PROGETTI DI "RICERCA CORRENTE 2017"
RELAZIONE FINALE

N. identificativo progetto: IZS LT 08/17 RC

Progetto presentato da:

ISTITUTO ZOOPROFILATTICO SPERIMENTALE

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Area tematica: Sanità animale

Titolo del progetto: Sviluppo di un ambiente informatico protetto per condivisione informazioni su zoonosi ed agenti zoonosici: un approccio "One Health"

Ricerca finanziata dal Ministero della Salute

Responsabile Scientifico: dott. Paola Scaramozzino

Summary of results and conclusions

During the research, an IT application was designed, built, implemented and tested capable of ensuring a protected environment for the timely sharing of detailed and contextual information relating to a priority list of bacterial isolates and zoonotic viral agents.

In particular, a "workspace" was created capable of tracing in a standardized and shared form between various laboratories and regional public health bodies, the current system of isolation, typing and deep characterization, at different levels of complexity, of agents of known zoonoses , emerging or re-emerging with a high potential for impact on animal and human health.

Agents considered include:

1. viruses or bacteria for which surveillance, control and monitoring plans are in place in the livestock sector, in primary production and responsible for community outbreaks in humans (Brucella spp, Mycobacterium spp. Zoonosic, Salmonella spp. E. Coli. .)

2. agents already subject to integrated surveillance plans in public and veterinary health (arbovirosis: Usutu and West Nile Disease Viruses)

3. emerging or re-emerging zoonotic agents not subject to specific surveillance and control plans, often considered in the course of differential diagnostics both in the human and veterinary fields (Coxiella burnetii, Orthopoxvirus, Leishmania infantum, Toxoplasma gondii) and which see animal populations as reservoirs of infection and potential source of human exposure.

The developed application allows to combine the possibility of systematically and in a standardized way archiving the deep characterization data of zoonotic agents, their integration with context information and the sharing of the database between different local authorities.

The tool therefore allows, on the one hand to maximize the information return of the laboratory results in parallel tracing mode of the typings in the human and veterinary compartments, on the other to perform, thanks to the presence of the metadata referring to the isolates, an epidemiological evaluation presumptive or descriptive, in the short term, retrospective and analytical in the medium to long term.

In the current configuration of the "worksapce", through the data extraction tools, the laboratories authorized to access the system are able to:

- perform searches by area, agent, source, sector (human, zootechnical chain, animals, food, carriers);

- monitor isolation frequency, spatial and temporal distribution of specific isolates,

- monitor the appearance and/or progressive spread of serotypes, biovariants, subtypes, antibiotic resistance profiles

- compare genetic sequences

- early identification of any presumptive isolation clusters of a change in the epidemiological picture

- formulate working hypotheses on the possible primary sources of infection

- establish contacts and collaboration relationships with the other laboratories authorized for the system

- set up specific scientific studies

- activate the regional alert systems

The various information "return" options guaranteed by the "zoonoses workspace" prefigure the possibility of providing, in a relatively short time, further support both for integration and collaboration between regional public health laboratories, and for the regional prevention and response system to infectious events. Research funded by the Ministry of Health - Directorate General for Animal Health and Veterinary Medicines IZS Project LT 08/17 RC pag. 14

The active and passive surveillance data flows, even where currently existing, and the case notification systems, active at regional level, allow for immediate activation of risk mitigation measures against the spread of these agents.

However, there is an information integration gap between the various sectors of the prevention system which often makes interventions in the human and veterinary sectors (animal health and food safety) asymmetrical. This integration is essentially based on the progressive decentralized activation of regulated risk mitigation processes by the Prevention Departments of the AASSLL following the notifications of cases in the areas of competence.

Frequently, moreover, the notification of cases represents an unexpected event in response to which the Prevention System is not fully prepared, due to the absence of an informed targeted alert system capable of anticipating, among all possible potential risks, those emergent specifics in the area of competence.

The "workspace" created in the course of the research therefore opens up a concrete possibility of supporting the targeted and preventive activation of risk alert, surveillance and mitigation activities against zoonotic agents for which we observe, over a period of time and an extension territorial boundaries, significant increases in the frequency of isolation and typing.