

## Supplemental Materials

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Supplement Table 1. Cardiology Societies Represented by the APSC Young Community

Zone 1 – NORTH EAST & CENTRAL ASIA AND THE PACIFIC

The Cardiac Society of Australia and New Zealand  
Hong Kong College of Cardiology  
The Japanese Circulation Society  
Mongolian Society of Cardiologists  
The Korean Society of Cardiology  
Taiwan Society of Cardiology  
The Cardiothoracic Society of Papua New Guinea

Zone 2- SOUTH-EAST ASIA

Cardiac Society, Brunei Darussalam  
Cambodian Heart Association  
Indonesian Heart Association  
National Heart Association of Malaysia  
Myanmar Cardiac Society  
Philippine Heart Association, Inc.  
Singapore Cardiac Society  
The Heart Association of Thailand  
Vietnam National Heart Association

Zone 3 – SOUTH ASIA AND THE MIDDLE EAST

Bangladesh Cardiac Society  
Cardiological Society of India  
Iranian Heart Association  
Cardiac Society of Nepal  
Pakistan Cardiac Society  
Sri Lanka College of Cardiology  
Emirates Cardiac Society

## Supplemental Table 2. Survey Questions

### Survey

We would like to invite members of the APSC Young Community to participate in a survey reflecting on the impact of the COVID-19 pandemic. Over the past three years, the pandemic has greatly influenced our lives, both personally and within our communities.

**We are interested in hearing about your experiences on how your professional and personal life have been affected by the pandemic.** This survey aims to identify challenges and seek solutions in preparation for future public threats in the region. Your input will be invaluable in shaping our understanding and response.

This study received an exemption for review from the Japanese Circulation Society-Institutional Review Board. This survey should take **5 to 10 minutes to complete.**

Please read the following information about the study.

- Participation is voluntary.
- Responses will be anonymous and confidential.
- You can skip uncomfortable questions or withdraw at any time.
- Data will be stored securely and handled in accordance with regulations.
- Your decision to participate or decline will not impact your relationship with members of the APSC.

Please indicate your agreement to participate in the survey by selecting the appropriate box below:

- Agree to participate.
- Do not agree to participate.

1. What is your current age group?

- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65 or older

2. What is your sex assigned at birth?

- Male
- Female

Prefer not to say

3. How do you identify your gender?

- Man
- Woman
- Non-binary
- Transgender
- Prefer not to say

4. What is your race? (Select all that apply)

- East Asian: China, Japan, South Korea, North Korea, Taiwan, Mongolia
- South Asian: India, Pakistan, Bangladesh, Sri Lanka, Nepal, Maldives
- Southeast Asian: Indonesia, Thailand, Vietnam, Philippines, Malaysia, Singapore
- Central Asian: Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan
- West Asian: Afghanistan, Iran, Iraq, Saudi Arabia, United Arab Emirates, Turkey
- Mixed Asian heritage: Individuals with multiple Asian backgrounds or heritage
- Black or African American
- Native American or Alaska Native
- Native Hawaiian or other Pacific Islander
- White
- Other
- Prefer not to say

5. What is your ethnicity? (Select all that apply)

- Hispanic or Latino
- Not Hispanic or Latino
- Other
- Prefer not to say

6. Which country do you practice as a cardiologist? (Please select one country)

- Afghanistan
- Armenia
- Australia
- Azerbaijan
- Bahrain
- Bangladesh
- Bhutan
- Brunei
- Cambodia
- China
- Cyprus
- East Timor (Timor-Leste)
- Fiji
- Georgia
- Hong Kong (Special Administrative Region of China)
- India

- Indonesia
- Iran
- Iraq
- Israel
- Japan
- Jordan
- Kazakhstan
- Kiribati
- Kuwait
- Kyrgyzstan
- Laos
- Lebanon
- Macau (Special Administrative Region of China)
- Malaysia
- Maldives
- Marshall Islands
- Micronesia (Federated States of)
- Mongolia
- Myanmar (Burma)
- Nauru
- Nepal
- New Zealand
- North Korea (Democratic People's Republic of Korea)
- Oman
- Pakistan
- Palau
- Palestine
- Papua New Guinea
- Philippines
- Qatar
- Russia
- Saudi Arabia
- Samoa
- Singapore
- Solomon Islands
- South Korea (Republic of Korea)
- Sri Lanka
- Syria
- Taiwan
- Tajikistan
- Thailand
- Tonga
- Turkey
- Turkmenistan
- Tuvalu
- United Arab Emirates

- Uzbekistan
- Vanuatu
- Vietnam
- Yemen
- Prefer not to say

7. How many years have you been involved in cardiovascular care as a physician?

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 20 years or greater
- Prefer not to say

8. What are the top 3 areas in cardiology that best describes your practice?

- General Cardiology
- Primary Prevention
- Critical Care
- Cardiac Imaging
- Interventional Cardiology
- Structural Heart and Valve Interventional
- Cardiothoracic Surgery
- Electrophysiology
- Advanced Heart Failure/Transplant
- Paediatric/Adult Congenital Heart Disease
- Cardiac Rehabilitation
- Cardio-Oncology
- Sports Cardiology
- Other

9. On a typical week, how has the percentage of time spent on NON-cardiovascular care (e.g. Care for COVID patients without CV complications) changed before and after the pandemic started?

2019

- 0-25%
- 26-50%
- 51-75%
- 76-100%

2020

- 0-25%
- 26-50%
- 51-75%

- 76-100%

2021

- 0-25%
- 26-50%
- 51-75%
- 76-100%

2022

- 0-25%
- 26-50%
- 51-75%
- 76-100%

10. On a typical week, how has the percentage of time spent on research changed before and after the pandemic started?

2019

- 0-25%
- 26-50%
- 51-75%
- 76-100%

2020

- 0-25%
- 26-50%
- 51-75%
- 76-100%

2021

- 0-25%
- 26-50%
- 51-75%
- 76-100%

2022

- 0-25%
- 26-50%
- 51-75%
- 76-100%

11. [STORIES] How has the pandemic affected your personal life or career as a physician and researcher? What would you recommend yourself to do or not do if you were to face a similar public threat? Please share your stories or opinions.

Responses available as free text

12. How has the pandemic affected the number of patients presenting to your healthcare facility compared with pre-pandemic years?

2020

- Increased
- No change
- Decreased

2021

- Increased
- No change
- Decreased

2022

- Increased
- No change
- Decreased

13. How has the pandemic affected the number of patients presenting with Acute Myocardial Infarction (STEMI & NSTEMI) compared with pre-pandemic years?

2020

- Increased
- No change
- Decreased

2021

- Increased
- No change
- Decreased

2022

- Increased
- No change
- Decreased

14. How has the pandemic affected the number of patients undergoing Elective procedures (Elective PCI, TAVR, EP ablation, etc.) compared with pre-pandemic years?

2020

- Increased
- No change
- Decreased

2021

- Increased
- No change
- Decreased

2022

- Increased
- No change
- Decreased

15. How has the pandemic affected the number of patients presenting with Acute Heart Failure requiring hospitalization compared with pre-pandemic years?

2020

- Increased
- No change
- Decreased

2021

- Increased
- No change
- Decreased

2022

- Increased
- No change
- Decreased

16. Chest pain, palpitations, cardiac impairment, myocardial inflammation, and POTS (postural orthostatic tachycardia syndrome) have been recognized as cardiovascular manifestations of post-acute sequelae of SARS-CoV-2 infection (PASC) or Long COVID. Some governments and cardiology societies have begun funding research for these conditions.

a. How would you characterize your country's public awareness and demand for the condition? (Low/Intermediate/High)

- High
- Intermediate
- Low

b. How would you characterize your country's level of interest in research and funding for diagnosing and treating the conditions? (Low/Intermediate/High)

- High
- Intermediate
- Low

c. How would you characterize your own level of interest in research for diagnosing and treating the conditions? (Low/Intermediate/High)

- High
- Intermediate
- Low

17. Please provide any noteworthy peer-reviewed articles reporting the association between COVID-19 and cardiovascular care in your country. We would like to consider including them as references to our final publication.

Responses available as free text

Supplemental Table 3. Trends in perceived number of cardiovascular patients and procedures

	East Asia (N=10)	Southeast Asia (N=36)	South Asia (N=8)	Oceania/Other (N=6)	Overall (N=60)
<b>Overall, 2020</b>					
Increased	3 (30.0%)	3 (8.3%)	0 (0%)	1 (16.7%)	7 (11.7%)
No change	3 (30.0%)	7 (19.4%)	0 (0%)	1 (16.7%)	11 (18.3%)
Decreased	4 (40.0%)	26 (72.2%)	8 (100%)	4 (66.7%)	42 (70.0%)
<b>Overall, 2021</b>					
Increased	3 (30.0%)	9 (25.0%)	3 (37.5%)	1 (16.7%)	16 (26.7%)
No change	2 (20.0%)	8 (22.2%)	1 (12.5%)	4 (66.7%)	15 (25.0%)
Decreased	5 (50.0%)	19 (52.8%)	4 (50.0%)	1 (16.7%)	29 (48.3%)
<b>Overall, 2022</b>					
Increased	3 (30.0%)	19 (52.8%)	5 (62.5%)	4 (66.7%)	31 (51.7%)
No change	2 (20.0%)	11 (30.6%)	2 (25.0%)	1 (16.7%)	16 (26.7%)
Decreased	5 (50.0%)	6 (16.7%)	1 (12.5%)	1 (16.7%)	13 (21.7%)
<b>Overall, 2023</b>					

Increased	4 (40.0%)	25 (69.4%)	4 (50.0%)	3 (50.0%)	36 (60.0%)
No change	4 (40.0%)	11 (30.6%)	4 (50.0%)	2 (33.3%)	21 (35.0%)
Decreased	2 (20.0%)	0 (0%)	0 (0%)	1 (16.7%)	3 (5.0%)

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AMI patients, 2020

Increased	1 (10.0%)	2 (5.6%)	1 (12.5%)	0 (0%)	4 (6.7%)
No change	2 (20.0%)	11 (30.6%)	1 (12.5%)	3 (50.0%)	17 (28.3%)
Decreased	7 (70.0%)	23 (63.9%)	6 (75.0%)	3 (50.0%)	39 (65.0%)

AMI patients, 2021

Increased	1 (10.0%)	6 (16.7%)	1 (12.5%)	1 (16.7%)	9 (15.0%)
No change	2 (20.0%)	15 (41.7%)	3 (37.5%)	3 (50.0%)	23 (38.3%)
Decreased	7 (70.0%)	15 (41.7%)	4 (50.0%)	2 (33.3%)	28 (46.7%)

AMI patients, 2022

Increased	2 (20.0%)	13 (36.1%)	1 (12.5%)	2 (33.3%)	18 (30.0%)
No change	4 (40.0%)	18 (50.0%)	7 (87.5%)	4 (66.7%)	33 (55.0%)
Decreased	4 (40.0%)	5 (13.9%)	0 (0%)	0 (0%)	9 (15.0%)

AMI patients, 2023

Increased	3 (30.0%)	16 (44.4%)	4 (50.0%)	2 (33.3%)	25 (41.7%)
No change	5 (50.0%)	20 (55.6%)	4 (50.0%)	4 (66.7%)	33 (55.0%)
Decreased	2 (20.0%)	0 (0%)	0 (0%)	0 (0%)	2 (3.3%)

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Elective procedures, 2020

Increased	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
No change	2 (20.0%)	7 (19.4%)	1 (12.5%)	2 (33.3%)	12 (20.0%)
Decreased	8 (80.0%)	29 (80.6%)	7 (87.5%)	4 (66.7%)	48 (80.0%)

Elective procedures, 2021

Increased	0 (0%)	2 (5.6%)	1 (12.5%)	0 (0%)	3 (5.0%)
No change	2 (20.0%)	10 (27.8%)	1 (12.5%)	2 (33.3%)	15 (25.0%)
Decreased	8 (80.0%)	24 (66.7%)	6 (75.0%)	4 (66.7%)	42 (70.0%)

Elective procedures, 2022

Increased	0 (0%)	13 (36.1%)	1 (12.5%)	3 (50.0%)	17 (28.3%)
No change	3 (30.0%)	17 (47.2%)	6 (75.0%)	3 (50.0%)	29 (48.3%)
Decreased	7 (70.0%)	6 (16.7%)	1 (12.5%)	0 (0%)	14 (23.3%)

Elective procedures, 2023

Increased	1 (10.0%)	18 (50.0%)	3 (37.5%)	3 (50.0%)	25 (41.7%)
No change	6 (60.0%)	18 (50.0%)	5 (62.5%)	3 (50.0%)	32 (53.3%)
Decreased	3 (30.0%)	0 (0%)	0 (0%)	0 (0%)	3 (5.0%)
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AHF patients, 2020					
Increased	1 (10.0%)	2 (5.6%)	2 (25.0%)	1 (16.7%)	6 (10.0%)
No change	5 (50.0%)	11 (30.6%)	1 (12.5%)	2 (33.3%)	19 (31.7%)
Decreased	4 (40.0%)	23 (63.9%)	5 (62.5%)	3 (50.0%)	35 (58.3%)
AHF patients, 2021					
Increased	1 (10.0%)	6 (16.7%)	3 (37.5%)	2 (33.3%)	12 (20.0%)
No change	4 (40.0%)	18 (50.0%)	2 (25.0%)	1 (16.7%)	25 (41.7%)
Decreased	5 (50.0%)	12 (33.3%)	3 (37.5%)	3 (50.0%)	23 (38.3%)
AHF patients, 2022					
Increased	2 (20.0%)	13 (36.1%)	4 (50.0%)	2 (33.3%)	21 (35.0%)
No change	4 (40.0%)	19 (52.8%)	4 (50.0%)	4 (66.7%)	31 (51.7%)
Decreased	4 (40.0%)	4 (11.1%)	0 (0%)	0 (0%)	8 (13.3%)
AHF patients, 2023					

Increased	3 (30.0%)	15 (41.7%)	3 (37.5%)	1 (16.7%)	22 (36.7%)
No change	7 (70.0%)	21 (58.3%)	5 (62.5%)	5 (83.3%)	38 (63.3%)
Decreased	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

AMI, acute myocardial infarction; AHF, acute heart failure

Supplemental Table 4. Trends in percentage of time spent on non-cardiovascular care and cardiovascular research

	East Asia (N=10)	Southeast Asia (N=36)	South Asia (N=8)	Oceania/Other (N=6)	Overall (N=60)
<b>Non-CV care, 2019</b>					
0-25%	8 (80.0%)	32 (88.9%)	6 (75.0%)	2 (33.3%)	48 (80.0%)
26-50%	1 (10.0%)	3 (8.3%)	2 (25.0%)	3 (50.0%)	9 (15.0%)
51-75%	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
76-100%	1 (10.0%)	1 (2.8%)	0 (0%)	1 (16.7%)	3 (5.0%)
<b>Non-CV care, 2020</b>					
0-25%	6 (60.0%)	8 (22.2%)	1 (12.5%)	2 (33.3%)	17 (28.3%)
26-50%	1 (10.0%)	21 (58.3%)	4 (50.0%)	3 (50.0%)	29 (48.3%)
51-75%	3 (30.0%)	4 (11.1%)	2 (25.0%)	1 (16.7%)	10 (16.7%)
76-100%	0 (0%)	3 (8.3%)	1 (12.5%)	0 (0%)	4 (6.7%)
<b>Non-CV care, 2021</b>					
0-25%	6 (60.0%)	9 (25.0%)	3 (37.5%)	4 (66.7%)	22 (36.7%)
26-50%	2 (20.0%)	19 (52.8%)	2 (25.0%)	1 (16.7%)	24 (40.0%)

51-75%	2 (20.0%)	7 (19.4%)	1 (12.5%)	1 (16.7%)	11 (18.3%)
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76-100%	0 (0%)	1 (2.8%)	2 (25.0%)	0 (0%)	3 (5.0%)
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Non-CV care, 2022

0-25%	6 (60.0%)	21 (58.3%)	5 (62.5%)	4 (66.7%)	36 (60.0%)
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26-50%	2 (20.0%)	13 (36.1%)	2 (25.0%)	0 (0%)	17 (28.3%)
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51-75%	2 (20.0%)	1 (2.8%)	1 (12.5%)	1 (16.7%)	5 (8.3%)
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76-100%	0 (0%)	1 (2.8%)	0 (0%)	1 (16.7%)	2 (3.3%)
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The percentage of non-CV

patients care in 2023

0-25%	8 (80.0%)	34 (94.4%)	8 (100%)	4 (66.7%)	54 (90.0%)
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26-50%	1 (10.0%)	1 (2.8%)	0 (0%)	0 (0%)	2 (3.3%)
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76-100%	1 (10.0%)	1 (2.8%)	0 (0%)	1 (16.7%)	3 (5.0%)
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51-75%	0 (0%)	0 (0%)	0 (0%)	1 (16.7%)	1 (1.7%)
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The percentage of research

efforts in2019

0-25%	6 (60.0%)	24 (66.7%)	2 (25.0%)	4 (66.7%)	36 (60.0%)
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26-50%	3 (30.0%)	11 (30.6%)	5 (62.5%)	2 (33.3%)	21 (35.0%)
76-100%	1 (10.0%)	0 (0%)	0 (0%)	0 (0%)	1 (1.7%)
51-75%	0 (0%)	1 (2.8%)	1 (12.5%)	0 (0%)	2 (3.3%)

The percentage of research efforts in 2020

0-25%	6 (60.0%)	23 (63.9%)	2 (25.0%)	3 (50.0%)	34 (56.7%)
26-50%	2 (20.0%)	10 (27.8%)	3 (37.5%)	2 (33.3%)	17 (28.3%)
51-75%	2 (20.0%)	2 (5.6%)	3 (37.5%)	1 (16.7%)	8 (13.3%)
76-100%	0 (0%)	1 (2.8%)	0 (0%)	0 (0%)	1 (1.7%)

The percentage of research efforts in2021

0-25%	5 (50.0%)	23 (63.9%)	3 (37.5%)	4 (66.7%)	35 (58.3%)
26-50%	3 (30.0%)	9 (25.0%)	3 (37.5%)	2 (33.3%)	17 (28.3%)
51-75%	2 (20.0%)	4 (11.1%)	2 (25.0%)	0 (0%)	8 (13.3%)

The percentage of research efforts in2022

0-25%	5 (50.0%)	20 (55.6%)	4 (50.0%)	4 (66.7%)	33 (55.0%)
26-50%	4 (40.0%)	12 (33.3%)	3 (37.5%)	1 (16.7%)	20 (33.3%)
51-75%	1 (10.0%)	4 (11.1%)	1 (12.5%)	1 (16.7%)	7 (11.7%)

The percentage of research  
efforts in2023

0-25%	6 (60.0%)	22 (61.1%)	4 (50.0%)	3 (50.0%)	35 (58.3%)
26-50%	3 (30.0%)	10 (27.8%)	4 (50.0%)	2 (33.3%)	19 (31.7%)
76-100%	1 (10.0%)	0 (0%)	0 (0%)	0 (0%)	1 (1.7%)
51-75%	0 (0%)	4 (11.1%)	0 (0%)	1 (16.7%)	5 (8.3%)

Supplement Table 5. Individual free text responses to Question 11

Response to “How has the pandemic affected your personal life or career as a physician and researcher? What would you recommend yourself to do or not do if you were to face a similar public threat? Please share your stories or opinions.”

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- Affected training - number of angiograms / PCI / echo performed.
- Time spent of cardiology caring for COVID patients.
- Ability to conduct research greatly affected as follow-ups were suspended.
- Continue to set aside time for research
- I want to arm myself with the information I need and spend quality time with my loved ones and friends. Make use of the free time to teach myself a new skill.
- I had to go to overseas training during the pandemic and couldn't see me family for a whole year due to travel restrictions.
- The main change is change in communication to online.
- Yes both affected during the COVID time
- More time for self and family and also besides medicine time for reading books hiking friends
- It allowed to put things in perspective, how to utilize resources, how to coordinate with the whole team in synchronizing care
- Made me more anxious in going out without mask
- More cooped up at home being unable to travel
- Identify the need ASAP and tackle the need by research or medical device development.
- More work and less family time
- Wearing mask is a mandatory until now
- Personally I felt COVID 19 pandemic hold back my personal development as a cardiologist / interventionist by 2-3 years (lack of training opportunity, limited number of patients & procedures). On the positive side, my kids got to spend a good amount of times with their parents during the pandemic.
- Less family life.
- More work attachment.
- The pandemic affected much to my surgical experience because of reduction of elective surgical cases.
- During lockdown, our practice schedule in the hospital had been reduced. Number of patients dropped in 2019-2020, then climbed up in 2021
- The pandemic changed the way we now do things with more emphasis on hygiene now than in the past.
- Reduced number of cases
- I have realised not to take infectious disease for granted. What you can see can kill. I have more respect for the personal protection protocols.

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- We were living in fear, separated from family and working in frustrating condition.
  - Cherish my family
  - Overall a lot of healthcare resources were used in 2020 for the treatment of COVID19, and much of it was misdirected/unnecessary wastage. Would have been good if the institutions had been more efficient in the utilisation of the resources.
  - An education to take care of the health of myself and family. Also, the effort to do research focusing on management of CV health during pandemic. We published six review articles regarding the CV complications of COVID.
  - Need to overcome the fear factor and deal with such challenges taking proper precautions, because lots of lives can be saved if proper care can be given in time
  - Not affected much
  - The positive side of the pandemic was it made me a fully independent surgeon. This way the hospital's management saw my capability without requiring a more senior surgeon's help in my clinical and surgical practice. As a result, I had an advanced promotion as a consultant less than 2 years into my practice.
  - COVID discouraged research and encouraged clinical skills.
  - Increased workload and stress; Adaptation to telemedicine; Collaboration and knowledge sharing;
  - Nothing to be specific
  - Cherish your family
  - More organised infrastructure within hospital and healthcare systems in preparation for another pandemic
  - There would be not much I would change.
  - Adversity brought about by the pandemic was transformed into opportunity for invocation in research and resilience in training.
  - still continue Public attendance during the pandemic, even the frequency significantly reduced
  - I should follow instruction from government and health specialists. I shouldn't be pessimistic