



# MEDEA SURVEY REPORT

Prepared for  
Asia Pacific Metrology Programme (APMP)  
Asia-Pacific Legal Metrology Forum (APLMF)

Prepared by  
MEDEA Coordination Committee

7<sup>th</sup> October 2020

(Revised Version)

## **Members of MEDEA Coordination Committee**

Mr Stephen O'Brien, President of APLMF  
Ms Alli Smith, APLMF Secretariat  
Ms Marian Haire, APLMF WG Chair Training  
Ms Haslina Abdul Kadir, APLMF WG Chair QMAP  
Ms Juan (Ada) Cai, APMP Secretariat  
Dr Angela Samuel, APMP DEC Chair  
Dr Chu-Shik Kang, APMP Lead TC Chair  
Dr Victoria Coleman, APMP Lead TC Chair elect  
Dr Charun Yafa, APMP MiC Focal Person  
Mr Abdul Rashid Zainal Abidin, PTB consultant  
Ms Corinna Weigelt, PTB Project Coordinator  
Ms Anne Höpfner, PTB Project Assistant

## Table of Contents

1.0 Summary and Recommendations.....	4
2.0 Introduction .....	6
3.0 Survey Methodology.....	6
4.0 Readiness for On-line Collaboration and Video Conferences .....	7
5.0 Availability of E-learning Materials .....	8
6.0 COVID-19 Impacts on NMIs/LMAs Operation .....	10
6.1 Main challenges of NMIs/LMAs facing the impact of the COVID-19 outbreak.....	10
6.2 BIPM's Repository of NMI's Actions on COVID-19 .....	10
7.0 Prioritizing of SDGs Topics for Future MEDEA 3.0 .....	16
8.0 Discussion.....	16
8.1 Readiness among members for on-line collaboration and video conferences.....	16
8.2 Materials on e-learning .....	17
8.3 Sharing of COVID-19 experiences.....	17
8.4 Prioritization of SDGs.....	18
9.0 Conclusions .....	18
Acknowledgements.....	18
References .....	18
APPENDIX A.....	20
APPENDIX B.....	21
APPENDIX C.....	22

## 1.0 Summary and Recommendations

This report covers the findings of the MEDEA survey that aims to capture APMP and APLMF members' inputs on the following topics:

- 1) Readiness for virtual communication;
- 2) Availability of e-learning materials for sharing;
- 3) The impact of COVID-19 pandemic on institutions; and
- 4) The UN's 2030 Agenda for Sustainable Development Goals (SDGs) initiatives relevant to their economies.

MEDEA CC invited the respondents to provide their inputs during the period of 25th May 2020 to 2nd June 2020. This report also incorporates information from other stakeholders such as the BIPM and the OIML to share and compare experiences and lessons learned concerning the pandemic.

No area, including metrology, has been spared the impacts of the COVID-19 pandemic. Therefore, the survey was timely and very useful. The results have provided insights on how the metrology community in the region should work together to recover the work of metrology. The spread and diversity of the Asia-Pacific region demand that members have to improve their virtual collaboration skills using web-based platforms. The results also indicate the limitations of developing economies in terms of stable internet infrastructure. The results also highlight how different NMIs and DIs are responding to the pandemic. Sharable e-learning materials should be the way forward for the sustainability of knowledge for the new generation of metrologists.

MEDEA is also on the right track to focus on the SDGs. For their own economies, members have selected the SDGs that are closely linked with economic growth, social well-being, and a clean environment. APMP and APLMF, as the regional leaders, would play their roles to coordinate and provide the focus on recovery efforts based on sound metrological practices.

The following recommendations are made based on the findings of the survey and the subsequent discussion topics.

### **Recommendation 1 (On virtual communication and collaboration)**

Zoom and equivalent platforms were already successfully used for virtual meetings in the region. The same is also true for webinars. These are viable solutions in lieu of normal face-to-face engagements. TCs, FGs and WGs can also adopt virtual communication for their technical activities.

### **Recommendation 2 (On e-learning)**

E-learning materials that have been reported through the survey and also available at OIML and APLMF websites can be shared by all and captured by KMS. This is recommended to avoid reinventing the wheel and perhaps new modules can be developed by joint efforts of

developing and developed NMIs. The hardware and software tools for producing e-learning materials need to be understood well including the cybersecurity issues. Materials that include test modules and generation of certificates were welcomed by some respondents for proofing of competency. This is already practised by NPL, UK in their e-learning offers. APMP can set up a dedicated group to look into e-learning that covers scientific and industrial metrology applications.

### **Recommendation 3 (On measurement needs related to COVID-19)**

On COVID-19 measurement matters, it is clear that the accuracy and traceability of IR thermometers are issues that can be addressed by APMP for the benefits of its members particularly those from the developing economies. Other than IR thermometers, flow measurement for ventilators/respirators, testing of PPE and production of reference materials are also areas to be considered.

### **Recommendation 4 (On pattern approval and verification of IR thermometers)**

There is a need in Sri Lanka to pattern approved and verify IR thermometers. APLMF is in the best position to provide guidance on this need.

### **Recommendation 5 (On getting the traceability of national measurement standards during the pandemic)**

Many developing NMIs obtain the traceability of their national measurement standards from higher echelon NMIs in the region and from the BIPM. The COVID-19 pandemic has limited the number of flights available and due to high demand, the fee for cargo is getting expensive. This situation is also impacting the accreditation community as accredited laboratories need traceability of their laboratory standards for services. In the case of budget cut, traceability issue can be severe. APMP is recommended to have a discussion with its members to share their experiences on this issue.

### **Recommendation 6 (On MEDEA proposal to adopt SDGs in the next project plan)**

Some SDGs topics are presently relevant to Focus Groups initiatives. A discussion with Focus Group Chairs may find good synergy with MEDEA 3.0 proposal. Further, the results of the survey as in Table 9 indicate that highest priorities were given to SDG 9 (Industry, innovation and infrastructure), SDG 3 (Good health and well-being) and SDG 7 (Affordable and clean energy). SDG 6 on clean water received only 2 votes. Latest reports on status of SDGs by UN and other relevant bodies should be consulted so as to have a feel of what is happening at government's level. NMIs and LMAs should also be aware of their governments' efforts and how metrology can contribute to those efforts.

### **Recommendation 7 (On actions to be taken by the APMP and APLMF)**

In Boxes 1 and 2 of this report, respondents indicated their expectations of APMP and APLMF support for them on digital knowledge sharing/collaboration tools and on impact of the COVID-19 outbreak. In Box 5, there were proposals by respondents on the content of the proposed COVID-19 forum. APMP and APLMF CCs are recommended to follow-up on these.

## 2.0 Introduction

The current COVID-19 pandemic has resulted in the rescheduling of many of the planned activities of the MEDEA 2.0 Project. This situation has a direct impact on the utilization of the budget allocated for the various activities as there is a time limit for the disbursement of the said budget. Specific activities that have been affected include workshops and trainings under both APMP and APLMF, KRISS-GMA technical trainings and CABUREK Asia-Pacific<sup>1</sup> workshops.

Besides discussions on COVID-19 impacts on the overall MEDEA Project, the MEDEA Coordination Committee (CC) was also deliberating on the design of the MEDEA 3.0 Project that will succeed MEDEA 2.0 Project after April 2021. MEDEA 3.0 will focus on capacity building measures to assist members to contribute to their economy's priorities in relation to key UN Sustainable Development Goals (SDGs).

In view of the above developments and the current difficult and unusual situation, the MEDEA CC took the immediate step to develop a questionnaire designed to capture members' inputs in the following key areas:

- 1) Understand what access/capacity members have to using virtual and/or digital collaboration tools;
- 2) Availability of e-learning tools among members;
- 3) Understand how members' institutes are dealing with the consequences of Covid-19 in terms of the issues that have arisen, support being provided to domestic stakeholders, lessons learned and how APMP and/or APLMF could support them; and
- 4) Obtain information on members' economies priorities in relation to the identified UN SDGs to maximise alignment of MEDEA 3.0 with these priorities.

## 3.0 Survey Methodology

The link to the on-line questionnaire was circulated to APMP and APLMF members on 25<sup>th</sup> May 2020 with a deadline for submission of inputs by 2<sup>nd</sup> June 2020. A pdf version of the questionnaire was also included with the announcement as an aid for preparation of responses. On-line electronic data and manual responses by email were collected for evaluation. The APMP and APLMF member institutes that have provided inputs are listed in Appendix A.

In addition to the main MEDEA findings, this report is also incorporating results from the BIPM and CABUREK Asia-Pacific surveys with regard to COVID-19 experiences. Inclusion of these additional results would be very useful for knowledge sharing and comparison purposes. Respondents' comments and suggestions that require APMP/APLMF actions are reproduced in Boxes 1, 2 and 4 in the following pages. The final tally of the MEDEA survey is as follows:

- a) Total number of respondents: 77
- b) Number of respondents from Developed Economies: 15

---

<sup>1</sup> There is also an on-going CABUREK Project in the SIM region.

- c) Number of respondents from Developing Economies: 62
- d) Number of institutes (NMI, LMAs and DIs) providing inputs: 34

## 4.0 Readiness for On-line Collaboration and Video Conferences

Tables 1 and 2 present the responses from all respondents regarding the new way of communication following the limitations imposed by the pandemic. On average, more than 80 % of respondents are ready for on-line collaboration and video conferences. This is also an indication of the alternative ways that can be used even when the pandemic has been alleviated.

**TABLE 1** Recommendation by members for using on-line platforms

Questions	Responses	Percentage
Recommended videoconference software to use in MEDEA 2.0	Zoom	58 %
	Microsoft Teams	30 %
	Skype	22 %
Recommended collaboration or learning tools to use in MEDEA 2.0	Video of lectures	42 %
	Webinar	39 %
	Self-Test	30 %

**TABLE 2** Readiness among members for on-line collaboration and video conferences

Questions	Strongly agree	Agree	Strongly Agree + Agree	Neither agree nor disagree	No opinion	Disagree	Strongly disagree
I am ready to participate in online webinars.	40 %	43 %	83 %	7 %	7 %	0 %	0 %
I am ready to take part in videoconferences.	38 %	46 %	84 %	7 %	7 %	0 %	0 %
I am ready to participate in online discussion fora or chatrooms.	34 %	48 %	82 %	9 %	7 %	0 %	0 %
I am ready to register on web pages with my email address (to enable online collaboration)	35 %	42 %	77 %	9 %	7 %	1 %	0 %
Are IT and data security important to you?	56 %	36 %	92 %	3 %	1 %	0 %	0 %

#### BOX 1

##### **Responses from the MEDEA survey to the question “What else should be considered when APMP, APLMF and/or the MEDEA project offer digital knowledge sharing or collaboration tools?”**

- Time zones are a real challenge even within the region, let alone with APMPs Associate Members located around the globe.
- Ease of downloading and uploading relevant documents prior to any conference Provision of word copy of surveys to facilitate coordination of responses within the organisation.
- Online field training exercise with discussions.
- Readiness of participant's facilities.
- APMP/APLMF and MEDEA should have more grant for training in specific technical area.
- IT and data security.
- Live sessions should be made available on alternative channels (e.g. zoom webinar streamed to YouTube) for participant who might have problem using one of the applications, and recording made available to participants who can't attend at the scheduled time.
- Share material and submit assignments, recorded lectures and live video conference for question and answer sessions.
- Recruiting officials who attended meetings and training in the wrong way did not work.
- 'MS Team' platform can also be considered.
- Maybe the emphasis should be put more non-interactive live content as internet connections in some APEC countries are not reliable for webinar or teleconference. Live chat is the better option.
- Participation through the messenger (video call) in Facebook if it is possible from your end.
- Need to consider the ability of interested organization preparing tools/hardware (i.e. computer etc.) required by MEDEA software.
- Provide the video record downloaded for those couldn't join the meeting. Even after the COVID-19 epidemic and the travel ban was removed, the video record downloading would expand influence by costing nothing.
- Practical field training videos will help in understanding the subject better.
- The lecture presentation should be given to the participants the day before the meeting is conducted. E-certificate should be provided for the participants. Online list of attendees also should be provided.
- I think most the learning will be successful by online but most of the metrology training and workshop have practical sessions. I have doubt to acquire practical knowledge in online session.
- Even online practical demonstration and technical discussions would be very useful in this critical situation of COVID-19 pandemic.
- Please make the materials downloadable (video, manuals and ppt file).

## 5.0 Availability of E-learning Materials

The availability of e-learning materials and tools that can be shared with or subscribed by members should be a welcomed alternative to face-to-face interaction during the pandemic restrictions. In Table 3, a listing of the e- learning materials already developed or currently under development is given. There is a good mixture of legal metrology and scientific metrology materials.



**TABLE 3** E-learning materials already developed or currently under development

Institute/Economy	Metrology Subject	Possibility of Sharing
NMIA, Australia	Verification of fuel dispensers. E-learning for verifiers: non-automatic weighing instruments, fuel dispensers, point of sale systems. E-learning for weighbridges operators in Australia.	Yes
NPL, UK	A range of on-line courses via web-site.	Yes
CMS, Chinese Taipei	Already developed, but subject to copyright.	
NMC, Singapore	Electrical, RF, microwave, time & frequency, dimensional, optical radiation, mass, pressure, vibration, acoustics, flow, pressure, force, temperature, humidity, gas. Target industries include testing, inspection and certification industry.	
NIMT, Thailand	On-line calibration courses for industrial sectors.	Yes
DOM, Indonesia	Legal metrology testing of measuring instruments. Repair of mechanical balances. Existing materials under Me You Channel on YouTube.	Yes
NML, Philippines	Introduction to metrology. Basic principles of measurement uncertainty for private calibration laboratories.	Yes
MASM, Mongolia	General theory of metrology, electricity, mass, heat, pressure, volume and length.	
SNSU-BSN, Indonesia	Can be assessed at <a href="https://elearning.bsn.go.id/">https://elearning.bsn.go.id/</a> Introduction to Metrology.	Yes
NMIM, Malaysia	Basic gas chromatography and analysis.	Yes
MUSSD, Sri Lanka	Basic metrology, uncertainty calculation, legal metrology type approval, verification of vehicle emission testing equipment, non-automatic weighing instruments and taxi meter.	Yes

**Note:** Organisations such as SNSU-BSN, DOM, MASM and NIMT have produced their e-learning materials in their own national languages (Indonesian, Mongolian and Thai respectively). While the majority of the institutes are willing to share their materials, others may subject their materials to copyright and fee.

## 6.0 COVID-19 Impacts on NMIs/LMAs Operation

In this section, the results of the MEDEA and the BIPM surveys on COVID-19 impacts will be discussed. For comparison purpose, the questions that have been asked by MEDEA, SIM and CABUREK Asia-Pacific to their members are listed in Appendix B.

### 6.1 Main challenges of NMIs/LMAs facing the impact of the COVID-19 outbreak

The challenges faced by the NMIs/LMAs in the Asia-Pacific region during the pandemic are listed in Box 3.

### 6.2 BIPM's Repository of NMI's Actions on COVID-19

The CIPM President has asked NMIs to share examples of how their work is supporting the fight against the pandemic – for example by applying expertise in measurement science to assist with the development of personal protection equipment, medical devices, certified reference materials or have joined efforts to find a vaccine. The details can be assessed from this link: <https://www.bipm.org/en/worldwide-metrology/covid-19-metrology.html>.

The responses received from the BIPM's member states' NMIs are listed below.

#### A. Ventilators/respirators

**BEV, Austria:** Set up a test centre for Corona SARS-Cov-2 pandemic respirators (CPA)

**CENAM, Mexico:** Collaboration in the development and testing of ventilators in Mexico in response to COVID-19

**INMETRO, Brazil:** Support in the development of pulmonary ventilators

**INTI, Argentina:** Progress towards an alternative respirator

**NPL, UK:** Support to industry in the production and supply of ventilators

**NRC, Canada:** Testing of N95 respirators in support of COVID-19 challenge programs at the NRC facilities in Ottawa

#### B. Reference materials

**CENAM, Mexico:** The technique of microfluidic digital PCR (dPCR) to assure traceability in SARS-COV-2 identification and quantification in Mexico

**KRISS, Korea:** Reference materials to improve the accuracy of virus testing

**NIM, China:** Development and Application of Reference Materials for SARS-CoV-2 Testing

**NIST, USA:** Biological Measurements

**TÜBITAK UME, Turkey:** 2019-nCoV Virus RNA Reference Material Production for RT-qPCR Measurements

#### C. Testing of Personal Protective Equipment

**BEV, Austria:** Establishment and provision of a test centre for respiratory masks

**CSIR-NPL, India:** Establishment of testing facilities for Personal Protective Equipment

**INRIM, Italy:** A facility to test PPE according to the European Standards

**NPL, UK:** NPL supports start-up, Protecting Heroes, in the production of PPE

#### **D. General Information (The URLs are available on the BIPM's website)**

**CEM, Spain:** Use of radiation thermometers and thermographic cameras to perform traceable non-contact measurements of human body.

**GUM, Poland:** Activity of the Central Office of Measures in Poland during the COVID-19 pandemic.

**INEN, Ecuador:** Infrared thermometers for clinical diagnosis (in Spanish).

**INM, Colombia:** Develops a biosafety protocol for calibration and testing laboratories in the management of COVID-19.

**INMETRO, Brazil:** Press releases on the Covid-19 pandemic.

**INRIM, Italy:** Quick and easy diagnosis of COVID-19.

**INRIM, Italy:** Treating COVID-19 pneumonia with ultrasound.

**INTI, Argentina:** INTI during the COVID pandemic.

**IPQ, Portugal:** Verification of syringe pumps using a measuring cylinder and a stop clock (volumetric method).

**KEBS, Kenya:** KEBS response to the COVID-19 pandemic.

**LACOMET, Costa Rica:** Actions taken by LACOMET against COVID-19.

**LGC, UK:** LGC's NML team supporting government efforts to measure COVID-19.

**LGC, UK:** LGC response to the COVID-19 pandemic.

**LNE, France:** LNE fighting against the COVID-19 pandemic in France.

**METAS, Switzerland:** Testing of Ultraviolet Radiation Sources Used to Reduce COVID-19 Spread.

**NIM, China:** Application of Infrared Thermometers in Response to COVID-19.

**NIMT, Thailand:** Metrology technology supports anti-COVID medical devices.

**NIST, USA:** NIST COVID-19 related research.

**NMIA, Australia:** Activities of the National Measurement Institute, Australia (NMIA) in supporting the fight against Covid-19.

**NMIA, Australia:** Helping the health and manufacturing industry respond to COVID-19.

**NMC, A\*STAR, Singapore:** A\*STAR collaboration on therapeutic antibody to fight COVID-19.

**NMC, A\*STAR, Singapore:** A\*STAR collaboration launches world's first SARS-COV-2 serology test to detect neutralizing antibodies without need for containment facility or specimen.

**NMC, A\*STAR, Singapore:** Research and development for COVID-19.

**NPL, UK:** Summary of NPL Covid-19 Activities.

**NRC, Canada:** NRC Canada COVID-19 response.

**RISE, Sweden:** RISE NMI activities to combat COVID-19, 2020-05-19.

**TÜBITAK UME, Turkey:** TÜBITAK UME's efforts in the fight against the COVID-19 pandemic.

#### **E. Projects**

##### **CCQM-NAWG**

Improving comparability of diagnostic test results for COVID-related molecular testing

##### **EURAMET**

EMPIR project MeDDII: Metrology for drug delivery

EMPIR project on biological research (LGC/ISO)

## **INRIM, Italy**

Adapting dishwashers to medical-grade PPE sterilization

### **F. Financial Assistance**

KRISS - Support for industries that are struggling due to COVID-19

NIST- Funding Manufacturing Institutes to Support Pandemic Response

NRC IRAP - Support for businesses seeking solutions to the most urgent COVID-19 needs

#### **BOX 2**

**Responses from MEDEA survey to the question “What can APMP/APLMF do to support your institute regarding the impact of the COVID-19 outbreak?”**

##### **Developed economies**

- Sharing experiences across both forums would enable NMIA to identify opportunities for collaboration as well as consider how it could support regional counterparts in addressing identified issues.
- Facilitating more remote ways of working and implementing the CIPM-MRA that don't require travel.
- We hope APMP/APLMF will provide an effective and user-friendly online system with sufficient security in order to facilitate communication among the member economies including NMIs.
- To solve the global issue, such as the COVID-19, the international cooperation is needed. APMP/APLMF may serve as the good platforms to bring stakeholders together.
- Harmonization of international metrology effort. Information exchange regarding latest development in metrology.
- We hope APMP/APLMF can consolidate technical resources existing in member NMIs, and provide Webinars and online trainings to facilitate communication among NMIs and help with capacity building. These resources should be shared between APMP and APLMF. Some joint activities are also welcome.

##### **Developing economies**

- We are eager to participate in any project related to COVID-19 with international organisations, if involved in.
- Guidelines for testing /verification of test equipment or PPE.
- Capacity building in the development of calibration methods for critical medical devices.
- Deliver and support working standard for calibration and testing of infrared medical thermometers.
- Awareness on the importance of metrology in society and dissemination of technical requirements required by stakeholders.
- Assisting with the following activities: 1. Using existing e-learning platforms to strengthen metrology education 2. Developing a video learning platforms to maintain social distance during the Covid-19 epidemic 3. Establishment of a Metrology App. to assist in the operation of all sections of the Department.
- If possible, provide trainings or work attach documents or videos as we can download.

### BOX 3

#### Responses to the question “What have been the main challenges for your institute in terms of the impact of the COVID-19 outbreak?”

- To provide metrological services during complete lockdown period. Also, to develop some technologies and testing facilities.
- The main challenges is to educate stakeholders and regulators the importance of temperature calibration in monitoring devices especially the accuracy of thermometer.
- We have to reduce the amount of activity in the lab (development, maintenance, and calibration service) due to distance restriction.
- Not prepared for remote 'work-from-home' working scheme.
- Testing of employees for COVID-19.
- Development of methods by expanding metrological infrastructure for verification of PPE.
- Due to the lack of working standards, calibration and verification of digital infrared medical thermometer are not carried out. Not enough experience, sufficient equipment, technical capacity and source, rules and regulations for organizing any online learning/meetings/conferences and trainings.
- Support the National Action Plan for Poverty Alleviation and Revitalization during the Covid-19 outbreak and beyond that.
- Lock down of the flight to attend any trainings and work attach from APLMF.
- Had to reduce the personnel's attendance rate to the office down to 20 % according to the governmental orders, which were issued both in national and regional levels. Even in such extreme circumstances, however, we continued to work on the services related to the quality management of the citizens' daily life in cooperation with the social contribution activities to take necessary measures against the COVID-19.
- Even under the influence of COVID-19, personnel in worksite is operating almost normally in order not to delay the implementation of legal work under measurement act. On the other hand, management personnel have been assigned to work from home because of declaration of a state of emergency.
- To maintain our services while keeping the staff safe and healthy.
- To quick set up covid-19 related calibration services with associated risk management and business continuity polices while sustaining current services.
- Implementation of social distancing measures pose challenges, e.g. reduced face-to-face interactions.
- The loss from cancelled business.
- Lockdown and restrictions on working. More demand for domestic testing services.
- Main challenges facing NIM during the COVID-19 pandemic are as follows:
- Surging demands for calibration and testing of personal protection and medical equipment.
- Intensive efforts on developing CRMs for accurate virus testing.
- Urgent provision of standard blackbodies for calibration of infrared thermometry and technical trainings to provincial level metrology institute.
- Remote working from home to reduce physical contacts.

#### **BOX 4**

##### **Responses to the question “Can you share any lessons learned with respect to this pandemic?”**

- To use online communication/video conferencing tools as far as possible.
- To prioritize and focus on important tasks.
- To maintain good contacts with clients.
- Reprioritization of services and resource allocation.
- Minimized direct and indirect interaction of staff to maintain social distancing.
- Implementation of split teams and staggered working hours.
- Constant communications.
- Use of technology to bridge the distance
- Keep alert to keep safe, and solve problems swiftly with the good foundation of technology and manufacturing.
- A trend towards onshoring services and developing the national quality infrastructure.
- Learn e-commerce.
- We must try to maintain the schedule of work so that goals will be accomplished.
- We need to have vision and anticipation of such unexpected situations. Be prepared with technological solutions in future.
- Some hospitals and clinics faced problems with inconsistency and reliability of temperature reading that affected the monitoring of patients during Covid-19.
- The need for a centralized and secure electronic filing and storage system that is accessible through the internet on a 24/7 basis.
- Sharing knowledges (our first experience with PPE).
- Gained experience, and learned about organizing online meetings/conferences and trainings.
- Special emphasis on revitalizing food security, export industry and the internal activities of the economy during the Covid-19 pandemic.
- It takes rapid and collaborative response against COVID-19.

#### **BOX 5**

##### **Responses to the question “What would you like the COVID-19 forum’s content to be?”**

- Harmonization of international metrology effort.
- Information exchange on latest development in metrology.
- Metrology for Health.
- Sharing of experiences from both developed and developing economy perspective in order to:
  - a) identify opportunities for collaboration, and
  - b) work together to develop strategies and activities to support regional counterparts.
- Roles of NMI to support central monitoring of temperature measurements.
- Sharing of problems, difficulties encountered.
- Proposed solutions to above problems
- Metrological services in support of COVID-19 containment, care and eradication
- Requirements, man and machine, standards, traceability, knowledge / skills / expertise for providing metrological services to support COVID-19 containment, care and eradication.
- Sharing of knowledge and guidelines.
- To learn from best experiences.
- Supporting poverty alleviation and metrology to regenerate the economy.
- Sharing through the emails or internet.
- To discuss Covid-19 protocol for on-site and in the laboratory calibration services.
- Accurate virus testing, calibration of medical equipment, experience and practices of other NMIs in response to the COVID-19.

#### **BOX 6**

##### **Responses to the question “Have you identified new services that need to be established?”**

- Regulated equipment on temperature measurements and collaborate with Ministry of Health.
- Infrared Body Thermometers and Ear Thermometers; Biomedical equipment calibrator/simulator calibration.
- Calibration services on temperature; moisture for storage rooms / cold rooms in food industry.
- Examine the weights and measures of retailers visiting villages during the Covid-19 pandemic.
- Testing of respiratory mask for COVID-19.

## 7.0 Prioritizing of SDGs Topics for Future MEDEA 3.0

The objective of this part of the survey is to study members' economies priorities in relation to the identified UN SDGs to maximise alignment of MEDEA 3.0 with these priorities. The MEDEA CC has proposed the following SDGs as the work topics for MEDEA 3.0.

SDG 1: No poverty

SDG 8: Decent work and economic growth

SDG 9: Industry, innovation and infrastructure

SDG 2: Zero hunger, including food security and food safety

SDG 3: Good health and well-being

SDG 6: Clean water and sanitation

SDG 7: Affordable and clean energy

SDG 13: Climate action

Table 9 shows the preferred SDGs by economies.

**TABLE 9** Selection of SDGs by NMIs and DI

NMIs/LMAs/DI	SDG 1	SDG 8	SDG 9	SDG 2	SDG 3	SDG 6	SDG 7	SDG 13
NMIA, Australia			X		X		X	
NIM, China			X		X		X	
NMIJ, Japan			X				X	X
SCL, Hong Kong, China		X	X				X	
NMC, Singapore			X	X			X	
CMS, Chinese Taipei			X		X		X	
MSL, New Zealand			X		X			X
NPL, India			X		X			X
NMIM, Malaysia		X	X		X			
SNSU-BSN, Indonesia			X		X	X		
BATAN, Indonesia			X	X	X			
NML, Philippines				X	X	X		
NIMT, Thailand	X		X		X			
MASM, Mongolia		X	X		X			
MUSSD, Sri Lanka			X		X		X	
MCIC, Kiribati		X		X	X			
<b>Number of Selections</b>	<b>1</b>	<b>4</b>	<b>14</b>	<b>4</b>	<b>13</b>	<b>2</b>	<b>7</b>	<b>3</b>

## 8.0 Discussion

### 8.1 Readiness among members for on-line collaboration and video conferences.

It has been demonstrated that the majority of members have no problem with attending virtual meetings and webinars. The zoom platform is already popular worldwide. However, problems do exist for some members due to poor internet coverage and bandwidth. Therefore, it is a great help to them when webinars sessions are recorded and made available



after the original session. Cybersecurity issues and the wide time zones are the other points to take care.

Some examples of recent successful use of virtual platforms are as follows:

8.1.1 Conduct of the MEDEA CC and CABUREK TC meetings by DFNconf.

8.1.2 Conduct of the recent APMP mid-year meetings by Zoom.

8.1.3 DEC KMS collaboration using Samepage (To be changed to Stackfield).

8.1.4 Conduct of CABUREK meetings by Zoom.

8.1.5 CABUREK collaboration using Mural.

8.1.6 Webinar on “Communication for Metrology” (19 June 2020, Recording available).

<https://www.quisp-course.de/course/view.php?id=12>.

8.1.7 Webinar on “IR Thermometers” (8 July 2020, by NIM, China).

## 8.2 Materials on e-learning

The survey results in Table 3 indicate that many developing and developed NMIs and LMAs across the region are already developing e-learning materials. One example of outside the region is NPL, UK. There is now plenty of materials available to cover both legal and scientific metrology.

In addition to materials reported by the respondents in Table 3, a series of training videos on legal metrology are available on the APLMF website (See <https://www.aplmf.org/training-videos.html>). Many respondents indicated preference to video format as they can watch and learn at their leisure and rerun them if required.

Also, the OIML legal metrology e-learning platform provides an accessible, comprehensive and interactive way of understanding the implementation of many common legal metrology activities. (See <https://www.oiml.org/en/structure/ceems/e-learning-platform>). This is also very useful to NMIs that also operate legal metrology services.

As additional resources, links to some interesting metrology related videos on YouTube are listed in Appendix C.

APMP and APLMF members would certainly benefit from the above resources to meet their knowledge sharing and training needs.

## 8.3 Sharing of COVID-19 experiences

COVID-19 experiences of the members of the BIPM and CABUREK were studied in addition to the experiences of the main MEDEA respondents. There were common experiences that can be shared as in Table 7. NMIs can also learn from the more advanced work carried out by their colleagues as reported at the BIPM’s repository. Respondents also reported difficulties faced by the laboratory staff and the staff performing on-site work. Problems in calibration and verification of IR thermometers were highlighted by developing NMIs.

#### 8.4 Prioritization of SDGs

Table 9 indicates that economies have given top priorities to SDG 9 (Industry, innovation and infrastructure), SDG 3 (Good health and well-being) and SDG 7 (Affordable and clean energy). This means that it would be better for the MEDEA CC to consider only these areas for MEDEA 3.0 proposal.

### 9.0 Conclusions

The questions posed by the MEDEA questionnaire were appropriate and able to elicit useful information from respondents. Such information would be helpful for CC preparation for the next steps.

New ways of collaboration and communication via virtual platforms such as zoom and webinars were already showing encouraging results for the metrology community in the region.

Information obtained from the BIPM and CABUREK on COVID-19 experiences give additional insights and complement the findings of the main MEDEA questionnaire. This then presents a global overview of NMIs initiatives to fight the pandemic.

The UN reports that the progress on SDGs initiatives worldwide is affected by the COVID-19 pandemic. It is a difficult situation from an economic point of view due to the allocated budget is now prioritized to COVID-19 fight and to restart the economy. MEDEA CC should carefully consider the success factors before finalizing the proposal.

### Acknowledgements

The MEDEA CC wishes to thank Ms Magdalena Navarro, Senior International Program Manager, NIST, for sharing the SIM's COVID-19 questions that have been adopted in the MEDEA questionnaire. The CC would also like to express its gratitude and thanks to all members of APMP and APLMF who have provided the responses to the survey.

### References

1. MEDEA Survey Data, June 2020.
2. CABUREK Asia-Pacific survey on COVID-19 experiences.
3. BIPM's repository of COVID-19 initiatives by NMIs:  
<https://www.bipm.org/en/worldwide-metrology/covid-19-metrology.html>.
4. BIPM's Consultative Committee for Amount of Substance (CCQM) Webinar on *Ensuring the reliability of measurements in response to the COVID-19 pandemic*:  
<https://youtube/0Jh65cEPrl>.
5. BIPM's Joint Committee for Traceability in Laboratory Medicine (JCTLM) *Special Edition Newsletter*, July 2020: <https://www.bipm.org/utils/common/pdf/JCTLM/JCTLM-Newsletter-2020-COVID-19.pdf>.

6. United Nations, *The Sustainability Development Goals Report 2020*:  
<https://www.un.org/sustainabledevelopment/progress-report/>.
7. United Nations, *How COVID-19 is changing the world: a statistical perspective*:  
<https://unstats.un.org/unsd/ccsa/documents/covid19-report-ccsa.pdf>.
8. United Nations Industrial Development Organization (UNIDO), *The Role of Metrology in the context of the 2030 Sustainable Development Goals*:  
[https://www.unido.org/sites/default/files/2017-05/SDG\\_Metrology\\_brochure\\_FINAL\\_pages\\_0.pdf](https://www.unido.org/sites/default/files/2017-05/SDG_Metrology_brochure_FINAL_pages_0.pdf).

## Listing of institutes and economies providing inputs (Developed Economies)

<b>Name of Country</b>	<b>Name of Institute</b>
Australia	National Measurement Institute, Australia (NMIA)
China	National Institute of Metrology, China (NIM)
Chinese Taipei	Center for Measurement Standards /Industrial Technology Research Institute (CMS)
Chinese Taipei	Bureau of Standard, Metrology and Inspection (BSMI)
Hong Kong, China	Standards and Calibration Laboratory (SCL)
Japan	National Metrology Institute, Japan (NMIJ)
Japan	Japan Electric Meters Inspection Corporation (JEMIC)
Japan	National Institute of Information & Communication Technology (NICT)
New Zealand	Measurement Standards Laboratory (MSL)
Republic of Korea	Korea Research Institute of Standards and Science (KRISS)
Singapore	National Metrology Centre (NMC)
Singapore	Consumer Protection, Enterprise, Singapore
UK	National Physical Laboratory (NPL)

## Listing of institutes and economies providing inputs (Developing Economies)

<b>Name of Country</b>	<b>Name of Institute</b>
Bangladesh	Bangladesh Standards and Testing Institution (BSTI)
Bhutan	Bhutan Standards Bureau (BSB)
Cambodia	National Metrology Center (NMC)
India	National Physical Laboratory (NPL)
India	Legal Metrology, Department of Consumer Affairs
Indonesia	SNSU-BSN
Indonesia	Directorate of Metrology (DOM)
Indonesia	National Nuclear Energy Agency
Kiribati	Ministry of Commerce, Industry and Cooperatives
Malaysia	National Metrology Institute, Malaysia (NMIM)
Malaysia	Malaysian Nuclear Agency
Mongolia	Mongolian Agency for Standardization and Metrology (MASM)
Myanmar	National Institute of Metrology, Myanmar (NIM)
Pakistan	National Physical Standards Laboratory (NPSL)
Philippines	National Metrology Laboratory (NML)
Sri Lanka	Measurement Unit Standards and Services Department (MUSSD)
Thailand	National Institute of Metrology, Thailand (NIMT)
Thailand	Department of Internal Trade (DIT)
Thailand	Central Bureau of Weights and Measures (CBWM)
Vietnam	Directorate for Standards, Metrology and Quality (STAMEQ)

## Questions on COVID-19 posed by CABUREK, SIM and MEDEA

CABUREK Asia-Pacific	SIM	MEDEA
1) How are you personally dealing with the COVID-19 pandemic situation	1) What have been the main challenges for your NMI about the impact of the COVID-19 outbreak?	1) What have been the main challenges for your institute in terms of the impact of the COVID-19 outbreak?
2) How is your NMI/LMA maintaining the service provision and / or operation?	2) Can you share any lessons learned respect to this pandemic?	2) Can you share any lessons learned with respect to this?
2a) Which are the main challenges for NMI/LMA?	3) Is your NMI playing a role to help your country address the challenges of the current health crisis? Are you pursuing new activities related to this?	3) Is your institute playing a role to help your country address the challenges of the current health crisis? Are you pursuing new activities related to this?
2b) Which strategies and approaches your NMI/LMA has developed to overcome these challenges?	4) Is your NMI able to maintain critical functions/calibration services?	4) Is your institute able to maintain critical functions/calibration service?
3) How is your institute contributing to the control and mitigation of the effects from the COVID-19 pandemic situation in your economy	5) Have you identified new services that need to be established?	5) Have you identified new services that need to be established?
	6) What can SIM do to support your NMI regarding the impact of the COVID-19 outbreak?	6) What can APMP/APLMF do to support your institute regarding the impact of the COVID-19 outbreak?
	7) Would your NMI be interested in participating in an information exchange forum for NMIs?	7) Would your institute be interested in participating in an information exchange forum for institutes on COVID-19 issue?
	8) What would you like the forum's content to be?	8) What would you like the forum's content to be?

## **Some links to metrology related materials on YouTube**

[Metrology in Daily life](#)

[A world without Metrology](#)

[MSL - New Zealand's National Metrology Institute](#)

[Measurement & Its Types - Mechanical Measurement and Metrology](#)

[Influence of Temperature on Measurement - Metrology Training Lab](#)

[What is Quantum Metrology?](#)

[National Metrology Laboratory - RTÉ's Morning Edition](#)

[What is Metrological Traceability - Requirements Traceability and Calibration](#)

[Metrology and Quality control](#)

[Laser metrology](#)

[Basics of Metrology for Optical Manufacturing](#)

[Become a measurement expert: ZEISS ACADEMY METROLOGY](#)

[Metrology - Science of Measurement \(Full list of Topics\)](#)

[WBPSC Legal Metrology Inspector 2020 Exam Strategy & Booklist](#)

[World Metrology Day 2020](#)

[Careers for Women in Metrology](#)

[History of Metrology](#)