 1/2/2021 and other sources:
Evaluation of novel therapeutics against 2019-nCoV in hospital settings across Europe in REMAP-CAP Adaptive Platform Trial.



Mermaids Ari 1.0 versus 2.0



	MERMAIDS 1.0	MERMAIDS 2.0
Etiology	Focus on most prevalent: Influenza, HRV, RSV and <i>S.pneumoniae</i> , SARS-CoV-2	Focus on SARS-CoV-2
Setting	Primary and hospital care	Hospital care
Severity	Mild (community care) Moderately severe (hospitalized) Severe (mechanical ventilation or death)	Moderately severe (hospitalized) Severe (mechanical ventilation or death)
Long term follow up	No	Yes
Nosocomial	No	Yes

Mermaids Ari 1.0 versus 2.0



Sampling scheme	Timepoint				
	Day 0 ^a	Day 2 ^b	Day 7 ^c	Day 28 ^d	Discharge
Tier 1					
Blood (EDTA)	•	•	•		•
Serum (SST)	•			•	
NP swab in UTM	•		•	•	•
NP RNA swab	•		•	•	•
Blood RNA (Tempus)	•	•	•	•	•
Stool sample		•	•	•	•
Tier 2		Day 2 ^b	Day 7 ^c	Day 28 ^d	Discharge
Blood CPT (Cell preparation tube)		•	•	•	•

An illustration of a woman with black hair in a bun, wearing red-rimmed glasses and a white business suit with a red tie. She has ten arms. Her right hand is on her chin, talking on a black mobile phone. Her left hand is on a laptop. Other arms hold various items: a red folder, a green banknote, a purple Euro banknote, a white document with a blue stamp, a green folder, a white document with a green checkmark, a white document with a blue stamp, a black mobile phone, a black folder, a yellow coffee cup with steam, a stack of books, and a pen. The background is a plain greyish-brown color.

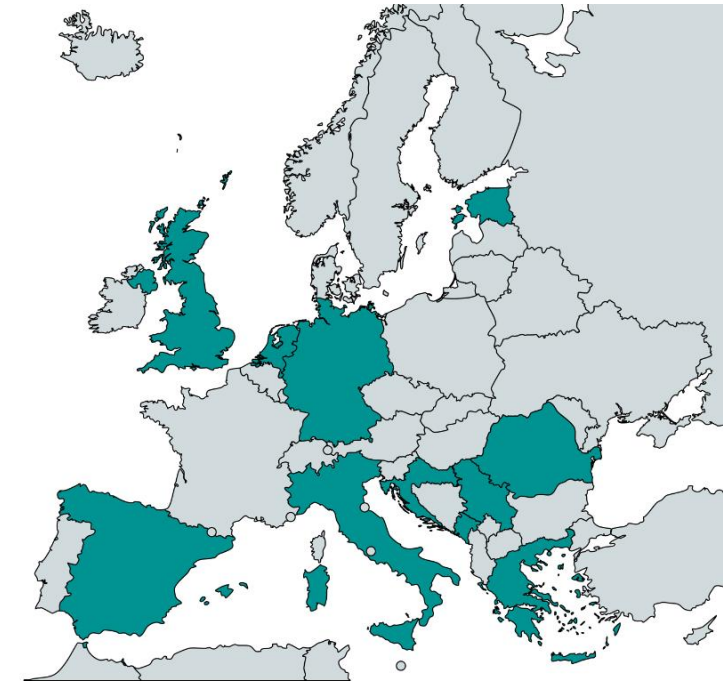
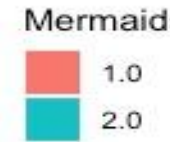
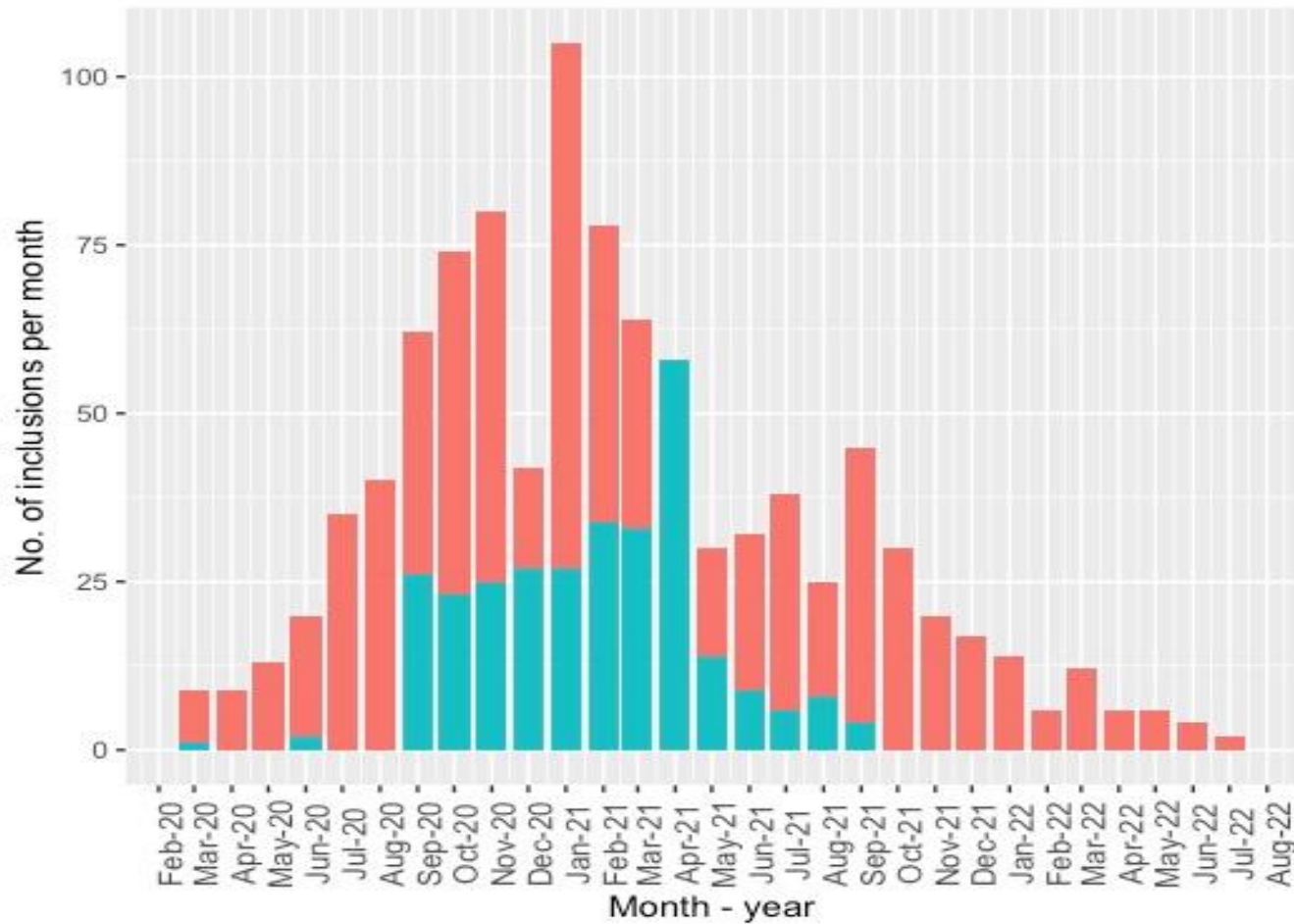
March 2020

**Sorry, no
time....**

Mermaids-ARI 1.0 & 2.0



- ❖ 11 countries
- ❖ 1260 subjects enrolled
- ❖ 860 COVID19 patients
- ❖ 5124 samples collected



Created with mapchart.net

Results sample analyses



80% SARS-CoV2 positive

2.3% co-infection with ≥ 1 virus (mostly Rhinovirus)

44.6% at ≥ 1 bacterial detection

S Aureus 28.9%

H Influenzae 17.2%

S Pneumoniae 7.9%

M Catarrhalis 5.5%

Viruses:

- influenza A virus (pan, duplo)
- Influenza A virus/H1-2009
- Influenza A virus/H3
- influenza B virus (pan, duplo)
- human rhinovirus (2 targets, duplo)
- human coronavirus (229E, NL63, HKU1, OC43)
- MERS-CoV
- SARS-CoV
- SARS-CoV-2 (3 targets)
- human parainfluenza (1-4)
- human bocavirus
- human respiratory syncytial virus A (2 assays, duplo)
- human respiratory syncytial virus B (2 assays, duplo)
- human metapneumovirus A&B

- human parechovirus
- Enterovirus (pan)
- Enterovirus D68
- human adenovirus (2 assays, duplo)

Bacteria:

- *Mycoplasma pneumoniae*
- *Staphylococcus aureus*
- *Chlamydia pneumoniae*
- *Haemophilus influenzae*
- *Streptococcus pneumoniae*
- *C. psittaci*
- *B. pertussis*
- *B. holmesii*
- *M. catarrhalis*
- *L. pneumophila*

Results and outcome COVID19 patients



Characteristics	Mermaids 1.0	Mermaids 2.0
	505	296
Male	61.0% (307/503)	62.2% (184/296)
Median age (range)	56.6 (22-87)	61 (18-89)
White/Caucasian	85.2 % (422/495)	95.9% (283/295)
Other Ethnicity	14.7% (73/495)	4.1% (12/295)
Nursing home/long-term healthcare facility resident	1.2% (6/481)	1.3% (4/296)
Completed high school or higher education	-	86.6% (253/292)
Healthcare Worker	-	5.1% (14/276)
Complications and Outcome	Mermaids 1.0	Mermaids 2.0
Any complications:	40.7% (190/467)	57.4% (167/291)
Discharge alive:	89.6% (424/473)	93.4% (267/286)
Disease progression during hospital stay:	13.6% (52/383)	12.6% (35/277)
Death:	10.4% (49/473)	6.5% (19/293)

Mermaids-ARI 2.0: extended follow-up

- 121 patients agreed to participate
- 94 patients started the follow-up 3 months after discharge

	Month 3	Month 6	Month 12
Questionnaire			
<i>Employment status</i>	X		
<i>Quality of Life</i>	X	X	X
Lung function	X	X	X
Blood sampling			
<i>Serum SST</i>		X	X
<i>Blood CPT</i>			X

COVID-19 patients extended follow-up

	Month 3 (n=94)	Month 6 (n=77)	Month 12 (n=78)
Sex: Male	66.0 (62/94)	62.3 (48/77)	66.7 (52/78)
Median age (range)	58 (18-89)	58 (18-81)	57 (23-81)
Ethnicity			
White/Caucasian	97.9 (92/94)	97.4 (75/77)	98.7 (77/78)
Other	2.1 (2/94)	2.6 (2/77)	1.3 (1/78)
Pulmonary function measured (% yes)	34.0 (32/94)	54.5 (42/77)	2.6 (2/78)
Normal lung function (% yes)	68.8 (22/32)	81.0 (34/42)	50.0 (1/2)
Median health rating (range 0-100)	80 (20-100)	85 (30-100)	85 (8-100)

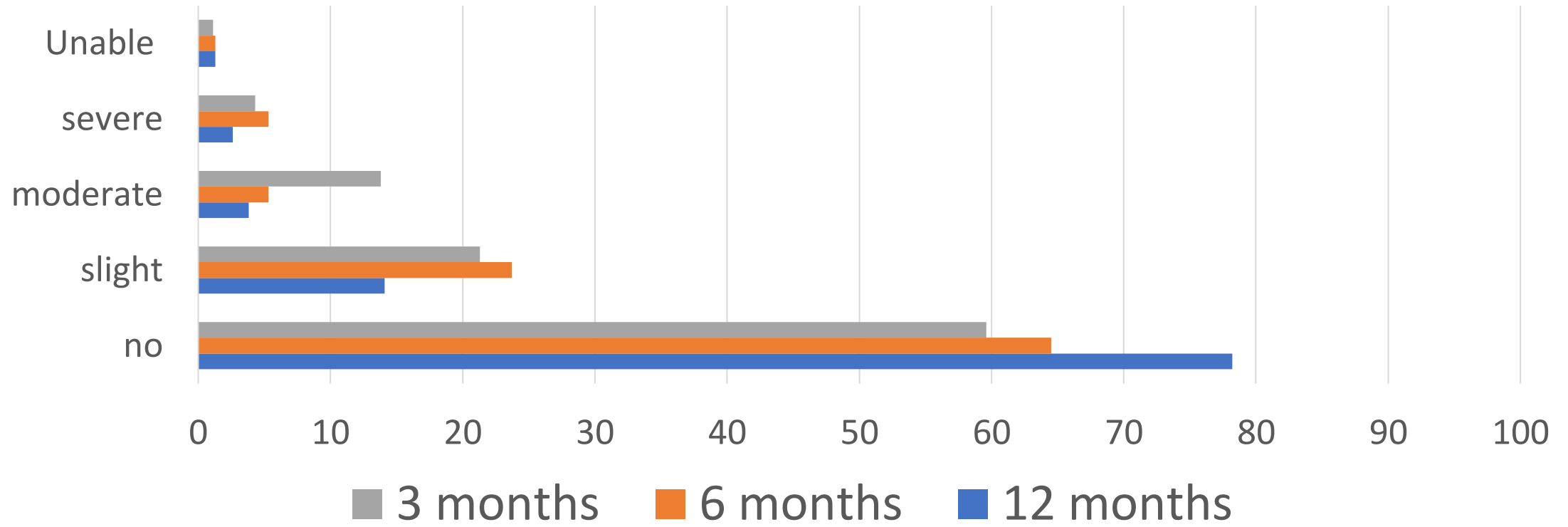
Employment and usual activities

3 months after discharge

- Employed patients
 - 94.3% has returned to work
 - 11.3% had to make significant changes to their work duties or occupation because of their hospital stay
- Unemployed patients (including retirement)
 - 86.5% has resumed their usual activities

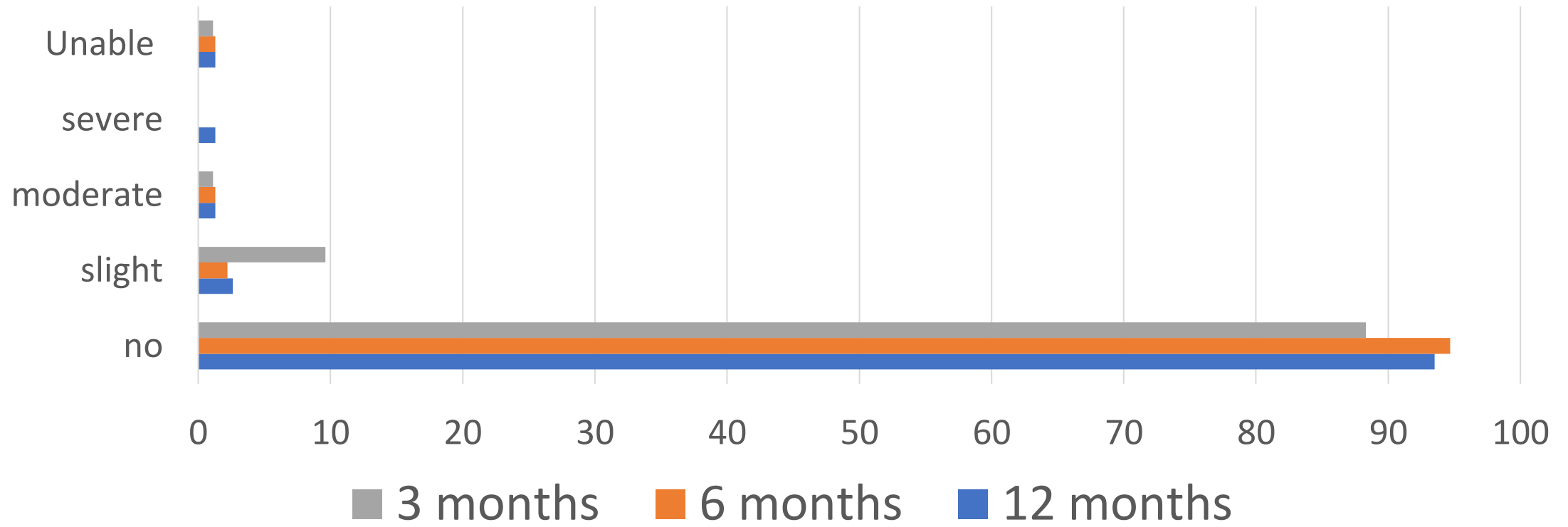
Quality of life

Problem with walking around (%)



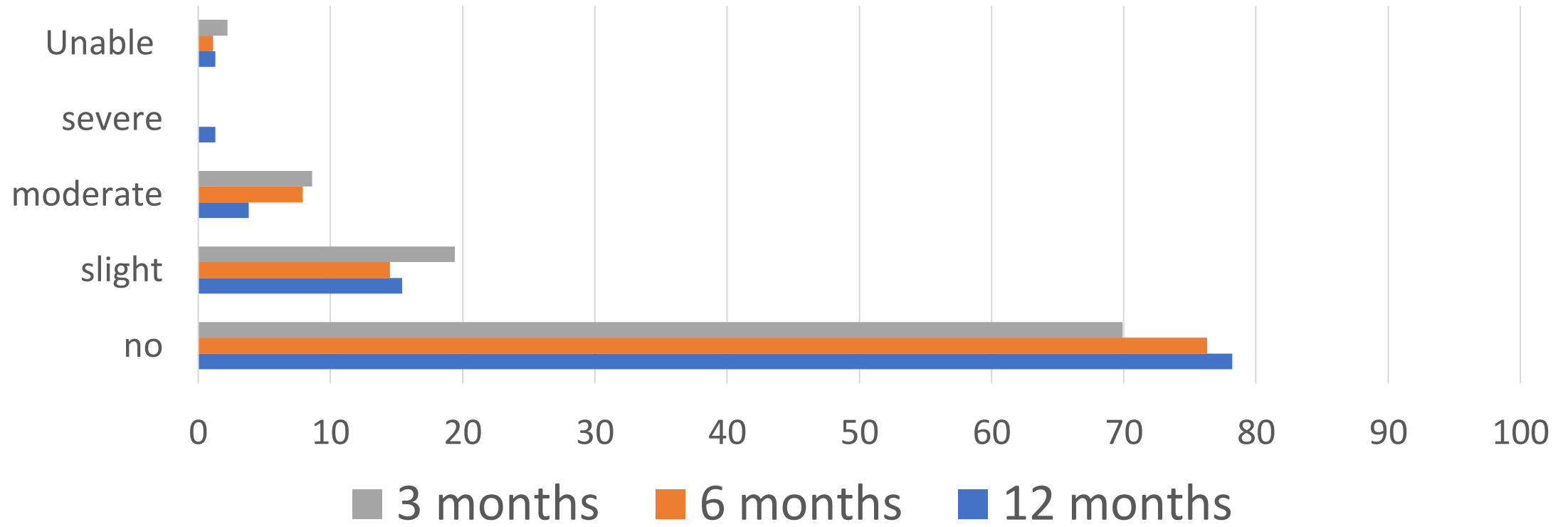
Quality of life

Problem personal care (washing/dressing (%))



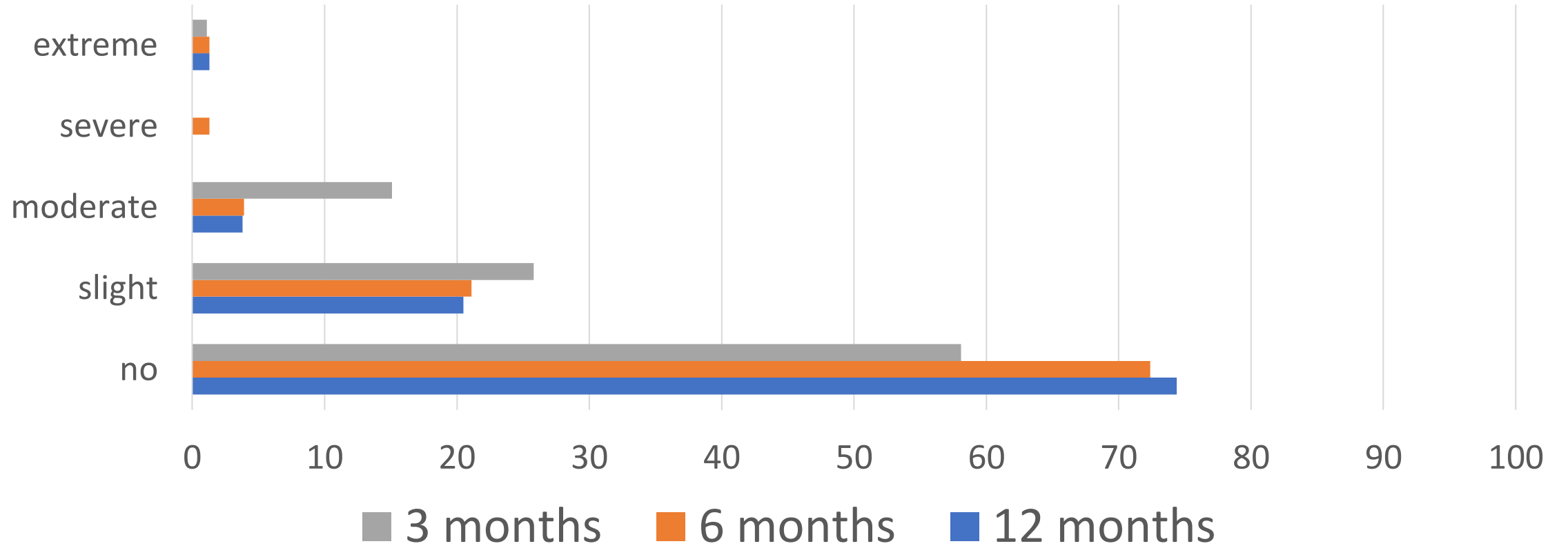
Quality of life

Doing usual activities (%)



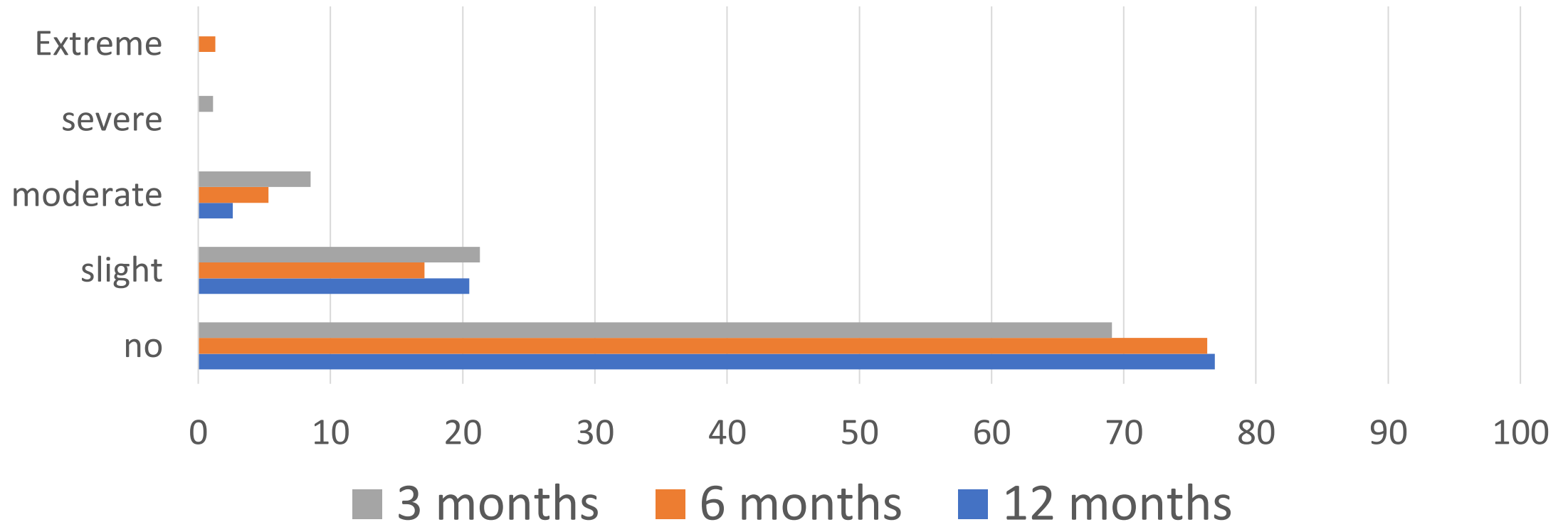
Quality of life

Pain or discomfort (%)



Quality of life

Anxious or depressed (%)

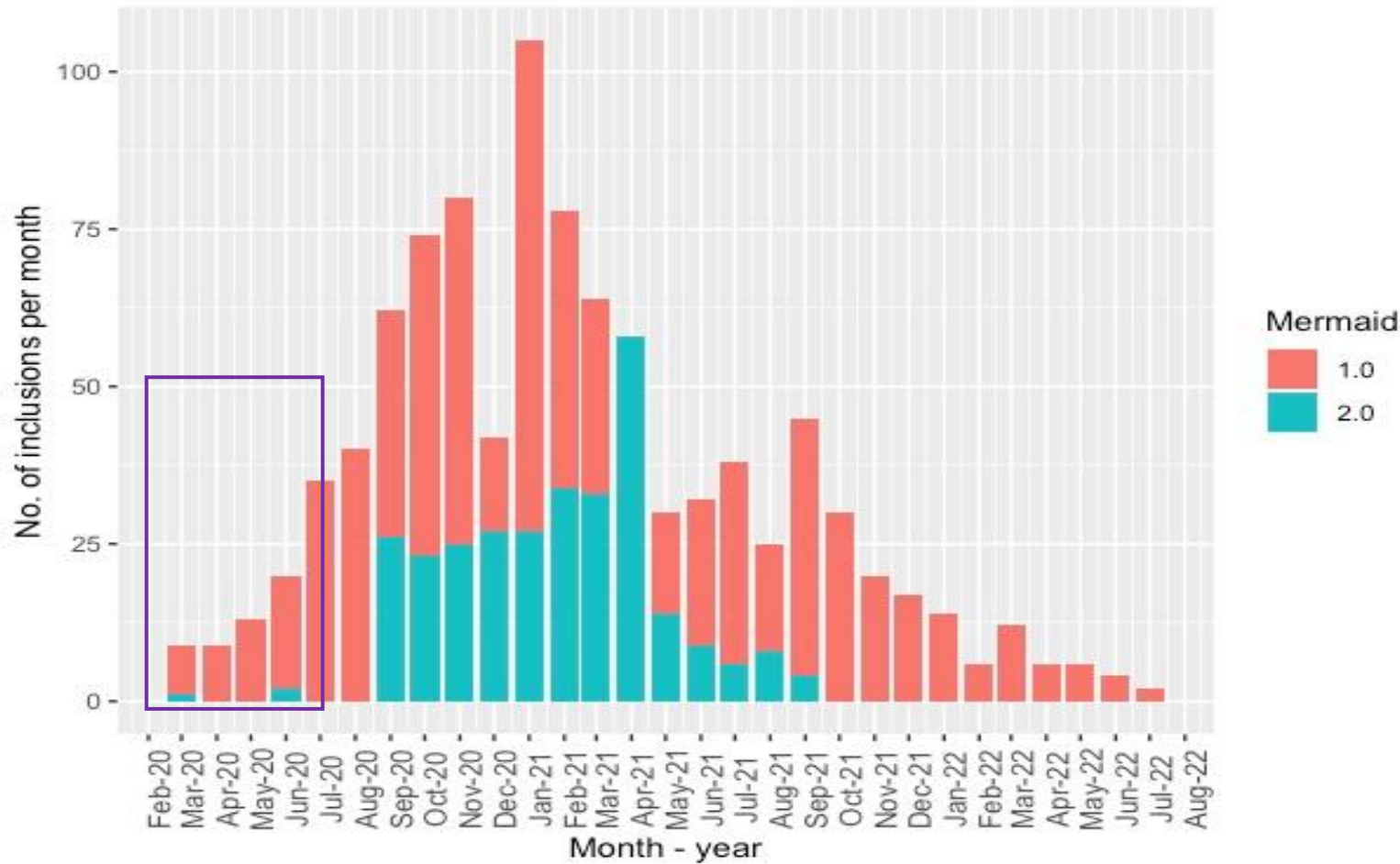


Conclusions



- A large, pan-European clinical cohort and biobank of COVID19 patients has been established
- Offers vast opportunities for studies on host-pathogen interactions in COVID19, and comparative studies with other infections >> WP5
- Mermaids data feed into other research projects > co-infection project
- Mermaids data structure aligned with ISARIC for harmonization across cohorts.

Lessons learned



Sources of delay:

- Site willingness/capabilities to participate
- Local approval and contracting
- Local staff shortage
- Sample shipments
- Lab capacity

Recommendations for scientists, healthcare workers and policy makers



- Fixed templates for EU-funded research contracts with sites
- Pre-organized site selection and contracting >>> perpetual observational studies
- Tiered approach (with and without ICF)
- Centralized ethical approval processes

