Innovate4Health: How Innovators Are Solving Global Health Challenges

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April 24, 2018
Meridian International Center, Washington, DC

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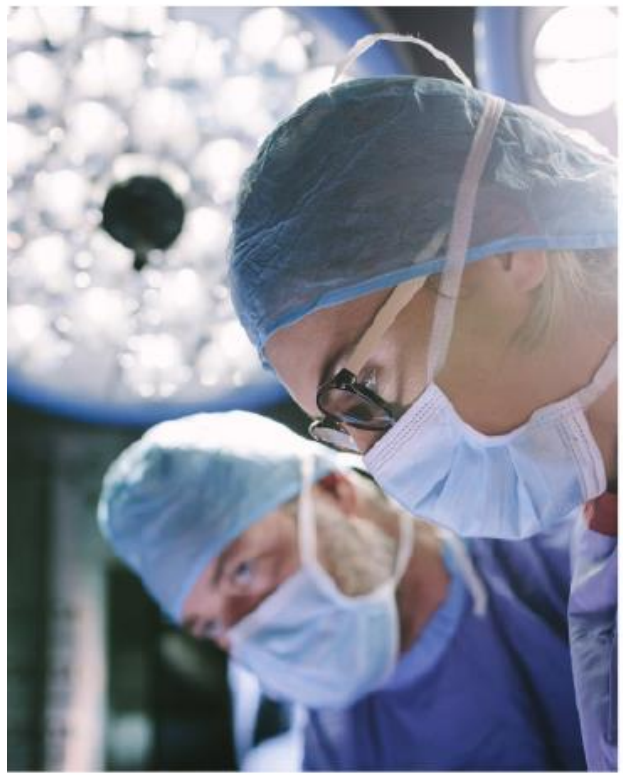
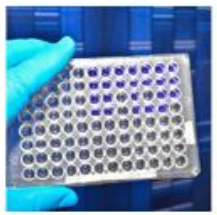
Innovate4Health

How Innovators Are Solving Global Health Challenges

Editors: Mark Schultz, Stephen Ezell, and David Lund









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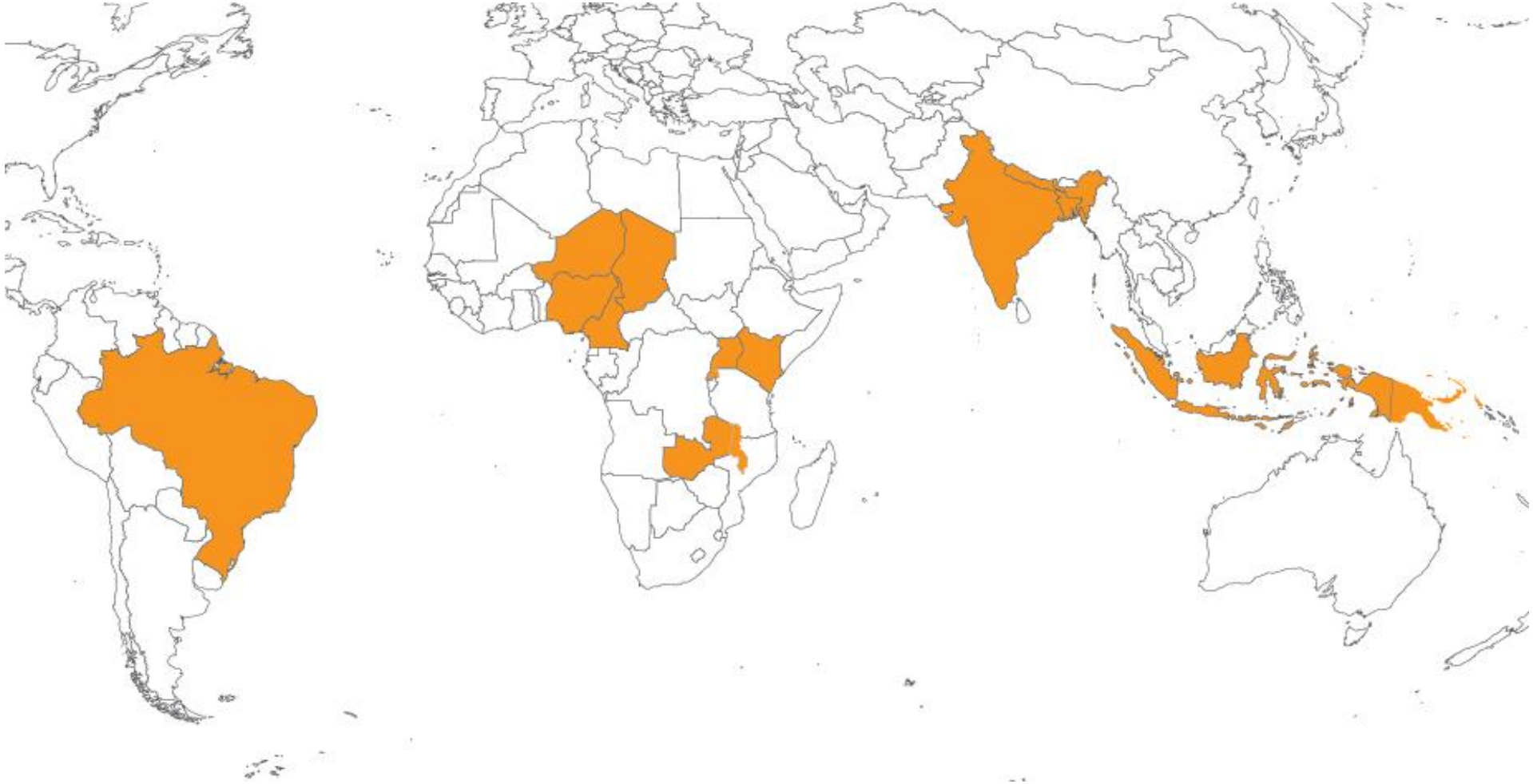
The I4H Report

- Our motivation: To explore how on-the-ground innovation is tackling global health challenges.
- Healthcare innovation isn't just about new medicines and doesn't happen only in labs in wealthy countries.
- IP-driven innovation in healthcare is happening everywhere.

Innovate4Health Case Studies



Innovate4Health: The Six Challenges

- Adapting healthcare interventions for environments where resources and infrastructure are challenging;
- Providing affordable and robust tests for diagnosing diseases;
- Improving HIV diagnosis and care;
- Developing affordable interventions to meet basic needs in challenging environments;
- Getting healthcare to the people in places where it's hard for people to come to the healthcare;
- Fostering health innovation in emerging economies.

Challenge: Getting Healthcare to People in Places Where It's Hard for People to Get to Healthcare Providers

- 1 billion people lack access to essential health care.
- Global shortage of 7 million public healthcare workers, with that number expected to rise to 13 million by 2035.

Source: WHO

Arktek

A passive vaccine cooler developed to keep vaccines at a steady cool temperature for 30 days.





Peek Eye Exam Kit (PEEK)

Bringing the optometrist's office to the patient.





Miriam Cancer Screening

Miroculous' affordable, easy to deploy cancer screening tool.

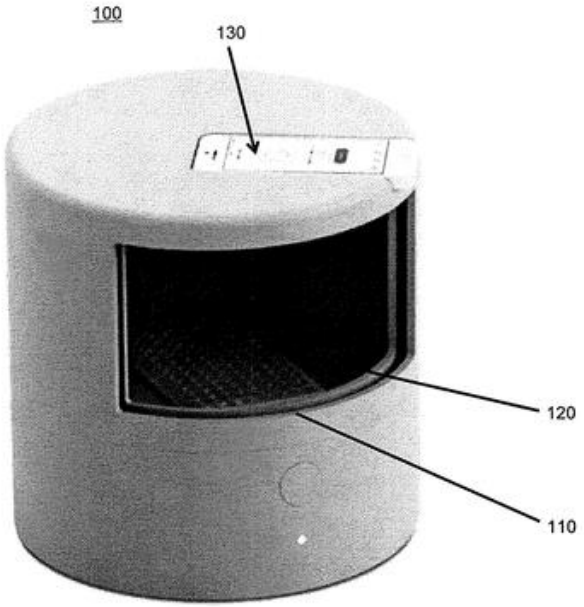


FIG. 11D

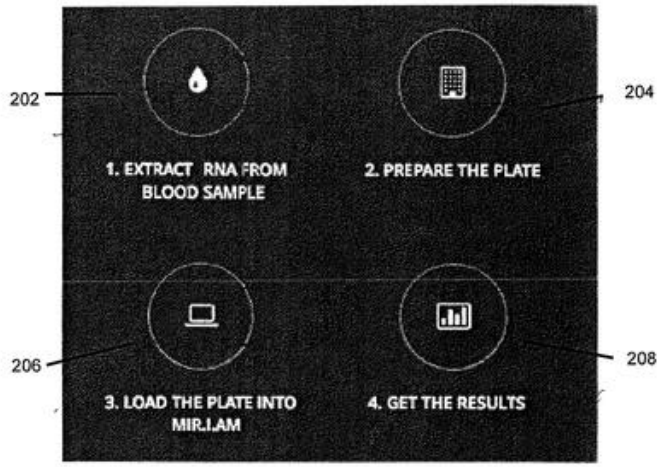


FIG. 25

Challenge: Adapting Healthcare Interventions to Environments Where Resources and Infrastructure Are Challenging

Nearly 1 billion people lack access to electricity. Access to reliable electricity is even more difficult.

Source: World Bank



Embrace Infant Warmers

Developed to save premature babies from hypothermia.



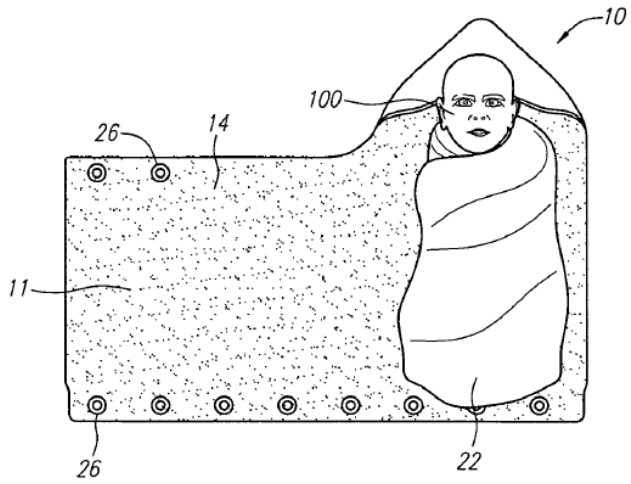


FIG. 3

FREO2—Siphon oxygen machine

Provides oxygen using water pressure, without electricity.

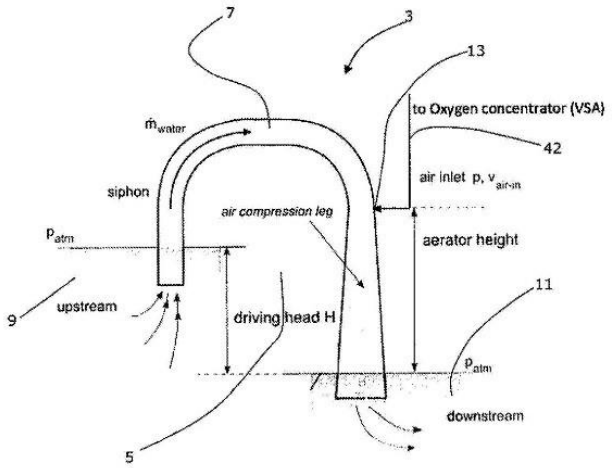


FIG. 2



Lessons Learned From the I4H Case Studies

- Developing countries have unique challenges, but global health challenges are increasingly commonly shared.
  - 70% of fatalities in developing world from non-communicable diseases.
  - High burden of heart disease and cancer.

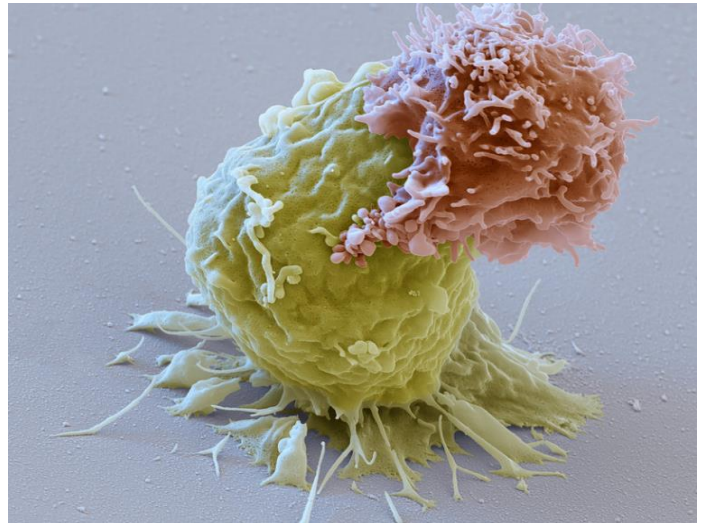


Image of a CAR-T cell (reddish) attacking a leukemia cell (green).

Lessons Learned From the I4H Case Studies

- Access challenges remain significant.
  - Essential medicines available in public-sector facilities in developing countries only 40% of the time.
  - More than two billion individuals lack adequate access to essential medical products/supplies.
- Innovators creating unique solutions to the challenge of access to medicines, supplies, and health services.

Zipline

- “Zips” serve 21 Rwandan hospitals.
- Provide instant access to emergency medical supplies for 2/3^{rds} Rwandans.
- Enable more agile, adaptable supply chains and expand product availability.



Cardio-Pad

- World's first medical tablet facilitating remote heart examinations/diagnosis.
- Tackled lack of specialists while dramatically raising affordability.







The Importance of Intellectual Property Rights

1. IPRs create incentives for innovation.
2. IPRs enable entrepreneurs to focus on innovating, not protecting IP.
3. IPRs serve as a validator that helps entrepreneurs secure financing.
4. IPRs induce knowledge spillovers that help others innovate.
5. IPRs boost domestic levels of exports, R&D, and FDI.

Ache Laboratories and Acheflan

Ryan: “Patents provided incentives for biomedical technology entrepreneurs to make risky investments into innovation in Brazil.”

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World Development Vol. 38, No. 8, pp. 1082–1093, 2010
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0305-750X/$ - see front matter
ELSEVIER
www.elsevier.com/locate/worlddev
doi:10.1016/j.worlddev.2009.12.013

Patent Incentives, Technology Markets, and Public–Private Bio-Medical Innovation Networks in Brazil

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Summary. — Contested is whether patent laws promote indigenous technology invention and innovation in developing countries. Brazil reformed its patent laws in 1996 to permit pharmaceutical product patents. Study of five post-patent law reform bio-medical technology invention and innovation projects in the state of Sao Paulo supports the propositions that patents provide incentives to Brazilian bio-medical technology entrepreneurs to make risky investments into innovation and that patents facilitate technology markets among public–private technology innovation networks, both Brazilian collaborations and North–South collaborations. Brazil enacted a technology law in 2005 that encourages public–private technology innovation through patent incentives and patent-facilitated technology markets.
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Key words — technology innovation, technology networks, patents, intellectual property rights, bio-medical technology, Brazil

1. INTRODUCTION

The 1994 World Trade Organization Agreement regarding Trade-Related Intellectual Property Rights obliges all WTO members to meet certain minimum standards of intellectual property law and enforcement and this means that scores of developing countries must provide higher levels of protection than has been their policy and practice in the past. Contested is whether patent laws promote indigenous technology innovation in developing countries. Runge (2006) rejects enclosure through intellectual property protections to promote technology progress in the North and says that the countries of the South have even more to lose from patent-based enclosure. Evans (2005) calls for an open science model for technology progress in developing countries. The development model should be non-proprietary and non-intellectual property-oriented. A developing country-based scholar says that stronger intellectual property rights in countries such as her Colombia will inhibit scientific research (Forero-Pineda, 2006). She argues that developing country scientists should participate in international professional networks to achieve science and technology advancement.

Though these scholars do not provide empirical evidence to support their arguments, they do ask important questions for development studies. Research universities, scholarly journals, and science conferences are the institutions that drive scientific progress (Pyenson & Sheets-Pyenson, 1999), but are these institutions sufficient to drive national technology innovation in developing countries (or developed countries, for that matter)? Technology innovation drives long-run national economic growth (Romer, 1986, 1990). Technology stasis leads to national economic stagnation; technology progress leads to national economic growth (Grossman & Helpman, 1991), so it is important to identify the institutional frameworks that best promote national technological innovation in developing countries. Do patent laws provide incentives to entrepreneurs in developing countries to make risky investments into technology innovation? Do patent laws facilitate the development of technology markets among public–private technology innovation networks? Do patent laws facilitate North–South technology innovation collaborations?

This is a study of invention and innovation in national technology development.

> “Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out into practice. . . . While inventions may be carried out anywhere, for example in universities, innovations occur mostly in firms, though they may also occur in other types of organizations, such as public hospitals. To be able to turn an invention into an innovation, a firm normally needs to combine several different types of knowledge, capabilities, skills, and resources” (Fagerberg, 2005, p. 4).

Post-patent law reform bio-medical technology invention and innovation in Brazil is studied here. Brazil has a long-established pharmaceutical industry, but Brazilian bio-medical R&D traditionally meant that their public and private drug-makers reverse-engineered international pharmaceuticals so that they could manufacture and market medicines and vaccines innovated in the North to the Brazilian marketplace. Brazilian pharmaceutical makers were at liberty to reverse-engineer, manufacture, and market products under patent in the United States and Europe because pharmaceutical compositions were not patentable subject matter in Brazil. But, in 1996 the Cardoso administration led the Brazilian congress to amend the patent laws with Law No. 9,279 to allow for the patentability of pharmaceutical product patents so that, subject to procedural processes and some restrictions, only patent-holders or their licensees would be permitted to market under-patent medicines.

Bio-medical technology invention and innovation in the state of Sao Paulo is the focus of study. The state of Sao Paulo is the wealthiest state of Brazil, representing some 40% of the gross domestic product of the country, and is the main scientific and business center of the country. Federal research support and “the strong support by the state government makes the state

*The author gratefully acknowledges, without responsibility for arguments, University of Sao Paulo Center for Science and Technology Policy director Professor Ary Plonski and PhD student Juliano Froehner, this journal’s thoughtful reviewers, and George Washington University research assistant Thomas Lee. Final revision accepted: December 7, 2009.

Conclusion

- The human mind, with its vast capacity for ingenuity, is the one resource that exists everywhere.

- Intellectual property, far from being an impediment, plays a vital role toward helping solve global health challenges.

Thank You!

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