The further need for strengthening One Health collaboration at national level



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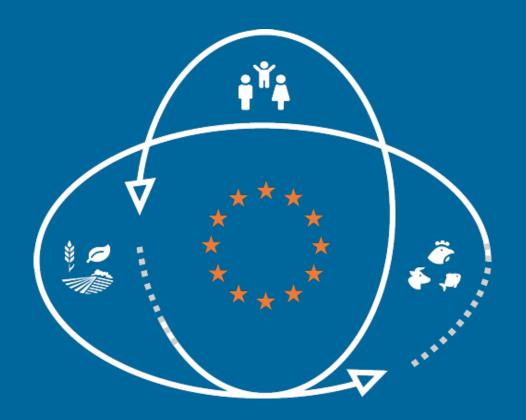
"A success and challenges story from Portugal"
Monica Oleastro
OHEJP Scientific Steering Board member, INSA











A success and challenges story from Portugal

M. Oleastro, A. Botelho (INSA & INIAV, Portugal)

One Health EJP Final Meeting

Paris, 11-12 September 2023



OH EJP Partners from Portugal

INSA, National Health Institute (Infectious

Diseases & F Instituto Nacional de Saúde rition

Dep.)

INIAV, National Institute of Agrarian and Veterinary Research, National Reference Laboratory for Animal Health





OH EJP Partners & Projects from Portugal

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INSA, National Health Institute (Infectious
                           F Instituto_Nacional de Saúde rition
Diseases &
Dep.)
3 JIP
         MATRIX
         OH-HARMONY-CAP
       COVIRIN
10 JRP
EMERGING THREATS
         IDEMBRU
         MEME
         TELE-VIR
FOODBORNE ZOONOSES
         DISCOVER
         TOXOSOURCES
         ADONIS
         BEONE
ANTIMICROBIAL RESISTANCE
         FULL-FORCE
         WORLDCOM
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FED-AMR

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INIAV, National Institute of Agrarian and
Veterinary Research, National Reference Laboratory
for Animal Health
Instituto Nacional de Investigação Agrária e
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3 JIP

COHESIVE (1st call)
OH-HARMONY-CAP
COVIRIN

6 JRP

EMERGING THREATS

IDEMBRU MEME PARADISE

FOODBORNE ZOONOSES

DISCOVER TOXOSOURCES ADONIS

ANTIMICROBIAL RESISTANCE





GENERAL OUTCOMES

- OH EJP raised awareness at the national level regarding OH concept

Institute Level

- Scientific Progress (scientific papers, thesis)
- Technical progress New Diagnostic/Surveillance Tools
 - reference databases of bacterial strains and genomes
 - harmonised procedures
 - validated metagenomics methods and guidelines
 - new molecular tools
 - handbooks
 - surveillance-oriented tools
- Capacity building for researches Short Term Missions
- This consortium enrolled teams with different skills that are still collaborating and exchanging experiences after the conclusion of the OHEJP projects
- Hiring specialized human resources in bioinformatics / microbial genomics that are now part of the INSA's team.





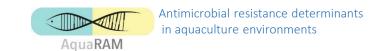


GENERAL OUTCOMES- capacity building

SHORT TERM MISSION (2022) in the frame of DISCOVER project (DTU)

Surveillance and source-attribution of AMR based on metagenomic analysis

Dataset of 34 metagenomes from aquaculture sediments from Portugal



- ✓ Implementation of these new approaches in INIAV
- Establishment of collaboration and improvement of scientific and technical capacity

SOURCE ATTRIBUTION OF ANTIBIOTIC RESISTANCE GENES IN ESTUARINE AQUACULTURES: A MACHINE LEARNING APPROACH









GENERAL OUTCOMES

Organizations / country level



- FAILURE to share National databases

- FAILURE to implement ONE HEALTH system involving different levels of organizations

- To some extent, FAILURE to translate suggestions and outputs into practice at national level.





WEAKNESS

- The AH and PH institutes prioritized different projects to participate in; the collaboration between both institutes was not as fruitful as desired
- Failure to engage the Programme Owners (the representatives of the ministries)
- Unable to set up a national mirror group that could have helped at enhancing collaboration and promote dissemination at a national level on progress of the project.





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Further need to strength One Health collaboration at national level





Further need to strength One Health collaboration at national level

- Establishment of a **One Health system** dependent on a proactive approach, focusing on "prevent-detect-respond", rather than a reactive approach
- > Development of a **standardized system** for the joint assessment of zoonotic disease risks;
- Creation of a common database for building sustainable mechanisms of communication, collaboration, and aligned local, regional, national, and international strategies
- Put in practice national level polices, beyond each institution, supporting collaboration, creating social, cultural, and educational environments that could reduce the gap between AH and PH
- Changes in cultural, social, and institutional practices within the country's organizational system
- Daily multisectoral and transdisciplinary collaboration
- Science-policy translation and political will







ONE HEALTH IN PRACTICE:

LESSONS FROM A NATIONAL / INTERNATIONAL COLLABORATION



COHESIVE: One Health Structure In Europe

- ❖ Development of a practical guideline (OHRAS) to help countries organizing the risk-analysis of emerging zoonoses in a One Health fashion (https://master.daf3qs583gvkb.amplifyapp.com/)
- ❖ Map of the current national (Portugal) situation: a pilot tool (workshop) bringing together key actors involved in the risk analysis of zoonoses was held at INIAV.
 - **The Portuguese participants agreed on the following suggestions:**

Raise awareness across sectors, generating cross-sectoral perspectives, and building on trusting relationships.

Establish a national OH community of practice, strengthening communication and data sharing across sectors, thus enabling signals to result in action across sectors.

Identification of gaps as well as strengths of already existing OH systems, enhancing the use of existing resources.







ONE HEALTH IN PRACTICE:

LESSONS FROM A NATIONAL / INTERNATIONAL COLLABORATION - SimEx



















Need of harmonization and data sharing

Clarification regarding the roles and functions of available systems



PUBLIC

HEALTH





ANIMAL

HEALTH

Need of political and organizational willingness and commitment

Constraints of existing legislation





TRIGGER OF TECHNICAL-SCIENTIFIC ADVANCEMENTS AND THEIR TRANSLATION INTO THE INSTITUTIONAL CONTEXT





João Santos, PhD, Population Genomic Analysis, Bioinformatics, multiple model organisms

"The TELEVIR project has given me the opportunity to develop my own skills while exploring the exciting worlds of microorganisms and health alongside a motivated and hard-working team. As a OHEJP fellow I integrated an international network collaborating to produce cutting edge and impactful research. It has been a rewarding experience to foster these connections and see my work benefit the important tasks of genomic surveillance and diagnostic at home and internationally."



2021 – INSA, Department of Infectious Diseases

Postdoc: TELEVIR - Point-of-incidence toolbox for emerging virus threats

(https://onehealtheip.eu/projects/emerging-threats/jrp-tele-vir)

TELEVIR toolbox

virus metagenomics detection and routine genomic surveillance

Bioinformatics component

(user-oriented, online, free)

Available at protocol.io:

https://www.protocols.io/private/07351F8EB59811ECB1480A58A9FEAC02

Fomsgaard, A. S et al. Viruses, 15(6), 1399.

Wet-lab component

(field deployable: both RNA and DNA virus)

Available at:

https://insaflu.insa.pt



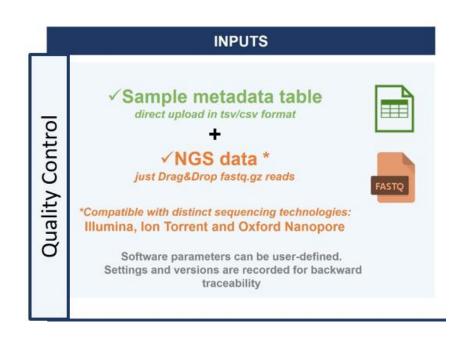
https://doi.org/10.3390/v15061399.

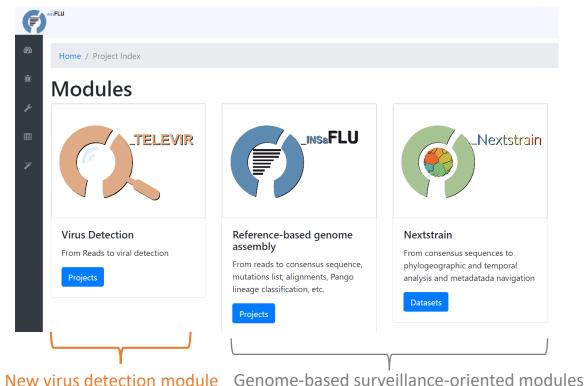




https://insaflu.insa.pt

<u>Motivation:</u> the implementation of metagenomic virus diagnostics and routine genomic surveillance can be particularly challenging due to the lack of bioinformatics infrastructures and/or expertise to process and interpret next-generation sequencing (NGS) data.





Outcome: INSaFLU-TELEVIR (https://insaflu.insa.pt/) is web-based (also locally installable) platform that handles read sequence data (ONT, Illumina and Ion Torrent), enabling the identification of both RNA and DNA viruses, while providing multiple surveillance-oriented features towards mutations detection, consensus generation, lineage/genotype classification, alignments, "genotype-phenotype" screening, phylogenetics, and integrative phylogeographical and temporal analysis.







https://insaflu.insa.pt

IMPACT of **INSaFLU-TELEVIR** platform

- It has been crucial for genomics surveillance of influenza, SARS-CoV-2 and mpox in Portugal.
- The default tool for viral metagenomics at INSA, with bacterial metagenomics applications currently under testing.
- It captured the attention of the international scientific community and key stakeholders in the field of public health (presented in several WHO, ECDC meetings).
- It has been enrolled in multiple national and international training activities to support the capacity building of several countries/laboratories in virus metagenomics detection and genomic surveillance:
 - ECDC programme AURORAE project to support microbiology-related activities and capacity building focusing on COVID-19 and influenza in the EU/EEA, the Western Balkans and Turkey"
 - ECDC GenEpi-BioTrain programme in genomic epidemiology and public health bioinformatics.
 - MediLabSecure (https://www.medilabsecure.com/project.html) workshops to improve the surveillance and monitoring of emerging zoonotic diseases of viral origin in the Mediterranean, Black Sea and Sahel regions
 - Collaboration actions with African countries of Portuguese official language (namely Guinea-Bissau, Angola, Cape Verde, etc) towards INSaFLU-TELEVIR training and/or implementation in emerging genomic surveillance systems

Dissemination:

OHEJP Webinar on "New tools in the Surveillance/Risk Assessment areas – demonstration of One Health outputs" (28 March, 2023)

OH EJP Stakeholder Conference (19-21 June, 2023)





FINAL BALANCE:

We achieved the Major Aim of the OH EJP - IMPROVE OUR PREVENT-DETECT-RESPONSE CAPACITY





FINAL BALANCE:

We achieved the Major Aim of the OH EJP IMPROVE OUR PREVENT-DETECT-RESPONSE CAPACITY

Looking forward for the OH EJP V2.0!







Thank you for your attention!







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