Department of Biotechnology, Ministry of Science & Technology, Govt. of India and it’s PSU, BIRAC have released 20 In-Market Startup Products which can be potentially used as COVID-19 solutions. These products have been supported by BIRAC.
These solutions are management solutions which can be employed for patients including COVID such as ICU settings, non-hospitalized patients, preventive monitoring (pregnant women, CV patients, digital stethoscope for higher sensitivity etc.) and others.
Increased viral load in the COVID patient show decreased concentration of Serum albumin and Hb (reference: Clin Chem Lab Med Feb 2020; Science China March 2020; Lancet Preprint March 2020). It is important to periodically monitor these markers for COVID-19 patients, instantly during ICU treatment.

AnuPathTM in ICU setting can yield immediate results for Serum Albumin, Hb and also offer additional parameters like HCT, MCV, MCH, MCHC, PCT, MPV parameters facilitating CBC (complete blood count).

Comprehensive IEC certification for safety and EMI/EMC, enabling its use for hospital settings.
PathShodh Healthcare Pvt. Ltd.

AnuPath: Point of Care Hand Held Multi-Analyte Diagnostic Device

Support Needed:

- PathShodh can immediately supply the handheld device and test strips to any hospital for use in ICU or otherwise.

- Funding required of Rs. 2 Cr. for increasing the production capacity to 1 lakh test strips/month and 1,000 handheld readers/month.
Heart Patients are more prone to the Corona virus disease severity. During treatment of Covid19 patients with hydroxychloroquine-azithromycin, it is essential to:

- Perform ECG and calculate QTc evaluation
- Avoidance of non-essential QT-prolonging medications
- Identifying and correcting electrolyte imbalances (potassium, magnesium, calcium)

ATOM ECG allows capture of a medical grade 12 lead ECG over a smartphone with immediate remote expert consultation.

It empowers doctors, health workers and nurses to perform treatment of Covid19 patients with confidence.

The recorded ECG can be instantly sent to a cardiologist for his expertise before administering the drugs and also continue a follow-up during the course of the treatment.
ATOM: Accurate TeleECG On Mobile

Support Needed:

- Rs 5.1 Cr to manufacture and supply approx.
- 1000+ units for PAN India usage
AyuSynk's unique stethoscope design allows healthcare workers to perform auscultation while being protected in an isolation environment and can be used with protective covers in the ED to reduce contamination when pre-screening admissions.

Solution:

- AyuSynk's unique stethoscope design allows healthcare workers to perform auscultation while being protected in an isolation environment and can be used with protective covers in the ED to reduce contamination when pre-screening admissions.

- AyuSynk can be used directly using earbuds or headphones, via bluetooth within the isolation room or to a consultant outside the room or send sounds via email or instant Messaging.

Biocontainment presents a unique challenge for auscultation (listening to the lung sound).

Production Capacity:

- In discussion with contract manufacturers to scale the production capacity.
Ayu Synk: Smart Stethoscope

Support Needed:
- Need Funds for scale up
- Logistics support
- Manufacturing scaleup support
Shortage of medical devices at hospitals may happen due to lack of imports, logistics issues impacting manufacturing supply chain world-wide.

Manual reprocessing of medical devices shall lead to higher rate of spread of infections, risking both patients and hospital staff.

Use of CRS – Catheter Reprocessing System

CRS ensures safe reprocessing of catheters and a variety of essential medical devices.

CRS is an automated system that safely reprocesses medical devices with minimal human intervention thereby ensuring doctor patients safety.

CRS shall help meet the demand of limited medical devices.

Challenges amid Coronavirus Pandemic:

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INCREDIBLE DEVICES PVT. LTD.

CRS - Catheter Reprocessing System

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Assistive

S (Sterilization for reuse of Medical Device)

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Assistive

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CRS - Catheter Reprocessing System

Support Needed:
- Regulatory support from the government
- Funds for manufacturing
Dozee: Contactless Health Monitor

Dozee converts any bed into a step-down ICU like continuous health monitor in less than 2 minutes of set-up.

It provides the data of the entire ward on a single screen from where patients' health can be easily managed and early distress signs can be caught. All this from a safe-distance without risking the chances of infection for the healthcare staff.

**Features include:** Contact-free (Placed under the mattress of the user), Remote Access, Custom distress alerts with SMS & Email Support, As accurate* as ECG, Echo-cardiography & RIP bands· Pulse oximeter (optional, requires extra accessory), CE Approved

Their algorithms detect the following health parameters from the raw ballistocardiography (BCG) data captured from under the mattress of a user: Heart Rate, Respiratory Rate, Snoring events, Body movements and restlessness, Sleep stages, Sleep Quality, Stress, Recovery and Heart rate variability parameters.
TURTLE SHELL TECHNOLOGIES PVT. LTD.

Dozee: Contactless Health Monitor

Support Needed:
- Regulatory guidance from CDSCO for Commercializing DOZEE
Expecting mothers and babies are vulnerable populations during the Covid-19 pandemic. It is highly risky for mothers to go to hospitals as there is a risk for infection. The right monitoring equipment is not available for mothers at home. Conventional monitoring equipment is not designed to be used at home as it needs a skilled operator, infrastructure and is not portable. This can lead to higher number of fetal distress cases not being detected, and maternal and fetal mortality during home births.

How can Fetal Lite help?
The Fetal Lite has been designed for home use by low skill operators, in extreme scenarios - mothers or family members can easily perform scans with remote monitoring capability allowing Obgyns to remotely receive scan reports and identify high-risk mothers who need to visit the hospital. Fetal Lite is CE Class 2A certified.

Over 1000 mothers have been monitored using the Fetal Lite device in the last 3 years.

Production Capacity:
- July to September onwards: 60 - 100+ units/ month
SATTVA MEDTECH

Fetal Lite: Fetal Heart Rate Monitor for Women in Labor

Support Needed:
Funds to scale the home monitoring platform.
Sanmitra 1000 HCT: Hand Cranked Defibrillator for Sudden Cardiac Arrest

SanMitra 1000 HCT Defibrillator is particularly useful for disaster struck situations (eg, COVID-19). Sequestration areas inside hospitals for Corona victims need lots of defibrillators.

- Battery-less, Reliable: For city hospitals, it saves them the cost of battery replacement (usually Rs 12,000 to Rs 35,000 per year).
- Patents (1 granted US patent, 1 Indian design registration, 1 Indian patents filed, more patents in the pipeline).
- Jeevtronics is an ISO13485 certified company. It is designed to international IEC standards for medical devices and has been tested and approved by the NABL accredited lab.
- It has been tested for 16,000 charge-discharge cycles thereby making it super long life world class product.

Production Capacity:
- 50 units per month per shift basis

SanMitra 1000 HCT: Rs. 89,000 + 12% GST

64 defibrillators sold till March 19th, 2020
Sanmitra 1000 HCT: Hand Cranked Defibrillator for Sudden Cardiac Arrest

Support Needed:

Seeking support for scaling up and looks forward to government entities, CSR donors and potential investors to help scale this mission urgently.
Remote monitoring: The doctors can guide the nurses without visiting them. The progress of labor can be seen by the doctor remotely.

Patient Management: Multiple patients will be seen on one screen, audio and critical alerts will be given based on the complications and reminders for the measurement of vitals.

Digital Documents: This is a paperless system, automated partographs are generated and case sheets will be maintained digitally. This means less contact and less exposure. This also gives unlimited cloud storage.

During the labor phase, women visit hospitals and get admitted for at least 48 hours. They are exposed to the risk of COVID-19. Doctors visit them frequently which increases contact and SBAs (Skilled Birth Attendants) are assigned to labor rooms also in constant contact. With DAKSH, these problems can be taken care of:

- **Remote monitoring**: The doctors can guide the nurses without visiting them. The progress of labor can be seen by the doctor remotely.
- **Patient Management**: Multiple patients will be seen on one screen, audio and critical alerts will be given based on the complications and reminders for the measurement of vitals.
- **Digital Documents**: This is a paperless system, automated partographs are generated and case sheets will be maintained digitally. This means less contact and less exposure. This also gives unlimited cloud storage.

**DAKSH allows the staff nurse to register and enter vital signs of a pregnant woman**

**JANITRI INNOVATIONS**

**DAKSH: An Advance Intrapartum Monitoring Tool for an Automated Partograph Generation**

**Production Capacity**:

- 400 hospitals/month can be monitored through DAKSH intrapartum remote monitoring mobile application.

**Available on request**

**Price**: 115

**Assistant (Monitoring Medical Device)**
JANITRI INNOVATIONS

DAKSH: An Advance Intrapartum Monitoring Tool for an Automated Partograph Generation

Support Needed:

- Outreach to maximum private and government hospitals and Help in awareness
- They have the capacity to enroll the hospital remotely and to provide training remotely.
Artificial Intelligence powered solution that quantifies patterns in lung computed tomographic imaging, providing quantitative metrics on the % of lungs affected with texture changes across a broad spectrum (from ground glass to consolidation).

Centralized repository which collects clinical features, radiology imaging and patient outcome data to help public health authorities and hospitals with a data-driven analysis of patient prognostication.

Proposed solution is a two-step product with following steps:

- Artificial Intelligence powered solution that quantifies patterns in lung computed tomographic imaging, providing quantitative metrics on the % of lungs affected with texture changes across a broad spectrum (from ground glass to consolidation).
- Centralized repository which collects clinical features, radiology imaging and patient outcome data to help public health authorities and hospitals with a data-driven analysis of patient prognostication.

Readiness of Technology: LungIQ has been developed using over 10,000 CTs over the last 1 year with use-case of pulmonary fibrotic diseases. The findings of COVID19 are very similar to that of other infectious and inflammatory diseases and hence we are in a unique position with a ready-to-use product in the fight against COVID19 pandemic.

The product is being tested on COVID with sites in Philippines & with individual hospitals in India.

Support Needed:

Outreach to Hospitals for Deployment
Reduced Infection Risk
- Increases the physical distance between patient and operator (for BMV, operator must be very close), exhaled air can be routed through a filter (with BMV, infected exhaled air is released freely into the surroundings)

Superior Ventilation
- Shows PIP in real time giving feedback on performance and lung condition, stronger in-built protection against excessive pressures (Pressure-safety), settable PIP. Doctors can preset the specific Peak Insp. Pressure to be delivered with each breath.

Greater Comfort
- By freeing both hands and employing highly ergonomic foot pedal, NeoBreathe increases the comfort of operation while BMV requires a patently uncomfortable, hunched-over position - causing fatigue and risk of failure

For COVID it offers following features:

- **Reduced Infection Risk** - Increases the physical distance between patient and operator (for BMV, operator must be very close), exhaled air can be routed through a filter (with BMV, infected exhaled air is released freely into the surroundings)

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- **Greater Comfort** - By freeing both hands and employing highly ergonomic foot pedal, NeoBreathe increases the comfort of operation while BMV requires a patently uncomfortable, hunched-over position - causing fatigue and risk of failure
Support Needed:
For modified form (proposed model): Funding requested for upgradation/development of ventilator.
PERIWINKLE TECHNOLOGIES PVT. LTD.

Net4Medix: Telemedicine Platform

A cloud-based system with apps on Android, iOS and web for patients and their healthcare providers

It is a multi-specialty system intended to be used by doctors/ caregivers to receive diagnostic data from the patients and provide related consultation even remotely.

Primary Goal Pandemic Monitoring: Enable effective management of positive patients / suspect positive patients of COVID-19, provide a pre-determined level of remote support to non-COVID-19 patients who need medical assistance. Easy-to-Use Functions:

- Monitoring Disease Control Status: Reporting of Infection by health facility, Area-wise Dashboards (numbers, counter measures)
- Monitoring Quarantine Facility: Patient Registration at Facility, Reporting, and Dashboards
- Staff Training: Repository of Video, Audio, Web Resources
- Self-reporting: Direct Status of Home Quarantined Patients as well

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Assistive
(Monitoring Solution)

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PERIWINKLE TECHNOLOGIES PVT. LTD.

Net4Medix: Telemedicine Platform

Support Needed:
Seeks deployment facilitation in Public Health System (State/Center level)
**UBIQARE HEALTH PVT. LTD.**

**Specialty Medical Supportive/Palliative Care to Patients at Home**

*Ubicare enables doctor-driven specialty care to patients at home, reducing hospital visits and stays.*

The Ubicare solution seamlessly combines clinical telepresence technology, collaboration framework, and last mile clinical network of doctors, nurses, therapists and phlebotomists. Covid-19 patients at home, under care from Ubicare, will get:

- Extension of care of Pulmonologist/Physician and interactive clinical telepresence
- Regular Monitoring by IoT enabled medical devices with cloud-based analytics on EHR
- Analytics-Assisted Triaging and Tele-Consultation by Ubicare Doctor/Pulmonologist/Physician
- Sample collection or interventions by the last mile clinical network/healthcare workers

The patients can be cared for at home during most of the illness trajectory - from the Asymptomatic stage to Mild Symptoms to Moderate Symptoms stage. This enables the hospital infrastructure to be leveraged for only those in the stage of Severe Symptoms. For patients in Moderate stage, Ubicare will support with shifting to an isolation ward in proximity and supported by the Care doctor over the telepresence platform.

**Subscription Range from Rs. 15,000 to Rs 20,000 per month**

**Served 110+ patients at home, Delivered 6200 patient-days of supportive medical care**

**Production Capacity:**

- Software solution can be scaled up quickly without any capacity limitations
Support Needed:

Development Support for implementing the necessary changes within a short time.
Provide effective secretion clearance and oral hygiene management in ventilated patients with limited nursing staff- and reduce VAP in these patients

Prevent cross infection of nurses and healthcare workers from COVID patients- thereby increasing caregiver safety

Free up critical nursing time by automating a frequent and laborious process

VAPCare provides a completely closed system for intelligent and accurate removal of saliva and secretions in a ventilated patient- without any risk of exposure of the nurse to these secretions. VAPCare also significantly reduces the nursing burden by automating a key nursing step in the management of ventilated patients- which will also be critical in the impending shortages of nursing staff with increased ICU admissions for COVID. In the context of the current Covid-19 crisis, VAPCare brings three unique benefits to healthcare systems:

- Provide effective secretion clearance and oral hygiene management in ventilated patients with limited nursing staff- and reduce VAP in these patients
- Prevent cross infection of nurses and healthcare workers from COVID patients- thereby increasing caregiver safety
- Free up critical nursing time by automating a frequent and laborious process

VapCare: Automated Secretion Management and Oral Hygiene System for Ventilated Patients

**Available on Request**

- 10 and 400 Disposables

**Production Capacity:**

- 1000 units/ month (Can be increased upto 5000/ month if the order is received 8 weeks before the production)
COEO LABS

VapCare: Automated Secretion Management and Oral Hygiene System for Ventilated Patients

Support Needed:

- Deployment in Private and Public Hospitals
- Funding for manufacturing and scale up
NEMOCARE WELLNESS PVT. LTD.

Continuous monitoring wearable device that will aid in remote monitoring of vitals along with geolocation and prognosis of affected and quarantined patients

- Nemocare also aids in tracking their symptoms and the doctors will be alerted on detection of deterioration.

- Clinical validation for normal use ongoing at Narayana Netralaya with good results.

- Has been tested on adults and children. Data read on dashboard. It can record sound and play it back for cough analysis.

Production Capacity:

- 1,000-10,000 units/month

All vendors in India, not dependent on Imports
Support Needed:

- 1-3 months Ready for use
- Access required to quarantine site to validate for COVID use
Facial Temperature of all people walking into a facility is measured remotely using a thermal camera. NIRAMAI Computer Vision technique identifies people with suspected fever. Just a simply skilled health worker is sufficient to conduct the test, thus reducing the pressure on clinical testing.

How is this done:

- Facial Temperature of all people walking into a facility is measured remotely using a thermal camera.
- NIRAMAI Computer Vision technique identifies people with suspected fever.
- Just a simply skilled health worker is sufficient to conduct the test, thus reducing the pressure on clinical testing.

**Market Status:**

- Stage – Pilot testing of the device (similar technology that the company developed for breast cancer).
- Large scale production: Each thermal camera cost 8 lakhs and based on the requirement of the number of units Vs cost.
NIRAMAI HEALTH ANALYTIX PVT. LTD.

NIRAMAI: Thermal Scanning for COVID-19

Support Needed:
- Preventive: (Monitoring Device)
  - 200 units/month (within 4 weeks of delivery time)

Production Capacity:
- 1-3 months (for validation and incorporation of other parameters)
- Budget – 25 lakhs (Company seeking fund for up to 25 lakhs to buy 2 thermal cameras and 2 researchers to develop other parameters like LFT etc.)
Silver nanoparticles have antiviral efficacy against many viruses viz. HIV, Hepatitis B, Herpes simplex virus, Influenza virus etc. Recent reports have suggested the role of GSH capped-Ag2S NCs (Silver nanoclusters) in inhibiting the proliferation of Coronavirus by inhibiting the synthesis of viral negative strand RNA and viral budding. Ag NP-based materials will be able to prevent the contact infection of health care workers (HCWs), besides preventing patient infection. Thus colloidal silver can affects Covid -19:1) Spread by blocking the RNA replication2) Infectivity by blocking the surface glycoproteins.

Synthesized from Green technology, free from hazardous chemicals and has no risk of flammability compared to alcohol based disinfectants. Test license for making hand sanitisers and disinfectants has been granted.

Silvo Clean: Nano Agcide Technology

A non-alcoholic aqueous based Colloidal Silver solution uniquely made for disinfecting hands and environmental surfaces.

Silvo Clean: Nano Agcide Technology

Preventive (Sanitizer, Disinfectant)

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Synthesized from Green technology, free from hazardous chemicals and has no risk of flammability compared to alcohol based disinfectants. Test license for making hand sanitisers and disinfectants has been granted.
Support Needed:
Scale up and Deployment
Nasofilters are the first-ever non inserted, hypoallergenic and self-adhering nanotechnology-based respiratory disposable nasal filters, which sticks to the user's nasal orifice, unlike traditional surgical masks which cover the half of the face and produces discomfort while wearing.

The company is selling other products also like Nasomask (Pollution mask), and G3 and F7 grade industrial filters along with Nasofilter.

The current product provides filtration of not only 2.5pm aerosols but also to bacteria, viral infections, and pollen allergies at cost five times lower than existing competing products (Global Nasal Filter Report 2017).
NANOCLEAN GLOBAL PVT. LTD.

NASOFILTERS, NASAL MASKS

Support Needed:
Outreach for Scaling
GOassure ensures that the users perform hand hygiene as per the WHO recommended six-step guide and notify the variation (or non-compliance) to the authorities/health officers/managers.

At the time when the entire world is fighting against SARS-CoV2 virus infection, effective hand hygiene is one of the most prominent tools we have to control its spread. Considering its importance, MicroGO in collaboration with the Airport Authority of India, Chennai have developed an SOP for all the arriving passengers at the International terminal, to perform hand hygiene using GOassure before entering into the main hall or immigration check.

Apart from airports, GOassure has been installed at various public and private spaces like Taj group of hotels, IRCTC kitchens, Farm aggregator Waycool, Banks among others.

**Production Capacity:**
- 90-100 units/ month (Can be increased up to 1000 units/month within the time period of 2-3 months)

**Already deployed the product at 11 airports**
MICROGO LLP

GOassure

Preventive
(Sanitizer)

Support Needed:
Requires financial assistance of Rs 1 Cr for scaleup
ReMeDi® CORONA Screening Application for Self-Use by Individuals: The screening can be taken by an individual often to check the updates in the Risk Assessment. High risk would prompt the individual to immediately visit a hospital. The location of individual is also tagged with his / her consent.

ReMeDi® CORONA Screening Kit for Health Workers / Nurses: This Kit includes a Tablet and IR Thermometer, as well as a Rapid Test Kit (lateral flow assay) for the Corona Suspects, and BP, SPO2 for other patients, who might need care, but are not corona suspects.

ReMeDi® CORONA Consult: Direct-to-Home or Clinic Tele-Consultation: This is an ideal mechanism presently to offer healthcare services to a large number of patients, who do not wish to visit the hospitals due to scare of infection, and for the hospitals as they may be too loaded to receive the patients.
NEUROSYNAPTIC COMMUNICATIONS PVT. LTD.

ReMeDi NOVA: Digital Health Solutions

Support Needed:
- Rolling out on mass scale, including the Screening App, Screening Kit and Telemedicine Direct-to-Home from hospitals and Funds to immediately start manufacturing
This lab is very rugged and maintenance free as all components of the Lab have their proper and predefined place. It can easily work at any temperature from 0 degrees C -50 degrees.

- Less power consumption, Requires a small space to set up
- Blood collection cost reduced, as tests performed on the spot
- Satellite control to provide information about tests conducted and even switch on/off from a remote location
- Bluetooth and GPRS tracking
- Instant reporting at the testing site
- Intimation of Quality Control to the technicians so as to be configured
- 76 test can be conducted: such as Hematology, Biochemistry, serology, urine, BP, ECG etc.
ACCUSTER TECHNOLOGIES PVT. LTD.

Portable Compact Mobile Lab (PCML) and La-bike

Support Needed:
Scale-up and Deployment
Contact us:

**CSR funds:**
Mr. Utkarsh Mathur,
Business Development Manager,
BIRAC
✉️ sped3@birac.nic.in

**Additional technical information/ Connecting with Startups:**
Ms Rashmika Singh,
Technology Transfer and Commercialization Officer,
BIRAC
✉️ sped-5@birac.nic.in

Thanks you for your support. These Startups require Outreach, Manufacturing, Procurement, Scaling, Funding and other facilitations from the Ecosystem Stakeholders at large.

**Dr. Manish Diwan,**
Head – Strategic Partnership and Entrepreneurship Development, BIRAC
✉️ sped.birac@gov.in