DOST delivers biomedical devices to PGH for COVID-19 in-patient monitoring

By Enrico C. Belga Jr., *DOST-CO*
Photos from PGH staff

RxBox units delievered by DOST to UP-PGH.

RAPPID-ADMATEC produced face shields for COVID-19 frontliners

DOST produces face shield frames for health workers

By Dannieline Solis, *DOST-PCIEERD*
Photos from DOST-PCIEERD

The Department of Science and Technology (DOST) delivered 106 units of RxBox to the Philippine General Hospital (PGH) on Tuesday, 31 March 2020 as part of its ongoing efforts to respond to the COVID-19 crisis.

RxBox is an innovation developed by researchers from University of the Philippines (UP) Manila and UP Diliman with support from the Department of Science and Technology (DOST) through the DOST-Philippine Council for Health Research and Development (PCHRD). It is a multi-component biomedical device capable of measuring a patient's temperature, blood pressure, heart rate, oxygen saturation, uterine contractions, and

To support frontline health workers in their battle to prevent the spread of COVID-19, the Department of Science and Technology (DOST) is currently producing 3D-printed face shield frames for distribution to the Philippine General Hospital, and will be extended to other hospitals.

Operating for 24 hours since 23 March, the team of Engr. Fred P. Liza, project leader of the Research on Advanced Prototyping for Product Innovation and Development using Additive Manufacturing Technologies (RAPPID-ADMATEC), started printing frames with an initial target of 1000 pieces for the Philippine General Hospital (PGH).

"We are humbled by the opportunity to help in the urgent need of face shields, to cease the spread of this contagious disease. It will protect the face whenever a patient coughs

or sneezes. Currently, we can print 10 frames every 1.5 hours," says Engr. Liza.

The design for the 3D-printed frames will be optimized for further reduction of time during the production process.

"Currently, we are looking for ways to hasten production, such as using a larger nozzle size and modifying our printing parameters. Additional 3D printers are being reconfigured to augment our production volume. We are also looking into fabricating molds through DOST –Metals Industry Research and Development Center (MIRDC) and our technology partner, particularly Omnifab, for faster production of these frames using injection molding. Our goal is to deliver to the Philippine General Hospital every week via courier service," he added.

RAPPID-ADMATEC is one of the projects under Advanced Additive Manufacturing R&D

RAPPID-ADMATEC produced face shields for COVID-19 frontliners

3D printing of RAPPID-ADMATEC face shield frames for use of health workers

Program (AMCen), being supported by the DOST and is monitored by DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST-PCIEERD). It focuses on advanced prototyping and speeds up its process by reducing the time it takes to fabricate components and products.

DOST Undersecretary for Research and Development Dr. Rowena Cristina L. Guevara lauded the group for going the extra mile and contributing to the needs of our frontliners in battling COVID-19.

"As we make change happen through research and development, we maximize our assets to do our part in fighting COVID-19 with innovative solutions. We support our health workers with these visor shields that are products of our R&D facility," she emphasized.

DOST-PCIEERD Executive Director Dr. Enrico C. Paringit commended the group for their dedication during the enhanced community quarantine period.

"As strong believer and willing partner in enabling innovation, we will continue to support endeavors like this to meet the urgent needs of the public especially during this outbreak," he said.

electrocardiogram readings. It can reduce contact between patients diagnosed with COVID-19 and healthcare workers.

The delivered devices will be used for bedside monitoring of the vital signs, oxygen saturation, and electrocardiogram readings of

PGH receives the 106 units of RxBox that will assist them in monitoring the vital signs of the COVID-19 patients.

patients diagnosed with COVID-19, especially those in severe or critical conditions who need continuous monitoring. It will also provide an efficient way for healthcare workers to monitor multiple patients at once.

DOST's RxBox comes with the following features—Blood Pressure Monitor (measures the patient's blood pressure to detect cardiovascular problems especially hypertension); Pulse Oximeter (measures the level of oxygen in the patient's blood and can help detect lung and cardiovascular problems); Electrocardiogram (monitors the heart's movement to pump blood throughout the body, helpful for those with acute and chronic heart problems); Fetal Heart Monitor (measures the baby's heart rate while in the womb); Maternal Tocometer (measures the strength of a mother's uterine contractions during labor and delivery); and Temperature Sensor (measures a patient's body temperature). It can help detect fever, a common medical sign of infection and other disease conditions.

The regional office of DOST-CALABARZON is the implementing agency that will coordinate with other regional offices for the distribution of the remaining 894 RxBox units to selected healthcare facilities.

DOST-NAST calls for change in local food system amid COVID-19 enhanced community quarantine

By David Matthew C. Gopilan, *DOST-STII*

In the midst of looming food crisis during the enhanced community quarantine, local government units (LGUs) were urged to promote community-based food system.

The recent statement from the Agricultural Sciences Division of the Department of Science and Technology–National Academy of Science and Technology (DOST-NAST) echoes the prompting for every household to grow their own food and consider community-based food system. The call was initially put forth by the Coalition for Agriculture Modernization in the Philippines.

DOST-NAST is the advisory council of the Philippine President and Cabinet members. Its Agricultural Sciences Division is currently headed by Academician Eufemio T. Rasco Jr. Acd. Rasco is known for his pioneering works with hybrid breeding of indigenous tropical vegetables.

Accordingly, there is "the justified sense of food insecurity, caused by disruption in the food systems" given the "deepening threat from COVID-19". For one, farmers are afraid to leave their homes. Next, traders could hardly transact with farmers to buy and deliver farm goods. Then, retailers have to go pass through numerous checkpoints, only to be turned away. Lastly, public markets could only open with limited hours and some food items are now scarce.

Considering this farm-to-fork journey, DOST-NAST sees community-based food system as alternative and complementary source for typical marketgoers.

This community-based food system can be likened to a community farm. In this case, the source of food for communities is no longer centralized to a market, and de-industrialized. A de-industrialized food production means that food products are no longer prepared large-scale, while use of harmful chemicals is reduced or none at all.

DOST-NAST recommended the barangay officials, advocates and all households to join community-based food system. The barangay officials can give out seeds, fingerlings, mushroom spawns, chicks, feeds, biofertilizers, and biopesticides. The whole community can also rent vacant lots or farms and put up deep wells for irrigation and nurseries for crops, fish and livestock. The community can also consider establishing a production facility for biofertilizers and biopesticides.

Everyone can participate in maintaining the community farm. Young adults can put up and maintain the farm and fishponds. The seniors can take charge of accounting and auditing, and communications, and do some food processing while at home. The jobless can either volunteer or be paid to help. Others who are less susceptible to contracting COVID-19 can distribute the food either by foot, bicycle or motorcycle.

Mentioned in the released statement is that citizens can simply look up to the internet for guides and manuals in putting up a community farm or fishery.

Prioritizing the less fortunate households was also mentioned given that they are vulnerable in terms of food security.

The advisory council also recommended that the citizens involved should still comply with the guidelines related to the enhanced community quarantine implemented by LGUs. Examples are social distancing and observing curfew hours.

Lastly, the advisory council said that committed leadership, volunteerism and civic spirit are key to changing the local food system.

On July 2019, Senators Francis N. Pangilinan and Grace Poe separately filed bills promoting vertical gardening and urban agriculture to address food security and livelihood opportunities. Sen. Pangilinan's bill proposes that the government may use idle or abandoned government lots and buildings to grow crops and raise livestock.

The full statement of DOST-NAST pertaining to the change in the local food system can be accessed through their Facebook page.

(Photo from businessmirror.com.ph)

(Photo from worldcrops.org)

Communities can plant malunggay and sweet potato in backyard patches as food complement.

DOST Pack of Hope
Hunger relief for frontliners during pandemic

By Geraldine B. Ducusin, *DOST-STII*

Pack of Hope is a ready-to-eat relief food developed by DOST-ITDI. (Photo from dost.gov.ph)

and Technology- Industrial Technology Development Institute (DOST-ITDI), on the use of ready-to-eat (RTE) food during COVID-19 Expanded Community Quarantine (ECQ).

"Hindi lasang relief," as one calamity survivor who tasted the Pack Of Hope-RTE said. The taste is very acceptable and the product is also convenient as it is ready-to-eat, easy-to-open, and does not require preparation or cooking.

Demand for the POH is high because it has a stable shelf life and it has passed the safety protocols set by both the local and international offices of the Food and Drug Administration (FDA).

"T**he product can be eaten directly from the pouch,"** thus emphasized by Daisy Tañafranca, head of the Packaging Technology Division (PTD) of the Department of Science

"While freshly cooked food prepared in mobile kitchen are susceptible to contamination and spoilage if not properly handled during distribution, these Pack of Hope (POH) ready-to-eat (RTE) food products are safe, that's why they're very beneficial for medical workers and men and women in uniform at the check points," she added.

Approximately 245,000 RTE chicken arroz caldo and 42,000 RTE smoked fish rice meals had already been distributed to calamity survivors since the Pack of Hope RTE technology was adopted in 2015. The POH RTE food developed by DOST-ITDI are being used as relief and emergency food in any type of calamities.

As early as March of this year, when the ECQ was already being enforced, samples of RTE chicken arroz caldo were deployed in five cities in NCR- Taguig, Pasig, San Juan, Manila and Quezon- to augment the cities' program in providing food packs to their constituents. Each city received 100 boxes each (3,000 pouches) of RTE chicken arroz caldo.

Meanwhile, the Department of Social Welfare and Development in Cebu used the RTE smoked fish rice meal and chicken arroz caldo as emergency food for fire victims and in Davao for their feeding program.

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To assist our frontliners in their battle against the COVID-19 crisis, the Department of Science and Technology (DOST) has partnered with a non-profit, local software developer to devise a system that can help decongest our checkpoints. The RapidPass.ph is a virtual identification system developed by Developers Connect (DevCon Philippines) that utilizes QR-code based technology to provide ease of passage for frontliners and priority vehicles. The Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID) has officially approved the use of the RapidPass.ph on 27 March 2020. On the same day, the system was tested within

Mandaluyong area to facilitate fast and simple travel through quarantine checkpoints. To use the system, users (people under the "Authorized Persons Outside of Residence" category as per IATF-EID's mandate) must register online, then a QR code will be sent to them once approved. Print the QR code and place it on your car window and checkpoint personnel will scan it. Through this system, there will be less contact between users and checkpoint personnel. The DevCon team will provide training and support to our checkpoint frontliners and agencies. The developers of the RapidPass.ph system are also working with the Philippine National Police (PNP) and the Armed Forces of the Philippines (AFP) for field testing and operations deployment. For further information on how frontliners can register online, visit the RapidPass.ph's official Facebook page, https://www.facebook.com/rapidpassph/.
(Information from Enrico A. Belga Jr., DOST-CO; Photo from RapidPass.ph's Facebook page)