



### True Benefit Unknown

- We think we're doing the right thing
- So we should keep doing it
- Without really considering the cost
- And not really working on defining the benefits
- And not really worrying about unintended consequences
- Or actual harms...

Absent answers to any of these questions, we can't draw any conclusions about the value of outcomes

### Short Term Medical Mission: Cost

- Two week direct care, one resident:
  - Direct resident salary & benefits (\$2500)
  - CRNA backfill & benefits (ca \$8000)
  - Airfare (ca \$2000)
  - Possible faculty backfill costs for coverage (\$11,000)

Is the short term (anesthesia) outcome worth \$12.5-23.5K per 200 patients?

Rough annual values:  
 CA... salary at approximately \$50,000/y;  
 CRNA salary at \$160,000/y; 29% fringe rate.  
 Faculty backfill cost estimate: SAAA median salary at \$200,000/year; 15% fringe rate.

### Chronic Unmet Surgical Need and Unsafe Anesthesia

- STMMs are just a drop in the bucket of an ocean of need
  - 2 Billion People without access to Surgery
  - Single-digit #s of qualified anesthetists in some countries
  - 35 Million Anesthetics/annually without Pulse Oximetry  
Lancet 2010, Funk et al.
- AND:
  - No leverage: direct service ends when we leave
  - Dangerous self-perception that we're actually helping



### Short Term Medical Missions: Cost

- Inefficient application of resources
  - Solutions developed to developed world standards and customs
  - Wastes resources; fewer people served
- Major unintended consequences
  - Example: Cholera epidemic introduced to Haiti by UN aid teams  
[https://en.wikipedia.org/wiki/2010\\_Haiti\\_cholera\\_outbreak](https://en.wikipedia.org/wiki/2010_Haiti_cholera_outbreak)
  - Exogenous missions preempt development of local infrastructure -
    - Induced dependency

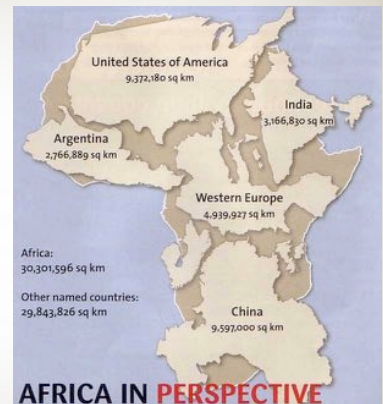
### Conclusion

- Unproven direct benefit to the traveller
- Definite material cost to send
- Un-assessed direct benefit to LIC patients
- Minimal impact on population health
- Sometimes spectacular harm

The outcomes of global health don't justify the costs

### Leverage Required

- Africa is big!
- Fastest pop growth of regions
- Volunteers doing 200 cases at a time can't make a dent



## Educators Needed

Every day, approximately **800 women die** from preventable causes related to pregnancy and childbirth.

**99%** of all maternal deaths occur in developing countries.

**AFRICA** bears **25%** of the global burden of disease with only 2% of the world's workforce.

**2 billion** people without access to safe anesthesia globally.

**90-95%** of the physicians live and work in urban settings but more than **50%** of the surgical need is rural.

Only **10%** of anesthesiologists in Sub-Saharan Africa work in public hospitals.

**Anesthesia-related MORTALITY is ONE of the TOP FOUR causes of death in the operative maternal patient, which is primarily occurring in rural hospitals and 90% of which are avoidable.**

## Why Insist on True Capacity Building?

- Recruit high impact trainees to our programs
- Our trainees return with:
  - Better sense of purpose
  - Improved cultural sensitivity
  - Parsimonious approach to modern surgery & anesthesia
  - Real appreciation of leverage
- Training site receives:
  - Lifetime training; potentially impacting 1000s per trained individual

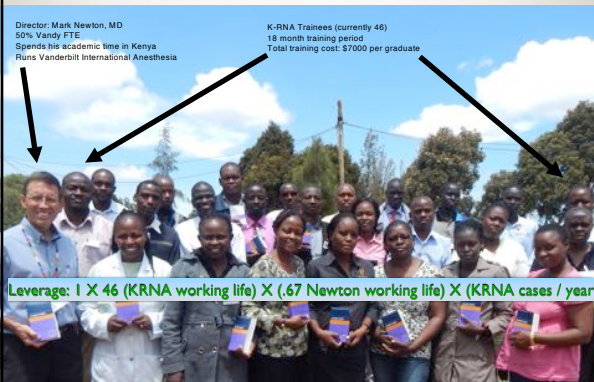


VANDERBILT UNIVERSITY School of Medicine

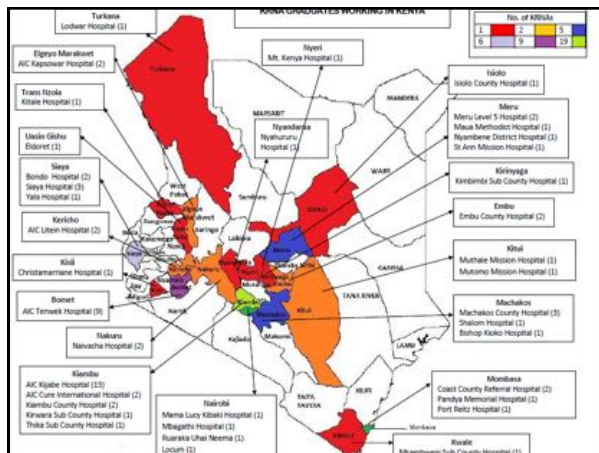
## Kenyan Registered Nurse Anesthetists

Director: Mark Newton, MD  
50% Vandy FTE  
Spends his academic time in Kenya  
Runs Vanderbilt International Anesthesia

K-RNA Trainees (currently 46)  
18 month training period  
Total training cost: \$7000 per graduate



**Leverage: 1 X 46 (KRNA working life) X (.67 Newton working life) X (KRNA cases / year)**



## ImPACT Africa (Improving Perioperative Anesthesia Care and Training)




37

## ImPACT Africa Goals (5 Year)

- Train 45 KRNA for Western Kenya
- Develop a packageable anesthesia curriculum for scale up.
- Develop a training program for anesthesia in W. Kenya within the GOK (Kijabe-model)
- Develop a system for determining Perioperative Mortality/Morbidity data in East Africa.
- Develop 2 Simulation Centers of Excellence in East Africa (Kijabe and W Kenya)

VANDERBILT UNIVERSITY School of Medicine

### Training of Trainers: Future Educators in East Africa

- Developing 2nd generation educators in anesthesia



VANDERBILT UNIVERSITY School of Medicine

### Testing Population Benefit



### Highlights of IMPACT Data Collection (POMR, Complications)

- June 1, 2014 start date
- 7900 cases recorded by April 2015 (Kijabe)
- POMR:
  - 24 hr: 1.26%
  - 48 hr: 1.38%
  - 7 days: 1.55%
- Safe Surgery Checklist (SSC) = 99.2%
- 12.3 % emergency cases
- 36.4% regional/spinal cases overall
- Now collecting data across Kenya

VANDERBILT UNIVERSITY School of Medicine

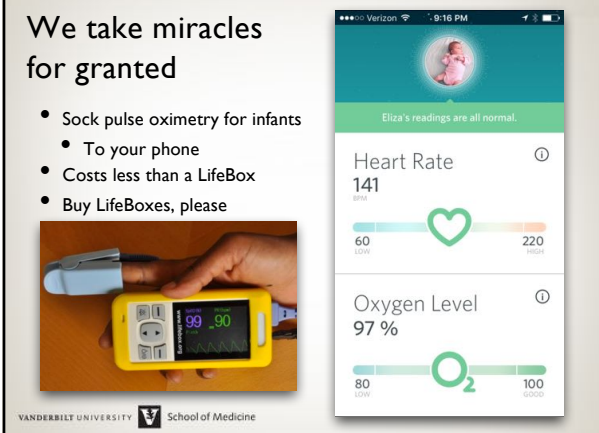
### I don't like winning the Con side

- Look for opportunities to create beneficial leverage
  - In practice, this means long-term teaching
  - Long term capacity building
    - As co-development, not *deus ex machina*
- Engage in activities that will develop evidence of benefit
  - To individuals
  - More importantly - to populations

VANDERBILT UNIVERSITY School of Medicine

### We take miracles for granted

- Sock pulse oximetry for infants
  - To your phone
  - Costs less than a LifeBox
  - Buy LifeBoxes, please

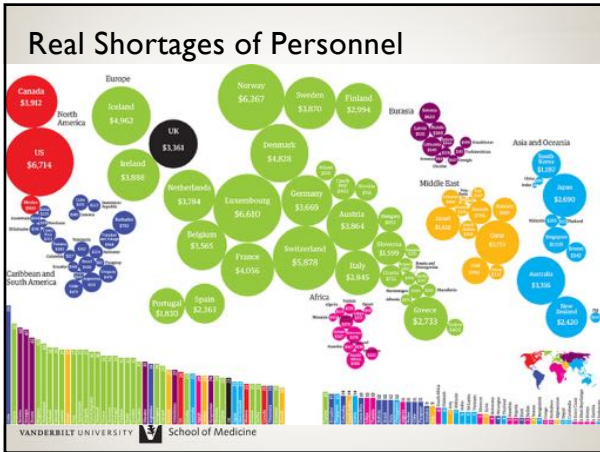


VANDERBILT UNIVERSITY School of Medicine

### Top 10 Causes of Death: WHO LIC 2008

	Deaths (M)	% Deaths
Lower respiratory infections	1.05	11.3%
Diarrheal diseases	0.76	8.2%
HIV/AIDS	0.72	7.8%
Ischemic heart disease	0.57	6.1%
Malaria	0.48	5.2%
Stroke/cerebrovascular disease	0.45	
Tuberculosis	0.40	4.3%
Prematurity and low birth weight	0.30	3.2%
Birth asphyxia and birth trauma	0.27	2.9%
Neonatal infections	0.24	2.6%

VANDERBILT UNIVERSITY School of Medicine



### Mosquitoes?

- Why does an anesthesia department sponsor research into mosquito renal physiology?
- Malaria

#### World's Deadliest Animals

Number of people killed by animals per year

Animal	Number of people killed per year
Mosquito	723,000
Human	475,000
Snake	55,000
Dog	33,000
Elephant	30,000
Shark	25,000
Wolf	20,000
Lion	15,000
Hyacinth	10,000
Coccoloba	5,000
Tapeworm	2,000
Acute myocardium	1,000
Redwater bug (Leishmaniasis)	1,000
Asian dog (Chagas disease)	1,000
Snake (Serpent bite)	1,000
Dog (Bite)	1,000

VANDERBILT UNIVERSITY School of Medicine