

Gallery of Actions - Example 3:

Title/Name:

Plague prevention and control in endemic areas of the Andean Region (Bolivia, Ecuador and Peru): An eco-systemic approach for strengthening early detection systems

Description/objectives:

Plague, in its three clinical forms, persists at a global level in 25 endemic countries of Africa, South East Asia, Eastern Europe and the Americas. Plague outbreaks represent a public health threat, which require an emergency response. In addition, pneumonic plague is one of the few diseases of compulsory notification under the International Health Regulations (IHR, 2005).

Plague being a vector-borne zoonotic disease, its occurrence is highly entangled with its vectors' and reservoirs' ecology, which in turn is being influenced by the effects of climatic, ecological and social changes. It is presumed that such modifications are contributing to the resurgence of the disease in endemic countries.

This pilot project focuses on the Andean Region since it is one of the sub-regions in the Americas where plague is still endemic with resurgence of cases. Plague outbreaks have been registered in Ecuador in 1998, 2004, and 2008, including 16 pneumonic case-fatalities; in Peru from 2009 to 2014, with 4 fatalities by pneumonic and septicemic plague and in Bolivia from 2011 to 2014, adding 3 bubonic plague deaths. In addition, the population of the Andean Region is the most at risk to ecological and climatic changes derived from the "El Niño" phenomenon, which have been associated with the reemergence of plague in the past (e.g. in 1992 and 1998).

The tools that will be developed through this pilot project will contribute to the strengthening of national and local health authorities in the involved countries, ultimately leading to the achievement of the goals stated in the 49th PAHO/WHO Directive Council resolution CD49/R19 (see [http://www2.paho.org/hq/dmdocuments/2009/CD49.R19%20\(Eng.\).pdf](http://www2.paho.org/hq/dmdocuments/2009/CD49.R19%20(Eng.).pdf)), referring to the elimination of plague as a public health threat through attaining "zero cases of mortality" in humans and "avoiding domiciliary outbreaks".

These tools could subsequently be expanded to other plague endemic countries around the world and may contribute to the early detection of other vector-borne diseases concurrent in the Andean Region, such as dengue, malaria and Chikungunya, as well as water-borne diseases such as cholera and acute diarrheal diseases.

The project aims at providing a systemic approach to a complex public health problem such as plague through a combination of skills which will translate into true trans-disciplinary work.

Overall objective

To strengthen the Andean health authorities for plague surveillance and control in endemic areas through the development and validation of innovative and replicable tools.

Key goals (KG)

- **KG1:** Reinforce nationally-integrated Plague plan development for surveillance, case management and infection control within the framework of IHR 2005 in Bolivia, Ecuador and Peru.
- **KG2:** Strengthen laboratory networks for early diagnostic and strain characterization.
- **KG3:** Foster interdisciplinary capacity building at institutional and individual levels for plague prevention through an eco-systemic characterization of plague's vectors, as well as its social and environmental determinants.
- **KG4:** Develop tools for mapping plague's disease-spread risk-related variables.

Plague, as well as other diseases associated with climatic and ecological changes present in the Andean Region, is highly entangled with ecosystems' variations. Their modification either through man-made agricultural productions (such as intensive sugar cane, rice, corn, quinoa or asparagus productions) or through ecological change in their dynamics through the El Niño phenomenon are contributing to their reemergence. Furthermore, demographic changes such as workers' migrations towards these man-made intensive agricultural productions are modifying local habits (such as maintaining "guinea pigs" – common in the Andean diet – within households - facilitating the interface between wild/synanthropic rodents and humans), hence affecting plague reservoirs' and vectors' behaviours. Finally, the presence in the Northern Peruvian Pacific coast of an international port/harbour, dominated by economic incentives (export of sugar, corn, asparagus and other commodities), opens the door for the globalisation of certain public health threats. Early detection through novel technologies and geospatial techniques is thus essential for prevention, alert and response. These tools will be replicated into other plague endemic countries and will serve for further expand research into other climate-associated diseases.

Where does your action take place?

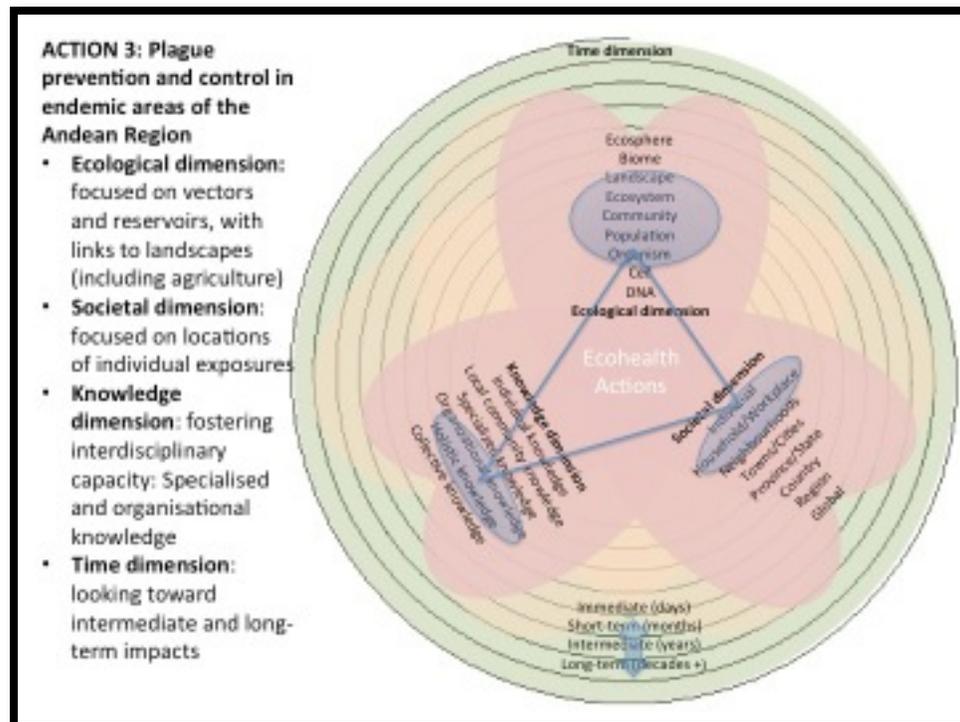
Andean Region, South America

Who is/should be engaged?

It encompasses systemic trans-disciplinary research spanning from social sciences to highly specialized health technologies and geographical mapping.

What are the opportunities for collaboration/coalition/scaling up of the activity?

- 1) Laboratory: Institut Pasteur de Paris and Madagascar and CDC Fort Collins (WHO Collaborating Centers)
- 2) National Institutes of Health of Bolivia (INLASA), Ecuador (INSP) and Peru (INS)



- 3) Ministries of Health of Bolivia, Ecuador and Peru.
- 4) Rodent control: Expertise from the Ministry of Health of Argentina
- 5) Geospatial mapping: CENEPRED-Peru
- 6) ECOSAD, CoPEH-LAC

Contact for follow up.

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