

The Electronic Trauma Health Record: Design and Usability of a Novel Tablet-Based Tool for Trauma Care and Injury Surveillance in Low Resource Settings

Global trauma rates

- Injuries—resulting from traffic collisions, drowning, poisoning, falls or burns - and violence - from assault, self-inflicted violence or acts of war—kill more than five million people worldwide annually and cause harm to millions more.
- Account for 9% of global mortality

Why address global trauma rates?

- Globally, injury accounts for as many deaths as HIV, malaria, and **tuberculosis** combined (>5 million people)
- Injury is the leading **cause of death** of young people, and therefore, the leading cause of loss of human potential.
- Implementation of effective systems of injury control and trauma care in LMICs (Low and Middle Income Countries) has the potential to save millions of lives every year.

How can we address global trauma rates?

- Trauma systems
 - Injury prevention
 - Injury surveillance
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graph LR; A[Trauma systems] --> D[eTHR]; B[Injury prevention] --> D; C[Injury surveillance] --> D;
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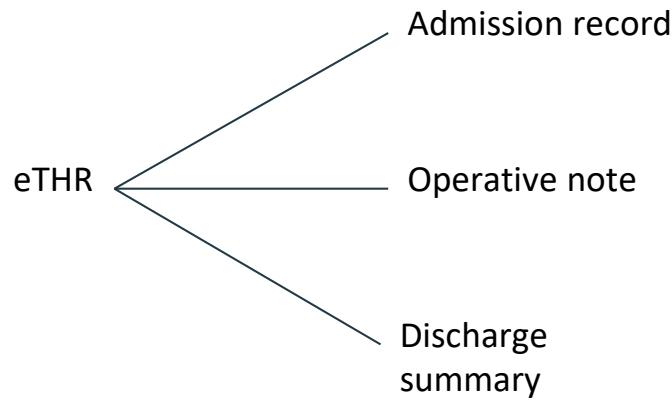
# Low resources?



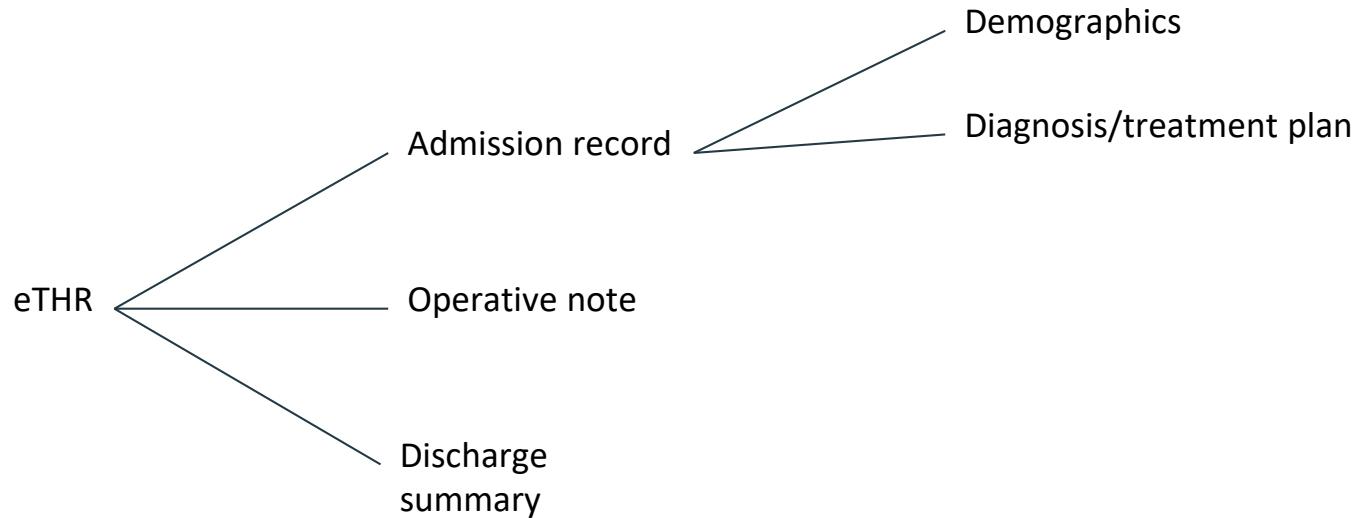
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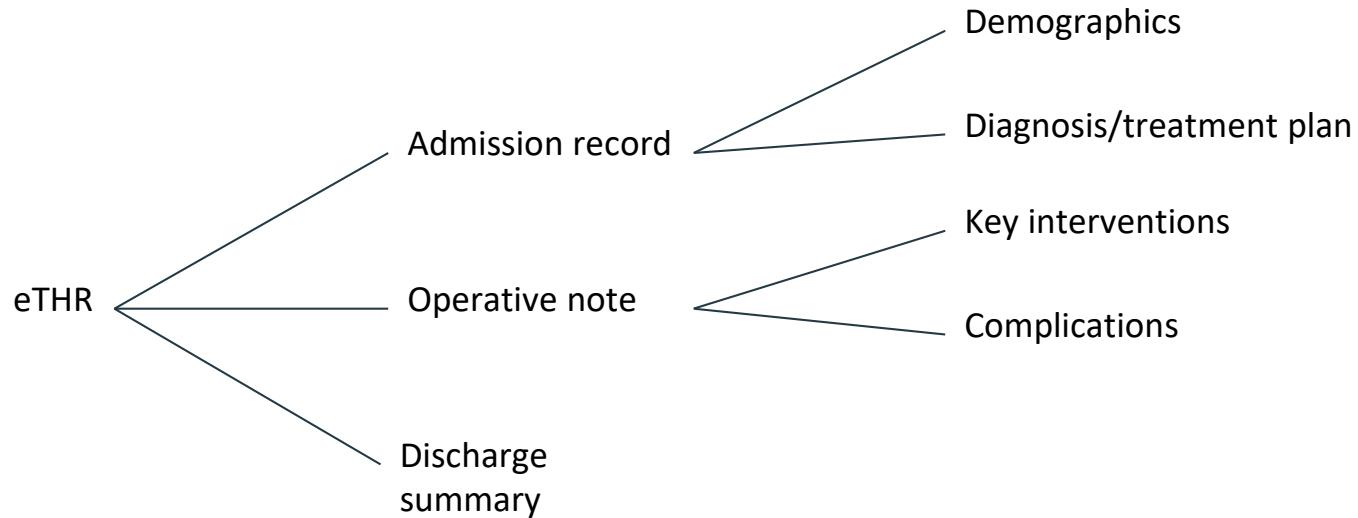
# The eTHR - modules



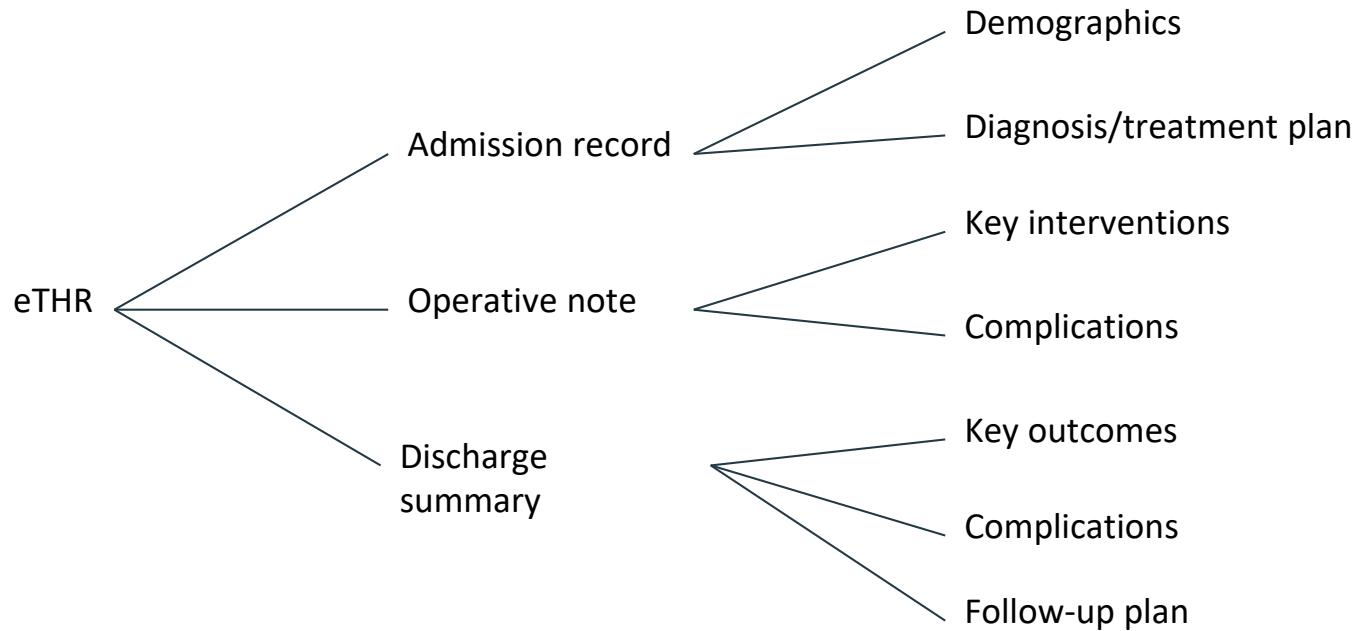
# The eTHR - modules



# The eTHR - modules



# The eTHR - modules



# What is great about the eTHR

- Doctors and nurses found usability of the system very high
- The system was very cost effective (10.000-15.000 USD annually)
- Doctors were impressed by some of the features, such as immediate calculation of a trauma score based on vitals data

# Not so great..

- Slow data transmission speeds cripple the system
- Doctors and nurses were worried about theft of the tablets
- Filling in a patient record took on average 12 minutes, which is longer than on paper (10 minutes)  
(However, data records in the eTHR were found to be more complete than paper records)
- No standardized data yet, quality of data input is dependent on the clinician

# And now?

- eTHR is now in use by Groote Schuur Hospital, South Africa
- Further research into data standardization of eTHR
- Research into other places the eTHR can be implemented, such as during environmental disasters

# Thanks for your attention

Questions?

|                                                                                                                                                                                                                     |                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The article briefly mentions the Revised Trauma Score calculator. How does this feature calculate the score?                                                                                                        | Do you see any risks in doctors relying on such a scoring calculator?                                                                                                                                    |
| What happens if there is no internet connection, given that no data reside on the tablet?                                                                                                                           | Why is the eTHR not designed to capture identifying data? Couldn't this process help in building a more general Health Record?                                                                           |
| - This study is about the feasibility, feasibility and qualitative usability testing of the eTHR, but how is it quantitatively?                                                                                     | - Don't you think that important data will be missed if input of free text is limited?                                                                                                                   |
| Can EHRs fully function with current privacy rules?                                                                                                                                                                 | Shouldn't this be designed for smartphones?                                                                                                                                                              |
| How can the frameworks used in eTHR be used in other departments of medicine?                                                                                                                                       | Would applying big data technology increase the speed connecting to the eTHR server?                                                                                                                     |
| mHealth applications are very usability oriented, of course, the physicians often work with such solutions, but when do you expect some quantitative analysis on this? (less people die, treatments are faster etc) | is it still an EHR if the information is not passed along? Bit of a philosophical question, but why is it not discussed that this info can be passed along once in the hospital..?                       |
| 1. In what way does the eTHR align with Mohammed Dalwai's solution?                                                                                                                                                 | 2. Do you think that in the future interactive glasses will be used instead of tablets?                                                                                                                  |
| Do you think eTHR as it's very low cost is one the best way to improve medical issues in LMIC ?                                                                                                                     | What would be the best way to not see the app as an app but to transform and implement it in a framework for clinical trauma and basic injury surveillance ?                                             |
| What data analysis can be done on the current app of eTHR?                                                                                                                                                          | How can the data abstraction and organisation be made easier? Suggest some possible ways to achieve that                                                                                                 |
| Should implementation of specialized EHRs precede usage of overall EHRs in developing countries?                                                                                                                    | What is the biggest challenge of implementation of the eTHR?                                                                                                                                             |
| Traditional hospital workflow seems to be a bottleneck for the author's proposed solution. How do you think a hospital's workflow should evolve in order to become more efficient?                                  | Data security is prioritized in this article, however in some cases it creates confusion of records. Do you think there is potentially a better approach that can be taken in order to avoid this issue? |
| Do you think that the quality of clinical care will be increase/decrease?                                                                                                                                           | What is your opinion about the tool itself? What are the advantages and disadvantages?                                                                                                                   |
| What are the differences between the Revised Trauma Score (RTS) and the Injury Severity Score (ISS)?                                                                                                                | Why injury surveillance is so expensive?                                                                                                                                                                 |
| How would you compare the use of eTHR with the Triage TedTalk?                                                                                                                                                      | What other method for measuring usability could be used instead of "think out loud", do you think this is the most appropriate method?                                                                   |
| Do you think eTHR has potential to be adopted widely and why (not)?                                                                                                                                                 | Do you think the limitation of free text input, besides offering advantages of data standardization, pose any obstacles as for completely and correctly interpreting all data?                           |