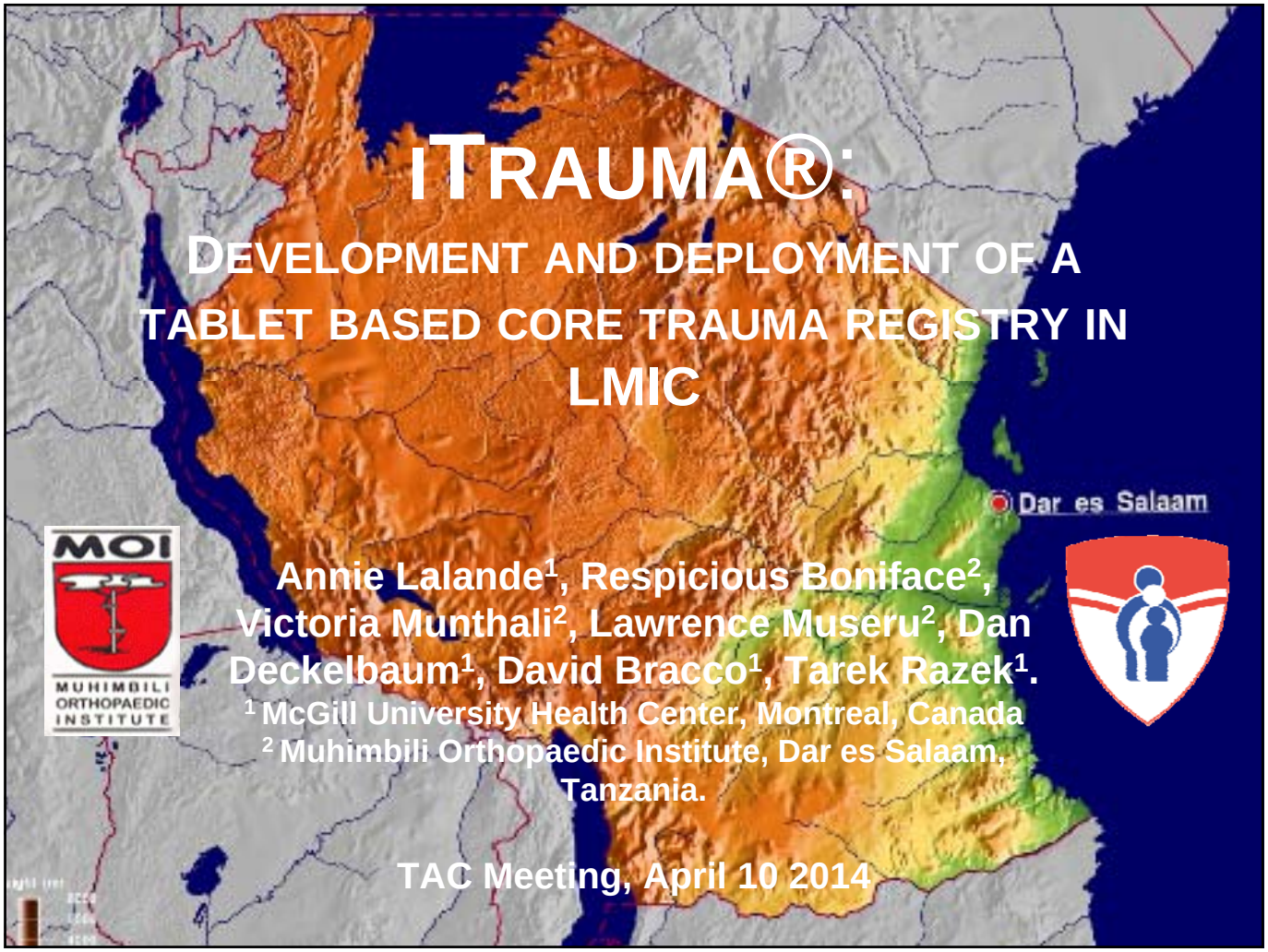

iTRAUMA®:

DEVELOPMENT AND DEPLOYMENT OF A TABLET BASED CORE TRAUMA REGISTRY IN LMIC

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TAC Meeting, April 10 2014

Disclosures

None

Injuries worldwide

- Injuries are responsible for 9% of the deaths worldwide and account for 12% of the burden of disease
- People between 15 and 44 account for 50% of trauma related mortality
- 90% of trauma deaths occur in low- and middle-income countries (LMIC)

Trauma Databases

- Cornerstone of trauma systems
- Obtain fundamental information about
    1. Trauma epidemiology
    2. Trauma process of care
    3. Trauma outcome
- Identify areas for improvement, measure the effect of change

Needs versus means

- There is a worldwide need for trauma registries
- Actual trauma registries are complex and require too many resources to be deployed in LMIC

Objectives

- Adapt current trauma registry to LMIC in a sustainable fashion
- Help LMIC design their response to trauma in their health care system
- Assess objectively the burden of injury with increased availability of data

How can we adapt

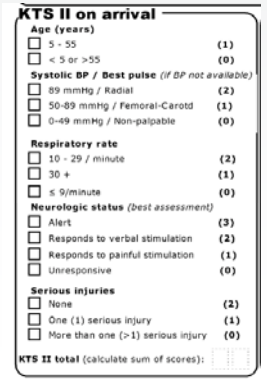
Simplicity: the key in LMIC

- Database
  - Essential parameters
- Trauma scores
  - Kampala Trauma Score (KTS)

Lessons from Uganda

- Kampala, Uganda in 2000
  - Trauma registry: 1 page
  - Scoring: Kampala Trauma Score (KTS)
  - Validity: KTS performed as well as TRISS in predicting mortality

KTS = Age + SBP + RR + AVPU + No. of serious injuries



KTS II on arrival

Age (years)
- ☐ 5 - 55 (1)
- ☐ < 5 or >55 (0)

Systolic BP / Best pulse *(if BP not available)*
- ☐ 89 mmHg / Radial (2)
- ☐ 50-89 mmHg / Femoral-Carotd (1)
- ☐ 0-49 mmHg / Non-palpable (0)

Respiratory rate
- ☐ 10 - 29 / minute (2)
- ☐ 30 + (1)
- ☐ ≤ 9/minute (0)

Neurologic status *(best assessment)*
- ☐ Alert (3)
- ☐ Responds to verbal stimulation (2)
- ☐ Responds to painful stimulation (1)
- ☐ Unresponsive (0)

Serious injuries
- ☐ None (2)
- ☐ One (1) serious injury (1)
- ☐ More than one (>1) serious injury (0)

KTS II total (calculate sum of scores):

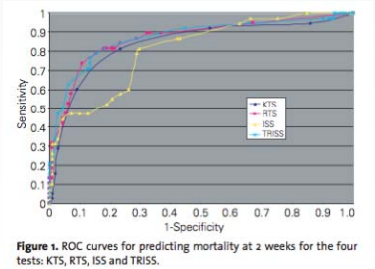


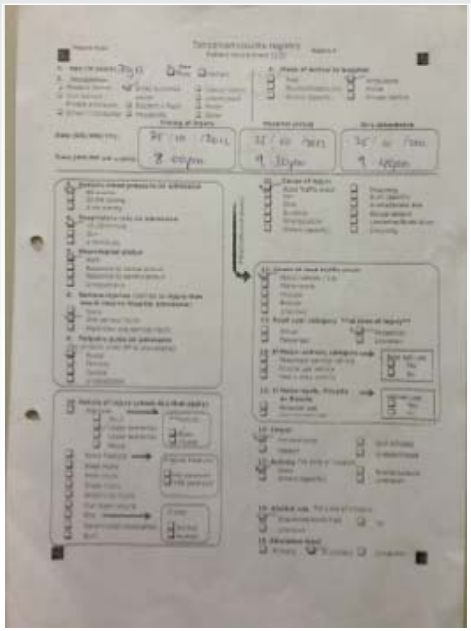
Figure 1. ROC curves for predicting mortality at 2 weeks for the four tests: KTS, RTS, ISS and TRISS.

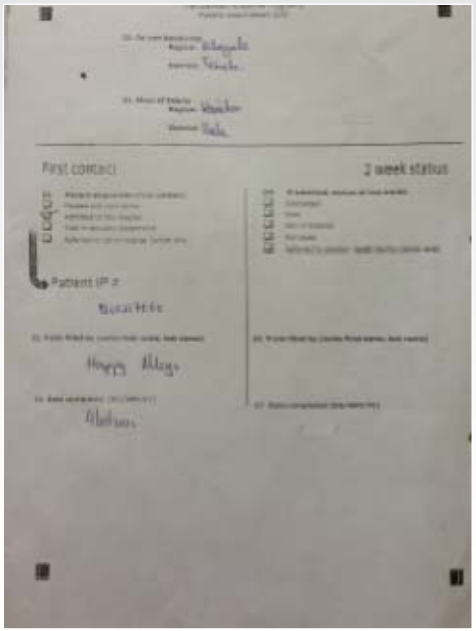
Current Collaboration

- Injury Control Center for Tanzania (ICC-T)
  - Muhimbili Orthopaedic Institute (MOI)
  - Dar es Salaam, Tanzania
- Collaboration since 2006

Original Database

Paper data collection started in 2006





Actual paper database

Advantages

- Sustainable (currently >14,000 patients in database)
- Essential information is obtained

Issues

- Slow data collection
- Data not standardized
- Inefficient analysis

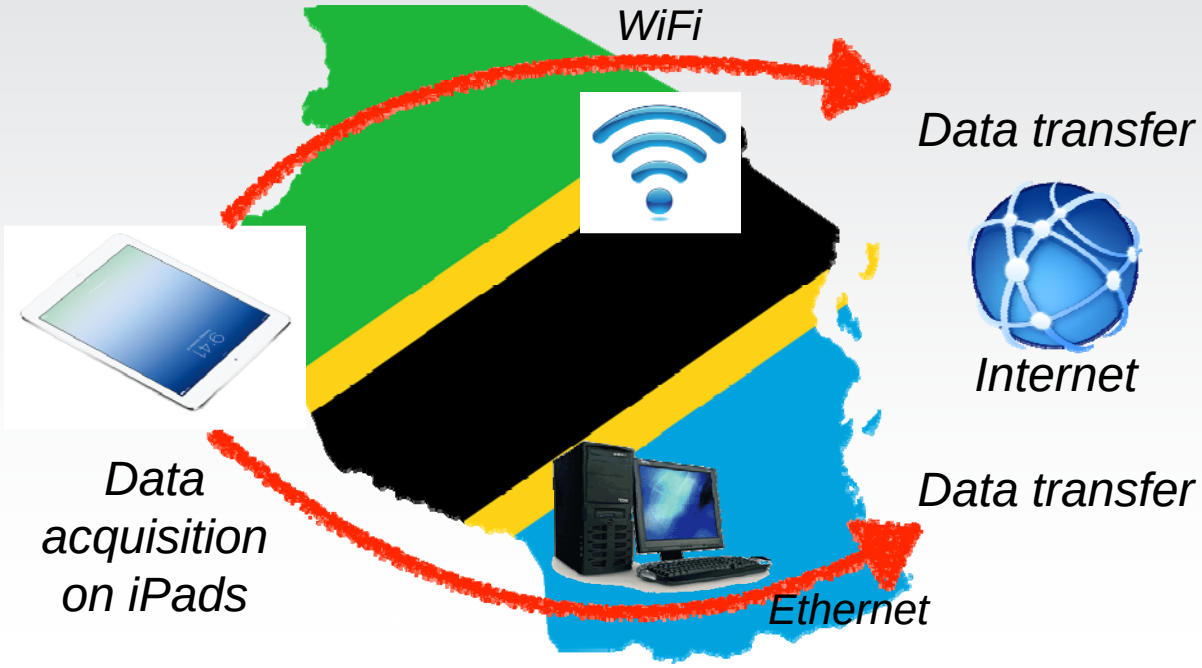
Hypothesis

An **iPad app based trauma registry** with simplified **standardized reporting** is feasible and more efficient in a low resource setting like Dar es Salaam, Tanzania.

The **increased flow** of trauma patients will **corroborate** the **high trauma morbidity and mortality** seen with the Global Burden of Disease data.

Methodology

Development in Montreal by Dr. David Bracco
Architecture of the system



Methodology

Data on server Firewall

Simple reporting through Excel

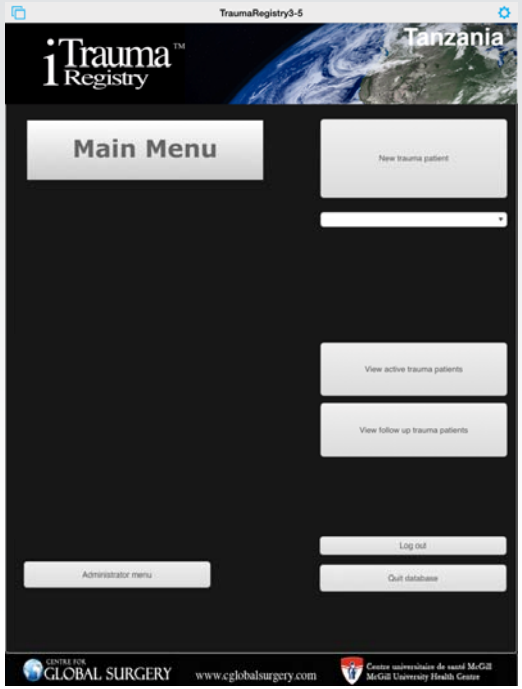
Advanced reporting through SAS including Geomapping & GIS data

System advantages

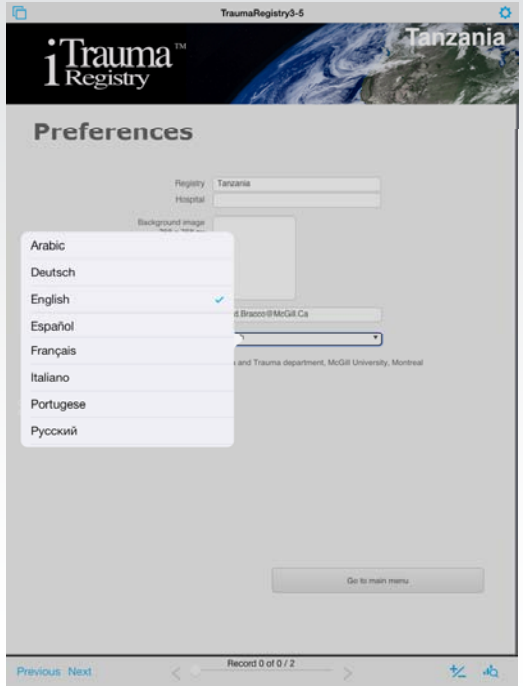
- *Works without live internet connection*
- *Standardized data*
- *User-friendly interface*

Methodology

Simple user menu



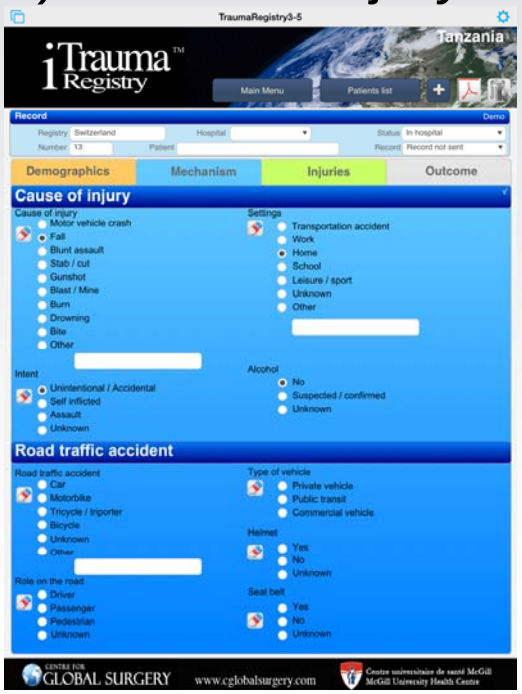
Multilingual support



Methodology

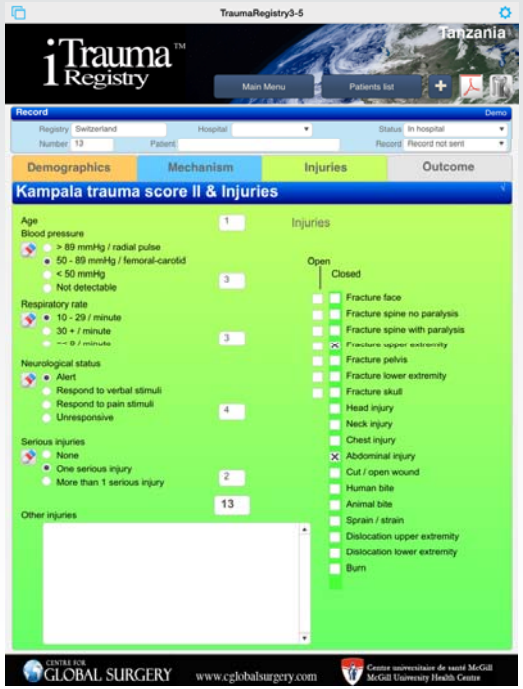
1) Demographics

2) Cause of injury

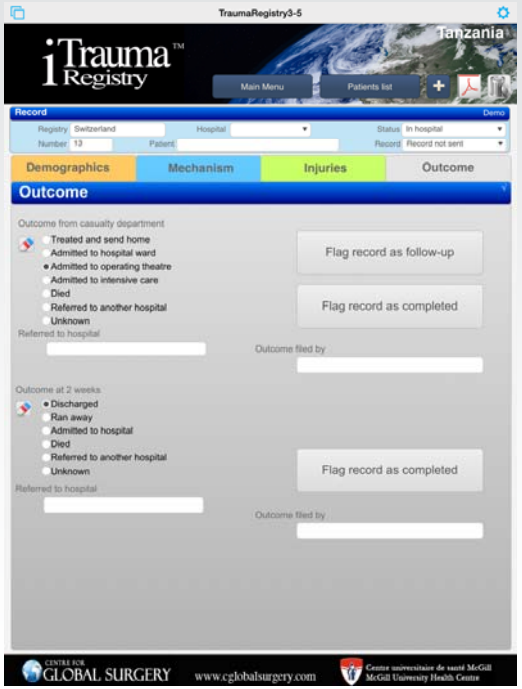


Methodology

3) Injuries



4) Outcome

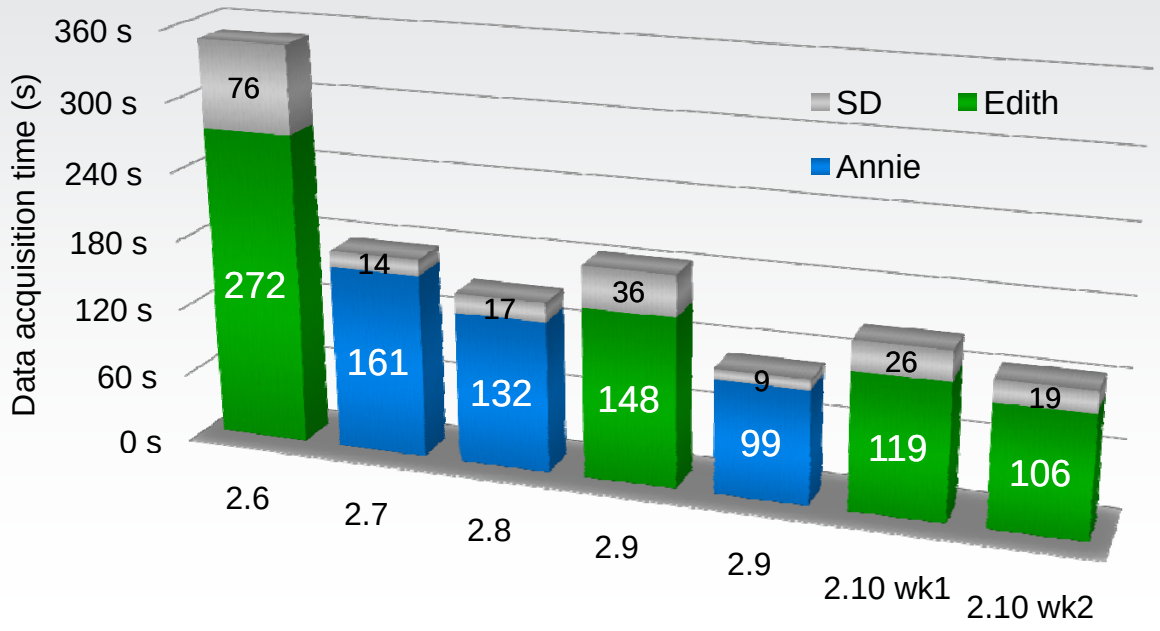


Software implementation

- Field testing
- Collaboration with ICC-T archivist
- Development of improved versions
    - Constant contact with developer
    - 5 beta versions

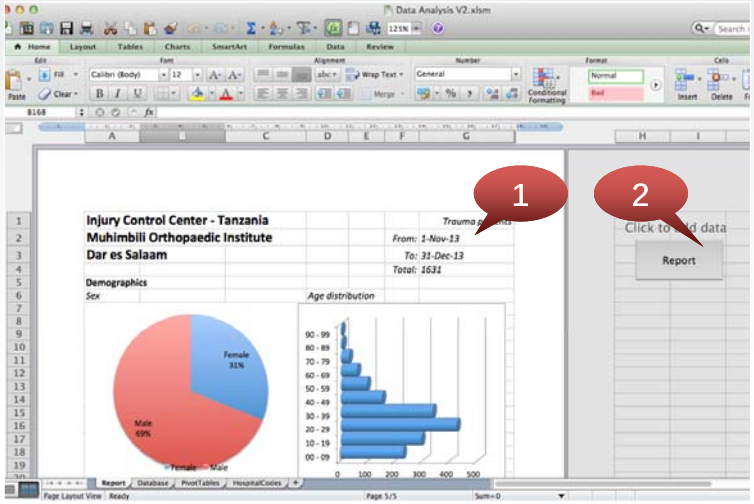
Results

- Testing phase: 447 patients entered
- Time to enter one patient file



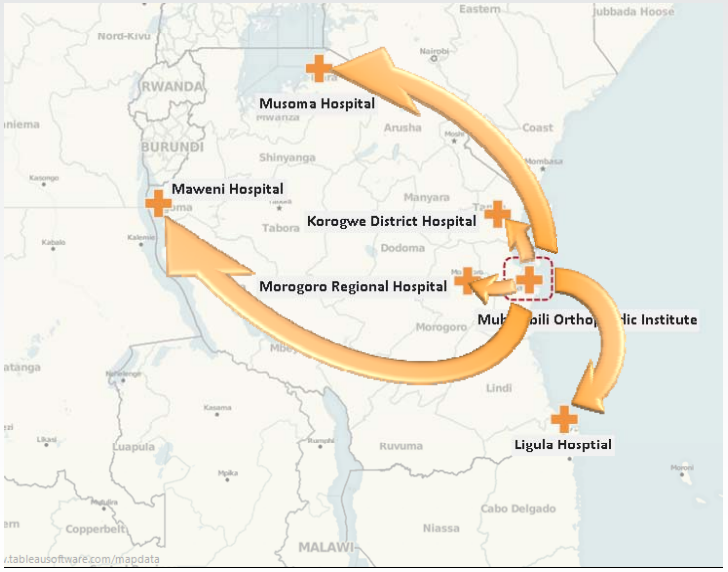
Report Generation

- Data from iPad populates Excel database
- Preprogrammed PivotTables and macros
- Automatic basic reporting
- Report generated in <15 sec



Go live: Prospective trauma

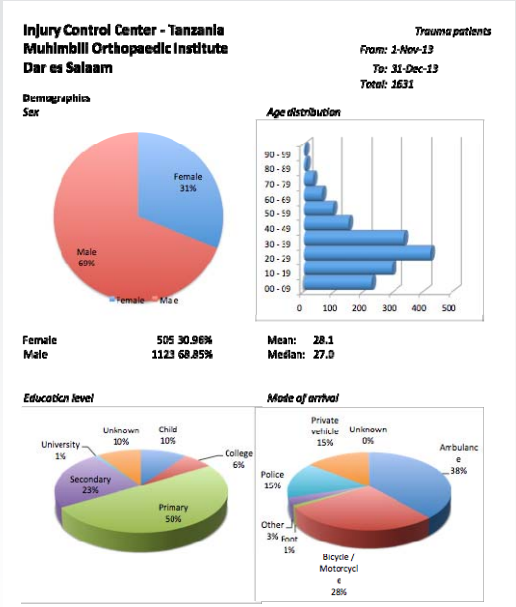
- November 1, 2013 to February 28, 2014
- 4455 new trauma patients from 6 different hospitals in Tanzania



4 pages trauma “dashboard”

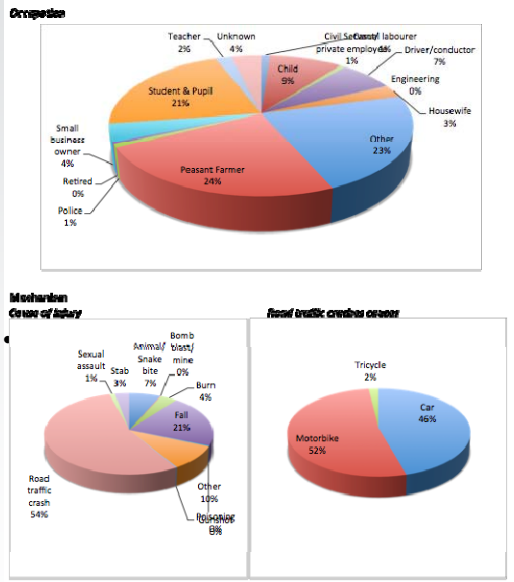
Classic trauma epidemiology / injuries / outcome data

Demographics

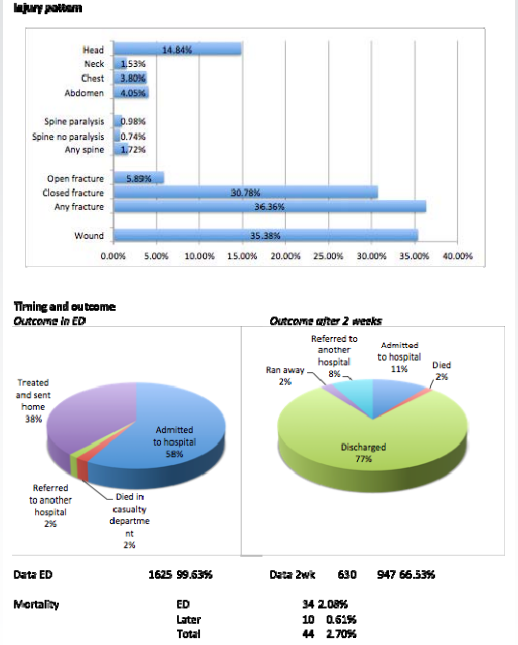


Trauma “dashboard”

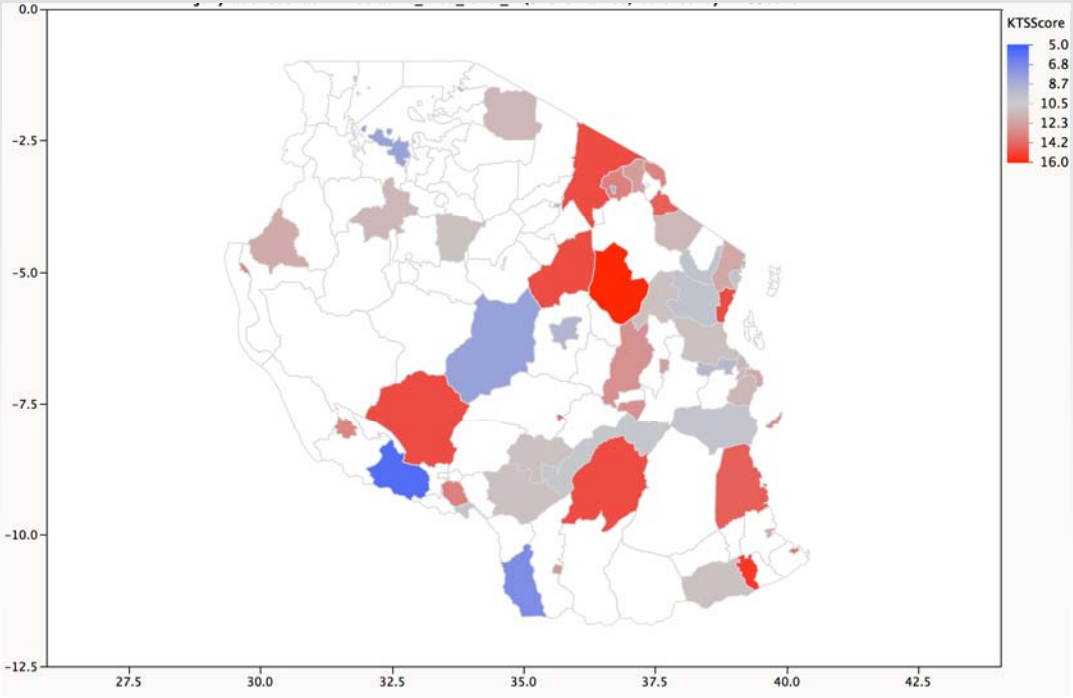
Mechanisms



Injuries / outcome



Geomapping information



KTS by region

Discussion

Using an **iPad app** to collect data and generate **standardized reports** is not only **feasible**, but **more efficient** in a **low-resource setting** like Dar es Salaam, Tanzania.

Discussion

The **increasing flow** of trauma patients seems to **corroborate** the Global Burden of Disease assessment of morbidity and mortality from trauma.

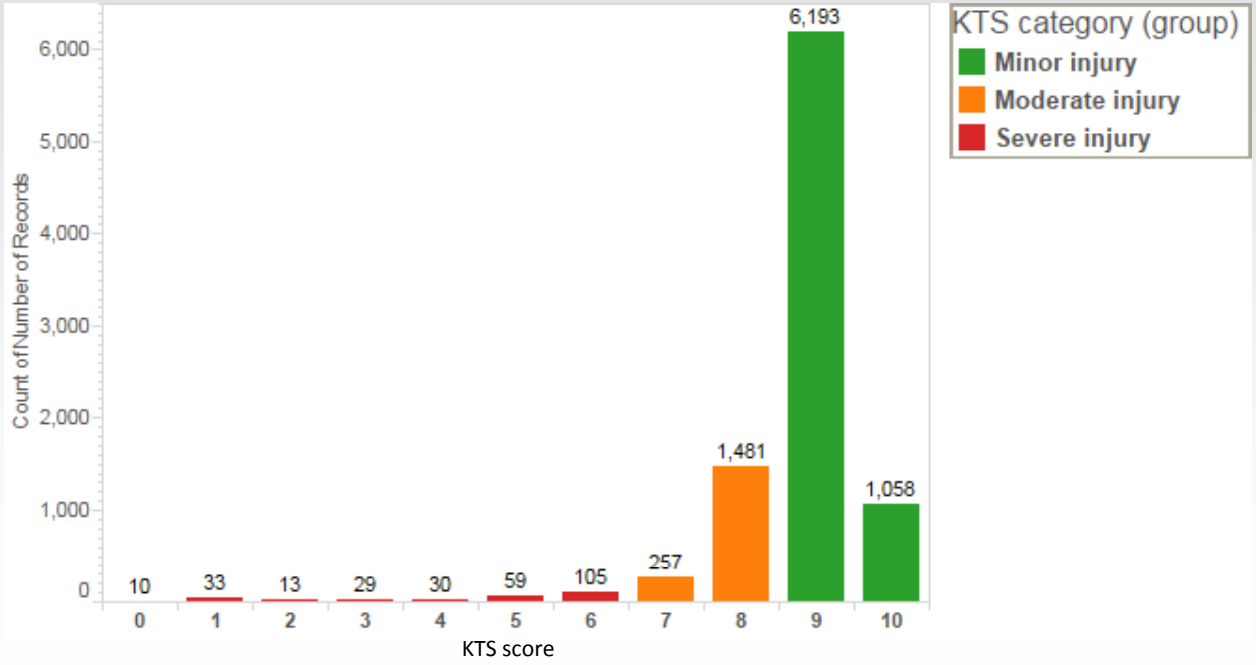
The **burden** of **trauma** could possibly be an **underestimate**.

Discussion

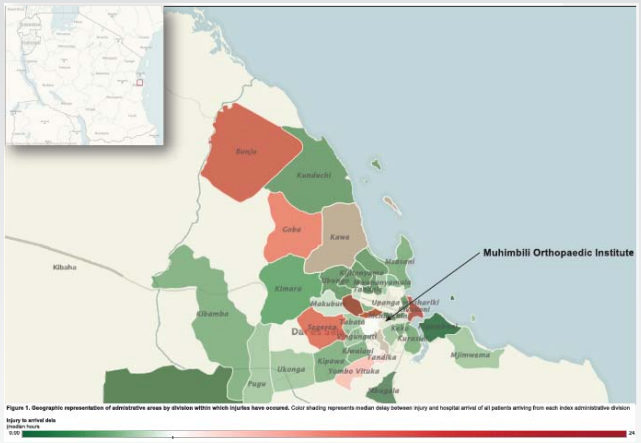
Very **few severely injured** trauma patients are **collected** in the database, suggesting **problems** with **pre-hospital** handling of trauma.

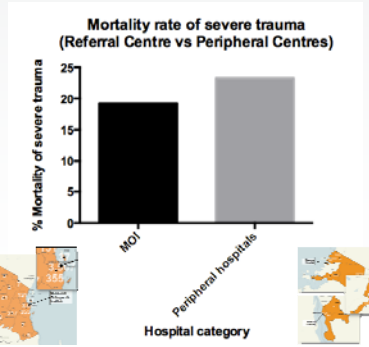
Discussion

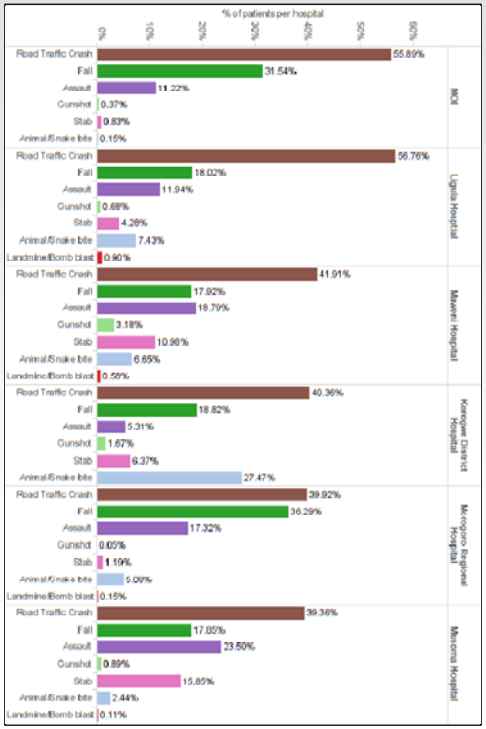
Injury severity distribution of total population sample between 2011-2012



Future developments



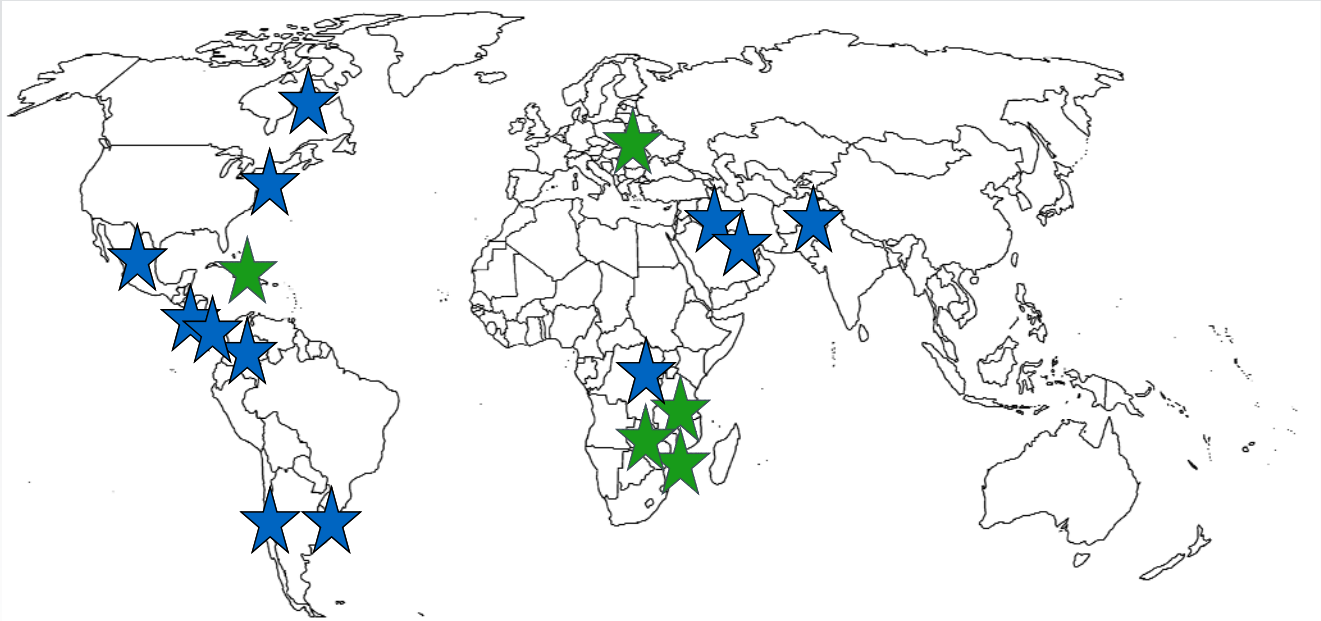




Future developments

- More extensive coverage of Tanzania
- Expansion to other countries
    - Allow for comparison between hospitals, regions and countries

Global expansion



Actually acquiring data

Interested countries / hospitals

Conclusion

iTrauma is not only **feasible**, it is also **sustainable** and very **efficient**.

Its **scalability** makes it a powerful tool for **worldwide trauma assessment**.

Acknowledgements

Edith Joseph,
Victoria Mu[illegible]ali,
Respici[illegible]oniface,
Law[illegible] Museru

Dan Deckelbaum,
David Bracco, Tarek
Razek