

Disaster Preparedness & Global Public Health Threats in the 21st.

*Disasters and public health: Why we are always
behind schedule. Key messages*

Eduardo Gotuzzo, MD, FACP, FIDSA FESCMID
Institute of Tropical Medicine, Alexander von
Humboldt, Peru
Peruvian University Cayetano Heredia

8th. International Conference on Global Health
FIU Robert Stempel College of Public Health & Social Work
May 24, 2018, Miami Florida

DISASTERS. WE ARRIVE LATE??

- LEARN FROM EACH OF THEM TO GET PREPARED
- DIFFERENT WAYS :
 1. EARTHQUAKES
 - 2.-TSUNAMIS
 - 3.-FLOODING AND HURRICANES
 - 4.-BELIC CONFLICTS
 5. CLIMATE CHANGES WITH EPIDEMICS



The overflows of the Huaycoloro and Rimac rivers have generated alarm in the city.



Evangelina Chamorro Diaz (32) saved herself from dying after being dragged by the hurricane that fell in a sector of Punta Hermosa, at kilometer 45 of the old South Panamericana.



Indeci indicated that the climatic phenomenon has affected more than 546,000 people and destroyed 6,500 homes, 27 schools and 1 health center.









Alabama

Florida

Mississippi

Louisiana

Hurricane
KATRINA
MISSISSIPPI GULF COAST





El mayor huracán en tocar tierra en
EE.UU

Katrina

1.836
muertos,

mitad de ellos ancianos.

US\$ 151.000 millones en daños, el
más costoso de la historia.

705 personas desaparecidas.

6 metros, altura del oleaje en costas
del golfo de México.

1 millón de casas dañadas.

Fuentes: NOAA/ National Research Council

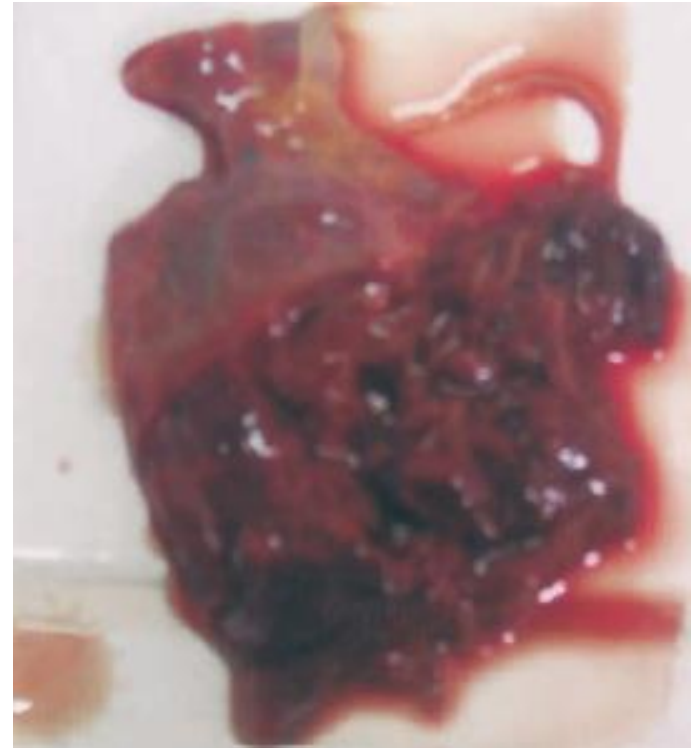
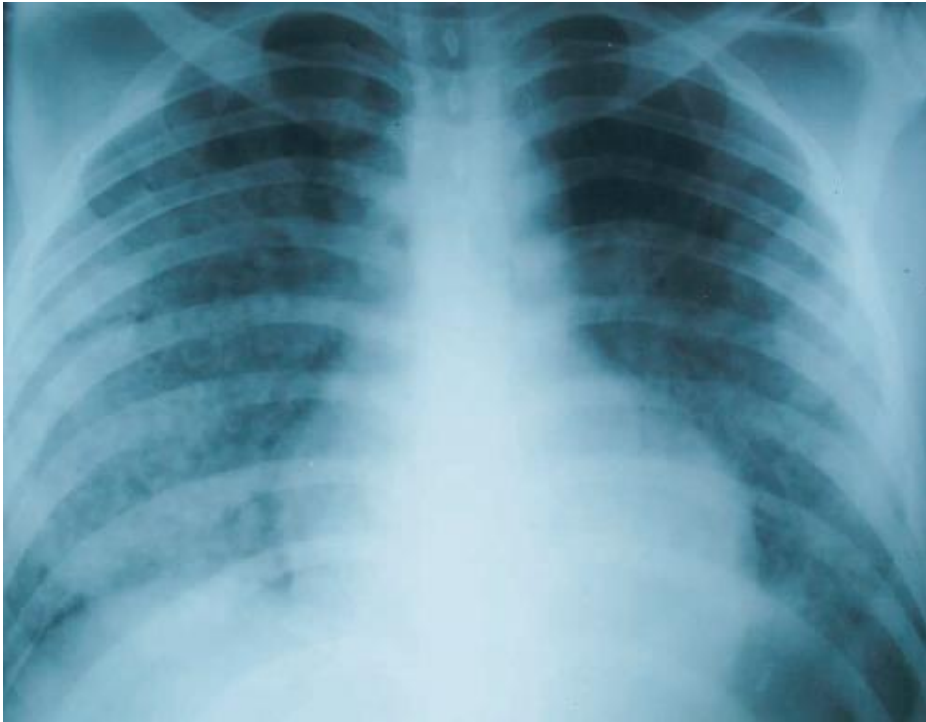




November 10, 1995 / 44(44);841-843

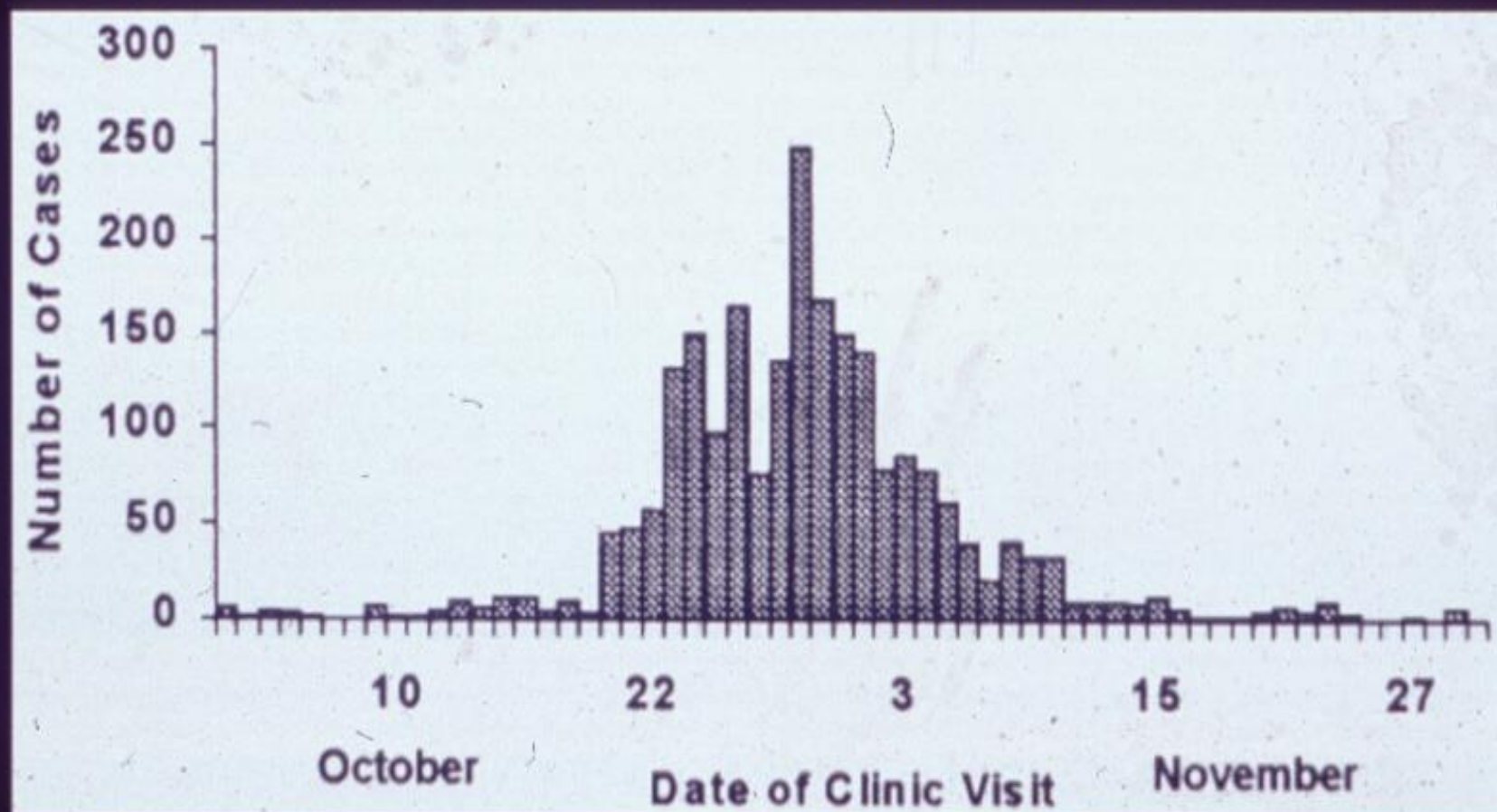
Outbreak of Acute Febrile Illness and Pulmonary Hemorrhage -- Nicaragua, 1995

PULMONARY INVOLVEMENT



- ranges from 20-70%; cough, dyspnea, hemoptysis, ARDS
- severity does not correlate with jaundice; 30% do not have jaundice
- patchy alveolar infiltrates; intra-alveolar or interstitial hemorrhage

Epidemic Curve of Leptospirosis Epidemic, Nicaraguan, 1995



COMMON PROBLEMS

1. LEPTOSPIROSIS
2. SKIN AND RESPIRATORY INFECTIONS
3. CHOLERA?
4. BITES OF ARTHROPODS, SPIDERS, SNAKES, ETC.
5. THERE IS NO NEED TO VACCINATE FOR TYPHOID FEVER OR INFLUENZA
6. A MEDIUM TERM, WHAT PROBLEMS ARE WE EXPECTING?

DISASTERS. WE ARRIVE LATE??

- LEARN FROM EACH OF THEM TO GET PREPARED
- DIFFERENT WAYS :
 1. EARTHQUAKES
 - 2.-TSUNAMIS
 - 3.-FLOODING AND HURRICANES
 - 4.-BELIC CONFLICTS
 5. CLIMATE CHANGES WITH EPIDEMICS

EARTHQUAKES

- WE CAN NOT EVEN PREDICT OR DETECT THEM EARLY.
- WE MUST MINIMIZE THE IMPACT OF THAT CATASTROPHE











Deaths and Yellow Fever Vaccine

1996-2001 Lancet, 14 July 2001

7 deaths



7 cases, 6 deaths

Vaccinated with 17D



150 millions

- Brasil (2) 5y 22yo, organs > CNS
- United States (3/4) >62 yo, clinical picture ≈, in only one antigenic evidence of the vaccine virus was found, CNS>organs
- Australia (1) 56yo, vaccine virus isolated other 20 vaccinees healthy

Investigation of Serious Adverse Events

- For yellow fever vaccine (Bio-Manguinhos, Brazil, March 21, 2008-PAHO)
- Vaccination campaign. September 23-October 6, 2007 in Ica Perú

Persons vaccinated	Lote	Deaths
42742	05OVFA121Z	4
20432	05OVFA123Z	None

The cases clinical evolution similar to that It started at 24 hs.

- Fever
- Diarrhea
- General malaise
- Multiorganic failure

Investigation of Serious Adverse Events

- For yellow fever vaccine (Bio-Manguinhos, Brazil, March 21, 2008-PAHO)

The 3 cases:

- High viremia
- Large amount of virus in tissues
- Strain virus vaccine
- Very high title of Abs

Autopsies were similar in the findings.

The vaccines were adequate in dose, feasibility and validity. It has not been possible to explain these unusual responses with viscerotherapy syndrome



IMULACRO POR SISMO A NIVEL NACIONAL



f /Indeci
t @indeciperu
www.Indeci.gob.pe



INDECI
INSTITUTO NACIONAL DE DEFENSA CIVIL











DISASTERS. WE ARRIVE LATE??

- LEARN FROM EACH OF THEM TO GET PREPARED
- DIFFERENT WAYS :
 1. EARTHQUAKES
 - 2.-TSUNAMIS
 - 3.-FLOODING AND HURRICANES
 - 4.-BELIC CONFLICTS
 5. CLIMATE CHANGES WITH EPIDEMICS

Plague cities



Venice - plague

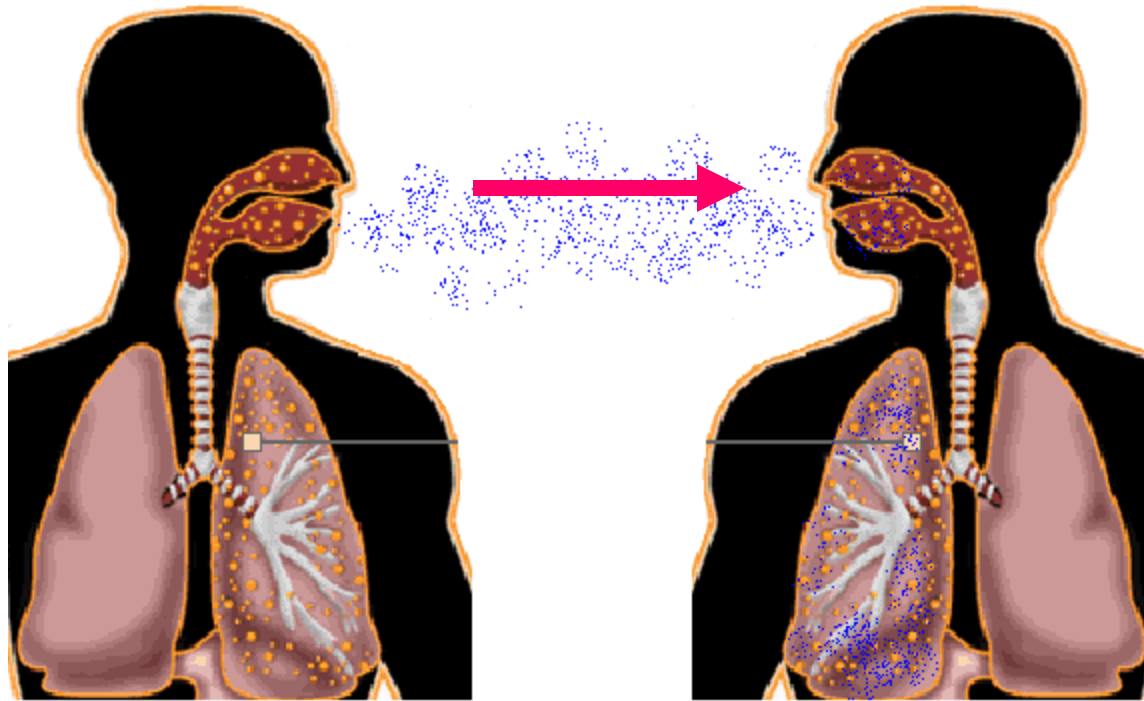


Plague in Peru

It occurs mainly in Cajamarca, Piura and Lambayeque

1975-1980	10 cases
1981	27
1982	11
1983	17
→ 1984	413
→ 1985	44
1986-1990	0-30/year
1991	occasionally
1992	120
→ 1993	611
1994	420
1995	97
1996-1998	<20

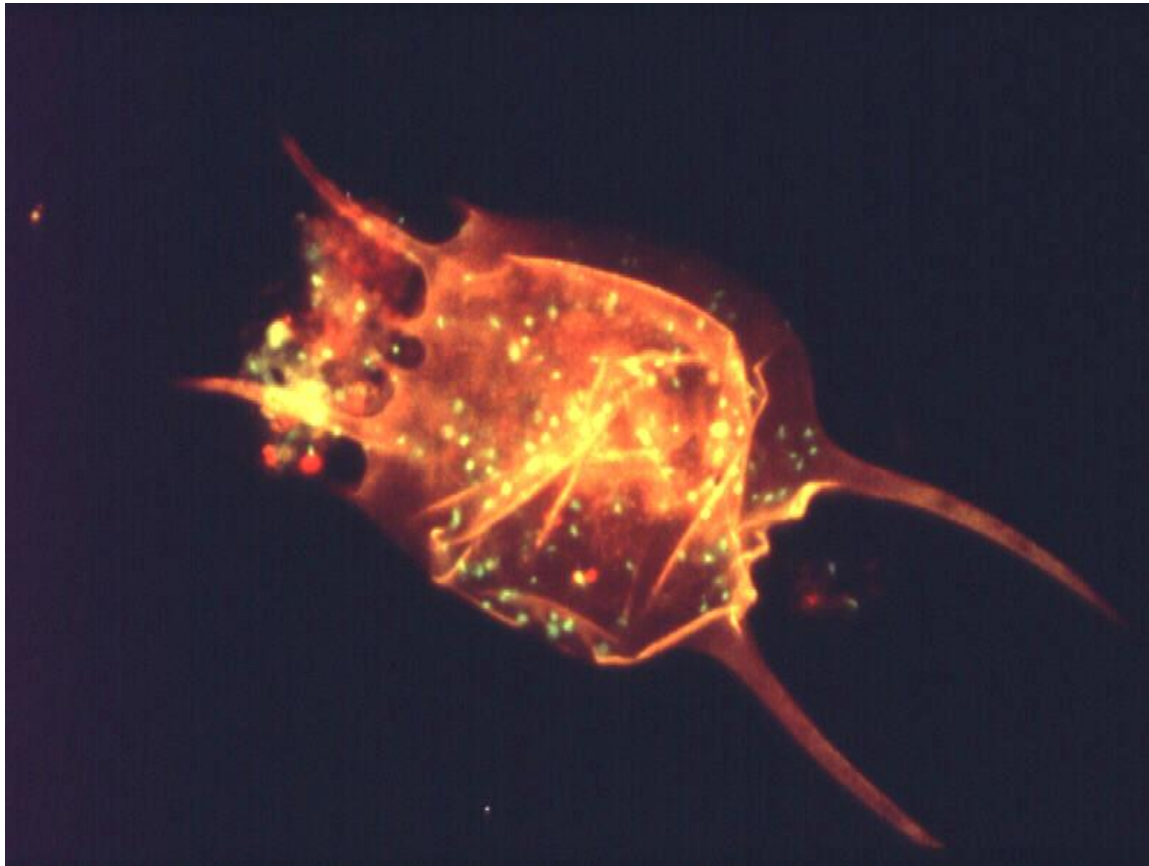
Transmission Person - Person

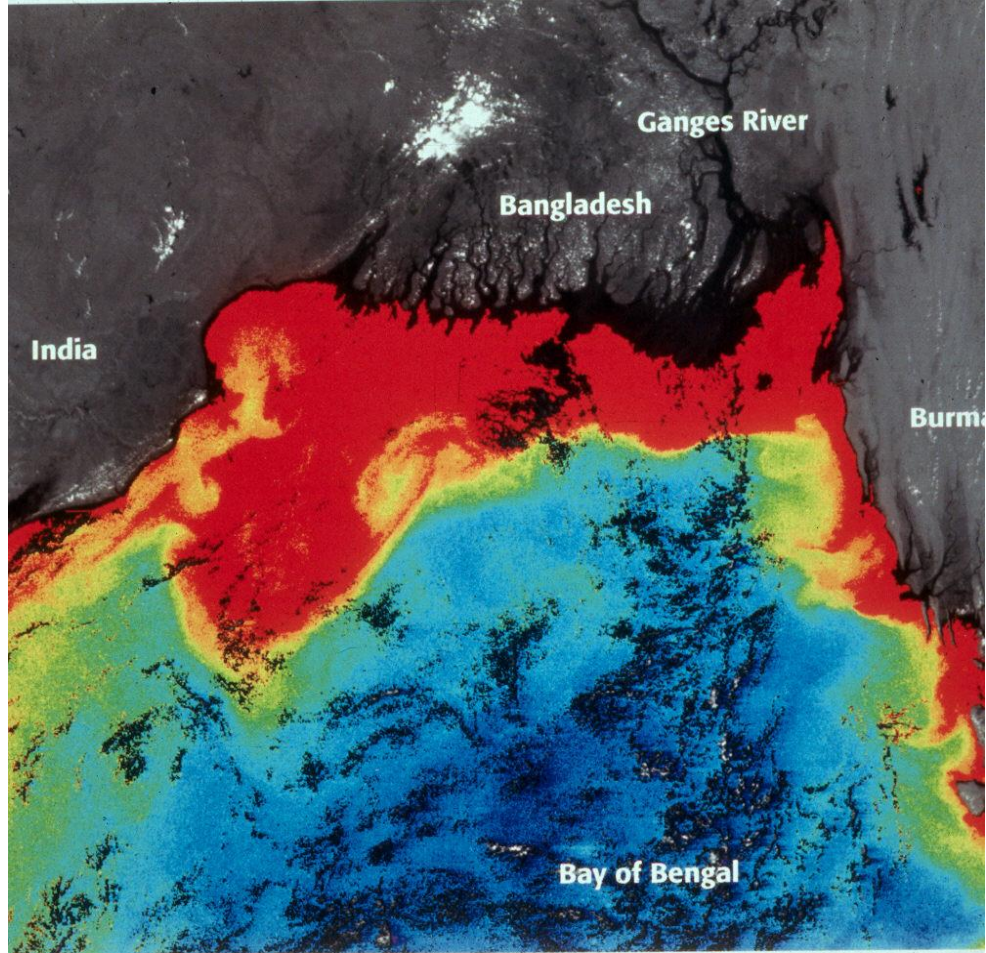


Pneumonic plague
Secondary

Pneumonic plague
Primary

Vibrio cholerae ON THE SURFACE OF A COPEPODE





Phytoplankton Bloom

Bay of Bengal • October 10, 1982

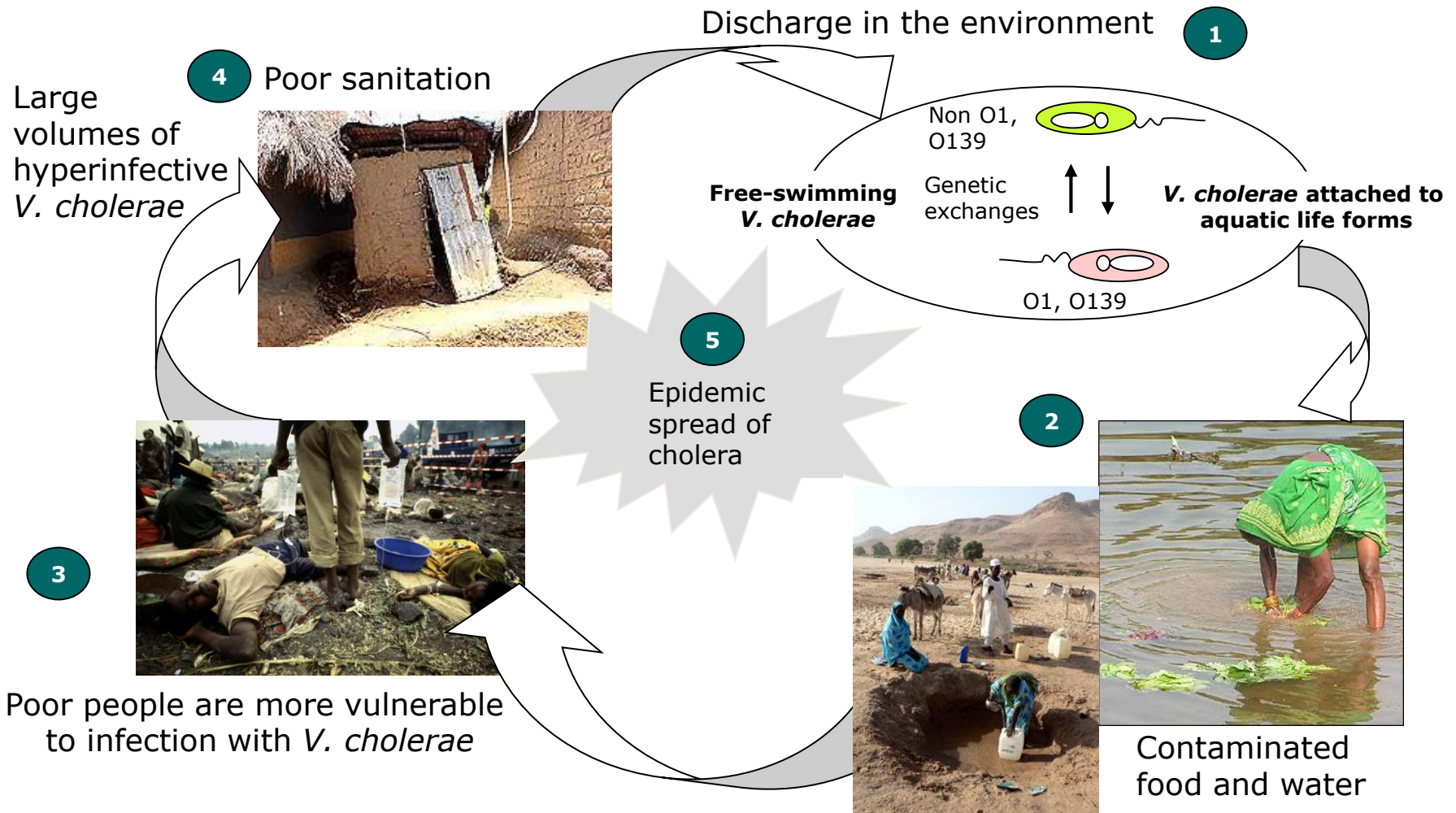
Coastal Zone Color Scanner (CZCS) 1km data



Data and image processing by the Goddard DAAC Ocean Color Team.
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/OB_main.html
Email: simmon@daac.gsfc.nasa.gov

Polluted water is the most common source of cholera transmission

Life cycle of *V. cholerae*



Contact with freshly shed *V. cholerae* is much more likely to cause disease



Transmission via contaminated water (higher ID_{50}) accounts for slower dynamics

Transmission through contact with fresh feces or vomit (lower ID_{50}) causes explosive epidemics

Climatic change impact and the future settings with Arbovirus

- Short incubation Period
- Increased vector spreading life
- Increased geographic location (Urbanizing tropical areas)
- Expansion of anthropophilic vectors as *Aedes albopictus*
- Arbovirus adaptation to alternative vectors
- The rains make a favorable environment for the larvae development
- Commercial trips take mosquitoes to new places (WNV)

Reinfestation of *Aedes aegypti*

1930s



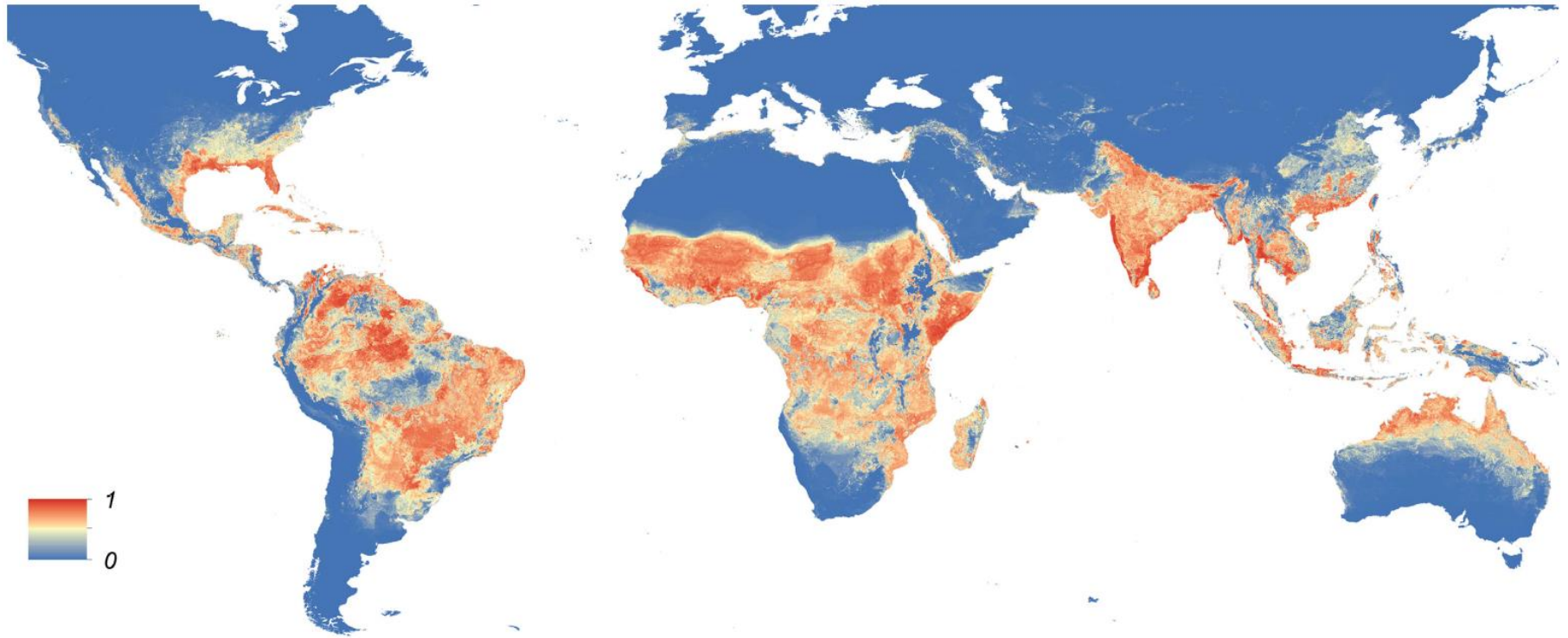
1970



2002



Global Map of the Predicted Distribution of *Aedes aegypti*



Pandemics

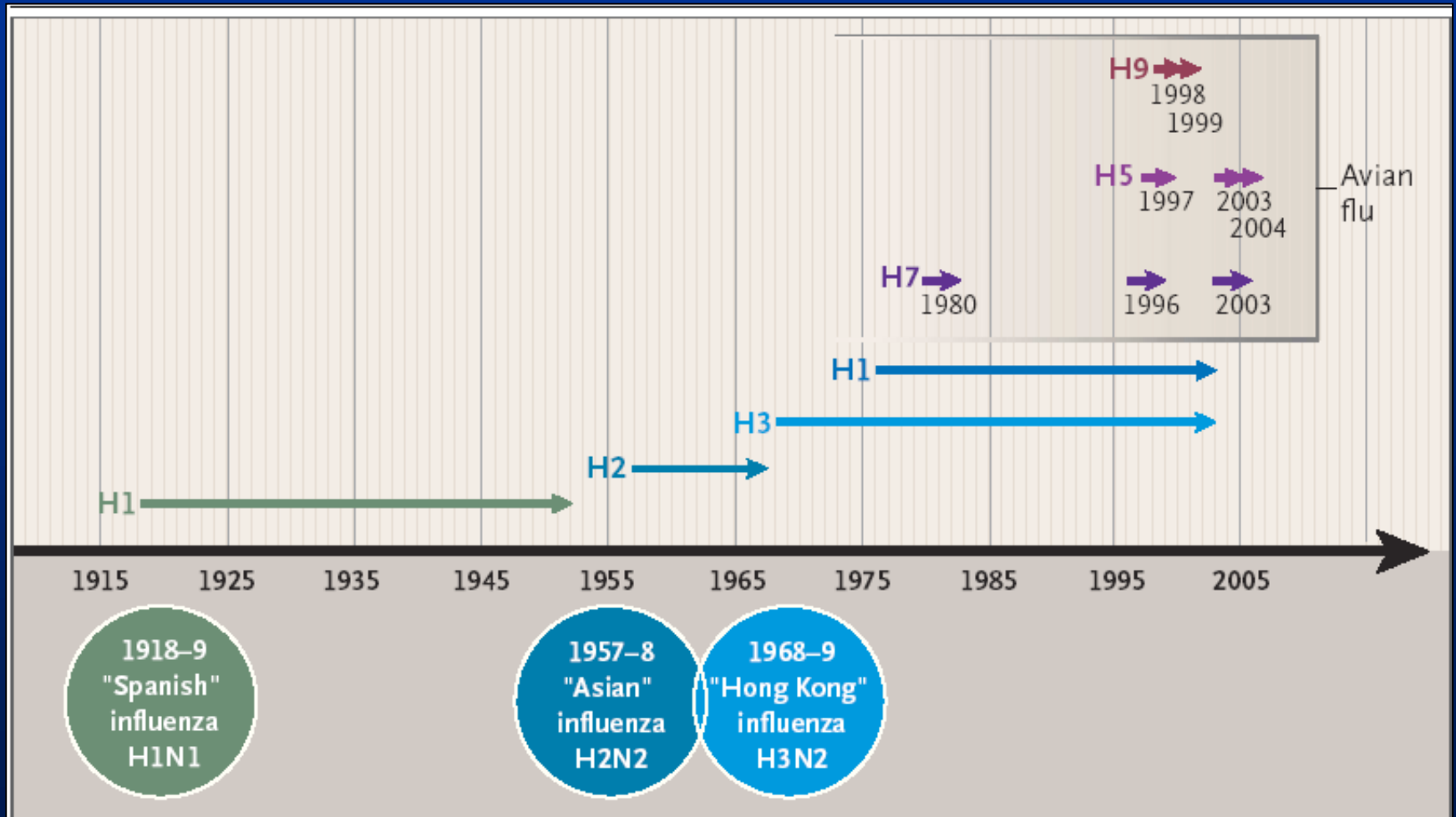


Figure 5. Emergence of New Influenza A Virus Subtypes in Humans.

Estimates for epidemics

Number of episodes due to illness, use of health resources and death associated with moderate and severe pandemic influenza *

Characteristics	Moderate (1958/68)	Severe (1918)
Disease	90 millions (30%)	90 millions (30%)
Outpatients	45 millions (50%)	45 millions (50%)
Hospitalized	865,000	9,900,000
In ICU	128,750	1,485,000
Mechanic ventilation	64,875	742,500
Deaths	209,000	1,903,000

*Estimates based on extrapolation of data from the pandemics that occurred in the USA. It is striking that these estimates do not include the potential impact of the interventions since these data are not available pandemics of the 20th century

Preparededeness



DIRECTIVA N° 057 - MINSAL/OGE-V.01

"VIGILANCIA CENTINELA DE LA INFLUENZA Y OTROS VIRUS RESPIRATORIOS"

En vista del incremento sostenido de infecciones r diferentes cepas de influenza a nivel mundial, coordinación con la Dirección General de Salud de l han elaborado la presente Directiva, con el propós influenza y otros virus respiratorios.

I. OBJETIVOS

OBJETIVO GENERAL


- Reforzar la vigilancia epidemiológica de la influen

OBJETIVOS ESPECÍFICOS

- Detectar brotes de síndrome gripal por influenza
- Identificar nuevas cepas de virus influenza para c
- Optimizar la vigilancia de las infecciones respirat

II. BASE LEGAL

- Constitución Política del Perú
- Ley N° 27867 - Ley General de Salud
- Ley N° 27867 - Ley del Ministerio de Salud
- Decreto Supremo N° 013-2002-SA, que aprobó Salud
- Reglamento Sanitario Internacional



Oficina General de Epidemiología
Dirección General de Salud de las Personas
Instituto Nacional de Salud

VIGILANCIA DE FORMAS GRAVES DE SÍNDROME FEBRIL RESPIRATORIO AGUDO


NORMA TECNICA N° 017 - MINSAL / OGE / DGSP / INS

En vista del incremento sostenido de infecciones respiratorias en nuestro país, habiéndose notificado un brote de SARS en China y ante la presencia del brote en humanos de influenza aviar A/H5N1 en Vietnam y Tailandia, caracterizado por cuadro clínico grave, acompañado de alta letalidad, así como por la propagación de nuevos serotipos de influenza A/H3N2 y de influenza B en los países de Europa y América, aunado al constante incremento de los viajes internacionales, lo cual favorece la diseminación del virus influenza y del coronavirus del SARS, la Oficina General de Epidemiología, la Dirección General de Salud de las Personas y el Instituto Nacional de Salud, emiten la presente Norma Técnica apuntando a fortalecer la vigilancia de formas graves de síndrome febril respiratorio agudo.

I. OBJETIVOS


OBJETIVO GENERAL

- Fortalecer la vigilancia de formas graves de síndrome febril respiratorio agudo.



MINISTERIO DE SALUD

PLAN NACIONAL DE PREPARACIÓN Y RESPUESTA FRENTE A UNA POTENCIAL PANDEMIA DE INFLUENZA

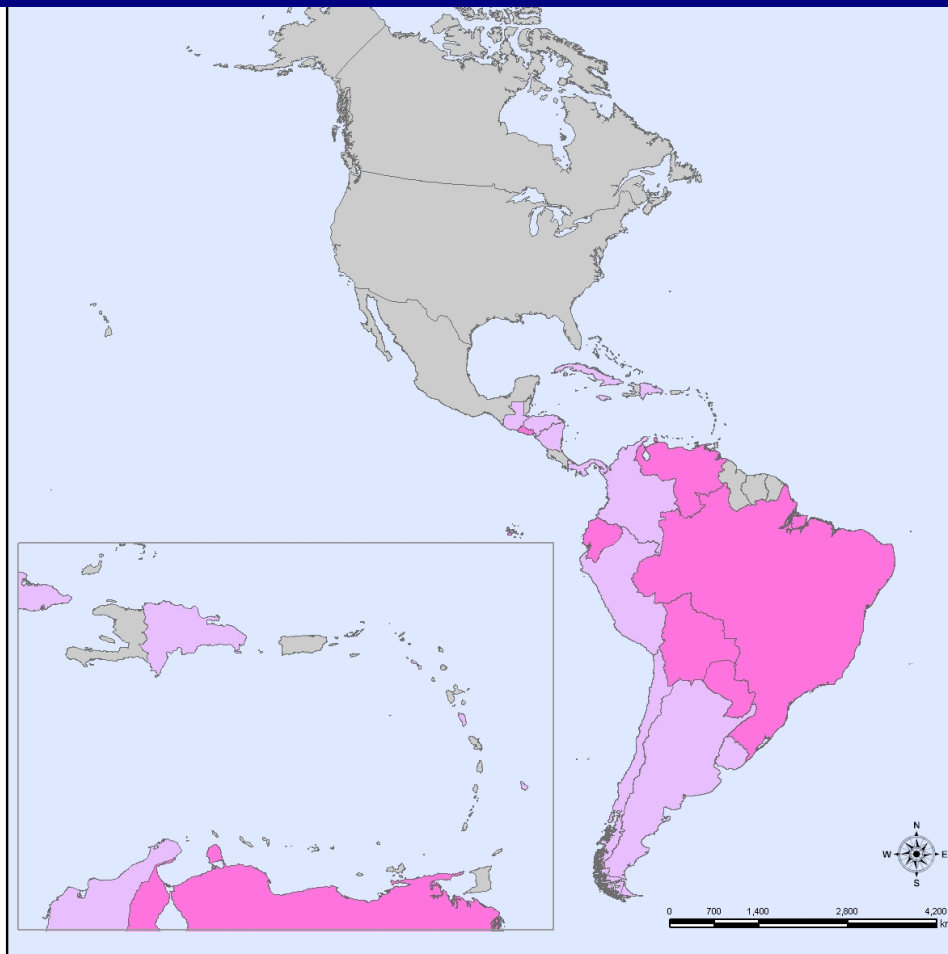


June 2004: Plans for country sentinel vigilance of severe acute respiratory infections and Influenza



National Plan approved by the Ministry of Health Nov. 2005

Pandemic H1N1 2009. Impact of Acute Respiratory Disease on Health Care Services. Americas Region EW 35



Bolivia,
Brazil,
Ecuador, El
Salvador,
Paraguay,
and
Venezuela:
moderate
impact

Source: PAHO
Weekly
Epidemiological
Bulletin



Map Production:
HSD/CD
September 10th, 2009

Cartographic projection:
Lambert Equal Area Azimuthal

Source: Ministries of Health of the countries
Consolidated by PAHO/WHO
Created by PAHO/WHO

*EW 35=Epidemiological Week from August 30 to September 5, 2009

LA ON
17

La gripe anda suelta

EMPLEADA DEL HOGAR QUE ATENDÍA A ESCOLAR ENFERMA CAYÓ CON EL MAL



Ya son 18 casos

Trabajadora de 25 años se fue a posta en Remolina. Dicen que había sido despedida por enfermarse. Está en aislamiento. En Pando, profesora de rido se encuentra en observación. En Arequipa se confirmó anoche el mal de estudiante que vino de Estados Unidos. (PÁG. 3)

CURSOS DE EXTENSIÓN

Call Center: 424-5858

IDAT

www.peru21.pe

Perú .21

MINISTROS DESHOJAN MARGARITAS

ORGANICE SU PRESUPUESTO FAMILIAR CON PLANES ON-LINE

Abierta a nuestra carpeta esta noche y por la mañana los planes al PAC. (PÁG. 2)

EL PERÚ ESTÁ CON KINA

¡Ayer se confirmaron otros 21 casos. Van 185 contagiados. Proteja especialmente a los niños y a los ancianos. (PÁG. 3)

A cuidarse

EL VIRUS DE LA GRIPE PORCINA YA CIRCULO POR TODO EL PAÍS

ESQUEMA DE SECRETARIAS EJECUTIVAS

ASISTENTE DE GERENCIA 01

SECRETARIA EJECUTIVA 03

Call Center: 424-5858

"NUESTRA CIVILIZACIÓN ES MUY FRÍVOLA"

Entrevista con Mario Vargas Llosa (PÁG. 16, 17 y 18)

TERCER CASO DE GRIPE PORCINA ES UNA ESCOLAR DE 16 AÑOS QUE VOLVIÓ DE VIAJE DE PROMOCIÓN

Alerta en colegio

Suspenden clases en secundaria de Altiplano, en La Molina, por caso de influenza AH1N1. Padre de familia reclamó que Ministerio de Salud se demoró en atender a hijo que presentaba síntomas del mal.

Región Callao retira a México y establece severo plan de control sanitario en aeropuerto. (PÁG. 9 y 11)



SUSPENDEN CLASES PARA PROMOCIONES DE TRECE COLEGIOS TRAS CONFIRMARSE DOS NUEVOS CASOS

Más alumnos infectados

Ministerio de Salud y de Educación dispuso ayer que estudiantes de 57 de las escuelas que forman el grupo a República Dominicana no asistan a clases para evitar la observación. En el aeropuerto Jorge Chávez se tomaron medidas y se inspeccionaron quienes cumplieron con los requisitos sanitarios preventivos. (PÁG. 3)

ESPECIALISTA EN REDES CCNA
Especialista V.4.0

PROFESIONAL EN REDES CCNP
Versión 5.0

CETIS
CENTRO EDUCATIVO TECNOLÓGICO INTEGRADO

INSCRÍBETE LLAMANDO AL 423-1241 423-1111

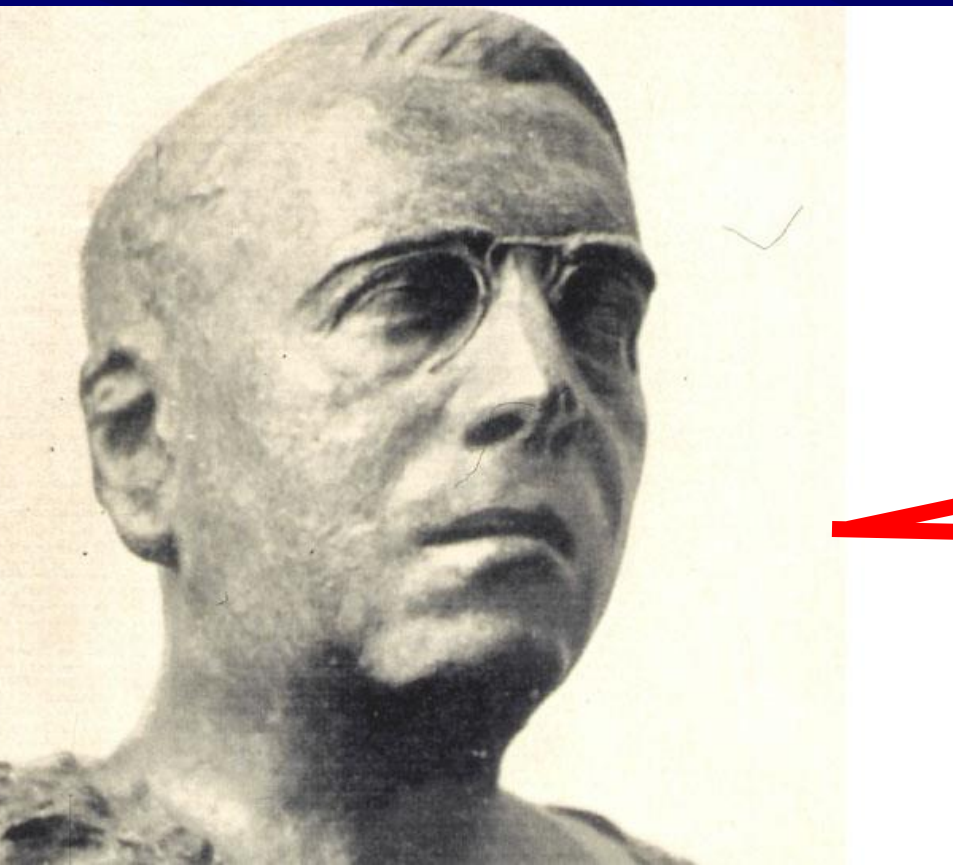
Peru: Initial Mass-Media Panic Effect

DISASTERS. WE ARRIVE LATE??

- LEARN FROM EACH OF THEM TO GET PREPARED
- DIFFERENT WAYS :
 1. EARTHQUAKES
 - 2.-TSUNAMIS
 - 3.-FLOODING AND HURRICANES
 - 4.-BELIC CONFLICTS
 5. CLIMATE CHANGES WITH EPIDEMICS

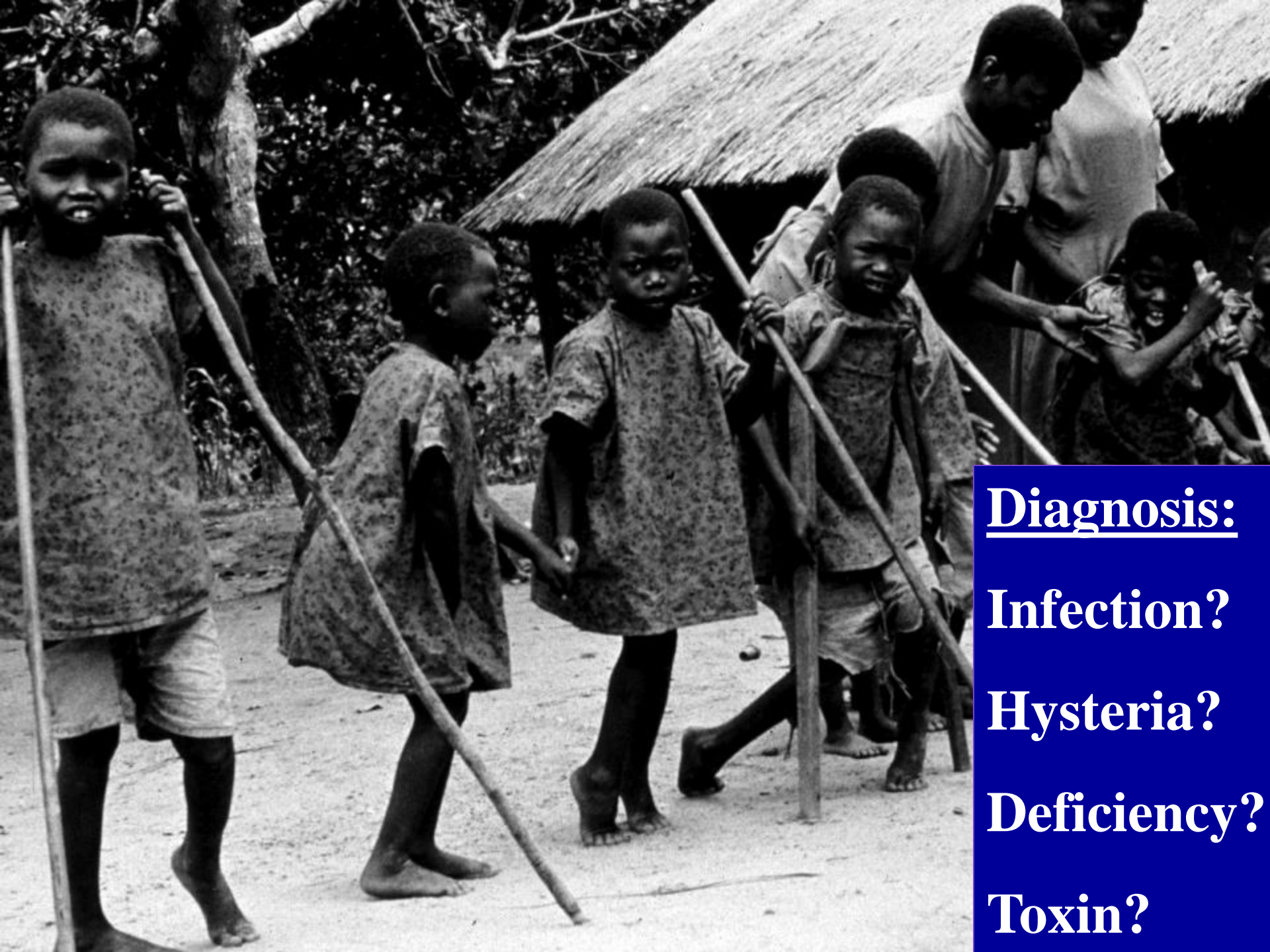
1938 Giovanni Trolli reported konzo in Bandundu Region.

Konzo means "Tied legs" in Yaka that is spoken by those first affected



New outbreaks in dry season since 1978





Diagnosis:
Infection?
Hysteria?
Deficiency?
Toxin?



Shortcuts:
Remaining
linamarin &
cyanohydrins

Traditional:
Complete
cyanogen
removal

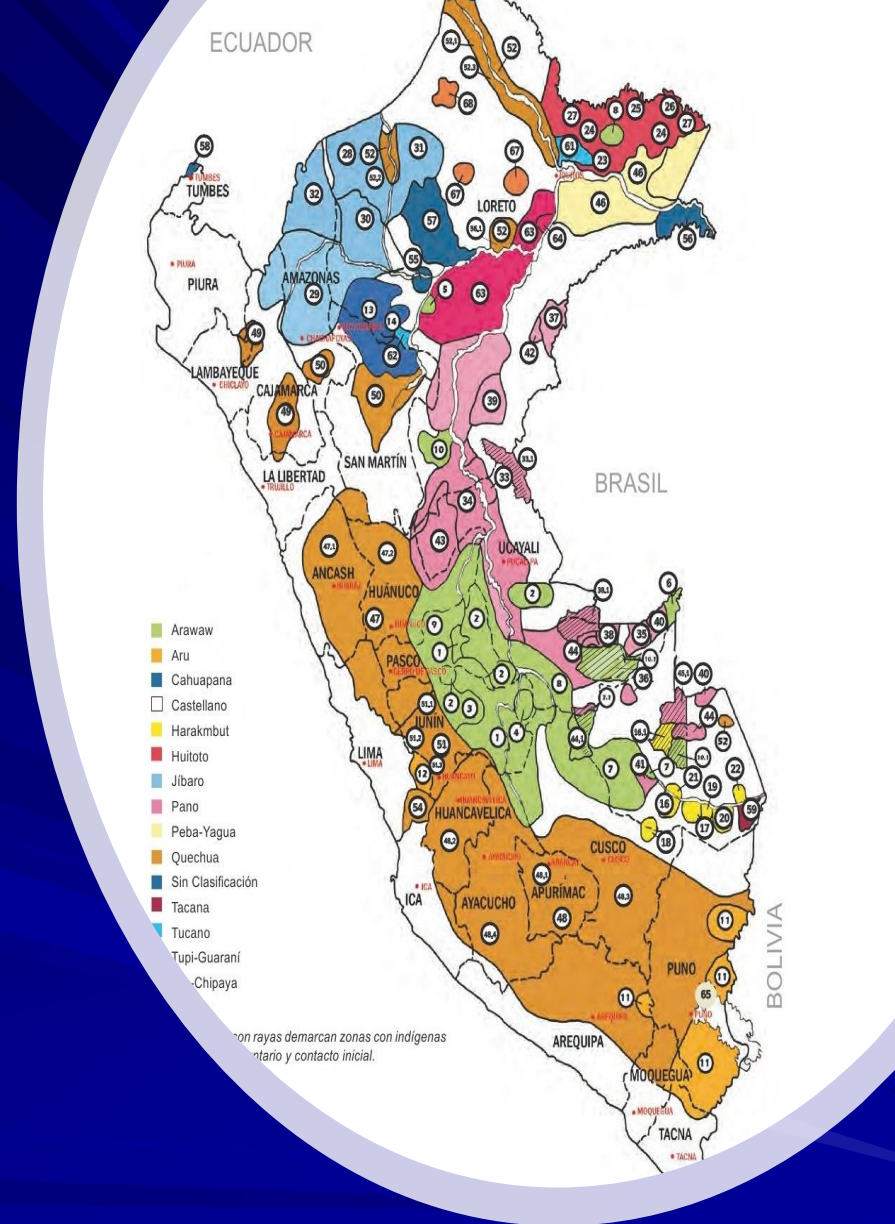
Konzo, an epidemic
upper motoneuron disease
linked to poverty and survival on
insufficiently processed bitter
cassava.

Hans Rosling
Professor of International Health
Karolinska Institutet, Stockholm, Sweden
"KONZO"

Why we are late?

Culture: Language

- Few health workers know any type of Indigenous language therefore, communication of any kind of information is delay
- There are more than 50 Indigenous Languages in the Peruvian Amazon and four in the Andeans
- Historically, the peruvian education system considers Spanish as the official language to be taught
- Only recently Native American languages (Quechua, Aymara and Amazon languages) are part of the curriculum and only for those children located in rural communities. Meaning that health practitioners educated in major peruvian cities, will not receive a clue about native languages



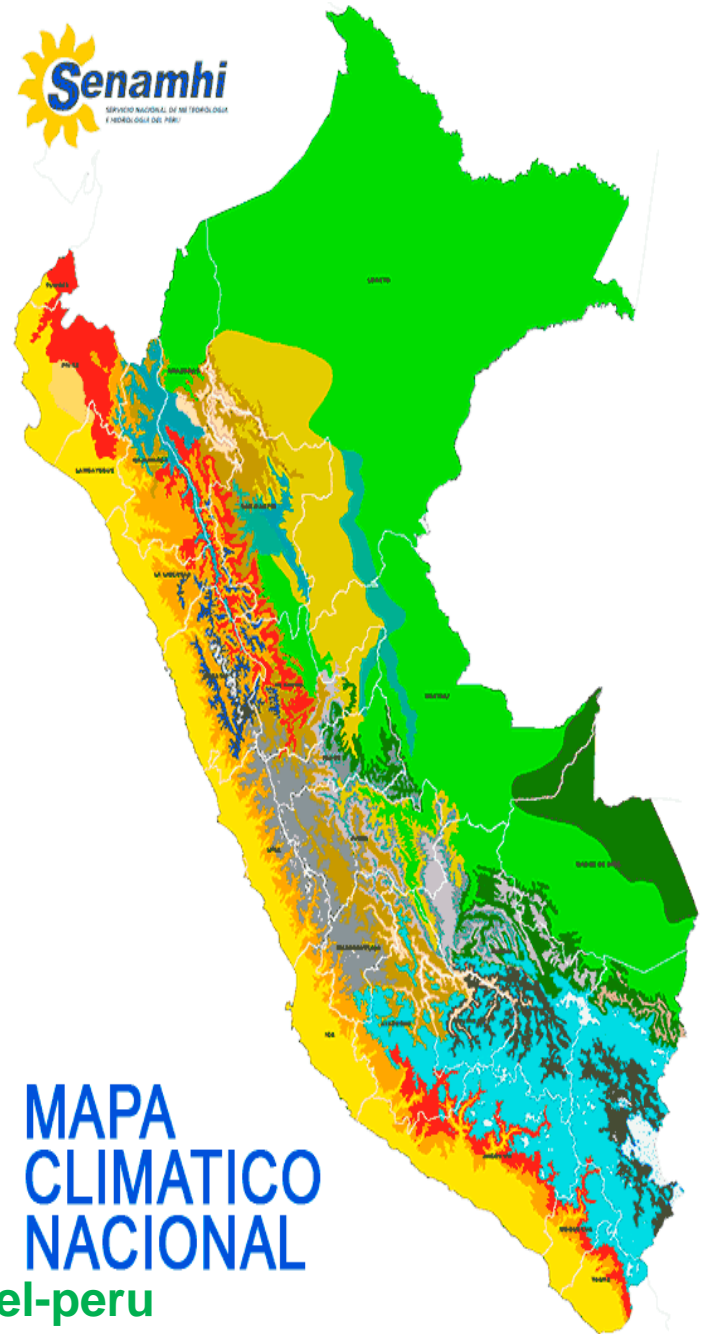
Culture: Traditional Knowledge

- Health worker did not know about traditional knowledge
- Indigenous are societies located in the Peru since many centuries ago, they did not disappear, they only have moved (hidden in the mountains or close to the borders with Brazil) or invisibilized within the Peruvian society
- They have survived by using their own technology
 - Medicinal plants and preparations: Ojé, Ayahuasca,
 - Indigenous Food and preparations (e.g. fermentation such as masato, chicha, fariña, dry the bushmeat)
 - Institutions : rituals and rules to get married, for puerperium, for menstruation, for going in the forest to hunt, for land distribution among their descendants,
- Specific knowledge to hunt, fish and produce agroproducts



Geography and climate:

- “El Perú está formado por ocho regiones naturales: Chala o costa, yunga, quechua, suni, puna, janca o cordillera, selva alta y selva baja. En éstas se presentan una diversidad de climas y microclimas que van desde lo costero árido y cálido, pasando por los valles interandinos de tipo templado, frígido y polar hasta los de tipo cálido y lluvioso de la selva.”



Geography and climate:

- To visit one community from the closest urban place is very expensive and it is affected by wether conditions:
 - \$100.00 flight from lima to a main city in the jungle, from there to the community a private boat at least \$100.00 per day of visit, plus walking by small trails
- Only big enterprises like oil companies can afford implement a camp to stay long time
- Also, local peruvian people who lives in the Amazon continuously to develop illegal mining and loggers can stay long time in the region for profit



La carretera Tarapoto Yurimaguas in winter

Representation and marginalization:

- 60% of the peruvian territory is Amazonia, although none of the congressman is truly representing Amazon Indigenous people
- There are a congress-female (Tania Pariona) that self-recognized as Indigenous
- There are few educative programs that promote the participation of Indigenous people in high level of education
- Access to appropriate intercultural health services that create opportunities to promote Indigenous health by : Vaccination, prevention for chronic conditions, knowledge about disaster risk management among health workers, safe blood transfussion, health personnal that value key prestigious Indigenous person and respect key moments in Indigenous spanlife (e.g. Parents should stay at least 15 days after delivery a new born to protect the baby, they can not go to the health post immediatly,)



Congressist Tania Pariona

Disasters: Some experiences

1. The community controls: Emergency
It can not be controlled: Disaster
2. The community must be involved, pro-active and educated. The state must monitor and supervise compliance
For example: The "El Niño" phenomenon damages homes, houses, etc. but they rebuild in the same vulnerable places.
3. Hurricanes are more frequent and more intense, producing intense flooding. The community must have the ability to overdo

Disasters: Why we are late?

1. The State must do everything ("rebuilding")
2. We must improve citizen participation and create social awareness
3. Fragmented health system (MINSA, EsSalud, FFAA, private sector) and uncoordinated.
Regionalization has increased informality to have "power struggle."
4. Scientific research allows generating data that reduce the impact of disasters. (construction of solid houses, hurricane surveillance, etc.)

Desastres: Algunas experiencias

1. Controla la comunidad: Emergencia
No puede ser controlada: Desastre
2. La comunidad debe ser participe, pro-activa y educada.
El estado debe vigilar y supervisar cumplimiento
Por ejemplo: El Fenómeno “El Niño” daña casas, hogares, etc. pero vuelven a construir en los mismo lugares vulnerables.
3. Los huracanes son mas fercuentes y mas intensos, produciendo intensas inundaciones. La comunidad debe tener capacidad de sobre hacerse.

Desastres: Por qué llegamos tarde?

1. El Estado debe hacer todo (“la reconstrucción”)
2. Debemos mejorar la participación ciudadana y crear conciencia social
3. Sistema de salud fragmentado (MINSA, EsSalud, FFAA, sector privado) y no coordinado.

La regionalización ha aumentado la informalidad al haber “lucha de poderes”.

4. La investigación científica permite generar datos que reducen el impacto de desastres. (construcción de casas sólidas, vigilancia de huracanes, et.