

SARINet
Pan-American Health Organization - PAHO

”Notas del campo sobre H1N2v”

Brazilian experience

Whole genome characterization of a novel human Influenza
A (H1N2) variant virus in Southern Brazilian region

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May, 2017

Background

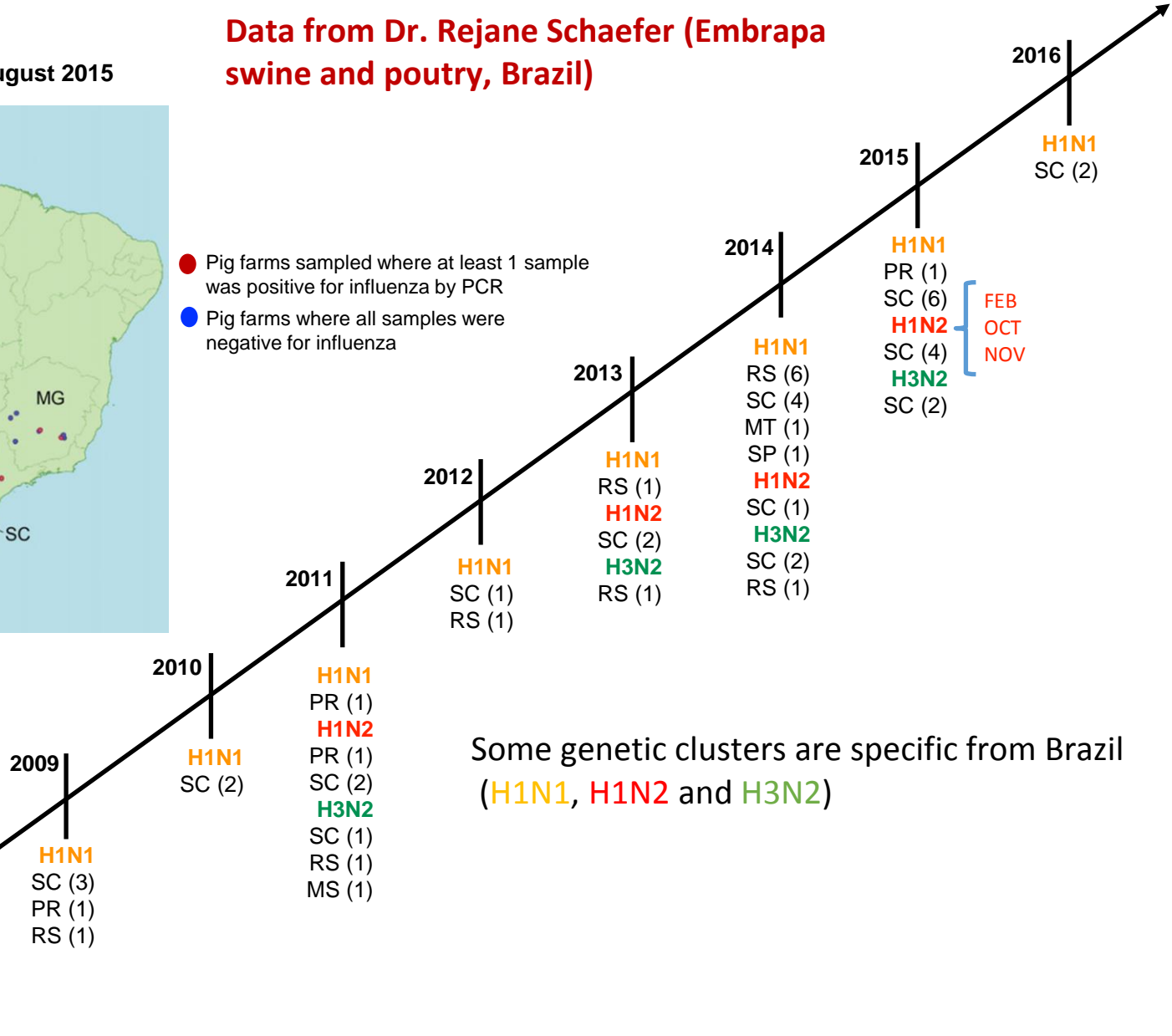
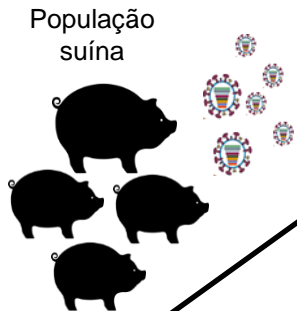
Influenza swine surveillance project

Data from Dr. Rejane Schaefer (Embrapa swine and poultry, Brazil)

Nelson et al, EID, Vol. 21, No. 8, August 2015



- Pig farms sampled where at least 1 sample was positive for influenza by PCR
- Pig farms where all samples were negative for influenza




Some genetic clusters are specific from Brazil (H1N1, H1N2 and H3N2)

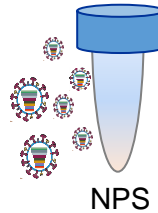
Case description of the Influenza H1N2v



Medical Form

Patient: XXX
City: Castro, Parana, Brazil 
Gender: Female
Age: 16 years-old
Onset symptoms: 23rd Nov, 2015
Symptoms: fever, cough, sore throat, chest pain and myalgia
(ILI case)

Risk factors: YES NO
Vaccination: YES NO
Antiviral: YES NO



Sample collected inside the Influenza like illness (ILI) sentinel program of MoH

Collection sample: 27 Nov, 2015

LACEN-PR: Dec, 2015

Real time RT-PCR for Influenza A and B
(CDC protocol)

Result:

Inf A: **Positive (Ct: 31)**

Inf B: **Negative**

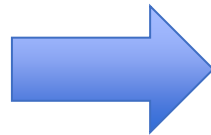
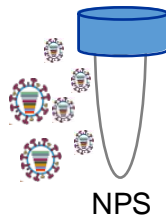
Pdm Inf A: **Positive (Ct: 25)**

H1pdm: **Negative**

H3: **Negative**

RNP: **Positive (Ct: 30)**

Influenza A
Subtype: not detected



NIC, FIOCRUZ - RJ

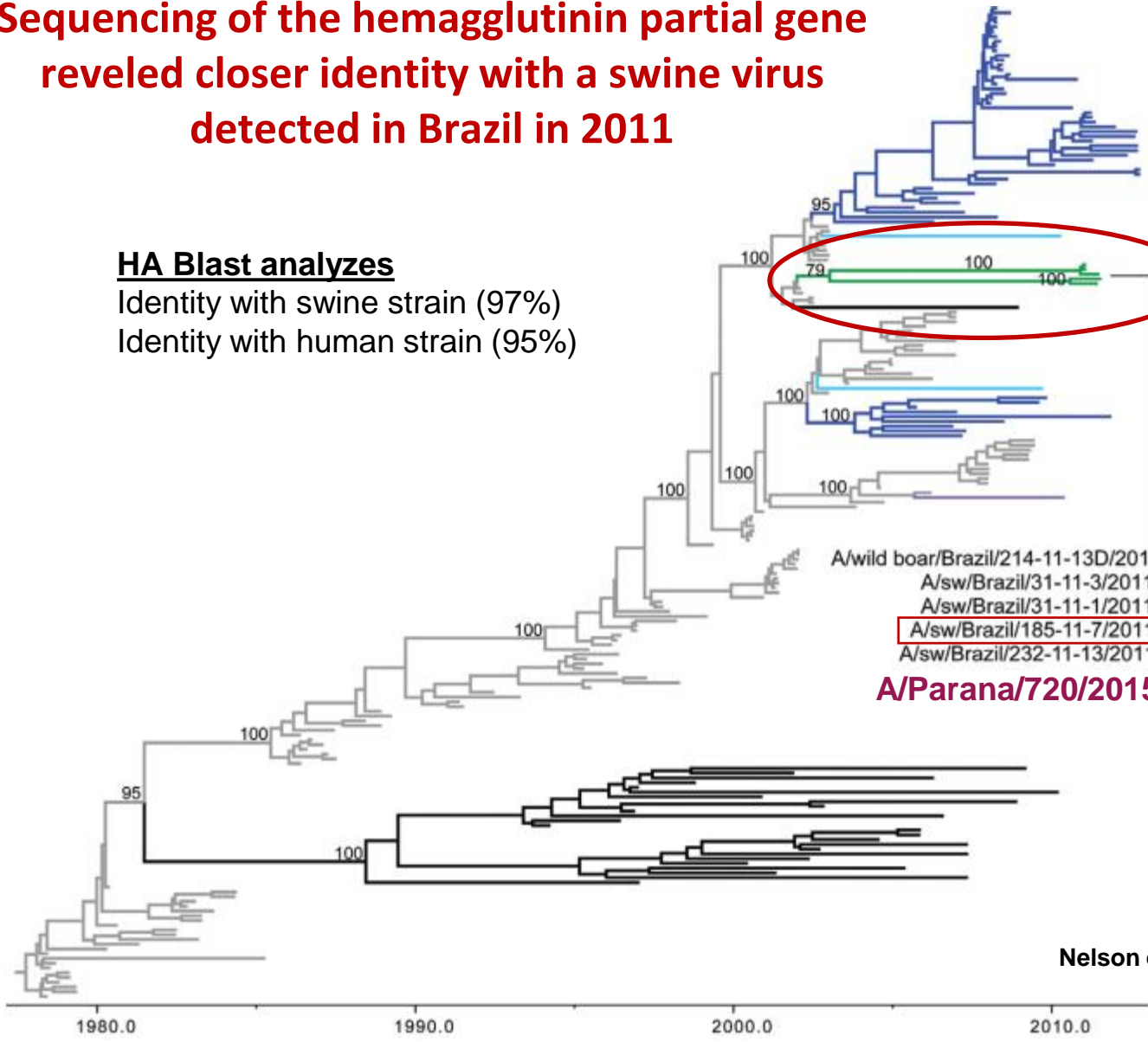
- ✓ Virus Isolation
- ✓ Antigenic analyzes
- ✓ Genetic sequencing
- ✓ Phylogenetic analysis

Sequencing of the hemagglutinin partial gene revealed closer identity with a swine virus detected in Brazil in 2011

- H1 human seasonal
- Argentina swine
- Brazil swine
- USA swine
- Vietnam swine
- Europe swine

HA Blast analyzes

Identity with swine strain (97%)
Identity with human strain (95%)



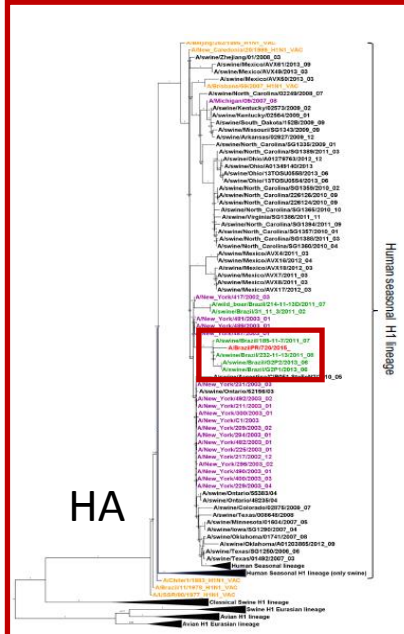
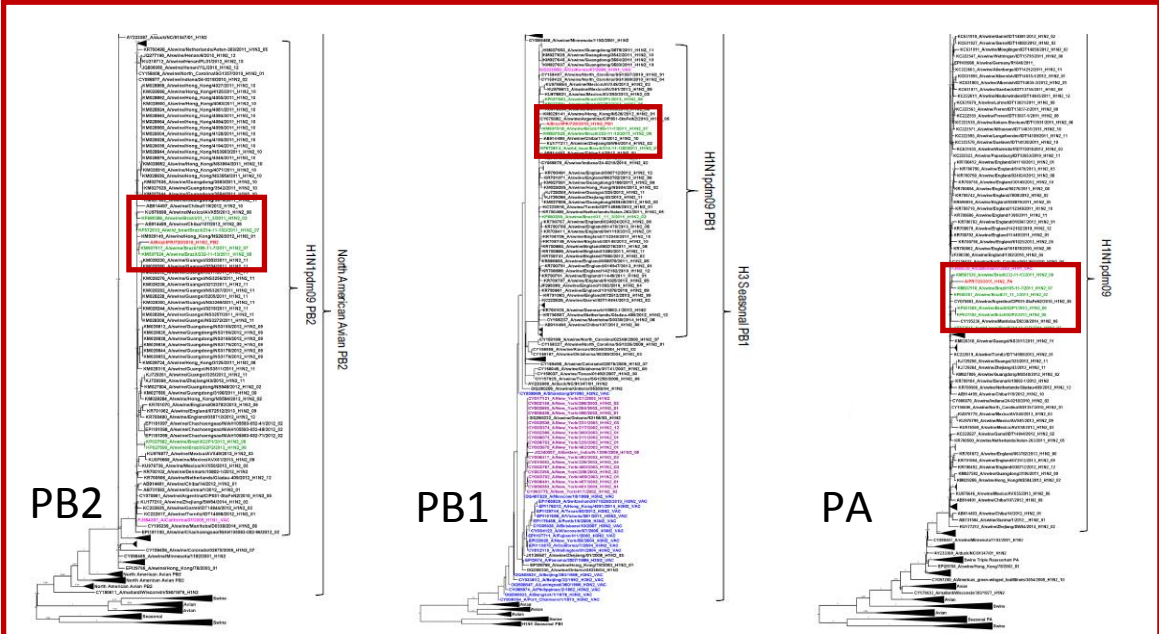
Specific Brazilian swine cluster

A/wild boar/Brazil/214-11-13D/2011/H1N2
A/sw/Brazil/31-11-3/2011/H1N2
A/sw/Brazil/31-11-1/2011/H1N2
A/sw/Brazil/185-11-7/2011/H1N2
A/sw/Brazil/232-11-13/2011/H1N2

A/Parana/720/2015 H1N2v

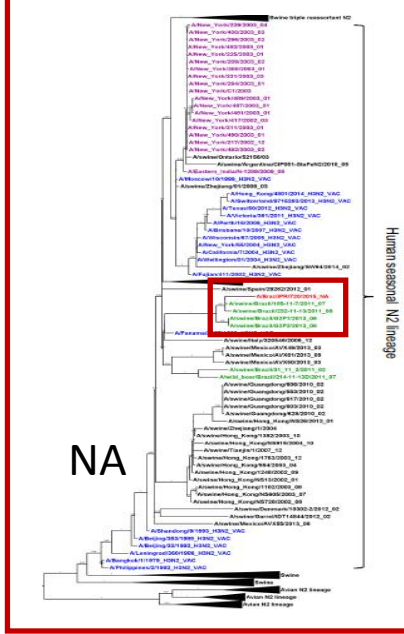
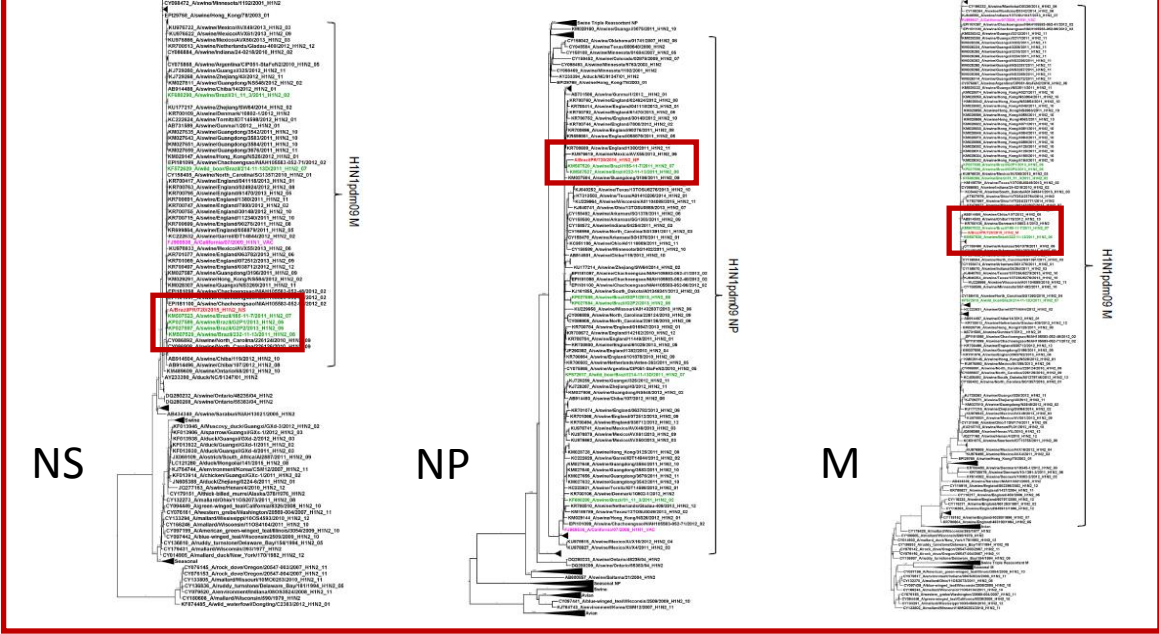
Phylogenetic relationship of Influenza A/Parana/720/2015 (H1N2)v and other strains

- H3N2 vaccine strains
- H1N1 vaccine strains
- H1N1pdm09 vaccine strain
- Swine and avian H1N2 strains
- Brazil swine H1N2 cases
- Brazil human H1N2v case
- Human H1N2 cases



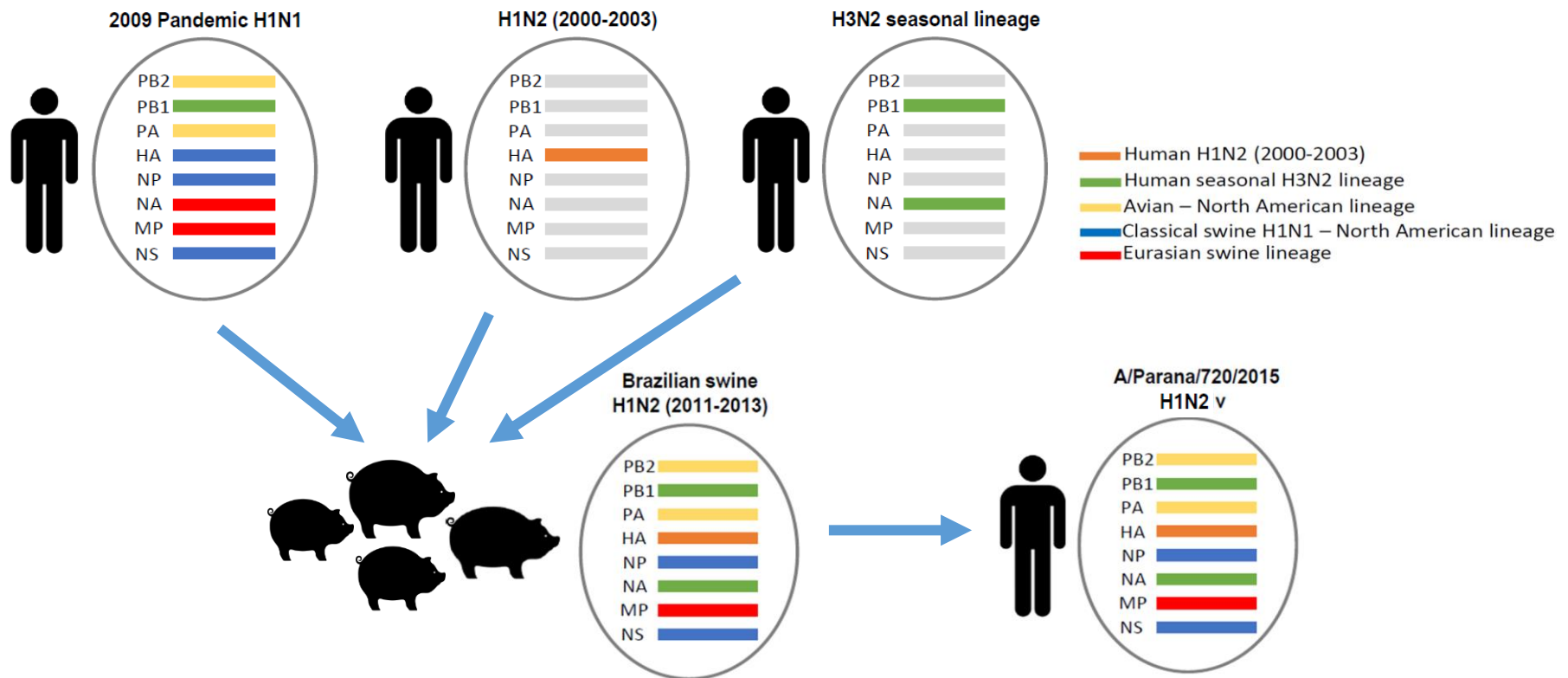
**H1N2
2002-2003**

H1N1pdm09 (2009-2010)



**H3N2
1998**

- The H1N2v detected in Castro had a genomic configuration not previously reported in humans.
- It had a swine genetic origin and possibly it was introduced in human population by the direct contact of the patient with pigs.
- This virus was a product of successive reassortant events that may occurred in Brazilian swine population through the years.



***Our results were confirmed by WHOCC, Atlanta

Case investigation

How was infected this patient?



Was this H1N2v the index case?



LOCAL EPIDEMIOLOGICAL INVESTIGATION

She had been moved to the rural area three month before to get sick. She had been working in a pig farm (\approx 600 pigs) and she feeding pigs. None closer contact reported ILI.

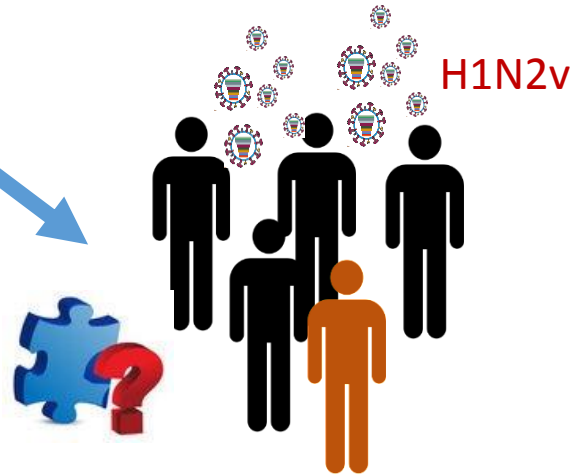
Would this virus be circulating in swine population from Castro city?

ANIMAL SURVEILLANCE (EMBRAPA)

They did not have sampling this area

LOCAL EPIDEMIOLOGICAL INVESTIGATION

People reported that sometimes the pigs get sick

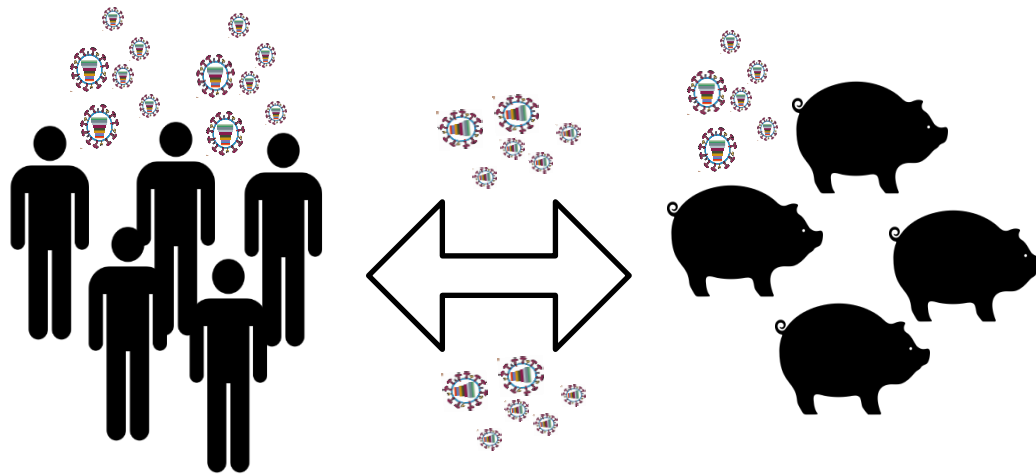


Would this virus be have circulated in Castro population?

LABORATORIAL INVESTIGATION (OTHER POSSIBLE CASES)

We recovered samples from patients with ILI in Castro from June 2015 to March 2016. real time RT-PCR for Influenza and the whole genome sequencing (All A/H1N1pdm09)

We need to **improve the integration** and **fortify the human and animal influenza surveillance network** in Brazil, especially on geographical areas where influenza A viruses subtypes co-circulate and human-animal contact is frequent.



"Two way street"

Acknowledgments

NIC, FIOCRUZ team

Marilda Siqueira
David Brown
Paola Resende
Fernando Motta
Priscila Born
Braulia Caetano
Aline Matos
Milene Mirada
Cristiana Garcia

Brazilian MoH

Sérgio Nishioka
Walquiria Almeida
Influenza team

Surveillance team of Parana State

LACEN Parana team

Irina Riediger
Maria do Carmo Debur
Alix Mazzetto
Mayra Presibella

CDC Influenza Division - WHOCC

Stephen Lindstrom
Toddy Davis
LaShondra Berman

PAHO Influenza team

Rakhee Palekar
Juliana Leite

Embrapa swine and poultry team

Rejane Schaefer

Thank you!
Muchas Gracias!
Obrigada!

Financial support:



CGLab/MoH