

Natural Language Processing for Event-based Surveillance with Africa CDC

NaLaA

Implementation of Novel Artificial Intelligence Methodology for Event-based Surveillance

Duration

2021 – 2023

Budget

approx. 600,000 EUR

Partner countries

Lesotho
Ethiopia

Challenges addressed by the project

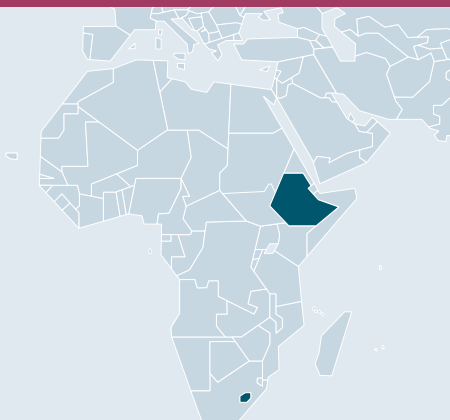
Surveillance is the main pillar in the detection of disease outbreaks, usually done using indicator-based surveillance. This process, however, suffers from time delay and is limited to testable diseases. To increase timeliness and flexibility in what can be observed, unofficial sources are included using a process called event-based surveillance (EBS). Africa CDC and partners use EBS systems. Their effectivity is conditioned by the number of sources used and the speed of processing its information. Current Artificial Intelligence (AI) methodology allows the filtering and extraction of key information out of online texts using textual context with high precision, much higher than current keyword-based approaches.

Objectives

- » Exchange of knowledge in surveillance and AI with colleagues from Africa CDC: Development of a software tool that aims to improve signal detection from news articles and social media
- » Lay the foundation for a prolonged exchange of expertise among both institutes
- » Ensure the persistent advancement of the project software by heavily involving colleagues from Africa CDC in the software development process

Overview of activities

EBS is a fundamental pillar in Africa CDC's infectious disease surveillance routine and its continent-wide mandate. Thus, the implementation of novel AI methodology for EBS promises the most impactful increase in value. The idea is to replace the key word search of EBS systems by an AI algorithm. Together with Africa CDC, expert-labelled data will be used to train such novel AI algorithms for EBS and new sources will be labelled, such as social media. These algorithms help prioritize the most important news trained on prior extraction work done by Africa CDC and based on jointly labelled data. Afterwards, used sources and algorithms will be adopted to the needs of Africa CDC. To ensure sustainability of the project, clear performance goals for each step are set, which measure that a sufficient amount of the code is documented and tested and that its performance is in accordance with what Africa CDC needs for their daily EBS-based screening. Documentation and testing will also help open sourcing the project and carry the idea to more users with the least possible friction to use this work. In parallel, workshops will be conducted with the partners and together with ProMED training on-site is planned to improve EBS efforts beyond the use of algorithms.



Supported by:



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Explainable AI. A text selected by an AI and
marked for the words that lead to the decision.

(Photo ©Auss Abbood)

There are also plans for an exchange with other countries on the application of Public Health Intelligence. All these individual modules will look at the work before, during and after the COVID-19 pandemic.

Partner institutions/Contact

- » Africa CDC
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- » Program for Monitoring Emerging Diseases (ProMed), USA
- » International Society for Infectious Diseases (ISID), USA
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