A Model to Maximize ROI for Emergency Care Training and Service Delivery

Bradley Dreifuss, MD
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University of Arizona
Assistant Professor of Emergency Medicine
Director of Rural, Border, and International Emergency Medicine Programs

Global Emergency Care Collaborative
Executive Committee Member
Twitter - @dreifussmd
Brad@globalemergencycare.org
My Interests (No conflicts)

• Global Emergency Care Collaborative
  ▫ Executive Committee Member

• University of Arizona, Dept of Emergency Medicine
  ▫ Director of Rural, Border, and Global Health Programs

• American College of Emergency Physicians
  ▫ International Section Steering Committee Member
  ▫ Inaugural Chair of ISSC’s “Grant’s and Funding Committee”
Objective

• Convince you that increasing access to crucial emergency care (EC) services is necessary and has a large return-on-investment for long-term health security and economic growth.

• Provide a scalable model for integration of Mid-level training/service delivery into existing health care structures
Where things are headed....

Where the Growth Is
Change from 2002–2012

- Latin America and the Caribbean
- Middle East and North Africa
- Sub-Saharan Africa

GRAPHIC BY BLOOMBERG BUSINESSWEEK. DATA: INTERNATIONAL MONETARY FUND
Industrial expansion risks worsened by poor infrastructure

28 Pipeline Explosions, (1754 deaths) in 10yrs (Carlson, 2014)
Africa: A new pole for global growth

Africa is creating a new economic momentum that is driving global growth. Nine of the fifteen fastest growing economies in the world today, are in Africa.
African economies are growing faster and faster

The number of fast growing economies in Africa has been growing steadily since 1990. In 2014, 22 African countries are expected to grow at more than 6%. At this rate GDP is set to double by 2026.

<table>
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<th>Share of African countries by real GDP growth rates</th>
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<tr>
<td>Over 6%</td>
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<tr>
<td>3% - 6%</td>
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<tr>
<td>0% - 3%</td>
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<tr>
<td>Under 0%</td>
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<td></td>
<td>3.4</td>
<td>4.6</td>
<td>5.1</td>
<td>5.7</td>
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Source: IMF

Figure 1.5 A decade of rapid social progress

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<th>Life expectancy at birth, total</th>
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<tr>
<td>Years</td>
</tr>
<tr>
<td>60</td>
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<tr>
<td>55</td>
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<td>50</td>
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<th>School enrollment, gross primary</th>
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<tbody>
<tr>
<td>%</td>
</tr>
<tr>
<td>110</td>
</tr>
<tr>
<td>100</td>
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<td>74</td>
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<th>Maternal mortality ratio</th>
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<td>Per 100 000 live births</td>
</tr>
<tr>
<td>1000</td>
</tr>
<tr>
<td>400</td>
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<tr>
<td>700</td>
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<th>Mortality rate, under-5</th>
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<tr>
<td>Per 1000</td>
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<tr>
<td>170</td>
</tr>
<tr>
<td>160</td>
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<td>150</td>
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Source: ADBI, UNESCO, WHO, UNICEF, UNFPA, World Bank, UN Inter-agency Group for Child Mortality
African Development Bank’s Private Equity Investment in Africa 2012

“AfDB approves US$98.22-million loan for biomedical sciences education in East Africa” 03/10/2014

“The emergence of Africa’s urban middle class, who are increasingly demanding better services and have more disposable income than ever before, means that the economics of private healthcare businesses on the continent are strong.”
Mangrove Forests = Metaphor for Emergency Care

**Mangrove Forest Functions**
1. Improve water quality
2. Shoreline Stabilization
3. Diverse Habitat
4. Aquatic Nurseries

**Emergency Care Functions**
- System-Based Emergency Care: 1) Injury/IDT Surveillance/Prevention
- Emergency Care/Disaster Preparedness/Surge Capacity
- "Horizontal care" - anytime, anybody, anything
- Excellent teaching/learning environment
Acute Care: a keystone of health systems

“Economy of Scale”

Hirshon (2013) Health Systems and Services: The role of acute care
Acute care systems are crucial to sustainable economic and social development

• Function on “Economy of Scale”

• Increases health security
  ▫ Disaster preparedness
  ▫ Disease and injury surveillance $\rightarrow$ prevention

• Reduces industrial development costs via decreasing magnitude of risk and insurance costs

• Buffers impact from downsides of expendable income
  ▫ Increasing Road Traffic Crashes
  ▫ Increasing NCD’s $\rightarrow$ acute exacerbation of chronic dz
So, who can we train in EC?
Proportional World Map: Number of Physicians

http://www.worldmapper.org/images/largepng/219.png
Source: Adapted from the WHR 2006

**Figure 4:** Average global urban-rural distribution of health service providers.
The Answer = Task Shifting

- Sub-Saharan Africa: 25% of GBD... 3% of the health care workforce

- Provider shortage worldwide = 4,600,000 MDs, RNs, midwives, & midlevels
  - 2,400,000 occurring 57 crisis countries

- “Task shifting involves the rational redistribution of tasks among health workforce teams. Specific tasks are moved, where appropriate, from highly qualified health workers to health workers with shorter training and fewer qualifications in order to make more efficient use of the available human resources for health.” WHO (2008)
Case Study: Sustainable/Scalable Emergency Care

- GECC was founded in 2007, by 3 emergency physicians
- Address access to timely and quality emergency care
- Work with local partners
- Train local staff
- Utilize appropriate technology
- 501(c)(3) US NGO status
Global Emergency Care Collaborative

- System-based Emergency Care training at several tiers
- Task Shifting → emergency care in district hospitals
Models for Emergency Care

- Reality: will need MDs trained
  - Understand principles to provide back-up
  - Leadership structure within countries
  - High volume areas

- Tiered System of emergency care
  - EPs in busy referral centers
  - EP “supervise” care at district level
  - ECPs provide care at district hospital
  - Clinic/Village engagement
The Emergency Care Practitioner

- 2 year intensive training program
  - 1<sup>st</sup> yr training in emergency care
  - 2<sup>nd</sup> yr
    - advanced skills in EC
    - Teaching → become trainers in emergency care

- Curriculum = Symptom based diagnosis and management

- Didactics, low-tech simulation, and bedside clinical work
  - 40-50hrs per week
  - Procedure Logs
  - Patient Logs

- Graduated ECPs function independently to provide quality emergency care
GECC’s ECP Training Program

1) Didactics, 2) bedside education and practice, 3) simulation, 4) POCUS training, 5) quality improvement projects, and 6) research

MP Paula Turyahikayo involved in accident, in critical condition
Ongoing Injury/Dz Surveillance and Outcomes data collection (>30,000 pt visits)


Cost Effectiveness

- Est. cost of training an ECP in small scale program:
  - $4000 Nursing School (RN) + $9300 ECP = $13,300
- Est. cost of training a specialty physician in EC:
  - $20,000 Medical School + $30,000 MMED = $50,000
- If 30,000 pts seen over 30yr career, training costs:
  - ECPs = $0.44 per patient cared
  - MMEDs in EM = $1.6 per patient cared for

- “Brain Drain” for physicians (Mills 2011)
  - Compounded lost investment to SSA = $2.17billion
Next 12-24 months...

- Expanding to a 2nd training site – Masaka
  - Collaboration with the MOH and Mbarara University of Science and Technology (MUST)
  - 25 ECPs to start training over first 2yrs
- Seeking funding to complete a randomized control trial for EC development and assessment of community impact
- Collaboration to start MMED in Emergency Medicine at Makerere University and MUST
- Further collaboration with MOH and Universities to scale up the ECP model
- Further developing programs to assess barriers to seeking and accessing care
Scaling up the ECP prog in Uganda...

Quick Math

- ~80 district in Uganda
- 1 National Referral Hospital + 11 Regional RH

- So to staff 24/7/365....
  \[(4 \times 80) + 15 + (11 \times 8) = 423\]

- Imagine if we could train 20 EPs/year and lost none....

  \[\text{Total time to achieve complete coverage} \]

  \[21 \text{ years}\]
Thank you!