

April 2021

EIOS NEWSLETTER

Image: Kevin Cobsic | Unsplash

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DEAR READER,

With the COVID-19 pandemic having entered its second year, the world has a funny way of seemingly standing still and changing at a dizzying speed all at the same time. And just as the world is constantly evolving around us, both dramatically and almost imperceptibly, so are the needs in public health intelligence (PHI). Consequently, the EIOS initiative, the community of practice behind it, and even the small EIOS Core Team are constantly changing as well.

This newsletter tries to reflect and update on some of the latest changes in our continuous efforts to strengthen PHI. The spotlight articles offers a glimpse into the complex team effort that is event-based surveillance for COVID-19 at WHO and exemplifies how needs and surveillance strategies have evolved over time. Training reports take us from Rwanda, over the Middle East and all the way to the subnational level in Brazil. And last but not least, representatives from Egypt, one of the first Member States to join the EIOS initiative in 2019, give us an update on the role of EIOS in the country.

With sincere greetings,
The EIOS Core Team

SPOTLIGHT

STRENGTHENING COLLABORATION ACROSS WHO TO IMPROVE EBS FOR COVID-19

Since December 2019, information detected through event-based surveillance (EBS) has provided timely and context-specific information for surveillance and response to the COVID-19 pandemic. At WHO headquarters (HQ), EBS and official reports from Member States were the main methods for collecting daily case and death counts and identifying newly affected countries in the early stages of the pandemic. Over time, the purpose, scope, and processes for conducting EBS changed to meet the evolving needs of the COVID-19 response. Since late 2020, the team charged with conducting COVID-19 intelligence and developing related information products at HQ further systematised its use of the EIOS system for its EBS activities. The addition of new categories and the enhancement of existing ones enabled the team to better refine their boards and thus to better manage the abundance of information related to the pandemic.

However, the large volume of COVID-19 signals, limited staffing resources, the need to continuously adapt to emerging topics of interest and competing responsibilities continue to create challenges for

the teams at HQ and their counterparts at the WHO regional offices alike. To maximize efficient use of resources and reduce the duplication of efforts, colleagues from HQ and the six regional offices joined forces and initiated a dedicated working group in late 2020. The objectives were to provide a forum for sharing EBS processes for COVID-19, discuss challenges and ideas for solutions and to identify opportunities for collaboration.

As of April 2021, a number of virtual working group meetings have been convened and active discussions have taken place allowing regional office and HQ teams to share their respective processes for signal detection and data management, along with their challenges and lessons learned from conducting COVID-19 EBS. In addition, technical experts of EBS and geographic information systems (GIS) from the European Region shared how they visualize signals and solicit input from country offices (learn more about this on the following page). Looking for solutions, working group members brainstormed ideas on how to best construct and utilize shared boards on the EIOS system that would be useful to more than one WHO office and which other short-term solutions for timely information sharing across offices could be facilitated.

Thanks to the working group, efforts are underway to develop shared processes, standard operating procedures and signal trackers. In collaboration with the EIOS core team, the group is currently piloting a shared board for monitoring signals related to COVID-19 Variants of Concern and any potential Variants of Interest on the EIOS system, and is exploring opportunities for incorporating social media sources into COVID-19 EBS. These improvements will enable streamlined and aligned EBS processes within WHO and reduce duplication of efforts at a time where resources remain limited and the amount of information available exceeds the capacity of individual offices. Lessons learned through collectively and collaboratively solving common challenges may provide a knowledge base that can be more broadly applied to and incorporated into routine non-COVID EBS activities in the future.

*Greene-Cramer, B., Griffith, B. and Togami, E.
WHO headquarters*



COVID-19 EBS AT WHO EURO

Starting in October 2020, the WHO Regional Office for Europe (EURO) has implemented systematic media monitoring using the EIOS system, as part of epidemic intelligence activities for the COVID-19 pandemic. Over the course of the pandemic, this methodology has been refined to improve detection, assessment and documentation of reports that provide complementary information to case and death statistics in European Member States, both at national and subnational levels.

Navigating the Infodemic

Through several cycles of testing and refinement, the team designed a specific EIOS search strategy to reduce irrelevant information— a major prerequisite to navigating the abundance of open source information, translating into more than 30 000 articles tagged with “coronavirus” in the EIOS system for the WHO European Region per day! A proportion of remaining articles are then manually screened and selected based on well-defined criteria adapted to emerging knowledge. Relevant articles are registered in a tracking tool where searchable metadata tags are applied, including the signal type (e.g. outbreak, change in trends, immunization, or health system), setting (e.g. health care facility or educational setting), and location details. Critical information is reported immediately to the COVID-19 incident management team for appropriate action, and key information gathered through this process frequently appears in daily and weekly internal information products.

Targeted information at a glance

The team recognized the opportunity to share this information not only as a detailed, continuously updated line list, but also as an intuitive, interactive mapping dashboard leveraging Geographic

Information Systems (GIS) technology (pictured below). With articles appearing as icons over a base map of 7-day subnational COVID-19 case incidence, the map conveys an overview of situational awareness throughout the WHO European Region. This dashboard tool invites its users to explore articles geographically, empowering them to quickly drill down to articles of specific interest by topic, location, and even across time.

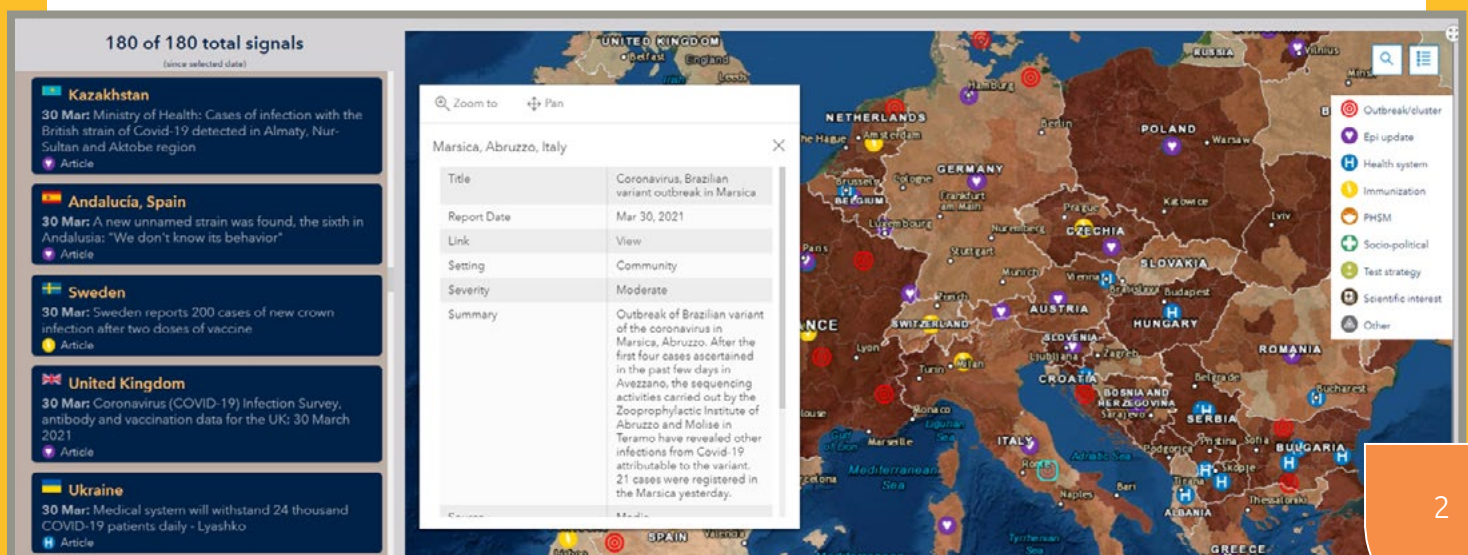
Using this EBS methodology and the EIOS system, the team systematically curates and shares significant open source information for the WHO EURO COVID-19 Incident Management Support Team that meet pre-defined criteria. Even prior to official verification, these articles offer potential insight to help inform rapid decision making in the pandemic response. For instance, the monitoring system has emerged as an important yet flexible component in detecting outbreaks in special settings and/or populations at the beginning of the pandemic and has recently moved towards tracking the detection and spread of emerging variants.

Limitations

It is important to recognize that information retrieved through this process does not represent a comprehensive collection of all relevant media in countries and pertinent reports may be missed. In addition, despite actively striving to identify and discard false information, such articles may still slip through on occasion. The team further noted that geographic distribution of articles typically favors western parts of Europe due to article availability and language challenges but continues to refine their search strategies to address this bias.

In conclusion, using open source reports systematically collected through an aggregator of publicly available information, such as EIOS, has proved useful and timely for COVID-19 response efforts. Maintaining a flexible and adaptable approach has allowed the team at WHO EURO to shift rapidly in the face of emerging COVID-19 issues. Near future steps include the incorporation of SARS-CoV-2 variants classification and the visualization of related updates on the GIS signals dashboard. Further, the team will continue to explore potential utility and expansion of these tools at country level.

Cheng K., Ciobanu S., Hernández-García L., MacDonald L., Pires J., WHO EURO



Coordination Group

This year, the EIOS governing body in its current composition is entering the third year of its mandate. As per Terms of Reference, new collaborators can join the CG as of 2022, provided that they have been active in the initiative for a minimum of six months. Given the current circumstances, in which active engagement with and proper consolidation of new communities has been more challenging due to the pandemic, an extension of the current members' term is being considered beyond January 2022 to allow for continuity. However, seats of members opting out of extension will be offered to representatives of other entities meeting the criteria through an open call. The number of member organisations represented on the CG will remain limited to twelve, including WHO as a permanent member.

In the current CG, Mike Reynolds has taken over representation for Public Health England (PHE) from Catherine O'Conner, who left PHE in March. Xiang Huo has ended his secondment at GOARN and with that, his role as GOARN representative on the CG. A new GOARN representative is yet to be nominated.

Training updates from across the globe

Africa Region

Our EIOS focal point at the WHO Regional Office for Africa organised a remote system training workshop for Rwanda in February. As previously piloted in Nigeria 2019 and Uganda 2020, the training was preceded by a broader EBS assessment and training run by colleagues from the US CDC. Africa CDC supported the training with a practical session.

Americas

The EIOS team at the Pan American Health Organization (PAHO) kicked off the first subnational expansion of EIOS in Brazil in March and has embarked on an ambitious plan to train and onboard 250 new users across all federal units in the country (read more on the next page).

Eastern Mediterranean Region

The EIOS power trio from the WHO Office for the Eastern Mediterranean Region (EMRO) set a new record for onboarding three new Member States in three weeks! In March, the EMRO team provided face-to-face system trainings in Afghanistan and Sudan, as well as a remote workshop for Tunisia (find out more on page 4). Virtual trainings for an NGO in north-west Syria as well as the Lebanon Ministry of Health have been scheduled for April.

News from the EIOS Core Team

Busy times for the ECT, our colleagues at the regional WHO offices and the wider Global EIOS Support Team (GEST)! The first quarter of 2021 has seen a peak in training and expansion activities with more than 250 new users joining the EIOS initiative between January and March – more than twice the number compared to the same period last year. New strategies around expansion to Member States are currently being explored and piloted in different regions. This includes the expansion of EIOS from national to subnational levels in Brazil, as well as plans for joint regional trainings in both the African region for Sierra Leone and Liberia, and in Central America (tbc).

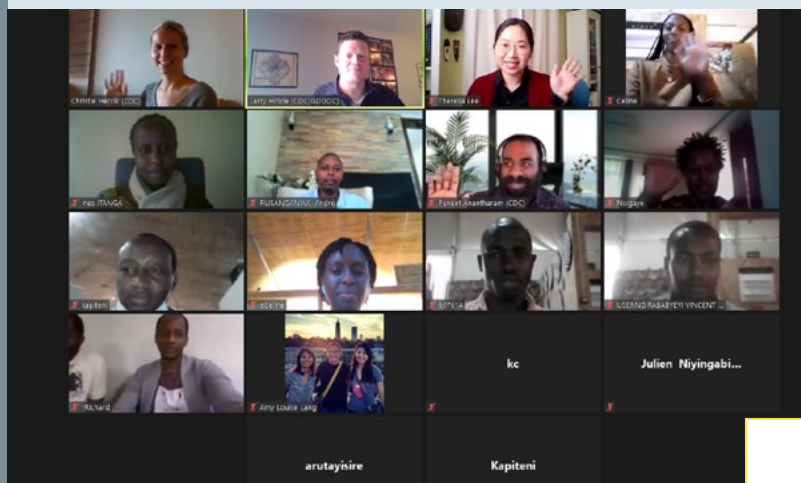
The majority of activities related to EIOS expansion in Member States in 2021 will be supported by resources from the Solidarity Response Fund. After successful application by the ECT in January, the Fund approved a US\$1.9million grant to help cover EIOS expansion and a small portion of planned anomaly detection work in 2021. Additional funds are being pursued for the latter.

In addition to the expansion to Member States, GLEWS+, the joint FAO-OIE-WHO Global Early Warning System for health threats and emerging risks at the human-animal-ecosystems interface, has reignited its collaboration activities on the EIOS system. The Vaccine Safety Network has joined the initiative as a new community and a number of teams within the WHO community have started using the system for targeted monitoring and collaboration activities in the first quarter.

Team updates

Carolyn Briody, who has been working as a consultant in the Sources Coordinator position since January 2020, has been selected to fill the vacant Epidemiologist staff position on the ECT for a duration of 6 months while we run a staffing competition. She will continue to oversee the sources work for the system, in addition to performing new duties, such as evaluating social media as a source for PHI and the upcoming anomaly detection project. The ECT has also requested the creation of three temporary staff positions until the end of the year. The three positions concern stakeholder engagement, systems architecture and training. While the first two are currently covered by consultants, the position of Training Coordinator has remained vacant since October 2020, causing important projects such as the definition of a broader PHI curriculum to be put on hold.

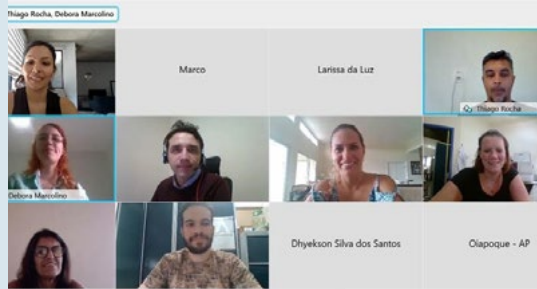
Cristian Marcu, who had supported the team as Project Manager since mid-2020 is leaving his position at the end of April to start a new professional adventure. We wish him all the best!



Participants and facilitators of the joint EBS/EIOS System Training in Rwanda in February 2021. Photo: Larry Hinkle/CDC.

Brazil pioneers subnational expansion of EIOS

Since its implementation in October 2019, the Brazil Ministry of Health (MoH) has been embracing the EIOS system to strengthen Event-Based Surveillance (EBS) in the country. Having demonstrated its utility already prior to the pandemic, with concrete examples ranging from arboviruses to immunopreventable disease surveillance, EIOS has continued to be crucial in rapidly identifying reports related to COVID-19 across the country. Recognizing the necessity of early detection, the Brazil MoH requested the Pan American Health Organization (PAHO) to expand the implementation of EIOS at subnational level.



Pioneers among the pioneers: screenshot of first training group kick-starting Brazil's subnational expansion of EIOS, March 2021. Photo: Thiago Hernandes Rocha.

In March, the EIOS team at PAHO, in collaboration with the WHO Country Office in Brazil, kicked off an ambitious expansion strategy, aimed at providing 3-day virtual EIOS system training workshops to more than 250 surveillance professionals across all 27 federative units. The first group to be trained was composed of staff from six Health Surveillance Strategic Information Centers (*Centro de Informações Estratégicas em Vigilância em Saúde*) located in states bordering Brazil's neighbouring countries Argentina, Bolivia, French Guiana, Paraguay and Uruguay. As of mid-April, seven workshops have been run and nearly 70 MoH staff have been trained.

Brazil is the first country to roll-out the initiative at subnational level. Training the entire surveillance network in the country in the use of EIOS and thus further strengthening national EBS capacity is expected to generate positive results for the promotion of surveillance activities, early detection of and response to health emergencies at different levels.

Stefany Ildefonso and Thiago Hernandes Rocha, PAHO



Sudan joined the global EIOS community of practice in March 2021. Photo: WHO Country Office Sudan.

EIOS

Community

Welcoming new communities in the Eastern Mediterranean Region

The WHO Regional Office for the Eastern Mediterranean (EMRO) welcomed three new Member States to the EIOS initiative in the first quarter of 2021. Successfully completing two face-to-face and one virtual workshop, Afghanistan, Tunisia and Sudan followed Egypt and Oman, the first countries to be trained on the EIOS system in the region in late 2019.

The workshops included participants from the Ministries of Health, WHO country offices, and, in some cases, other organizations such as the International Office for Migration (IOM). During the workshops, participants were introduced to the EIOS system through theory and practical exercises, emphasizing case studies and field scenarios. All trainings will be followed up by regular engagement calls and the development of standard operating procedures (SOP) to ensure the robust implementation of EIOS to strengthen national event-based surveillance.

In Afghanistan, EIOS complements the ongoing implementation of a broader EBS project run in collaboration with the US CDC. The aim of implementing community- and internet-based surveillance components, is to scale-up the early warning and response function by supporting early detection of unusual public health-related information from a variety of sources in addition to indicator-based surveillance. A national EBS

implementation operational guide is currently under development, and is to include the jointly drafted SOPs.

In Sudan, an EBS system had already been established in 2016. However, no formal or standardised media scanning activities have been carried out since, except for sporadic ad-hoc occasions. For this reason, the Federal Ministry of Health (FMOH) opted to deploy the EIOS system and join the initiative to strengthen their surveillance coverage and augment their existing community-based surveillance. The Sudan FMOH plans to integrate the EIOS system with the Online Signal Module (OSM), a signal management system designed and maintained by EMRO. The integration aims to support the dual application of both systems to ensure early detection and response.

The National Observatory for New and Emerging Diseases in Tunisia is planning to establish and digitalize their EBS and is currently developing a digital tool to facilitate automated surveillance. The EIOS system is expected to complement that system as an indispensable component.

The new members were excited to become part of the global EIOS community of surveillance experts and the enthusiasm, commitment, and dedication of the participants made all three workshops a dynamic and safe learning experience.

Aboushady, A., Mahran M., and Sadek, M., WHO EMRO



Group photo of participants at the EIOS system training in Afghanistan, March 2021. Photo: WHO Country Office Afghanistan.

WHAT'S NEW in EIOS?

CATEGORY CORNER

Since the beginning of the year, we have been working to further support the monitoring of the evolving COVID-19 pandemic. A general category for **Adverse Events Following Immunization (AEFIs)** and a specific category for **Cerebral venous sinus thrombosis** were created to monitor ongoing global vaccination efforts. Additionally, new categories related to **Coronavirus Variants and Coronavirus Mutations** were added to support related monitoring across all communities on the EIOS system. By mid-April, 24 related categories had been created and the ECT continues to collaborate with members of the EIOS community and subject matter experts to add additional variant/mutation categories to the EIOS system as they emerge.

Unrelated to Coronavirus, we have also added categories to monitor **Cyclonic Storms, Wildfires, Maternal Mortality and H5N8**.

The ECT strives to provide categories that cover various languages and dialects and provide articles relevant to users with limited noise. In the first quarter of this year, we have added additional translations for nearly 40 categories within the EIOS system. We have also worked with users to refine various category definitions resulting in decreased noise and improved functionality.

If you think a category you are interested in could use some refinement to better support your monitoring objective, please do not hesitate to contact us!

Quarterly system update

Every three months, we release a series of new features or improvements to existing functionalities. The last scheduled update was implemented on 23 March 2021. Below, we provide a short overview of the main changes relevant to EIOS system users.

For a full list of updates and more details, please refer to the Reference Manual on the documents page of the EIOS system.

UPDATES - EXPLORE TAB

The **Text search** is now triggered by a submit button rather than automatically updating on the fly.

WHO Regions and Continents have been added to the Mentioned country filter.

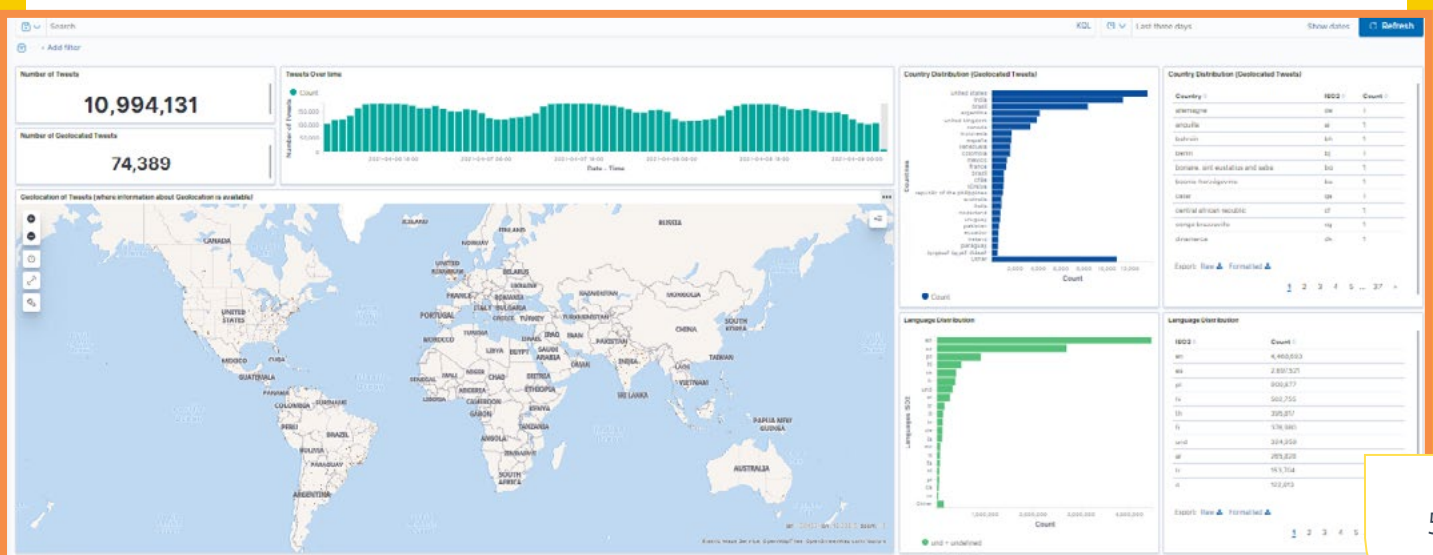
WHO Regions, Continents, Types and Geographical coverage have been added to the Source filter.

HELP AND FEEDBACK

The User guide can now be accessed and downloaded under the Help and Feedback menu.

DASHBOARDS

A new dashboard which provides an overview of Twitter messages related to COVID-19 was added under the Dashboard menu (pictured below).



EIOS SYSTEM

Update on
ongoing
collaborations

EIOS at HNPW 2021 28 April, 12-13.30 UTC

Thijs Cornelissen and Dusan Milovanovic from the ECT will be presenting the EIOS initiative at the **Humanitarian Networks and Partnerships Weeks 2021**, a three week virtual event co-hosted by the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) and the Swiss Agency for Development and Cooperation.

Speaking at the Priority Topic session *Safeguarding against future medical threats utilizing artificial intelligence supported medical intelligence*, Thijs and Dusan will provide a brief overview of the concept of health intelligence from open sources.

For more information and registration, please visit the [HNPW 2021 website](https://www.hnpw.org/).

Research and collaboration projects

Web scraping

User acceptance testing of the platform developed by Adappt, scraping, collecting and presenting COVID-19 case count from selected websites, is now underway. Data sources have been identified together with experts from the WHO regional offices and preliminary feedback is positive. Currently, data is mainly extracted and validated manually by WHO experts, depending on the context and relevant sources. An open source solution is being developed in parallel that will extract the data fully automatically, as well as providing a lot of flexibility e.g. for adding additional indicators. This new solution is expected to be ready toward Q3.

News credibility

Renewed efforts to retrain and refactor the news credibility algorithm developed together with Amazon Web Services (AWS), after a first version had produced unstable results, were started this year and improvements are already visible. The measured model accuracy has been further improved, while the time and cost for training the model have been significantly reduced. Data used for training are currently being scrutinized and new training data are being added. In addition to improving the model, the focus is also on deploying it in an open, shareable manner, making it available for use and improvement by others. In this sense, it is expected that this project will provide solid foundations for other upcoming machine learning projects.

Summarization

We were able to train and run the first models developed by Hong Kong University

of Science and Technology (HKUST) with data from the EIOS system. Exposing the article clusters (calculated by the EIOS clustering algorithm) to the Hong Kong group enabled them to generate summaries for these clusters using their model. A first evaluation of these summaries has just been completed and our collaborators at the HKUST are now improving the model based on our feedback.

Anomaly detection

Thanks to funds received through the Solidarity Response Fund, we have started to scope work on anomaly detection. Considerations include different scenarios of early-detection of new, unusual or unexpected public health events and threats as well as new alerting mechanisms.



COMMUNITY CLOSE-UP: EGYPT

Name of Community: Egypt

Active on EIOS since: 2019

Number of members: 15 in total, of which 9 are the core EBS team who use the system on a regular basis

HOW MANY DIFFERENT ENTITIES ARE REPRESENTED IN YOUR COMMUNITY?

One, the Ministry of Health and Population (MoHP)

WHAT DO YOU USE EIOS FOR?

We use the EIOS system as a media scanning tool to support our overall event-based surveillance (EBS) by enforcing the early detection of public health-related signals to trigger the response as early as possible. The main focus of the Egypt EIOS community is on communicable diseases, including zoonotic ones. The important role of EBS/EIOS in Egypt was highlighted last year when we detected the first signal of pneumonia cases in China through a board for international events we had created in EIOS system.

WHAT DO YOU LIKE BEST ABOUT EIOS?

We find different features of the system very useful and it saves us a lot of time in the daily routine media scanning by making the process a bit easier. The saved time from the scanning is directed to the next steps in the EBS cycle, e.g. the verification through respective authorities at the subnational level.

SUCCESS STORY

Looking at the period between June and September 2020, we found that using the EIOS system helped us detect 68 signals earlier than through traditional manual search. Of these 68 that went for triage and filtration, 46 were sent for verification and almost half of them (21) including human, animal and environmental events, have been verified as true and were followed up.

Compiled by Dr. Hanaa Abu Elsood and Dr. Fatma Osman, MOHP