Accelerating New Ideas To Tackle Infectious Diseases Through Partnerships And Collaborations

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India Health Fund was set up to lead collaboration with the public and private sectors to develop and scale innovative solutions, business models and financing solutions to improve outcomes in diagnosis, treatment, prevention, and eventual elimination of infectious diseases. In order to ensure we are able to address the emerging challenge of COVID-19, while continuing to address the needs of other infectious diseases, we have organised our efforts to focus on **5 areas**.

Our efforts centre around identifying science & technologies relevant to infectious diseases in each area and supporting the development and scale up of solutions which apply these technologies in one or more diseases, with a focus on TB, COVID-19 and vector borne diseases.

This shift in approach has enabled us to develop a wider range of applications, ensuring greater impact. Our measures of impact include being accessible at scale, being affordable, being efficient in saving lives and being adopted into the healthcare system with a consistent success record of reliable outcomes.

PREVENTION

Innovations in airborne infection control, vector control and personal protection

SCREENING

Identify symptomatic, asymptomatic, latent infections

DIAGNOSIS

Rapid accurate affordable point of care diagnostics & tele diagnostics

TREATMENT PATHWAYS

Drug Adherence, Disease & progression monitoring

SURVEILLANCE

Digital data-driven decision support systems, data analytics

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PARTNERSHIPS AS AN ENABLER FOR GREATER IMPACT

While India Health Fund continues to lead providing support for the development of new solutions, partnerships play a key role in enabling the lab to last mile journey of innovations, including support for **co-creation and sourcing of solutions, validation & assessment, mentorship, co-funding, implementation, and market access**.

Collaborations in these areas have helped to aggregate expertise, experience, efforts, and resources to ensure better outcomes and use of human and financial resources. Partnerships will continue to play an important role in mitigating the impact of COVID-19, and in mitigating the impact COVID-19 has had on other areas of healthcare.

PARTNERSHIPS AS AN ENABLER FOR GREATER IMPACT

PARTNERSHIP AREA	PARTNER	PARTNERSHIP OUTCOME
Validation & assessment	**Central TB Division (CTD)**	• <u>Focus areas</u>: Support for identifying solutions, technical support, facilitating development deployment, and scale-up of innovations for TB • <u>Outcome</u>: Call for ideas for solutions for airborne infection control & diagnosis in collaboration with CTD
Implementation	**The Union**	• <u>Focus areas</u>: Integrate & deploy IHF supported innovations in public & private healthcare systems • <u>Outcome</u>: Support Truenat™ and Qure.ai adoption
	Foundation for Innovative New Diagnostics (FIND)	• <u>Focus areas</u>: Deploy Truenat™ tests in public health projects • <u>Outcome</u>: Deploy tests at four MCGM-run COVID-19 sites in Mumbai to strengthen testing capacity
Market Access & Co-funding	**ACT Grants**	• <u>Focus areas</u>: Fund deployment of IHF supported innovations • <u>Outcome</u>: Support deployment of qXR in 9 hospitals, 1 mobile van; also deploy 1 Truenat™ machine with testing kits. This is aimed to improve access to accurate, low cost diagnostics

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PARTNERSHIPS AS AN ENABLER FOR GREATER IMPACT

PARTNERSHIP AREA	PARTNER	PARTNERSHIP OUTCOME
Assessment and Market Access to other geographies	**Asia Pacific Leaders Malaria Alliance (APLMA), RBM Partnership to End Malaria**	• <u>Focus areas</u>: Deployment and regulatory support for global scale-up of IHF innovations, and enabling strategic partnerships for enhancing IHF's mandate across the malaria ecosystem • <u>Outcome</u>: Explore market access opportunity for IHF supported innovations in India & other geographies
	Stop TB Partnership	• <u>Focus areas</u>: Support roll-out of Truenat and Qure.ai solutions for TB in TB affected countries • <u>Outcome</u>: Developed implementation guidance for Truenat to support its market access and scaled roll-out • Innovation Spotlight on Qure.ai's qXR and qScout solutions to increase awareness and credibility
Capability Development	**Empower School of Health**	• <u>Focus areas</u>: Providing capacity-building resources to frontline health workers deploying IHF supported solutions. Training healthcare workers in the use of IHF supported innovations through e-learning to develop long term capabilities • <u>Outcome</u>: Develop e-learning project for technicians in the use of Truenat™ machines to improve user experience and maximise potential of the test

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Portfolio Progress

Our portfolio of innovations is making progress in adapting existing solutions to battle COVID-19, while also working towards faster, more affordable integration into our healthcare systems

SCREENING

qure.ai   **Disease - TB***   ***Adapted for COVID-19**

PROBLEM

The widespread use of analog X-rays for TB diagnosis at district & sub-district hospitals and clinics, results in long lead time for treatment initiation, and several cases going undiagnosed due to the lack of trained radiologists & clinicians at many locations.

PROJECT

Using artificial intelligence to improve diagnosis of TB & COVID-19.

A smartphone app linked to AI algorithms that analyze an analog chest X-ray to enable faster screening and diagnosis of TB, without a trained technician, which is specially relevant in low resource settings.

Faster & more accurate diagnosis will also help reduce the number of missed cases of TB, the number of false positive tests & confirmatory microbiological tests required.

IHF SUPPORT AND PROGRESS

- Maps the TB screening journey using the qTrack App to analyse **100,000 analog X-rays** for TB screening & convert into digital images
- Facilitated access to working groups at the National TB Elimination Programme for clinical expertise to improve the quality of the algorithm
- Enabling the deployment of qXR as a screening tool for presumptive TB - partnering with The Union and Medanta Hospital for community-based TB testing project in Delhi.

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Portfolio Progress

qure.ai

Disease - COVID-19

PROJECT

AI driven software qXR is developed and deployed for COVID-19 screening and triaging as well as progression monitoring.

It empowers frontline health workers with faster decision-making to direct patients for swab testing/ quarantine within a minute of taking the Chest X-Ray.

IHF SUPPORT AND PROGRESS

- Enabled the deployment of qXR solution in 9 hospitals and a mobile van partnering with Mumbai civic body (MCGM)
- Mobilized external grant funding from ACT Grants for **25,000 qXR** scans at MCGM sites

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Portfolio Progress

Hemex Health

Disease - Malaria*

*Adapted for COVID-19

PROBLEM

In the absence of an accurate, rapid diagnostic test for malaria, there are many avoidable deaths due to delayed diagnosis – specially in remote areas.

PROJECT

A one-minute, accurate rapid diagnostic test for malaria, at a targeted cost of $1 per test. The test device, *Gazelle* also enables automated reporting of case & patient details to the national and state malaria surveillance systems.

IHF SUPPORT AND PROGRESS

- Clinical studies are underway at the National Institute of Malaria Research (New Delhi) and the National Institute of Tribal Health. Currently undergoing regulatory process
- Validation studies on **1,300** patients have shown promising results. The diagnostic will be tested on additional **4,000** patients.
- Work with the National Vector-Borne Disease Control Programme (NVBDCP) to integrate into the malaria elimination framework.

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Portfolio Progress

Centre for Health Research and Innovation

Truenat™

Disease - TB*

*Adapted for COVID-19

PROBLEM

The need for specialized testing facilities and skilled technicians to diagnose TB results in several cases of TB going undiagnosed ("the missing million") hampering efforts to eliminate the disease.

PROJECT

Using molecular diagnostics to improve diagnosis of TB & COVID-19 at the point of care. Truelab is a compact, battery-operated system with test results at the point of care within 1 hour. This enables same day reporting and initiation of evidence-based treatment of tuberculosis, reducing the risk of infection spread.

IHF SUPPORT AND PROGRESS

- Deployed at **five** community health centres in Uttar Pradesh **67 percent** of the patients screened began their treatment within a week of their diagnosis; significantly improving their fight against TB.

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Portfolio Progress

Centre for Health Research and Innovation   **Truenat™**   **Disease - COVID-19**

PROJECT

Truenat COVID-19, chip-based RT-PCR test, approved by ICMR in May 2020; is a point-of-care indigenous technology to diagnose COVID-19 under an hour; highly affordable in comparison to other available RT-PCR tests.

IHF SUPPORT AND PROGRESS

• Facilitating wider rollout of test with a proposed deployment of **four machines at 4 high-volume antigen testing centres**

• Integrate the solution in community-based COVID-19 project in Delhi partnering with The Union and Medanta Hospital.

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Portfolio Progress

VALETUDE PRIMUS HEALTHCARE

Disease - TB*

***Adapted for COVID-19**

PROBLEM

Sputum samples for TB diagnosis are currently collected from patients at healthcare centers in plastic bottles. This exposes healthcare workers to the risk of infection. It is also a time-consuming process with low accuracy resulting in delayed diagnosis & treatment

PROJECT

Using safer sample collection & patented diagnostic technology for faster and more accurate diagnosis of TB at point of care.

A system which uses specially designed bottles that protect the healthcare worker from exposure to pathogens while collecting sputum samples for TB tests. An in-built diagnostic setup uses patented immuno-magnetic cell capture technology iMC^2 to diagnose TB, as a replacement for the slower, less accurate sputum smear diagnostic method currently used. Diagnosis is within 1 hour, without skilled technicians – unlike sputum smear microscopy.

IHF SUPPORT AND PROGRESS

- Manufacturing of devices underway & clinical study to be completed by December 2020
- *Adaptation of sample collection method for COVID-19 & integration with COVID-19 diagnostic tests under assessment*

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Portfolio Progress

Disease - TB[*]

*Adapted for COVID-19

PROBLEM

Bovine TB is chronic among cattle, represents the 7th largest zoonotic transmission threat to humans, as per WHO. With the largest cattle population in the world, India is at high risk of TB transmission from cattle to humans, made worse by low diagnosis due to lack of an efficient test for bovine TB.

PROJECT

A rapid antigen test to diagnose bovine TB and control zoonotic transmission to humans. Affordable point-of-care animal TB diagnostic kit for TB control.

IHF SUPPORT AND PROGRESS

- Prototyping and validation of the testing kit for identification of TB among infected animals.
- **1200 prototype** testing kits manufactured locally are now deployed in **three states**. The validation studies have also shown promising results.

Portfolio Progress

TMEAD

Disease - TB*

*Adapted for COVID-19

PROBLEM

The side-effects of TB medication often lead to a lack of treatment adherence and patients do not complete a prescribed course of treatment, leading to the emergence of drug-resistant forms of TB. There are 130,000 patients with drug resistant TB in India.

PROJECT

Product design, Internet of Things and cellular technology combined to improve adherence to TB medication regimes, enable remote patient monitoring & focus on critical patients.

To improve patient adherence to a prescribed TB treatment regimen and improve recovery rates, TMEAD (Tuberculosis Monitoring Encouragement Adherence Drive) is a device pre-filled & pre-sorted with prescribed medicines. Using internet of things, the device sends alarms & digital notifications to patients as reminders to take their medication. It also notifies health-workers of patient adherence with the same technologies, allowing them to focus on critical & non-adhering patients.

IHF SUPPORT AND PROGRESS

- Device validation is in progress, 80 patients recruited with **93%** treatment adherence. **700 patients** to be enrolled within 6 months.

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Innovation and interoperability are at the core of our portfolio of solutions. Using the latest in science and technology and through an ecosystem of partners, these innovations are addressing the continued challenges posed by infectious diseases including TB, vector-borne diseases and COVID-19.

In the weeks ahead, we look forward to bringing on new innovation projects and partners and strengthening existing collaborations to scale-up the reach and impact of the work that IHF has set out to do.