



**Asia-Pacific  
Economic Cooperation**

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# **Project Report of Integrative Medicine (IM) and COVID-19 Care**

**APEC Health Working Group**

July 2023





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APEC Project: HWG 13 2021A

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APEC#223-HT-04.3

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## Executive Summary

As of March 2023, more than 758 million people worldwide have been infected with severe acute respiratory syndrome–related coronavirus (SARS-CoV-2), the virus that causes coronavirus disease 2019 (COVID-19). While conventional medicine has various evidence-based interventions to prevent and manage symptoms associated with COVID-19 including vaccines, antibodies and antiviral medications, many patients still experienced poor outcomes. In fact, the World Health Organization (WHO) reports that almost 7 million people worldwide have died as a result of COVID-19 infection (1). For those who survive, many suffer from the long-term ramifications of COVID-19 infection termed post-acute sequelae of COVID-19 (PASC), otherwise known as long COVID. PASC is a condition characterized by the “continuation of COVID-19 symptoms – or the emergence of new ones – after recovery from acute (or the initial phase of illness of) COVID-19” (2).

Therefore, complementary and alternative approaches delivered by Integrative Medicine (IM) such as nutrition, dietary supplementation, herbal medicine, acupuncture/acupressure, exercise, and stress resilience therapy may offer alternative, or additive, or complementary benefit alongside conventional interventions for preventing or managing COVID-19 symptoms and PASC. Emerging evidence demonstrates that such approaches may enhance the immune system, adjusting other systems such as neuroglial, respiratory, digestive and motion, offering protection and healing for patients both physically and mentally.

Several Asia-Pacific Economic Cooperation (APEC) economies have adopted IM strategies rooted in their respective cultures and traditions to combat COVID-19 including Traditional Chinese Medicine (TCM), Traditional Thai Medicine (TTM), herbal medicine, nutrition and lifestyle, acupuncture/acupressure, yoga, Tai-Chi, qigong, sonotherapy and aromatherapy. Such strategies have demonstrated benefits in the prevention, management, and rehabilitation of COVID-19 patients in these economies.

Global collaborations around IM interventions targeting COVID-19 can be invaluable to APEC economies, and support efforts related to controlling and combating the COVID-19 pandemic. Sharing and utilizing big data for policy making, healthcare strategies and ensuring the safety and security of caregivers are also paramount. In addition, policy-making considerations, such as healthcare reimbursement by insurance, helping indigenous people on COVID-19 prevention and treatment are also necessary for promoting a wider implementation of such strategies for COVID-19 care.

However, basic mechanistic studies as well as rigorous, high-quality clinical trials are needed to demonstrate the efficacy and safety of IM interventions for COVID-19 care alongside conventional care. Historically, collaborations with conventional medicine have been sparse and weak. To promote collaboration around IM for COVID-19 care, APEC economies need to foster open dialogue and establish platforms for discussion about conventional, and IM strategies for COVID-19 care for the exchange of valuable learnings and scientific discoveries.

To this end, this report summarizes efforts from a first-of-its-kind, three-part project focused on IM for COVID-19 care: 1) A survey focused on science-based IM for COVID-19 care, 2) A Workshop to host various APEC economies to share and discuss efforts around the adoption and implementation of IM approaches for COVID-19 care, and 3) The development of Recommendations and Guidelines of IM for COVID-19 care.

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## Acronyms

ACE2	Angiotensin Converting Enzyme 2
APEC	Asia-Pacific Economic Cooperation
ASF	APEC Support Fund
CCER	Cooperation on Combating COVID-19 and Economic Recovery
CECC	Central Epidemic Command Center
CAM	Complementary and Alternative Medicine
CIM	Complementary and Integrative Medicine
COPD	Chronic Obstructive Pulmonary Disease
COVID-19	Coronavirus Disease 2019
CPG	Clinical Practice Guidelines
DTAM	Department of Thai Traditional and Alternative Medicine
EGCG	Epigallocatechin Gallate
EUA	Emergency Use of Authorization
FDA	Food and Drug Administration
FM	Functional Medicine
GMP	Good Manufacturing Practice
GSH	Glutathione
HLA	Human Leukocyte Antigen
HWG	Health Working Group
IFM	The Institute for Functional Medicine
IM	Integrative Medicine
IND	Investigational New Drug
KIOM	Korean Institute of Oriental Medicine
KM	Korean Medicine
LCS	Long-COVID Syndrome
MM	Mild-To-Moderate
MOH	Ministry of Health
NAC	N-Acetyl-Cysteine
NCI	National Cancer Institute
NHRI	National Health Research Institute
NHSO	National Health Security Office
NIH	National Institutes of Health
NLEM	National List of Essential Medicines of Thailand
NRICM	National Research Institute of Chinese Medicine
NUSM	National University of San Marcos
OCED	The Organization for Economic Co-Operation and Development
OTC	Over-The-Counter
PAHO	Pan American Health Organization
PASC	Post-Acute Sequelae of COVID-19
SARS-CoV-2	Severe Acute Respiratory Syndrome-Related Coronavirus-2
SMA	Shared Medical Appointment
SNP	Single Nucleotide Polymorphisms
STPA	Symptom-Titrated Physical Activity

T&CM	Traditional & Complementary Medicine
TCM	Traditional Chinese Medicine
THM	Traditional Herbal Medicine
TM	Traditional Medicine or Traditional Medicinal
TAM	Thai Traditional and Alternative Medicine
TTM	Thai Traditional Medicine
WHO	World Health Organization

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## Introduction

The end of 2019 brought forth the emergence of SARS-CoV-2, a novel coronavirus that triggered an outbreak of viral pneumonia (3). SARS-CoV-2, a highly transmissible virus, quickly resulted in the development of COVID-19 across the world and became a significant threat to global public health (4, 5). As of March 2023, more than 758 million people worldwide have been infected with SARS-CoV-2 and almost 7 million have died as a result of infection (1). Based on a WHO analysis, the Western Pacific, Americas, and South-East Asia regions made up by most APEC economies, are responsible for almost 60% of all COVID-19 cases and 60% of COVID-19-related deaths despite having the highest rates of vaccination and boosting (Table 1).

**Table 1. COVID-19 Statistics by WHO Region (as of March 2023)**

WHO Region	Cases-Cumulative Total	Deaths-Cumulative Total	Total Vaccine Doses Administered Per 100 Population	Persons Boosted Per 100 Population
<b>Global</b>	<b>758,390,564</b>	<b>6,859,093</b>	<b>169.72</b>	<b>65.1</b>
Europe	273,261,618	2,193,638	183.17	64.51
Western Pacific	201,263,891	405,481	237.12	84.95
Americas	190,340,817	2,931,281	205.31	70.93
South-East Asia	60,767,139	803,851	163.95	68.46
Eastern Mediterranean	23,258,662	349,534	120.03	50.02
Africa	9,497,673	175,295	50.82	29.26

Modified from the table presented by the WHO (1).

In general, cases of COVID-19 can be stratified into asymptomatic, mild to moderate (M to M; e.g. fever, fatigue, dry cough, headache, sore throat, diarrhea, chest pain, anosmia, ageusia), severe (e.g. dyspnea, co-existing illnesses) and critical/deceased (e.g. acute respiratory distress syndrome, acute cardiac injury, multi-organ failure) (3, 6). The incubation period for COVID-19 is approximately 5 days, and infected individuals are typically asymptomatic. Following symptom onset, M to M and severe disease can manifest approximately 8 days later and death can occur approximately 16 days after infection (3).

While all populations and age groups are susceptible to COVID-19, the disease manifests differently based on age and comorbidities. In terms of age, those less than 50 years are more likely to experience asymptomatic or M to M disease while those 60 years and older are more likely to experience severe disease with those older than 68 years of age at highest risk of mortality (3). Individuals with comorbidities such as heart disease, type 2 diabetes, obesity, asthma, and COPD are also predisposed to COVID-19 severity, hospitalization, and adverse outcomes (6, 7, 8). This is especially problematic as it is estimated that 1.7

billion people globally (or 22% of the population) has at least one comorbidity placing them at increased risk of COVID-19 severity and adverse outcomes (9).

Transmission of SARS-CoV-2 can occur by dispersion of liquid droplets (10), aerosolized particles (11, 12), or physical contact (12) especially through ocular surfaces (13). Several public health interventions have been instituted worldwide to mitigate SARS-CoV-2 transmission or reduce symptoms or severity of COVID-19 including masking (e.g., medical/surgical or N95/P2), hand hygiene (e.g., washing or sanitizer), social distancing and vaccinations. The evidence for masking is mixed in terms of its ability to slow the transmission of respiratory viruses such as COVID-19; however, hand hygiene is beneficial (14, 15). Conversely, vaccinations for COVID-19 are likely the most effective at reducing the proportion of individuals with symptomatic COVID-19 as well as disease severity (16).

While many individuals infected with SARS-CoV-2 make a full recovery, approximately 7% develop persisting symptoms commonly referred to as post-acute sequelae of COVID-19 (PASC) or Long COVID (3, 17, 18) which is not a unique phenomenon for viruses (19, 20). PASC typically occurs 4 or more weeks following infection and may be attributed to the virus, a non-resolved host inflammatory response and/or non-specific effects of critical illness, none of which are mutually exclusive (3, 17). Individuals with PASC experience a wide variety of symptoms including fatigue, brain fog, headaches, memory issues, insomnia, muscle aches, dyspnea, joint pain, tachycardia and sleep disorders (17, 21). However, fatigue is the most common symptom affecting more than 75% of individuals following infection (17, 21).

Because of the severity of COVID-19 is linked to common nutrition and lifestyle-driven comorbidities and the wide array of symptoms in COVID-19 and PASC likely require multimodal therapeutic interventions, complementary and alternative approaches as adjuncts to conventional care strategies may be valuable for addressing COVID-19 and PASC (22).

Integrative medicine (IM) offers complementary and alternative approaches to conventional care strategies for various chronic diseases. As the name suggests, IM merges “conventional and complementary approaches together in a coordinated way” (23). An important tenant of IM is that it incorporates multimodal interventions (i.e. medication, psychotherapy) and complementary and alternative approaches (e.g. Acupuncture, yoga, supplementation) to treat the whole person (23). Functional medicine (FM) is a similar, yet distinct, field of medicine that looks upstream of a patient’s signs, symptoms and diagnosis and considers the complex web of interactions within a patient’s history, physiology, genetics, lifestyle and environment that contribute to their physical and mental functional status (24).

Multimodal interventions commonly utilized by IM and/or FM practitioners have demonstrated ability to prevent or manage common comorbidities attributed to the severity of COVID-19 including cardiovascular disease (25), asthma and COPD (26), type 2 diabetes (27, 28) and autoimmunity (29, 30, 31). In addition, IM and FM approaches have demonstrated the ability to manage symptoms commonly associated with PASC including fatigue (32, 33), insomnia (34), pain (35, 36), headache/migraine (37, 38, 39) and cognitive/memory issues (38, 40). Therefore, IM and FM interventions may have broad applications for the prevention and/or management of COVID-19 and PASC as adjuncts to conventional interventions. However, awareness, acceptance and application of such interventions and the ability to integrate them into conventional healthcare settings may vary by APEC economies.

## Project Proposal

COVID-19 remains an unprecedented global health crisis that presents many unique challenges warranting innovative healthcare solutions. IM is one solution that incorporates evidence-based, multimodal interventions to treat the whole person. Using these treatments, IM may provide therapeutic benefits for preventing and/or managing COVID-19 and PASC and could benefit both developed and developing economies.

### Project Objective

Therefore, a project proposal was submitted to the APEC in May 2021 by the sponsoring economy of the United States, and co-sponsored by the APEC economies of Indonesia, Chinese Taipei, and Thailand **to promote high quality, science-based, effective, and feasible IM applications and integrations with conventional medicine for COVID-19 care in the current pandemic situation.**

This will be achieved through the:

- Exchange of science-based information relating to IM for COVID-19 care;
- Creation of collaborative opportunities for projects among APEC economies on IM for COVID-19 care; and
- Promotion and implementation of action plans for APEC economies related to IM for COVID-19 care.

This project is a first-of-its-kind in the area of IM and COVID-19 care and will benefit COVID-19 patients and healthcare institutions in participating APEC economies.

### Participating APEC Economies and Funding

The project is proposed and sponsored by the economy of the United States. Co-sponsoring economies include Indonesia, Chinese Taipei, and Thailand. The project is funded by the APEC Support Fund (ASF) APEC Cooperation on Combating COVID-19 and Economic Recovery (CCER).

In total, 13 APEC economies participated in the project including:

- Canada
- Chile
- Indonesia<sup>†</sup>
- Japan
- Republic of Korea
- Malaysia
- Mexico
- Peru
- The Philippines
- Chinese Taipei<sup>†</sup>
- Thailand<sup>†</sup>
- United States\*
- Viet Nam

\* Primary sponsoring economy

<sup>†</sup> Co-Sponsoring economy

### Project Outputs

The project has two main outputs including: 1) Holding a virtual APEC IM and COVID-19 Care Workshop, and 2) Establish Recommendations and Guidelines on IM and COVID-19 Care for all APEC economies

and healthcare communities. Various activities related to these outputs are outlined in Table 2 and can be stratified into pre-Workshop activities, Workshop activities and post-Workshop activities.

**Table 2. IM and COVID-19 Care Project Outputs**

<b>Project Activity</b>	<b>Goal</b>
<b>Pre-Workshop Activities</b>	
Survey	<ul style="list-style-type: none"> <li>• Conduct basic research using an online/in-person survey of the member economies and other COVID-19 care communities to find and select best practice examples and develop preliminary main areas of Recommendations and Guidelines on IM for COVID-19 care.</li> </ul>
Workshop Agenda	<ul style="list-style-type: none"> <li>• Develop an agenda with assigned speakers and hosts.</li> </ul>
Project Website	<ul style="list-style-type: none"> <li>• Organize public-facing information related to the project for posting on the website.</li> </ul>
<b>Workshop</b>	<ul style="list-style-type: none"> <li>• Hold a virtual, 3-day Workshop open to all APEC economies and interested healthcare communities to: <ul style="list-style-type: none"> <li>- Gather expertise from research, clinical care, prevention, and policy making on IM care for COVID-19;</li> <li>- Provide a forum for the exchange of knowledge and experiences; and</li> <li>- Guide discussion around evidence-based strategies and policies related to IM for COVID-19 care.</li> </ul> </li> </ul>
<b>Post-Workshop Activities</b>	
Feedback and Suggestions	<ul style="list-style-type: none"> <li>• Gather Workshop feedback and suggestions for improvement by way of an online survey</li> </ul>
Recommendations and Guidelines for IM and COVID-19 Care	<ul style="list-style-type: none"> <li>• Collate Workshop outputs into Recommendations and Guidelines for IM and COVID-19 care and publish final product</li> </ul>
Project Report	<ul style="list-style-type: none"> <li>• Summarize the objective of the project, alignment with APEC priorities, target audiences, pre-Workshop activities, Workshop activities, post-Workshop activities, project feedback and suggestions as well as all relevant outputs.</li> </ul>

The outputs of the project will have long-term positive effects for APEC economies on healthcare, which not only for the current care on COVID-19, but also for other infectious diseases and non-communicable diseases. It will also promote Good Practice (manufacture or clinical) for APEC economies in healthcare fields.

### **Project Outcomes**

The outcome indicators of this project include:

1. A Workshop on IM and COVID-19 care for APEC members to bring expertise in the areas of research, practice, clinical trials, population science and health care policy for exchanging and promoting effective ways on IM for COVID-19 care and other diseases;
2. Evidence-based effective IM care procedures, products, methods, tools, systems, and policies on COVID-19 care will be reviewed and distributed among APEC members and healthcare communities; and
3. Valuable project information including Workshop presentations and discussions, Recommendations and Guidelines on IM for COVID-19 care will be submitted to the APEC and published.

A Project Report will capture project outcomes including key learnings from all aspects of the project that support future action and capacity building in the region. The Project Report will also summarize Recommendations and Guideline (R&G) of IM on COVID-19 care as well as key research findings and takeaways from the Workshop. All outcomes will be available to APEC members and healthcare communities.

### **Beneficiaries**

Invitations to participate in project activities will be extended to members of the APEC Health Working Group (HWG), Life Sciences Innovation Forum, other APEC fora with COVID-19 projects including the WHO, the Federal Drug Administration (FDA), and organizations and experts in IM and COVID-19 care from APEC economies.

Primary beneficiaries include participants from the APEC Forum. Secondary beneficiaries are those that may not attend the event but may benefit from the project outputs. Potential beneficiaries include:

- 1) Senior level IM and COVID-19 care researchers, practitioners, educators among APEC economies. By attending the Project Workshop, the evidence based effective tools, products, procedures, and systems of IM on COVID-19 care could enhance and promote the knowledge obtaining for these people. The IM on COVID-19 care information will make Workshop participants learn the most frontier means in the area and could be used for future applications.
- 2) Health care policy makers/analysts of APEC economies especially for those government and Medicare officials who are involved in the policy and strategy setting of this pandemic control, prevention, and COVID-19 patient treatment. In addition, medical professionals with skillsets and experiences directly on patients' treatment. The effective and workable healthcare policy of IM on COVID-19 care could be used or adopted (selectively) for each APEC economy based upon their own system structure and feasibility.

- 3) Providers and developers of IM systems, procedures, and products (on efficacy, quality control and standardization), especially those senior and leaders who are directly involved in the medical service and products, and care procedure applications during this pandemic. They could be from institutional or private sectors with the qualification of COVID-19 care experience or involved in related medical products and service protocol development. The comprehensive IM on COVID-19 care information will allow care providers and developers to gain new and innovative concepts, clinically tangible examples for their future research, practice, and products development.
- 4) Eventually this project will benefit COVID-19 patients, promote better healthcare delivery, and economic recovery and development for APEC economies. When more COVID-19 patients including those with long haul symptoms are cared for by evidence based effective IM, their cure quality levels and conditions could be improved. COVID-19 pandemic affected APEC economies could be benefited from this project to have more patients recovered quickly and effectively. With IM care professional's instruction, even for uninfected normal population, this project could provide better COVID-19 prevention means and self-care procedures for person's health status.

### **Dissemination**

Several channels are being used to disseminate important work completed as part of this project. Information about the project is being housed on the APEC website under the project database, the project website (<http://integrativemed-study.net>) and disseminated to participants through email. The Project Report which includes all the key points of presentations and discussions from the Workshop will be published on the official APEC website and in a high-impact journal following review and approval from the APEC Secretariat. The Recommendations and Guidelines (R&G) of IM on COVID-19 Care will be published as an e-version and available to all APEC economies.

### **APEC Alignment**

This project matches the 2020 APEC theme on “Optimizing Human Potential towards a Future of Shared Prosperity”. The project also fits with the APEC priorities on the goals of Health Asia and Pacific 2020 on the following areas of 1) improving health emergency preparedness, surveillance, response and recovery systems for public health events and disasters in the APEC regions; 2) to encourage health research and support health innovation and to promote their translation into practice. Integrative medicine (IM) could strengthen health systems to support universal health coverage (41).

This project is also closely related to the APEC HWG on the Statement on COVID-19 (23 March 2020) ‘to reaffirm the central importance of collaboration at all levels to combat this infectious disease and commit to working together to bring this epidemic under control as fast as possible’(42). This project is consistent with the goal of APEC member economies to reach sustainable growth and equitable development of healthcare in the Asia-Pacific region, to improve the economic and social well-being of the people, to have cost-effectiveness from valuable outcomes of the project, and to work collaboratively with other APEC projects related to COVID-19 (43).

This project will bring APEC economies together to review available evidence-based research and practices for healthcare policies, regulations and standards on COVID-19 care. This project is in accordance with the concept and emphasis on APEC's capacity building on innovation which brings proven best health practices and implementations, new approaches to solving the current challenges from COVID-19 pandemic.

Compared to conventional medicine, many IM procedures have the characteristics of low cost, relatively easy access, and practice. This aspect fits well with the APEC concept on cost-effectiveness to bring the benefit to APEC economies especially for those developing economies. Since COVID-19 pandemic affects all human beings, to find comprehensive and effective ways to lessen the impacts is very urgent and important. This project involved both genders, different ethnicities, ages, sexual orientation, and disabilities. It brought beneficiaries from the above fields from all APEC economies.

The project is in compliance with the eligibility criteria of APEC Support Fund (APEC Cooperation on Combating COVID-19 and Economic Recovery) to address and manage the economic impacts of COVID-19; to strengthen public health system and capacity building; to expedite economic recovery, build resiliency against future large-scale economic disruptions; and to facilitate APEC economies to better adapt to available comprehensive tools to boost economic recovery and growth. In addition, the project will bring capacity building activities that promote better healthcare and economic growth in remote areas among APEC economies.

## **Pre-Workshop Activities**

Pre-Workshop activities were conducted to find and select the most effective IM practice examples, strategies and develop preliminary main frames for Recommendations and Guidelines (R&G) on IM for COVID-19 care.

### **Survey**

To gather perceptions and early indicators for benefits related to IM management of COVID-19, a survey was developed by experts from various APEC economies and distributed to 11 participated medical and health policy professionals from various APEC economies. The survey domains included knowledge around COVID-19 infection, strategies for COVID-19 prevention, views on effectiveness of IM interventions or protocols on COVID-19, and challenges related to IM management of COVID-19. A literature review was also performed to support the identification of appropriate domains.

Specific survey items are listed below along with collated participant responses:

#### **1) What are your views on the severeness of COVID-19?**

Since the onset of the COVID-19 pandemic in late 2019, 6.52 million people worldwide have lost their lives to COVID-19. The severeness of COVID-19 has been categorized into five levels:

1. Mild, asymptomatic or coughingly only;
2. Moderate I, with pneumonia and/or short of breath, but not requiring supplementary oxygen;
3. Moderate II, requiring supplementary oxygen;
4. Severe, with respiratory failure, requiring ventilation or ICU care; and

5. Long COVID, or Post-acute Sequelae of COVID-19 (PASC), with chronic or delayed symptoms experienced 4-12 weeks after COVID-19 diagnosis.

The majority of people who are infected with SARS-CoV-2 experience mild to moderate (M to M) symptoms. People with underlying conditions (such as diabetes, heart disease, hypertension, cancer, immunosuppression, diabetes, chronic obstructive pulmonary disease (COPD), pregnancy woman, and the elderly are more susceptible to develop severe COVID-19.

**2) What are views on the paths of SARS-CoV-2 infection?**

There are three paths for the contraction of SARS-CoV-2 viruses:

1. Droplets expelled from the upper respiratory tract (coughing, sneezing, spitting, runny nose, etc.),
2. Physical contact of infected persons and/or surfaces,
3. Aerosol in exhaled air (airborne infection)

Incubation period is usually 1-14 days after exposure. Most people start to experience the onset of symptoms in 5 days. Infectivity is strongest 2 days before and a few days after the onset of symptoms.

**3) Do you have any other suggestions on COVID-19 preventive measures?**

To prevent and mitigate the spreading of SARS-CoV-2, economies and regions implemented different measures to cut the aforementioned paths of spreading. The primary strategies are:

1. Vaccination and boosters
2. Wearing face masks and eye shields, face shields, or goggles
3. Social distancing (6 feet or more for indoor gatherings)
4. Hand sanitization
5. Telemedicine for patient care to reduce crowding in hospitals and clinics and prevent nosocomial infection. Doctor visits are changed to remote visits when possible.
6. Caring for COVID-19 patients separately in healthcare settings. Establish outpatient clinic for patients with fever to care for potential COVID-19 patients separately. If spatial separation is not feasible, consider temporal separation.
7. Adequate ventilation
8. Border control
9. Quarantine

As an example, in Chinese Taipei, mitigation measures such as border control, masking, social distancing, and the setup of outdoor clinics helped control the disease without lockdown in the initial wave of COVID19, before vaccines became available.

**4) What are your views on IM for COVID-19 care? What are other methods you can suggest?**

As the pharmaceutical industry work around the clock to search for treatments for COVID-19, some methods have been deployed in hospitals and clinics to counter the COVID-19 symptoms and control the progress of the disease.

These treatments include:

**1. Antiviral agents and drugs**

Most of these agents are still under development. For example, favipiravir (44), tocilizumab (45), ciclesonide (46), nafamostat (47), sarilumab (48), nelfinavir (49), and ivermectin (50) are not approved in Japan for treatment of COVID-19 but are sometimes used off-label or in clinical trials.

**2. Convalescent plasma antibody**

Convalescent plasma donated by people who recover from COVID-19 is used in investigator-sponsored or industry-sponsored clinical trials in Japan. Adequate and well-controlled randomized trials remain necessary to determine its efficacy (51).

**3. Steroids**

Dexamethasone was among the first drugs approved for treating COVID-19 (52, 53). The alternatives include prednisolone and methylprednisolone. It is noteworthy that steroids can reduce mortality in those receiving supplemental oxygen, but not in those receiving no respiratory support (53).

**4. Ventilation management**

Ventilation is used in intensive care for severely ill COVID-19 patients (54).

Lifestyle changes are also among the strategies that can help people better cope with COVID-19 infections. Convalescence of COVID-19 usually takes longer than the initial virus infection. Conventional medicine has been largely (and appropriately so) directed on life-saving efforts for patients with severe COVID-19. However, most people infected with SARS-CoV-2 have M to M symptoms. People who experienced sequelae from M to M COVID-19 have few conventional therapeutic approaches to support their recovery, and the convalescence from M to M infections has been overlooked for some time.

Integrative medicine (IM) is at the forefront of supporting convalescence from M to M COVID-19. IM is a larger paradigm that includes conventional treatments and preventions such as medication and vaccination. A holistic approach involving all aspects of lifestyle, integrative medicine integrates a multitude of strategies to optimize the healing and wellbeing of M to M COVID-19 patients. Potential utilities include healthy and anti-inflammatory diet, dietary supplements (such as Vitamin D, glutathione, melatonin, Cordyceps, Astragalus and garlic), osteopathic manipulation (55), qigong, breathing exercise, aerobic exercise, and stress reduction.

Below are some of the most common strategies for IM:

Nutrition	Tai-chi (tai-ji)
Dietary supplements	Yoga
Herbs or herbal medicine	Meditation
Physical therapy	Exercises
Acupuncture/Acupressure	Sleep
Moxibustion	Psychotherapy
Qigong	

Except for conventional approaches such as vaccination, most IM recommendations are interventions that patients can do for themselves with instructions from doctors/practitioners/instructors, so it empowers patients to aid their own recovery. This enhances individual control of chronic conditions and may lower the cost of care.

For example, nutrition can be modified by patients to potentially manage the body's response to COVID-19. A low-sugar, low-fat diet can modulate inflammatory responses in general. An anti-inflammatory diet is high in vegetables, fruit, legumes, fish, lean protein, whole grains, nuts, and seeds, but low in refined grains and processed foods. It also emphasizes the use of certain herbs and spices that are known to be antioxidants. Anti-inflammatory diets have been proven effective for improved lung function, mood, and cognition in certain studies (56).

Transient nutrition depletion, especially of proteins, Vitamins B and D, copper, zinc, and iron, is likely to happen to COVID-19 patients. Proper dietary support during recovery can help with nutrient repletion.

Dietary intake of meat, poultry, fish, eggs, dairy, legumes, nuts, and seeds help supply amino acids needed for protein synthesis, cell activities, and immune modulation. In addition, fruit and vegetables are rich in vitamins, minerals, antioxidants, and anti-inflammatory phytochemicals, thus improving respiratory function. Dietary supplements containing vitamins and/or minerals can complement the intake from foods to support recovery.

- 5) What are your views and comments on herbs and herbal medicine for COVID-19 care?**  
Some herbs have immunity-boosting, antiviral, and anti-inflammatory properties. Such herbs and dishes comprising the herbal ingredients have been used in Thailand to boost the immune system and cope with COVID-19 pandemic.

Thai traditional herbal medicine has been used as core drug or complement drug for patients with Long COVID symptoms.

For mild or asymptomatic COVID-19 patients in Thailand, *Andrographis Paniculata* extract, or powdered doses have been used. However, it is not recommended for prevention of COVID-19, and it should not be used with antiviral drugs, such as remdesivir and molnupiravir, due to drug-drug interactions.

**6) What are your comments on stress management for COVID-19 care?**

About 31-69% of COVID-19 patients continue to experience symptoms one month after the acute illness. They complain of cardiac, pulmonary, neurological, autonomic, gastrointestinal, autoimmune problems and others. The chronic COVID-19 syndrome is known as Long COVID or PASC. The prevalence of PASC highlights the urgent need for supporting these patients.

Studies have suggested that PASC is likely to be a result of inflammation process that rarely, fully resolve (17). Chronic diseases are commonly caused by chronic inflammation and are lifestyle-driven.

Lifestyle interventions effective in other chronic disease management can also support the recovery of COVID-19 patients. Lifestyle intervention focuses on nutrition, stress management, sleep, and exercise.

Tai-chi, qigong, yoga, meditation, and physical exercises can effectively reduce stress level and improve the quality of sleep. Group support, peer-to-peer support, and psychotherapy can boost mental and emotional wellbeing and alleviate depression.

**7) What are your views and comments on the challenges of IM and FM for COVID-19 care?**

FM was established for addressing complex chronic conditions with multiple underlying causes. It is patient-centered (vs. disease-centered) and function-focused (vs. pathology focused). FM uses a systems biology approach and defines health as a positive vitality (not just the absence of diseases). It utilizes patients' genetic, biochemical, and lifestyle factors to direct personalized treatment.

Genetic information can help identify high-risk individuals for severe COVID-19 symptoms and inform personalized care. For example, single nucleotide polymorphisms (SNP) on chromosome 3, seven structural variations (57, 58), and human leukocyte antigen (HLA) genotypes (59) are strongly associated developing COVID-19 and severe outcomes.

Biochemical imbalances, such as mitochondrial function and oxidative stress, hyperglycemia, inflammation, and immune system function, can inform clinical decisions for COVID-19 prevention and treatment.

Lifestyle risk factors, such as non-restorative sleep, sedentarism, obesity, gut health, social determinants of health (SDoH), nutrition, stress, loneliness and isolation, smoking, and implicit bias (these factors aligning with the biochemical imbalances), are related to both chronic and acute COVID-19.

For reducing COVID-19 exposure risk and viral loads, FM recommends masking, coughing/sneezing etiquette (covering mouth), handwashing, social distancing, and wearing eye protection gears.

Stress reduction, nutrition, exercise, and supportive relationships are important for managing comorbidities.

For helping build a resilient immune system and cope with inflammation, beneficial nutrients include epigallocatechin gallate (EGCG), curcumin, quercetin, Resveratrol, glutathione (GSH), N-Acetyl Cysteine (NAC), berberine, astragalus, vitamins A, B6, B12, C, D, and E, folate, iron, zinc, copper, selenium, heparin nasal spray, mushrooms, B-glucans, elderberry, and melatonin. If the intake of these nutrients from food is not sufficient, dietary supplements should be considered.

For managing PASC symptoms, vitamins B and D, curcumin, omega-3, melatonin, glutathione, NAC, carnitine, prebiotics, probiotics, multi-vitamins, arginine, and citrulline are important. People should consider complementing the intakes with dietary supplements as needed. Beets, pomegranate, and dark leafy greens are great food sources for arginine and citrulline.

Lack of education in the general public and the healthcare workers, cost of healthy diet, and limited time for doctor visits posed some challenges for adopting IM and FM for COVID-19 patients.

IM and FM strategies such as nutrition, supplements, herbal medicine, stress management, sleep, acupuncture/acupressure, and exercise can help patients better counter COVID-19 symptoms. Many IM strategies are lifestyle adjustments that can be implemented by patients themselves with instructions from physicians, practitioners, or instructors. By putting patients in control of their diseases, IM and FM approaches not only enhance patients' recovery and wellbeing but may help reduce the cost of care in the long run.

IM and FM may also play a role in other infectious and/or chronic inflammatory diseases, such as monkeypox, cancer and cardiovascular diseases, etc. Each APEC economy should consider combining conventional medicine with all available IM and FM resources to address their individual pandemic situations.

### **Workshop Agenda**

IM and infectious disease research and care experts, government officials and healthcare professionals who are responsible for COVID-19 research and management during the COVID-19 pandemic among APEC economies were invited. In addition, representatives from academic and private sectors were invited to share their experiences on COVID-19 care with IM.

The purpose of the Workshop was to extensively gather evidence-based effective care procedures, tools, products, and systems from participating APEC economies. That said, invitations were sent to and accepted by 29 high-level experts including infectious disease experts, government officials, and medical and academic professionals focused on IM and COVID-19 care from 13 APEC economies (Table 3). Workshop participants were 38% female.

### **Table 3. Speaker Affiliation and APEC Economy Representation**

<b>Name</b>	<b>Title</b>	<b>Organization</b>	<b>APEC Economy</b>
Anchalee Chuthaputti, PhD	Advisor and Expert	Pharmacy Department, DTAM	Thailand
Cecilia C. Maramba-Lazarte, MD	Director, Institute of Herbal Medicine Professor, Department of Pharmacology and Toxicology Clinical Professor, Infectious and Tropical Diseases Section, Department of Pediatrics	National Institute of Health and UP College of Medicine	The Philippines
Cecilia Plaza Bobadilla, MD	Physician and Member	TCIM Americas Network and Academic Network of Integrative Medicine and Health	Chile
Charles Wu, PhD	Master Pharmacology/ Pharmacognosy Reviewer and Leader, Botanical Review Team, Office of Pharmaceutical Quality, Center for Drug Evaluation and Research	FDA	United States
Chien-Yu Lin, MD	Pediatric Physician	Hsinchu MacKay Memorial Hospital	Chinese Taipei
C. Jason Wang, MD, PhD	Professor and Director Center for Policy Outcomes and Prevention	Stanford University, and New School for Leadership in Health Care	Chinese Taipei
Danang Ardiyanto, MD, MKM	Medical Director and Coordinator, Research and Development Center for Medicinal Plant and Traditional Medicine	MOH	Indonesia
Elizabeth Margarita Gonzalez Quinteros, PsyD	Clinical Psychologist, Primary Care Direction of	MOH	Chile

	the O'Higgins Health Service		
Hernan Jose Garcia Ramirez, MD	Deputy Director	Complementary Care Systems	Mexico
Hiroshi Yotsuyanagi, MD	President, Japanese Society of Infectious Diseases Chairman, Division of Infectious Diseases of Advanced Clinical Research Center	IMS, University of Tokyo	Japan
Jagravudh Puangkong, MD	Director, Institute of Traditional Thai Medicine	DTAM	Thailand
Jeffery A. Dusek, PhD	Director of Research	University Hospitals Connor Whole Health	United States
Jeffrey D. White, MD	Director, Office of Cancer Complementary and Alternative Medicine,	NCI	United States
Jun-Yang Liou, PhD	Director, Department of Research Planning and Development	NHRI	Chinese Taipei
Khwanchai Visithanon, MD	Deputy Director-General	DTAM	Thailand
Libin Jia, MD	Program Director, Office of Cancer Complementary and Alternative Medicine,	NCI	United States
Martha Villar Lopez, MD	Physician, Professor, Founder and Manager of the Complementary Medicine Program	NUSM	Peru
Joel M. Evans, MD	Chief of Medical Affairs and Co-Director, Courses on COVID-19	IFM	United States
Julalak Chokpaisarn, PhD	Professor and Faculty Member	Prince of Songkla University of Thailand	Thailand
Michelle Beidelschies, PhD	Staff and Investigator, Center for Functional Medicine	Cleveland Clinic	United States
Monica A. Galanti de la Paz, MD	Physician and Academic	University of Chile and Academic Network of Integrative	Chile

		Medicine and Health	
Myeong Soo Lee, PhD	Professor	KIOM	Republic of Korea
Peristiwa Ridha Widhi Astana, MD	Physician and Researcher, Jamu Saintification Program	MOH	Indonesia
Pongsadhorn Pokpermddee, MD	Chair, APEC Health Working Group Assistant Permanent Secretary	MOH	Thailand
Richard C. Niemtzow, MD, PhD, MPH	Physician, United States Air Force Acupuncture and Integrative Medicine Center	Joint Base Andrews	United States
Rusmiyati Hardjoutomo, MD	Senior Healthcare Administrator, Directorate of Public Health Management	MOH	Indonesia
Songxuan Zhou Niemtzow, MD	Physician, United States Air Force Acupuncture and Integrative Medicine Center	Joint Base Andrews	United States
Yi-Chang Su, MD, PhD	Professor and Director	NRICM	Chinese Taipei
Yufang Lin, MD, FACP, FAAP	Internal Medicine-Pediatric Physician, Center for Integrative and Lifestyle Medicine	Cleveland Clinic	United States

An agenda for the Workshop was developed (Table 4) and distributed to all Workshop participants well-ahead of the program along with participant biographies. The Workshop specifically arranged a session on topics related to female perspectives related to IM on COVID-19 care, such as how to care for pregnant, female patients with COVID-19. In addition, each presentation was allotted 20 minutes (15 minutes for presentation and 5 minutes for Q&A) except for the keynote speaker who was allotted 30 minutes.

The presentation and discussion topics for the Workshop were designated as:

- Emergency needs and margining frontier of IM for COVID-19 care;
- IM applications on COVID-19 prevention and treatment and symptom (Long COVID) management;
- Integration of IM and conventional medicine for COVID-19 care;
- New and emerging procedures, tools and systems of IM used for COVID-19 care,
- Health policies on COVID-19 care;
- A session that speaks to female perspectives;
- Sessions that discuss the research findings, recommendations/guidelines with the differentiated by the unique circumstances of APEC member economies; and

- A (discussion) session on developing individual action plans that the participants take to their home economies to implement.

A website that outlines the program’s objective, structure, speakers, and content was successfully launched before the Workshop for all participants to easily search and find needed information on the project and associated Workshops (<https://www.integrativemed-study.net>)

**Table 4. Workshop Agenda for IM and COVID-19 Care**

<b>DAY 1: 20 September 2022, 8-11 PM US EST, GMT 12 – 3 AM, 21 September 2022</b>	
<b>OPENING SESSION: Chair, Libin Jia, MD (United States)</b>	
<b>Speaker (Economy)</b>	<b>Title</b>
Libin Jia, MD (United States)	Introduction: “Integrative Medicine (IM) and COVID-19 Care”
Jeffrey D. White, MD (United States)	Representative Speech
Jun-Yang Liou, PhD (Chinese Taipei)	Representative Speech
Rusmiyati Hardjoutomo, MD (Indonesia)	Representative Speech
Khwanchai Visithanon, MD (Thailand)	Representative Speech
Jeffrey A. Dusek, PhD (United States)	Keynote Speech: “Current State of Integrative Medicine (IM) and COVID-19”
<b>SESSION 1: Roles of IM for COVID-19 Care (Chair: Danang Ardiyanto, MD, MKM (Indonesia))</b>	
<b>Speaker (Economy)</b>	<b>Title</b>
Yi-Chang Su, MD, PhD (Chinese Taipei)	“The Development and Application of NRICM101 and CRICM102 in the Treatment of COVID-19”
Martha Villar Lopez, MD (Peru)	“Health Care in COVID-19, From Integrative Medicine”
Khwanchai Visithanon, MD (Thailand)	“National Policy on COVID-19 Management in the Area of Thai Traditional Medicine”
<b>SESSION 2: The Integration of IM with Conventional Medicine on COVID-19 Care (Chair: Yi-Chang Su, MD, PhD (Chinese Taipei))</b>	
<b>Speaker (Economy)</b>	<b>Title</b>

Hiroshi Yotsuyanagi, MD (Japan)	“Integrative Medicine for COVID-19 in Japan”
Jagravudh Puangkong, MD (Thailand)	“COVID-19 Treatment with Traditional Thai Medicine”
Peristiwaan Ridha Widhi Astana, MD (Indonesia)	“Integrative Medicine on COVID-19 Treatment in Indonesia”
<b>DAY 2: 21 September 2022, 8-11 PM US EST, GMT 12 – 3 AM, 22 September 2022</b>	
<b>SESSION 1: New and emerging systems of IM on COVID-19 care (Chair: Anchalee Chuthaputti, PhD (Thailand))</b>	
<b>Speaker (Economy)</b>	<b>Title</b>
Joel M. Evans, MD (United States)	“Clinical Recommendations for the Prevention and Management of COVID-19 and PASC: A Functional Medicine Approach (Part 1)”
Michelle Beidelschies, PhD (United States)	“A Virtual SMA for the Management of PASC” A Functional Medicine Approach (Part 2)”
Julalak Chokpaisarn, PhD (Thailand)	“Long-COVID Care with Traditional Thai Medicine (TTM)”
Richard Niemtzow, MD, PhD, MPH (United States)	“Medical Acupuncture: COVID “Long Haulers”: Treating Long-Term Effects of COVID-19 Syndrome”
Songxuan Zhou Niemtzow, MD (United States)	
<b>SESSION 2: Health Policy and Strategy for COVID-19 Care (Chair: Joel M. Evans, MD (United States))</b>	
<b>Speaker (Economy)</b>	<b>Title</b>
C. Jason Wang, MD, PhD (Chinese Taipei)	“The Use of Big Data in Pandemic Response”
Charles Wu, PhD (United States)	“Potential Use of Botanicals in COVID-19 Management, Opportunity and Challenge? An FDA’s Regulatory Perspective”
<b>SESSION 3: The Research Findings, Research and Guidelines with Differentiated by Unique Circumstances of APEC Members (Chair: Yi-Chang Su, MD, PhD (Chinese Taipei))</b>	
<b>Speaker (Economy)</b>	<b>Title</b>

Myeong Soo Lee, PhD (Republic of Korea)	“Integrative Medicine for COVID-19 in Korea”
Hernan Jose Garcia Ramirez, MD (Mexico)	“Traditional and Complementary Medicine Contributions Regarding COVID-19”
<b>DAY 3: 22 September 2022, 8-11 PM US EST, GMT 12 – 3 AM, 23 September 2022</b>	
<b>SESSION 1: Women’s Perspectives on COVID-19 Care (Chair: Libin Jia, MD (United States))</b>	
<b>Speaker (Economy)</b>	<b>Title</b>
Chien-Yu Lin, MD (Chinese Taipei)	“Public Strategies and Delivery Policy”
Yufang Lin, MD, FACP, FAAP (United States)	“Integrative Medicine Approach for Long COVID Syndrome”
Cecilia Plaza Bobadilla, MD, Monica A. Galanti de la Paz, MD and Elizabeth González Quinteros, PsyD (Chile)	“Sonotherapy for the Healthcare Workers”
<b>SESSION 2: How Each APEC Economy Will Develop Individual Action Plans for Implementation on COVID-19 Care (Chair: Richard C. Niemtzow, MD, PhD, MPH (United States))</b>	
Richard C. Niemtzow, MD, PhD, MPH (United States)	
Yi-Chang Su, MD, PhD (Chinese Taipei)	
Khwanchai Visithanon, MD (Thailand)	
Danang Ardiyanto, MD, MKM (Indonesia)	
Hiroshi Yotsuyanagi, MD (Japan)	
Myeong Soo Lee, PhD (Republic of Korea)	
Martha Villar Lopez, MD (Peru)	
Cecilia Plaza Bobadilla, MD, Monica A. Galanti de la Paz, MD and Elizabeth González Quinteros, PsyD (Chile)	
Hernan Jose Garcia Ramirez, MD (Mexico)	
Cecilia C. Maramba-Lazarte, MD (Philippines)	
<b>CLOSING SESSION: Chair, Libin Jia (United States)</b>	
Pongsadhorn Pokpermddee, MD (Director, APEC Health Working Group, Thailand)	

Richard C. Niemtzow, MD, PhD, MPH (United States)
Libin Jia, MD (United States)

Due to the COVID-19 pandemic and related travel restrictions, it was determined that the Workshop would be virtual rather than in-person. Therefore, invited speakers and session chairs were provided links to a WebEx meeting for participation. A series of WebEx test runs were performed with invited speakers and session chairs to guarantee optimal connections and to ensure they were aware of the platform's functionality.

## **Workshop**

The virtual Workshop was held from 20-22 September 2022 and allotted 3 hours each day for sessions based upon requirements from the APEC. All Workshop activities including opening and closing remarks, presentations and roundtable discussions were recorded, and ran on time each day.

The intent of the Workshop was to provide several valuable outputs including the opportunity for APEC members to: 1) Share their expertise in the areas of research, practice, clinical trials, population science and health care policy as it relates to IM for COVID-19 care and other diseases; 2) Discuss evidence-based, IM procedures, products, methods, tools, systems and policies for COVID-19 care; and 3) Develop Recommendations and Guidelines (R&G) on IM for COVID-19 care. In the near-term, attendance was expected to highlight the current needs for IM in the COVID-19 prevention, improve and increase treatment and symptom management, promote the adoption of workable IM systems for the COVID-19 care, harmonize the integration of conventional and IM practices for COVID-19 care, and create high-quality and efficient healthcare delivery for COVID-19 care.

A summary of each presentation and associated learning objectives from the Workshop are provided In Table 5.

**Table 5. Overview of Workshop Presentations**

<b>Day 1, Opening Session</b>	
<b>Presenter</b> Libin Jia, MD	<b>APEC Economy</b> United States
<p><b>Presentation Summary</b></p> <p>Since early 2020, more than 600 million people have been infected with SARS-CoV-2, and over 6 million of them have succumbed to COVID-19 worldwide. Though COVID-19 vaccines provide certain degree of protection, the ceaseless emergence of new virus variants could escape such protection and still cause symptoms especially to those with weak immunity and other conditions. The drugs against SARS-CoV-2 are still in the early phase. There are limitations on conventional medicine on the cure of the COVID-19 symptoms, for example, the long haul COVID causes lingering issues (brain fog, fatigue, depression, anxiety) in many COVID-19 patients after the acute phase. IM, which uses multiple approaches including nutrition and supplements, mind-and-body practices, exercises, better sleep, lifestyle and environment adjustment, psychotherapy, acupuncture and acupressure, herbal medicine, telemedicine, and combines conventional medicine with traditional medicine, may play beneficial and complementary roles for COVID-19 patients.</p> <p>At this APEC virtual workshop, experts from 13 APEC economies come together to discuss a series of topics on IM and COVID-19 care. Evidence based and science-based information will be shared, collaborative opportunities will be created, and individual action plans from APEC economies will be developed and shared. The outcomes of the workshop will benefit COVID-19 patients, improve healthcare delivery, and promote economic recovery among APEC economies.</p>	

<p><b>Presenter</b> Jeffrey D. White, MD</p>	<p><b>APEC Economy</b> United States</p>
<p><b>Presentation Summary</b></p> <p>We support research in complementary and alternative medicine (CAM), including IM, at the Office of Cancer, Complementary and Alternative Medicine of the US National Institute of Cancer. COVID-19 is an important issue in immunosuppressed patients such as cancer patients, who have a weakened immune system due to cancers or the therapies they receive. Therefore, the role of IM on COVID-19 is an issue of particular importance to us. Since the onset of the pandemic, IM practice approaches to COVID-19 management have emerged in the United States and elsewhere. Some medical subdisciplines have adopted complementary and alternative approaches in their care (e.g., acupuncture use in pain management by anesthesiologists). IM, although not yet a uniformed field of practice, offers additional options for COVID-19 patients.</p> <p>Still the evidence base for an objective value of this integration, or of collaboration between Western biomedical practitioners and traditional or complementary medicine practitioners is relatively weak.</p> <p>Several things are needed to improve the situation. A greater dialogue is necessary between practitioners who have experience in effective IM treatment approaches and researchers who can help document and perform experiments on IM.</p> <p>This 3-day workshop and the planned products from it will be a positive step towards a greater dialogue. Hopefully, it will lead to more platforms for discussion and greater collaborations on research regarding the efficacy of IM on COVID-19. This is necessary to attract more attention in the West that could eventually lead to more reimbursement for approaches that are found to be effective.</p>	

<p><b>Presenter</b> Jun-Yang Liou, PhD</p>	<p><b>APEC Economy</b> Chinese Taipei</p>
<p><b>Presentation Summary</b></p> <p>During the COVID-19 pandemic, practitioners have utilized different approaches and summarized their experiences. Traditional Chinese Medicine (TCM) has been widely used in the diagnosis and treatment of COVID-19, demonstrating its advantages. In March 2022, the WHO experts held a meeting on the evaluation of TCM on COVID-19. It was recognized that TCM could reduce the severeness of symptoms in M to M patients and shorten hospital stay. In Chinese Taipei, the NRICM developed a TCM formula which consisted of 10 herbal medicines. This formula, named NRICM101, was studied for its potential to disrupt COVID-19 progression with antiviral and anti-inflammatory properties. The director of NRICM, Dr Yi-Chang Su, will give more detailed information at the workshop.</p> <p>Chinese Taipei shared the empirical research on the clinical efficacy of NRICM101 and its integrated model for COVID-19 with Asia, America, Europe, Australia, and Africa. Up to now, NRICM101 has been exported to more than 50 economies. In the last 2.5 years, IM has helped people cope with the COVID-19 outbreak, both physiologically and psychologically.</p> <p>Apart from TCM treatment, Chinese Taipei has also achieved effective policymaking and strong implementation for epidemic prevention. Since we suffered from severe acute respiratory syndrome (SARS) in 2003, several control measures were activated, including a centralized commanding system, surveillance, real-time reporting, laboratory diagnostics improvement, and law and regulation. Such an existing infrastructure for prevention and detection has sustained Chinese Taipei through the subsequent epidemics. We are delighted to have this workshop opportunity to share our experience and look forward to collaborating with you all.</p>	
<p><b>Presenter</b> Rusmiyati Hardjoutomo, MD</p>	<p><b>APEC Economy</b> Indonesia</p>
<p><b>Presentation Summary</b></p> <p>The COVID-19 pandemic posed a great challenge to the world, and there is a pressing need for efficient medicines. Plants and natural components are proven resources for new drug discovery, and IM has the potential to be used in both prevention and disease management strategies.</p> <p>Indonesia recognizes that traditional, complementary, and alternative medicine offers benefits. IM remedies have been used in daily life in Indonesia for centuries. Traditional medicine is believed to be one of the ways to combat infectious disease. Herbal drinks have gained increased popularity during COVID-19 pandemic in Indonesia, as it is affordable and easy to make at home. Specifically, Jamu is believed to be able to fight COVID-19 (60, 61, 62).</p> <p>More research is needed for herbs, including standardization of raw materials for clinical trials. More scientific evidence for the mechanisms and pharmacology of herbs is also needed, as is the standardization of herbal medicines in pharmacies. Indonesia hopes the development of IM therapies can provide maximum immunity with the richness of biodiversity to APEC economies.</p>	

<p><b>Presenter</b> Khwanchai Visithanon, MD</p>	<p><b>APEC Economy</b> Thailand</p>
<p><b>Presentation Summary</b></p> <p>Since 2019, over 6 million people have died from COVID-19, and over 599 million people have been infected. The COVID-19 pandemic not only affects people’s health and livelihood, but also impacts economic activities.</p> <p>In Thailand, an herb, Fa Thalai Chon (<i>Andrographis paniculata</i>, another common name is “King of Bitters” and “Green chiretta”) was selected to fight COVID-19. A retrospective study showed that Fa Thalai Chon helped prevent disease progression, reduce the chance of developing pneumonia, and shorten the viral shedding period (63, 64). Therefore, Fa Thalai Chon was recommended for M to M COVID-19 patients following the National Clinical Practice Guideline for COVID-19 Treatment in Thailand (65, 66). To promote accessibility, Fa Thalai Chon was included on the Thailand National List of Essential Medicines (NLEM), and its reimbursement was covered by the universal health insurance for COVID-19 treatment.</p> <p>In addition to Fa Thalai Chon, another 15 Thai traditional medicine preparations, which had already been listed on NLEM, were selected to treat a variety of COVID-19 and Long COVID symptoms. Thai people’s wellbeing is our top priority at the DTAM. We put tremendous effort in promoting evidence-based information, creating a practice guideline of Thai Traditional Medicine (TTM), as well conducting research on TTM and alternative medicine, to ensure that Thai people receive efficient, safe, quality medicine and service.</p> <p>In conclusion, TTM not only contributes to people’s health, but also to economic growth. It helps reduce the import of modern medicine, foster the equity of accessibility, and enhance economic recovery. There is a great need for building, deepening, and broadening cooperation on IM among APEC economies. As a project co-sponsor, Thailand is committed to work constructively with all APEC economies.</p>	

<p><b>Presenter</b> Jeffery A. Dusek, PhD</p>	<p><b>APEC Economy</b> United States</p>
<p><b>Presentation Summary</b></p> <p>There is a great need for IM as the symptoms of Long COVID and COVID-19 are persisting, and the deaths are amassing (67, 68). We looked across the world to see the utilization of IM during the COVID-19 pandemic. A recent paper (69) discussed why and how IM was in high use globally, especially with pursuit of immune strength. In one study, 44% of the reported use was in Hong Kong (70). Clearly, IM was filling in gap as used across the world (69).</p> <p>Another study showed that in Mild-to-Moderate (M to M) COVID-19 patients, acupuncture was associated with suppression of inflammatory stress, improved immunity, and regulating nervous system function (71). A separate research team observed that yoga improved immunological profile against COVID-19 by strengthening cell-mediated immunology. It also reduces anxiety and depression, alleviating the psychological symptoms that COVID-19 patients may have (72). Other mind-body interventions indicated that mindfulness practice can be an important self-care tool complementing the usual treatment for COVID-19 patients (73, 74).</p> <p>It is noteworthy that these were correlative studies (not causal), randomized clinical trials would take years to conduct, and we are only two years into the pandemic.</p> <p>There is strong evidence in the literature that supplements such as zinc, vitamin C, and melatonin can be adjuvant to other treatments to prevent, reduce, or shorten the duration of COVID-19 symptoms (75, 76, 77, 78).</p> <p>Nutrition (increased whole foods, vegetables, grains; reduced fast foods and boxed foods) improves the post-infectious intestinal dysbiosis in COVID-19 patients (79, 80, 81).</p> <p>Sleep disturbances are associated with increased infection risk and muted immunologic reaction to vaccine (82, 83, 84).</p> <p>It is well documented that of TCM or herbal medicines is effective, safe, and well-tolerated when used in conjunction with standard therapy in COVID-19 symptom alleviation (85, 86, 87).</p> <p>In severe and Long COVID, a trial on qi gong and acupressure resulted in improved lung function and shortened hospital stay. Long COVID, also called post-acute sequelae of COVID-19 (PASC), is expected to be a major issue in the future, and IM is important for improving the quality of life for patients with Long COVID (88).</p> <p>As of 2021, a new post-COVID long-haul clinic was launched at University Hospitals in Cleveland. The initial 60 Long COVID patients who came to this clinic had primary complaints of fatigue, brain fog, and sleep problems. A majority (70%) of these patients were referred to University Hospitals Integrative Medicine Clinics called Connor Whole Health by clinical providers at the post-COVID indicating that IM can be supportive of the healthcare system. Our IM consultants at Connor Whole Health evaluated and addressed the patients' whole health, nutrition, sleep, healthy diet, stress.</p> <p>In one of our case studies, we used a comprehensive approach including acupuncture and physical therapist-led symptom-titrated physical activity (STPA). The patient's chest pressure and palpitations resolved after one week, and the patient recovered after 9 weeks (89).</p>	

Healthcare workers are a tremendously disadvantaged group working 24/7. Mind-body therapies are important for the self-care of this group to reduce COVID-specific chronic stress (90).

Finally, utilization of IM *via* telehealth has increased drastically. Telehealth affords people who are otherwise unable to participate the opportunity to participate in IM therapy. Acupressure, body-mind therapies, and yoga can be carried out *via* telehealth (91).

In conclusion, patients continue to seek IM therapies worldwide for COVID-19, especially Long COVID-related symptoms (22, 92). There is promising preliminary evidence in the effectiveness of IM therapies in treating various aspects of COVID-19. However, future research with randomized trials is needed.

### Day 1, Session 2: Roles of IM for COVID-19 Care

**Presenter**  
Yi-Chang Su, MD, PhD

**APEC Economy**  
Chinese Taipei

#### Presentation Summary

During the COVID-19 pandemic, researchers at NRICM in Chinese Taipei developed two medications, NRICM101 and NRICM102, using TCM herbs (93, 94). Both are manufactured in Good Manufacturing Practice (GMP) facilities and are composed of 10 herbs. They target multiple pathways for treating COVID-19. Evidence has shown that NRICM101 and NRICM102 can reduce SARS-CoV-2 infection rate, decrease the severity and mortality of COVID-19, and speed up recovery (93, 95).

NRICM101 is for COVID-19 patients with M to M illness. It functions by blocking the interaction between spike proteins of the virus and angiotensin-converting enzyme 2 (ACE2), preventing the virus from entering cells, and preventing virus from replication inside cells. It can inhibit cytokine storms, thus markedly reducing severe illness and death (93). Until August 2022, NRICM101 has been exported to nearly 60 economies.

NRICM102 is for severe and critical illness patients. It reduces SARS-CoV-2 spike protein subunit (S1protein) (94) and thrombin-induced pulmonary embolism, thus significantly reducing mortality rate in severe and critical COVID-19 patients (95).

NRICM101 and NRICM102 are directed to multiple therapeutic targets compared to the available antiviral medicines. They both have antiviral, immunomodulatory, and body function supporting features. More importantly, they are cost-effective, the publicly funded “NRICM101” for 5-day regimen costs USD50, only 1/10 of the price of antiviral medication such as Paxlovid.

The presentation on NRICM101 and NRICM102 sparked great interest among the participants. There were follow-up discussions on the potential collaborations in this area.

<p><b>Presenter</b> Martha Villar Lopez, MD</p>	<p><b>APEC Economy</b> Peru</p>
<p><b>Presentation Summary</b></p> <p>In Peru, traditional medicine is used by over 76% of the population. Peru does not have a unified healthcare system, but everyone has health insurance coverage during the COVID-19 pandemic. Complementary medicine methods including acupuncture, biological therapies, mind-body therapies, energy therapies, and manual therapies are well-accepted. For example, acupuncture was used for treating anxiety and depression related to COVID-19, and the user satisfaction rate was as high as 90%. The adoption of IM has decreased medicines consumption and promoted health support and self-care in the population.</p> <p>More awareness needs to be brought to communities and scientific institutions. Plants and food that have therapeutic effects should be reinforced in daily use in the most natural way possible. Self-care and inter-care of the population (everyone is both cared for and caregivers) should be emphasized, and the care for healthcare workers should not be forgotten. It is also important for healthcare providers to have knowledge in both traditional and conventional medicine.</p>	
<p><b>Presenter</b> Khwanchai Visithanon, MD</p>	<p><b>APEC Economy</b> Thailand</p>
<p><b>Presentation Summary</b></p> <p>Traditional and Complementary Medicines (T&amp;CM) such as Traditional Thai Medicine (TTM), Traditional Chinese Medicine (TCM) and chiropractic care are recognized by the law in Thailand. Both TTM and TCM are used for health promotion, prevention, treatment, and rehabilitation. There are 97 items of herbal medicines on the NLEM (96). There have been steady increases in the budget for the reimbursement of T&amp;CM services, the number of medicines on NLEM, and the number of T&amp;CM practitioners over the two decades. The National Health Security Office (NHSO) which oversees Universal Health Coverage Scheme has allocated ‘on-top’ additional per capita budget for public health facilities providing T&amp;CM services since 2007. The ‘on-top’ per capita budget has been increasing every year. It started from THB0.5 (USD0.01) in 2007 to THB19.00 (USD0.5) in 2021 (97).</p> <p>During the COVID-19 pandemic (2020-2021), multiple studies on an herb, <i>Andrographis paniculata</i> or ‘King of Bitters’ or Green Chiretta or known as Fa Thalai Chon in Thai have been carried out locally and internationally (63, 64, 98, 99, 100, 101). The observational results demonstrated that Fa Thalai Chon can prevent disease progression, reduce the chance of developing pneumonia, and shorten viral shedding period in asymptomatic and mild COVID-19 patients (63, 64). Fa Thalai Chon, together with other TTM formulas, were included in the NLEM list for expanded access. Such medicines for mild COVID-19 patients were distributed to hospitals, field hospitals, prisons, and high-risk communities (for in-hospital use and home care). Evidence-based information and practice guideline for IM during COVID-19 have been put out in Thailand to increase health literacy.</p>	

**Day 1, Session 3: Integration of IM with Conventional Medicine on COVID-19 Care**

**Presenter**  
Hiroshi Yotsuyanagi, MD

**APEC Economy**  
Japan

**Presentation Summary**

The closing of borders during the COVID-19 pandemic had a great impact on Japan. Since March 2022, Japan gradually relaxed its border control. Starting on 7 September 2022, COVID-19 test was no longer required for traveling to Japan. There has never been major epidemic in Japan up to now. About 80% of the general population in Japan have no history of infection. Therefore, there is a possibility that there will be a major epidemic wave in the future.

By 2020, all societies of clinicians in Japan were required to develop guidelines for protecting patients. The Japanese Medical Science Federation compiled and summarized expert opinions on COVID-19 from each medical society to provide necessary information for physicians and medical staff (102).

By August 2022, over 80% of the population in Japan had received the third or subsequent dose of vaccination. It is assumed that many people acquire immunity to the coronavirus through vaccination or natural infection. The number of severe cases in Japan is decreasing in 2022, but the number of deaths was increasing. This can be attributed to the fact that the majority of people infected in the recent waves were over 60 years old. They had more underlining conditions and insufficient immune responses to the virus.

Japan has many hospital beds comparing to other APEC economies, but the number of physicians is low in Japan. In addition, Japan has a larger aging population, and more people are in (self-reported) poor health comparing to other OECD (The Organization for Economic Co-operation and Development) economies. The number of COVID-19 deaths was low in Japan, but the number of excess deaths was high (103). A low percentage (about 20%) of government-controlled and public hospitals in Japan is said to be a weak point of its healthcare system.

Long COVID is becoming an increasingly prominent issue. The decreased labor productivity due to Long COVID will be a major global problem in the future. IM is becoming more important in treating a wide range of residual COVID symptoms. In Japan, IM for Long COVID has just been launched. An aftercare outpatient clinic for COVID-19 was first opened in 2021. Similar outpatient clinics are gradually being established. In Tokyo, over 100 medical institutions are now treating patients affected by Long COVID.

<b>Presenter</b> Jagravudh Puangkong, MD	<b>APEC Economy</b> Thailand
<p><b>Presentation Summary</b></p> <p>Traditional Thai Medicine (TTM) has been used in the treatment of COVID-19 in Thailand. Different herbal medicines were used at specific stages of the disease. Clinical Practice Guidelines for COVID-19 (65), developed by Department of Medical Services, supported joint treatment of infected group by TTM doctors and conventional medicine doctors, and treatment of post-infected group (long-COVID) by TTM doctors.</p> <p>Fa Thalai Chon, the “King of Bitter”, was used for anti-inflammatory effect and immuno-modulation (64, 99, 104). Ya Ha Rak or Ben-cha-lo-ka-wi-chian (formula of five roots) and other TTM herbal formulas were proven to have anti-pyretic, anti-inflammatory, and/or analgesic effects and were used to counter the specific symptoms (65, 105).</p> <p>Long-COVID syndrome may affect different systems in the body, causing brain fog, anxiety, depression, short of breath, chronic fatigue, heart palpitation, etc. Various herbal formulas have been used to specifically counter those symptoms.</p> <p>In addition to herbal medicine, integrative medicine (IM) also includes approaches such as essential oil inhalation therapy, herbal steam bath, acupuncture, and medication. In general, IM is more affordable than conventional medicine, thus the implementation of IM can reduce the overall cost of care (65).</p>	

<p><b>Presenter</b> Peristiwa Ridha Widhi Astana, MD</p>	<p><b>APEC Economy</b> Indonesia</p>
<p><b>Presentation Summary</b></p> <p>The practice of traditional medicine (TM) originated since the days of Nusantara in Indonesia. It is still used in both rural and metropolitan areas. Traditional medicinal (TM) products are commercialized in the form of herbal supplements and regulated by the Minister of Health in Indonesia.</p> <p>To better regulate the distribution of TM products, the Indonesia FDA classified them into three categories: 1. Jamu (created empirically based on experience from generations, with no animal testing or clinical trials), 2. Standardized herbal medicine (tested in animals), and 3. Phyto-pharmacy (based on clinical trials, and clinically approved).</p> <p>The traditional health services are regulated by three statues under the MOH in Indonesia, each governing empirical, complementary, and integrative traditional health services (equivalent to IM) separately. The three types of services are provided by empiric traditional healers, certified traditional healers, and hospitals, respectively. IM, including herbal and non-herbal approaches (such as manual technique, energy and thought therapy), is performed in health facilities (such us primary health care, hospitals) by a doctor together with a certified traditional therapist.</p> <p>IM plays a complementary role of improving the immune system and enhancing recovery in the fight against the COVID-19 pandemic. It is mainly practiced in the primary health services and communities. Statutes, guidelines, and information sheets have been developed on the use of TM for health maintenance, disease prevention and healthcare during the COVID-19 pandemic. According to the guideline, several indigenou plants such as ginger, turmeric, curcuma, bitter leaf, Andrographis paniculata can be used for improving immune system. While as complementary therapy for COVID-19, the use of these herbals should be supervised by the doctor in charge.</p> <p>Indonesia is still on the progress to improve the implementation of IM in the healthcare facilities. However, there are still some challenges in implementing IM. The biggest obstacle is Indonesia’s health insurance does not cover TM in hospital.</p>	

**Day 2, Session 1: New and Emerging Systems of IM on COVID-19 Care**

**Presenters**

Joel M. Evans, MD  
Michelle Beidelschies, PhD

**APEC Economy**

United States

**Presentation Summary**

Functional medicine (FM) provides an operating system that works to reverse illness, promote health, and optimize function by addressing underlying causes, symptoms, and functional imbalances (24, 29). It identifies what the body is lacking or in excess of, such as nutrition, stress, social relations, and environment, and informs clinical recommendations to correct imbalances. Most important, FM does not replace, but rather extends conventional care.

Acute and chronic COVID-19 share common biochemical imbalances and lifestyle factors with the common chronic diseases we see worldwide, such as obesity, coronary artery disease, chronic obstructive pulmonary disease, type II diabetes, and hypertension. These biochemical imbalances include mitochondrial dysfunction and oxidative stress, hyperglycemia, inflammation, and immune system dysfunction. The lifestyle factors that COVID-19 shares with chronic illness are non-restorative sleep, sedentarism, gut dysfunction, poor nutrition, loneliness and isolation, implicit bias, social determinants of health, stress, and smoking. These commonalities can help inform the prevention and management of acute and chronic COVID-19.

While FM has a comprehensive approach to acute and chronic COVID-19, conventional medicine specializes in the care of severe acute COVID-19 with minimal successful treatment approaches to many aspects of chronic COVID-19.

FM has established evidence-based recommendations for preventive strategies (pre-exposure) as well as management strategies (post-exposure) related to acute and chronic COVID-19 [[www.ifm.org/covid](http://www.ifm.org/covid)]. These recommendations encompass nutrition and lifestyle behavioral interventions complemented with dietary supplementation, as needed, and were implemented as part of a virtual, shared medical appointment (SMA) targeting patients with PASC at Cleveland Clinic Center for Functional Medicine (106). The SMA program consisted of 10-weekly appointments with a multi-disciplinary team of caregivers including providers, dietitians, and health coaches. Patients were provided with education regarding PASC, tools to help manage their condition (e.g., nutrition and lifestyle behavioral interventions), and support by way of a team of caregivers and other patients with PASC. Preliminary findings indicate that the approach can improve nutrition and lifestyle-related behaviors, post-COVID functional status, symptoms, and quality of life for some patients.

<b>Presenter</b> Julalak Chokpaisarn, PhD	<b>APEC Economy</b> Thailand
<p><b>Presentation Summary</b></p> <p>Most people infected with SARS-CoV-2 experience M to M syndrome, and only a small portion becomes severely ill. However, patients from both groups can experience Long COVID-19 syndrome, which lingers for at least two months after the COVID-19 recovery, with complications such as dysautonomia, myocarditis, brain fog. In the absence of definitive treatment, Thailand has used Thai Traditional Medicine (TTM) to manage Long COVID care.</p> <p>Based on the analysis of the four TTM elements (fire, wind, water, and earth) (107), TTM treatment guidelines were put in place, encompassing special herbal recipes, Thai massage, herbal steam, and breathing exercises (information under Journal consideration). Studies have demonstrated the effectiveness of such approaches. For example, Ya-Ha-Rak, an antipyretic drug, has strong anti-inflammatory function (108, 109). Thai massage together Thai acupressure massage, and herbal steam significantly reduced Long COVID symptoms such as muscle pain, difficulty breathing, sleeping issues, fatigue, and coughing.</p>	

<p><b>Presenters</b>  Richard C. Niemtow, MD, PhD, MPH  Songxuan Zhou Niemtow, MD</p>	<p><b>APEC Economy</b>  United States</p>
<p><b>Presentation Summary</b></p> <p>TCM writings and contemporary scientific literature support the value of acupuncture in treating symptoms associated with chronic COVID-19 as published as a special feature edition in <i>Medical Acupuncture - COVID “Long Haulers”</i>: Treating Long-Term Effects of COVID-19 Syndrome.</p> <p>A few study references from this special feature edition in <i>Medical Acupuncture</i> are listed here:</p> <ol style="list-style-type: none"> <li>1. “The Role of Acupuncture for Long Covid: Mechanisms and Models” (110)</li> </ol> <p style="padding-left: 40px;">Since acupuncture may favorably modify the length and outcome of this condition, the model of acupuncture presented in this article warrants broader use in the integrative clinical setting and for further research.</p> <ol style="list-style-type: none"> <li>2. “Conceptualizing a Traditional Chinese Medicine and Pathology of Arousal Diagnostic and Pathophysiological Framework for Post-acute Sequelae of Covid-19” (111)</li> </ol> <p style="padding-left: 40px;">The authors provide an overview of the potential value of TCM for conceptualizing and treating Post-Acute Sequelae with a few examples and clarify directions for research.</p> <ol style="list-style-type: none"> <li>3. “Acupuncture in Multidisciplinary Treatment for Post Covid-19 Syndrome” (89)</li> </ol> <p style="padding-left: 40px;">Acupuncture is an attractive potential PCS therapy, considering its holistic approach and that it may be added to a multidisciplinary, guideline-concordant regimen.</p> <p>On the innovated therapy for COVID-19, Richard C. Niemtow, MD, PhD, MPH, Songxuan Zhou Niemtow, MD (China), LAc, and Erik Koda, MD, MPH studied Long Haul COVID-19 by acupuncture with the project titled: Anosmia and Ageusia Rapid Treatment Electro-Acupuncture and Hexapolar Static Medical Magnet on ST-43 Bilateral – A Novel Treatment Proposal. The use of multipolar magnets on acupuncture points ST-43 helps restore anosmia and ageusia.</p>	

**Day 2, Session 2: Health Policy and Strategy for COVID-19 Care**

**Presenters**  
C. Jason Wang, MD, PhD

**APEC Economy**  
Chinese Taipei

**Presentation Summary**

Big data plays an important role in the COVID-19 pandemic response, but there have been many challenges in its implementation. For example, there are various forms of data that came into play. Data from travelers (airplanes, cruises, land), doctor’s offices, labs (with COVID test results), and hospital data on capacity (e.g., the number of beds, PPEs, masks, ventilators, doctors, and nurses available) were sent to central and local governments for contact tracing and policy planning. However, data is useful if it is made available quickly to people who need to know; these may include patients/parents, doctors, workplace, schools, bus drivers, and the health department. Time is of the essence given the rapid spread of the virus. However, gathering, preparing, checking, and sending data take time.

Further, there was a great need for collaboration globally to bring the pandemic under control, politics aside. Yet, economies responded to the pandemic differently, and the types of data collected were variable and often not well-integrated due to lack of technology and interoperability, lack of time for analysis, or confusing laws and rules. There was no framework for trust and collaboration, and the data systems in different places do not talk to each other.

Digital Epidemiology involves lots of public health data that are coming from consumer electronics network, which may include smartphones (symptom reporting through phones), Bluetooth “handshakes” between devices, GPS location, cellular signals, video surveillance, social media, QR code in shops, traffic data, etc. This poses ethical questions: Should you use it? Are there laws to support the use during a pandemic? Are there laws to protect privacy and confidentiality of personal data? For example, cell phone locations greatly facilitate contact tracing. People can be informed quickly, but they are also being tracked. While some economies make the installation of such a phone app mandatory, it is voluntary in other economies, particularly in the Western world. This makes the adoption rate drastically different among economies.

<b>Presenters</b> Charles Wu, PhD	<b>APEC Economy</b> United States
<p><b>Presentation Summary</b></p> <p>Traditional herbal medicine (THM) has been used for thousands of years for a wide variety of health conditions. However, many medical studies on THM are of inadequate quality, leading to lack of firm conclusion on efficacy. The interactions between the naturally derived ingredients are complex, and the mechanisms of action are largely unknown.</p> <p>Recognizing differences between botanical and non-botanical medications, the US FDA offers incentives for early-phase trials with botanicals. From chemistry manufacturing control considerations, further purification is not required, and identification of active constituents is not essential. From pharmacology/toxicology perspective, if a botanical product has extensive prior human experience, sufficient information may be available to support initial clinical studies without additional nonclinical pharmacological/toxicological testing (Refer to FDA’s Botanical Drug Development Guidance for Industry <a href="https://www.fda.gov/media/93113/download">https://www.fda.gov/media/93113/download</a>).</p> <p>For late-phase trials on new drug applications, however, well-controlled trials are required, and same levels of clinical efficacy/safety data as non-botanical drugs are needed.</p> <p>Since the onset of COVID-19 pandemic, the US FDA has received nearly 50 Investigational New Drug (IND) or pre-IND applications, and three EUAs (Emergency Use of Authorization) applications with botanical components for COVID-19 treatment, mitigation, or prevention. The indications included symptom relief, antiviral, prophylaxis, immunity modulation and combination. More robust clinical trials and safety data have been requested of the three EUAs. FDA has issued guidance documents regarding the conduct of clinical trials during COVID-19 and Botanical Drug Development Guidance for Industry for clinical trial with botanical in management of COVID-19.</p> <p>The major challenges for the regulatory review of botanical drugs include: the lack of well-controlled clinical trials due to the emergency, the complicated QC process for complex and heterogeneous raw materials, and the difficulty in making an appropriate placebo.</p>	

**Day 2, Session 3: The Research Findings, Research and Guidelines with Differentiated by Unique Circumstances of APEC Members**

**Presenter**  
Myeong Soo Lee, PhD

**APEC Economy**  
Republic of Korea

**Presentation Summary**

Korean Medicine (KM) was influenced by Chinese medicine but acquired its own content during the development. KM doctors need to receive six years of medical education including western medicine, Chinese medicine, and Korean medicine.

The Korean Clinical Practice Guideline (CPG) (112), which includes consensus guideline of herbal medicine for COVID-19 treatment was developed based on input from a group of experts. Different herbal prescriptions were given to people in need of prevention, with a history of exposure, with mild symptoms, or in the recovery stage. The CPG was limited in that the amount of clinical evidence was inadequate, and there was no treatment strategy for severe COVID-19 patients.

KM telemedicine centers were set up during the pandemic which offered telephonic consultation. There was limitation on the program, including the difficulty coordinating with conventional treatment for comorbidities, and the lack of observing patients' tongues and faces over the phone.

IM is not highly supported by the health insurance policy in Korea, but the public was inclined toward adding it to their management of COVID-19. According to retrospective surveys, herbal preparations, acupuncture were the two most frequently used KM approaches for the management of COVID-19-related symptoms, as well as for managing Long COVID (113). In South Korea, conventional medicine was mainly used for COVID-19 treatment whereas CAM was commonly used as preventive measures.

<p><b>Presenter</b> Hernan Jose Garcia Ramirez, MD</p>	<p><b>APEC Economy</b> Mexico</p>
<p><b>Presentation Summary</b></p> <p>The Traditional indigenous Mexican medicine is a complete and comprehensive health system with a different rationale. Traditional practitioners continued to provide care during the COVID-19 pandemic while protecting themselves with preventative remedies. Virtual meetings were held between traditional medicine practitioners and community leaders who had access to cell phones and network coverage. Traditional midwives continued to care for women during pregnancy, childbirth, and postpartum period to avoid coronavirus exposure with risks at hospitals. Ointments were offered as remedy for rashes developed from wearing masks.</p> <p>One indigenous community Seri in Sonora, Mexico, in coordination with health authorities, transformed a health center into an intercultural COVID-19 (care) Unit, where traditional therapists participated in developing traditional medicine remedies using medicinal plants. With a comprehensive approach that included the use of oxygen concentrators, medicinal herbs, culturally relevant healthy eating, plus respiratory rehabilitation at sea, the pandemic was controlled in this community (114).</p> <p>The contributions against COVID-19, from traditional indigenous medicine, homeopathy, and acupuncture, were included in comprehensive protocols for the prevention and care of patients with COVID-19. In this regard, a strategy called “Caring for Caregivers” was defined and developed. Its objective was to protect health workers with the use of homeopathic medicines according to different protocols. Homeopathic medicine was widely supplied to health personnel for their own care and infographics were developed to facilitate the understanding and use of the protocol by doctors. We also elaborate and disseminate a document on the foundations, evidence and contributions to health of Homeopathic Medicine, to facilitate its understanding by health personnel (114, 115).</p> <p>A healthy diet was promoted (foods rich in antioxidants, phytochemicals, vitamins A, B6, B12, C, folic acid and minerals copper, iron, selenium, zinc), physical activities (such as qigong, yoga, and dance) and the state of health was emphasized emotional (good humor and reduction of fear) to strengthen the immune system.</p>	

**Day 3, Session 1: Women's Perspectives on COVID-19 Care**

**Presenter**  
Chen-Yu Lin, MD

**APEC Economy**  
Chinese Taipei

**Presentation Summary**

In Chinese Taipei, the public strategies and policies were different during different periods as Alpha, Delta, and Omicron strains surged during the pandemic. When the Alpha strain, and then the Delta strain were dominant, high mortality rate and the absence of vaccine mandated a strong focus on containment.

When the Omicron strain took the stage, we were already in the third year of the pandemic. The widely available vaccines allowed us to have the transition from a containing strategy to a co-existing strategy. Omicron posed lower risk for ER and critical care, but it can be fatal too. Most children and older adults (60 years or above) hospitalized or died due to Omicron were unvaccinated, therefore, vaccination was one of the most important strategies to combat COVID-19.

In addition to vaccination, non-pharmaceutical interventions, such as social distancing, strict hand hygiene, masking, coughing etiquette, were among the things everyone can do to help slow down the spreading. Public policies such as border control, travel-related testing and quarantine requirement, masking mandates, and outdoor clinics, were proven to be effective when well implemented. It is also important for the government to establish official channels and clear communication to reduce anxiety and panic of the public, and to correct intentional or unintentional misinformation.

It was recommended hospital visits should be restricted, but childbirth was an issue. One study showed that 3% babies born during the pandemic had COVID-19 infection. In Chinese Taipei, delivery was performed in isolated rooms, and newborns were kept and supported in single-babe suites until cleared of COVID-19.

<p><b>Presenter</b> Yufang Lin, MD, FACP, FAAP</p>	<p><b>APEC Economy</b> United States</p>
<p><b>Presentation Summary</b></p> <p>Integrative Medicine (IM) is a medical approach based on lifestyle intervention that helps patients manage chronic disease, including Long-COVID. In the US, IM is a 2-year fellowship, board-certified specialty. Integrative Medicine providers evaluate and treat patients holistically using an allopathic and complementary medicine approach to harness the internal healing power of human body.</p> <p>Chronic diseases are generally inflammation-driven and commonly based on lifestyle factors, such as poor diet, poor sleep, high stress, and sedentary lifestyle. Inflammation is the main mechanism of injury contributing to Long COVID Syndrome (116). Lifestyle interventions are an effective way to manage chronic disease and may also provide effective support for Long COVID recovery. Assessment and treatment start with identifying imbalances in lifestyle and is followed by intervention to optimize nutrition, sleep, stress management, and exercise.</p> <p>Micronutrient deficiency has been seen in patients with long COVID syndrome. Laboratory tests can evaluate the levels of nutrition and inflammation to inform an individualized treatment plan. Nutrients critical for healing can be obtained from food, herbs and spices, and dietary supplements. Recover Clinic was established in Cleveland Clinic in the US. to support the recovery of Long COVID patients. Patients with long COVID syndrome interested in lifestyle support can be referred to Integrative Medicine for additional support.</p> <p>One-on-one IM consults are limited by insufficient time to discuss materials and infrequent visits hinder longitudinal support. A 6-week longitudinal group visit (aka SMA) was established to provide peer to peer support and time to discuss lifestyle interventions (117).</p> <p>More women than men experienced Long COVID syndrome (118) and related mental issues such as anxiety and depression (119). This trend was observed in the SMA participants. Post-study questionnaires showed significant improvement in disease burden after IM treatment, but the improvement in mental and physical health was not statistically significant. Limitations in the study include small sample size, lack of control, and insufficient time to make lifestyle changes.</p>	

<p><b>Presenters</b>  Cecilia Plaza Bobadilla, MD  Monica A. Galanti de la Paz, MD  Elizabeth Margarita Gonzalez Quinteros, PsyD</p>	<p><b>APEC Economy</b>  Chile</p>
<p><b>Presentation Summary</b></p> <p>There was a lack of dedicated time and space to care for the health workers whose jobs were highly stressful during the COVID-19 pandemic. This may cause healthcare workers to suffer long-term repercussions. In Chile, a sonotherapy (sound therapy) program was put in place for improving healthcare workers’ mental health, emotional stability, and psychological coping abilities.</p> <p>Sonotherapy is an ancient practice that uses voice or musical instruments to generate vibration (sympathy resonance) that may benefit the body. Benefits of sonotherapy include relaxation, pain relief, stress relief, and emotional regulation. The intervention was complemented with yoga and Tai Chi workshops via Zoom.</p> <p>It was a collaborative work provided by the Chile Department of Quality of Life, Worker Health, and Complementary Medicine. Health workers who have been trained as therapists in complementary medicine were used as providers. There was a high participation rate in the program, and participants had positive evaluation of the interventions.</p> <p>Certain challenges still exist for this program: There is a need for formalized health workers’ space. Maintaining a complementary medicine intervention for health workers and the services they provide can be challenging. And there is a need for more trained local therapists to provide the interventions.</p>	
<p><b>Day 3, Session 2: How Each APEC Economy will Develop Individual Action Plans for Implementation on COVID-19 Care</b></p>	
<p><b>Presenter</b>  Richard C. Niemtzow, MD, PhD, MPH</p>	<p><b>APEC Economy</b>  United States</p>
<p><b>Action Plan</b></p> <p>After the workshop, what we can do to perpetuate the outcome of the workshop is to systemically review and incorporate the workshop outcomes into the Recommendation and Guidelines (R&amp;G) for COVID-19 Care, a publication that healthcare workers and patients can read. Many of our colleagues would like to know the information transpired during the workshop.</p>	

<p><b>Presenter</b> Yi-Chang Su, MD, PhD</p>	<p><b>APEC Economy</b> Chinese Taipei</p>
<p><b>Action Plan</b></p> <p>After the COVID-19 outbreak, our Central Epidemic Command Center (CECC) formulated guidelines for epidemic prevention and medical care, including the prevention and treatment of SARS. But it was a pity CECC did not include TCM members, so the role of TCM and IM in epidemic prevention has not been considered.</p> <p>Based on the treatment and prevention of SARS epidemic in 2003, we first established a guideline for treating COVID-19 using TCM. I championed joined research by clinicians, scientists, and industry to develop TCM drugs to treat COVID-19. I also helped establish a collaborative research platform of TCM and western medicine to care for COVID-19 patients. We obtained Emergency Use Authorization in Chinese Taipei for NRICM101, and we also developed NRICM102 for severely ill patients. It is estimated that 3 million people worldwide have been treated with NRICM101 and NRICM102 till now.</p>	
<p><b>Presenter</b> Khwanchai Visithanon, MD</p>	<p><b>APEC Economy</b> Thailand</p>
<p><b>Action Plan</b></p> <p>Community participation is important to prevent and control COVID-19. In Thailand, we need to reflect on and evaluate our experience, develop an effective public health policy for combatting COVID-19, and research on how to best integrate traditional and conventional medicine.</p> <p>Our ancient textbooks documented that our ancestors used many types of herbs to fight off infectious diseases. We were able to bring the existing traditional medicine knowledge into our clinical research for developing COVID-19 medicines. We are impressed with the herbal medicines Chinese Taipei and other economies effectively used on COVID-19 patients. In addition, most of our clinical and pharmaceutical research use crude forms of herbs, but Japan, Republic of Korea, and Chinese Taipei have experiences in using extraction of traditional medicine. We would like to learn from them and maybe form collaborative research in the future.</p>	

<p><b>Presenter</b> Danang Ardiyanto, MD, MKM</p>	<p><b>APEC Economy</b> Indonesia</p>
<p><b>Action Plan</b></p> <p>There are several factors to consider in the IM area:</p> <ol style="list-style-type: none"> <li>1. The safety of the IM products should be guaranteed. The use of IM and herbal medicine on COVID-19 has been focused on the symptoms. Benefit has been seen on the chronic and long COVID-19 rather than the acute phase.</li> <li>2. Evidence of efficacy and safety of IM, especially herbal medicine, should be based on clinical trials. Preclinical studies should show promising data before the research progresses into the next phases. In Indonesia, there is a lack of such evidence.</li> <li>3. The molecular mechanisms of herbal medicine in treating COVID-19 are still unclear. The potential danger of using such treatment should be recognized. Herbal medicine is over-the-counter (OTC) and can be accessed without prescription. Patients can use it for self-treatment without doctors' prescriptions. However, herbal medicine should not be used in urgent cases, because delaying getting the right treatment prolongs the recovery process and can even be fatal. The safe practice of IM should be communicated to the public. FDA approved medicines should be considered first.</li> <li>4. There are big opportunities for research collaboration among APEC members. Let us share our experience and increase capacity building.</li> </ol>	
<p><b>Presenter</b> Hiroshi Yotsuyanagi, MD</p>	<p><b>APEC Economy</b> Japan</p>
<p><b>Action Plan</b></p> <p>I would like to stress three points on how each APEC economy develops individual action plan for implementation of COVID-19 care:</p> <ol style="list-style-type: none"> <li>1. Promote vaccination. Vaccination boosts immune system, reduces symptoms, and decreases the frequent of Long-COVID. Therefore, continued vaccination is very important.</li> <li>2. Care for infected persons. In Japan, some patients are cared for at home. We allow homecare patients to log in online or call in to receive support from local institutions and hospitals. Such a system is important for patients to receive family and community support.</li> <li>3. Manage Long COVID. IM can be the most effective for Long COVID. Many APEC members have mentioned this in the workshop. Functional food, acupuncture, massage, etc. have been implemented in many economies, but without clinical trials, the effectiveness of such an approach has yet to be demonstrated. We need criteria for endpoints and should consider using objective physical findings, laboratory findings, in addition to subjective symptoms in the evaluation items.</li> </ol>	

<b>Presenter</b> Myeong Soo Lee, PhD	<b>APEC Economy</b> Republic of Korea
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**Action Plan**

There are four steps in Korea’s action plan:

1. Establish the evidence of herbal medicine for COVID treatment. This part has been finished in 2022 (120, 121).
2. Analyze cases where traditional medicine was used for infectious diseases. I presented the results yesterday. It is nearly finished.
3. Establish a Korean herbal medicine platform for managing infectious diseases based on eosinophilic chronic rhinosinusitis.
4. Implement a clinical decision support system to respond to new infectious diseases. Establish an economy-wide response system with information and communication technology (ICT) infostructure for standard clinical practice guidelines and pathway regarding infectious diseases.

Steps 3 and 4 are ongoing. Results are expected in 2023.

<b>Presenter</b> Martha Villar Lopez, MD	<b>APEC Economy</b> Peru
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**Action Plan**

Complementary medicine contributes to the treatment of COVID-19, especially for MM symptoms.

1. IM promotes health, self-management and well-being and offers a support network for lifestyle change. Additional networks for those who are at risk are encouraged.
2. IM promotes health-maintaining activities, for example, increased consumption of grains, seeds, fresh fruits, and decreased consumption of fried food, sugar, pastries, and salty foods.
3. IM builds resilience and stress management skills and helps achieve healthy interpersonal relationships. Interventions with yoga, Tai-chi, and qigong can strengthen patients’ immunity. Singing, dancing, and having pets or plants can boost identity and self-esteem.
4. Interventions with yoga, Tai-chi and qigong can strengthen patients' immunity. Singing, dancing, and having pets or plants can decrease anxiety and depression.
5. Acupuncture, music therapy, aromatherapy, magnet therapy, homeopathy, meditation, and prayer, among others, are activities that can be used for rehabilitation, palliative care, and dignified death.
6. Further research is needed to elucidate the role of herbal plants in the prevention, comprehensive care, and rehabilitation of COVID-19 patients, including those with post-COVID symptoms.
7. Virtual communication is good for answering questions and educating people, but it cannot replace person-to-person communication, especially when it comes to diagnosis and treatment.

<b>Presenter</b> Cecilia Plaza Bobadilla, MD	<b>APEC Economy</b> Chile
<p><b>Action Plan</b></p> <p>One of the fundamental pillars to contribute to health promotion and prevention is to improve the access of workers to practice supporting their recovery and promote their health.</p> <p>One of the things we learned during the pandemic of SARS-CoV2 is the opportunity for implementing self-care, inter-care, and co-care strategies for healthcare teammates, and understanding the role of IM in reaching these objectives.</p> <p>One central plan we propose is to take care of the healthcare teams, starting with addressing their needs, giving access to a self-care and collaborative care strategy using IM, and then opening this strategy for patients. We aim to cultivate a wellbeing culture for the entire community, and to achieve that objective it is essential to start with healthcare teams.</p> <p>One of our strategies is three-pronged: promoting the use of Complementary and Integrative Medicine (CIM) practices by our therapists, implementing structural changes, and protecting time for the self-care and co-care of healthcare teams.</p> <p>Adding, different medical schools of universities in Chile, are already developing strategies for cultivating wellbeing practice, raise awareness for self-care and patient care, and center on compassionate self-care, self-awareness, where IM practices offer concrete tools for reaching this target.</p>	

<p><b>Presenter</b> Hernan Jose Garcia Ramirez, MD</p>	<p><b>APEC Economy</b> Mexico</p>
<p><b>Action Plan</b></p> <p>The Directorate of Traditional Medicine of the MOH of Mexico carried out an immediate response to the COVID-19 pandemic, with messages for the population and for clinical and epidemiological management (with the support of regional intercultural coordinators in government health services). We achieved some impacts in the incidence rate in some places, especially with health personnel, giving us a time to learn and respond. In Mexico, the traditional medicine of indigenous peoples, traditional herbalism, homeopathy, and acupuncture, are legally recognized and can be used to provide alternative care during the pandemic. We identify and recommend the contribution of Integrative Medicine to the central health system. Approaches that contribute to strengthening people’s health were incorporated, with an immune-stimulating diet, physical activity, and a positive emotional state.</p> <p>We also bring health care closer to indigenous peoples, developing a specific protocol (114) that promotes listening to their fears and the collective construction with them of different strategies, including the use of their herbal medicinal remedies, as therapeutic alternatives and symptomatic management which has also been identified and promoted by the Traditional, Complementary and Integrative Medicine Network of the Americas, sponsored by Pan American Health Organization (PAHO).</p> <p>Recommendations (114) were formulated and disseminated through campaigns directed by the intercultural coordinators of the government health services that exist in the different states of Mexico (local economies). Although it was not possible to carry out a formal investigation of the outcome, we consider the strategies developed and promoted on these issues by the Ministry of Health valuable. Thanks to this workshop, we learned that other APEC members also implemented very valuable initiatives. I will take all the experience and the elements to continue and strengthen our work in Mexico.</p>	

<b>Presenter</b> Cecilia C. Maramba-Lazarte, MD	<b>APEC Economy</b> The Philippines
<p><b>Action Plan</b></p> <p>We did the clinical trial on one of our herbal medicines, Vitex negundo, on mild COVID-19 with no comorbidities.</p> <p>Prior to this study, Lagundi’s constituents had been identified, and pre-clinical data had shown pharmacology and its bronchodilator and anti-inflammatory activities. Lagundi had been registered as a tablet and a syrup in our essential medicine list in the Philippines.</p> <p>Computational and in silico studies indicated that Lagundi has possible antiviral activity and strong affinity for three potential COVID-19 targets. Therefore, we embarked on a 2-stage, randomized, double-blind, placebo-controlled clinical trial to investigate the safety and efficacy of Lagundi in its tablet and syrup forms on mild COVID-19 patients without comorbidities.</p> <p>Our results showed that anosmia and total symptom score in the Lagundi group were significantly better. There were no statistically significant differences in other symptoms, although we think the differences may be clinically significant. Because of the study outcomes, Lagundi has been included in the homecare kit and insurance coverage in the Philippines. Many people and economies are now more open to IM than ever. We should take this opportunity to move IM forward.</p>	
<p><b>Day 3, Closing Session</b></p>	
<b>Presenter</b> Pongsadhorn Pokpermddee, MD	<b>APEC Economy</b> Thailand
<p><b>Closing Remarks</b></p> <p>First, I would like to thank the speakers, the panelists, and the host for conducting such a productive workshop.</p> <p>Second, IM plays essential roles during the COVID-19 pandemic. More people are using holistic approaches for their health issues. IM is an alternative way to cure diseases and to improve health. It would be useful for the APEC members to apply the knowledge to their contexts.</p> <p>Third, I remember one thing that my master told me: Our society has problems. There are known and unknown, and there are action and inaction. Once we know and then we act, everything will be better.</p>	

<b>Presenter</b> Richard C. Niemtzow, MD, PhD, MPH	<b>APEC Economy</b> United States
<p><b>Closing Remarks</b></p> <p>To summarize the 3-day workshop, there are several perspectives that I will comment on:</p> <ul style="list-style-type: none"> <li>• During the 3-day workshop, we have taken a panoramic view of how IM plays a role in COVID-19, especially in the chronic, symptomatic COVID-19 patients.</li> <li>• IM may not take the place of classical western medicine during life-saving resuscitation and life-saving stabilization; however, IM may mitigate significantly the psychological and physical aspects of stress and pain associated with COVID-19. For this reason, discussion of the role of IM in the current world environment has been warranted. In particular, evidence has demonstrated the effectiveness of specific techniques supporting the use of IM.</li> <li>• The rescue, intervention, and treatment of COVID-19 patients, or even people who suffer due to other natural disasters, must be coordinated with a lead agency that is recognized and responsible, such as the APEC group.</li> <li>• It cannot be an ad-hoc effort; rather, it must be one that has been conceptually established, and the medical care recommended must meet, at a minimum, the local and international standards of patient care.</li> <li>• In conclusion, the workshop demonstrated that several IM products and practices could provide valuable adjunctive approaches to strategies used for the treatment or palliation of COVID-19. These IM approaches are usually inexpensive, nontoxic, inherently low risk, and do not require complicated delivery methods. They can be pushed far forward in urgent and catastrophic events when other resources cannot be delivered. Such approaches may provide significant and rapid relief for patients and their caregivers. These approaches should be invested further and systematically categorized into best practices. In addition, APEC healthcare providers of IM techniques should be advocating and building community resilience for future natural pandemic and natural disasters. Second, IM plays essential roles during the COVID-19 pandemic. More people are using holistic approaches for their health issues. IM is an alternative way to cure diseases and to improve health. It would be useful for the APEC members to apply the knowledge to their contexts.</li> </ul>	

<b>Presenter</b> Libin Jia, MD	<b>APEC Economy</b> United States
<p><b>Closing Remarks</b></p> <p>We had a very productive workshop. Thanks to all the speakers for their interesting presentations, session chairs for their hosting, and audiences for their participations and discussions. We have participants from Canada, Chile, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, Peru, The Philippines, Chinese Taipei, Thailand, USA, Viet Nam to join this APEC workshop. Thank you all for your interest, support, and contributions.</p> <p>At this workshop, we have achieved the following goals:</p> <ul style="list-style-type: none"> <li>• Exchanged evidence-based and science-based information on studies and projects from different APEC economies on IM for COVID-19 Care. Many IM approaches including effective products and methods showed that the IM could play effective roles for COVID-19 care, especially for patients with long haul symptoms.</li> <li>• Demonstrated IM’s functional roles on COVID-19 care by itself, and by combining with conventional medicine for better and more efficient outcomes. IM could also be used for the management of other infectious diseases, and chronic diseases.</li> <li>• Created collaborative opportunities for involved APEC economies on IM for COVID-19 Care. Many speakers have expressed strong interest in potential collaboration on several products, procedures, and methods from IM on COVID-19 cares presented at this workshop.</li> <li>• Promoted the development of individual action plans from 10 APEC economies that the project participants can take to their home economies to implement.</li> <li>• Eventually, the outcomes from this workshop will benefit COVID-19 patients, promote better healthcare delivery, and enhance economic recovery and development for APEC economies.</li> </ul>	

This workshop provided a panoramic view of the roles of IM on COVID-19 care during the pandemic, especially in chronic COVID-19 patients. The workshop findings demonstrated that IM approaches have provided valuable strategies for the treatment or palliation of COVID-19 patients. Certain IM approaches are generally affordable and require less complicated delivery methods. Thus, wide adoption of IM practices can reduce cost of care, increase medicine accessibility, and improve the overall care efficiency and efficacy. Herbal medicine NRICM101 and NRICM102 have brought extensive attentions with suggestive future collaborations. Different IM tools and approaches brought interest to participating APEC members. Economies like Mexico targeted the indigenous population using IM on COVID-19 care. Potential collaborations on different topics using IM on COVID-19 were discussed. Issues and challenges on IM on COVID-19 care include more needs from government support and insurance coverage.

The project achieved the following goals:

1. Running on schedule, meeting the budget, and achieving the targeted outcomes.
2. The project achieved acceptable gender balance with 38% of the speakers being female with the overall goal being 40%.

3. Thirteen APEC economies joined the project and workshop. Speakers from 10 APEC economies gave presentations, joined discussions, and established an action plan for IM on COVID-19 care. Over 102 people participated in the three-day workshop.
4. APEC Policy Support Unit's Senior Analyst Emmanuel A. San Andres attended the workshop. APEC HWG Chair Dr Pongsadhorn Pokpermddee provided the closing remarks.

Certain challenges exist around the implementation of IM including the need for well-controlled clinical trials to demonstrate the efficacy and safety of IM scientifically. A lack of such evidence may prevent IM from gaining wider recognition and future development. Moreover, it is needed to have well-established legal frameworks that allow IM practices to obtain reimbursement from health insurance are warranted.

Despite these challenges, there are enormous opportunities for collaborative research amongst the APEC members on IM for COVID-19 care and other diseases, especially for clinical trials. However, such collaborations cannot be an *ad-hoc* effort. Rather, they should be coordinated by a larger organization such as APEC that is recognized and responsible.

## Post-Workshop Activities

### 1. Feedback and Suggestions

Following the completion of the Workshop, all participants were asked to evaluate the program as delivered and offer suggestions for improvement of future Workshops.

Most participants agreed that:

- The objectives were clearly defined and achieved;
- The contents were well-organized and easy to follow;
- The speakers and facilitators were well-prepared;
- The topics covered, particularly for Long COVID, were very relevant to the member economies; and
- There was a beneficial exchange of best practices of IM for COVID-19 care.

There were several improvements recommended for future Workshops, including:

- Building in more pre-Workshop meetings, roundtable discussions and break-out sessions,
- Sharing slides before or after the Workshop (with speakers' permissions);
- Releasing the topics/titles for the presentations in advance of the Workshop;
- Allocating more time for each presentation and for open discussion;
- Streaming the Workshop in real-time to allow more people to participate in the live program, if permissible by APEC; and
- Expansion of discussion on gender-related issues.

Participants also provided several action items to consider following the Workshop including:

- Publication of the workshop findings or summaries;
- Collaborative research on IM among APEC members;
- Development of international IM courses;
- Compilation of IM glossaries;

- Building a worldwide network for IM;
- Establishing central government and international policies on IM;
- Developing new procedures to combining IM and western medicine;
- Raising global awareness on IM;
- Establishing APEC guidelines on the inclusion/exclusion criteria and endpoints for clinical trials; and
- Including more audiences (universities, research institutes, and more APEC economies) for the workshop such as this one and others in the future.

## **2. Recommendations and Guidelines for IM and COVID-19 Care**

One of the main outputs of the project and Workshop is the development and publication of ‘Recommendations and Guidelines for IM and COVID-19 Care’ which will be a separate official document.

This document will discuss the following:

1. The background and needs of IM for COVID-19 care;
2. Emerging evidence-based procedures, tools, and systems of IM for COVID-19 care;
3. Strategies to effectively combine IM and conventional medicine for COVID-19 care;
4. Strategies to support developing APEC economies in their use of IM for COVID-19 care;
5. Challenges and opportunities of IM for COVID-19 care;
6. The future development of IM for COVID-19 care; and
7. Suggestions on how APEC can do more to support IM for COVID-19 care.

## **3. Establishment of IM and COVID-19 Care Working Network**

For continuing having more effective communications on IM and COVID-19 care, and promote collaborations in the area among APEC economies, with the willingness and support from speakers of the Workshop, a working network of IM and COVID-19 care has been established. It will play roles for potential future works and activities as suggested on the list above.

## **Conclusion**

This project report provides an overview of efforts to foster open discussion and collaboration among medical providers, researchers, policy makers and government officials in APEC economies around IM approaches to COVID-19 care. These efforts are expected to promote action in APEC economies regarding IM and COVID-19 care to improve the quality and efficiency of interventions for COVID-19 management. While the COVID-19 pandemic has brought significant challenges to various APEC economies, it has also provided an opportunity to transform conventional healthcare interventions and delivery models to include IM approaches for the improvement of patient outcomes. Program efforts will promote open discussion across APEC economies to support international collaborations, build trust and establish policies for areas such as data collection and sharing, laboratory testing and symptom reporting. Long-term, these efforts will be a call-to-action for the establishment of international frameworks which are presently lacking, but desperately needed to support global collaboration and public health. The efforts documented in this report will facilitate collaborations among APEC economies around clinical care, research, and healthcare policy for IM and COVID-19 care, and position APEC as a leader in emerging strategies to combat this global pandemic.

## Acknowledgements

The project organizers are appreciative of the support and enthusiasm of all participating APEC economies and their respective representatives including:

**Chile:** Cecilia Plaza Bobadilla, MD, Monica A. Galanti de la Paz, MD, Elizabeth González Quinteros, PsyD

**Indonesia:** Rusmiyati Hardjoutomo, MD, Danang Ardiyanto, MD, MKM, Peristiwa Ridha Widhi Astana, MD, Herma Trilas

**Japan:** Hiroshi Yotsuyanagi, MD

**Republic of Korea:** Myeong Soo Lee, PhD

**Mexico:** Hernan Jose Garcia Ramirez, MD

**Peru:** Martha Villar Lopez, MD

**The Philippines:** Cecilia C. Maramba-Lazarte, MD

**Chinese Taipei:** Jun-Yang Liou, PhD, Yi-Chang Su, MD, PhD, C. Jason Wang, MD, PhD, Chien-Yu Lin, MD, Wei-Zhen Yang

**Thailand:** Khwanchai Visithanon, MD, Jagravudh Puagkong, MD, Anchalee Chuthaputti, PhD, Julalak Chokpaisarn, PhD, Pongsadhorn Pokpermddee, MD (Director, APEC Health Working Group), Benjama Boonterm

**United States:** Libin Jia, MD, Jeffrey D. White, MD, Jeffrey A. Dusek, PhD, Joel M. Evans, MD, Michelle Beidelschies, PhD, Richard Niemtow, MD, PhD, MPH, Songxuan Zhou Niemtow, MD, Charles Wu, PhD, Yufang Lin, MD, FACP, FAAP

We also want to thank Program Director Ms Aurora Wanmei Tsai and Program Executive Ms Nor Chahaya binte Subari of APEC Health Working Group for their help on this project.

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