



Alert-Early System for Outbreaks with Pandemic Potential

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An overview:

- Aims to anticipate outbreaks and advise the health authorities on science-based decision-making measures;
- It is developed in close interaction with the stakeholders;
- Integrates into existing systems for using regularly-generated multimodal data;
- Leverages *bona fide* health data and several alternative data;
- The system is scalable to all Brazilian cities and adaptable to different syndromes;
- It is built to preserve data security in parallel with swift data management;
- AESOP's data models and open-source products will be available to leverage, adapt, replicate, and scale, contributing to a global federated model of digital health surveillance.



Characteristics of the AESOP outbreak detection system

Characteristics	AESOP
Fit for purpose	Upfront involvement of stakeholders/end-users.
Sensitivity	Prediction & Forecasting leveraging diverse data streams.
Specificity	Advanced molecular pathogen characterization.
Rapid response	Earliest possible detection of human health anomalies.
Scalability	All 5,570 Brazilian municipalities.
Integration with existing systems	Most data from current systems.
Data security, privacy and trust	Data not individually identified and to be used in a federated network.
Easy to use	Pathogen Threat Detection Dashboards Adapted to User Requirement
Cost-effectiveness	Based on continuously collected health surv. data (except genomic)
Flexibility	Incorporation of new data sources; Adaption to other syndromes.

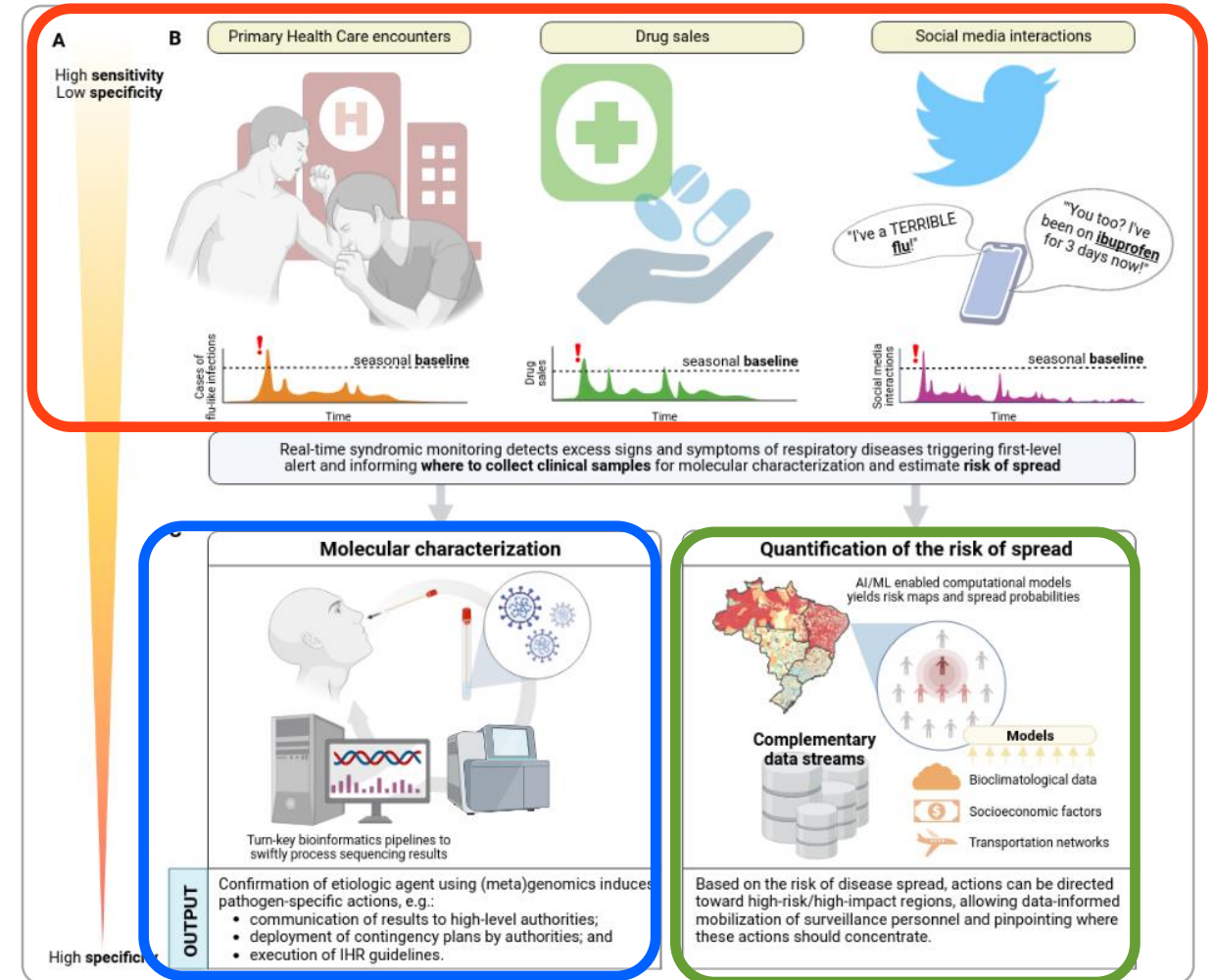
AESOP's overview and objectives

 **Increase accuracy and anticipate the identification of the initial steps of an outbreak** by detecting rise of respiratory infections at the Primary Health Care level;

 **Molecularly characterize known or unknown infectious agents** implicated in perturbation of the human health;

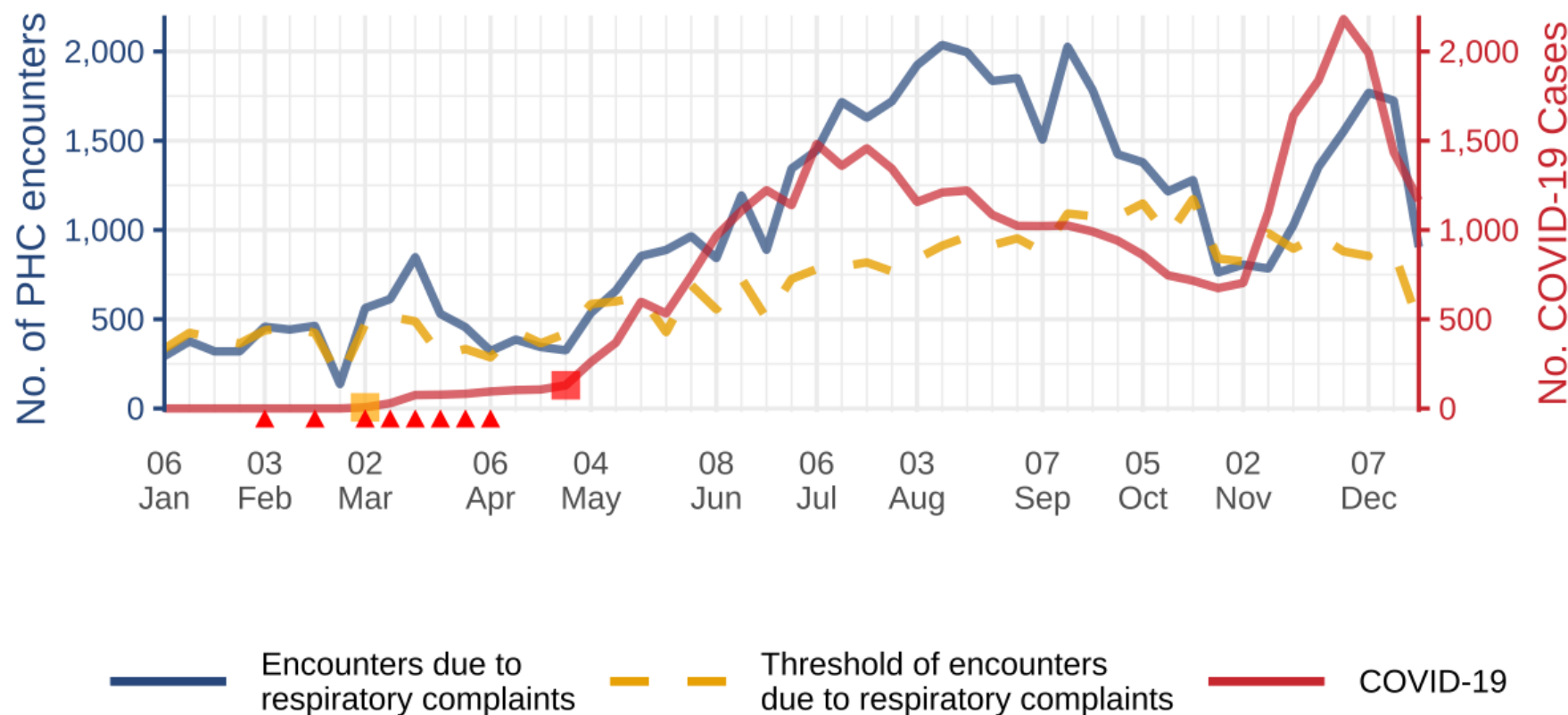
 Characterize the climatological and socio-economical **conditions that facilitate outbreak spreading**;

 **Model the outbreak dispersion** providing the basis of rational mitigation/control measures.



Ramos *et al.* Combining digital and molecular approaches using health and alternate data sources in a next-generation surveillance system for anticipating outbreaks of pandemic potential. Submitted.

Weekly syndromic surveillance for ARI encounters at PHC data and COVID-19 cases in Bahia State – Brazil, 2020

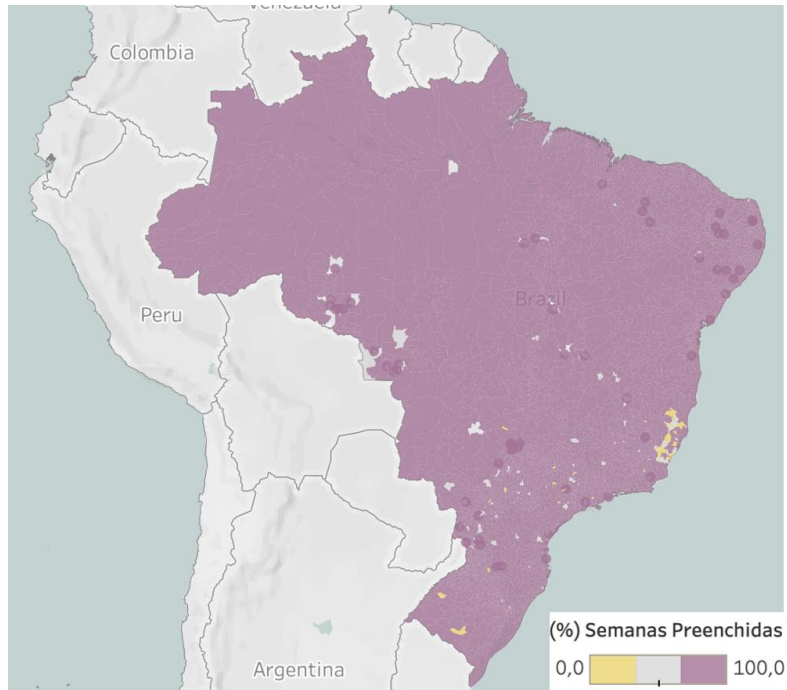


Cerqueira-Silva *et al.* Early detection of respiratory disease outbreaks through primary healthcare data. *Journal of Global Health*. In press.

Brazilian National PHC database quality indicators, 2023

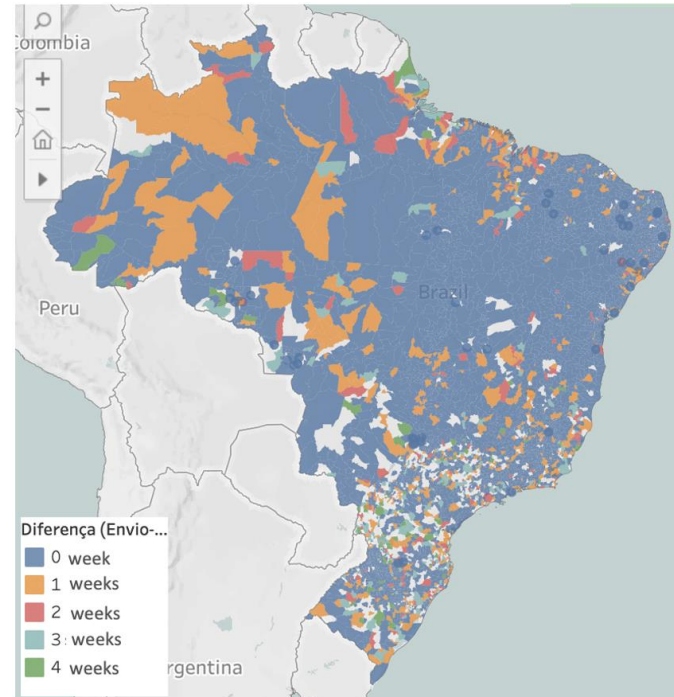
2017 - Jul 2023 - 1.300.200.810 coded

Completeness encounters **Timeliness**



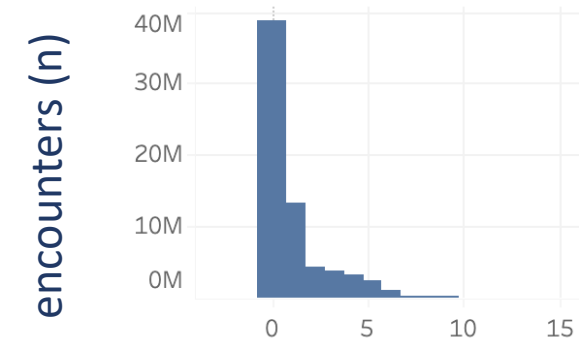
% of Epi Weeks Reported in the last 24 weeks

- All PHC facilities in the country
- Weekly reports on PHC encounters due to ILI causes



The time span between date of encounter – registry in the database

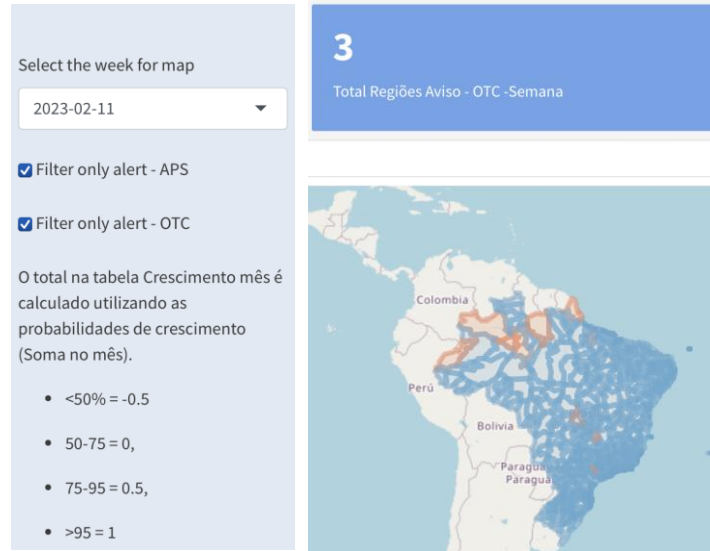
Total number of encounters per number of week lag between date of encounter and date of registry in the database, in the current week



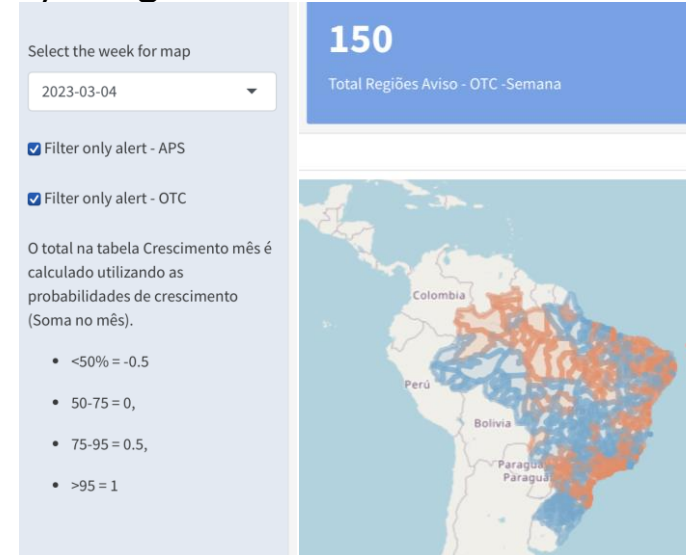
AESOP's alerts for all 5,570 Brazilian Municipalities, 2023

EARS C2 Alerts base on: a) PHC syndromic ARI detection; b) Drug sales

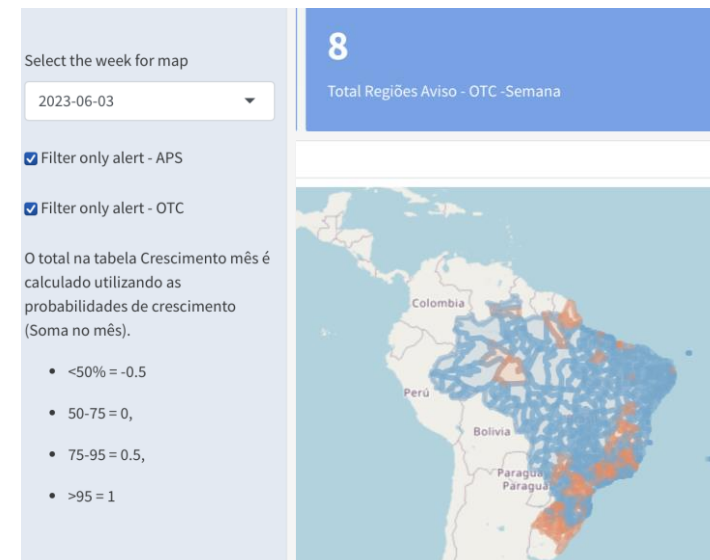
2023-02-11



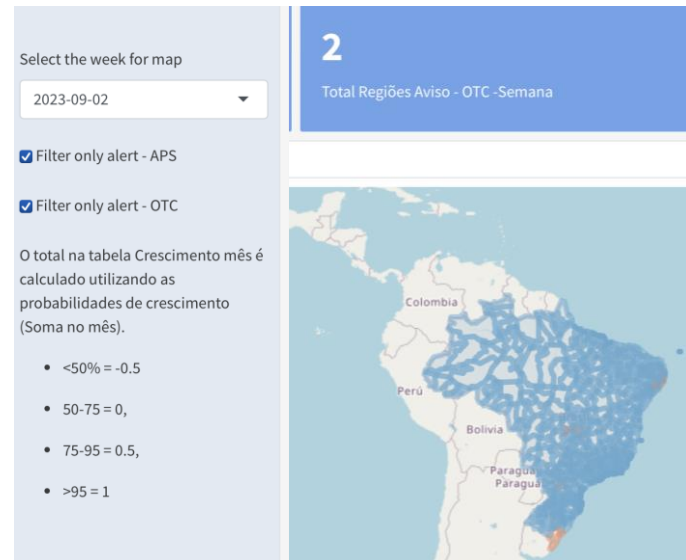
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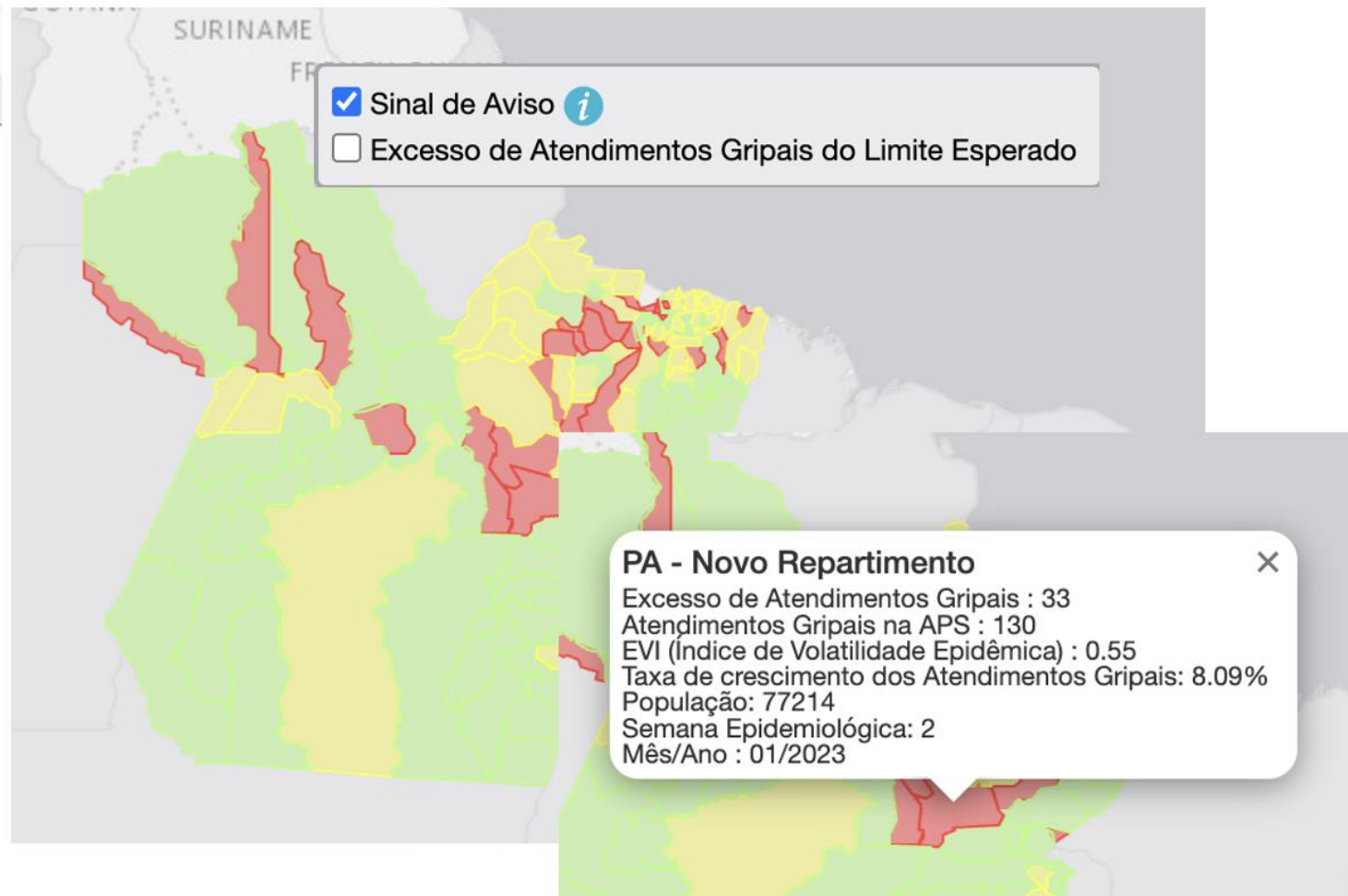
2023-06-03



2023-09-02



Oct 2023



How does AESOP contributes to ARS surveillance ?



-  Anticipates outbreaks at the PHC level pinpointing areas at risk;
-  Combined to molecular surveillance, the clinical signal may facilitate early identification of human cases infected by H5N1;
-  Complements, but does not replace, currently used surveillance strategies.



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