HIGHLIGHTS IN PEDIATRIC INFECTIOUS DISEASES 2013

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2013....THE YEAR THAT WAS

- Respiratory Viruses
  - MERS CoV
  - Avian Influenza A: H7N9 vs H5N1
- Dengue and Chikungunya
- Outbreaks
  - Measles
  - Pertussis

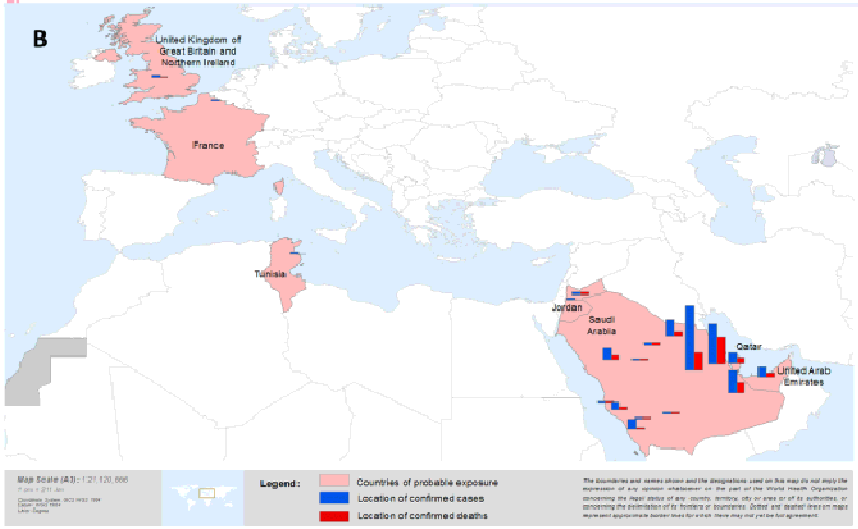
MERS COV

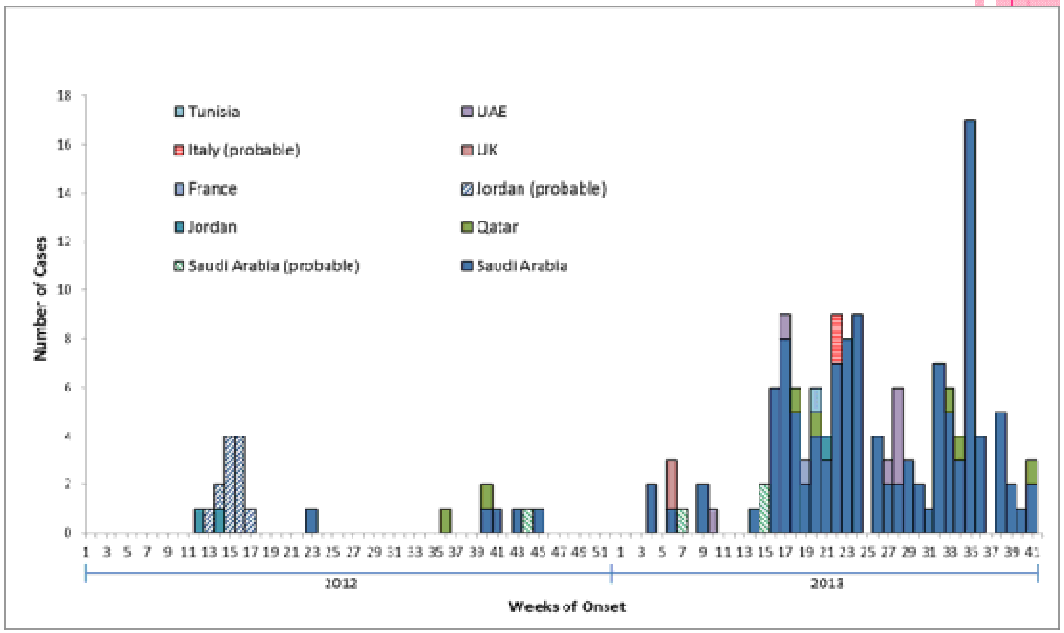
- First reported in Sept 22, 2012 to WHO as a novel Co-V
  - The first case identified in a patient with acute pneumonia and renal failure in Jeddah, KSA in June 2012
  - Now called Middle East Respiratory Syndrome Coronavirus
- Mode of transmission - unknown
  - Most confirmed cases did not have human source of infection nor direct exposure to animals, including camels
  - Limited person-to-person transmission
  - Transmission in HC setting – mainly secondary cases among HCW, visitors of confirmed cases, other patients
  - MERS CoV found in camel but role in transmission unclear

MERS COV

- As of Jan 27, 2014: 180 lab confirmed cases, 77 deaths (CFR 43%)
  - Affected countries - France, Germany, Italy, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, UK

Of 20 suspected cases tested at RITM, none were found to be positive by RT-PCR





WHO, 2014

EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS (N=144)

- Median age - 50 years (range: 14 months to 94 yrs)
  - Only 3 cases reported among children < 5 years old
- 64.5% male; 80% of deaths among males
- 63.4% severe respiratory disease, 29.8% non-severe disease, 18 cases asymptomatic
  - 1/3 had GI Sx (vomiting, diarrhea)
  - Exposure to animals in 14% (camels, sheep)
- Risk factor - chronic medical condition
  - Chronic renal failure (13.3 %), DM (10 %), heart disease (7.5 %)
  - 76.0% of patients with ≥1 underlying medical condition
  - Fatal cases more likely to have an underlying condition (86.8% vs. 42.4%, p<0.001)

WHO MERS CoV Research group, Nov 2013

MERS COV REVISED CASE DEFINITION (WHO, JULY 2013)

Confirmed case

- A person with laboratory confirmation of MERS-CoV infection

Probable case:

- A person with a febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome) **AND**
  Testing for MERS-CoV is unavailable or negative on a single inadequate specimen **AND**
  The patient has a direct epidemiologic-link with a confirmed MERS-CoV case
- A person with a febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease **AND**
  An inconclusive MERS-CoV laboratory test (that is, a positive screening test without confirmation) **AND**
  A resident of or traveler to Middle Eastern countries where MERS-CoV virus is believed to be circulating in the 14 days before onset of illness.
- A person with an acute febrile respiratory illness of any severity **AND**
  An inconclusive MERS-CoV laboratory test **AND**
  The patient has a direct epidemiologic-link with a confirmed MERS-CoV case

ADVICE TO HCW

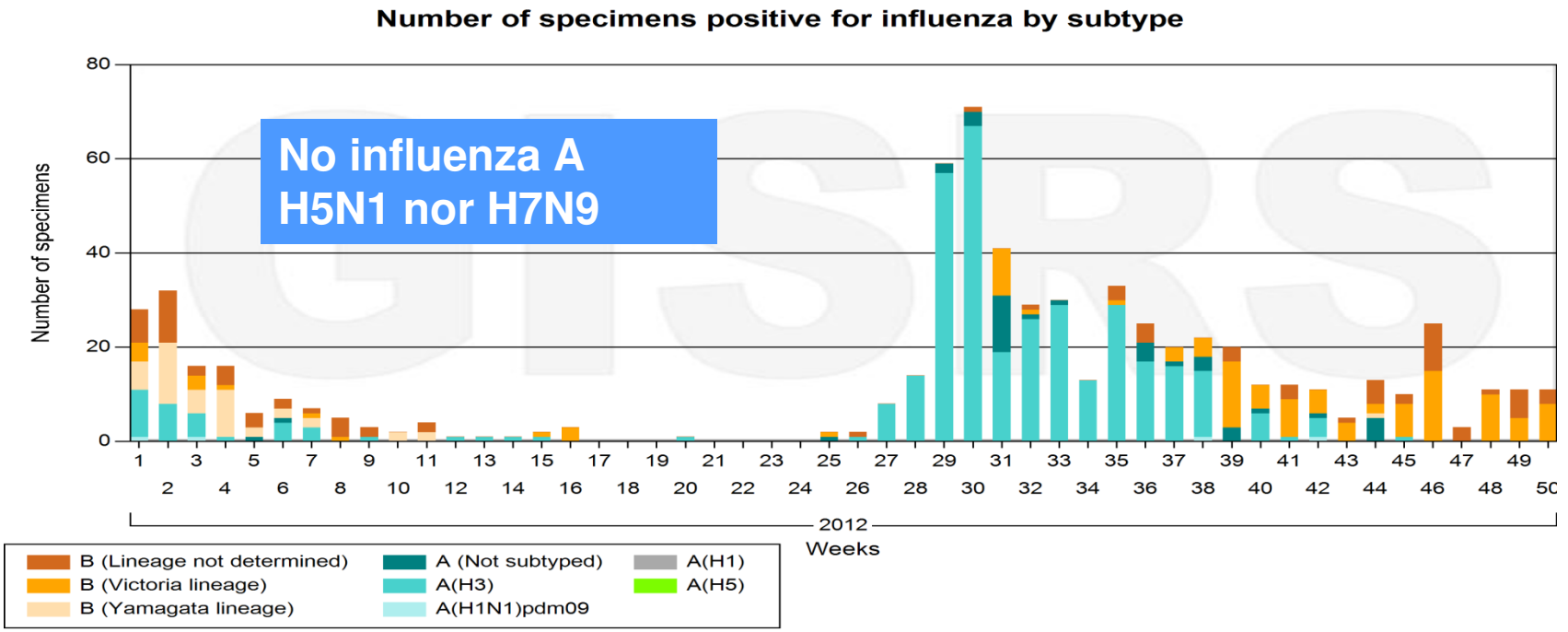
- Consider possibility of MERS-CoV infection in travellers with fever, cough, shortness of breath, or breathing difficulties, who have a recent history of travel to the ME
- When MERS-CoV strongly suspected, manage patient as potentially infected, even if NS is negative. Repeat testing using specimens from the LRT
- Strengthen IC measures
  - Precautions - standard precautions (all patients); PLUS droplet precautions (ARI Sx); PLUS contact precautions and eye protection (confirmed or probable cases); airborne precautions (performing aerosol generating procedures)
- Education and training on IC for all HCW
- Surveillance for SARI

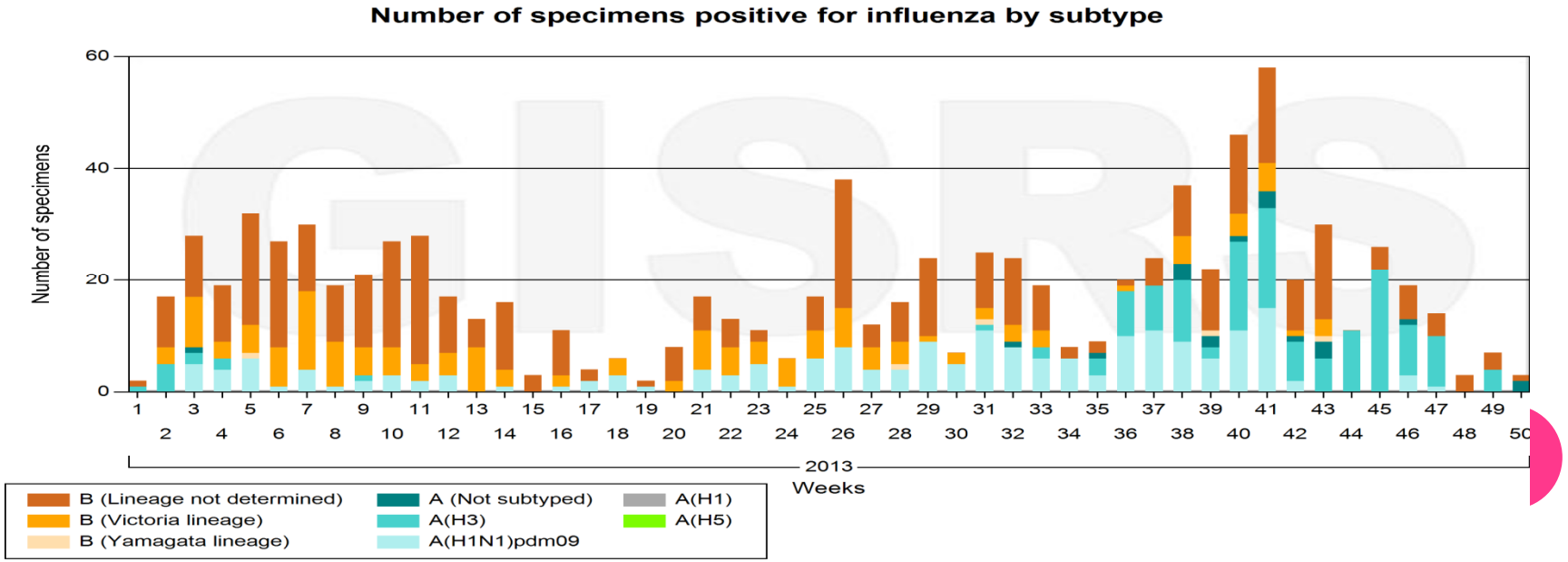
GENERAL ADVICE

- **Advice to travellers:**
  - No need for special screening at points of entry nor travel or trade restrictions
  - Avoid close contact with people suffering from ARI
  - Frequent hand-washing, especially after direct contact with ill people or their environment
  - Adhere to food safety and hygiene rules (avoid undercooked meats, raw fruits and vegetables unless they have been peeled, or unsafe water)
  - Avoid close contact with live farm or wild animals
  - Travellers to ME who develop Sx during travel or after their return should seek medical attention and to share their history of travel
- **Advice to general population:**
  - People Sx of ARI - cough etiquette; delay travel until asymptomatic

AVIAN INFLUENZA (BIRD FLU)

- Contagious disease of animals caused by a subgroup of influenza viruses that normally circulate among birds
- Most do not cause disease in humans
- Some are zoonotic (i.e. that they can infect humans and cause disease); example is H5N1
  - Influenza A H7N9
  - Highly Pathogenic Influenza A H5N1
  - Influenza A H7N7, H9N2, H7N2, H7N3


Number of specimens positive for influenza by subtype
No influenza A H5N1 nor H7N9
Number of specimens
2012
Weeks
B (Lineage not determined)
B (Victoria lineage)
B (Yamagata lineage)
A (Not subtyped)
A(H3)
A(H1N1)pdm09
A(H1)
A(H5)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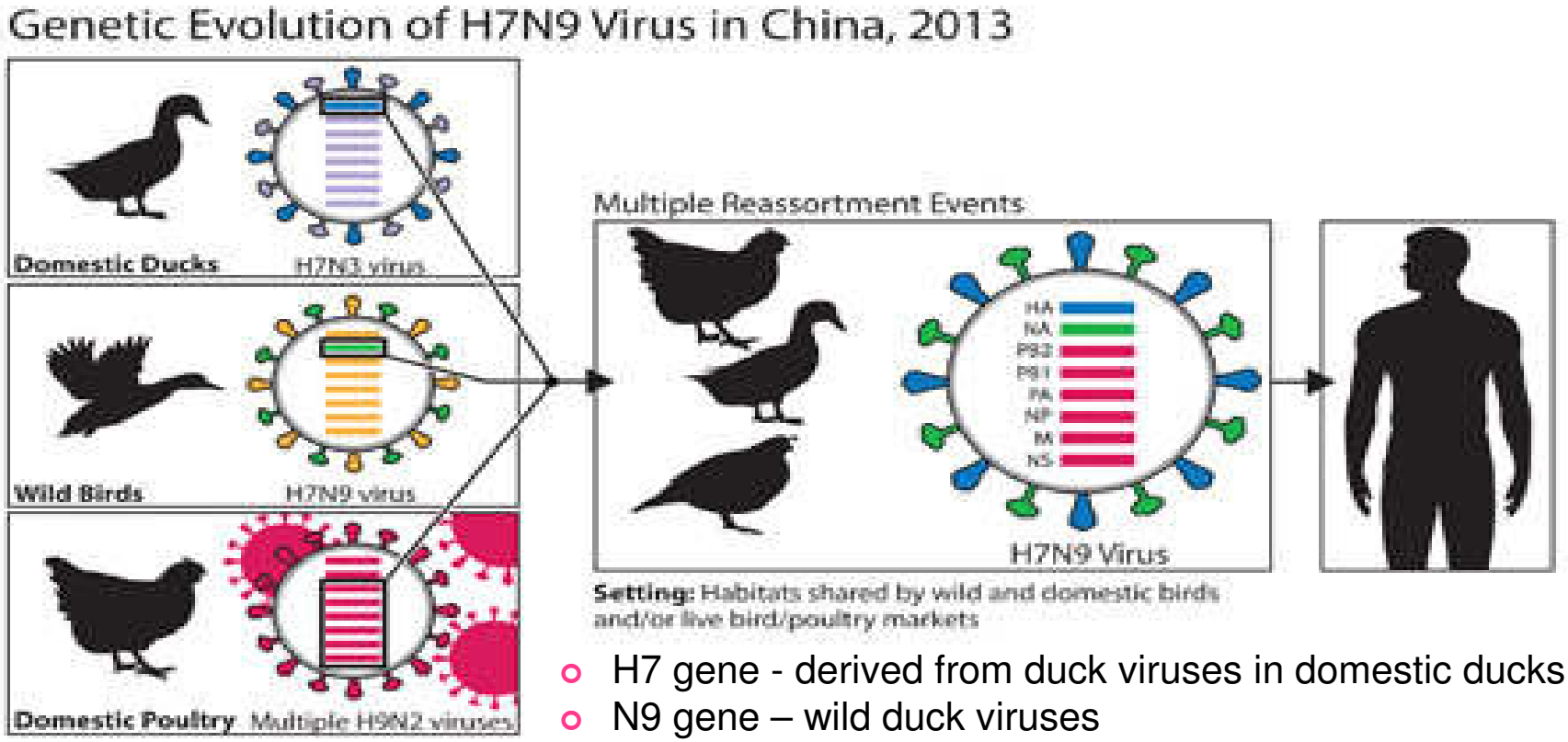
A(H1N1)pdm09
A(H1)
A(H5)

AVIAN INFLUENZA A H7N9

- H7 viruses – conjunctivitis and mild URT Sx
- Human H7N9 viruses closely related to a previously unidentified AI virus with genes derived from several potential parental strains

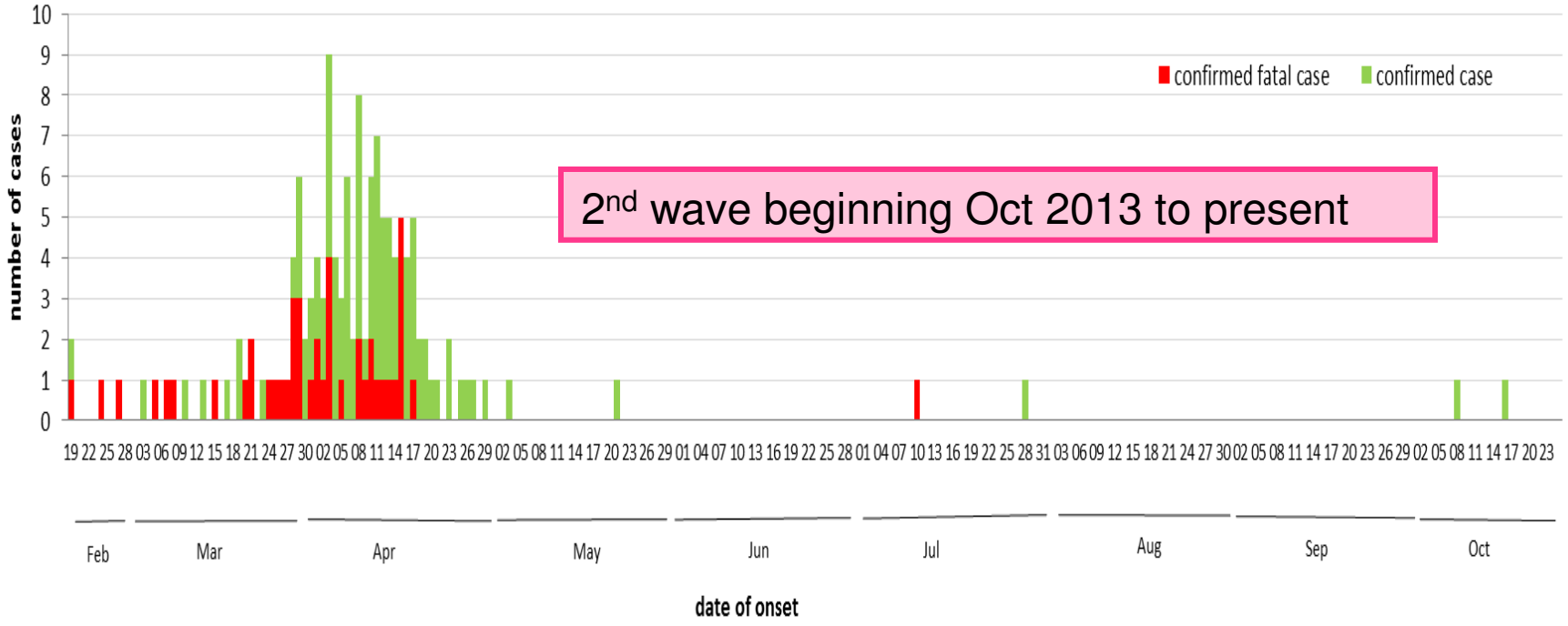


- H7 gene - derived from duck viruses in domestic ducks
- N9 gene – wild duck viruses
- Poultry H9N2 viruses - donors of 6 of the 8 genes

H7N9 OUTBREAK

- March 31, 2013 – China reported to WHO 3 cases of confirmed infection with Influenza A H7N9
- Affected areas – Shanghai and Anhui → Shandong, Zhejiang, Henan, Hunan, Fujian, Jiangxi, Jiangsu, Beijing
- Manifested as ILI → severe respiratory syndrome → hospitalization → death in 28%
- Median age – 62 yrs (range 2-89 yrs), M:F ratio 2.4:1
- Children – either mild (fever) or asymptomatic
- Most cases with underlying medical conditions; 72% reported recent exposure to poultry (live bird markets)
- No evidence to support human-to-human transmission

CASES



	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct
Cases	4	33	94	2	0	2	0	0	2
Deaths	3	18	23	0	0	1	0	0	0

First wave

http://www.who.int/influenza/human_animal_interface/20140131_background_and_summary_H7N9_v1.pdf?ua=1

AVIAN INFLUENZA A H5N1

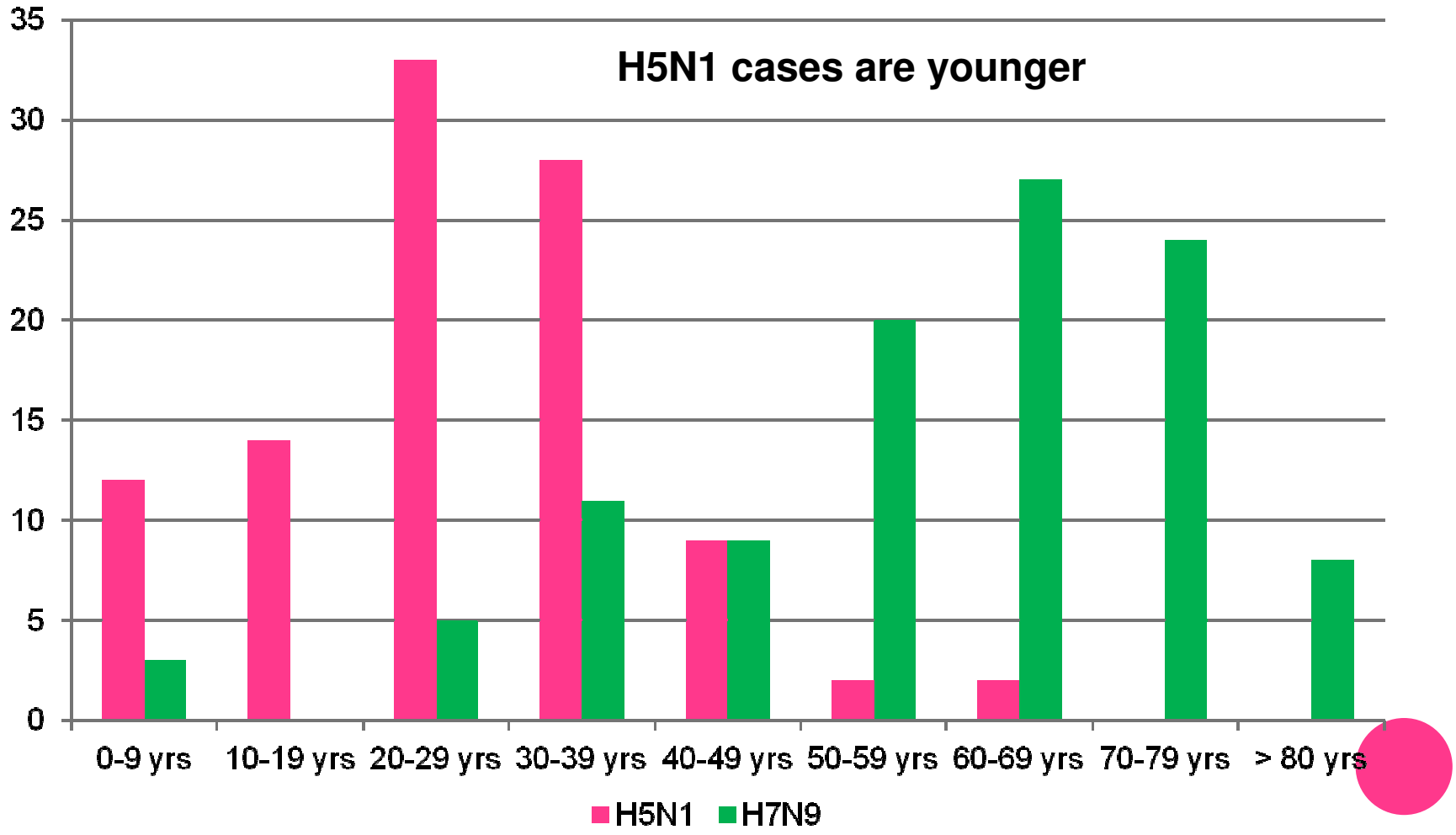
- 1997
  - H5N1 isolated in 1997 from a farmed goose in Guangdong Province, China
  - Outbreaks of HPAI H5N1 among poultry in farms and wet markets in HK
  - Human infections with H5N1 in HK (18 cases, MR 33%)
- 2003
  - Two cases of H5N1 (one fatal) are confirmed in a Hong Kong family with a recent travel history to Fujian Province, China. A third family member died of severe respiratory disease while in mainland China, but no samples were taken
- 2003-2009
  - Outbreak affecting 15 countries; virus became endemic among poultry in 6 countries (Bangladesh, Cambodia, China, Egypt, Indonesia, Vietnam)

H5N1 NUMBER OF CONFIRMED CASES

Country	2003-2009		2010		2011		2012		2013		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	1	0	0	0	2	0	3	0	1	1	7	1
Cambodia	9	7	1	1	8	8	3	3	26	14	47	33
China	38	25	2	1	1	1	2	1	2	2	45	30
Djibouti	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	90	27	29	13	39	15	11	5	4	3	173	63
Indonesia	162	134	9	7	12	10	9	9	3	3	195	163
Iraq	3	2	0	0	0	0	0	0	0	0	3	2
Lao PDR	2	2	0	0	0	0	0	0	0	0	2	2
Myanmar	1	0	0	0	0	0	0	0	0	0	1	0
Nigeria	1	1	0	0	0	0	0	0	0	0	1	1
Pakistan	3	1	0	0	0	0	0	0	0	0	3	1
Thailand	25	17	0	0	0	0	0	0	0	0	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	112	57	7	2	0	0	4	2	2	1	125	62
TOTAL	468	282	48	24	62	34	32	20	38	24	648	384

COMPARISON OF INFLUENZA H7N9 AND H5N1

AGE COMPARISON BETWEEN H7N9(N=104) AND H5N1 CASES （N=43, 2003-2013)



INFLUENZA H7N9 VERSUS H5N1

Characteristics	H7N9	H5N1
Affected countries	China, HK SAR, Taipei	15 countries affected; Current - Bangladesh, Cambodia, China, Egypt, Indonesia, Vietnam
Affected age	Mean - 58 years Range - 2-89 yrs	Mean - 18 years Range: 4 mos to 75 yrs
Predominant gender	67 % males	54% females
Exposure history	64.3 % reported d**irect** contact with live poultry or infected environment (visits to live market)	75% with **direct/close contact** with sick/dead infected poultry; unprotected close contact with a sick HPAI H5N1 patient
Illness in birds	No severe disease in poultry	Severe disease and death in poultry

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 19, No. 11, Nov 2013
China-WHO H7N9 Joint Mission report, April 2013
MMWR / May 10, 2013 / Vol. 62 / No. 18
http://www.who.int/influenza/human_animal_interface/20140131_background_and_summary_H7N9_v1.pdf?ua=1

INFLUENZA H7N9 VERSUS H5N1

Characteristics	H7N9	H5N1
Transmission	Contact with poultry or infected environment	Contact with poultry or infected environment
Human-to-human Transmission	No evidence of sustained transmission	Limited, non-sustained
Clinical Presentation	S/Sx characteristic of influenza	S/Sx characteristic of influenza
Children	Mild or asymptomatic	Mortality highest in people aged 10-19 years old and young adults
Risk factor	Older males with underlying medical conditions	Those with exposure to infected poultry
Course	Rapidly progressing severe pneumonia	Rapidly progressing severe pneumonia
Mortality rate	22 %	50-70 %

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 19, No. 11, November 2013
China-WHO H7N9 Joint Mission report, April 2013
MMWR / May 10, 2013 / Vol. 62 / No. 18

CDC CASE DEFINITION

- **Confirmed case -** A person with laboratory confirmation of a recent infection caused by the **H7N9** virus
- **Probable case -** Illness compatible with influenza in a patient with any of the exposure criteria and for whom lab testing is (+) for inf A, (-) H1, (-) H1pdm09, and (-) H3 by RT-PCR (unsubtypable)
- **Case under investigation -** Illness compatible with influenza in a patient with any of the exposure criteria below and for whom laboratory confirmation is not known or pending:

- Recent travel (within <10 days of illness onset) to areas with human cases of AI **H7N9** infection or to areas where AI **H7N9** are known to be circulating in animals (poultry) **OR**
- Recent close contact (within <10 days of illness onset) with confirmed or suspected cases of human infection **H7N9** virus **OR**
- Unprotected exposure to live influenza A (**H7N9**) virus in a laboratory

*Close contact - coming within 6 feet (2 meters) of a confirmed/suspected case while the case was ill (1 day prior to illness onset and continuing until resolution of illness); includes HCP providing care for a confirmed case, family members who lived with or stayed overnight with a confirmed or suspected case, and others who have had similar close physical contact

CDC CASE DEFINITION

- **Confirmed case -** A person with laboratory confirmation of a recent infection caused by the **H5N1** virus
- **Probable case -** Illness compatible with influenza in a patient with any of the exposure criteria and for whom lab testing is (+) for inf A, (-) H1, (-) H1pdm09, and (-) H3 by RT-PCR (unsubtypable)
- **Case under investigation -** Illness compatible with influenza in a patient with any of the exposure criteria below and for whom laboratory confirmation is not known or pending:

- Recent travel (within <10 days of illness onset) to areas with human cases of HPAI **H5N1** infection or to areas where HPAI **H5N1** are known to be circulating in animals (poultry) **OR**
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SHOULD WE WORRY?

- So far, no confirmed cases in the Philippines
- H7N9 risks to people considered unusually serious:
  - Virus has caused serious disease, including death
  - Virus does not appear to cause disease in poultry and therefore could spread silently
  - Virus has caused more human infections and disease in a shorter period of time than any other known AI virus
  - Some H7N9 viruses show genetic changes → partially adapted to infect humans more easily than other AI viruses → new virus against which humans have little or no immunity
    - Such "reassortment" events are believed to have happened before the influenza pandemics of 1918, 1957, 1968 and 2009

MMWR / May 10, 2013 / Vol. 62 / No. 18

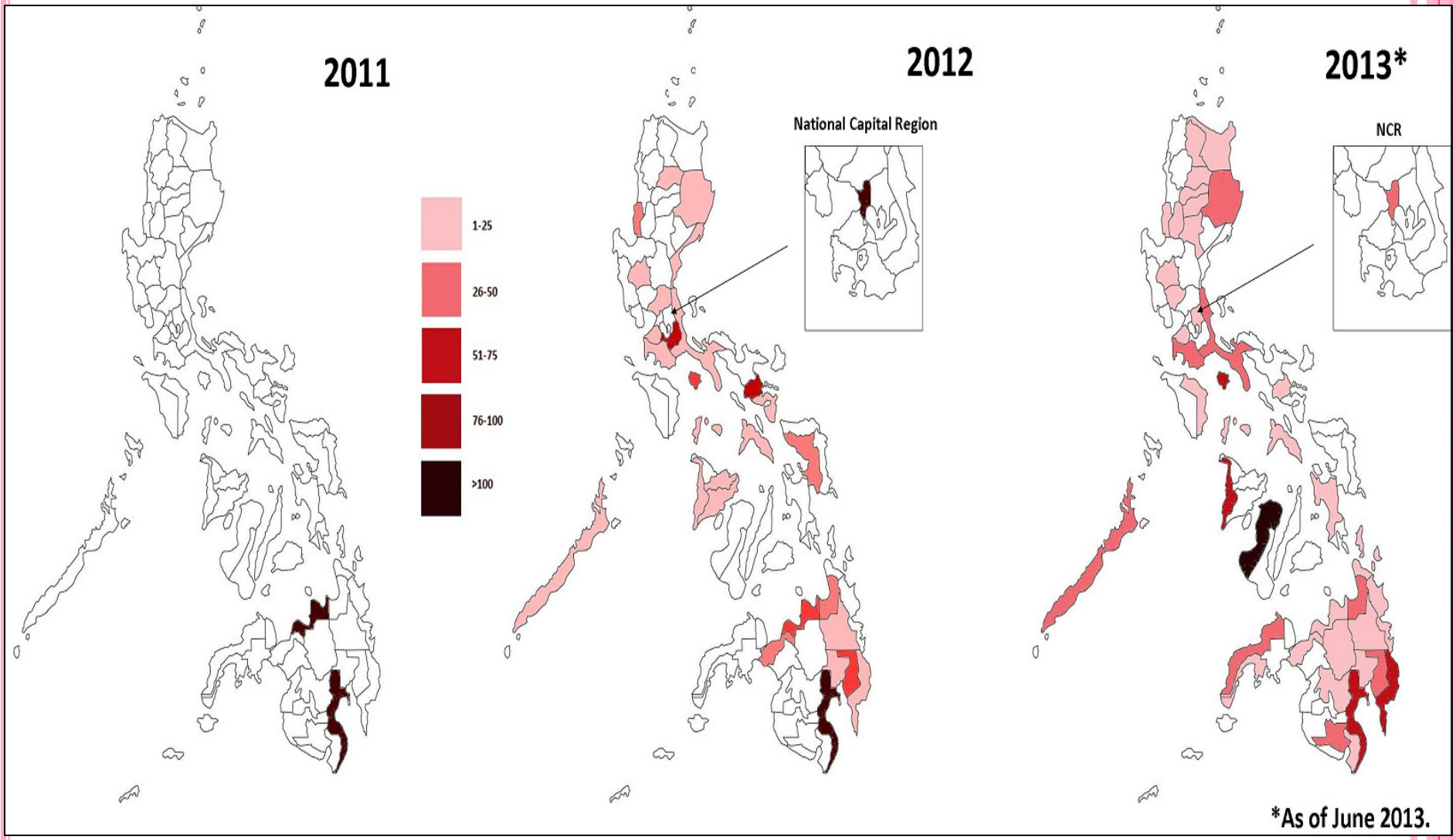
ADVISE TO CLINICIANS

- No travel restrictions to affected areas at this time
- No recommendations for prescribing antiviral drugs for prophylaxis or self-treatment of H7N9 influenza
- For travelers:
  - follow standard precautions to avoid touching birds, pigs, other animals
  - eat only food that is fully cooked, including poultry
  - practice good hand hygiene
- Consider influenza among the DDx when evaluating patients with acute respiratory illnesses, including pneumonia
- Management - neuraminidase inhibitors (oseltamivir and zanamivir); resistant to adamantanes (amantadine and rimantadine).

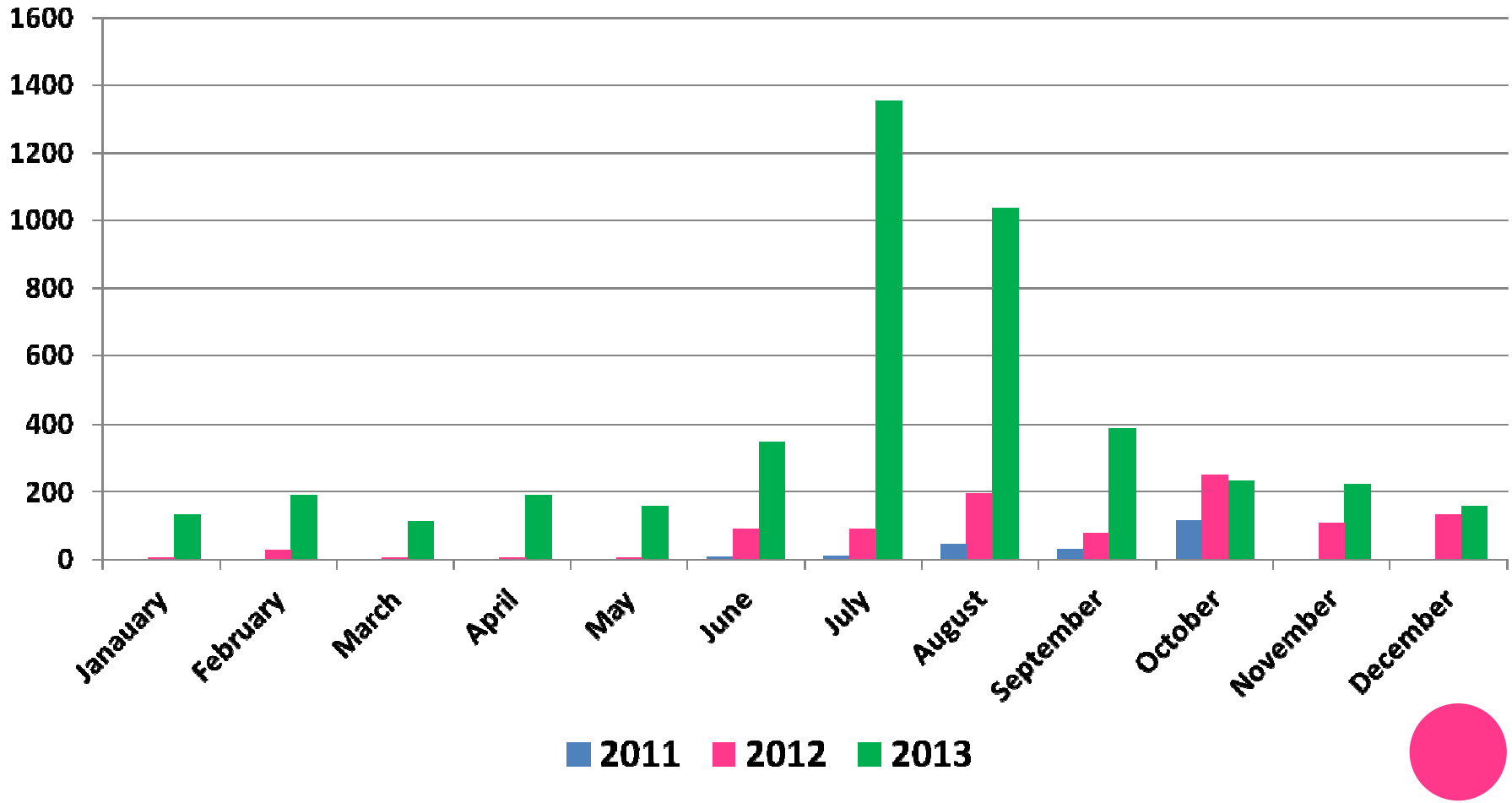
CHIKUNGUNYA

- Benign, dengue-like syndrome characterized by abrupt onset of fever, arthralgia, maculopapular rashes and leukopenia
- Same vectors as dengue but different geographic distribution
- 1967 – Manila, N = 26; 7 with HI Ab against CHIKV (Campos, 1969)
- 1986 - Davao del Sur, Cebu, Masbate, among US Peace Corps volunteers, N=3, (Hayes, 1986)
- 1996 - Brgy Pulo in Indang, Cavite; 72% with IgM Ab titers and 28% with IgG Ab titers (Retuya, 1998)
- 2003 -survey among Philippine monkeys showed positivity rate of anti-CHIK Ab at 14.8% for IgM and 59.3% for IgG (Inoue, 2003)
- 2010 - Febrile illness study revealed that CHIKV most common etiologic agent next to Dengue (35/300; 21.3%) (Capeding, et. al. unpublished data)
- 2011 - Retrospective testing of serum samples from suspected Dengue pediatric patients collected in 2010 showed 40% (86/216) have CHIKV anti-IgM (Sy, et. al. unpublished data)

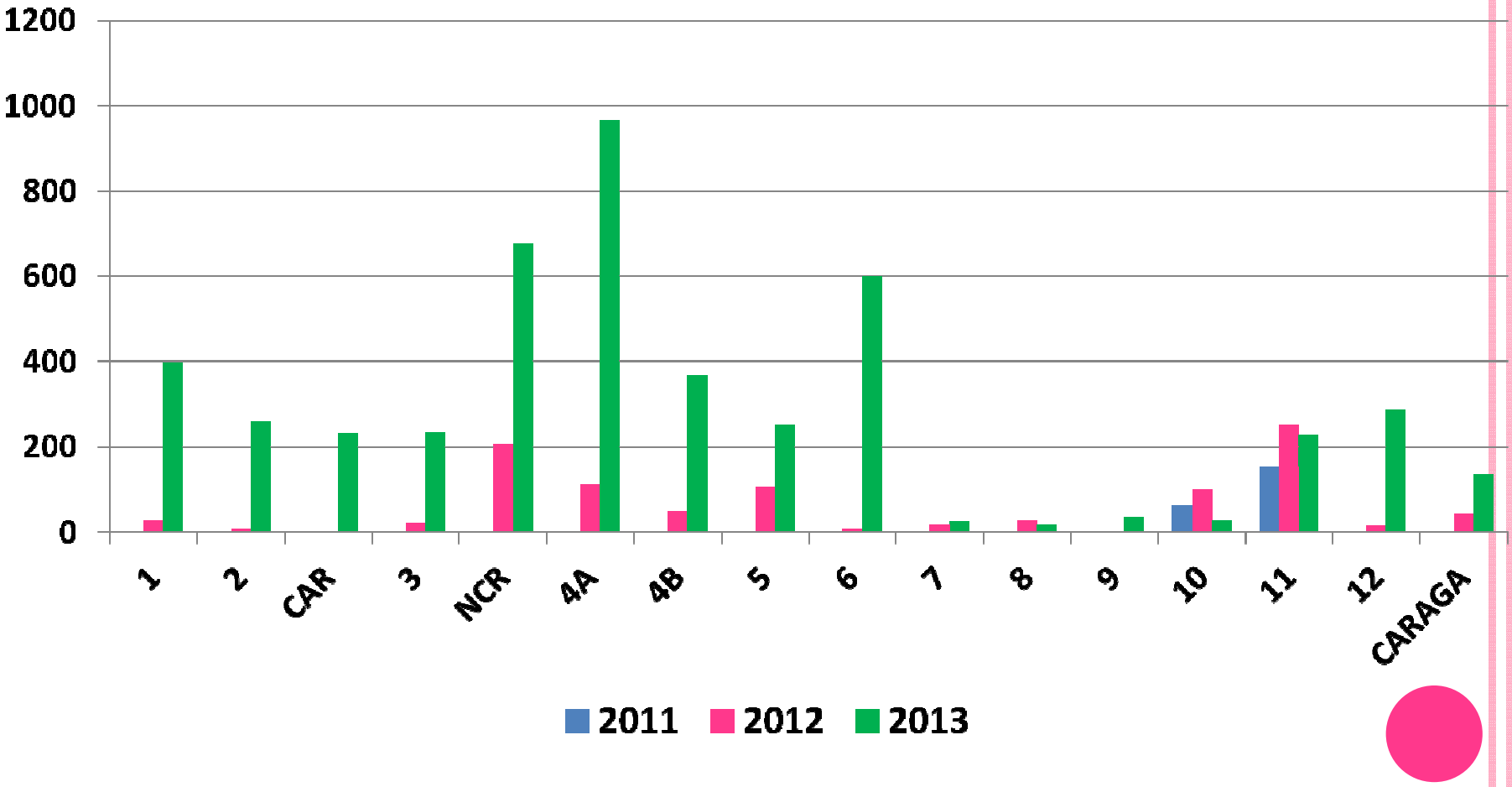
RE-EMERGENCE OF CHIKUNGUNYA 2011-2013



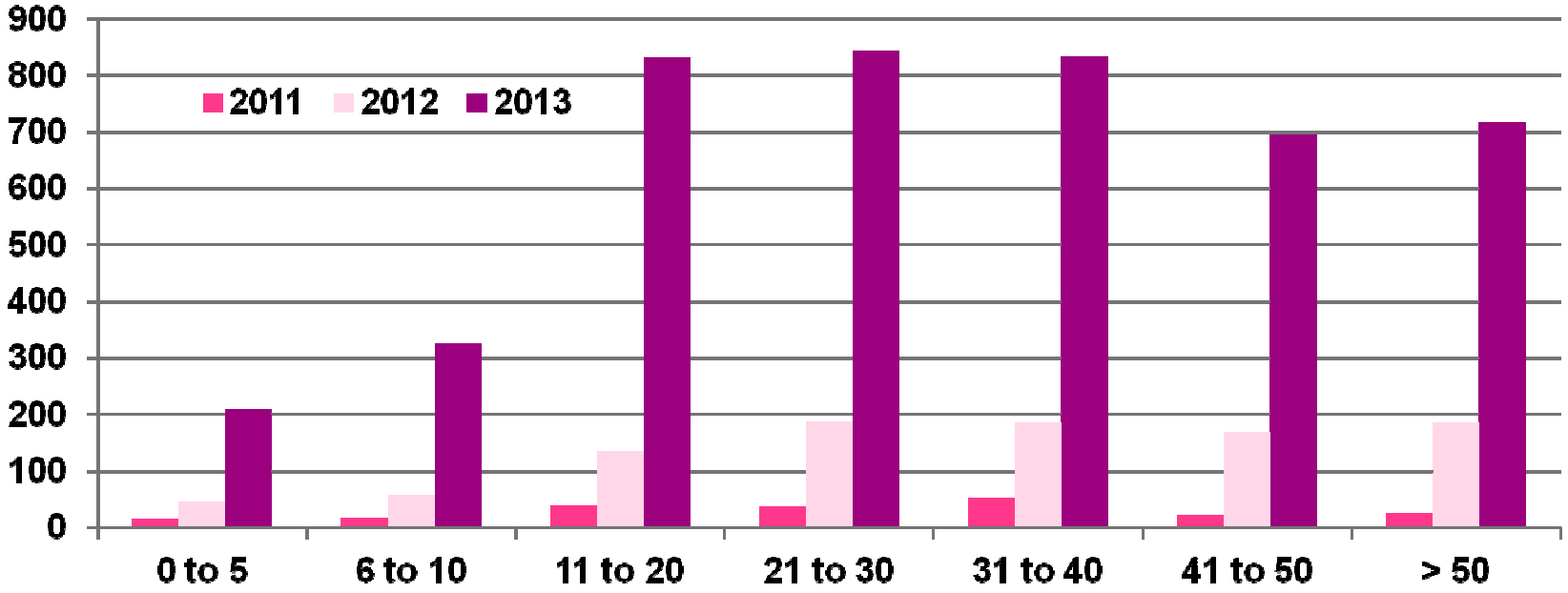
SEASONAL DISTRIBUTION, 2011-2013

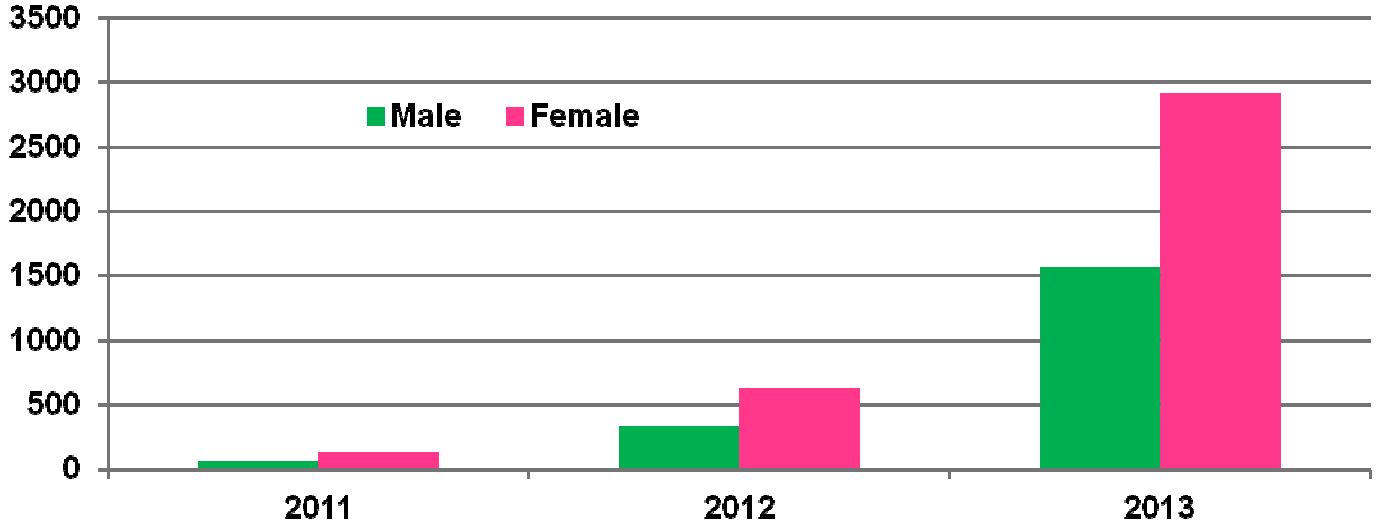


REGIONAL DISTRIBUTION, 2011-2013



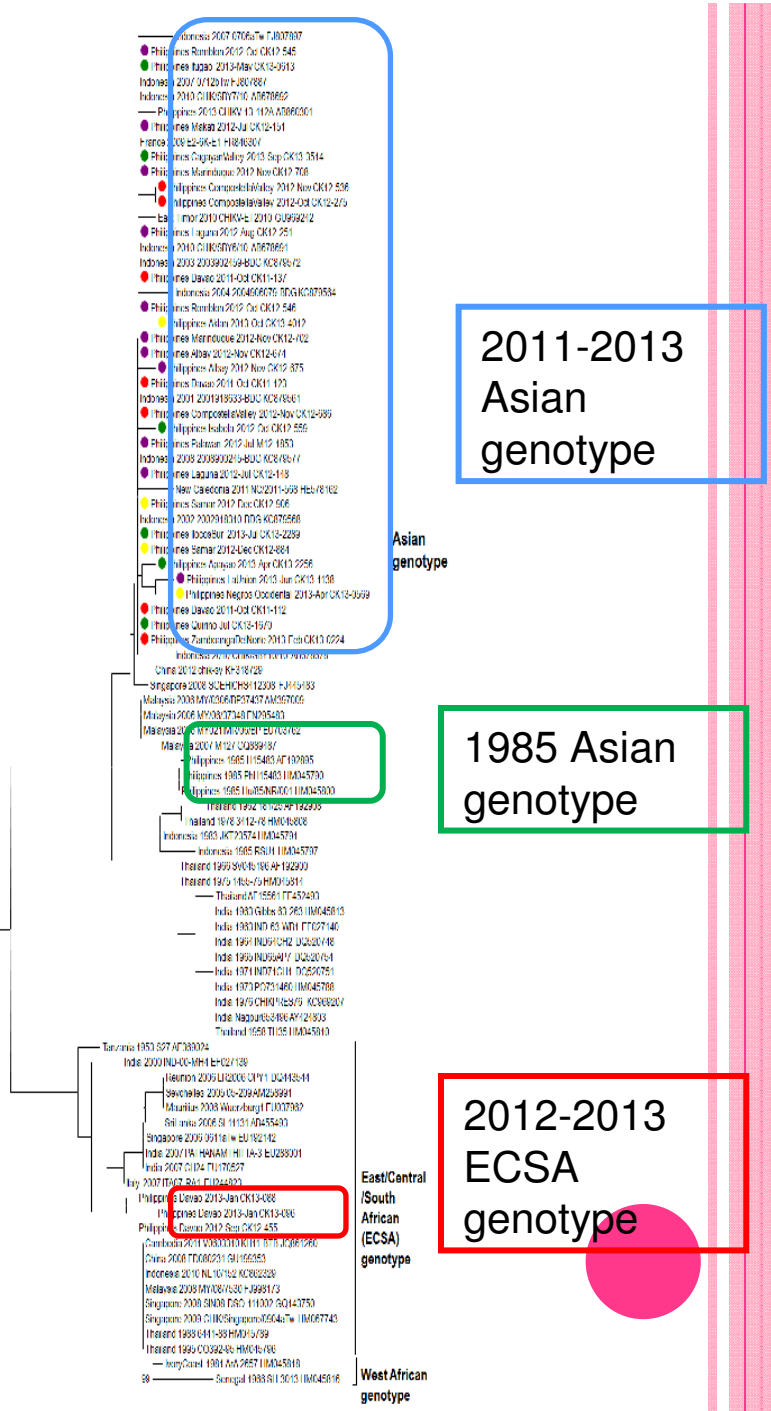
AGE/GENDER DISTRIBUTION





GENOTYPING

- 2011-2013, n= 5,729 samples tested, 2,891 (50%) have detectable CHIKV IgM
- 31 samples were sequenced for partial E1 gene
- Most belongs to the Asian genotype and were clustered into the same branch and were very closely related regardless of geographic location and date of collection
- 3 samples from Davao (collected in 2012 and 2013) belongs to ECSA and have the A226V mutation



CHIKUNGUNYA

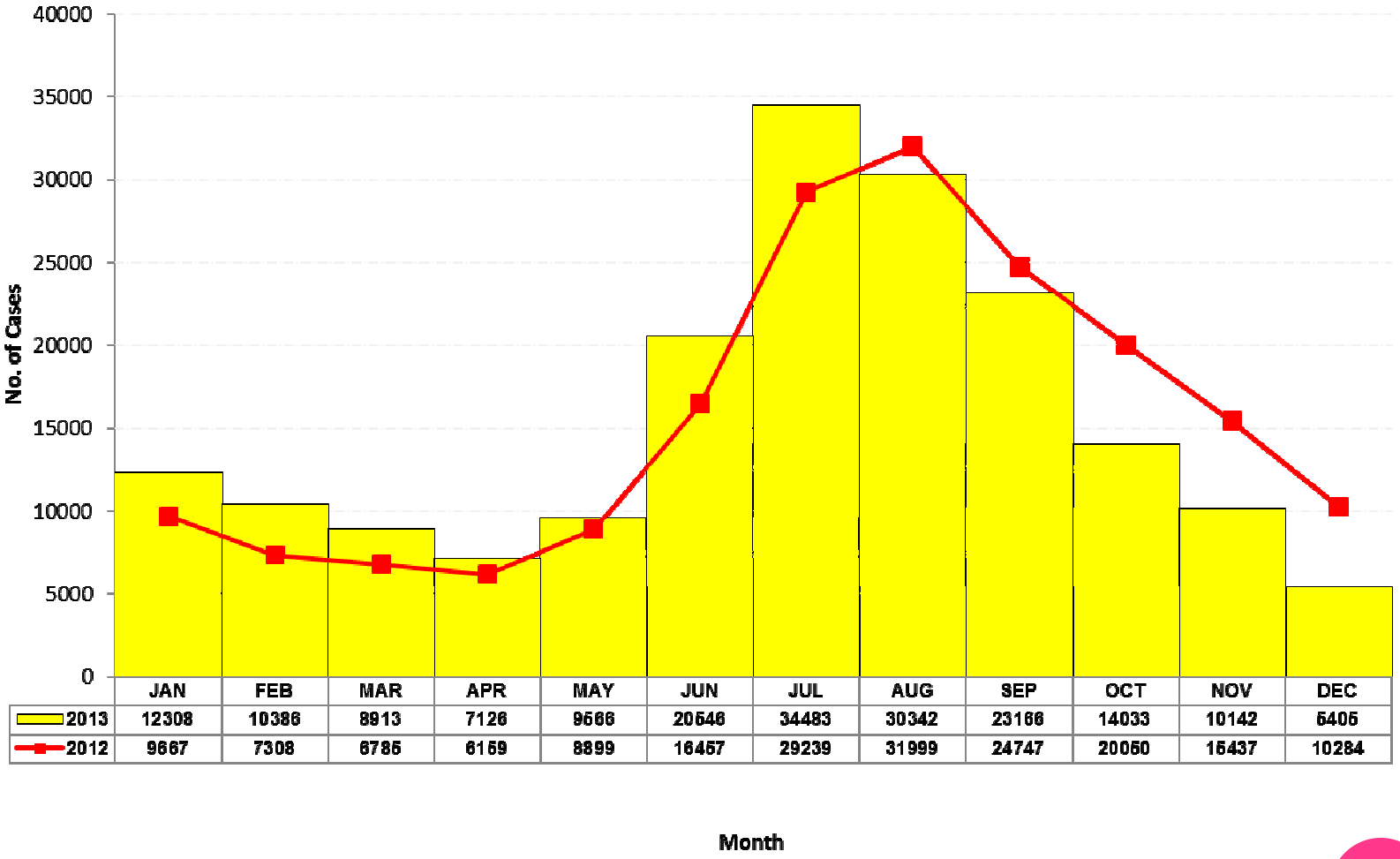
- Although not a notifiable disease under the PIDSR and usually causes a mild to moderate non-fatal illness (fever and polyarthritis), there are reports of:
  - Rare atypical lethal cases
  - Chronic symptoms of disability
- It is important to report, investigate and confirm suspected cases to guide control and prevention programs
- The fact that it is transmitted by the same vector as Dengue suggests that control of the vector for Dengue may lead to control of the 2 diseases

DENGUE

- DENV - positive-sense, single-stranded RNA virus of the genus Flavivirus (family *Flaviviridae)* that uses Aedes mosquitoes as vectors for transmission among primates
- 1960's - only 9 countries worldwide experienced severe dengue epidemics
- Current – endemic in over 100 countries worldwide with 50 - 100 M cases/year
- 40 % of the world is currently at risk for dengue
- Affects infants as young as 2 months

Nat Rev Microbiol. ; 9(7): 532–541. doi:10.1038/nrmicro2595
cidrap.umn.edu-Researchers_identify_fifth_dengue_subtype

Fig. 1 Dengue Cases by Month,
Philippines, 2013* vs 2012 (N=186,416)



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2013	12308	10386	8913	7126	9566	20646	34483	30342	23166	14033	10142	6405
2012	9667	7308	6785	6159	8899	16457	29239	31999	24747	20060	16437	10284

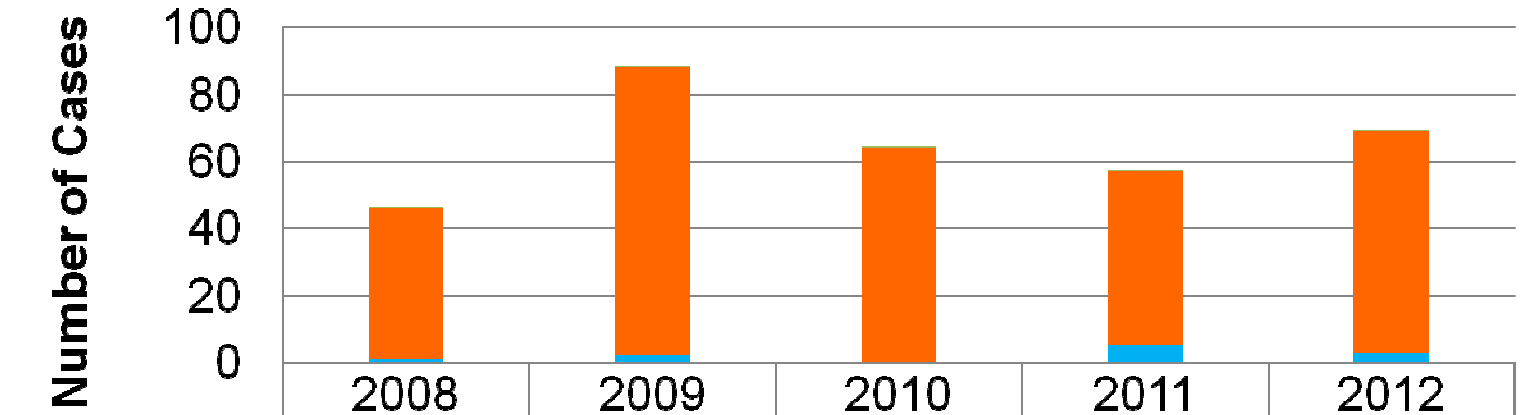
DENGUE

- 4 antigenically distinct but genetically related serotypes (DENV-1 to DENV-4)
- **DENV 5** - first new dengue subtype in 50 years
  - Discovered by chance during screening of samples from collected from a 2007 outbreak of dengue in Malaysia's northern Sarawak state
  - Oct 2013; 3rd International Conference on Dengue and Dengue Hemorrhagic Fever in Thailand by researchers from the University of Texas Medical Branch in Galveston
  - Virus sequence is phylogenetically distinct from the other four types
  - Belongs to the 'sylvatic' cycle, meaning that it circulates primarily in non-human primates. Humans can be infected with sylvatic dengue viruses, but there have been no sustained epidemics

Nat Rev Microbiol. ; 9(7): 532–541. doi:10.1038/nrmicro2595
cidrap.umn.edu-Researchers_identify_fifth_dengue_subtype

PERTUSSIS

- Characterized by catarrhal Sx including cough; in 1–2 weeks, coughing paroxysms with characteristic whoop
- Vaccine preventable disease
  - DPT3 coverage in 2011 was 84% (range 78-92%)

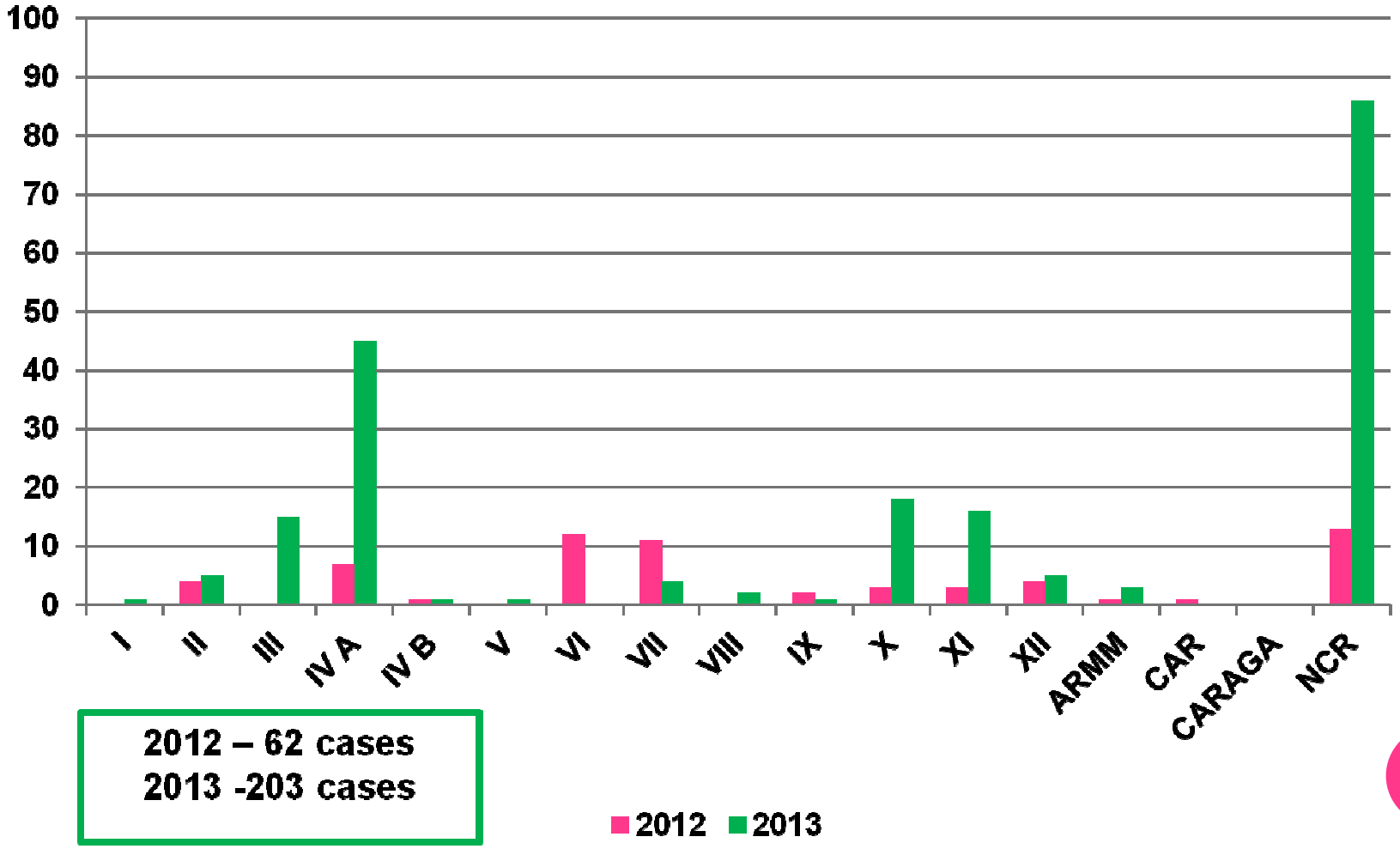


	2008	2009	2010	2011	2012
CFR	2%	3%	3%	5%	3%
Suspect	45	86	64	52	66
Confirmed	1	2	0	5	3

Year

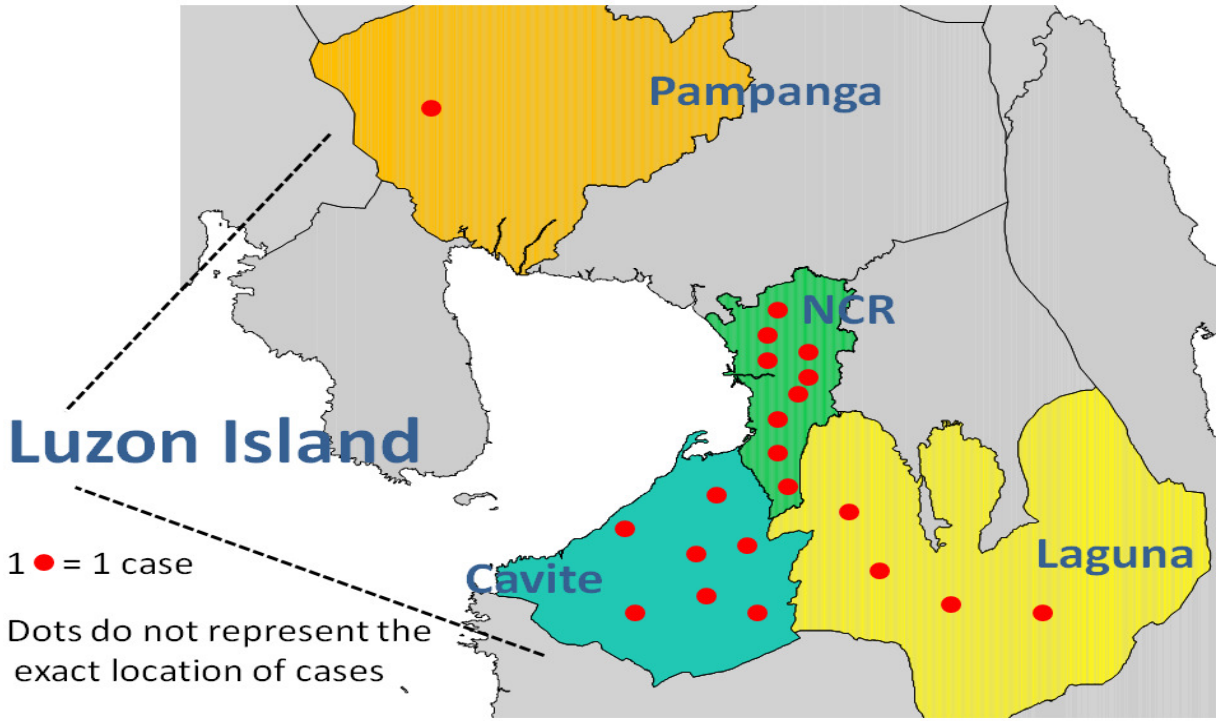
FHSIS 2011; FETP report

REGIONAL DISTRIBUTION OF REPORTED CASES OF PERTUSSIS, 2012-2013



PGH OUTBREAK

- October 30, 2012 to April 13, 2013, n = 21
- 52% were females
- Median age – 7 weeks (range 4 weeks to 4 years)
- High CFR – 48%



Ramos, FETP report, 2013

PGH OUTBREAK

- 76% of the cases were eligible for vaccination
  - 38% of eligibles were not vaccinated

Reasons	Number	Percentage
With cough	7	70
With fever	1	10
With rashes	1	10
Refusal of Mother	1	10

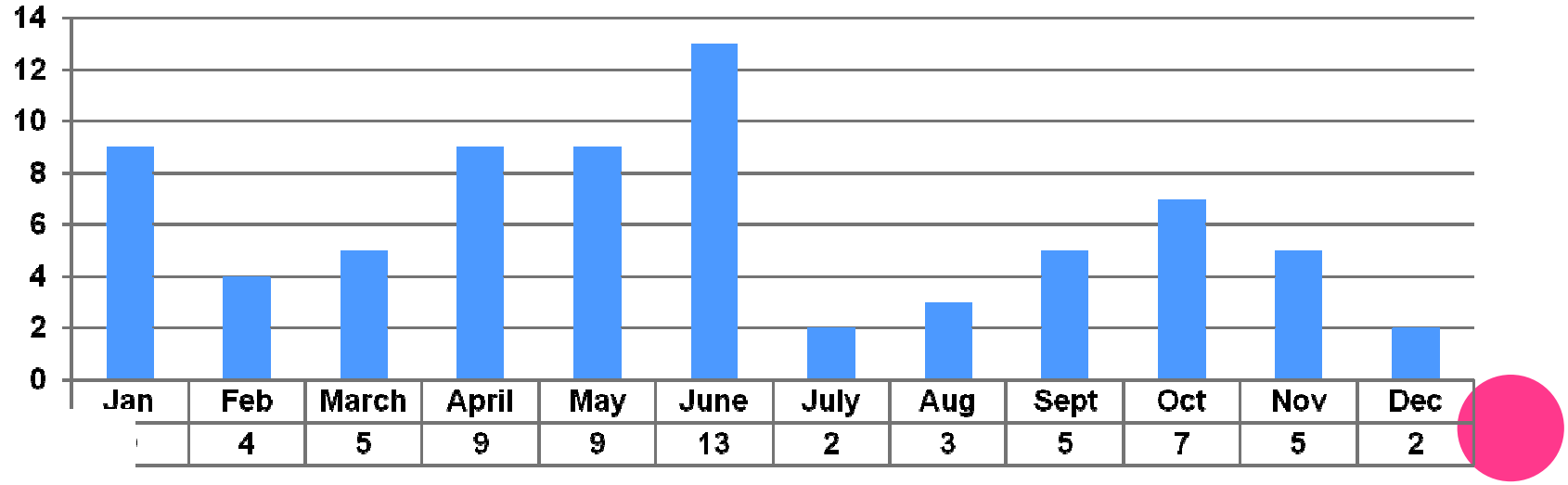
Ramos, FETP report, 2013

PERTUSSIS

- Laboratory confirmation of suspect cases

	2010	2011	2012	2013	TOTAL
Number tested	12	12	23	128	175
Number PCR (+)	5	6	12	73	96
Confirmation rate	42 %	50 %	52.2 %	57%	55%

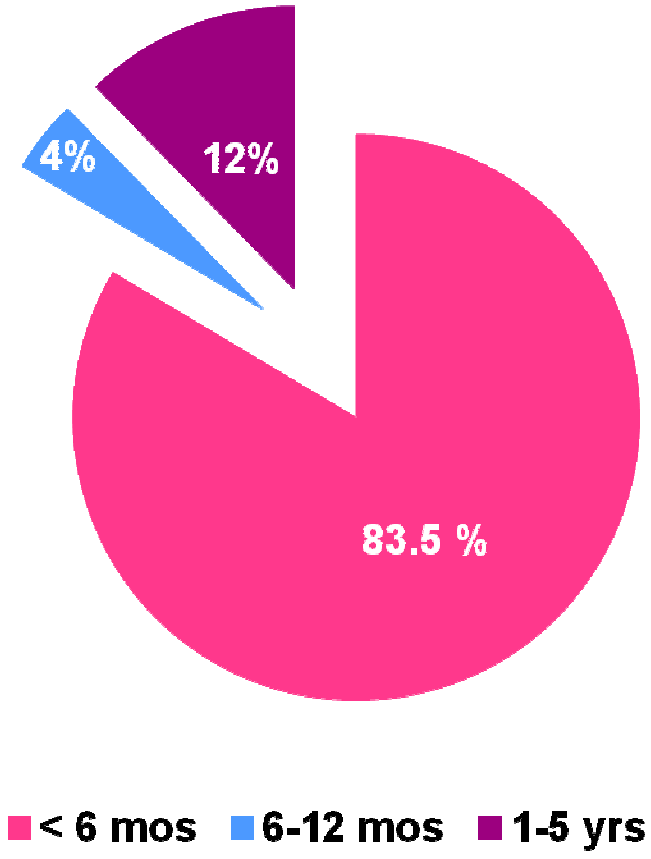
- Monthly distribution of lab confirmed cases, 2013



RITM Microbiology laboratory

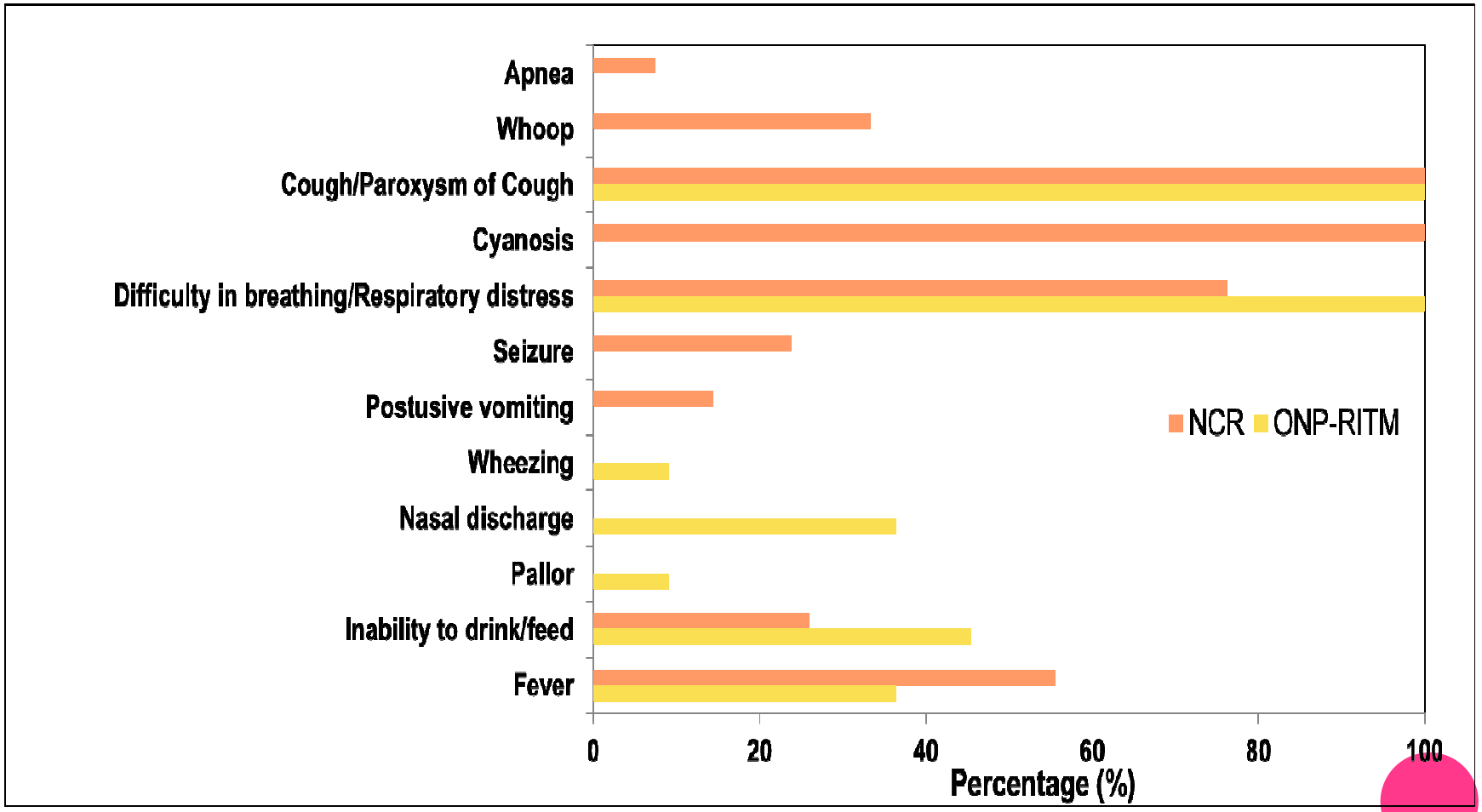
LABORATORY CONFIRMED CASES, 2013

AGE DISTRIBUTION



RITM Microbiology Dept

CLINICAL MANIFESTATIONS OF CONFIRMED PERTUSSIS CASES, 2012-2013



*Prevalence of *Bordetella pertussis* in Childhood Pneumonia in the Philippines
** RITM Microbiology laboratory

VACCINATION HISTORY OF CONFIRMED PERTUSSIS CASES, 2012-2013

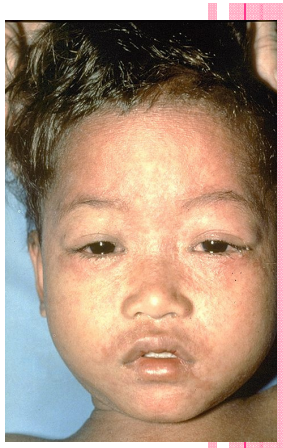
Site	No. of cases	Vaccinated	Not Vaccinated
Pneumonia study (RITM and Palawan)	11	2 (18%) Both received 1 dose of DPT	9 (81%)
NCR	24	5 (21%) 1 received 3 doses of DPT 4 received 1 dose of pentavalent vaccine	19 (79%)

*Prevalence of *Bordetella pertussis* in Childhood Pneumonia in the Philippines
** RITM Microbiology laboratory

ADVICE TO HCW

- Pertussis cases continue to occur, targeting unvaccinated and incompletely vaccinated infants
- Laboratory confirmation is available
- Reporting is vital
- Immunization
  - Use TdaP in place of a due Td dose
  - Children and adolescents 7 to 18 years of age who are not fully immunized with DPT vaccine should be given a single dose of TdaP; remaining doses are given as Td

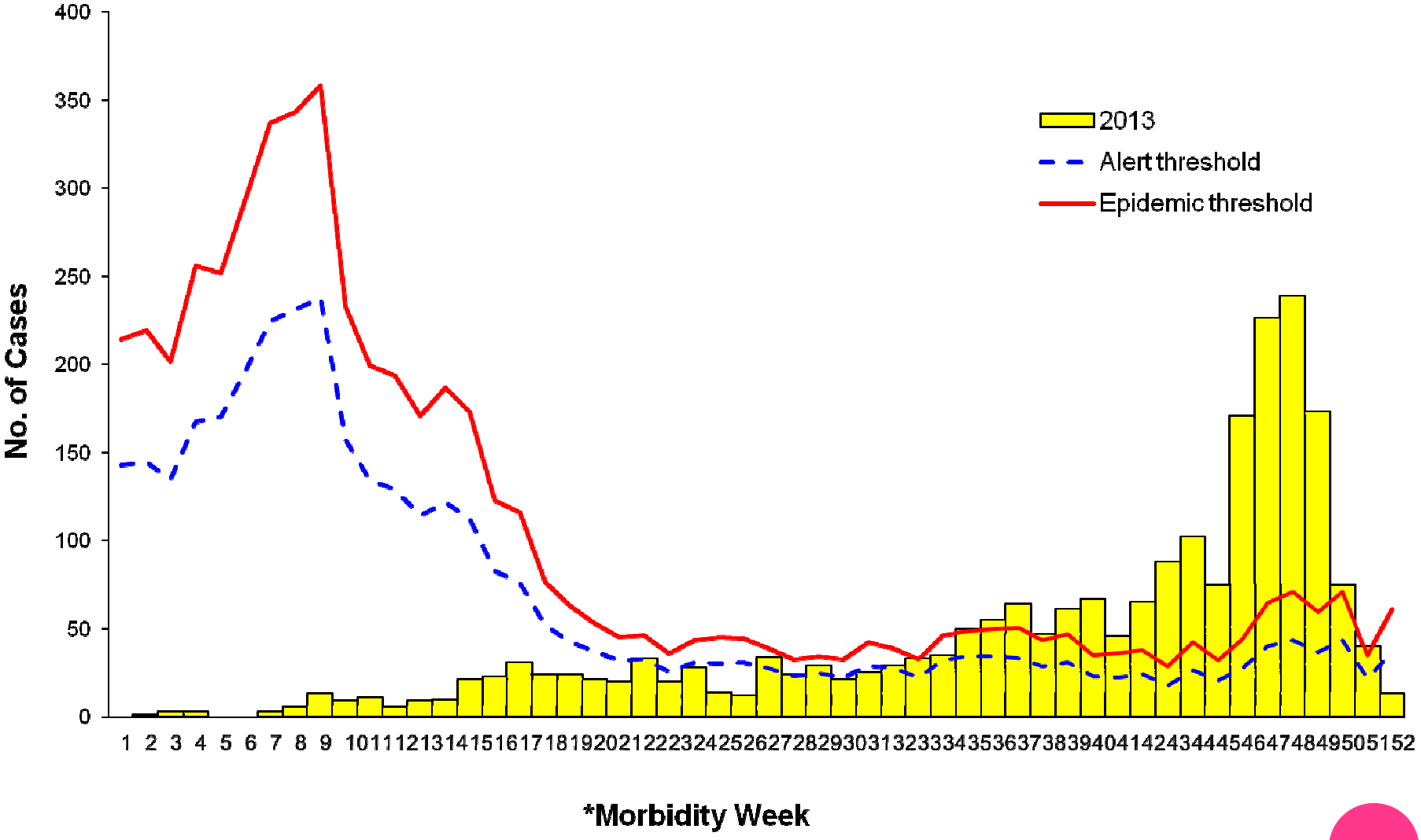
MEASLES OUTBREAK



- Acute viral disease characterized by fever, cough, coryza, conjunctivitis, maculopapular rash and pathognomonic Koplik spots
- Reportable vaccine-preventable disease
- Elimination by 2017

*Source: WHO vaccine-preventable diseases: monitoring system 2012 global summary

Fig. 1. Distribution of Confirmed Measles Cases by Morbidity Week*
Philippines, as of January 1 - December 31, 2013



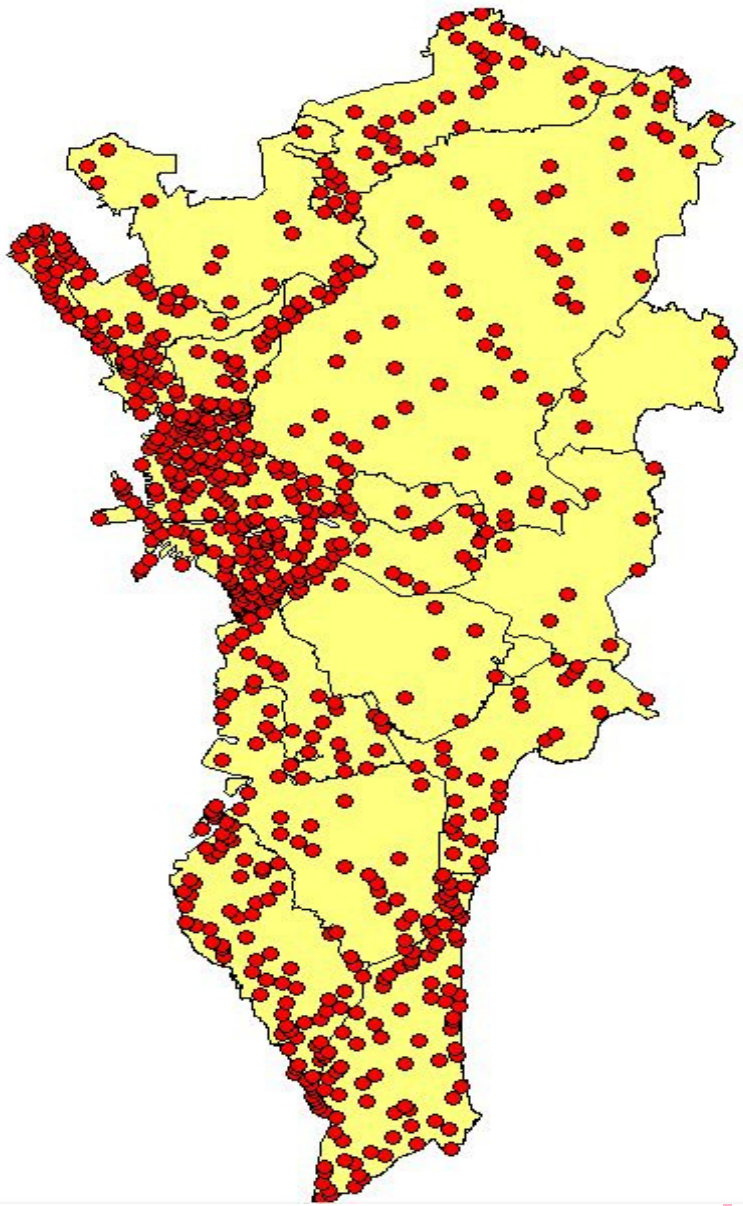
Confirmed measles cases includes laboratory confirmed and epi-linked confirmed measles cases only.

*every morbidity week is counted by 7 calendar days

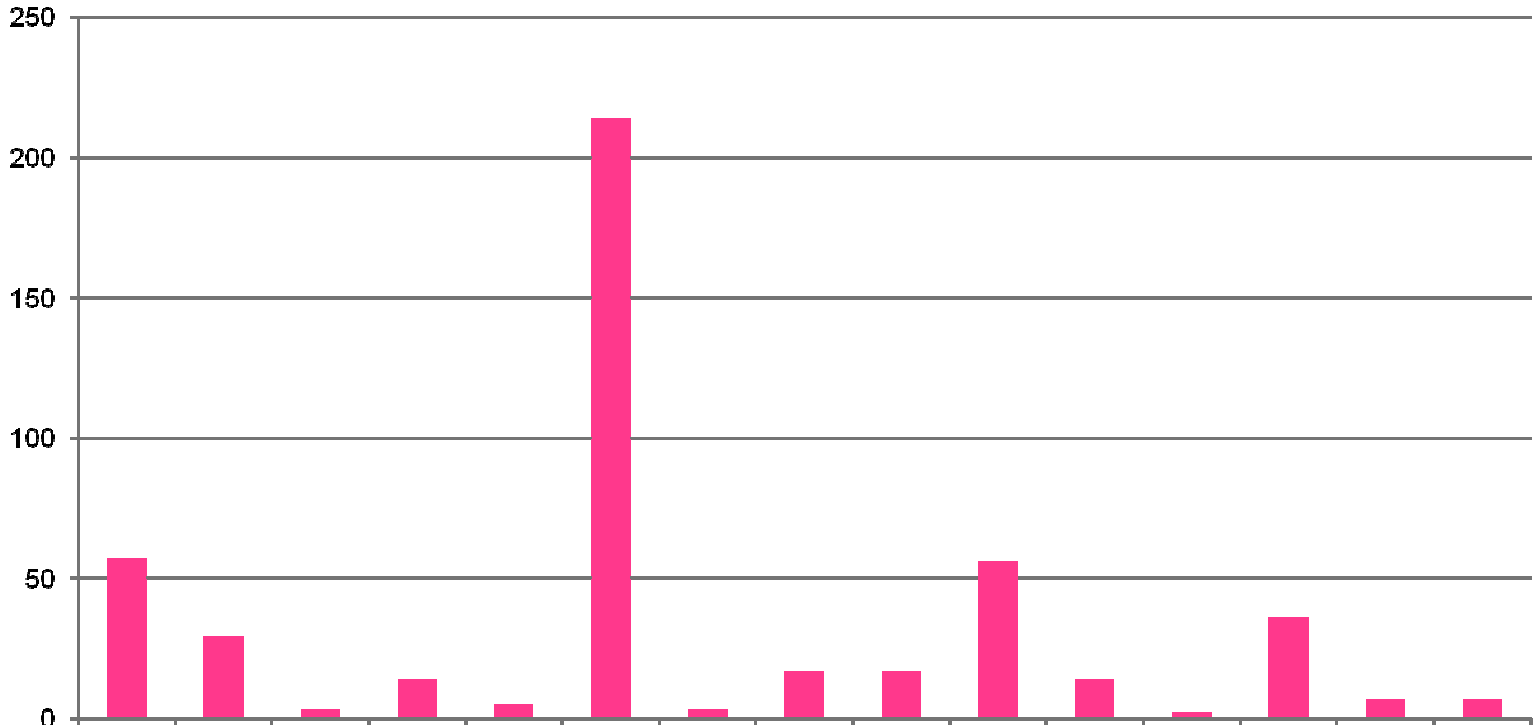
REGION	REPORTED	CONFIRMED MEASLES		MEASLES COMPATIBLE	CONFIRMED RUBELLA		DISCARDED AS NON- MEASLES NON-RUBELLA	PENDING CLASSIFICATION
		LABORATORY CONFIRMED	EPI-LINKED CONFIRMED		LABORATORY CONFIRMED	EPI-LINKED CONFIRMED		
I	214	49	0	36	5	0	102	22
II	193	12	0	19	12	0	144	6
III	459	101	2	36	27	0	254	39
IVA	1569	446	80	288	49	0	490	216
IVB	230	11	0	29	15	0	161	14
V	149	39	3	11	10	0	76	10
VI	797	291	15	9	35	0	426	21
VII	135	8	0	15	10	0	81	21
VIII	71	1	0	35	2	0	22	11
IX	148	16	8	28	9	0	82	5
X	79	3	0	12	11	0	49	4
XI	188	19	0	13	17	0	120	19
XII	145	8	0	25	17	0	71	24
ARMM	17	2	0	6	0	0	9	0
CAR	213	60	7	6	11	0	119	10
CRG	65	0	0	15	8	0	41	1
NCR	1825	1001	50	105	16	0	392	261
PHL	6497	2067	165	688	254	0	2639	684

DISTRIBUTION OF CONFIRMED MEASLES CASES
NCR, JANUARY TO DECEMBER 31, 2013

Muncity	EPI-LINKED CONFIRMED MEASLES	LABORATORY CONFIRMED MEASLES	TOTAL
UNSPECIFIED	0	26	26
CALOOCAN CITY	8	98	106
LAS PIÑAS CITY	3	105	108
MAKATI CITY	0	9	9
MALABON CITY	13	54	67
MANDALUYONG CITY	0	13	13
MANILA CITY	7	299	306
MARIKINA CITY	0	4	4
MUNTINLUPA CITY	13	76	89
NAVOTAS CITY	0	46	46
PARAÑAQUE CITY	4	87	91
PASAY CITY	0	31	31
PASIG CITY	0	8	8
PATEROS	0	0	0
QUEZON CITY	0	76	76
SAN JUAN CITY	0	7	7
TAGUIG CITY	1	45	46
VALENZUELA CITY	1	17	18
METRO MANILA	50	1001	1051



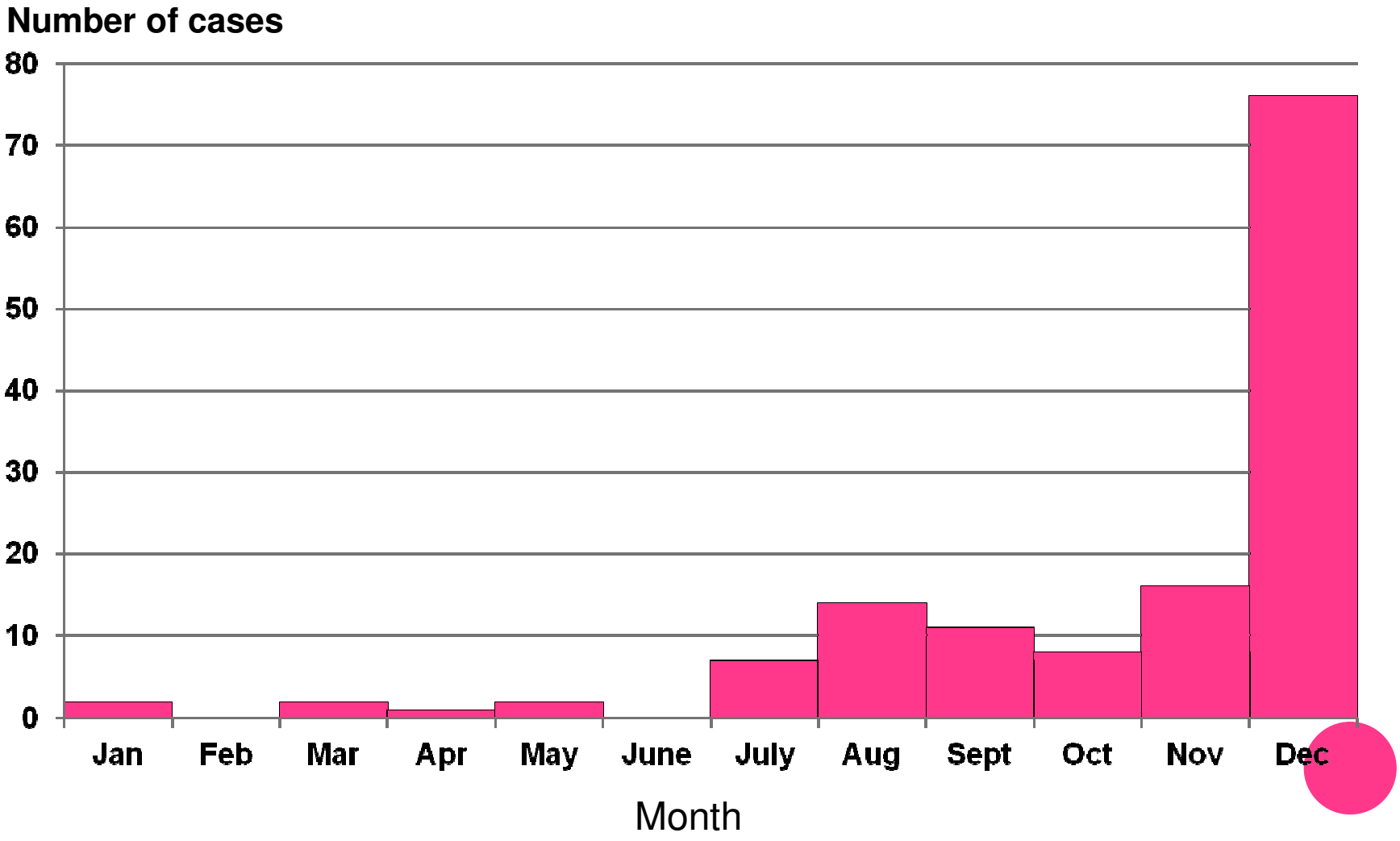
DISTRIBUTION OF CONFIRMED MEASLES NCR, JAN. 1, 2014- JAN. 9, 2014



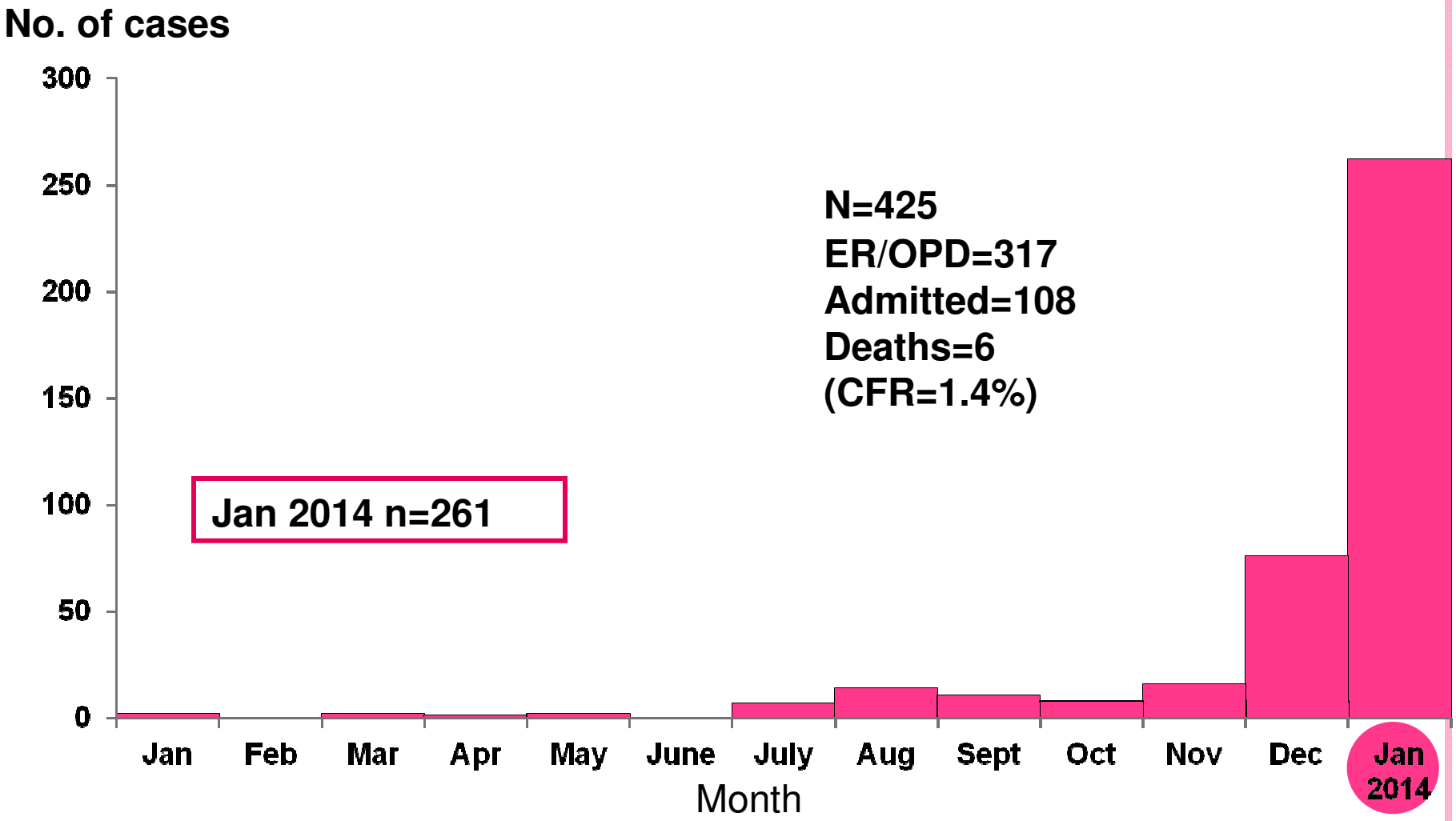
	Caloocan	Las Piñas	Makati	Malabon	Mandaluyong	Manila	Marikina	Muntinlupa	Navotas	Parañaque	Pasay	Pasig	Quezon	Taguig	Valenzuela
Confirmed Measles	57	29	3	14	5	214	3	17	17	56	14	2	36	7	7

Virology Dept, RITM

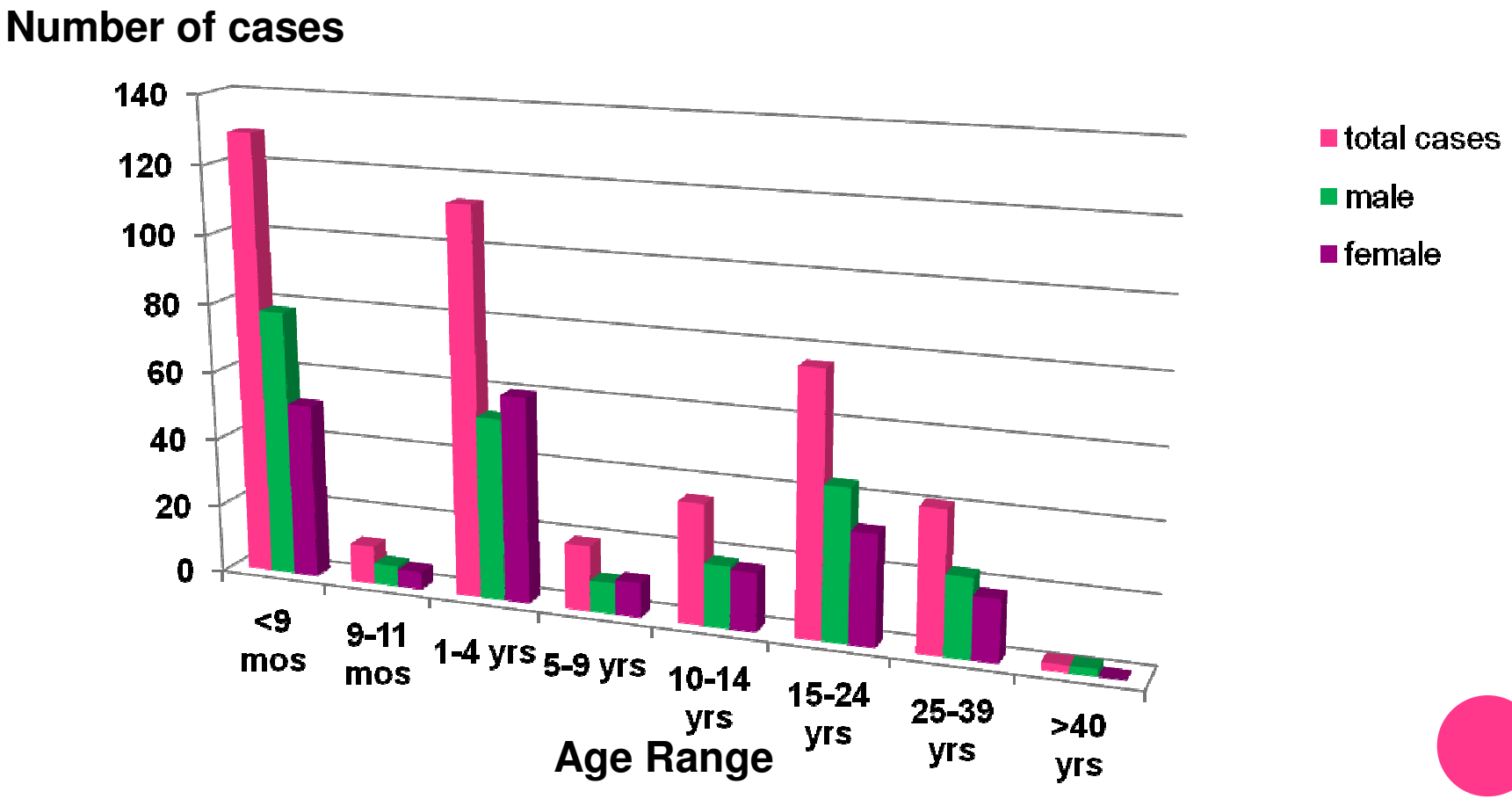
Distribution of Measles Cases by Month, RITM, January-December 2013 (N=164)



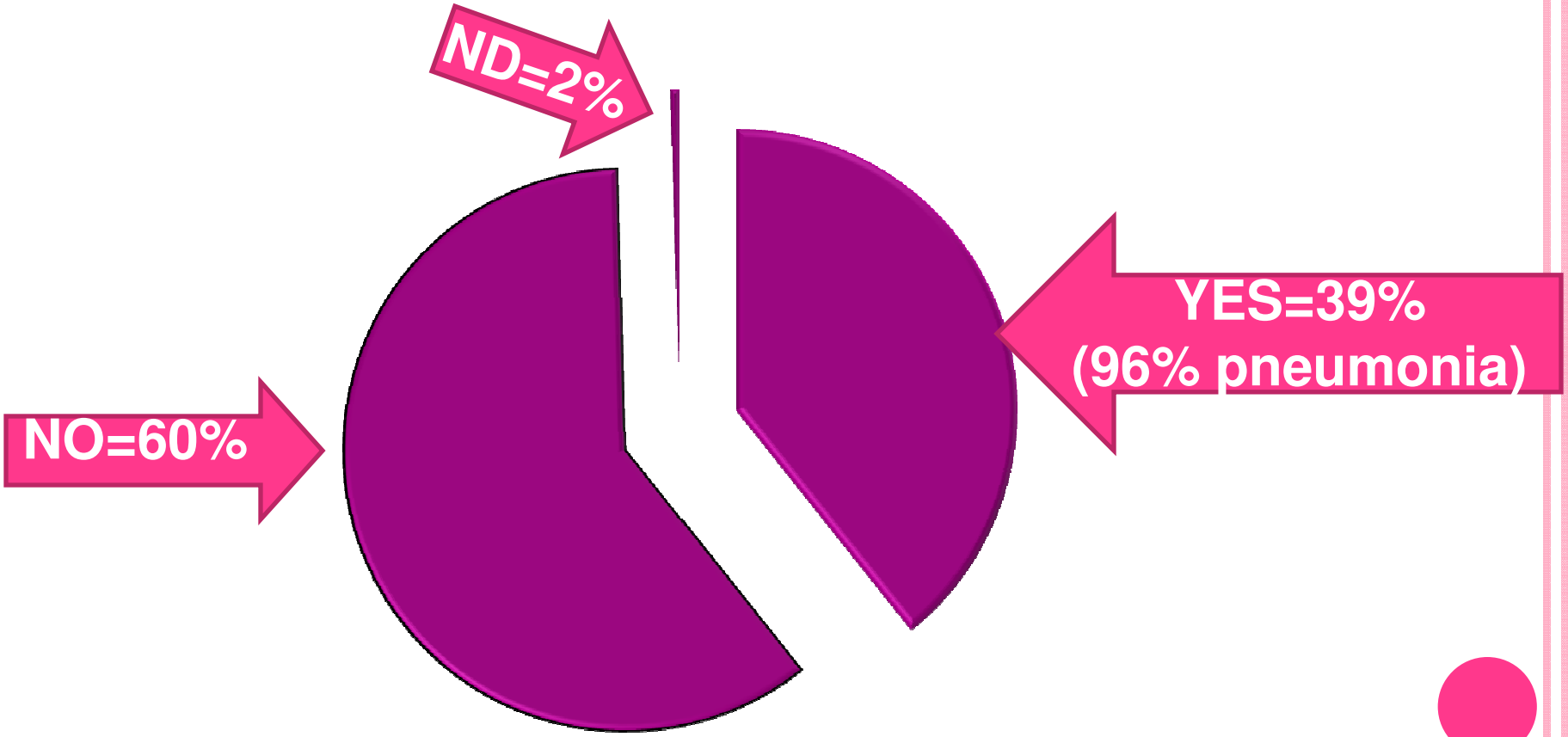
Monthly Distribution of Measles Cases, RITM, Jan. 2013-Jan. 27, 2014



Age and Sex Distribution
RITM, Jan. 2013-Jan. 27, 2014 (N=425)

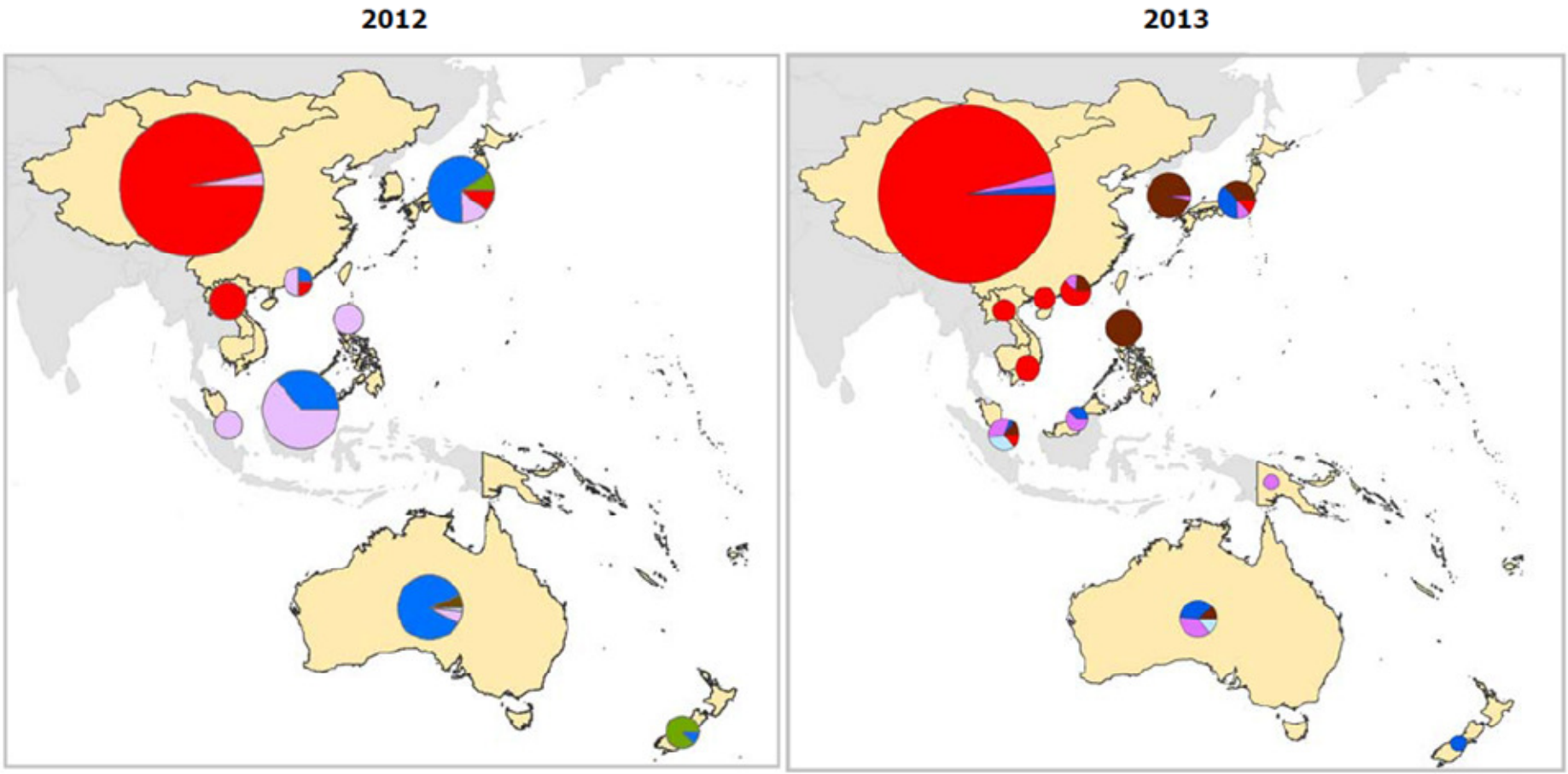


Complications
RITM, Jan. 2013-Jan. 27, 2014
(N=425)



MEASLES GENOTYPE DISTRIBUTION IN WHO-WPRO 2012-2013*

AS OF NOVEMBER 2013



* Size of the pie chart is proportional to the number of genotypes reported by the country

WHO WPRO Measles-Rubella Bulletin Volume 7 Issue 11 (November 2013)

MEASLES GENOTYPE PHILIPPINES 2000-2013

Year	Source	Genotype	Number
2000	Measles IgM+ Serum	**D3**	9
2001	Measles IgM+ Serum	**D3**	6
2002	Measles IgM+ Serum	**D3**	5
2003	Measles IgM+ Serum	**D3**	4
2004	Measles IgM+ Serum	**D3**	1
2005	Measles IgM+ Serum	**----**	None tested
2006	Measles IgM+ Serum		
2007	Measles IgM+ Serum	**D9, G3**	4
2008	Measles IgM+ Serum	**D9**	1
2009	Measles IgM+ Serum	**D9, G3**	11
2010	Measles Virus Isolates	**D9**	8
2011	Measles Virus Isolates	**D9**	24
2012	Measles Virus Isolates	**D9**	5
2013	Measles IgM+ Serum; Measles Virus Isolates	**B3***	33*

For 2013, B3 genotype detected in samples from April to September only (pre-outbreak). NML now working on isolates from October-November and OPS/NPS

• Naoko, et al
• Fuji N, Suzuki A, Saito M, **Centeno R**, Galang H, Lupisan S, Olveda R, Oshitani H. **Interruption of the Circulation of an Indigenous Measles Genotype and the Introduction of Other Genotypes After a Mass Vaccination Campaign in the Philippines.** Journal of Medical Virology 83:1424-1427 (2011)

MEASLES GENOTYPE DISTRIBUTION IN WHO-WPRO 2012-2013*

AS OF NOVEMBER 2013

Country	2012									2013								
	B3	D4	D8	D9	D11	G3	H1	A	Total	B3	D4	D8	D9	D11	G3	H1	A	Total
Australia	8	-	112	8	-	1	-	5	134	4	-	13	13	-	5	-	6	41
Brunei Darussalam	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
Cambodia	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
China	-	-	1	13	-	-	449	6	469	-	-	37	48	-	-	2003	15	2103
Hong Kong (China)	-	-	1	2	-	-	2	1	6	5	-	-	3	-	-	13	-	21
Macao (China)	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	3	-	3
Japan	-	6	44	9	-	-	7	2	68	14	-	14	4	-	-	5	5	42
Lao People's Democratic Republic	-	-	-	-	-	-	13	-	13	-	-	-	-	-	-	5	-	5
Malaysia	-	-	36	64	-	-	-	-	100	-	-	3	5	-	-	-	-	8
Mongolia	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
New Zealand	-	7	1	-	-	-	-	2	10	-	-	1	-	-	-	-	-	1
Papua New Guinea	-	-	-	-	-	-	-	-	0	-	-	-	1	-	-	-	-	1
Philippines	-	-	-	5	-	-	-	-	5	33	-	-	-	-	-	-	-	33
Republic of Korea	-	-	-	-	-	-	-	-	0	55	-	-	2	-	-	-	4	61
Singapore	-	-	-	4	-	-	-	-	4	3	-	1	7	-	7	3	1	22
Viet Nam	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	11	-	11
Pacific island countries and areas	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	0
Total	**8**	**13**	**195**	**105**	**0**	**1**	**471**	**16**	**809**	**114**	**0**	**69**	**83**	**0**	**12**	**2043**	**31**	**2352**

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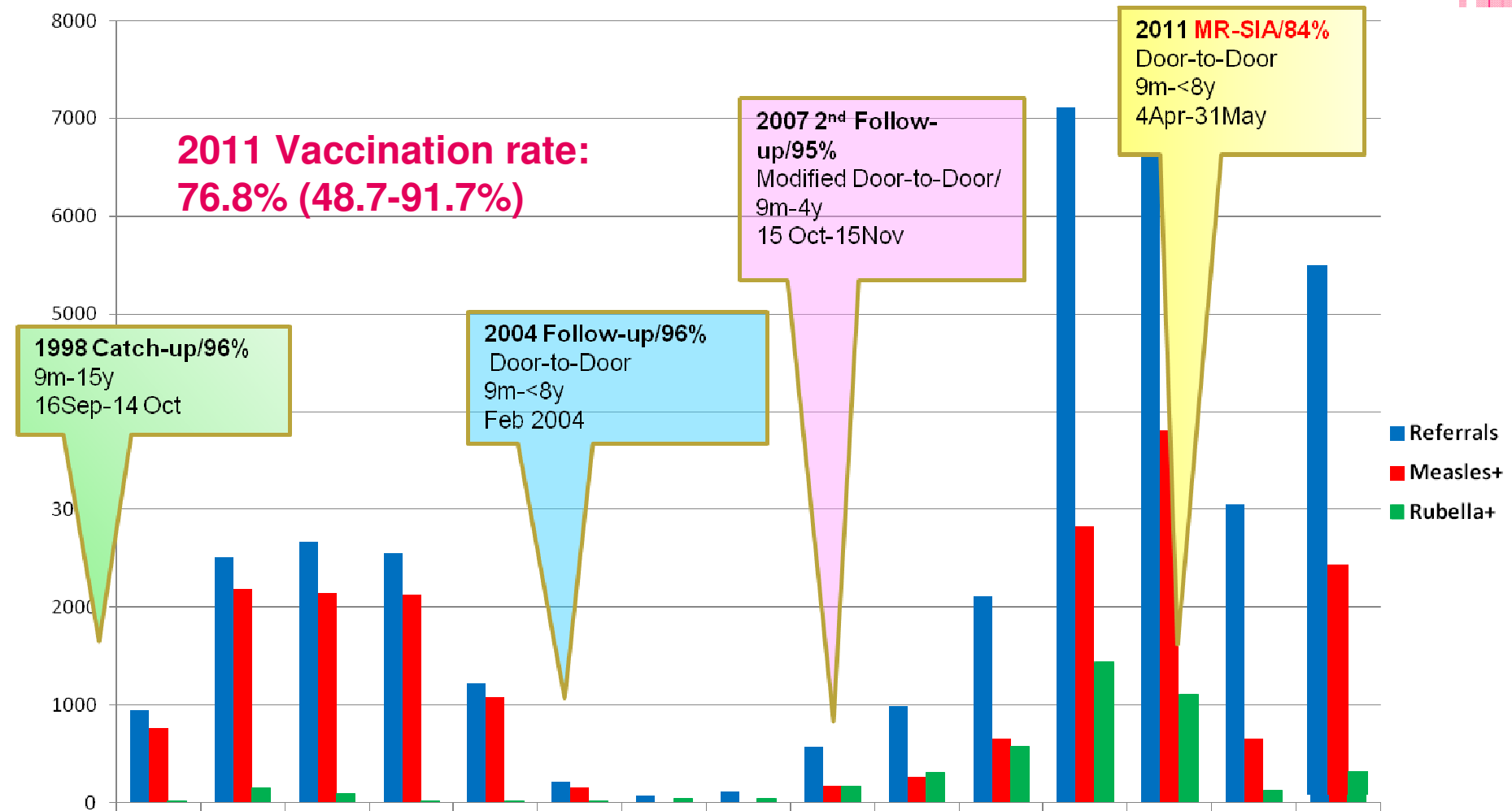
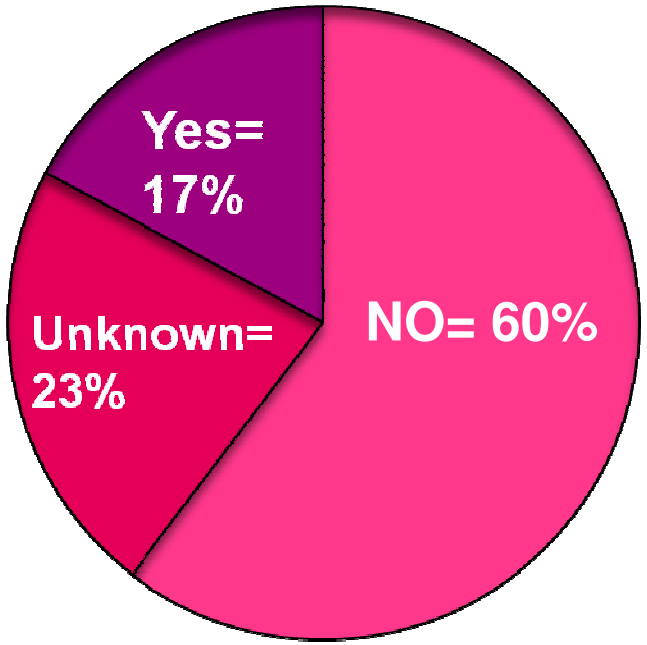
MEASLES & RUBELLA & VACCINATION ACTIVITIES

NATIONAL DATA (1999- AUGUST 2013)



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Referrals	940	2506	2665	2552	1225	221	71	114	566	981	2118	7114	7538	3048	2249
Measles+	758	2193	2143	2124	1081	155	0	3	173	266	659	2826	3807	654	387
Rubella+	25	148	94	27	21	25	46	43	171	309	574	1440	1107	131	89

Immunization Status
RITM, Jan. 2013-Jan. 27, 2014 (N=425)



Reasons for Not Vaccination	Number of Cases
Unspecified	200
Not eligible for vaccination	123
Forgot the schedule	47
Mother was busy	29
Other reasons	12
Child was sick	9
No vaccine available	3
Fear of side effects	2
TOTAL:	**425**

ADVICE TO HCW

- **Surveillance**
  - Suspect measles case: any individual, regardless of age, with the ff: history of fever (temp $\geq$ 38^0C), generalized non-vesicular rash of $\geq$ 3 days duration and at least one of the ff: cough, coryza, conjunctivitis
  - Send specimens for lab confirmation (FREE OF CHARGE)
    - Blood - 2 ml serum taken 4-28 days from onset of rash; allowed to clot in the refrigerator and refrigerated until transport
    - NPS/OPS in VTM - taken within the first 3-5 days after onset of rash; refrigerated until transport
  - Tests - IgM, Virus Isolation, PCR, Genotyping
- **Immunization**
  - DOH - vaccinate children 6 mos to 3 yrs old regardless of previous doses of MV

ACKNOWLEDGEMENTS

- Dr Eric Tayag and staff, National Epidemiology Center
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- Lydia Sombrero/Daryl Almonia, Microbiology Department, RITM
- RITM-Tohoku Research Collaborating Center

THANK YOU VERY MUCH FOR LISTENING