

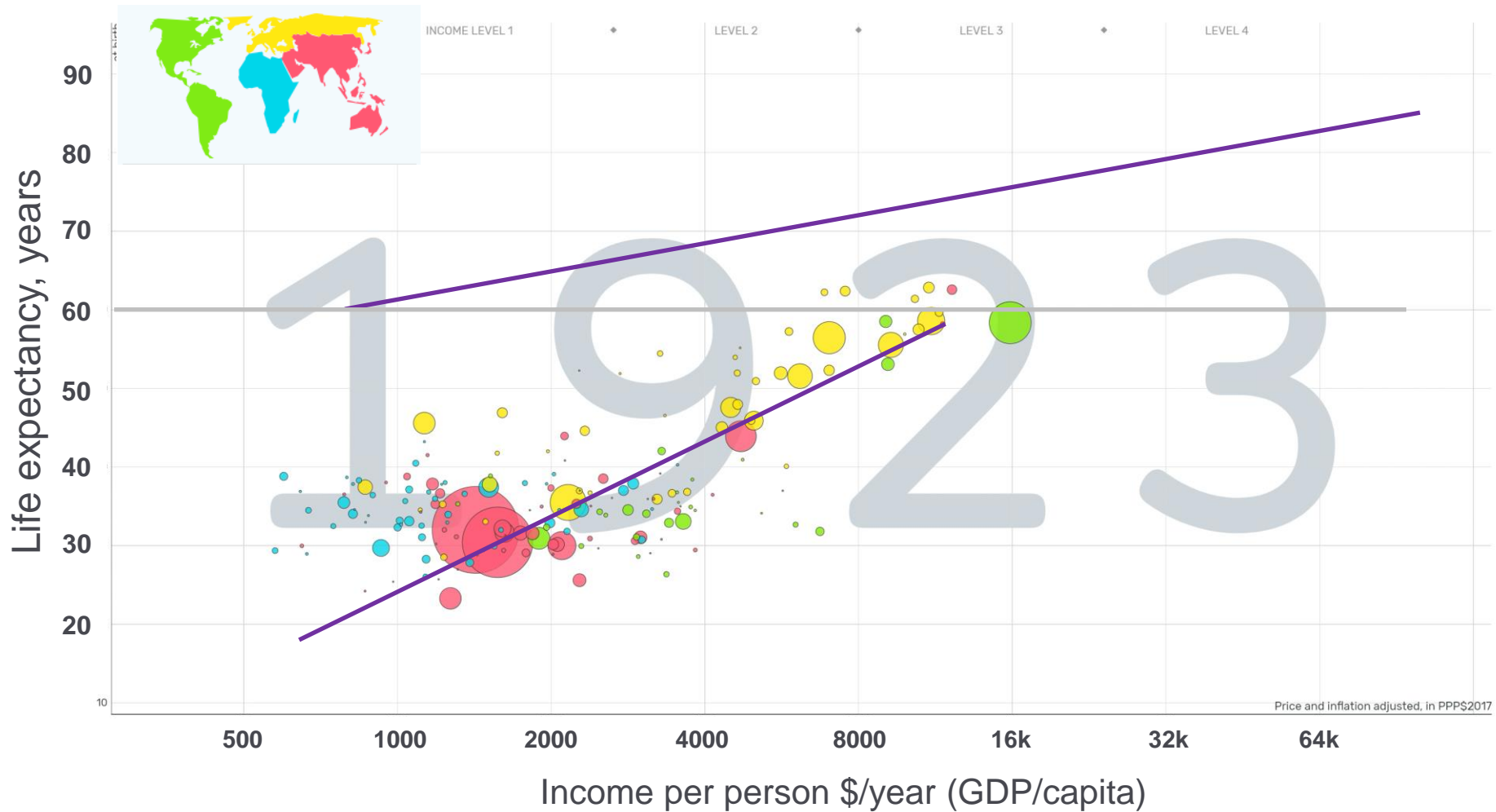
Scaling procedural skills training in low-resource environments

Catherine Mohr, MD MSME
President, Intuitive Foundation

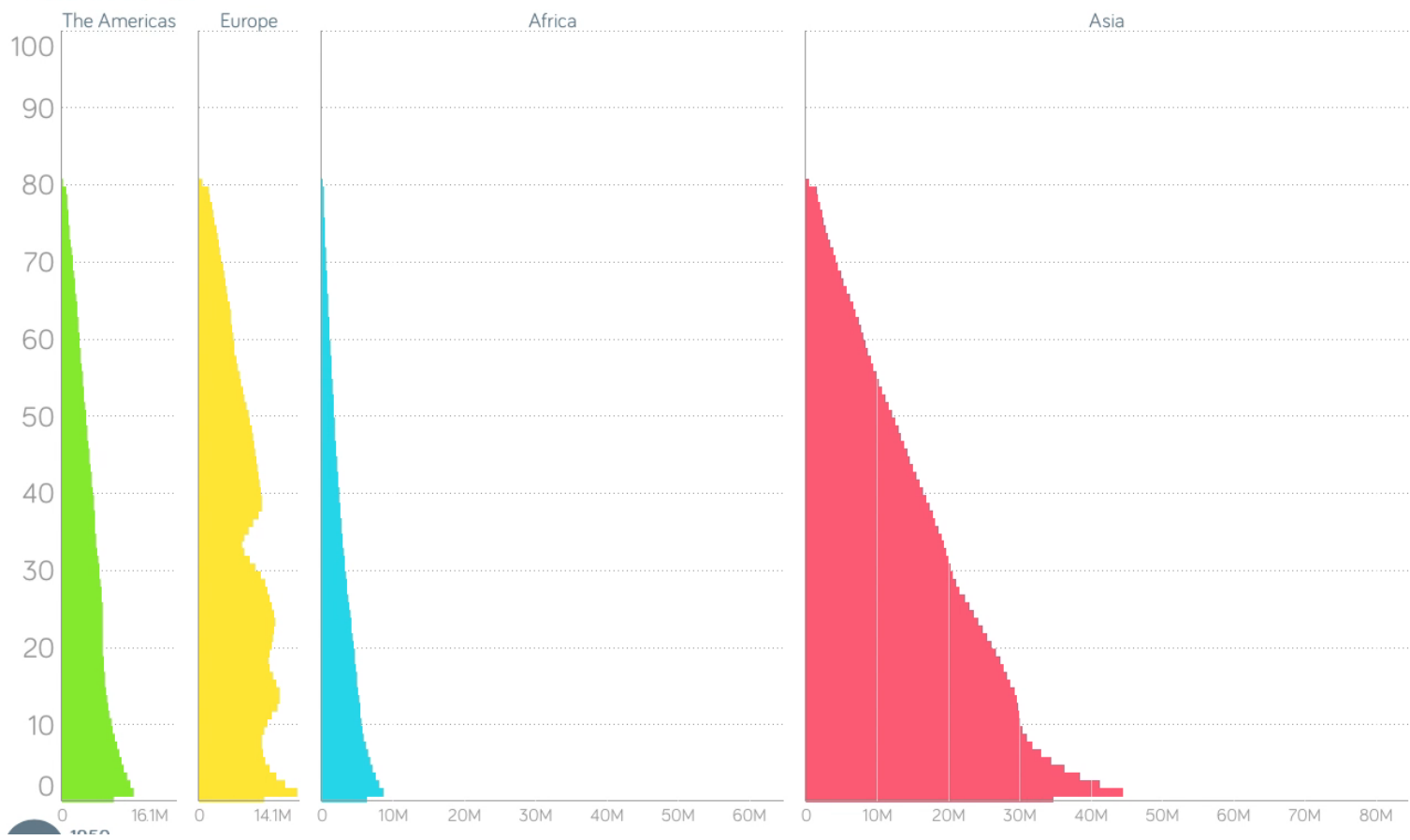
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Disclosure Statement

- Intuitive Foundation is funded by Intuitive Surgical
- I am an employee of Intuitive Surgical (100% seconded to the Foundation)
- No Intuitive Surgical products will be mentioned in this talk



Population by age



1950

Color World Regions



Show

- Geographic location**
- The Americas
 - Europe
 - Asia
 - Africa

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda

RESET APPLY

Group

2020

Color World Regions



Show

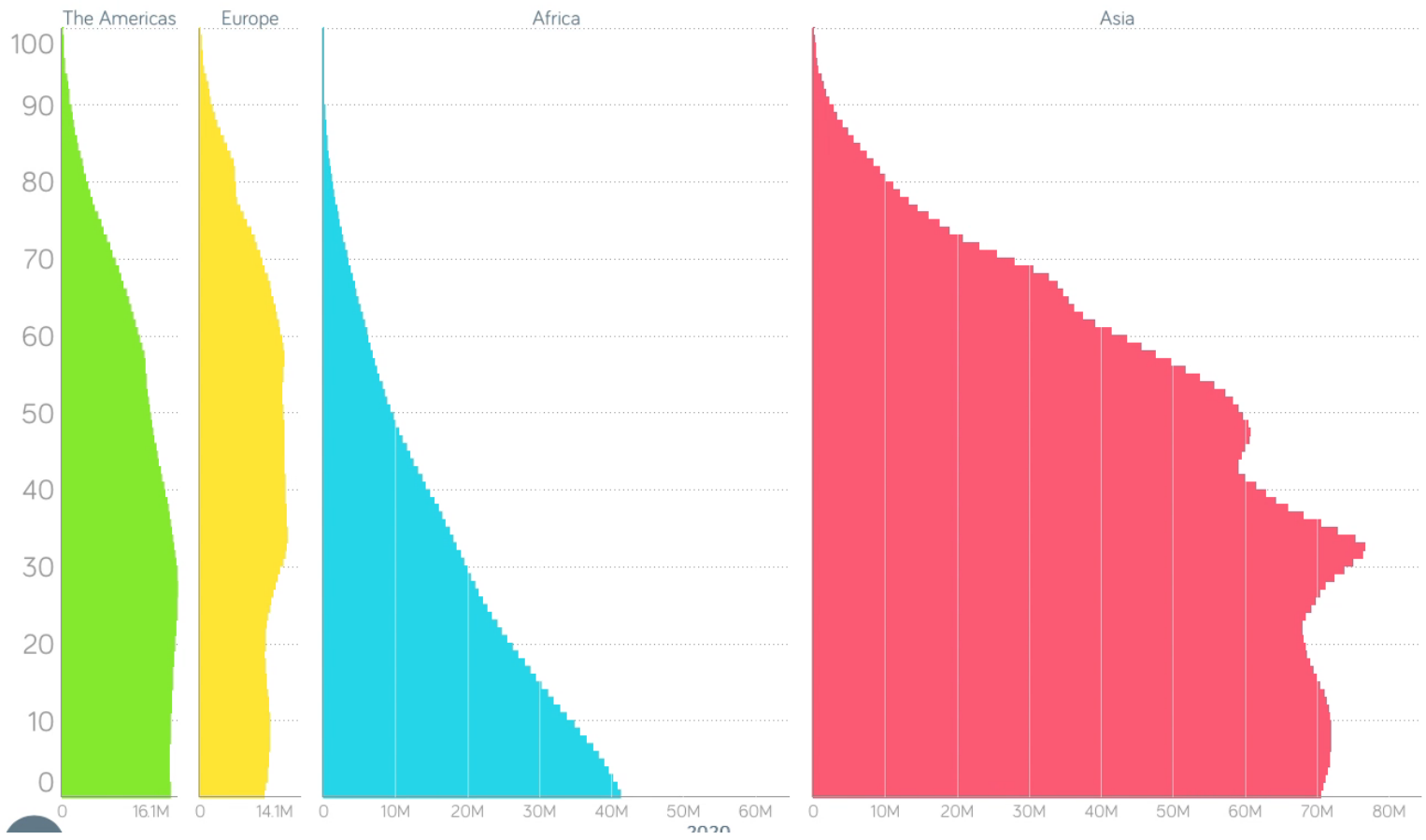
Geographic location

- The Americas ✕
- Europe
- Asia
- Africa
- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda

RESET APPLY

Group 1 5 10 15

Population by age



**Surgery and
Critical Care
should be
considered
cornerstones
of public
health**

300+ Million surgeries annually

Yet Millions of people never receive needed
basic surgery or critical care

Resulting in 7–17 Million potentially preventable
deaths globally and even greater disability,
suffering and lost potential



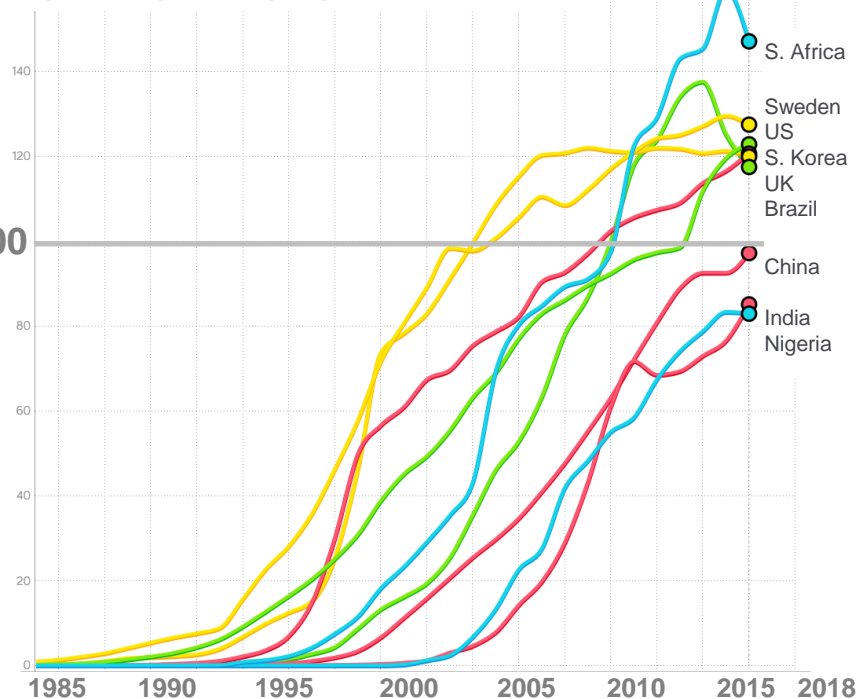
Scaling surgery needs **hospitals**
equipment
surgical practitioners
anesthetists
nurse midwives
medical officers
scalable education

exponentially

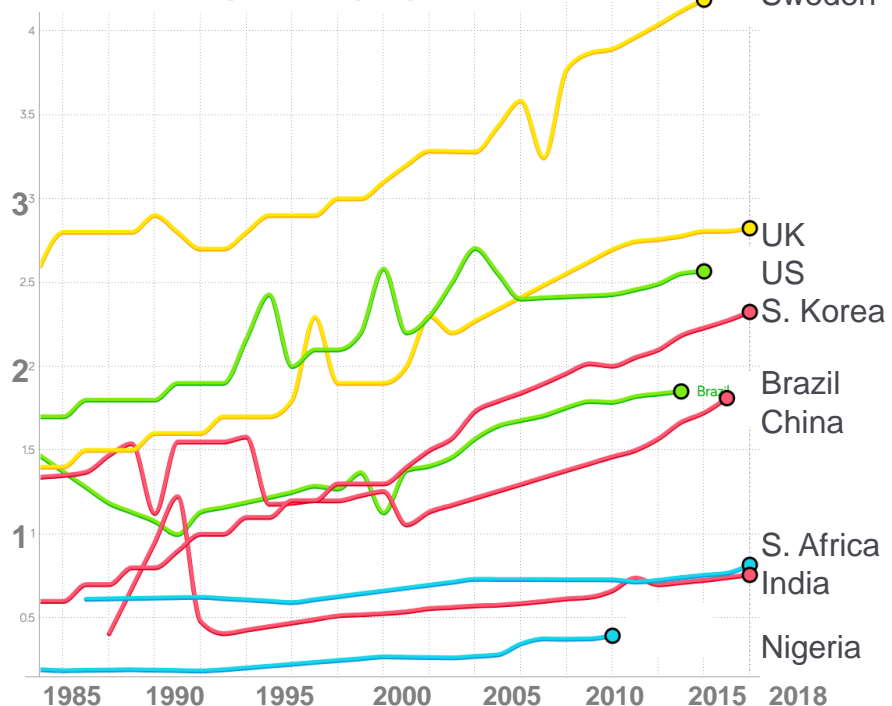




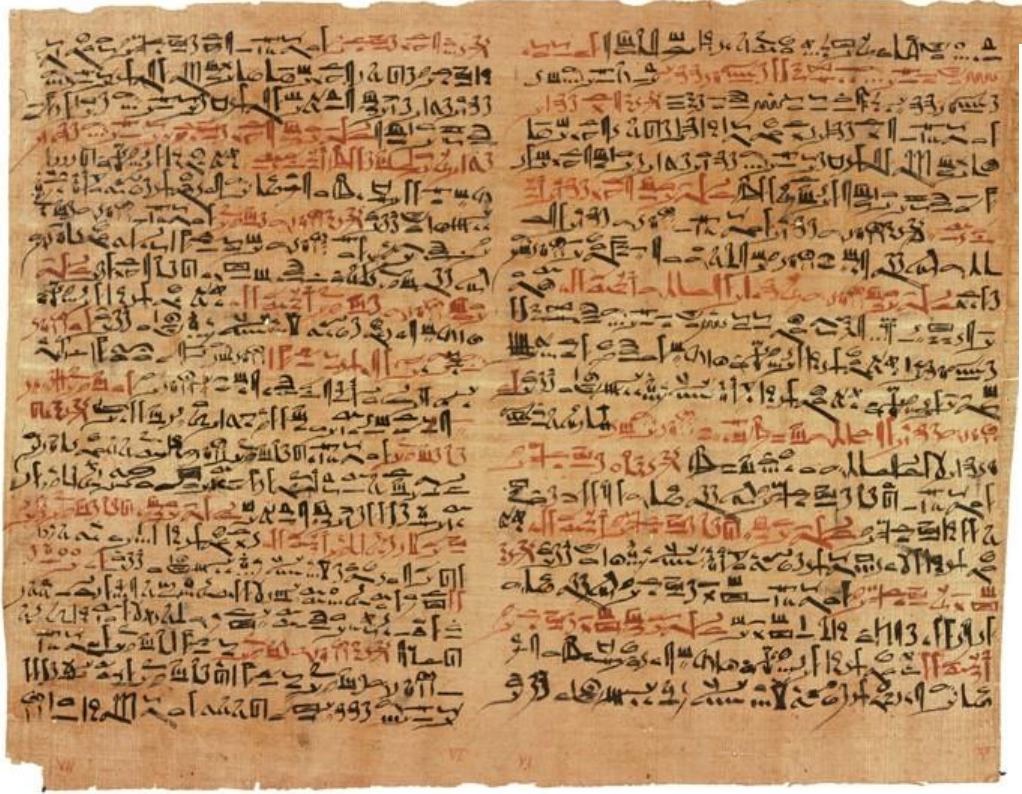
Cellphones per 100 people



Medical Doctors per 1000 people



Scaling Reading Based Knowledge Acquisition



WIKIPEDIA
The Free Encyclopedia

English

6 458 000+ articles

日本語

1 314 000+ 記事

Español

1 755 000+ artículos

Русский

1 798 000+ статей

Deutsch

2 667 000+ Artikel

Français

2 400 000+ articles

Italiano

1 742 000+ voci

中文

1 256 000+ 条目 / 條目

Português

1 085 000+ artigos

العربية

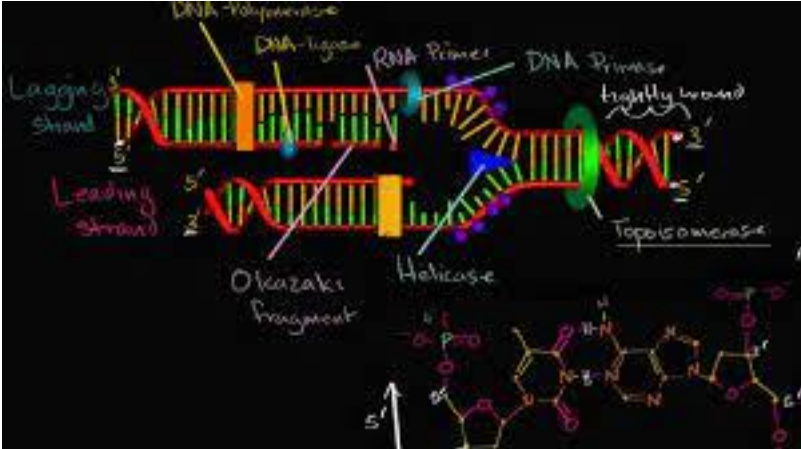
مقالة 1 159 000+



EN

Read Wikipedia in your language

Scaling Lecture Based Knowledge Acquisition



Can We Decentralize and Scale Skill Acquisition?



Assessment is the key to guided practice
Self-administered assessment is the key to scale.

**see
one**

**do
one**

**teach
one**

**see
one**

**teach yourself
one**

**do
one**

Surgical Education Learners Forum

SELF is a community of practice for developing and evaluating self-directed training modules for clinicians that enables:



independently learning new skills



at any point in a clinician's career



at the point of health care delivery



SELF Module

Self-directed skills training for clinicians

Simulation-Based Clinical Skills Practice

Build simulators with rigorous task deconstruction, appropriate fidelity, local materials, and evidence-based validity testing

Self Administered Assessment

Use peer to peer video-based assessment tools to make high quality formative feedback to prevent the acquisition of “anti-skills”

Knowledge and Contextual Training

Use authoring tools to easily create OSE type clinical cases around skills training, so that learners know when, and *when not to*, do the procedures

Rigorous high-quality Evidence

**African Laparoscopic Learners – Surgical
Advancement For Ectopic Pregnancy**



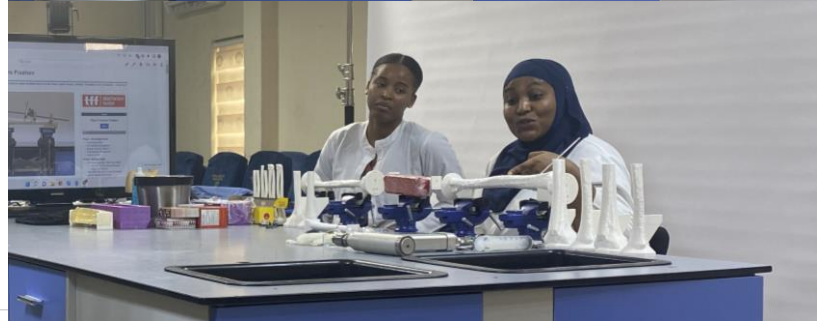
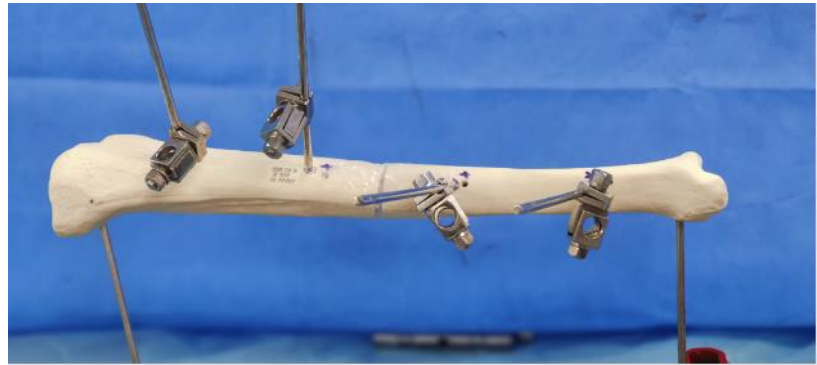
Dr. Blessing Ngoin Ngam
Mgingo Baptist Hospital



Tibial Fracture Fixation



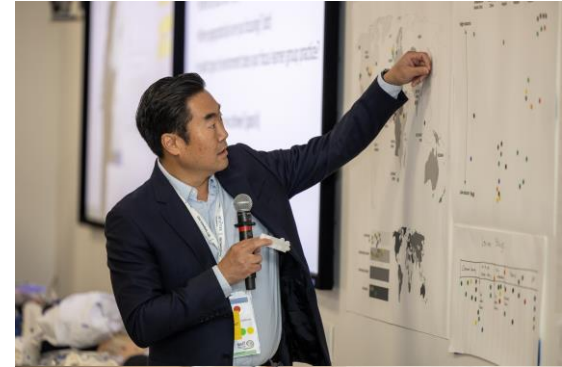
Jonah Tang Kat
Adamawa State Specialist Hospital, Nigeria



SELF Symposium | August 2023

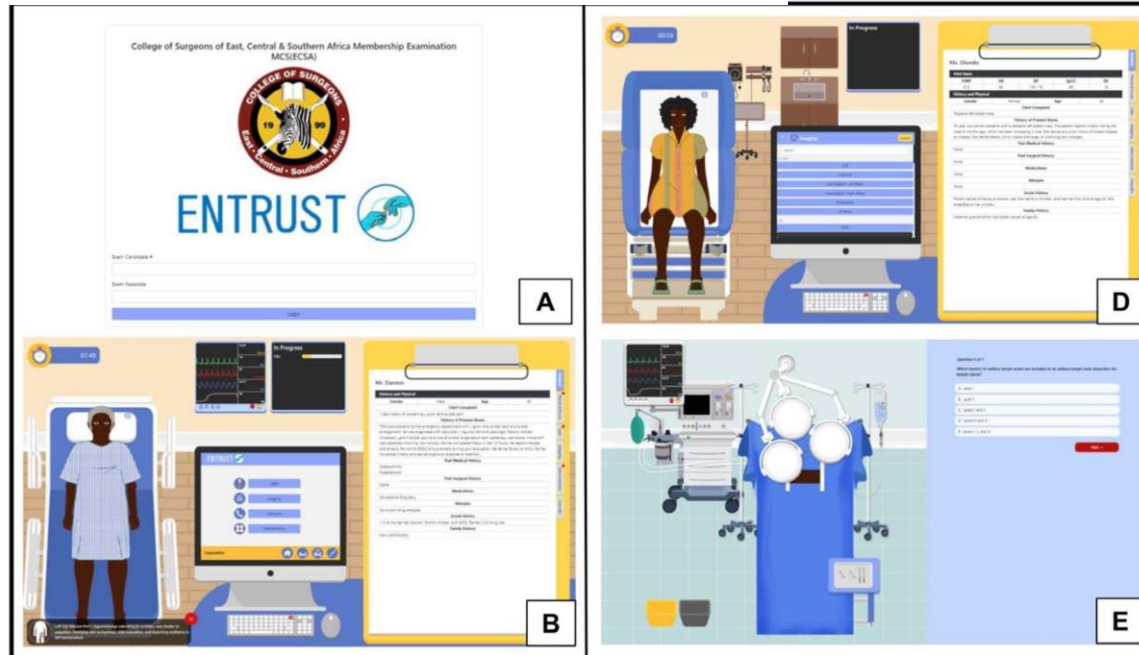
Convened ~45 global surgical and educational leaders in California

- Presented on and demonstrated existing SELF training modules
- Created consensus documentation for later publication on:
 - framework for evaluating training modules
 - needed degree of fidelity in simulators
 - best practices in self-assessment
 - protocols for evidence generation
 - prioritization of procedures for module development
 - roadmap for “theory of change”
- Brought leaders in the ACS, SAGES, COSECSA, WACS, WHO together for collaboration



Correlation of Performance on ENTRUST and Traditional Oral Objective Structured Clinical Examination for High-Stakes Assessment in the College of Surgeons of East, Central, and Southern Africa

Cara A Liebert, MD, FACS, Edward F Melcer, PhD, Hyrum Eddington, BS, Amber Trickey, PhD, MS, CPH, Samuel Shields, BS, Melissa Lee, BA, James R Korndorffer Jr, MD, MHPE, FACS, Abebe Bekele, MD, FACS, FCS(ECSA), Sherry M Wren, MD, FACS, FCS(ECSA), Dana T Lin, MD, FACS



“PeerReview”



> *Surg Endosc.* 2023 Sep;37(9):7170–7177. doi: 10.1007/s00464-023-10182-y. Epub 2023 Jun 19.

Evidence supporting performance measures of laparoscopic appendectomy through a novel surgical proficiency assessment tool and low-cost laparoscopic training system

Christopher W Reynolds¹, Deborah M Rooney², David R Jeffcoach³, Melanie Barnard⁴, Mark J Snell⁵, Kevin El-Hayek⁶, Blessing Ngoin Ngam⁵, Serena S Bidwell¹, Chioma Anidi¹, John Tanyi⁵, C Yoonhee Ryder¹, Grace J Kim⁷

Affiliations + expand

PMID: 37336843 DOI: [10.1007/s00464-023-10182-y](https://doi.org/10.1007/s00464-023-10182-y)

Abstract

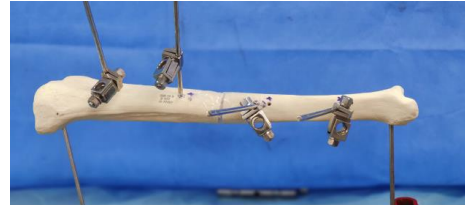
Background: Laparoscopic training remains inaccessible for surgeons in low- and middle-income countries, limiting its widespread adoption. We developed a novel tool for assessment of laparoscopic appendectomy skills through ALL-SAFE, a low-cost laparoscopy training system.

Methods: This pilot study in Ethiopia, Cameroon, and the USA assessed appendectomy skills using the ALL-SAFE training system. Performance measures were captured using the ALL-SAFE verification of proficiency tool (APPY-VOP), consisting of a checklist, modified Objective Structured Assessment of Technical Skills (m-OSATS), and final rating. Twenty participants, including novice (n = 11), intermediate (n = 8), and expert (n = 1), completed an online module covering appendicitis management and psychomotor skills in laparoscopic appendectomy. After viewing an expert skills demonstration video, participants recorded their performance within ALL-SAFE. Using the APPY-VOP, participants rated their own and three peer videos. We used the Kruskal-Wallis test and a Many-Facet Rasch Model to evaluate (i) capacity of APPY-VOP to differentiate performance levels, (ii) correlation among three APPY-VOP components, and (iii) rating differences across groups.

Materials Database

Landing Page

contains
pulldown lists of
Tissues and
Structures and a
brief description
of how to use the
database and a
link for submitting
a material form



Recommendation engine

User enters:
"I need training in
Procedure X"

Engine prompts the
user for setting, current
level of training,
available resources

Feedback ★★☆☆★

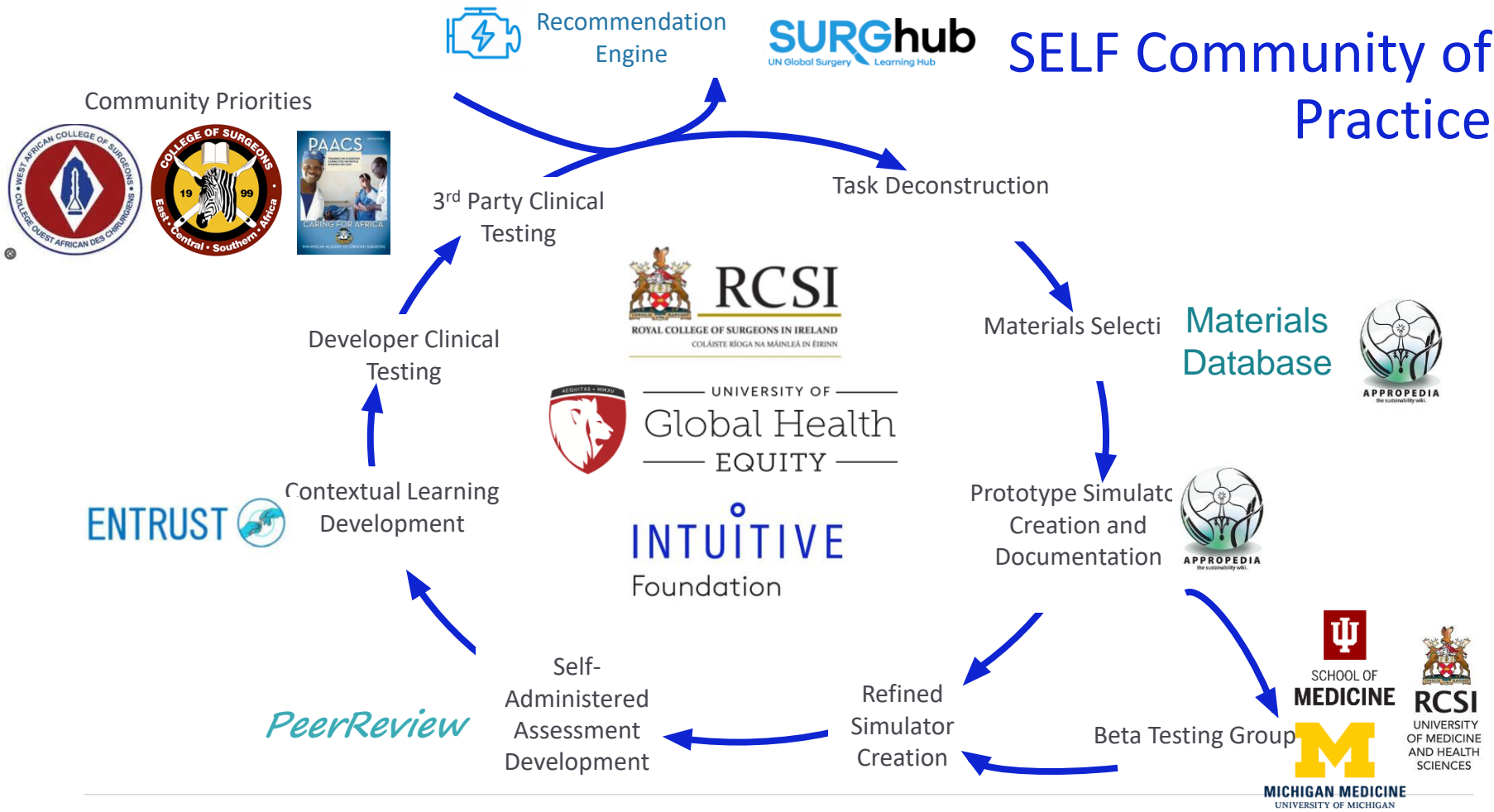
The best
match for X



AI training on reference material



SELF Community of Practice



Academic Alliances



ABOUT FOR STUDENTS & RESIDENTS ACTIVITIES FOCUS AREAS NEWS & EVENTS



PROGRAMS IN EDUCATION

MED 232 Global Health:
Scaling Health Technology
Innovations in Low
Resource Settings

Photo credit: National Cancer Institute, unsplash.com



PeerReview

Materials
Database



About Academic Programs Our Campus Latest News Donate

Academic Programs

Bachelor of Medicine,
Bachelor of Surgery

Master of Science in
Global Health Delivery

The Center for
Leadership in Global

Innovation Center

The Innovation Center (IC) was conceptualized in 2019 and officially opened in 2020 with the primary purpose to encourage UGHE students to create and generate high-value solutions in global health through education, collaboration, innovation, action, and dissemination to address long-standing



Biomedical Training Program

Collaboration with Medical Aid International to train **70** biomedical technicians across **25** health facilities.



Self-administered training and skills assessment



Baseline equipment audit and inventory



Open-access medical device documentation library



Technician toolbox and laptop



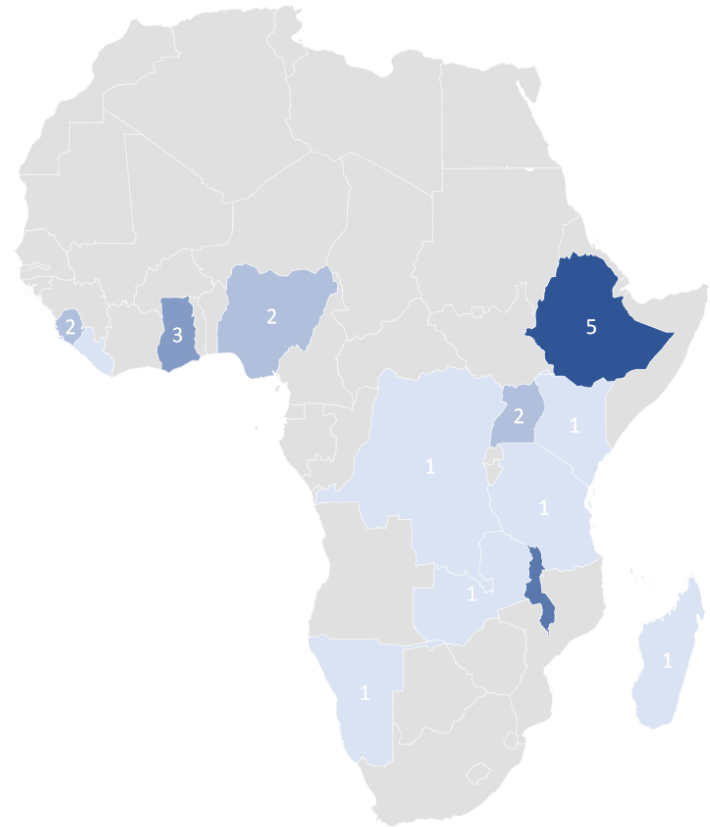
Unboxing of technician tools

Biomedical Training Program

Pre-training equipment audit & survey findings

> $\frac{3}{4}$ of technicians said a lack of spare parts is the top reason why equipment isn't working.

> $\frac{3}{4}$ of technicians said they have insufficient tools to fix and maintain medical equipment.



Pilot site distribution

Moving forward with SELF

Create and grow a [Community of Practice](#) to realize this vision for scale with RCSI and develop the UGHE Course

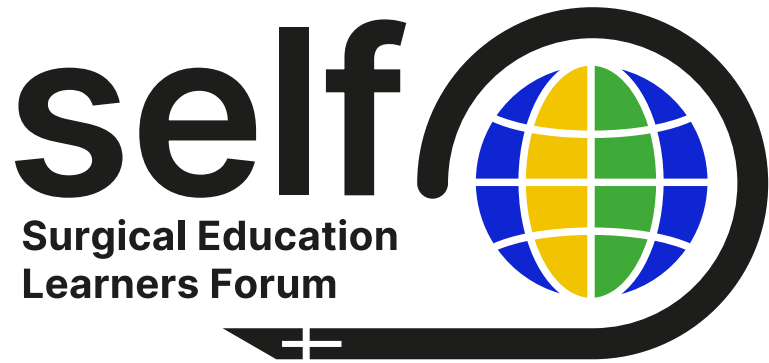
Build a new “[SELF Foundation](#)” non-profit organization to take on the “toolbox” - notably ENTRUST and PeerReview and the Recommendation Engine

Support the development of several new training modules through [Clinical Skills Training Grant](#).

Publish a [set of journal articles](#) to share the SELF community’s vision for achieving scalable models for clinical procedure training.

Convene the SELF community at global health events, including the SELF Symposium during [International Surgical Week \(August 29–30 | Kuala Lumpur\)](#)

Continue the next phase of the [Biomedical Training Program](#) with additional partners like Engineers without Borders



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