



**International Council of  
Cardiovascular Prevention  
and Rehabilitation (ICCPR)**

# ICCPR GLOBAL SURVEY OF CARDIAC REHABILITATION PROGRAMS REGARDING IMPACTS OF COVID-19

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# PRESENTATION SUMMARY

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- ICCPR
- COVID-19 and the need for a Global Survey on CR
- How the Global Survey was structured
- Results
- Summary of Regional Results
- Implications



# ICCPR

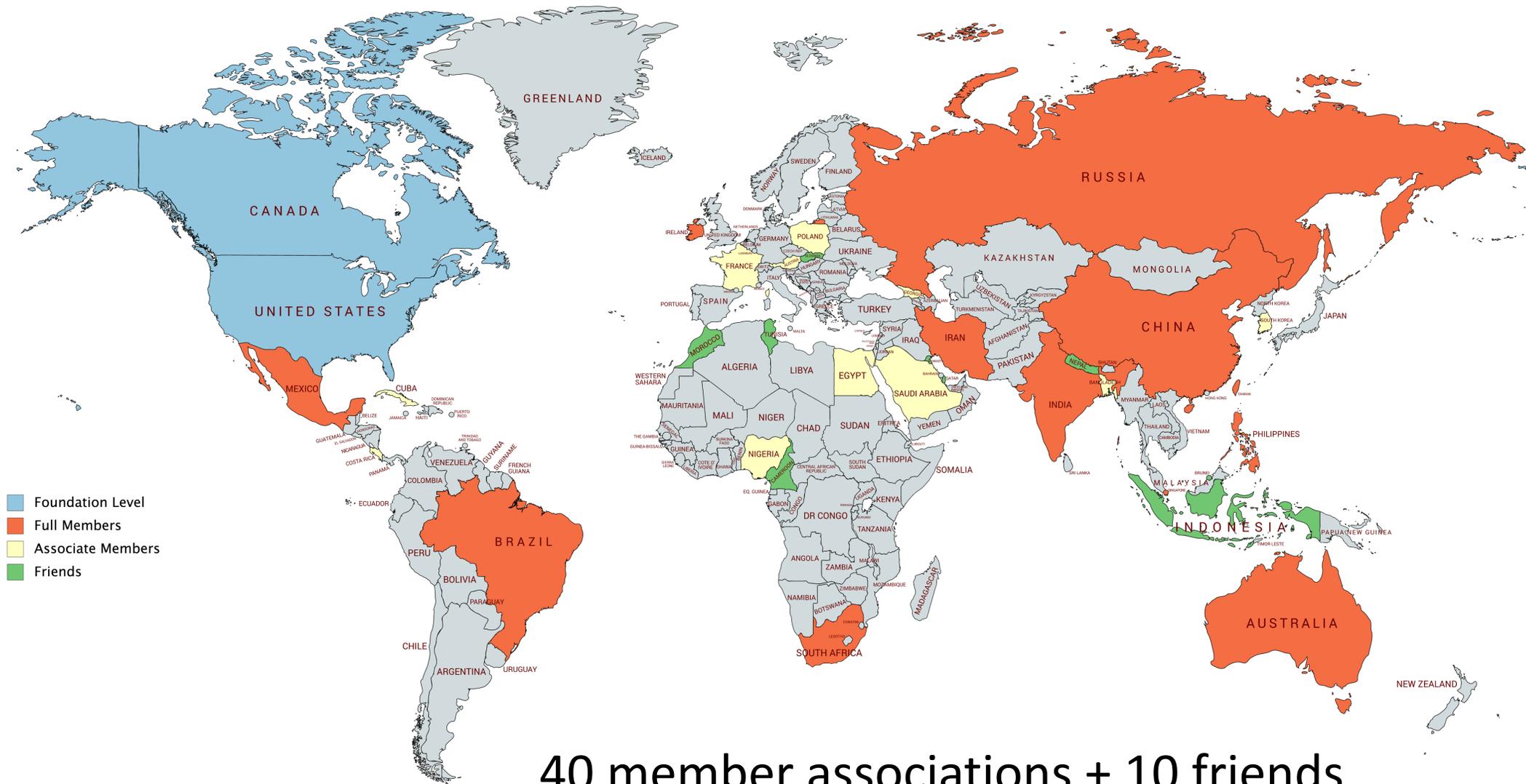
## GOALS

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1. Bring together national CR associations
2. Work towards on-going consensus
3. Promote CR as an essential service
4. Support countries to establish and augment CR
5. Communicate the evidence base for CR

**International Council of Cardiovascular Prevention and Rehabilitation**

[globalcardiacrehab.com](http://globalcardiacrehab.com)



40 member associations + 10 friends

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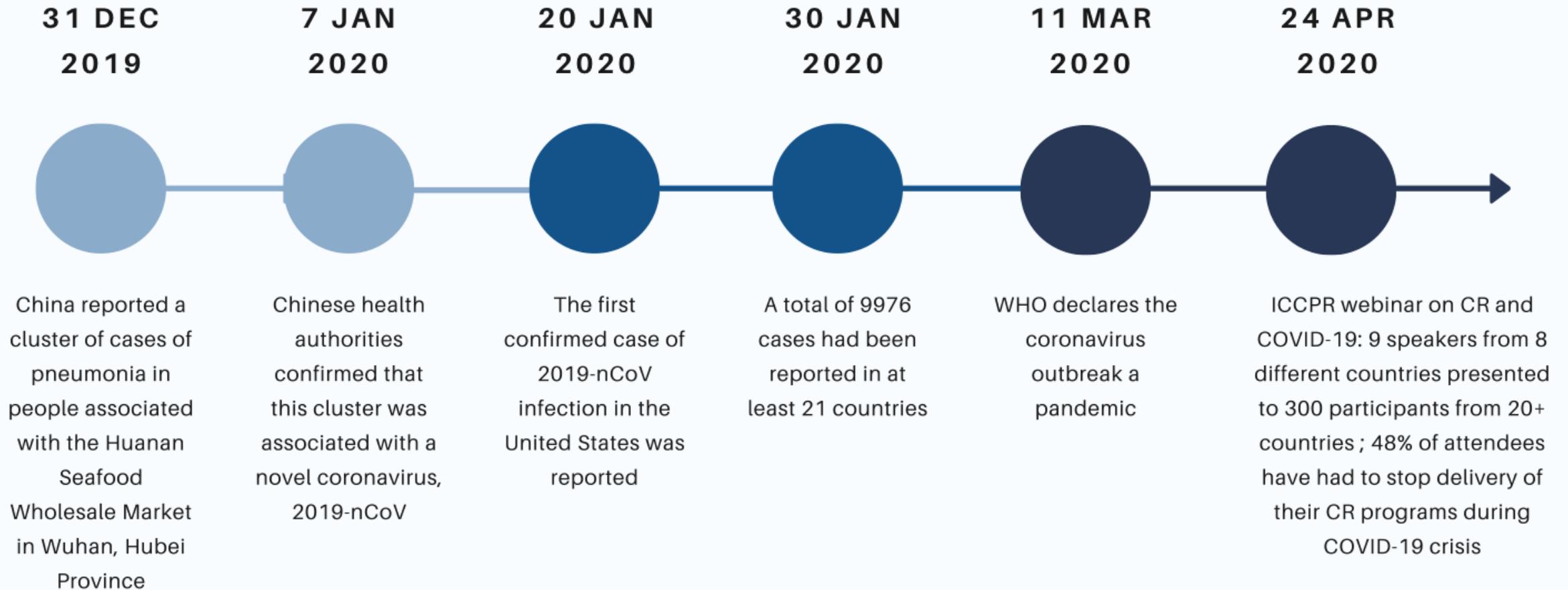
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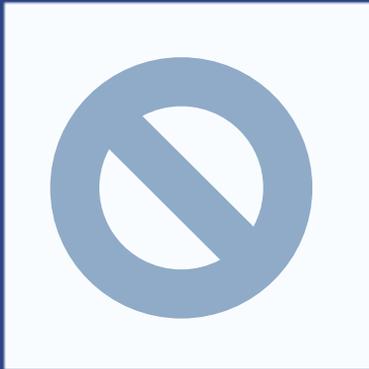
# Coronavirus Disease 2019

# COVID-19 TIMELINE



# RATIONALE AND OBJECTIVES

Government restrictions include limits to non-essential health care services

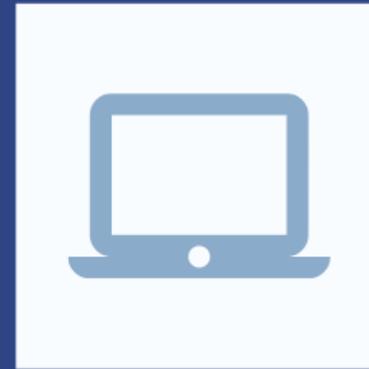


Yeo TJ, et al. *Eur J Prev Cardiol.* 2020;27:903-5.  
Thomas E, et al. *Eur J Prev Cardiol.* 2020. doi:10.1177/2047487320922926.  
Babu AS, et al. *Can J Cardiol.* 2020;36:792-4.  
Percy E et al. *Can J Cardiol.* 2020;36:956-60.  
Neubeck L et al. *Eur J Cardiovasc Nurs.* 2020. doi:10.1177/1474515120924530.

Delivery of Cardiac Rehabilitation has been impacted around the globe



Many CR programs have closed or quickly switched to virtual delivery



Negative impact on patients and CR providers



Dawkes S, et al. *Brit J Cardiol.* 2020. doi:10.5837/bjc.2020.019.  
Khara A, et al. *Am J Prev Cardiol.* 2020. doi:10.1016/j.ajpc.2020.100009.  
Mureddu GF, et al. *Monaldi Arch Chest Dis.* 2020. doi:10.4081/monaldi.2020.1439.  
Moulson N, et al. *Can J Cardiol.* 2020. doi:10.1016/j.cjca.2020.06.006.  
Scherrenberg M, et al. *Eur J Prev Cardiol.* 2020. doi:10.1177/2047487320939671.

Therefore, the objective of this study was to investigate impacts of COVID-19 on CR delivery around the globe, including impacts on providers and patients.

# METHODS



Ethics Approval at  
York University  
(Toronto, Canada)



All ICCPR members  
were contacted and  
requested to  
circulate the survey



Data collection from  
March to June 2020  
via online survey  
REDCap (English).



Survey was translated  
to Simplified Chinese)  
and disseminated  
through Sojump in  
China

# SAMPLE



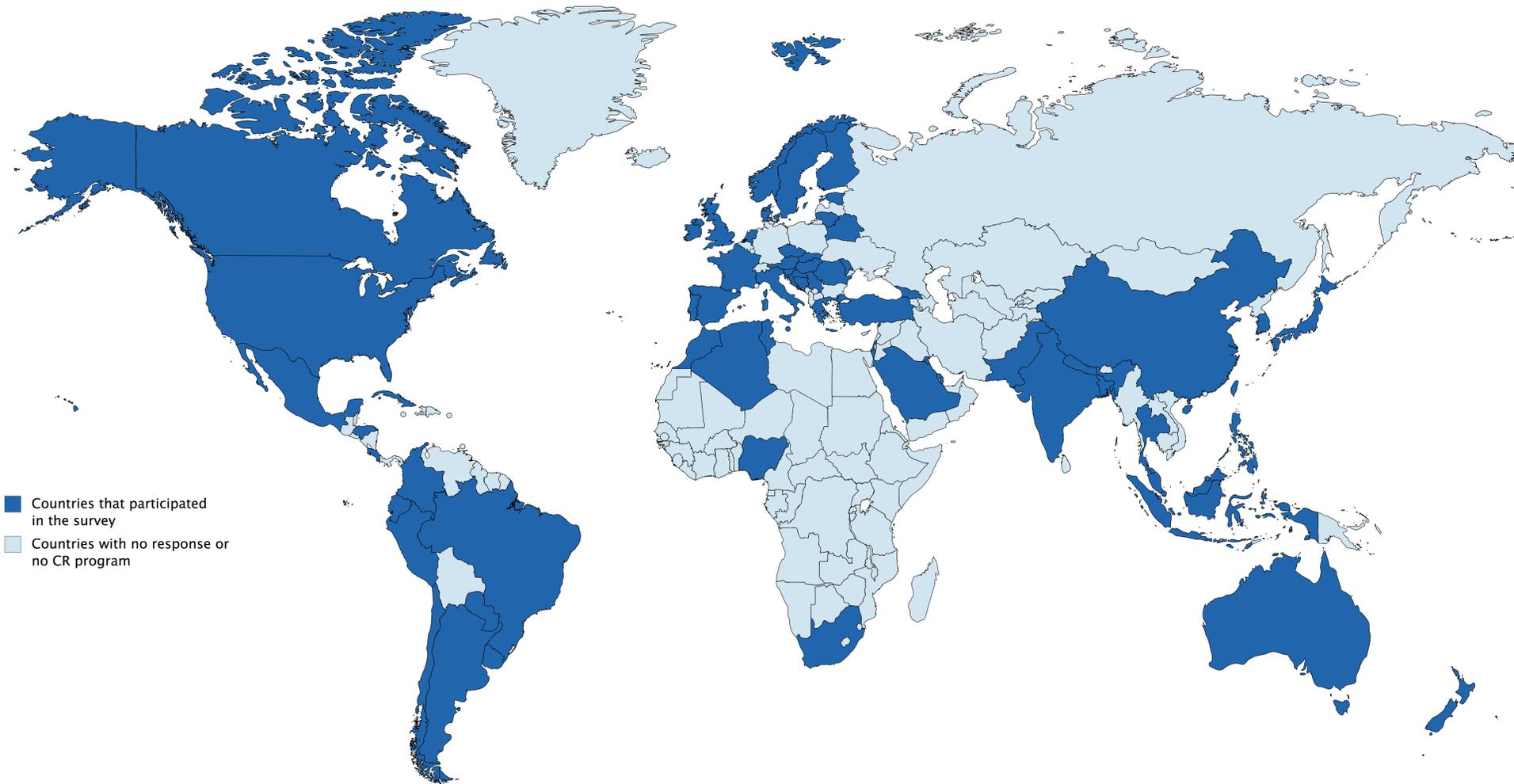
- CR programs around the world that offered:
  1. initial assessment,
  2. structured exercise, and
  3. at least one other strategy to control risk factors
- We asked the CR program manager to complete the survey where possible
- Countries were categorized by WHO region
  - 5,756 CR programs in 111/203 countries with CR internationally  
(Turk-Adawi K, et al. EClinicalMedicine. 2019;13:31-45)

# MEASURES



- 33 items
- 3 sections
  1. CR program characteristics and impacts of COVID-19
  2. Barriers and facilitators to delivering CR programs virtually, and
  3. COVID-related impacts on staff and patients.
- Forced-choice (e.g., check all that apply)
- Skip-logic (some missing data as n/a)
- Country and date
  - COVID-19 cases at the time of survey completion in each country was extracted from the website <https://ourworldindata.org/>

# RESULTS: 1062 RESPONSES



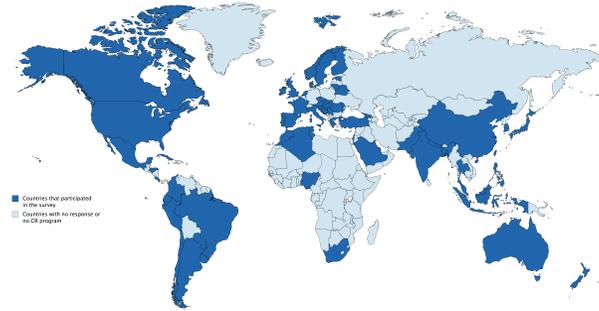
**70 (60.3%)**  
of 111 countries  
in the world  
with CR

Median number  
of responding  
programs per  
country = 98.0  
Q25-75=36.0-  
108.0

# RESULTS: 1062 RESPONSES

Responses were received from **18.3%** of the CR programs in the world

Ascertained **13** countries have more CR programs since global audit, for a total estimate of **5,813** CR programs globally



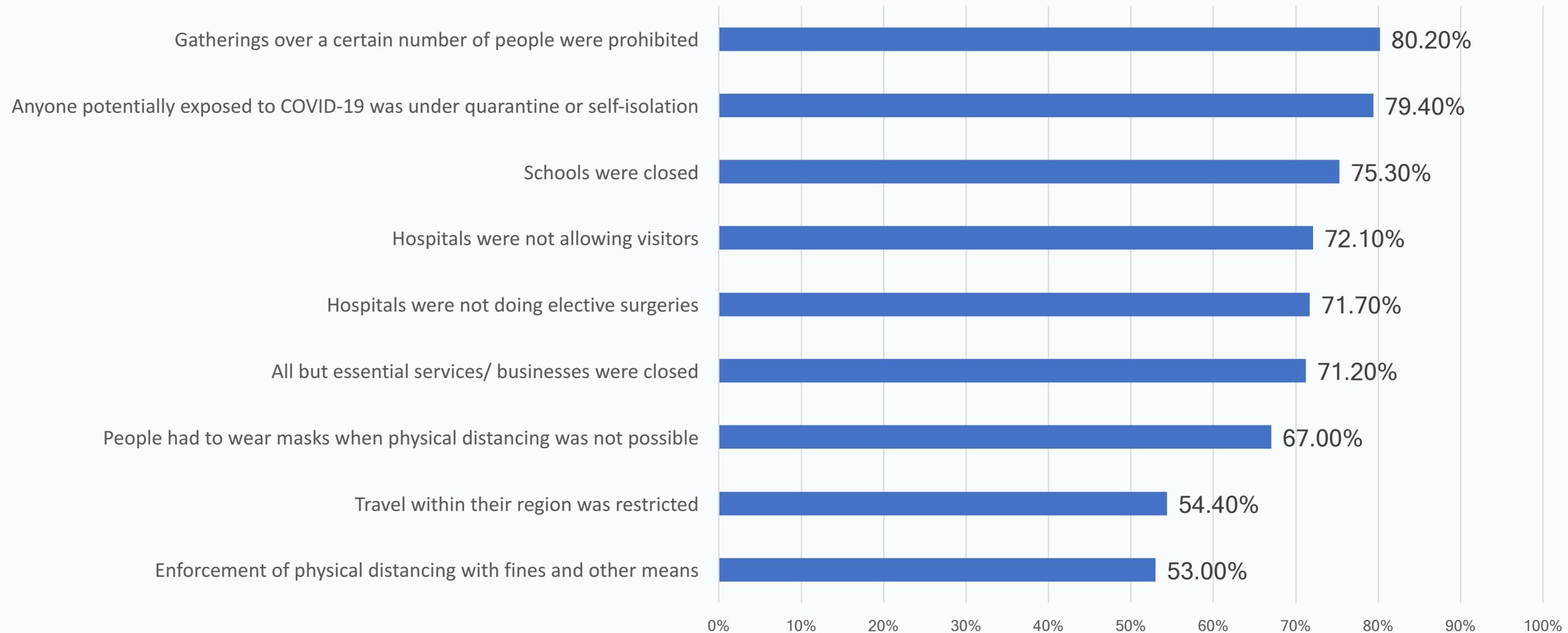
## Responses received from all WHO regions

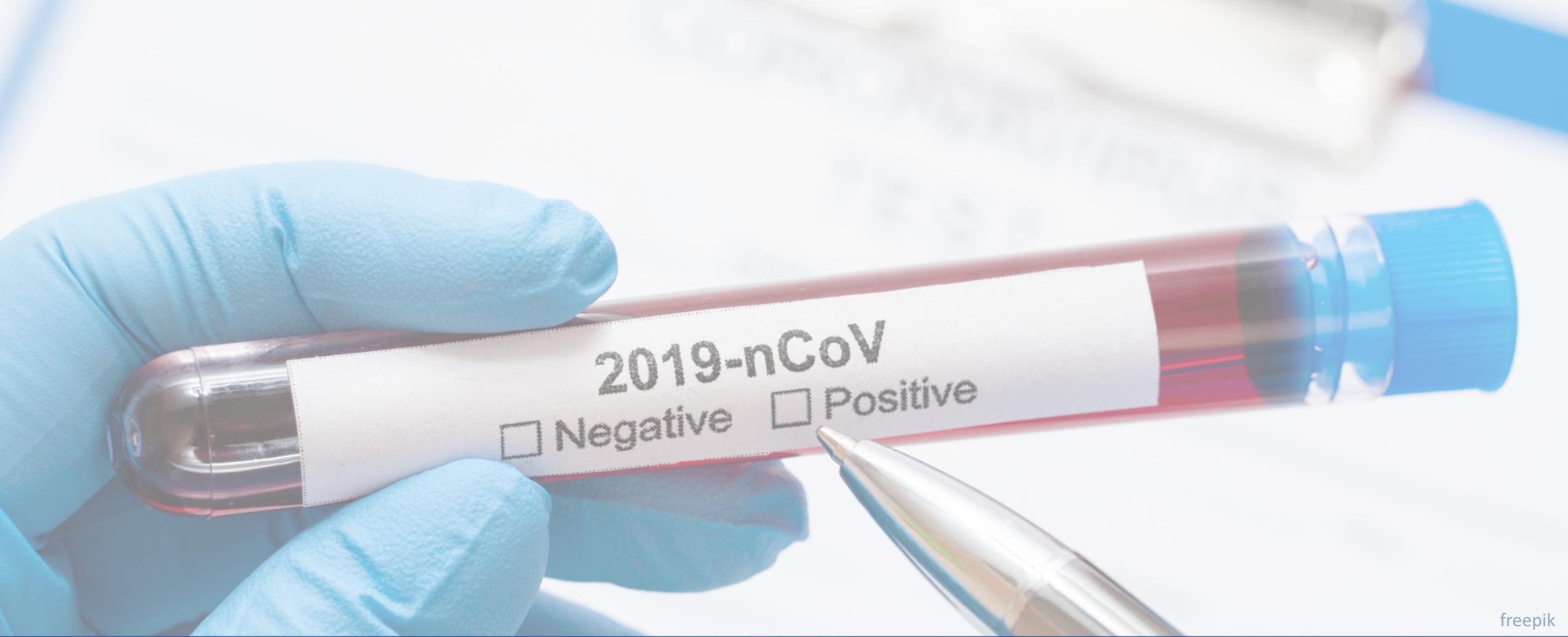
- *African: 10 (40%)*
- *Americas: 535 (17.3%)*
- *Eastern Med: 14 (31.8%)*
- *Europe: 232 (14.1%)*
- *South-East Asian: 53 (100.0%)*
- *Western Pacific: 200 (20.5%)*

## Location:

- **392 (37.4%)** CR programs were located in a community hospital
- **364 (34.7%)** located in a referral center, quaternary or tertiary facility, and/or academic center

# COVID-19 RESTRICTIONS





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# 106 (14.4%) programs had had suspected or positive COVID-19 patients

Africa: 50%

Americas: 12.9%

Eastern Med: 55.6%

Europe: 20.6%

South-East Asia: 10.7%

Western Pacific: 8.0%

# RESULTS: SERVICE CONTINUITY

- 367 (49.1%) programs reported they had completely stopped CR delivery
- 203 (27.1%) stopped for a period
  - mean  $8.3 \pm 2.8$  weeks
- 178 (23.8%) programs did not stop
- Of those that stopped for any amount of time,
  - 363 (30.0%) made no other arrangements to provide patient care,
  - 202 (16.7%) made arrangements as following: home-based CR/ telehealth, online consultations (WeChat, MS Teams, and Zoom), phone or email consultations, and education offered more often via phone, online or via mail to patients.

# CR PROGRAM ADAPTATIONS

	WHO region						Total
	Africa	Americas	Eastern Mediterranean	Europe	South-East Asian	Western Pacific	
<b>Reducing some elements offered</b>	3 (30.0%)	110 (20.6%)	3 (21.4%)	57 (24.6%)	10 (18.9%)	43 (27.0%)	228 (19.5%)
<b>Only treating existing patients</b>	2 (33.3%)	100 (41.3%)	4 (57.1%)	51 (46.8%)	14 (63.6%)	29 (33.3%)	202 (17.3%)
<b>Deferring graduation until post-program assessments can be completed</b>	2 (20.0%)	71 (13.3%)	2 (14.3%)	21 (9.1%)	3 (5.7%)	19 (12.3%)	120 (10.3%)
<b>Shortening the program duration</b>	3 (30.0%)	46 (8.6%)	1 (7.1%)	18 (7.8%)	4 (7.5%)	22 (14.1%)	95 (8.2%)
<b>Graduating patients more quickly</b>	2 (20.0%)	57 (10.7%)	1 (7.1%)	7 (3.0%)	2 (3.8%)	14 (9.2%)	85 (7.3%)
<b>We are adapting all elements to retain service levels</b>	2 (20.0%)	91 (17.0%)	6 (42.9%)	31 (13.4%)	12 (22.6%)	35 (21.6%)	177 (15.1%)

# RESULTS

- 202 (42.3%) programs were **only treating existing patients**, while all others that were open were still accepting new patients
- **CR capacity**
  - Median of 20.0 (Q25-27 =10.0-40.0) patients / month pre-COVID
  - Median of 3.0 (Q25-75=0.0-15.0) during COVID.
- **Type of providers delivering CR**
  - In 111 (13.6%) programs had changed
  - In 122 (15.0%) patients have had to interact with a different provider (e.g., mainly one professional interacting with patients – mostly nurses, and access to allied health care providers ceased due to COVID-19).

# CR COMPONENTS PROVIDED IN THE PROGRAMS, AND THAT CONTINUED TO BE PROVIDED DURING THE COVID-19 PANDEMIC



## Initial Assessment

371 (45.3%)

390 (47.6%)

58 (7.1%)



## Exercise Prescription

375 (46.0%)

386 (47.3%)

55 (6.7%)



## Patient Education

445 (54.4%)

331 (40.5%)

42 (5.1%)



## Individual Consultation

356 (44.0%)

335 (41.4%)

118 (14.6%)

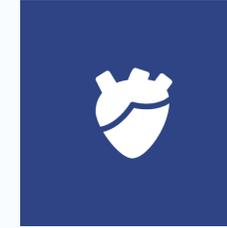


## Supervised Exercise Training

208 (25.5%)

521 (63.9%)

86 (10.6%)



## RF Management

436 (54.6%)

320 (40.1%)

42 (5.3%)

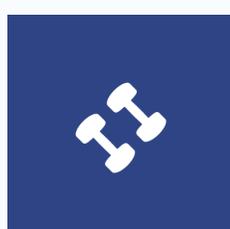


## Exercise Stress Test

144 (18.3%)

288 (36.5%)

357 (45.2%)



## Resistance Training

224 (27.9%)

480 (59.8%)

99 (12.3%)



## Meds Prescription

271 (33.9%)

250 (31.3%)

278 (34.8%)



## Other Functional Test

166 (20.9%)

438 (55.2%)

189 (23.8%)

Offered and continue to be offered during COVID-19  
Offered, but not during COVID-19  
Never offered



## Nutrition Counseling

352 (43.4%)

377 (46.5%)

82 (10.1%)

# CR COMPONENTS PROVIDED IN THE PROGRAMS, AND THAT CONTINUED TO BE PROVIDED DURING THE COVID-19 PANDEMIC



## Psychological Counseling

298 (37.3%)  
301 (37.7%)  
199 (24.9%)



## Relaxation Techniques

260 (32.6%)  
370 (46.4%)  
168 (21.1%)



## Final Assessment

245 (30.4%)  
449 (55.7%)  
112 (13.9%)



## Tobacco Cessation

199 (25.1%)  
344 (43.3%)  
251 (31.6%)



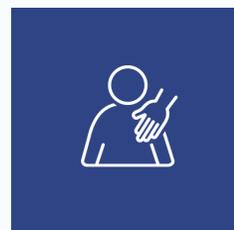
## Alternative Exercise Modes

94 (12.1%)  
174 (22.4%)  
508 (65.5%)



## Comm'n with PCP

322 (40.5%)  
342 (43.0%)  
132 (16.6%)



## Sexual Counseling

134 (17.2%)  
219 (28.2%)  
424 (54.6%)



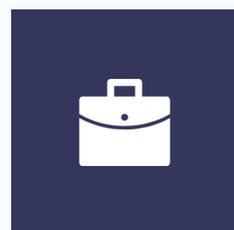
## Inclusion of Family

179 (22.5%)  
465 (58.6%)  
150 (18.9%)



## Follow-up

198 (25.3%)  
294 (37.5%)  
292 (37.2%)



## Vocational Counseling

166 (21.3%)  
238 (30.6%)  
374 (48.1%)

Offered and continue to be offered during COVID-19  
Offered, but not during COVID-19  
Never offered



## Maintenance Prog

147 (18.7%)  
404 (51.3%)  
236 (30.0%)

# ALTERNATIVE/REMOTE DELIVERY OF CR DUE TO COVID

	Yes, before COVID-19	Yes, during COVID-19	No
Reimbursement of alternative models	102 (12.7%)	67 (8.3%)	636 (79.0%)
Alternative models offered	150 (18.5%)	172 (21.2%)	488 (60.2%)
Proportion of patients served in remote model	16.5±24.5%	69.0±37.2%	n/a
Perceive program has sufficient capacity to meet need/demand for remote delivery	142 (49.1%)	155 (54.0%)	121 (42.2%)



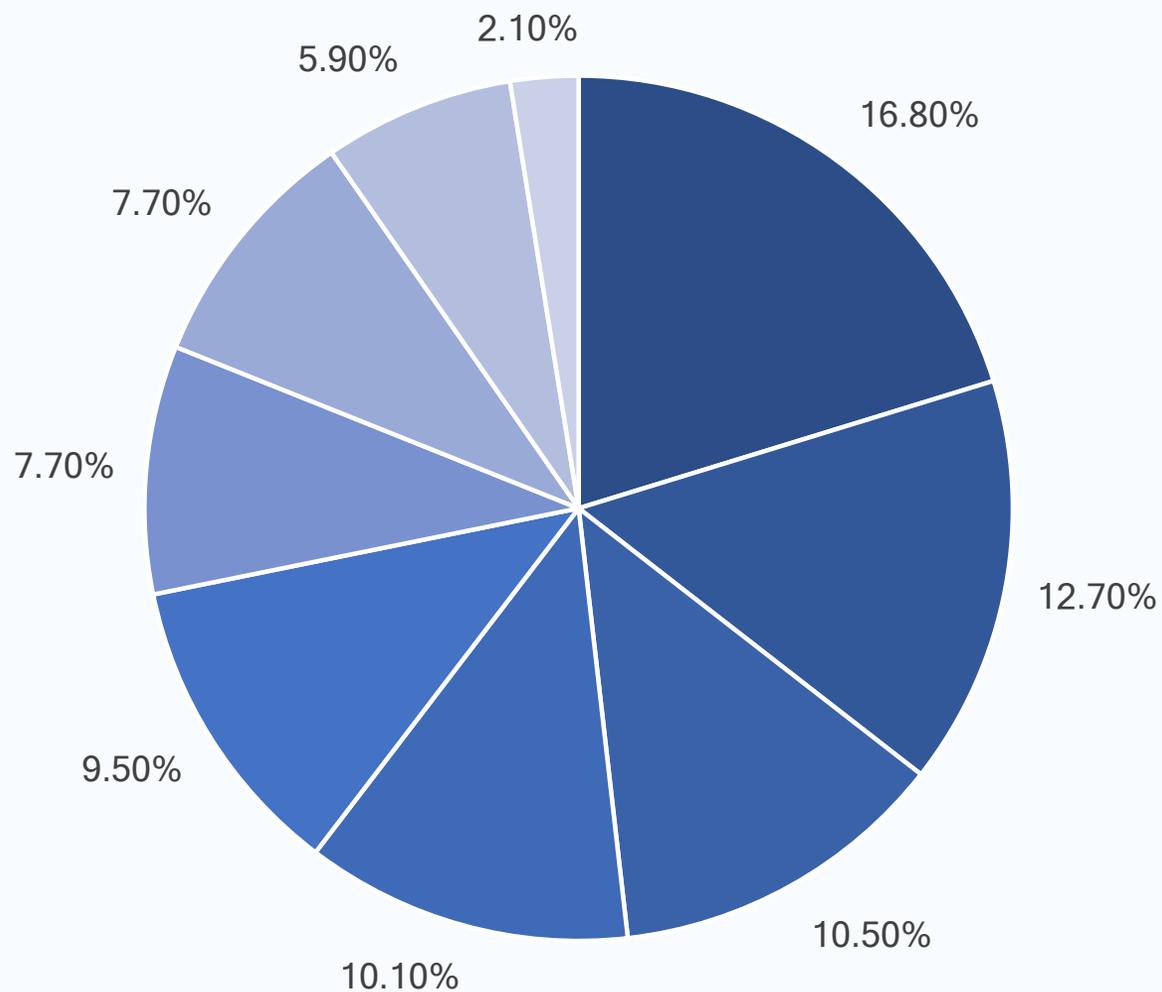
# ALTERNATIVE/REMOTE DELIVERY OF CR DUE TO COVID

Forms of Communication	Yes, before COVID-19	Yes, during COVID-19	No
Phone	178 (62.2%)	96 (33.6%)	12 (4.2%)
Email	128 (46.9%)	88 (32.2%)	57 (20.9%)
Internet webpage	104 (38.4%)	99 (36.5%)	68 (25.1%)
Text messages	93 (34.8%)	42 (15.7%)	132 (49.4%)
Smartphone app	52 (20.6%)	67 (26.6%)	133 (52.8%)
Webcam / videoconference (e.g. education sessions)	37 (14.2%)	105 (40.4%)	118 (45.4%)
Other	14 (15.6%)	6 (6.7%)	70 (77.8%)



# ALTERNATIVE/REMOTE DELIVERY OF CR DUE TO COVID

## Barriers to delivering CR remotely



- Patients do not have the technology to connect with program staff remotely
- Lack of equipment /program resources for secure and private remote delivery
- Not enough funding
- Not enough staff
- Patients' risk is too high for unsupervised exercise/safety concerns
- Too inefficient
- Staff need training

# ALTERNATIVE/REMOTE DELIVERY OF CR DUE TO COVID

## What respondents perceive they would need to overcome these barriers

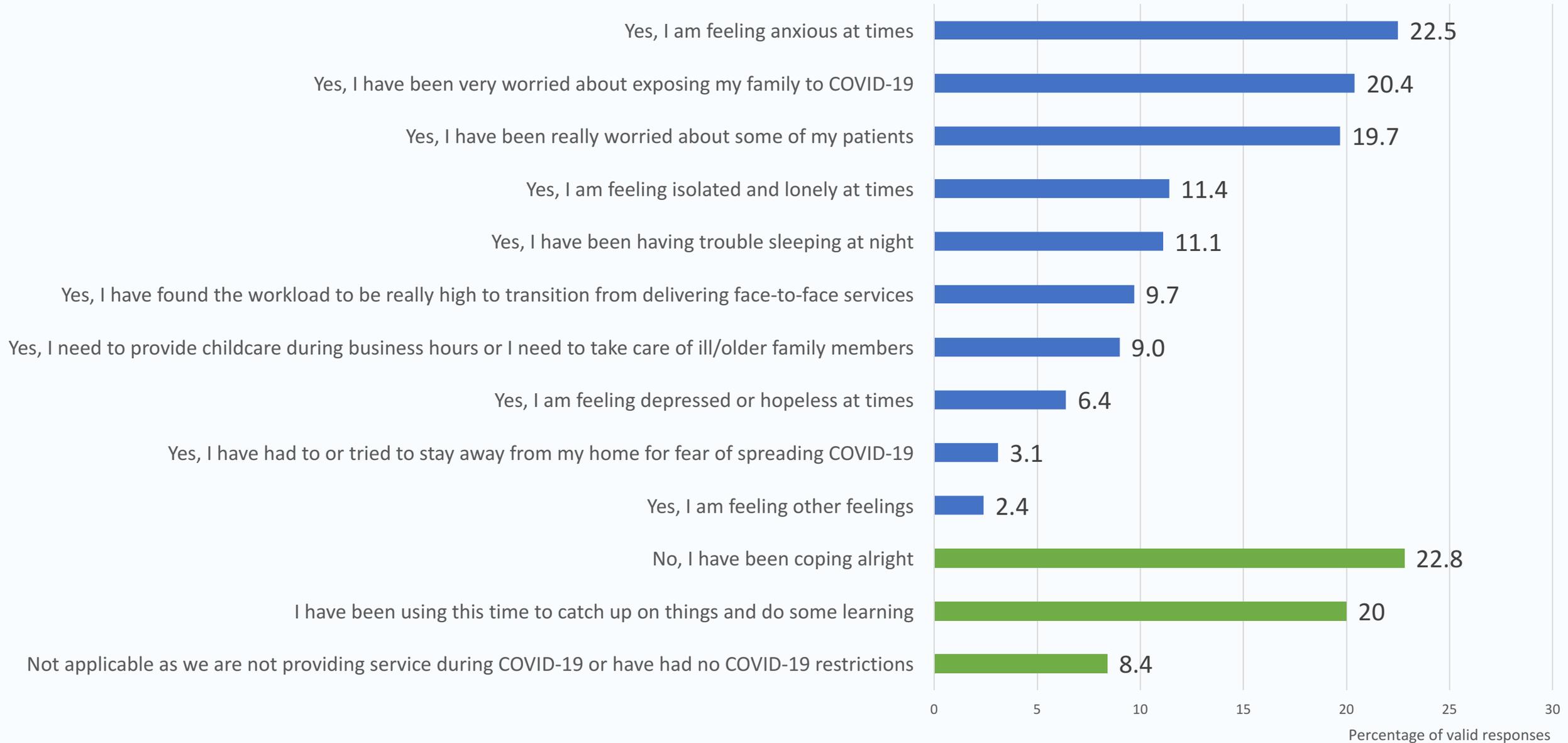
- time to research and develop the model
- secure /private means for staff to communicate with patients electronically;
- equipment to communicate remotely with patients
- facilities / space
- home equipment to loan patients
- cheap and reliable wireless technology to monitor for adverse events remotely
- reliable and low-cost high-speed internet access for staff and patients
- a dedicated multidisciplinary team
- physician champions
- administrative staff to facilitate scheduling of virtual sessions
- a structured, evidence-based home-based CR program software platform or smartphone app
- technology support staff (with time) to train patients and staff to use the remote technology and equipment, and also for database management support
- ability to have at least one safe in-person session with each patient to ensure safety and education
- financial resources as well as reimbursement of remote model
- patient as well as provider awareness of availability of the remote model (including referrals) to increase their capacity to deliver home-based/remote CR services to patients.

# IMPACT ON CR STAFF

## Occupational Impacts on CR Staff by World Health Organization Region

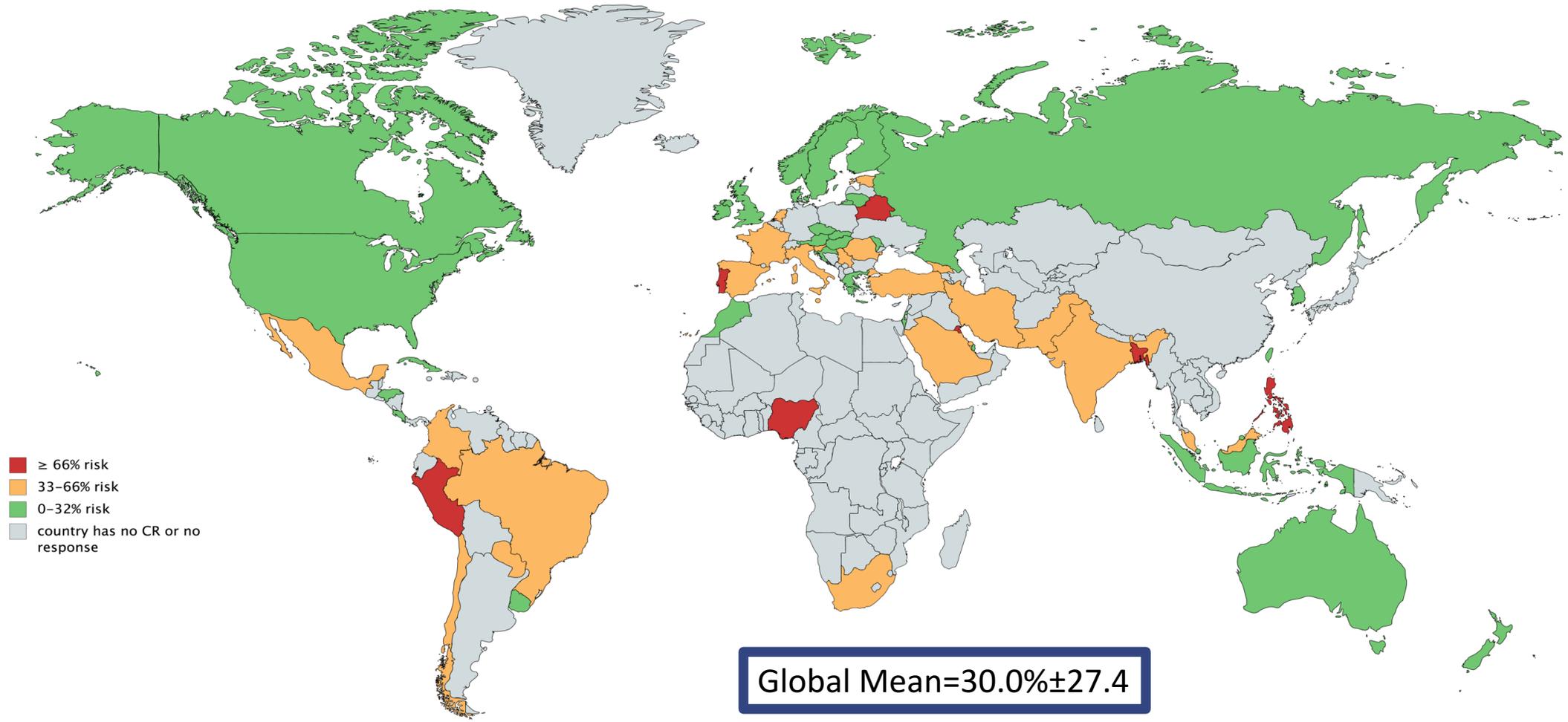
	Africa	Americas	Eastern Mediterranean	Europe	South-East Asia	Western Pacific	Total
Re-deployed	4 (40.0%)	203 (37.9%)	7 (50.0%)	87 (37.5%)	5 (9.4%)	41 (25.6%)	353 (30.2%)
Reduced hours	4 (40.0%)	163 (30.5%)	4 (28.6%)	16 (6.9%)	4 (7.5%)	21 (13.5%)	215 (18.5%)
Some staff have had to practice somewhat outside their scope	3 (30.0%)	80 (15.0%)	7 (50.0%)	41 (17.7%)	4 (7.5%)	21 (13.5%)	159 (13.7%)
Laid off temporarily	1 (10.0%)	96 (17.9%)	4 (28.6%)	21 (9.1%)	4 (7.5%)	12 (7.8%)	138 (11.9%)
Pay reductions	3 (30.0%)	36 (6.7%)	4 (28.6%)	10 (4.3%)	5 (9.4%)	13 (8.2%)	71 (6.1%)
Permanently let go	1 (10.0%)	14 (2.6%)	0 (0.0%)	6 (2.6%)	1 (1.9%)	2 (1.0%)	24 (2.1%)
Other	0 (0.0%)	24 (4.5%)	0 (0.0%)	8 (3.4%)	2 (3.8%)	9 (6.0%)	43 (3.7%)

# PSYCHOSOCIAL IMPACT ON CR STAFF



# IMPACT ON CR STAFF

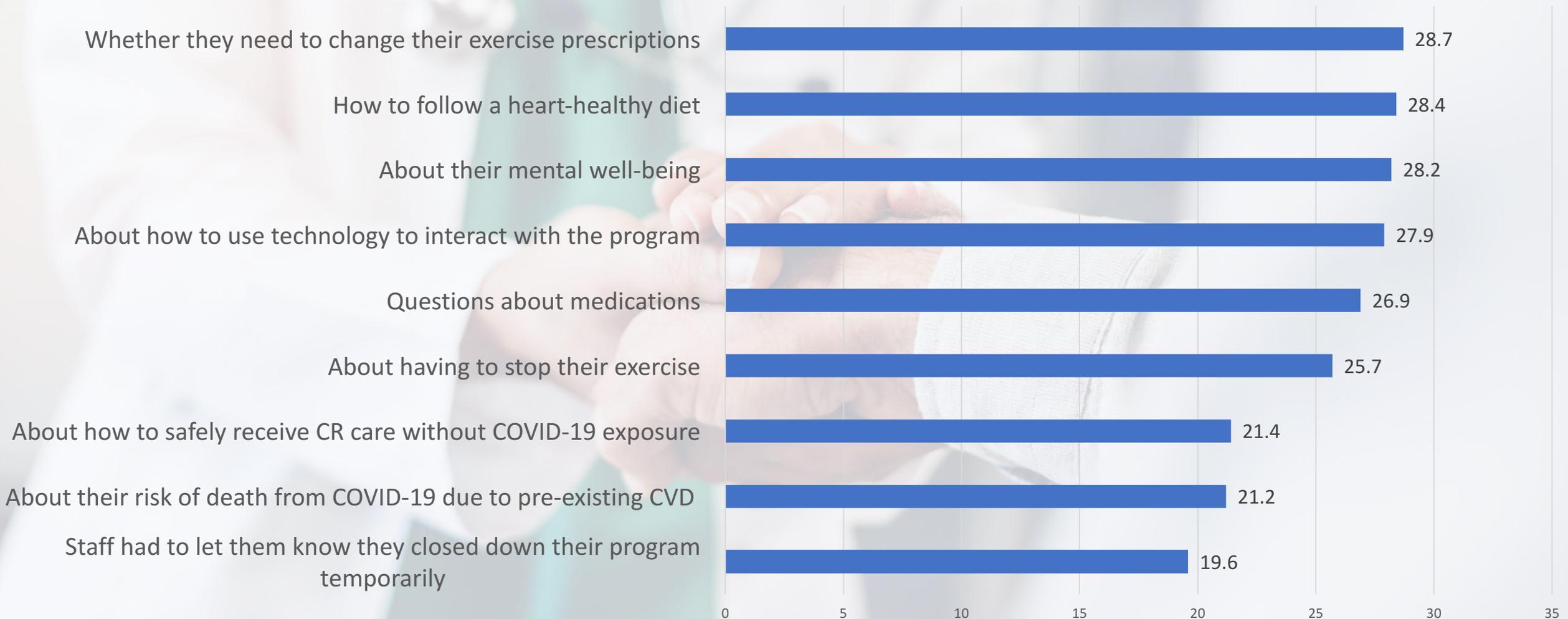
Perceived risk in contracting COVID-19 through their CR work by country



GLMM accounting for country as a higher-order variable, revealed degree of perceived risk was associated with country stringency index ( $p=0.01$ ), but not number of cases ( $p=0.80$ )

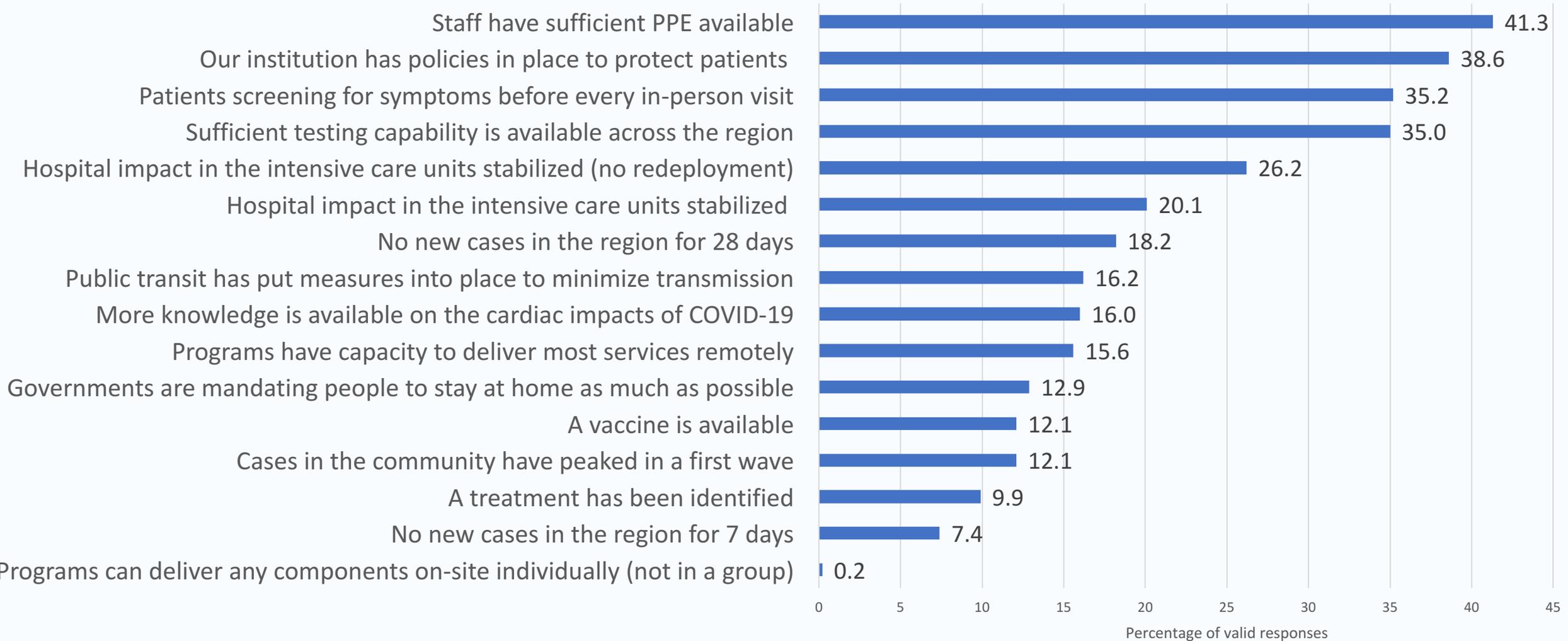
# IMPACT ON CR PATIENTS

## Patients reservations and concerns regarding COVID-19:



# RESUMPTION OF CR SERVICES

273 (36.8%) reported that their institution had a policy regarding the circumstances under which regular services could resume



# LIMITATIONS

- Convenience sample: bias towards programs that are still open and have staff available to answer the survey
- Response rate was lower in the Americas and Europe, so generalizability to those regions is more questionable
- The reliability and validity of the survey is unknown
  - Programs may have responded in a socially-desirable manner, although survey was confidential
- Since the survey was mainly completed in English, some concepts could have been misunderstood by respondents for whom English was not their first language.

WHAT HAVE WE LEARNED FROM THIS STUDY?



# FINAL CONSIDERATIONS

- Impact of COVID-19 goes beyond the disease and infection risk:
  - Effects CR availability, structure, delivery format, and components; and,
  - the mental health of providers and patients receiving it
- COVID-19 has been responsible for the closure of close to 4400 CR programs worldwide
  - In programs that remain open:
    - Key risk-reducing components have stopped being delivered in more than 60% of the programs that remained open, including supervised exercise training
- New patients were not accepted in almost half of programs, with a reduction of 75% in their monthly capacity

# FINAL CONSIDERATIONS

- Safe resumption of CR services:
  - American and British CR Associations have published recommendations on resuming face-to-face CR services, which include external and internal (patient, staff, and program) considerations
  - Most of these were also identified as paramount in our study
- Over 60% of programs did not offer any remote model of CR delivery
- How to offer remote model?
  - Home-based models of CR have similar effects in improving clinical outcomes and quality of life in cardiac patients compared to center-based models
  - Not reimbursed
  - Programs face many barriers, including development of the remote model, as well as the associated policies, and acquiring and learning the new technologies to support this.

# FINAL CONSIDERATIONS

- For safety, some in-person contact at the beginning of the CR program was advocated, following screening and with PPE
- Programs are then using different functional capacity testing to inform exercise prescription and different means to monitor exercise.
- Loan patients equipment for remote monitoring of risk factors?
- Most CR components could then be safely delivered through remote means, with the use chiefly of webcam/videoconferencing where resources and supports exist.
- A significant drop in amount of patient education was concerning
  - Free online, evidence-based resource:  
<https://www.healthuniversity.ca/en/cardiacollege/Pages/default.aspx>

# FINAL CONSIDERATIONS

- Psychological well-being of healthcare workers: impact of COVID-19 can be substantial and long-lasting
- Although about a fifth of respondents in this study reported they have been coping “alright” with COVID-19, many are experiencing:
  - anxiety, fear of exposing family, loneliness, difficulty sleeping, and stress due to higher workloads
  - Over a third felt the need to work despite perceived risk, due to fear of losing their job or pay (and one in five had no sick pay).
- Approximately a third of CR program respondents had been re-deployed.



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## COVID-19

### COVID-19 SURVEY OF CR PROGRAMS GLOBALLY



#### GLOBAL SURVEY OF CARDIOVASCULAR REHABILITATION PROGRAMS: COVID-19 IMPACT

ICCP's survey of CR programs globally **has now closed**. We received approximately 1100/~5753 program responses from 75/111 countries with CR. Thank you to all the programs who participated.

Resources identified by programs are collated below (you are welcome to email us with new resources to add as they become available at [globalcardiacrehab@gmail.com](mailto:globalcardiacrehab@gmail.com)).

We are now analyzing the data, and look forward to sharing learnings with the CR community in due course. We hope to work together to mitigate COVID-19 impacts identified in ways we can.

**COVID-19 RESOURCES** (resources will be added regularly)

<https://globalcardiacrehab.com/COVID-19>



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# International Council of Cardiovascular Prevention and Rehabilitation

[globalcardiacrehab.com](http://globalcardiacrehab.com)

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