GO FAIR Implementation Network Africa: Containing the Corona Virus

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1. The promise of Digital Health in Africa

2. The Ebola Crisis

3. Lessons learnt

4. Introducing GO FAIR in Africa

5. Challenges presented on the Corano Virus Covid-19

6. Containment and prevention through GO FAIR Africa

7. Opportunities to advance Digital Health

Content

1. Digital Health in Africa: opportunities

To overcome distances

To introduce low-treshold entries

To Adapt to local context, culture and realities

To save costs

To overcome shortages of health care workers

To enable connected care

To reduce overuse of higher level health facilities

To strengthen data for health care analytics

To strengthen evidence-based prevention and health care interventions

To link remote areas to quality interventions

To plan responses, interventions, medicin stocks and other critical input for universal health care delivery

2. Ebola Crisis West Africa - 2014

Long delay of response after first patient was identified: serious loss of time

No build-up of urgency and international support

No connectivity, no architectures for connectivity (including internet, electricity, mobile connected health reporting networks) and lack of medical data points, data-driven analytics
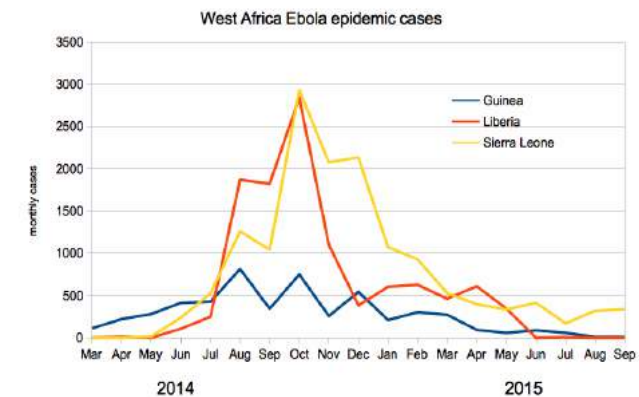
No collaboration between health and digital experts

Lack of information to the general public

Undetected spreading of infections

Panic-response among population and loss of trust in authorities impeded interventions

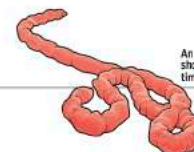Misfiring because of culturally insensitive measures

Medical personal infected and dying

This shows the monthly aggregate in Ebola cases in the West Africa epidemic 2014-15. The data is drawn from the WHO Situation reports (apps.who.int) with early data from CDC (cdc.gov)

10 October 2015 (Chris55)

THE EBOLA EPIDEMIC

An Ebola virus particle, shown 1.55 million times its actual size

One of the world's deadliest diseases, the ebola virus is currently sweeping the African continent, which is experiencing its worst outbreak ever. Symptoms can be horrific, and it has a case fatality rate of up to 90%, making it a nightmare for health officials.

The incubation period, or the time interval from infection to onset of symptoms, is from two to 21 days. Patients become contagious once they begin to show symptoms.

Lungs
Liver
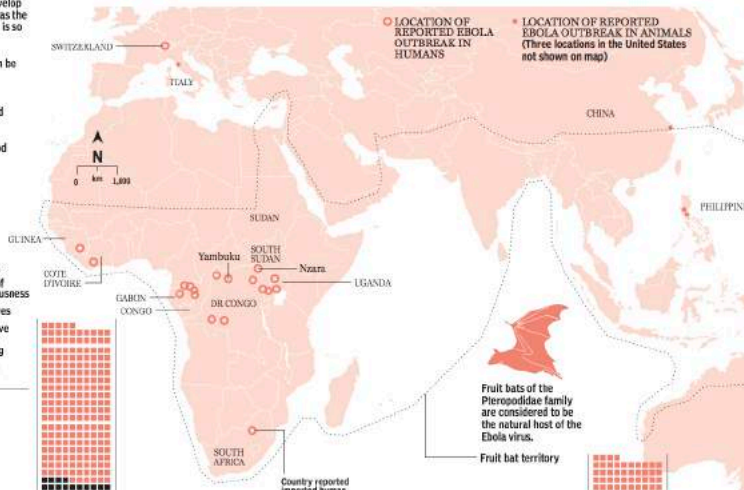Kidney
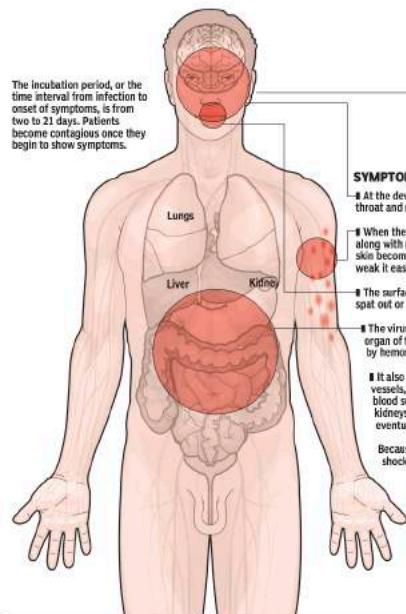
SYMPTOMS AND EFFECTS

- At the development stage of ebola virus disease (EVD), patients have inflammation of the throat and mucous membranes of the eyes (conjunctivitis), abdominal pains and vomiting.

- When the infection attacks, it causes severe damage to the skin. Small white blisters develop along with red spots, referred to as maculopapular rash. These spots develop into bruises as the skin becomes pulpy in texture. Rips randomly appear, allowing blood to pour out. The skin is so weak it easily tears with any movement of the patient.

- The surface of the tongue becomes a brilliant red and eventually sloughs off. It may even be spat out or swallowed.

- The virus is known to be systemic, which means the infection attacks every tissue and organ of the body, except the skeletal muscles and bones. The virus is also characterized by hemorrhaging and blood clotting.

- It also causes blood clots in the bloodstream. These clots tend to get stuck in the blood vessels, which in turn causes the red spots on the skin. The clots also slow down the blood supply to most organs of the body, such as the lungs, brain, liver, intestines, kidneys, testicles and breasts. All these organs become severely damaged and eventually stop functioning.

Because of the many devastating effects on the body, death may be caused by shock, renal failure or loss of blood.

DAY 7—9
- Headache
- Fatigue
- Fever
- Muscle soreness

DAY 10
- Sudden high fever
- Vomiting blood
- Passive behaviour

DAY 11
- Bruising
- Brain damage
- Bleeding from nose, mouth, eyes and anus

DAY 12
- Loss of consciousness
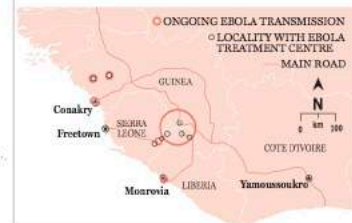- Seizures
- Massive internal bleeding
- Death

DISTRIBUTION OF PREVIOUS OUTBREAKS

Ebola first appeared in 1976 in two simultaneous outbreaks, in Nzara, Sudan, and Yambuku, Democratic Republic of Congo. The latter was in a village situated near the Ebola River, from which the disease takes its name.

○ LOCATION OF REPORTED EBOLA OUTBREAK IN HUMANS
● LOCATION OF REPORTED EBOLA OUTBREAK IN ANIMALS (Three locations in the United States not shown on map)

SWITZERLAND
ITALY
CHINA
GUINEA
COTE D'IVOIRE
GABON
CONGO
SUDAN
SOUTH SUDAN
Yambuku
Nzara
UGANDA
DR CONGO
PHILIPPINES
SOUTH AFRICA

Fruit bats of the Pteropodidae family are considered to be the natural host of the Ebola virus.

Fruit bat territory

Country reported imported human Ebola case

RECENT OUTBREAKS IN WEST AFRICA JAN. — JULY 2, 2014

Guinea: 412 cases (305 deaths)
Liberia: 115 cases (75 deaths)
Sierra Leone: 252 cases (101 deaths)

○ ONGOING EBOLA TRANSMISSION
○ LOCALITY WITH EBOLA TREATMENT CENTRE
— MAIN ROAD

These figures are current estimates for EBV cases in three countries.

Conakry
Freetown
SIERRA LEONE
GUINEA
COTE D'IVOIRE
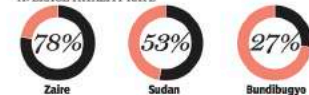Monrovia
LIBERIA
Yamoussoukro

TRANSMISSION

Ebola is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals. In Africa, infection has occurred through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest. Once a person comes into contact with an animal that has Ebola, it can spread within the community from human to human. Infection occurs from direct contact (through broken skin or mucous membranes) with the blood, or other bodily fluids or secretions (stool, urine, saliva, semen) of infected people.
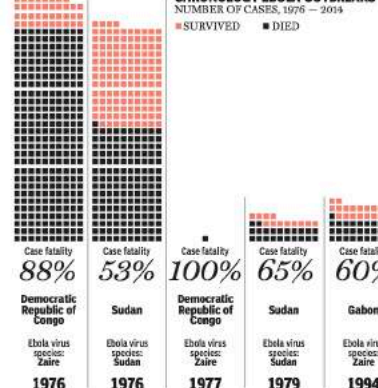
DEADLY EBOLA SPECIES

There are five known species of Ebola virus. The Bundibugyo, Zaire and Sudan species have been associated with large EVD outbreaks in Africa, whereas Reston and Tai Forest have not. The Reston species, found in Philippines and the People's Republic of China, can infect humans, but no illness or death in humans from this species has been reported to date.

AVERAGE FATALITY RATE

78% Zaire
53% Sudan
27% Bundibugyo

CHRONOLOGY EBOLA OUTBREAKS
NUMBER OF CASES, 1976 — 2014

■ SURVIVED ■ DIED

Case fatality	88%	53%	100%	65%	60%	0%	81%	68%	75%	100%	53%	82%	75%	90%	83%	41%	83%	71%	25%	44%	100%	71%	57%	51%	62%
Country	Democratic Republic of Congo	Sudan	Democratic Republic of Congo	Sudan	Gabon	Cote d'Ivoire	Democratic Republic of Congo	Gabon	Gabon	South Africa (from Gabon)	Uganda	Gabon	Congo	Congo	Congo	Sudan	Congo	Democratic Republic of Congo	Uganda	Democratic Republic of Congo	Uganda	Uganda	Uganda	Democratic Republic of Congo	Guinea, Liberia and Sierra Leone
Ebola virus species	Zaire	Sudan	Zaire	Sudan	Zaire	Tai Forest	Zaire	Zaire	Zaire	Zaire	Sudan	Zaire	Zaire	Zaire	Zaire	Sudan	Zaire	Zaire	Bundibugyo	Zaire	Sudan	Sudan	Sudan	Bundibugyo	Zaire
Year	1976	1976	1977	1979	1994	1994	1995	1996	1996	1996	2000	2002	2002	2003	2003	2004	2005	2007	2007	2008	2011	2012	2012	2012	2014

SOURCES: WORLD HEALTH ORGANIZATION, THE HUFFINGTON POST, SUPERPAGES.COM

MIKE FAILLE / NATIONAL POST

http://ebolaresources.org/

Data-driven response to containment of Ebola

Late 2014:

Architectures for connectivity are brought in

To reach data on patients in inaccessible remote areas

Easy diagnostics on four points

Preventive instructions to contain epidemic

Providing information and build trust (contain panic)

3. Lessons learnt

Data analytics were key to containing the virus, its spread, prevention, treatment, and abolishing it

The data architectures (hard and soft ware) were introduced approximately 9 months after the first case was identified

The hard and soft architectures were introduced without any foundation

All infrastructure was withdrawn from the affected countries after the crisis was containted

Affected countries were left in a vulnerable state, with depleted health systems, reduced capacities none of the innovation remained

Lack of capacity building and transfer knowledge and failure to increase capabilities to respond to future health crises

Space aids Ebola patients
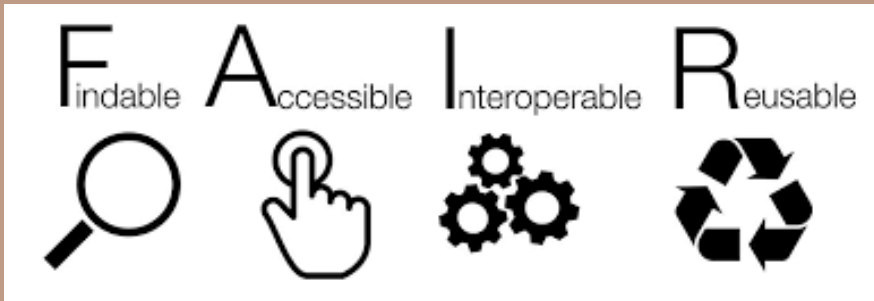
4. Introducing Internet of FAIR Data and Services

Challenge in GO FAIR Africa

Need to expand participation in GO-FAIR Build, Train and Change

GO Change: Limited broadband, requires adaptation to m-FAIR

GO Train: Need for Capacity-Building on FAIR Data stewardship

GO Build: Building capacities for data-driven health
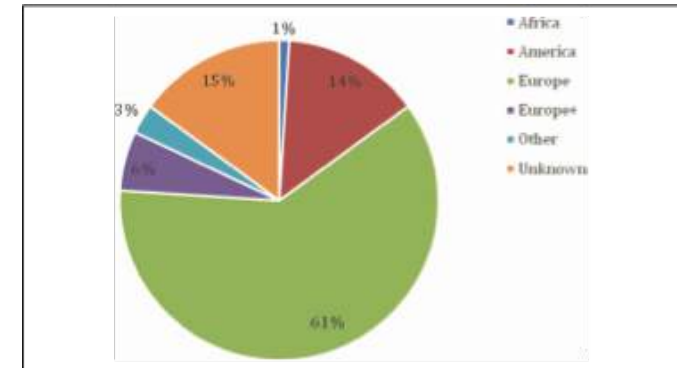

Figure 1. FAIR implementation by continent (n = 100)
Source: Created by authors, Stokmans & Basajja
Note: Europe+ is Europe and other continental geographies, mainly the United States of America

Van Reisen, 20129. Data Intelligence, MIT: http://www.data-intelligence-journal.org/static/publish/06/F6/C6/63EC8D41CC8D50A6C4A4EDBA85/26427-Mirjam_Van_Reisen-42_mT8NiDS.pdf

Implementation Network Africa: bridging data science across the continent

IN-Africa

Home › Implementation Networks › Current Implementation Networks › IN-Africa

Active GO FAIR Implementation Network

The GO FAIR Implementation Network Africa (IN-Africa) is an open network and any suggestions for expansion are welcome.

The IN acknowledges the potential of global development in building an internet of data and services (IFDS) and considers:

- the possibility for African universities and service providers to be connected to IFDS;
- the benefit of the FAIR-principles to help solve the problem of the current extraction of data from the continent without returning benefits;
- the possibility of a governance of data that will benefit the African continent;
- the emerging possibility through FAIR to root digital data within a philosophy that data are owned by the data-subject;
- the exploration of the contribution that Africa philosophy can make to the global IFDS due to its epistemology of united and collective existence expressed within local realities;
- the engagement with the FAIR-initiative to strengthen an African connection, perspective and orientation in a globally connected world.

Universiteit Leiden

5. Challenges COVID-19

22 cases in 7 African countries: Algeria, Egypt, Tunisia, Morocco, Nigeria, South Africa, and Senegal (5 March 2020)

https://www.world-heart-federation.org/news/preventing-covid-19-spread-in-poor-areas/

Coronavirus **COVID-19**

Global map of SARS-CoV-2/COVID-19 epidemic by region

Data extracted on 03 March 2020 at 23:00 CET from the online interactive dashboard, hosted by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, Baltimore, MD, USA (https://github.com/CSSEGISandData/COVID-19). Not included on the map are 706 cases tested positive for SARS-CoV-2 on "Diamond Princess" cruise ship, 6 people died (0.8%).

North America
Confirmed n=147
Deaths n=7
Mortality 4.8%

Europe
Confirmed n=3,347
Deaths n=84
Mortality 2.5%

Middle East
Confirmed n=2,540
Deaths n=77
Mortality 3.0%

China
Confirmed n=80,151
Deaths n=2,945
Mortality 3.7%

Asia (excl. China)
Confirmed n=5,860
Deaths n=39
Mortality 0.7%

Middle and South America
Confirmed n=17
Deaths n=0
Mortality 0%

Africa
Confirmed n=10
Deaths n=0
Mortality 0%

Global
Confirmed n=92,818
Deaths n=3,159
Mortality 3.4%

Oceania
Confirmed n=40
Deaths n=1
Mortality 2.5%

WORLD HEART FEDERATION

UNIVERSITY OF CAPE TOWN

COVID-19 Dangers in Africa

Undetected spread and sudden crisis due to high mortality

Mobility across the continent and with other continents and uncontroled spreading of the virus

Lack of information in remote areas, inaccessibility of remote areas and preventive measures do not reach population

Inability to reach populations outside health systems with infections which may spread

Unpreparedness of health systems and large outbreaks in high and/or remote density populations and mismatch with medicin availability

Uncontained crisis leading to panic and adoption of beliefs and practices that may aggrevate the spread of the virus

https://disasterdisplacement.org/disasters-climate-change-and-human-mobility-in-southern-africa-consultation-on-the-draft-protection-agenda

6. Global FAIR Data for COVID-19

LEADERSHIP FOR FAIRIFICATION PROCESS OF MEDICAL COVID-19 RELEVANT DATA

IMPROVED APPRECIATION OF DETECTION AND DIAGNOSTICS IN AFRICA ON COVID-19

START OF PROCESS OF PREPAREDNESS OF A COVID-19 OUTBREAK ON THE CONTINENT

SKILL AND CAPACITY BUILDING ON FAIR-BASED DIGITAL HEALTH DATA

COLLABORATION FOR FUTURE FAIR-BASED DIGITAL HEALTH

7. A Window of Opportunity for Digital Health in Africa

- Containment of COVID-19
- Prevention and build trust in digital data driven health care in Africa
- Strenghten collaboration between digital and medical experts on the continent and globally
- Build an African infrastructure for data-driven health
- Build FAIR Data capacity and integrate Africa in Global GO FAIR Health interoperability
- Ensure Africa is connected to Global GO FAIR health data architecture

Thank you