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Macomb County Health Department

COMMUNICABLE DISEASE NEWSLETTER

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MEASLES (Rubeola)

Measles is back! During the first 19 weeks of 2011, 118 cases of measles were reported in the US – the highest number for the same period since 1996[1], according to a CDC Report on Measles in the MMWR. Measles transmission occurred in households, child care centers, shelters, schools, hospital emergency departments, and a large community event.

Measles is an acute, highly communicable viral illness (caused by a virus in the family Paramyxoviridae, genus *Morbillivirus).* Humans are the only reservoir for the measles virus. Measles virus infection is characterized by a prodromal fever and malaise; the ***3-C's*** – cough, coryza and conjunctivitis; and maculopapular rash beginning on the face then becoming generalized. Koplik's spots (small spots with bluish-white centers on an erythematous base, located on the buccal mucosa) are pathognomonic of measles.

The average incubation period for measles is 14 days (range = 7-21 days). **Persons with measles are considered infectious from 4 days before until 4 days after onset of the rash.** Rash onset date is the definitive marker for public health contact investigation.[1] All infected people develop symptoms; and there are no chronic carriers.

Laboratory confirmation of measles is made by detection of measles-specific serum IgM antibodies, isolation of measles virus, or detection of measles virus RNA by nucleic acid amplification in nasopharyngeal or oropharyngeal swabs, nasal aspirates, throat washes, or urine.

Measles is usually mild, but can result in complications. During 1987-2000, in the United States, 29% of measles cases developed some complication, with 19% requiring hospitalization and 0.3% died. The most severe sequela of measles virus infection is **subacute sclerosing panencephalitis (SSPE)**, a fatal disease of the central nervous system that generally develops 7-10 years after infection. The risk of SSPE was estimated to be 6.5-11 cases per 100,000 cases of measles, and the risk may be higher when measles occurs before the second year of life.[2] During a resurgence of measles during 1989-91, over 100 deaths occurred and in the years that followed, we witnessed the return of SSPE.

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1 CDC. Measles. In: epidemiology and prevention of vaccine preventable diseases. 10th ed. Atkinson W, Hamborsky J et al, eds. Washington DC: P.H. Foundation; 2007; 129-48

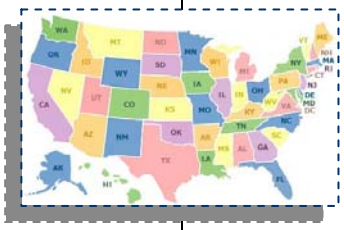
2 Bellini WJ, Rota JS, et al. Subacute sclerosing panencephalitis: more cases of this fatal disease are prevented by measles immunization. *J Infect Dis* 2005; 192:1686-93

Measles can be prevented by vaccination with live attenuated measles vaccine generally given as combined Measles, Mumps and Rubella vaccine, MMR. Current CDC/ACIP recommendations advise a routine 2-dose measles vaccination schedule – the initial dose at 12-15 months and the second dose given at school entry at 4-6 years. In 2010, Michigan's estimated coverage for 1 or more doses of MMR in children aged 19-35 months was 91.1+3.8 %. However, 95% vaccine coverage is considered the level for community-wide prevention of Measles transmission.

In 1998 a British medical researcher reported "findings" (which garnered intense media coverage) that there was a link between measles vaccine and autism. Numerous subsequent studies have determined the fraudulent nature of his report, and have shown no such correlations, but the misinformation persists. In Macomb County, **4015 (60%)** of the 6687 students/childcare attendees with valid vaccine waivers, are waivered for a measles containing vaccine.*

Measles in USA (for 1st 19 weeks of 2011) **

Outbreaks 2011	9 outbreaks accounted for 58 (49%) of 118 cases - Median # of cases = 4 Range of number of cases per outbreak = 3-21 In 6 outbreaks – index case acquired measles abroad. In 3 outbreaks – source could not be determined.
Number of reported cases	**118 cases from 23 States and New York City** 105 (89%) were unvaccinated persons **45 US residents aged 12 mths – 19 yrs** 39 (87%) of 12 mth -19yr olds were unvaccinated. 24 - parents claimed religious or personal exemption 8 - missed opportunities for vaccination **42 US residents aged 20 years and older** 35 (83%) of 20 yrs & older were unvaccinated 6 - declined vaccination (philosophical objections) **33 US residents were vaccine-eligible & had traveled abroad** 30 were unvaccinated 1 had received only 1 of the 2 recommended doses
Age group of cases	**Range: 3 months – 68 years** Under 12 months = 18 (15%) – ***not yet eligible for vaccination*** 1 – 4 years = 24 (20%) 5 – 19 years = 23 (19%) 20 years or older = 53 (45%)
Hospitalizations	**47 (40%) of 118 cases** *(46 were unvaccinated; 1 had received 1 dose of vaccine)* Complications: 9 - pneumonia, 0 - encephalitis, 0 - deaths. Hospitalization rates (age <5 years) = 52% Hospitalization rates (age >5 years) = 33%
Import-associated cases	**105 (89%) cases; *source of 13 cases could not determined.*** 46 imported from >15 countries (mainly in Europe & SE Asia) - 34 were in US residents traveling abroad. 49 were import-linked 10 were imported virus cases



TAKE-AWAY MESSAGES

1. Measles is highly infectious and can result in severe complications, even in death.
2. Unvaccinated children who develop measles put others in their community at risk (especially infants too young for routine vaccination, and persons with medical contraindications).
3. Measles is preventable, and Measles vaccine is safe and effective.
4. Maintaining high immunization coverage rates with MMR vaccine is the cornerstone of outbreak prevention.
5. Health care providers should suspect measles in persons presenting with "fever with rash and the 3-Cs" who have recently traveled abroad or have contact with travelers.
6. Rapid diagnosis by health care providers and control efforts by public health authorities limit the size of outbreaks.

* Macomb County Health Department: Immunization Waiver Database

** CDC. Measles – United States, January-May 20, 2011; MMWR 2011;60:666-668.

ACTIVE TUBERCULOSIS IN MACOMB COUNTY, 1996-2010
Part I of III:
Excerpts from: A Review of TB Program Data, 1996-2010

Highlights of the 2006-2010 Report – Part I

1. **Case rates**: During the 3-year period 2008-2010, average annual TB case rate declined from 2.2 per 100,000 persons to **0.9 per 100,000 persons**, representing a 59.1% decrease from the 3-year period 2005-2007 (***Chart 1***).
   - Asians have the highest case rate (18.7 per 100,000 persons) among the racial groups (***Table 2***).
   - The average annual TB case rate was 9.7 per 100,000 for foreign-born persons and 0.5 per 100,000 for US-born persons (***Table 2***).
   - The TB case rate among Blacks or African-Americans (2.5 per 100,000) exceeded the overall average County rate of 1.3 per 100,000 (***Table 2***).

TUBERCULOSIS

Tuberculosis, or TB, is an infectious bacterial disease caused by *Mycobacterium tuberculosis* and most commonly affects the lungs (pulmonary TB). Tuberculosis is transmitted from person-to-person via droplets from the throat and lungs of people with the active respiratory disease. In healthy people, infection with *M. tuberculosis* often causes no symptoms, since the person's immune system acts to "wall off" the bacteria, producing latent tuberculosis infection (or LTBI). The symptoms of active TB disease of the lungs are coughing, sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweats. **Tuberculosis is treatable with a six-month course of antibiotics** (*Source:* http://www.who.int/topics/tuberculosis/en/).

The most cost-effective public health measure for the control of tuberculosis is the identification and cure of active, infectious TB cases, that is, patients with smear-positive pulmonary TB. The strategic plan for the elimination of TB issued in 1989 by CDC and the Advisory Committee for the Elimination of Tuberculosis (ACET) set a goal for the USA of TB elimination (less than one case per 1 million population) by 2010 and an interim target case rate of 3.5 per 100,000 population by 2000. These goals have not been met.

CDC / ACET

Goal: Elimination of tuberculosis (*<1.0 case per 1,000,000 population*)

2010 Target: 3.5 new cases per 100,000 population.

USA Achievement 2008-2010

4.0 new cases per 100,000 population – NOT MET!!

CASE DEFINITIONS

The diagnosis of tuberculosis refers to the recognition of an active case, i.e. a patient with symptomatic disease due to *M. tuberculosis.* Beyond the diagnosis of TB disease, the type of TB case should also be defined to allow appropriate treatment to be given and the outcome of treatment evaluated.

Case of tuberculosis: A patient in whom TB has been bacteriologically confirmed or diagnosed by a clinician. ***Note***: *Any person given treatment for tuberculosis should be recorded as a case*.

Confirmed case of tuberculosis: A patient with positive culture for the *M. tuberculosis* complex.

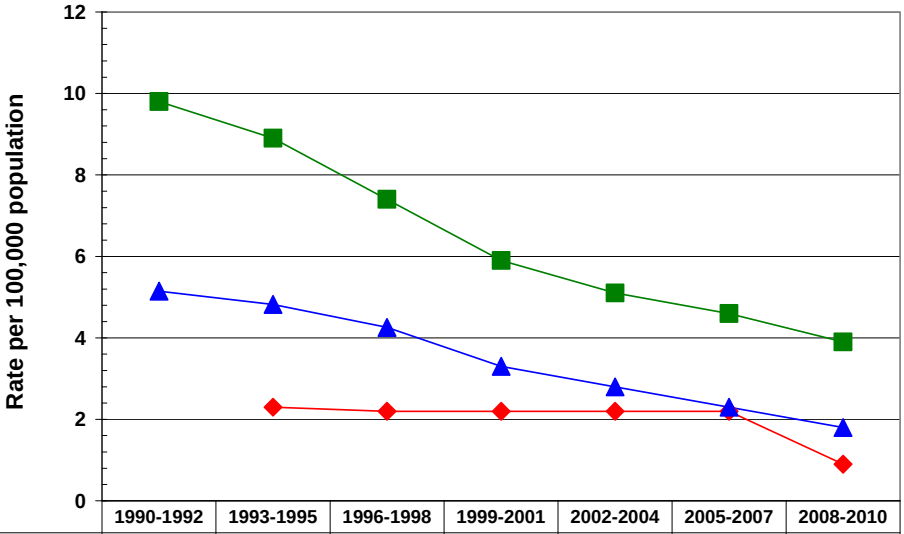
Pulmonary tuberculosis refers to disease involving the lung parenchyma. A patient with both pulmonary and extra-pulmonary TB is classified as a case of pulmonary TB.

Extra-pulmonary tuberculosis refers to tuberculosis of organs other than the lungs, e.g. pleura, lymph nodes, abdomen, genitourinary tract, skin, joints, bones, and meninges. Diagnosis should be based on one culture-positive specimen, or histological or strong clinical evidence consistent with active extra-pulmonary TB, followed by a decision by a clinician to treat with a full course of tuberculosis chemotherapy.

TB INCIDENCE IN MACOMB COUNTY

The overall 3-year average TB incidence rate of 2.2 per 100,000 persons in Macomb County remained steady over the period 1993-2007, and then decreased to 0.92 per 100,000 for the period 2008-2010. The 3-year average TB rate per 100,000 persons also declined during the 2008-2010 period at the Michigan state level (from 2.3 to 1.8) and USA national level (from 4.6 to 3.9) – (***Chart 1*** below).

Chart 1: TB Case Rates 1990-2010; US, MI and Macomb County



	1990-1992	1993-1995	1996-1998	1999-2001	2002-2004	2005-2007	2008-2010
Macomb County		2.3	2.2	2.2	2.2	2.2	0.9
United States of America	9.8	8.9	7.4	5.9	5.1	4.6	3.9
State of Michigan	5.15	4.82	4.26	3.3	2.8	2.3	1.8

The overall number of TB cases for 3-year periods in Macomb County remained steady at 52-55 persons over the period 1993-2007, and then decreased to 23 persons for the period 2008-2010. For the State of Michigan, the numbers decreased from 1,451 in 1990-92 to 532 in 2008-2010 (***Table 1***).

Table 1: New Reported Tuberculosis Cases in Macomb County, Michigan & USA; 1996-2010 (by 3-year periods)

GEOGRAPHIC AREA	1990-1992	1993-1995	1996-1998	1999-2001	2002-2004	2005-2007	2008-2010
Macomb County		52	54	55	52	53	23
			Mid-period Population Est. (1 Jul 2009)			**831,427**	
State of Michigan	1,451	1,370	1,201	968	830	693[#]	532**
			Mid-period Population Est. (1 Jul 2009)			**9,969,727**	
United States of America	78,657	72,040	59,248	49,756	44,406	41,078	35,632*
			Mid-period Population Est. (1 Jul 2009)			**307,006,550**	

* 2008–2009 data for USA *(SOURCE: CDC, Reported Tuberculosis in the United States, 2009*) [#] MDCH 2007 Report
** SOURCE: Weekly Surveillance Report 2008-2010, MDCH

Healthy People 2010

Objective 14.11: Reduce tuberculosis

Target: 1.0 new cases per 100,000 population.

Macomb County Achievement 2008-2010

0.9 new cases per 100,000 population – MET!!!

Table 2: TB Case Rate by Race & Birth Origin for Macomb County in 2006-2010

RACE	Number of TB Cases	Est. Mid-point Population (2005-09)*	5-year TB Case Rate (per 100,000)	Avg. Annual TB case Rate (per 100,000)
Asian	24	25,625	93.7	18.7
Black	7	55,197	12.7	2.5
White	25	727,799	3.4	0.7
BIRTH ORIGIN				
Foreign	38	78,187	48.6	9.7
US	18	745,689	2.4	0.5
TOTAL MACOMB	**56**	**831,427**	**6.7**	**1.3**

* Source: 2005-2009 American Community Survey 5-Year Estimates

The average annual TB case rate for Macomb County in the 5-year period 2006-2010 was 1.3 per 100,000 reflecting the more recent decline in rates. Asians have the highest case rate (18.7 per 100,000 persons) among the racial groups, with Blacks also having a higher than average TB case rate of 2.5 per 100,000 persons. Whites have a TB case rate of 0.7 per 100,000 persons (***Table 2***).

The average annual TB case rate was 9.7 per 100,000 for foreign-born persons and 0.5 per 100,000 for US-born persons (***Table 2***).

TUBERCULOSIS DISEASE CLASSIFICATION

The source of infection of *Mycobacterium tuberculosis* is people with TB affecting the lungs (i.e. pulmonary TB). Defining the smear result in pulmonary cases is therefore very important in order to:

1. Identify smear-positive cases, because they are the most infectious cases and usually have higher mortality;
2. Record, report and evaluate program performance (smear-positive cases are the cases for which bacteriological monitoring of treatment progress is most practicable).

Pulmonary tuberculosis, sputum smear-positive is classified based on:

a) Two or more initial sputum smear examinations positive for acid-fast bacilli (AFB), or
b) One sputum smear examination positive for AFB plus radiographic abnormalities consistent with active PTB as determined by a clinician, or
c) One sputum smear positive for AFB plus sputum culture positive for *M. tuberculosis.*

Pulmonary tuberculosis, sputum smear-negative is defined as a case of pulmonary TB that does not meet the above definition for smear-positive TB. This includes cases without smear result, which should be exceptional in adults but are relatively more frequent in children. In keeping with good clinical and public health practice, diagnostic criteria for sputum-negative pulmonary TB should include:

a) At least three sputum specimens negative for AFB, and
b) Radiographic abnormalities consistent with active pulmonary TB, and
c) No response to a course of broad-spectrum antibiotics, and
d) Decision by a clinician to treat with a full course of anti-tuberculosis chemotherapy.

World Health Organization

Objective: Proper application of diagnostic criteria for TB

Target: Smear-positive pulmonary TB cases represent at least 65% of the total of pulmonary TB cases in adults, and 50% or more of all TB cases.

Macomb County Achievement 2006-2010

Smear-positive pulmonary TB cases represent 54.3% of pulmonary TB cases

Smear-positive pulmonary TB cases represent 44.6% of all TB cases

NOT MET!!!

During the period 2006-2010, pulmonary tuberculosis accounted for 82.1% of all reported TB cases.

Table 3: Pulmonary and Smear- positive Pulmonary TB, Macomb County 1996 - 2010

INDICATOR	1996-2000	2001-2005	2006-2010
Total TB cases	**88**	**93**	**56**
Pulmonary	**69**	**66**	**46**
Extra-pulmonary	**19**	**27**	**10**
% Pulmonary Cases	***78.4%***	***71.0%***	***82.1%***

INDICATOR	1996-2000	2001-2005	2006-2010
% Extra-pulm. TB	*21.6%*	*29.0%*	*17.9%*
PULMONARY TUBERCULOSIS CASES			
Sputum AFB +ve	**42**	**28**	**25**
Sputum AFB -ve	**26**	**28**	**15**
Sputum not done	**1**	**10**	**6**
% Sputum AFB not done	*1.4%*	*15.2%*	*13.0%*
Sputum AFB +ve as % of Pulm. TB Cases	*60.9%*	*42.4%*	*54.3%*
Sputum AFB +ve as % of ALL TB cases	*47.7%*	*30.1%*	*44.6%*

For the period 2006-2010, there were 56 reported TB cases, averaging 11 cases per year. Extra-pulmonary TB cases decreased to 17.9% of all reported cases during the period (***Table 3***).

DATA AND REFERENCE SOURCES

1. Macomb County Health Department TB Program Report, 1996-2000
2. TB Case Report Data 2001-2010; TB Control Program, Macomb County Health Department.
3. Macomb County Health Department, Tuberculosis Program Policies and Procedures Manual (March 2005).
4. CDC MMWR – June 9, 2000 / Vol. 49 / No. RR-6. Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection.
5. American Thoracic Society: Diagnostic Standards and Classification of Tuberculosis in Adults and Children; Am J Respir Crit Care Med, Vol 161. pp 1376-1395, 2000.
6. WHO/CDS/TB/2003.313 Treatment of Tuberculosis: guidelines for national programmes, third edition.
7. American Thoracic Society/Centers for Disease Control and Prevention/Infectious Diseases Society of America: Treatment of Tuberculosis; Am J Respir Crit Care Med, Vol 167. pp 603-662, 2003.
8. Michigan Advisory Committee for Elimination of Tuberculosis. www.michigantb.org/epi/
9. CDC. Reported Tuberculosis in the United States, 2009. Atlanta, GA: U.S. Department of Health and Human Services, CDC, October 2010.

Note: To see the entire report, Active Tuberculosis in Macomb County 1996-2010: A Review of TB Program Data 1996 – 2010, please access the Health Department's TB Control Program webpage at www.macombcountymi/publichealth/hpdc/hpdc_TB.htm

Macomb County Health Department Reportable Diseases Summary

Diseases Reported - Note: Cumulative total for previous years; year-to-date for **SEPTEMBER** 2011

	2011	2010	2009		2011	2010	2009
AIDS	11*	26*	49*	**KAWASAKI SYNDROME**	3**	6**	4
AMEBIASIS	0	1	1	**LEGIONNAIRE'S DISEASE**	24	33	16
BLASTOMYCOSIS	0	0	0	**LISTERIOSIS**	1	0	3
BOTULISM (FOODBORNE)	0	0	0	**LYME DISEASE**	2**	0	0
BOTULISM (INFECTIOUS)	0	0	0	**MALARIA**	1	0	1
BRUCELLOSIS	1	0	0	**MEASLES**	0	0	0
CAMPYLOBACTER	97**	132**	46	**MENINGITIS VIRAL**	55**	75**	71
CHICKENPOX	34	98	120	**MENINGITIS BACTERIAL/BACTEREMIA**	**6**	**12**	**17**
CHLAMYDIA	1492*	2127*	2219*	***(EXCLUDING N. MENINGITIDIS)***			
COCCIDIOIDOMYCOSIS	2	0	2	**MENINGOCOCCAL DISEASE**	0	2	0
CREUTZFELDT JAKOB	1	0	4	**MUMPS**	0	5	5
CRYPTOCOCCOSIS	0	0	0	**PERTUSSIS**	49**	76**	70
CRYPTOSPORIDIOSIS	4	4	3	**POLIO**	0	0	0
DENGUE FEVER	0	0	0	**PSITTACOSIS**	1**	0	0
DIPHTHERIA	0	0	0	**Q FEVER**	0	0	0
EHRLICHIOSIS	1			**RABIES ANIMAL**	1	4	2
ENCEPHALITIS PRIMARY	1	0	0	**RABIES HUMAN**	0	0	0
ENC POST OTHER	2	0	1	**REYE SYNDROME**	0	0	0
E. COLI 0157	***	***	7	**ROCKY MNTN SPOTTED FVR**	0	0	2
FLU-LIKE DISEASE	33767	40074	79787	**RUBELLA**	0	0	0
GIARDIASIS	14	34	35	**SALMONELLOSIS**	60	66	83
GONORRHEA	386*	506*	570*	**SHIGELLOSIS**	1	20	4
GRANULOMA INGUINALE	0	0	0	**STEC*** **	3	8	
GUILLAIN-BARRE SYNDROME	4**	4	2	**STREP INVASIVE DISEASE**	13	10	8
HEMOLYTIC UREMIC SYN.	1	0	0	**STREP PNEUMO INV DS**	24	57	76
HEPATITIS A	4*	6*	5	**SYPHILIS**	32*	27*	23*
HEPATITIS B (ACUTE)	10	10*	18	**SYPHILIS CONGENITAL**	0	0	0
HEPATITIS B (CHRONIC)	82**	152**	161	**TETANUS**	1	0	0
HEPATITIS C (ACUTE)	9	5*	2	**TOXIC SHOCK SYNDROME**	0	1	0
HEPATITIS C (CHRONIC)	430	498**	542	**TUBERCULOSIS**	7	13	4
HEPATITIS D	0	0	0	**TULAREMIA**	0	0	0
HEPATITIS E	0	1	0	**TYPHOID FEVER**	0	0	0
H. FLU INVASIVE DISEASE	6	5	7	**VIBRIOSIS**	0	1	
HISTOPLASMOSIS	5	1**	1	**WEST NILE VIRUS**	7**	11	0
INFLUENZA, NOVEL	0	0	28	**YERSINIA ENTERITIS**	1		

**PROVISIONAL*
***REFLECTS BOTH PROBABLE & CONFIRMED CASE REPORTS*
****New category of Shiga-toxin producing Escherichia coli per MDCH in 2010; combo of E. coli & Shiga Toxin 1or2*

The October 2011 Communicable Disease Newsletter – Volume 8 can be found on the Health Department Web site on the Communicable Disease Web page at: www.macombcountymi.gov/publichealth/HPDC/hpdc_cd.htm