

# Using AI and Social Media for Education Insecurity Data Mining

Muhammad Imran

Research Scientist and Lead of the Crisis Computing Team  
Qatar Computing Research Institute  
Hamad Bin Khalifa University, Qatar

# Collaborators and Team Members



- Maleiha Malik
- Muhammad Imran
- Ferda Ofli
- David Megginson
- Obadah Diab
- Elliot McBride
- Kareem Elbayar

Duration: 1 year (2019)

# Goal and Scope of Work

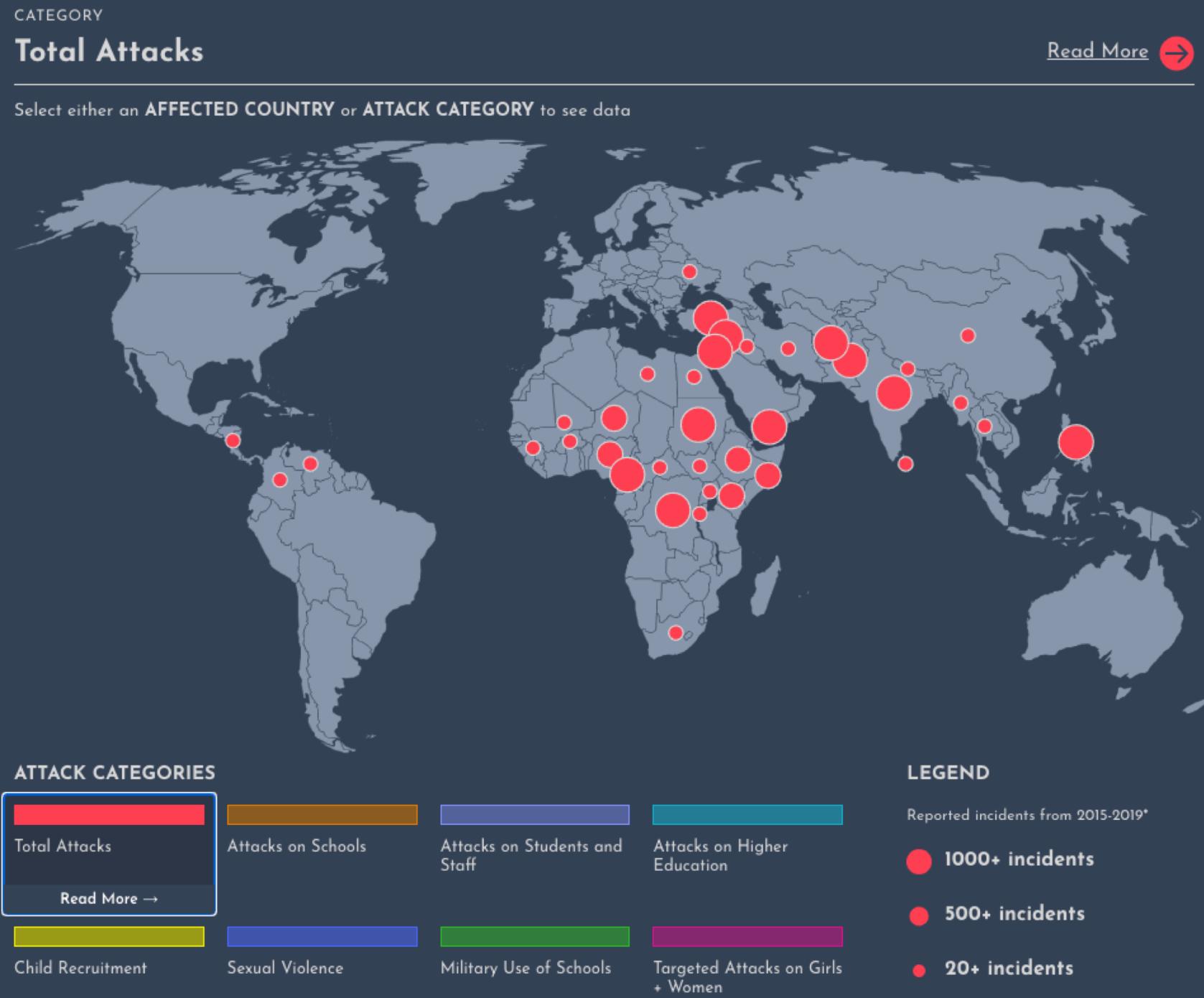
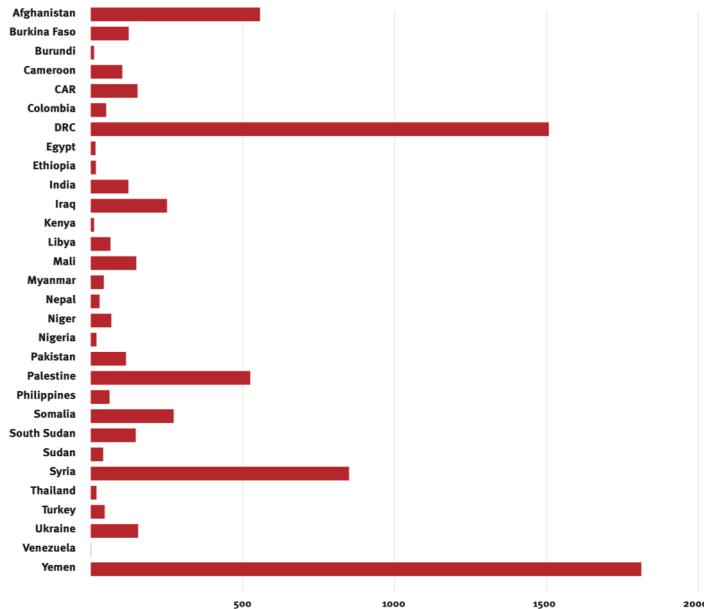
- **Goal:** To collect and make available timely and accurate data about education insecurity from social media sources.
- **Focus:** More focus on “attacks on education”
- According to “Global Coalition to Protect Education from Attack (GCPEA)”, the definition of **“attacks on education”** is:

*“Any threat or actual use of force against students, teachers, academics, education support and transport staff (e.g., janitors, bus drivers), or education officials, as well as attacks on education buildings, resources, material, or facilities (including school buses).”*

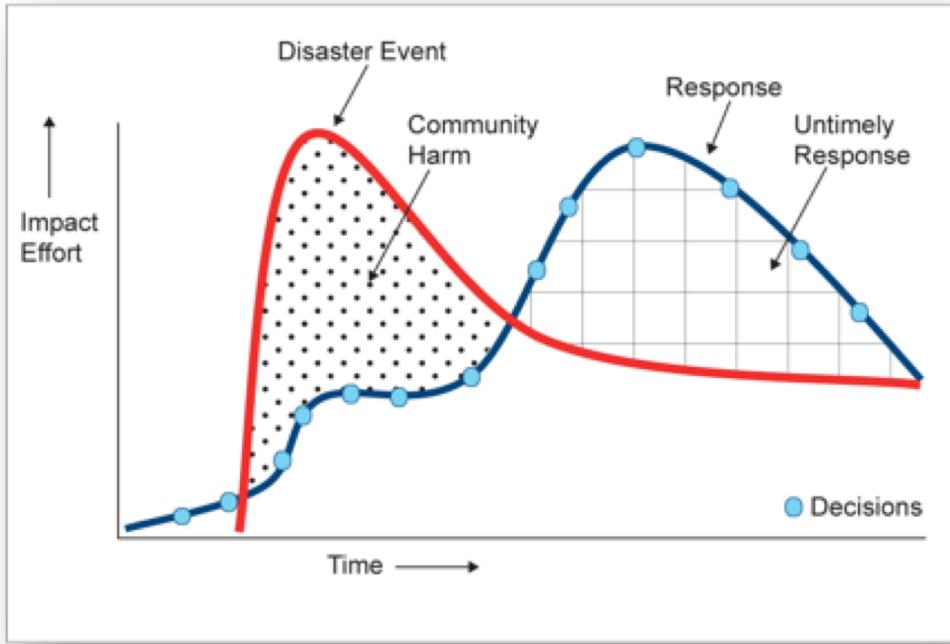
# Attacks on Education (2015-2019)

By: GCPEA

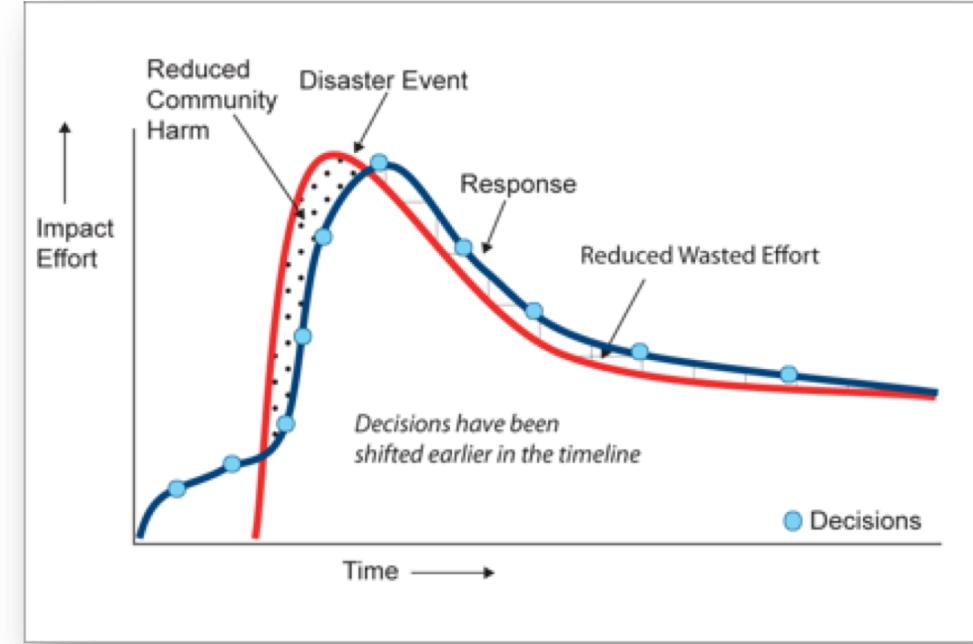
More than **11,000** reported attacks  
**22,000** students harmed  
In **93** countries



# Information Gaps and Recency Issues

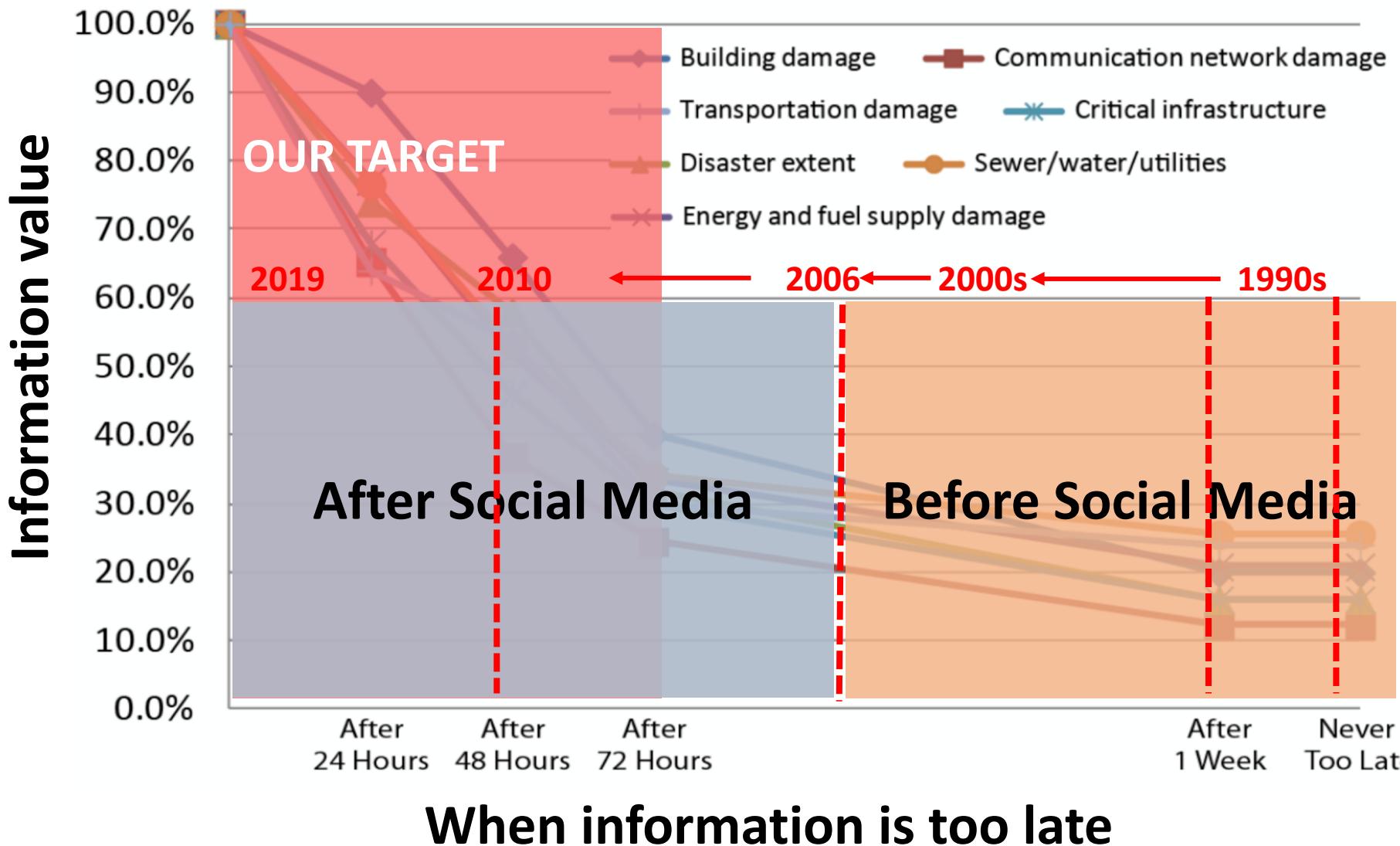


- Delayed access to data
- Delayed decision-making
- Delayed actions
- High community harm



- Timely access to data
- Timely decision-making
- Rapid actions
- Low community harm

# The Value of Timely Information



Each passing minute and hour reduce information value

# Attacks on Education Reports on Twitter

Taha Bali  
@tahabitob

Today Russia and Assad bombed EIGHT schools in Idlib and its countryside.

Al-Zahir Baibars  
Al-Bara'em  
Al-Izz bin Salam  
Taha Gharib  
Khaled Shaar  
Al-Yarmouk  
Al-Manahel KG  
Al-Bara'em KG

3 teachers and 1 student were killed, \*dozens\* were injured.

How many more?



10:03 PM · Feb 25, 2020 · Twitter for iPhone

Habibies  
@Habibies

School children fleeing the area after suicide attack in #Jalalabad city. #Afghanistan

Imagine these children. What might go through their minds. #Kabul



Hamid Mir and 6 others  
1:06 PM · Jan 24, 2018 · Twitter for iPhone

संवेदनिक इकेत  
@Shivam\_h9

This is happening in Seelampur area of Delhi.

School bus has been attacked by the rioters opposing CAA,

Praying that no kid is injured or otherwise, Please save our kids from such rioters 🙏🙏



0:15 | 20.2K views  
1:13 PM · Dec 17, 2019 · Twitter for Android

Isabella Trevino  
@Isabell93574317

Afghanistan military school under attack, reports say Explosions and gunfire were heard at a military university in Afghanistan early Monday, as reports emerged that the school was under attack. [ift.tt/2nmCX5d](http://ift.tt/2nmCX5d)

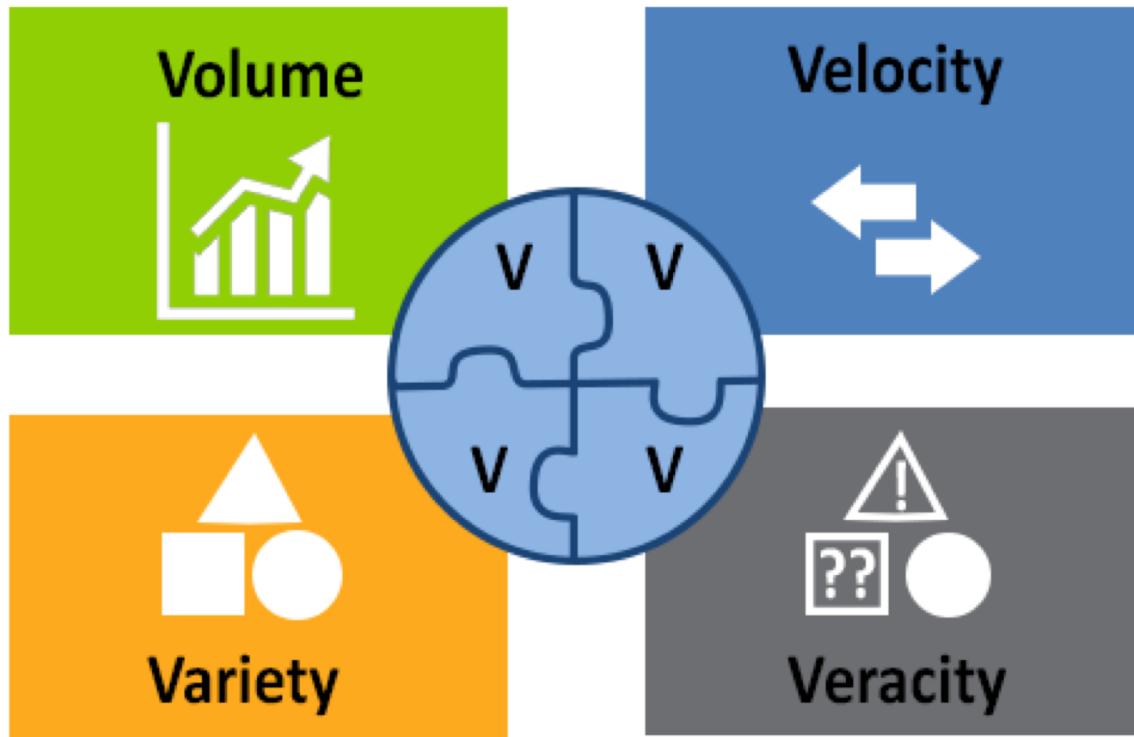
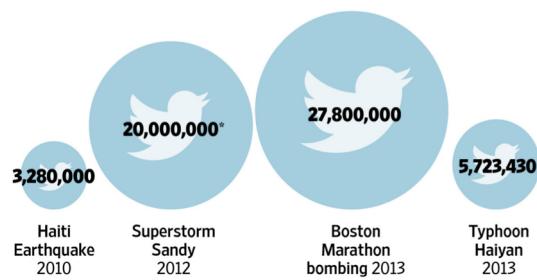
8:06 AM · Jan 29, 2018 · IFTTT

## Education insecurity reports:

- Killing, murder, assassination
- Injured, wounded
- Abduction, kidnapping, detention, imprisoned
- Rape, sexual violence or harassment
- Threats, extorted, abused
- Forced labor
- School/college/university damage

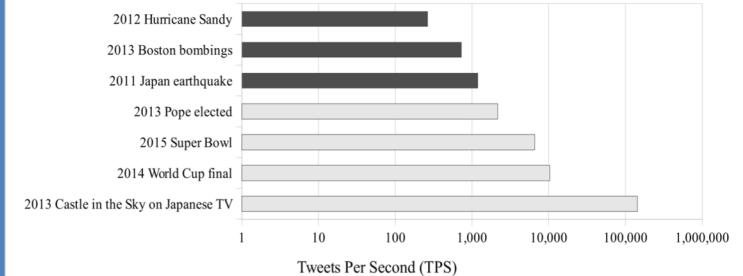
# Social Media Data Analysis Challenges (4Vs)

Data volume  
increases rapidly



Unknown variety

High data rate



Uncertainty, fake  
news, misinformation

# Processing Big Data Using AI

**Goal:** To find relevant and actionable information in near real-time.



## Human Intelligence + Machine Learning



Growing stack of data



Apply crowdsourcing

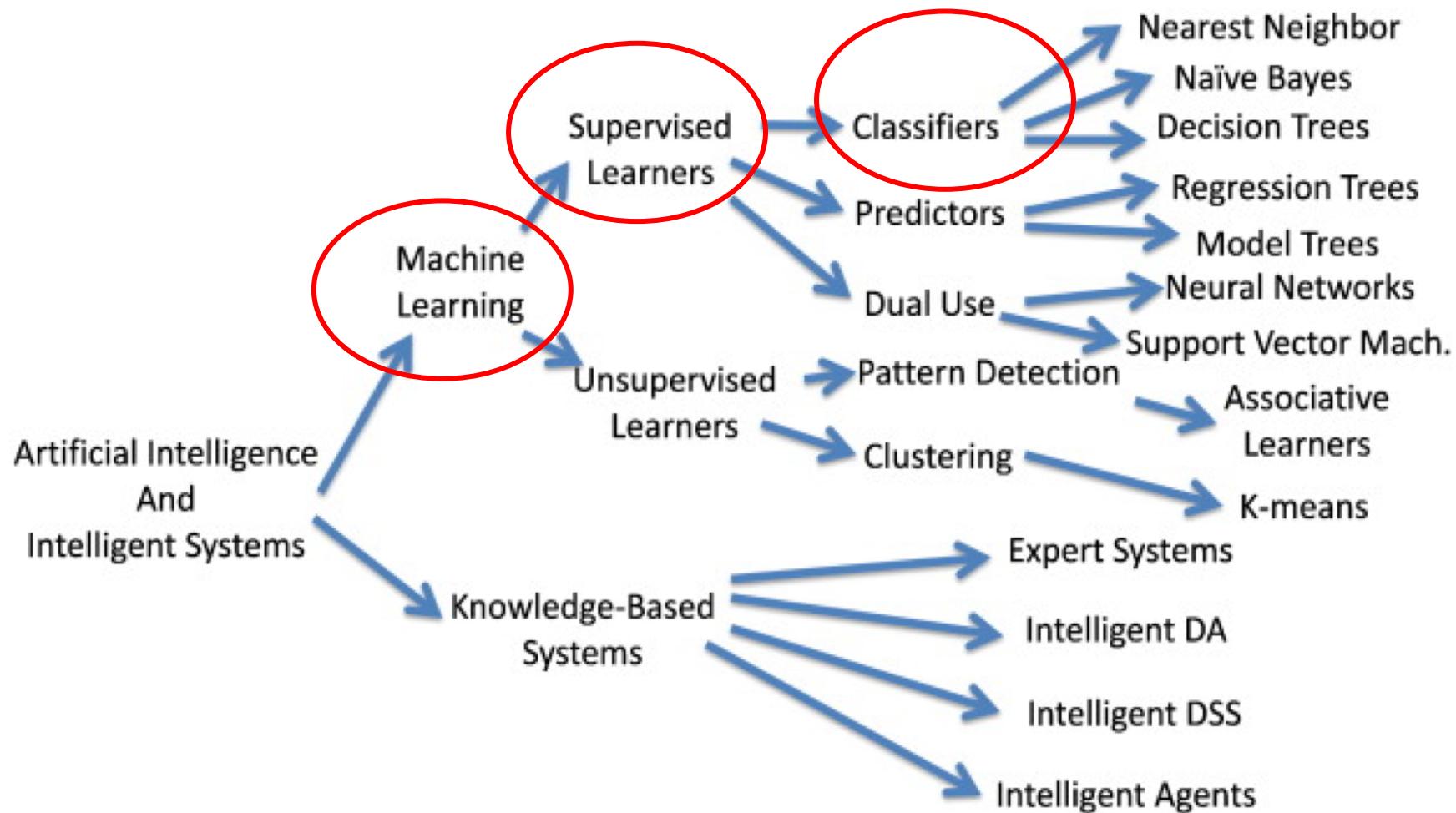


Filter-failure



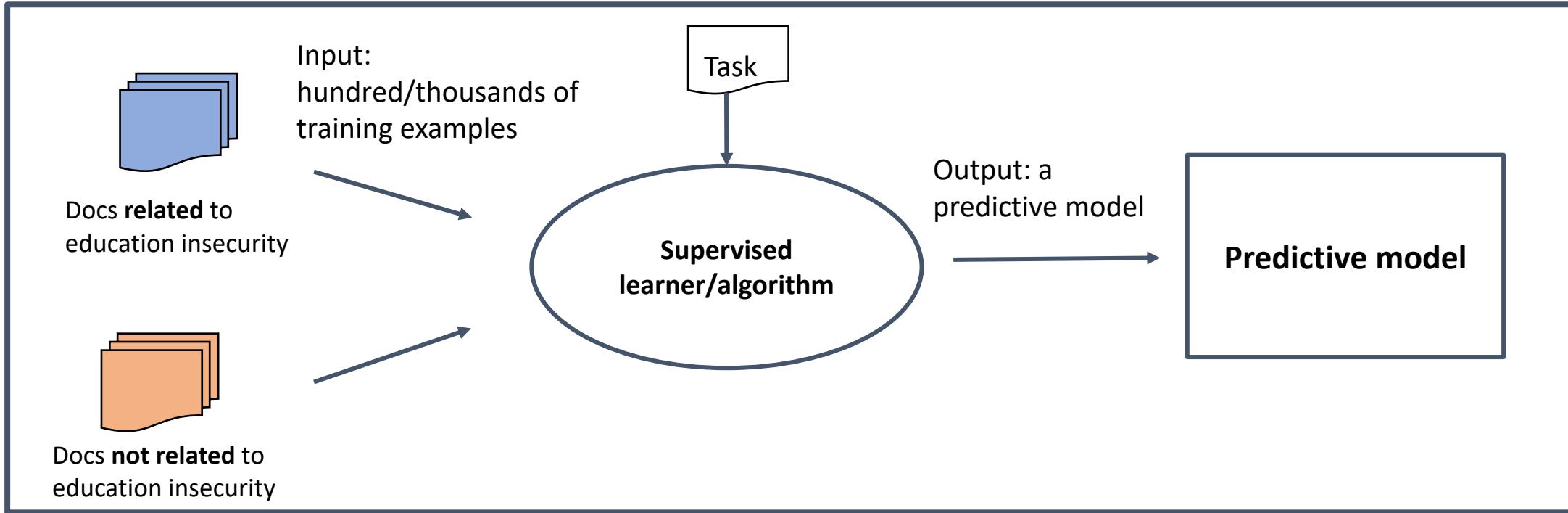
Need human-labeled examples

# Artificial Intelligence & Supervised Learning



# Supervised Machine Learning

## TRAINING



## TESTING



# Artificial Intelligence for Digital Response

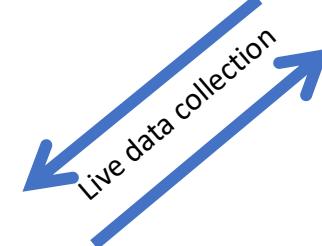
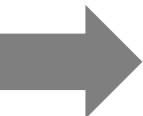
Disaster event (earthquake, flood)



AIDR deployment



AIDR uses machine learning techniques to process social media messages and images



Critical information



- Urgent needs
- Damage assessment
- Other useful info



Relief operations

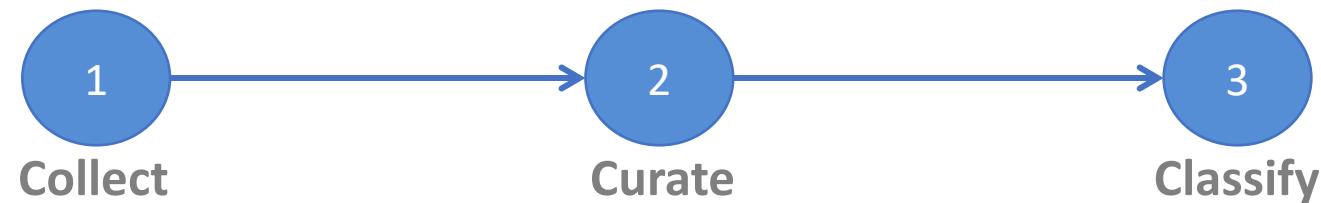


Humanitarian organizations and local administration





<http://aidr.qcri.org/>



Grand Prize Winner at the Open Source Software World Challenge 2015

## End-Users:



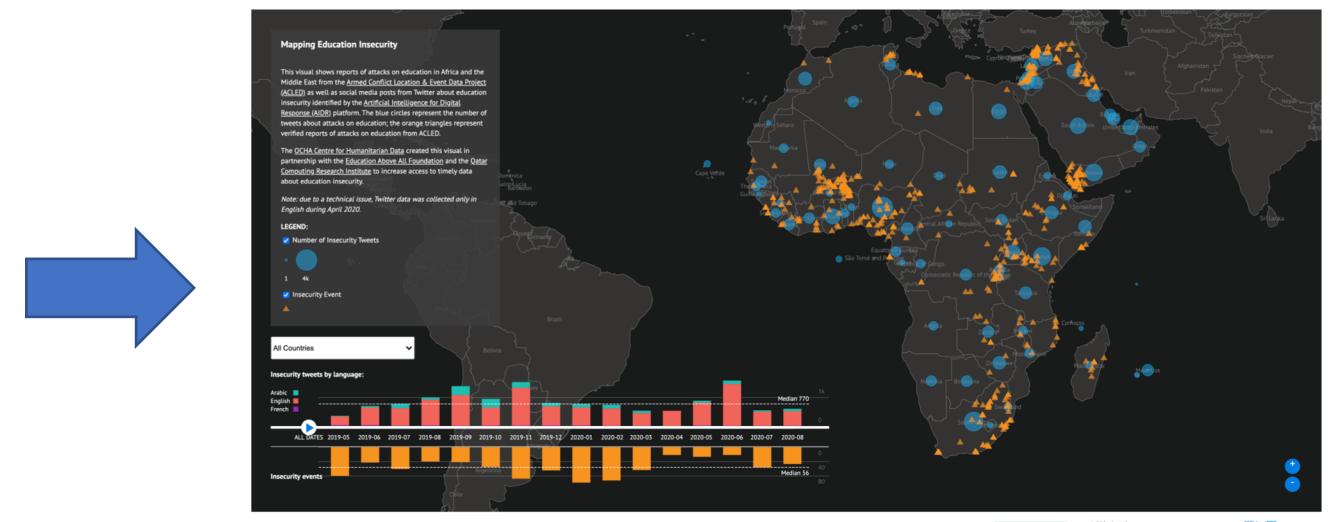
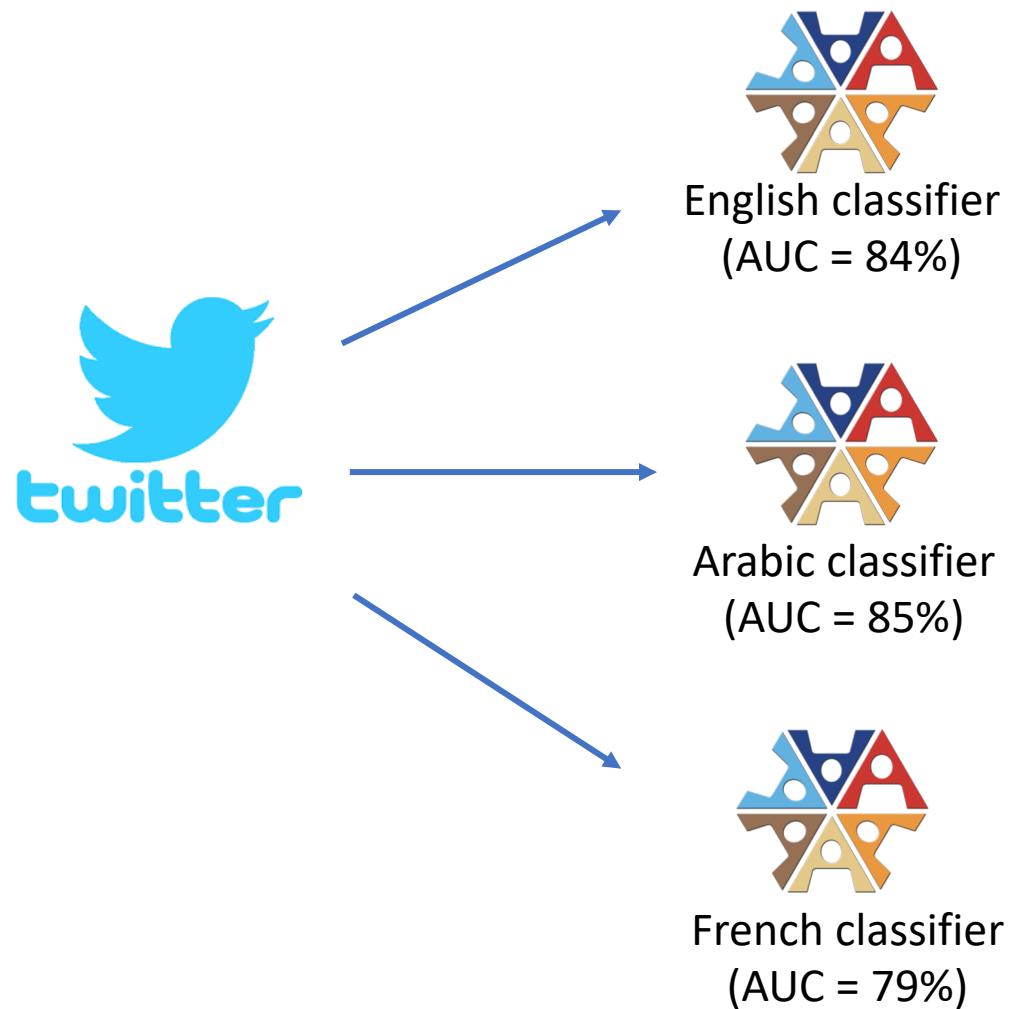
& many more....

# Data Collection Strategy (Attacks on Education)

**Target languages:** Arabic, French, and English



# Supervised Learning (Machine Learning Models)



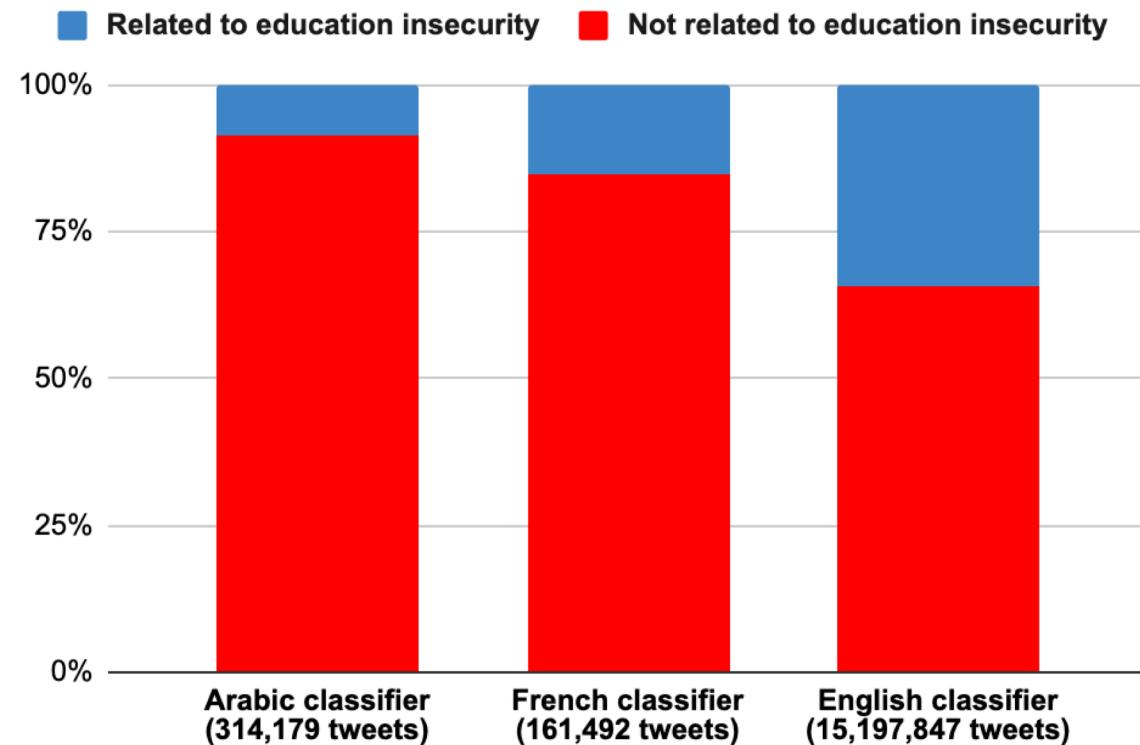
# AIDR Processed Data (last updated Aug 2020)

## Tweets collection and processed

- English: 15,197,847
- French: 161,492
- Arabic: 314, 179

According to the system, only  
**8% of the Arabic, 15% of the French, and 34% of the English data is relevant.**

## Education insecurity data processed by AIDR



# Some Reports (Positive and Negative)

**Tweet:** *"Knife attack at middle school leaves several kids dead..."*

**Tweet:** *"Mass attack on Conservative Students at High School. The Media doesn't cover it or covers up the fact this was a political attack..."*

**Tweet:** *"The man is reported to have carried a newly sharpened axe and a knife in a sack and waited the lady at the gate where he attacked her and tried to escape..."*

**Tweet:** Lorry driver was watching TV on his phone when he killed student, 21, in crash ....

**Tweet:** Cousin of USC student killed: The sadness will 'never end' ....

## Mapping Education Insecurity

This visual shows reports of attacks on education in Africa and the Middle East from the [Armed Conflict Location & Event Data Project \(ACLED\)](#) as well as social media posts from Twitter about education insecurity identified by the [Artificial Intelligence for Digital Response \(AIDR\)](#) platform. The blue circles represent the number of tweets about attacks on education; the orange triangles represent verified reports of attacks on education from ACLED.

The OCHA Centre for Humanitarian Data created this visual in partnership with the Education Above All Foundation and the Qatar Computing Research Institute to increase access to timely data about education insecurity.

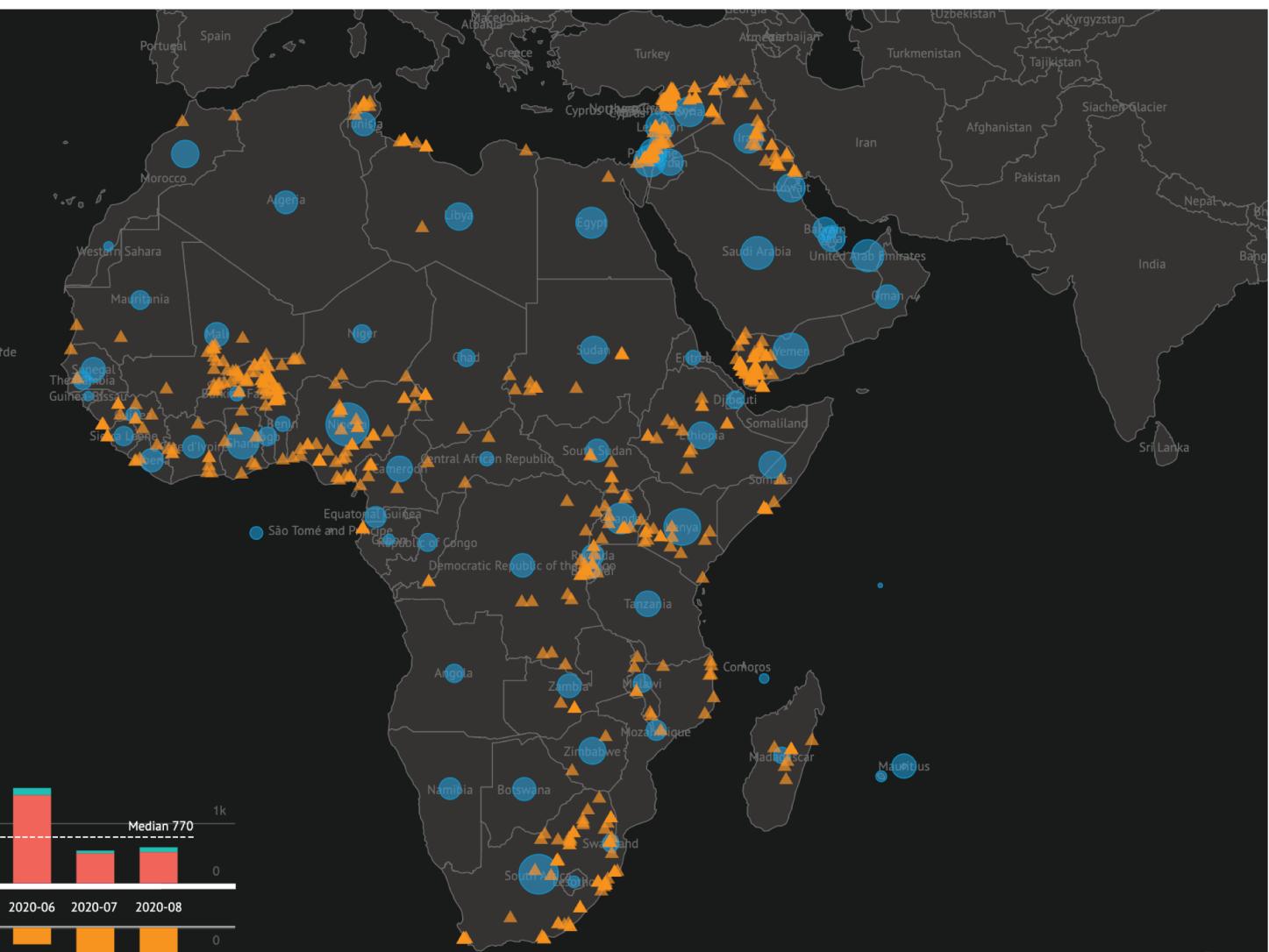
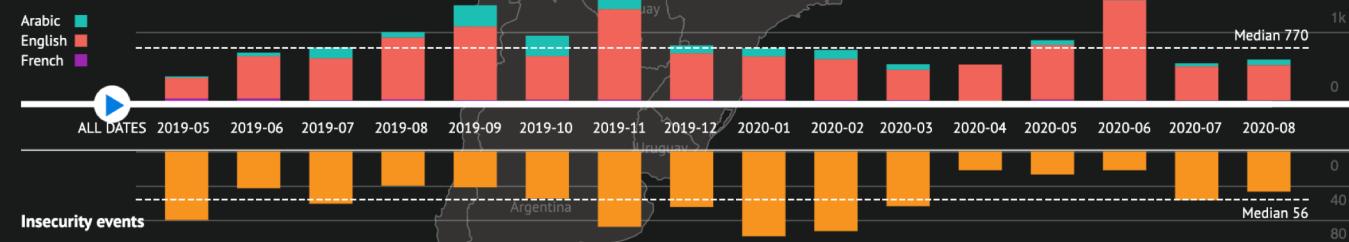
*Note: due to a technical issue, Twitter data was collected only in English during April 2020.*

**LEGEND:**

- Number of Insecurity Tweets

All Countries

### Insecurity tweets by language:



centre for humdata




**QCRI**  
 قسم علمي قطر لبحوث الدوّامة  
 Qatar Computing Research Institute  
**جامعة حمد بن خليفة**  
 HAMAD BIN KHALIFA UNIVERSITY

# Thank you!

Contact: *mimran@hbku.edu.qa*

Twitter: @mimran15

<https://mimran.me/>

<http://AIDR.qcri.org>

<https://crisiscomputing.qcri.org/>