Challenging conventional medical wisdom in the age of data and disruption

Experience from the Aga Khan University

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THE AGA KHAN UNIVERSITY

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Disclosure

- I have nothing to disclose

Learning Outcomes

1. Describe burden of disease in Pakistan

2. Examine need for innovation in healthcare

3. Describe our experience of instilling above @ AKU

4. List challenges and future directions

The problem and need for a solution

Pakistan's immense burden of disease

- Currently ranks 3rd in the world for under 5 child mortality
- Pregnancy/child birth among leading causes of death in women
- Huge surgical inequity / disparity (lack of access in rural areas)
- Triple burden: communicable, non communicable, trauma
- Substantial burden on citizens, health systems, governments

- *Bhutta Z, Das J. Health & SDGs for Pakistan, Paramount 2019*
- *Ahmed R, Mian A. JPMA 2018*

Is healthcare innovation needed?

1. Simply 'importing' health-tech from HICs to LMICs not enough
2. Improvisation (or adaptation=>*"Jugaar"*)
3. Trickle up innovation*
   - Hackathons and other activities enabling local innovators to develop their own solutions for low-resources settings
   - Much of Africa skipped landlines and went straight to wireless

- *Farooqi W, Subhani F, Mian A. Arch Dis Child 2017*
- Plsek PE, Wilson T. *BMJ* 2001
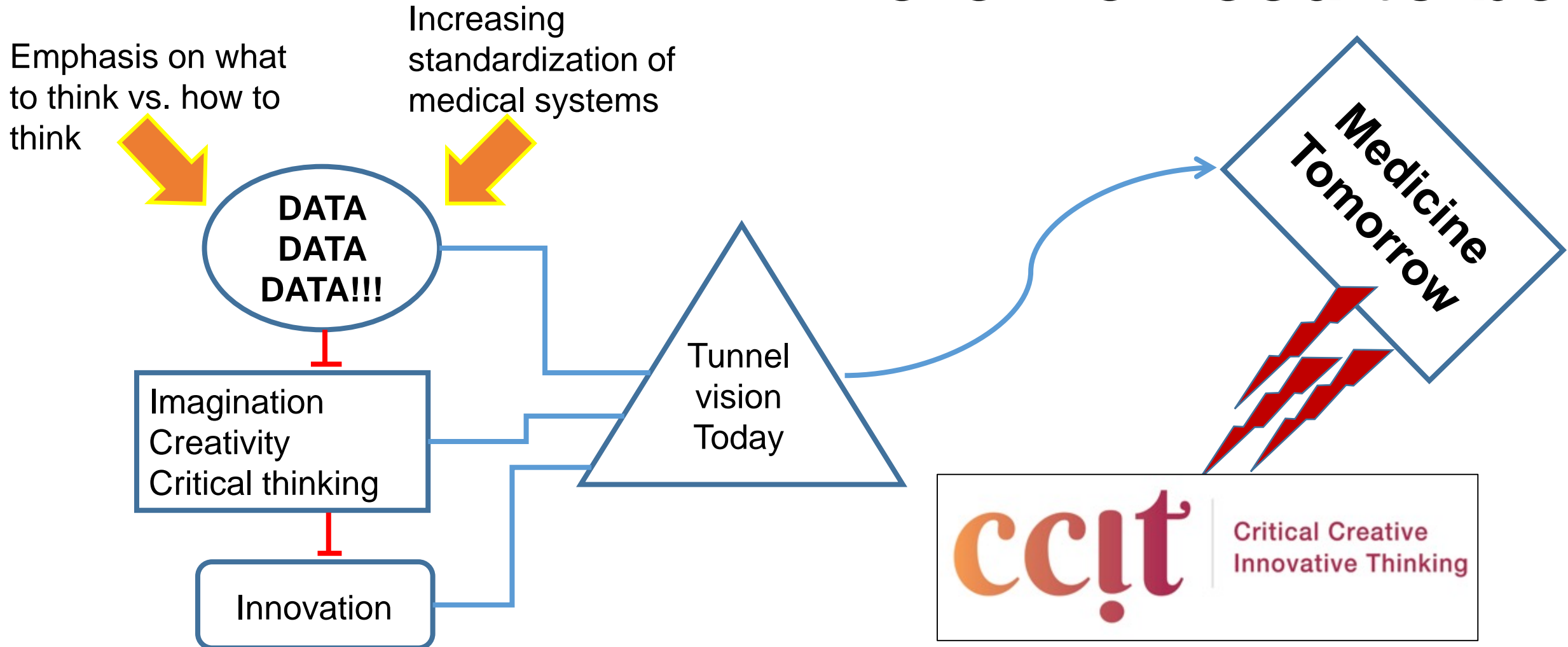*The Future of Medicine Report http://futureof.org/medicine-1-0/*

The LMIC's unique position

resource limited ≠ innovation limited!

"**Rich countries** can learn a great deal about health and human services from **poorer ones**… **Combining the learning** from rich and poor countries can give us new insight on how to improve health"- **Lord Nigel Crisp** former CEO, NHS, UK

*The Future of Medicine Report http://futureof.org/medicine-1-0/

Our experience of instilling creativity & innovation into biomedicine and healthcare at AKU

Where we were….
…Where we need to be

Emphasis on what to think vs. how to think

Increasing standardization of medical systems

DATA DATA DATA!!!

Imagination
Creativity
Critical thinking

Innovation

Tunnel vision Today

Medicine Tomorrow

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• *Farooqi W, Subhani F, Mian A. Arch Dis Child 2017*

Modus operandi ('the big picture')

- *Farooqi W, Subhani F, Mian A. Arch Dis Child 2017*
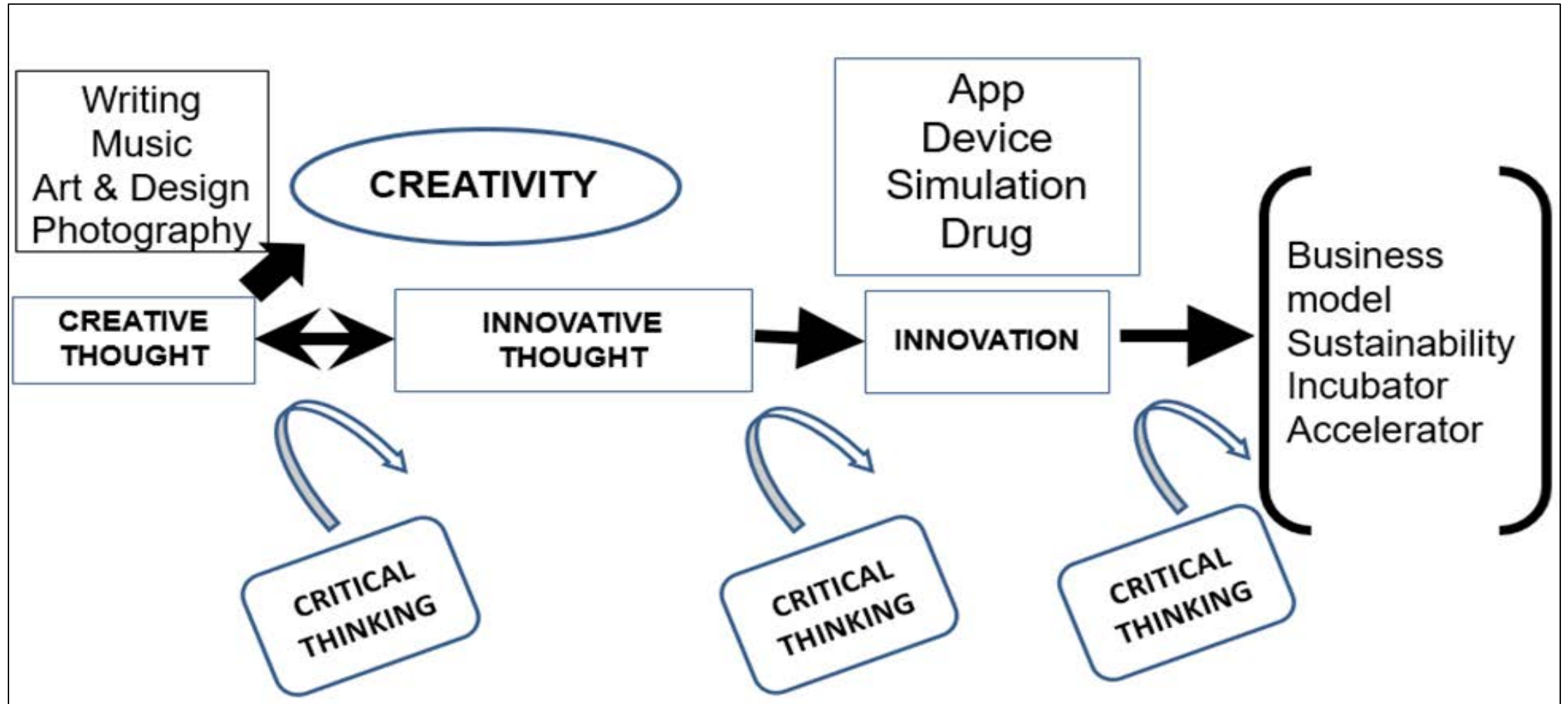
Hacking medicine

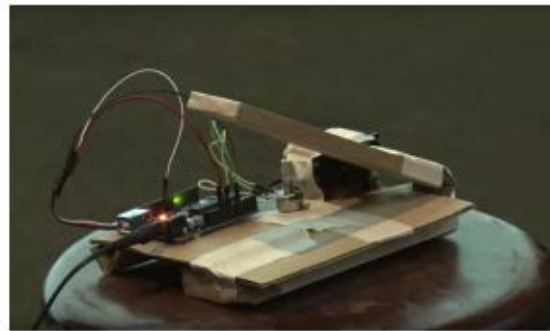## Karachi Hackathon Takes on Emergency Medicine Challenges

Solutions Pitched for Resource-Poor Environments

by ERIC BERGER

Special Contributor to Annals News & Perspective

There was a tinge of nervousness in her voice and manner as Huba Atiq, MBBS, a pediatric emergency physician in the sprawling city of Karachi, stepped to a lectern last August on the campus of Aga Khan University. Speaking in front of a group of fellow Pakistani physicians and students, Dr. Atiq held aloft a photo of a mother struggling to provide manual ventilation to her child with a bag-valve-mask device. She explained that the picture had been taken in a Karachi public hospital, one of many in the region that are generally overburdened and scrape by with minimal resources. Karachi may be Pakistan's most cosmopolitan city, and one of the largest metro areas in the world, but its public health facilities cannot adequately care for a population of more than 24 million people.

"Due to a large volume of critically ill patients requiring ventilator support, they end up in the emergency department [ED] on manual Ambu bagging," Dr. Atiq told her audience. "Because of the shortage of doctors and nurses in a public hospital, an attendant has to do the Ambu bagging."

Moreover, although it may be difficult to comprehend from a western perspective, in many instances, a parent has to step in to perform the task. Consider how the parents of an ill child might have come from a rural area, navigating through the

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Figure 1 Participants 'hacking' away.

their ideas in a 5-min format to a jury comprising professionals from the sectors of health, business and innovation. The Hackathon brought about a range of creative and innovative proposals easily applicable to an LMIC setting. Standout ideas included: *Smart-ER* that proposed the development of an app that would help parents decide whether their child required immediate emergency services; *Stealth* and *Nap Cuff* worked around the concept of developing vital signs monitoring instruments that are child friendly

Figure 2 Hackidathon participants displaying their projects.

should give the concept serious consideration, including children's hospitals in resource-limited settings, aiming to ideate, innovate, and thus evolve in a child-centric fashion. Everyone stands to gain from sharing ides in such an environment.

Sarosh Madhani,[1] Walid Hussain Farooqi,[2] Asad I Mian[3]

[1] Fourth Year Medical Student, Aga Khan University

- *Berger E. Ann Emerg Med 2017*
- *Madhani S, Farooqi W, Mian A. Arch Dis Child 2017*

Hackathons	Emergency Medicine	Children's Tower	Medical Education	Global Surgery
Hackers at event (n)	81	114	116	109
Age (%)				
<20 years	1	5	7	11
21-30 years	76	71	64	76
31-40 years	17	19	17	8
>41 years	6	5	12	5
Gender (%)				
Male	37	28	45	46
Female	63	72	55	54
Primary Profession (%)				
Nurses & nursing students	10	17	6	15
Doctors & medical students	54	30	83	75
Non-med 'others'	36	53	11	10

Our incubation program

- To grow creative & innovative ideas to business potential and impact
- To develop a mentorship network
- To strengthen multi-disciplinary linkages across Pakistan

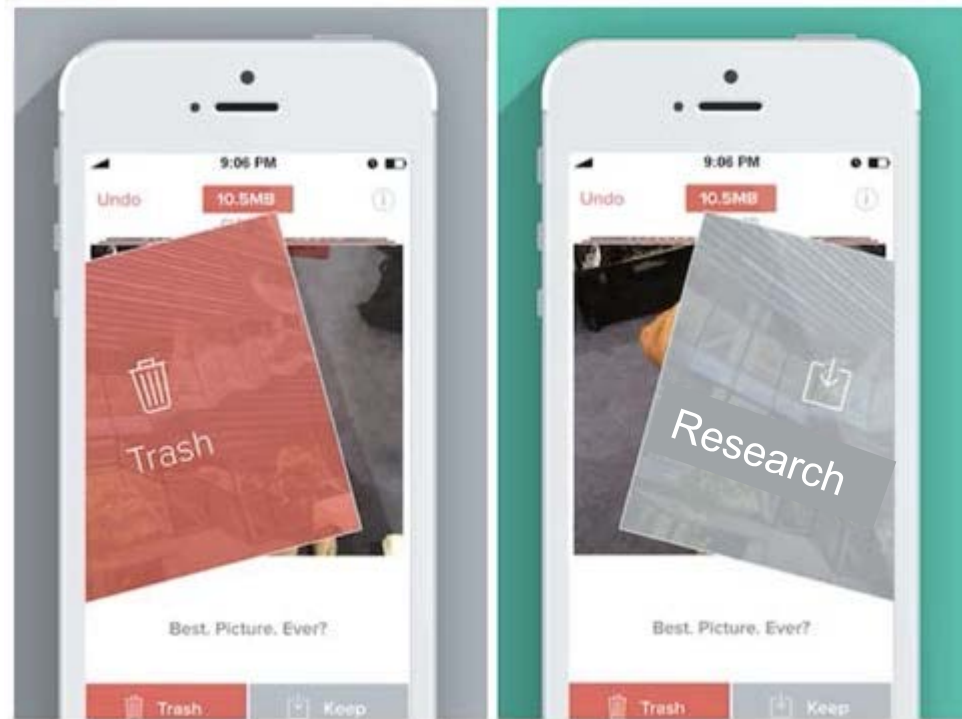
i2S The Innovation & Incubation Space

The breath hacks journey:
From hackathon innovation to incubation (& beyond)
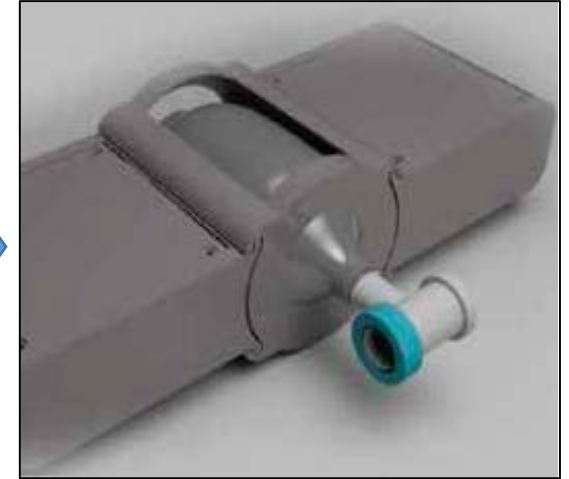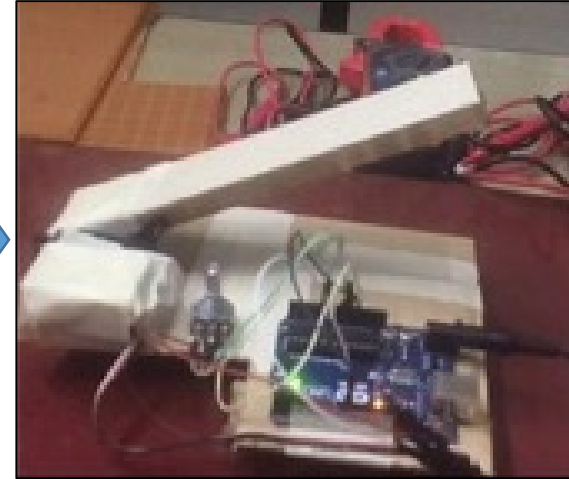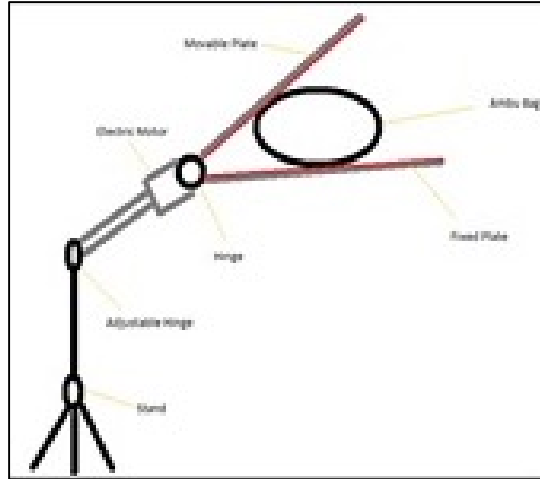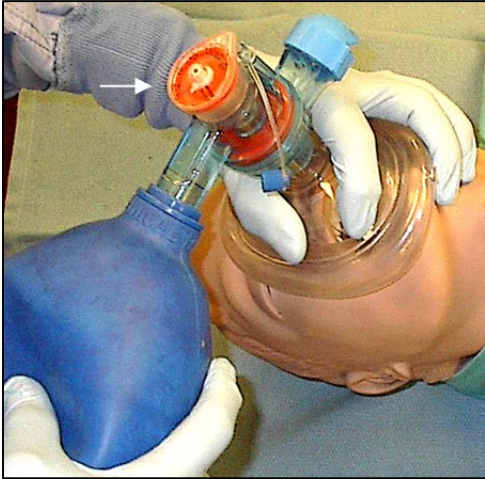
- Low cost ventilation device
- Collaboration with AKDN dHRC
- Prototype testing stage
- Patent filed

Credits: Huba Atiq, Saleem Sayani, et al.

RINDER

Don't swipe left for love, swipe right for research!

Credits: Kaleem Ahmed et al.

Incubate status*

	Breath Hacks	Rinder	BitMed	PFIN	JackED	HistorER
Incubation	X	X	X	X	X	X
Funding	X	X	X	X	X	X
Patent	X					
Prototype	X	X	X	X		
Testing	X					

*Does not include most recent cohort; i.e., from the Global Surgery Hackathon, Feb 2019

4 years of impact

Hackathon
- 4 themes
- 420 Participants
- 55 teams

Incubation
- 2 Cycles
- 6 incubates

Narrative Medicine
- 3 Workshops
- 18,500 Blog Views

Research & communication
- 3 papers
- 2 newsletter articles
- 3 grants
- 2 grand rounds

Student Activities
- 1 Gaming League Season
- 4 Speaker Sessions
- 12 Ideation Sessions

Ignite
- 6 Sessions
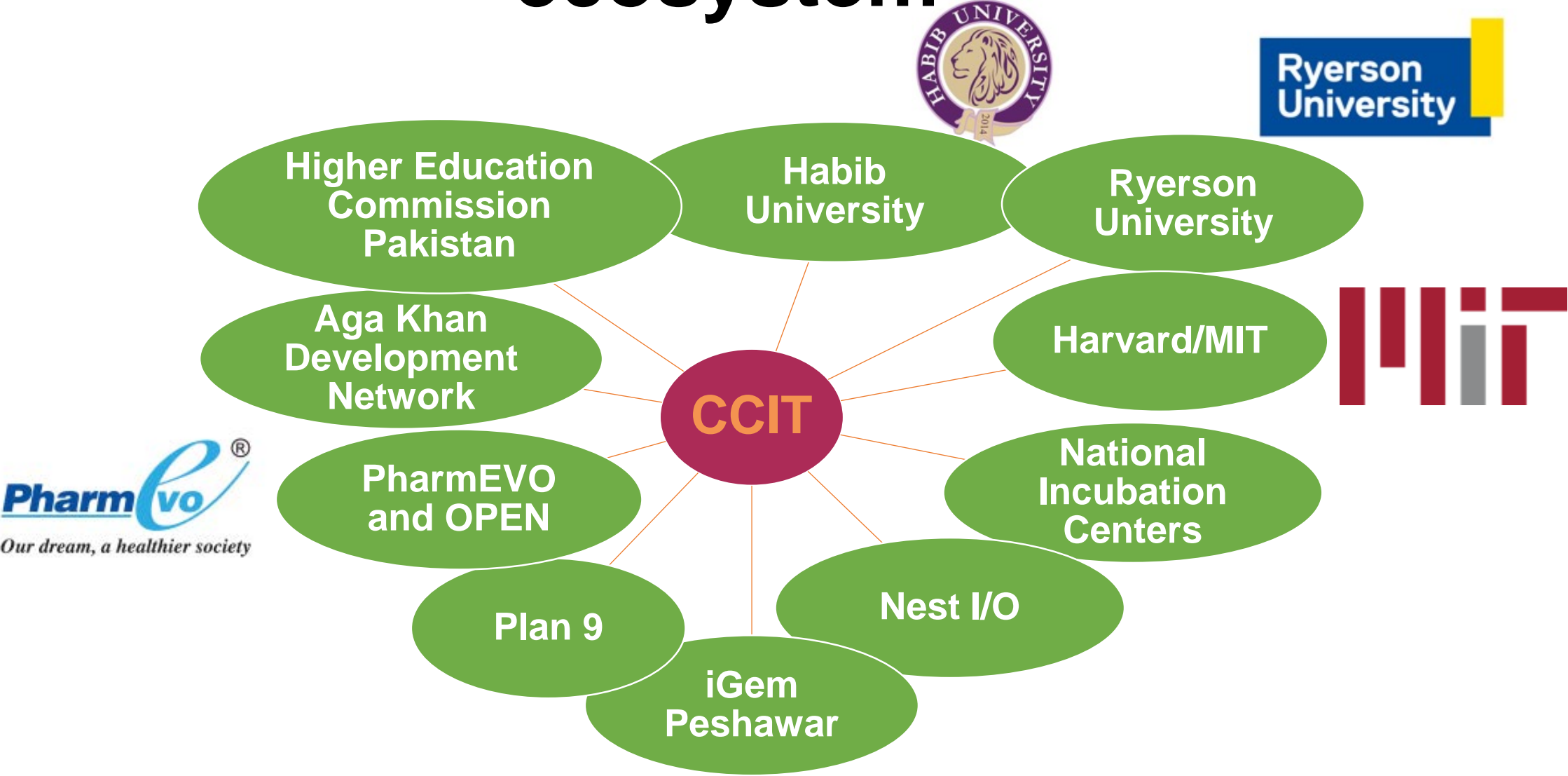- 56 talks
- 15,000 video views

Challenges and future directions

Challenges for biomed creativity & innovation in an academic medical institution

Need for:

Culture or ecosystem of innovation

CCIT expanding within an external ecosystem

Potential impact of our collaborative health innovation mission

- More robust public-private partnerships
  - Innovate and disrupt through multi-disciplinarity
- Decrease in morbidity & mortality; meet target SDGs
- Influence mindsets per 21st century skills
- Better community engagement; creating citizen scientists

Challenging conventional medical wisdom

Thank you for listening!

ACKNOWLEDGMENT

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- President Firoz Rasul

Reach out…we would love to connect!

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