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Honour the Past, Embrace the Future

SCIENTIFIC PROGRAM & ABSTRACTS

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BP5

[Contribution withdrawn]

BP6

Experience in the participation of the CBRN Defense Systems Department of the INTA-La Marañosa Campus (Spain) in projects of the European Commission ISF-P: BULLSEYE and MALL-CBRN

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The CBRN Defense Systems Department of the INTA-La Marañosa Campus (Spain) currently participates in two European consortia for the calls of the Internal Security Fund-Police (ISF-P) instrument of the European Commission: the BULLSEYE and MALL-CBRN projects. The first of them aims to improve the preparation and response of European emergency services to chemical and biological incidents, while the second aims to create a protection system against CBRN and explosives incidents in large shopping malls. In both, the methodology is based on gaps analysis, and it is also supported by state of the art research, through interviews, meetings with experts, and the organization of workshops and training exercises. The main expected results in relation to the BULLSEYE is the provision of highly trained first responders who can then serve as trainers for their respective teams in their country of origin. In relation to the MALL-CBRN, one of the most important results will be the development of recommendations to improve prevention and response to these types of incidents, including those related to food.

CP1

Agent-based simulation as an effective tool for COVID-19 anti-epidemic policy formation

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The COVID-19 pandemic has become a problem for health systems and predicting the dynamics of cases has become an indispensable tool for calculating the necessary capacity of medical institutions, the supply of personal protective equipment, medicines, ventilators, and the like. Mathematical modeling tools can be an effective solution to control the epidemic. With the help of modeling, it is possible to identify the factors that most affect the dynamics of the epidemic process in a certain area, and to regulate them. We hypothesize that agent-based approach will reveal the significance of factors affecting the epidemic process, such as quarantine restrictions, isolation of patients, the use of masks and antiseptics, adherence to vaccination, over current models that only allow to forecast the morbidity. We present our results of an agent-based model which is a set of interacting agents with different characteristics (age, sex, quantity of contacts per day, etc.) and different states (Susceptible, Infected, Exposed, Recovered, Dead). Transitions between states are implemented probabilistically and are determined experimentally based on statistics on the COVID-19 incidence. We used data on COVID-19 morbidity in Ukraine provided by Center for Public Health of Ministry of Health of Ukraine. We used C# programing language for program realization. The developed agent-based model of COVID-19 allows calculating the predicted incidence of COVID-19 in the regions of Ukraine based on real statistical data. The advantage of the approach is the ability to identify factors affecting the dynamics of the incidence of COVID-19, in contrast to classical and neural network models. While other models only allow constructing predictive incidence rates, the extended model makes it possible to conduct experiments and determine the leading driving forces of the epidemic process. This is the basis for developing optimal management decisions to help minimize the risk and increase the effectiveness of the epidemic response. The accuracy of predictions obtained using our model is 97.6%, which is higher than the compartment models widely used for modeling COVID-19. Experiments provided with agent-based model showed that the most effective measure for susceptible population to reduce the epidemic incidence of COVID-19 is contact tracking with isolation of patients and contact persons. At the same time, there is no need for complete isolation of the population.

CP2

Biological Threats and Special Pathogens - Why is a Quality Management beneficial?

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The Robert Koch Institute (RKI) is Germany's central governmental scientific institution in safeguarding public health and infection protection