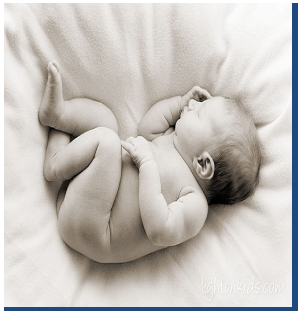
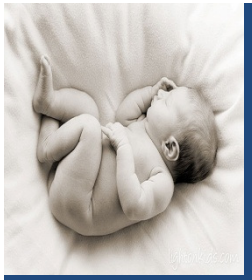


THE YEAR IN REVIEW: PEDIATRIC INFECTIOUS DISEASE HIGHLIGHTS

MAY EMMELINE BOOK-MONTELLANO, MD, FPPS, FPIDSP, FPISMID

Professor of Pediatrics – Department of Child Health, Far Eastern University – Nicanor Reyes Medical Foundation

President – Pediatric Infectious Disease Society of the Philippines

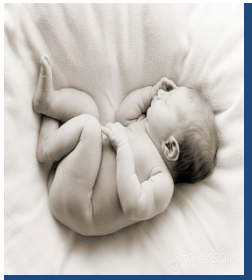


Pediatric Infectious Disease Highlights

I. Antimicrobial Resistance Rates (2007)

II. 2008 Recommendations on Immunizations

III. Infectious Disease Outbreaks in 2008



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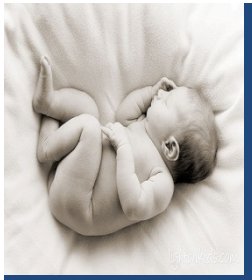
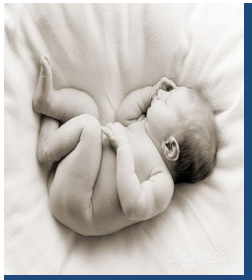


The Antimicrobial Resistance Surveillance Program Progress Report (%)

Enteric Pathogens	Ampicillin (Year) 06	07	Chloram (Year) 06	07	Cipro (Year) 06	07	Cotri (Year) 06	07	Tetracycline (Year) 06	07	Nalidixic Ac (Year) 06	07
S. typhi	0.62	2.3	0.8	0			1	1.7				
Non Typhoidal Salmonella	12	15.5	10	9.7	2	2.9	17	26.9				
Shigella	76	87.5	67	57.1	6	5.3	79	65			0	5.9
Vibrio cholera			0	1			9	1	0	1.9		

The Antimicrobial Resistance Surveillance Program Progress Report
January 2006 – December 2007
Celia C. Carlos, MD



The Antimicrobial Resistance Surveillance Program Progress Report (%)

Staphylococci and Enterococci	Ampicillin (Year) 06	07	Cotrimox (Year) 06	07	Oxacillin (Year) 06	07	Vancomycin (Year) 06	07
Staph aureus			8	4.3	30	30.6	0	0
Staph epidermidis			45	38.6	53	61.7	0	0
Enterococcus faecalis	9	2.6					1	0.5

The Antimicrobial Resistance Surveillance Program Progress Report
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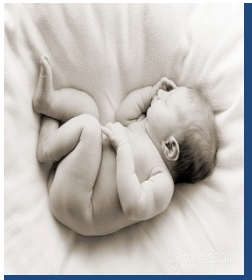

The Antimicrobial Resistance Surveillance Program Progress Report (%)

ARI Pathogens	Penicillin (Year) 06	07	Ampicillin (Year) 06	07	Chloram (Year) 06	07	Cotrimox (Year) 06	07	Co – Amox (Year) 06	07
S. pneumonia	6	0.9			5	5.2	14	18.5		
Haemophilus influenzae			9	11.1	14	8	16	13.4		
Moraxella catarrhalis			15	19.6			59	49.6	5	11.4

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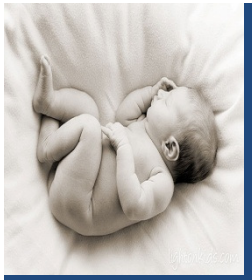
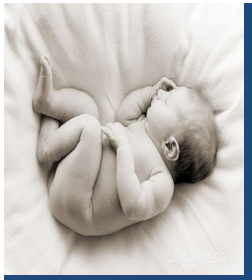


The Antimicrobial Resistance Surveillance Program Progress Report (%)

Enterobacter	Amikacin (Year) 06	07	Ampi-Sulbac (Year) 06	07	Cefuroxime (Year) 06	07	Cefepime (Year) 06	07	Imipenem (Year) 06	07
E. coli	8	9.6	24	23.7	17	23.2	6	13.2		
Klebsiella	15	12.5	30	24.6	29	38	10	6.9	0.6	0.4
Enterobacter	9	10.9					9	11.1	2	2.5

The Antimicrobial Resistance Surveillance Program Progress Report
January 2006 – December 2007
Celia C. Carlos, MD

Pediatric Infectious Disease Scenarios : Unraveling the Complexities
16th Annual Convention of PIDSP, February 4-5, 2009



The Antimicrobial Resistance Surveillance Program Progress Report (%)

Gram negative Nonfermentative bacilli	Amikacin (Year) 06	07	Cefepime (Year) 06	07	Cefta (Year) 06	07	Pip-Tazo (Year) 06	07	Cipro (Year) 06	07	Imipenem (Year) 06	07
Pseudomonas aeruginosa	14	14.2	11	11.9	15	14.8	20	15.1	23	28.3	14	14

Neisseria gonorrheae	Cefixime (Year) 06	07	Ceftriaxone (Year) 06	07	Cipro (Year) 06	07	Spectimomycin (Year) 06	07	Penicillin (Year) 06	07
Neisseria gonorrheae	0	0	0	0	66	56.8	2	0	83	85.6

The Antimicrobial Resistance Surveillance Program Progress Report
January 2006 – December 2007

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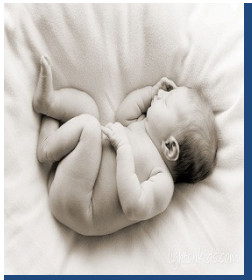

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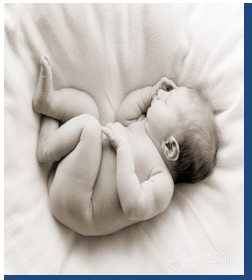
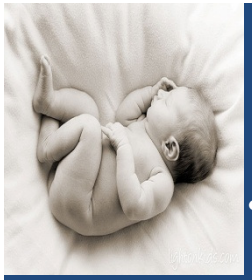


ACIP Expands Influenza Vaccine Recommendations

- The Advisory Committee on Immunization Practices :

  - Recommends routine influenza vaccination to all children between 6 months and 18 years

  - Implementation should take effect as soon as feasible, no later than 2009 to 2010 influenza season

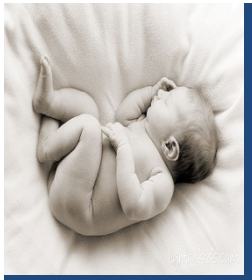


- Strong evidence for the benefit to vaccinated children was sufficient to recommend the change to a universal childhood immunization

- Recommendation was based on several factors :
  - Influenza vaccine is safe and effective for school-aged children
  - Influenza has a number of adverse effects on children in this age group and their contacts
  - Simple age-based influenza vaccine recommendation will improve the current low coverage rate among 50 % of school-aged children who already have either a risk-based or a contact-based indication for annual flu vaccination
  - Reduction of influenza transmission is expected to reduce the incidence of influenza among household contacts and within the community

- Consistent with the ACIP's current recommendation that all people who wish to receive the vaccine may do so

- Discussion on the issue of expanding the universal vaccination recommendation to all adults is being undertaken

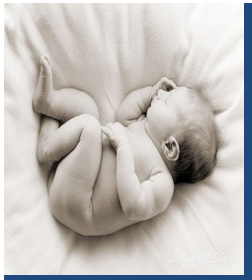


ACIP New PCV7 Recommendations

- The safety and immunogenicity of PCV7 among children 24 to 59 mos of age group, current rates of PCV7-type invasive disease, post-licensure vaccine effectiveness and vaccine coverage rates data are the basis for the following revised recommendations :

  - For all healthy children who have not completed any recommended schedule for PCV7, administer 1 dose of PCV7
  - For all children with underlying medical conditions who have received 3 doses, administer 1 dose of PCV7

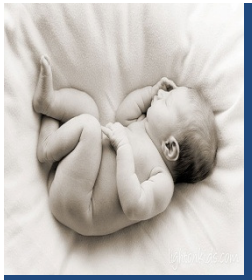
  - For all children with underlying medical conditions who have received fewer than 3 doses, administer 2 doses of PCV7 at least 8 weeks apart



Revised Rotavirus Vaccine Recommendation

- New criteria for administering the first dose and the maximum age for any dose :
  - Minimum age for 1st dose : 6 wks (unchanged)
  - Maximum age for 1st dose : increase from 12 wks to 14 wks and 6 days

    Caution : no vaccine initiation after a child is aged 15 wks, 0 days
  - Final doses should now be administered by the time the child is age 8 mos, 0 days
  - Rotarix 2 doses, Rota Teq 3 doses



Tdap Launched in the Philippines

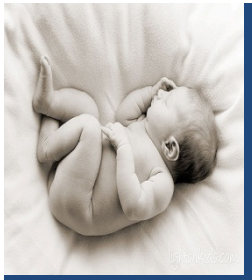
- 2 Tdap vaccines were made commercially available :

  1. For 4 – 18 yr old
  2. For 10 – 64 yr old

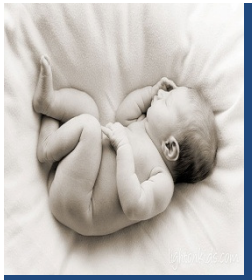
Schedule :

1 dose Tdap if primary series and 2 boosters have been completed

1 dose Tdap as first dose and Td for subsequent doses to complete the series if patient has not received the primary series



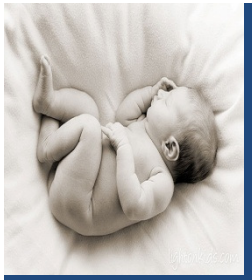
- Vaccination schedule when administering the tetanus-diphteria-toxoids-acellular-pertussis vaccine (Tdap) as booster after the last tetanus and diphteria dose for adolescent age 7-18 yrs have been shortened from 5 years to 2 years



Human Papilloma Virus Vaccine

- Quadrivalent vaccine minimum interval between doses have been established :
  - 4 wks between the 1st and 2nd doses
  - 12 wks between the 2nd and 3rd doses
  - 24 wks between the 1st and 3rd doses

- Recommended schedule :
  - 0, 2 mos, 6 mos

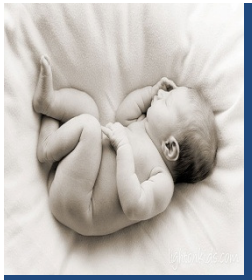


New Guidelines Issued for Tdap Vaccine for Adults

- June 10, 2005

  - Tdap formulated for use in aults and adolescents was licensed in United States for persons aged 11 to 64 yrs

  - Tdap given as a single booster dose to adults proveided immunogenicity against tetanus, diphteria, and pertussis

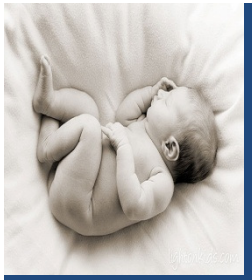


ACIP Recommendations

- Adults aged 19 to 64 yrs
  - Single dose of Tdap if they received the last dose of Td more than 10 yrs earlier and if they have not previously received Tdap
- For booster protection against pertussis, intervals shorter than 10 yrs since the last Td may be used

- Adults having close contact with infant younger than 12 mos such as parents, grandparents younger than 65 yrs should receive a single dose of Tdap. Suggested interval as short as 2 years from the last Td, but shorter interval can be used

- Women should receive Tdap before becoming pregnant, but women who have not previously received Tdap should receive a dose of Tdap in the immediate postpartum period



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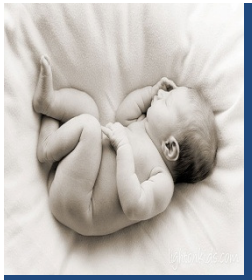
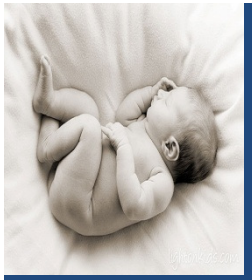


Factors Affecting the Emergence of New Infectious Diseases

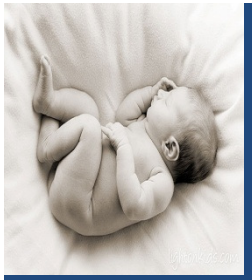
- Environmental changes
  - Global warming
- Shifts in human population
- International travel and commerce

- Changes in technological / industrial practices
- Microbial adaptation
- Breaks (breaches) in public health system



Infectious Disease Outbreaks in 2008

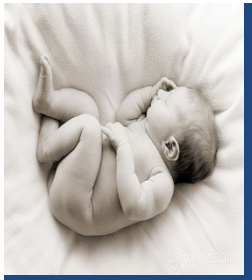
- Philippines
  - January to July
    - Dengue outbreak declared in Tierra Monte Subdivision in Barangay Silangan, San Mateo Rizal
      - 25 cases and 6 deaths
  - January to March
    - Dengue outbreak declared in Zamboanga
      - 406 dengue cases and 2 deaths



Infectious Disease Outbreaks in 2008

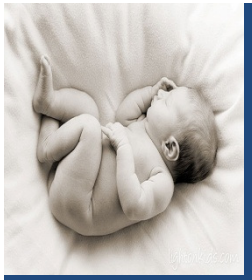
- Philippines

  - August
    - Suspected cholera outbreak in Palimbang town, Sultan Kudarat province
    - 71 cases; 21 deaths
    - Contaminated water supply and poor sanitation



Infectious Disease Outbreaks in 2008

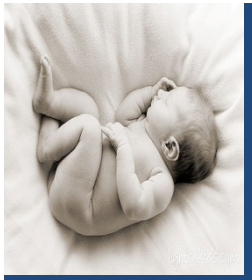
- Philippines – Typhoid fever outbreaks
  - May
    - Guadalupe, Maasin City, Southern Leyte
      - 20 cases
  - June
    - Villareal, Samar, E. Visayas
      - 43 cases; 1 death
    - Abuyog, Leyte
      - 48 cases
    - San Miguel village, Eastern Samar
      - 25 cases



Infectious Disease Outbreaks in 2008

- Philippines – Typhoid fever outbreaks

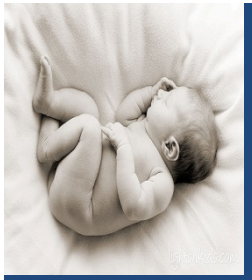
  - November
    - Northeast of Manila
      - 109 cases
      - Contaminated water, no chlorination is being done



Ebola-Reston Virus Detected in Pigs in Philippines

- Samples of pig tissues, sera and cell cultures collected from the pig farm outside Manila

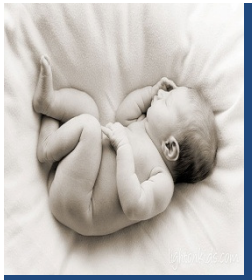
- Foreign Annual Disease Diagnostic Lab (FADDL), Plum Island, NY identified multiple sirine pathogens, Porcine reproductive and respiratory syndrome virus, Porcine circovirus type 2 and Ebola-Reston virus



Ebola-Reston Virus Detected in Pigs in Philippines

- CDC confirmed the presence of Ebola- Reston virus similar to the Ebola-Reston virus that infected monkeys from the Philippines imported to the US for research in 1989, 1990 and 1996, and into Italy in 1992

- The clinical significance of Ebola-Reston virus in pigs is unknown
- Apparent disease due to infection with Ebola-Reston has never been documented in human



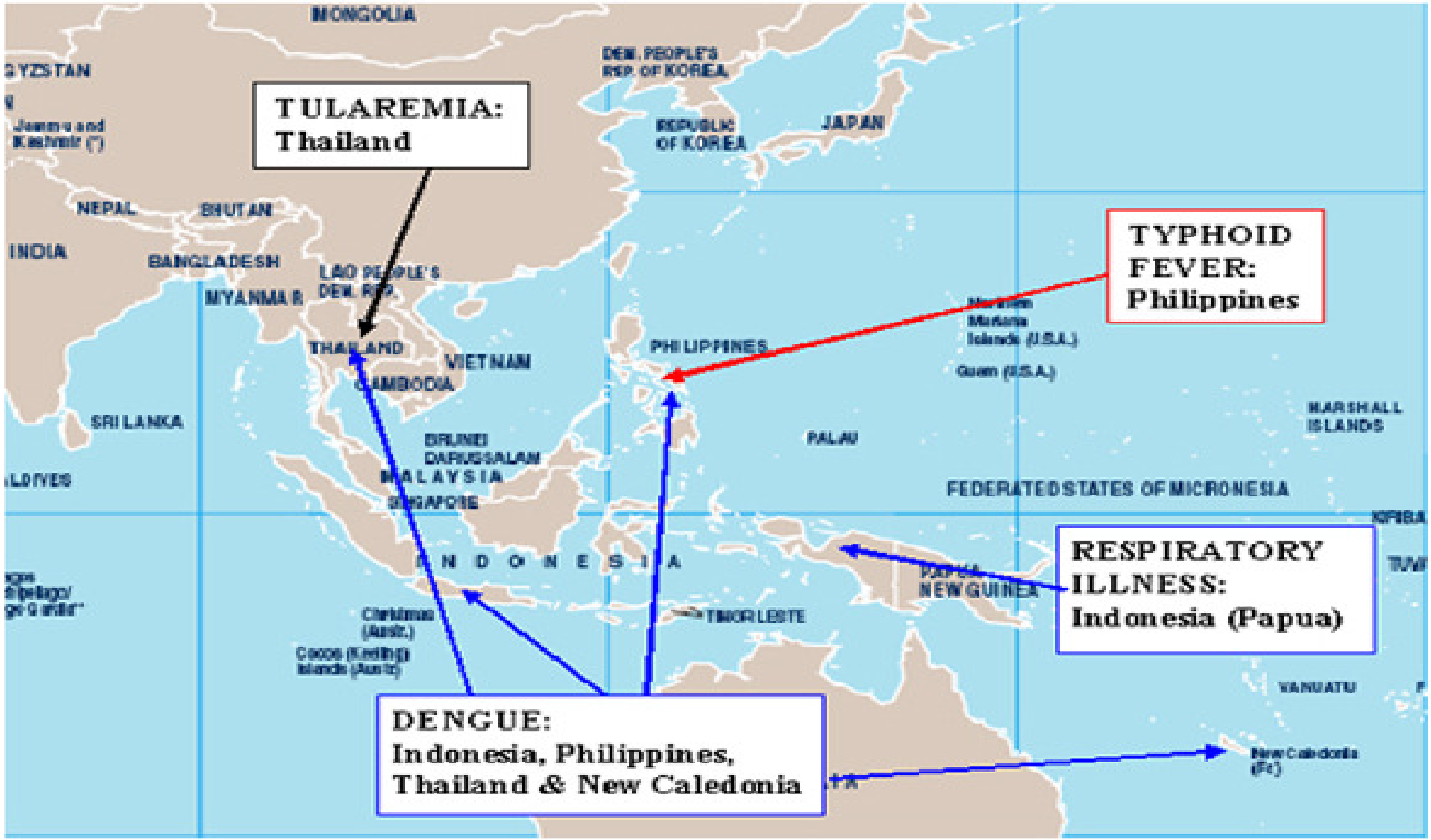
Infectious Disease Outbreaks in 2008

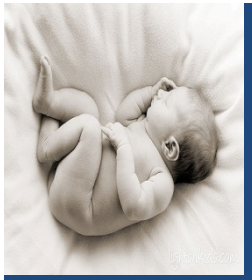
- Jan 1 – May 9, 2008 :
  - 61.459 children contracted Hand, Foot and Mouth Disease caused by enterovirus 71 (EV 71)
  - 43 children died
  - Concentrated in Fuyang City, the eastern part of the Anhui province

Oct, 2008 :

- 113 contracted HMFD
- 3 infants died, all under 1 year of age
- Fujian province

Disease Outbreaks in South East Asia and the Western Pacific Region – International Surveillance Report 2008



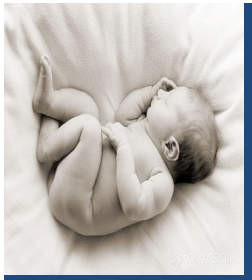


Influenza (AVIAN)

- March 15 to 28

  - WHO : Confirmed one human H5N1case worldwide from Vietnam

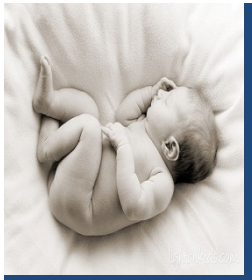
  - The case had contact with sick and dead poultry prior to the onset of his illness



Japanese Encephalitis : United States (ex Cambodia / Vietnam)

- January 2008

  - Unvaccinated 9 year-old boy from US was infected with JE while travelling with his family in Vietnam and Cambodia
  - 10,000 to 50,000 cases reported annually
  - Incidence 1 to 10 : 10,000

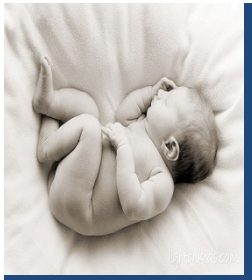


Dengue Fever : Philippines, Brazil, Indonesia, Thailand

- Brazil
  - Rio de Janiero
  - 32, 615 cases ; 49 deaths

South East Asia and the Western Pacific
Indonesia

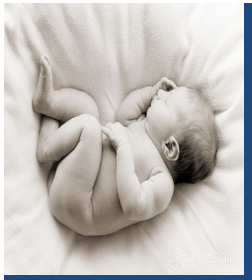
- Continue to be reported across these regions



Polio

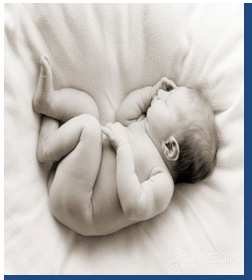
- March
  - Global Polio Eradication Initiative (GPEI) reported 77 of confirmed cases of wild poliovirus in India, Nigeria and Pakistan

  - The GPEI declared Somalia polio-free country
    - An intensive eradication programme was implemented in 2007



Salmonella Outbreaks

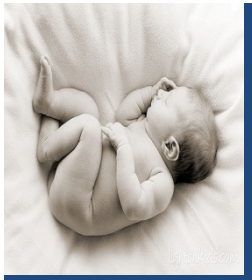
- February
  - UK, Ireland, Finland, Sweden and France
    - An outbreak of gastroenteritis – S. agona
    - Source : meat plant in Ireland
  - Sweden
    - Limited to animal involvement
    - Found infected by S. reading
    - It was decided to destroy 700 calves, lambs, and bulls



Salmonella Outbreaks

April and July

- US (43 states and the District of Columbia) and Canada
  - 1,300 persons infected with S. Saintpaul
  - Source : raw tomatoes, fresh jalapeno peppers and fresh cilantro

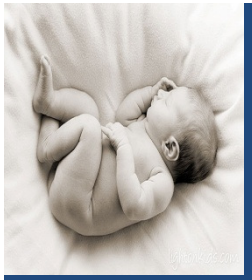


Peanut Butter Salmonella Outbreaks

- January 2009

  - 486 people sickened in 43 US states and one Canadian province
    - 107 hospitalization; 6 deaths

  - Peanut butter from Connecticut plant, Minnesota, Blakely plant

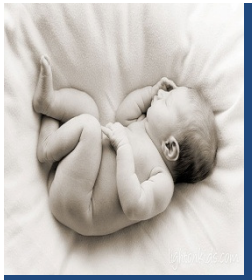


Peanut Butter Salmonella Outbreaks

- January 2009

  - How can intensely processed foods contain living bacteria ?

    - A curious phenomenon of the organism :
      - Heating to a proper temperature kills salmonella, but only if the bacteria are in a moist place
      - When in a product relatively free of water, such as peanut butter, the bacteria can survive heating

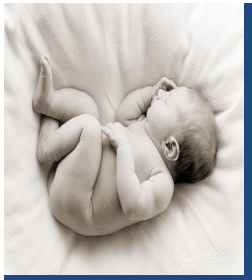


Serious Invasive CA-MRSA Infections
A Growing Concern

- CA – MRSA infections associated with clinical manifestations of :
  - Venous thromboses
  - Pyomyositis
  - Meningococcal disease

- Not seen previously in serious staphylococcal infections in children

Sheldon L. Kaplan, M.D.
Infectious Disease in Children, July 2008

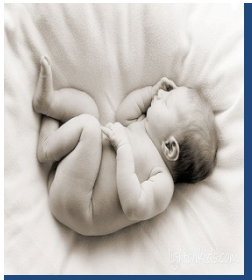


- Patients with CA-MRSA experience
  - Longer duration of fever
  - Prolonged hospital stay
  - More complicated clinical course

- CA-MRSA with osteomyelitis, venous thrombosis and prolonged fever are more commonly seen in patients with isolates containing genes encoded with Panton – Valentine leukocidin

- 15 % tendency for multiple sites of infection

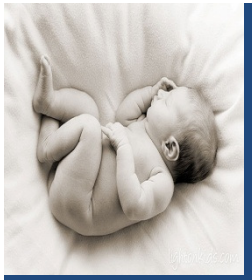
Bocchini C, et.al
Staphylococcus aureus Osteomyelitis in Children
Pediatrics, 2006



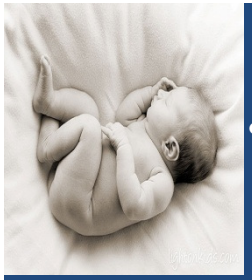
Diagnosis

- MRI and Bone Scintigraphy - For diagnosis and in determining therapeutic interventions
- In acute hematogenous osteomyelitis, MRI is the imaging modality of choice
  detects thrombosis or pyomyositis that will generally not be detected by any other imaging studies
- 98 % efficacy rate of MRI vs 53 % efficacy rate of Bone Scintigraphy diagnosed with CA-MRSA

Optimal Imaging Strategy for CA – Staph aureus Musculoskeletal Infection in Children
Pediatric Radiology, 2008



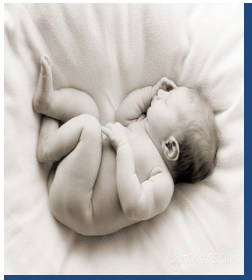
- Treatment
  - AAP Guidelines recommend vancomycin for initial management of severe and critically ill patients
    - » No large studies exist involving children regarding serious CA-MRSA infection treatments
  - American Thoracic Society recommends linezolid as an alternative to vancomycin for treating MRSA ventilator-associated pneumonia. Linezolid is comparable with vancomycin for the treatment of gram-positive infections in children
    - » No data exist on the efficacy of linezolid in treating pediatric patients with pneumonia or osteomyelitis



- Kaplan suggested that pediatric trials be conducted to determine the value of the following possible treatment options:
  - Establishing vancomycin MIC's and E-tests for all Staph aureus isolates
  - Establishing higher vancomycin troughs for children
    - Increase in MIC's correlates with treatment failure in adult patients with < 15 mcg/mL of vancomycin
    - No pediatric data available to determine the need to increase the trough levels of vancomycin between 15mcg/mL and 20 mcg/mL for serious infections
  - Facilitating routine echocardiograms for patients with prolonged bacteremia
  - Combination therapy with vancomycin or daptomycin with clindamycin or linezolid to inhibit protein synthesis. Clindamycin remains an important option for treating serious non-endovascular infections in children due to susceptible isolates

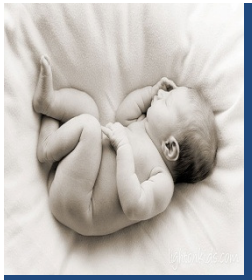
- IDSA is drafting MRSA treatment guidelines to be available in about 12 months

Serious Invasive Infections Caused by Community-Acquired Methicillin-Resistant Staph aureus
Kaplan SL, May, 2008



Thank you

Pediatric Infectious Disease Scenarios : Unraveling the Complexities
16th Annual Convention of PIDSP, February 4-5, 2009



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