MINISTRY OF CITIZEN POWER FOR HEALTH

SENTINEL MONITORING IN NICARAGUA

Sentinel Surveillance:

In a system that allows us:

To learn the behavior of certain diseases that have been defined as a priority for public healthcare in Nicaragua (influenza type A and type B, pneumonia, meningitis, rotavirus and respiratory syncytial virus).

To monitor resistance to antibiotics or anti-malaria drugs used to treat diseases.

Sentinel surveillance contributes to:

Identify the beginning of the annual season for the diseases subject to surveillance, in

order to take actions that reduce the severity of the illness and death from these causes.

Determine the use of certain treatments and when to vaccinate the population at risk, before the seasonal onset of the disease begins.

In Nicaragua, between April and May we vaccinated against influenza and pneumonia to protect the population before the arrival of the period of greatest circulation of these diseases.

Also, through this system the appearance of new influenza subtypes, or strains of bacteria, are detected, which allows us to know the susceptibility to antibiotics and the effectiveness of vaccines.

In addition, Nicaragua contributes to the global surveillance of these diseases and their prevention,

contributing samples taken at the sentinel sites, to the CDC and to PAHO for the preparation of annual vaccines.

Sentinel Surveillance in the country:

1. Sentinel surveillance has been carried out in the country since 2004, beginning with the surveillance of resistance to first-line antimalarial drugs used in 10 Nicaraguan municipalities.

Siuna Primary Hospital, Las Minas.
Bonanza Primary Hospital, Las Minas.
Rosita Primary Hospital, Las Minas.
Puerto Cabezas Healthcare Center, Bilwi.
Prinzapolka Primary Hospital, Bilwi.

Waspam Primary Hospital, Bilwi.
Bluefields Healthcare Center, RACCS.
Hospital España, Chinandega.

Chichigalpa Primary Hospital, Chinandega.
Viejo Sur Healthcare Center, Chinandega.

1,300 samples are taken annually from these sites and to date no resistance to antimalarial drugs has been detected.

2. Later in 2010, sentinel surveillance of pneumonia and bacterial meningitis was added in 2 hospitals of the country.

This surveillance constitutes a source of information that allows data to be collected over long periods of time with consistent and comparable quality. It is called the Integrated Sentinel Surveillance for Bacterial Pneumonia and Viral Pneumonia (in children under 5 years of age).

The hospitals designated for this surveillance are:

German Nicaraguan Hospital, Managua.

Manuel de Jesús Rivera Hospital “La Mascota”, Managua.

3. In 2010, rotavirus surveillance was also started in children under 5 years of age, in the following hospitals:

Fernando Vélez Paiz, Managua.
Humberto Alvarado, Masaya.
César Amador Molina, Matagalpa.

Subsequently, in 2012, the country became part of the Global Rotavirus Surveillance Network and currently surveillance is carried out in three hospitals:

Manuel de Jesús Rivera Children's Hospital "La Mascota", Managua.
Fernando Vélez Paiz Hospital, Managua.
Humberto Alvarado Hospital, Masaya.

On average, 1,500 samples are collected annually.

Rotavirus surveillance allows us to:

Learn the behavior of diarrhea due to this cause.
Take measures to control this disease.
Evaluate the effectiveness of vaccination.
Monitor any adverse event attributable to the vaccine.

4. Then in 2011, due to the global avian influenza A (H1N5) alert, 12 healthcare units were added to the sentinel surveillance for influenza and acute respiratory infections caused by bacteria and other viruses.

Currently the sentinel hospitals for influenza and acute respiratory infections caused by bacteria and other viruses are as follows:

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Manuel de Jesús Rivera Hospital
"La Mascota", Managua.

German Nicaraguan Hospital, Managua.

Humberto Alvarado Hospital, Masaya.

San Juan de Dios Hospital, Estelí.

Condega Primary Hospital, Estelí.

Pedro Altamirano Hospital, La Trinidad, Estelí.

Villa Libertad Healthcare Center, Managua.

Sócrates Flores Healthcare Center, Managua

Nindirí Healthcare Center, Masaya.

Dávila Bolaños Healthcare Center, Masaya.

Tisma Healthcare Center, Masaya.

Leonel Rugama Healthcare Center, Estelí.

Annually, for surveillance of influenza, pneumonia and meningitis, an average of 12,500 samples are taken from patients between the ages of one month to 5 years and over 19 years, with a history of fever above 38^0C, over the last ten days, cough or sore throat or respiratory distress.

5. Finally, in 2019, entomovirological surveillance in mosquitoes was incorporated, to detect the

circulation of dengue serotype in mosquitoes, in entomological laboratories in 7 departments:

Madriz

Nueva Segovia

Chinandega

León

Managua

Rivas

Río San Juan

Every year, 350 samples are processed to detect the circulation of dengue virus serotype in mosquitoes.

This surveillance system has allowed local epidemiological and vector control measures to be taken to anticipate epidemic outbreaks and better protect the population.

6. Other surveillance for vector diseases is also carried out.

Since 2006, surveillance of vector-borne diseases such as Arbovirosis (Dengue, Zika and Chikungunya) and Leptospyrosis, Malaria, Leishmaniasis, and Chagas, among others, were carried out in an integrated manner.

The strategies used to monitor them included Clinical, Epidemiological and Laboratory Surveillance, through:

Daily notification of febrile syndromes.

Daily notification of suspected cases.

Online Laboratory Surveillance through the Alert System (Laboratory Surveillance System)

For the surveillance of arbovirosis, samples are taken in all the healthcare units of the country from 20% of febrile cases suspected of these diseases, which allows for:

Early identification of the sites with the highest risk of outbreaks due to these diseases.

Implement measures for early detection and timely case management.

7. Surveillance of water quality: These are actions to monitor the quality of the water supplied by the potable water systems, as well as to improve quality.

It is preventive, because it allows timely detection of risk factors and taking action before abnormalities in water quality or health effects occur.

It is corrective, because it allows us to identify the outbreaks of waterborne diseases in order to act upon them, restore water quality and control the spread of disease.

The Ministry of Health supervises the quality of the water through the sanitary inspection of the systems, the control

of the residual chlorine in the distribution network, the bacteriological quality in the networks and the physical-chemical quality in the supply sources.

For the measurement of residual chlorine, in 2019, 1,510 sampling points were established nationwide, where 162,943 residual chlorine determinations and 16,994 bacteriological analyzes were carried out, in order to guarantee that the water supplied to the population does not have microbes that can cause harm to human health.

Also, an average of 1,704 physical chemical analyzes were carried out to determine the presence of lead, mercury, arsenic and other heavy metals, as well as the degree of transparency and turbidity of the water, according to the parameters established in the Surveillance Standard of Water Quality (CAPRE).

Since 2019, work has been carried out at the national level, strengthening the intersectoral and multisector alliance for the fulfillment of Sustainable Development Goal (SDG6): “Clean water and sanitation”.