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Communicable Disease Services

A Year in Review

2015

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Tularemia

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Sharing a Year in Review

Multnomah County Health Department (MCHD) Communicable Disease Services (CDS) provides core public health work that has protected people for over 100 years. We honor this rich history, and are always looking for better ways to do our work.

We respond to diseases and conditions that are reportable under Oregon statute and rules. The focus is on potentially serious diseases where disease transmission can be interrupted. New public health threats and imported diseases, like Ebola or Zika, are also tracked to make sure they don't gain a local foothold. Sexually transmitted infections like gonorrhea and syphilis are handled in another service group, so are not included here. Our work in communicable disease (CD) investigations, tuberculosis (TB) prevention, and assuring immunization services is organized across closely coordinated teams within CDS.

CDS Investigations and Case Management (ICM) covers general CD investigations and a few disease-specific programs. We determine when a disease report meets a public health case definition, assure provider access to necessary lab tests, and coordinate patient access to treatment. When reports are found to be a communicable disease of public health significance, we investigate to see who was exposed to the case and recommend interventions to prevent ongoing illness and transmission.


The CDS Clinic focuses on specialty-care patient services. We primarily work with people who have latent TB infections and people who need essential immunization services. We also provide occupational infectious disease screenings and trainings for Health Department employees.

The CDS Community Immunizations Program (CIP) assures access to immunizations provided under the Federal Vaccines for Children (VFC) and Section 317 programs; enforces Oregon rules related to school immunization requirements; and provides technical assistance to providers for safe vaccine storage and handling.

Supporting all these programs are Epidemiologists for complex outbreaks and program evaluation; a Community Liaison shared with the Department's Public Health Preparedness program; and a Data Analyst following our business and IT needs. All staff have training in Lean process improvement, and we routinely use quality assurance activities to keep our program efficient and flexible.

The 2015 Year in Review provides information on our programs and outcomes, including the reportable communicable diseases we see in our community. We also wanted to share stories of how our work helps keep our community safe. The stories were written by staff, describing situations they encountered during the year.

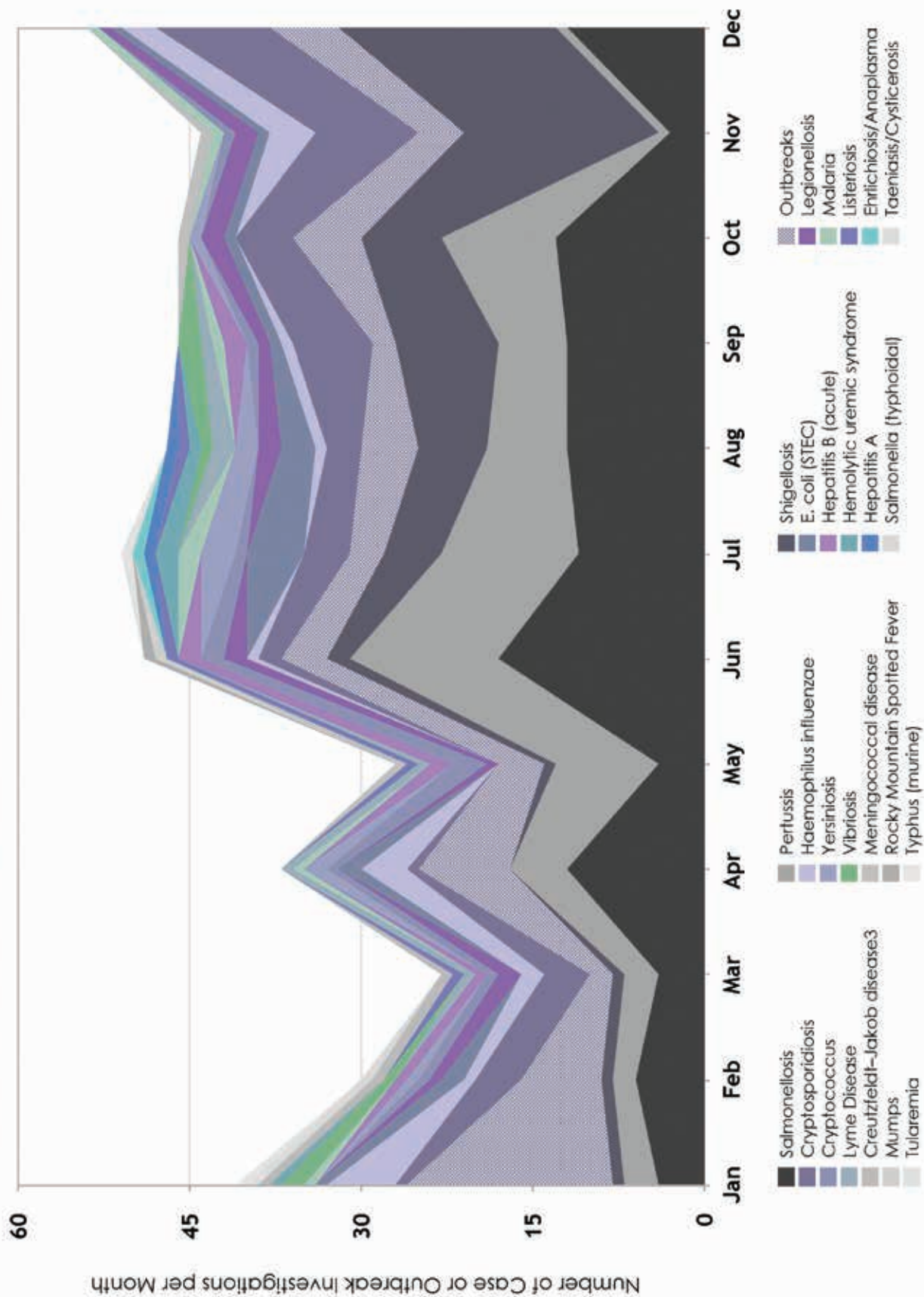
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The background of the slide is a collage. The top half has a light blue background with various medical terms in a light, semi-transparent font, including 'Hepatitis A', 'Vibriosis', 'Ehrlichia', 'Typhus', 'Murphy', 'Hemolytic uremic syndrome', 'Lyme Disease', 'Tularemia', 'Shigellosis', 'Typhoid fever', 'Hemolytic uremic syndrome', 'Lyme Disease', 'Tularemia', 'Shigellosis', 'Typhoid fever', 'Hemolytic uremic syndrome', 'Lyme Disease', 'Tularemia', 'Shigellosis', 'Typhoid fever'. The bottom half features a close-up image of a hand holding a lemon, with the words 'coccal disease' and 'onellosis' overlaid in a light, semi-transparent font. The main title 'Program Activities and Outcomes' is centered in a large, bold, blue font.

Program Activities and Outcomes

Figure 1

Investigated communicable disease cases and outbreaks by month, excluding TB, for Multnomah County Communicable Disease Services, 2015. Month-to-month changes show the need for flexible response, with varying numbers & types of investigations.



Communicable Disease Investigations and Case Management

The CDS Investigations and Case Management (ICM) Team investigates reportable communicable diseases in Multnomah County. By law, physicians and laboratories are required to report certain diseases to the local health department. The list of these notifiable diseases can be found on the State of Oregon website. Each reportable condition has different requirements and specific guidelines to follow during the investigation.

The ICM team is notified about reportable conditions via fax, phone call or electronic lab report. Each new case report is assigned to a registered nurse or epidemiologist to conduct a timely investigation. The nurses and epidemiologists work with the patient, physician and other community partners to interrupt the spread of communicable diseases. Example interventions to prevent spread include providing preventive treatment, disease screening, and health education.

In 2015, ICM staff investigated or otherwise followed up on 2,579 cases involving notifiable conditions (Appendix Table A1 on page 31 and Figure 1). Most cases require a full investigation, with tracking of interventions taken to subsequently limit spread. For high-volume reports, like those for Hepatitis B and C, laboratory and provider reports must be reviewed to see if the case is in a specific high-risk intervention group, like an acute hepatitis case or a pregnant woman with chronic Hepatitis B infection. This follow-up can involve collecting additional laboratory reports or contacting

providers. Investigations are then conducted for the specific high-risk intervention groups. Lower acuity conditions, like giardiasis, are followed up with a letter unless a cluster of related cases is identified. Some unusual conditions, like Carbapenem-Resistant Enterobacteriaceae, are predominantly investigated through special programs at the OHA's Acute and Communicable Disease Program. In these cases, we serve as local support as requested. In addition to these cases, we received 587 reports that required review or investigation to determine that they were not reportable conditions (Table 1).

The ICM team also investigates outbreaks that occur in schools, day cares, restaurants and other places in our community. They interview

Table 1

Reports Not Resulting in Confirmed or Presumptive Case (excluding Emerging Diseases and Disease Outbreaks).

Multnomah County Health Department, Communicable Disease Services, Jan. 1, 2015 through Dec. 31, 2015

Description	Number
Animal Bites	123
Lab Reports: negative or non-reportable Hepatitis = 103 Other = 24	127
Immunity Testing	58
Investigated: disease ruled out; suspect case only ¹ Hepatitis C (chronic) = 110 Lyme Disease = 72 Pertussis = 45 Other = 52	279
Total	587

¹Compatible illness not meeting criteria as a confirmed or presumptive case

Communicable Disease Investigations and Case Management



individuals to find common exposures, trying to identify the cause of the outbreak and stop others from becoming ill. In some settings, like long-term care facilities, the interventions are

well-established, and we primarily work with providers to successfully implement control measures. In all

of these types of outbreaks, the ICM nurses and epidemiologists work closely with the facilities, Multnomah County Environmental Health, and the Oregon Public Health Division. In 2015, the ICM team investigated 67 outbreaks (Table 2). Almost one third (n=21) of these outbreaks were caused (or very likely caused) by norovirus. About half (n=32) of all outbreaks investigated were in long-term care facilities, highlighting the susceptibility of vulnerable, physically frail people to infectious diseases.

Table 2

**Disease Outbreaks Investigated. Multnomah County, Oregon.
January 1 - December 31, 2015.**

Description	Norovirus/ Noro-like	Other GI	Influenza	Other Respiratory	Other	PFGE Linked Cases	Total
Outbreaks Investigated	21	13	17	13	3		67
Persons:							
Potentially Exposed	2,797	1,066	2,596	1,439	453		8,351
Total Number Ill	455	245	318	240	10		1,268
Confirmed Cases	38	73	54	28	3	20	216
Facility Type:							
Hospital	4	-	1	-	-		5
Long-term Care Facility	11	3	14	4	-		32
Restaurant/Caterer	3	5	-	-	-		8
School/Child Care Facility	2	2	2	8	1		15
Home/Non-catered Event	1	-	-	-	-		1
Other	-	3	-	1	2		6

Communicable Disease Investigations and Case Management

Disease Specific Programs

Metro Area Pertussis Surveillance (MAPS) Program

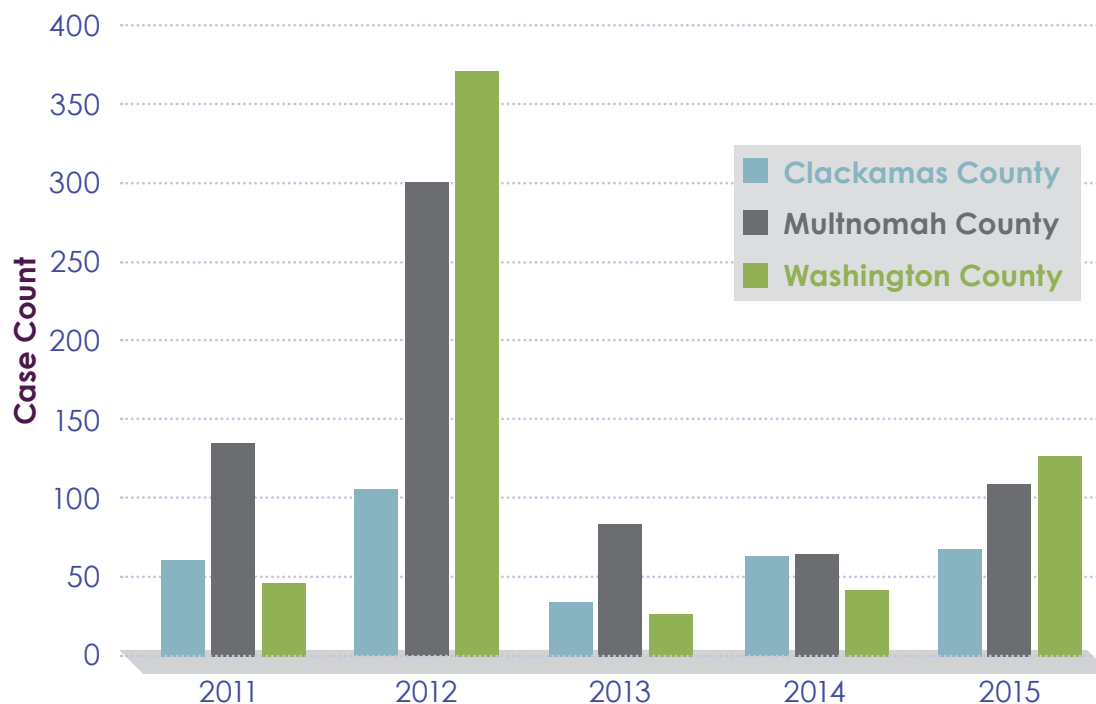
The Metro Area Pertussis Surveillance (MAPS) Program is a Centers for Disease Control (CDC) funded, enhanced public health surveillance program that includes disease tracking and investigation for all reported pertussis cases in Multnomah, Clackamas, and Washington Counties (the tri-county Portland-Metropolitan area). The reason it is “enhanced” is that we follow cases until they stop coughing -- up to 100 days -- to see how people are recovering from their illness, and collect detailed immunizations information to better understand Pertussis immunity in our community. The Pertussis cases for the tri-county area are investigated by the MAPS nurse, Joanie Coleman.

Looking at the changing number of Pertussis cases in the last five years (Figure 2), the 2012 epidemic jumps out, with about 800 cases in that year. The rates of Pertussis over these five years varied from a low of about 7 cases per 100,000 people in 2013 to a high of 45 cases/100,000 people in the 2012 epidemic year.

In 2015 there were eight pertussis outbreaks in the tri-county area, all involving schools or school-aged cases. Four of these outbreaks included cases crossing county boundaries from where the original exposures occurred, highlighting the importance of regional coordination.

Figure 2

Reported Cases of Pertussis: 2011-2015



Communicable Disease Investigations and Case Management

Disease Specific Programs

Perinatal Hepatitis B Prevention Program

The need for Perinatal Hepatitis B Prevention Programs was established in the early 1990s by the Centers for Disease Control and Prevention (CDC) to prevent hepatitis B transmission from pregnant women to their infants. Protecting newborns at high risk for acquiring Hepatitis B is essential (see box). Hepatitis B is a virus passed between people through exposure to blood or other bodily fluids, and risk of transmission at birth is very high. Given this risk, we follow pregnant women with chronic hepatitis B infections and their newborns to assure that preventive measures are successful.

Why Do We Need to Protect Infants?

Age of infection affects the risk of developing Hepatitis B related cirrhosis or liver cancer. Without vaccination, up to 90% of infants who contract hepatitis B at birth develop chronic infections. Premature death from liver disease is seen in 1-in-4 people infected with the virus as infants or young children. Children of hepatitis B positive mothers also remain at risk of contracting hepatitis B through personal contact with infected family members. Vaccinating infants born to hepatitis B positive mothers helps protect them against hepatitis B

Pregnant women are routinely tested for hepatitis B as a part of their prenatal care. If a woman tests positive, the program's Data Technician, Marta Fisher, follows up to enroll her into the Perinatal Hepatitis B Prevention Program. The woman then gets counseling on how to protect

household members and sexual contacts from hepatitis B, and what steps to take to protect her newborn. After the birth, Marta follows up with the infant's health care provider to make sure the provider knows that the infant was exposed, and to recommend immunizations that support the infant's Hepatitis B immunity. Nine months later, the infant has hopefully received all the hepatitis B vaccines, and Marta works with the providers to confirm the hepatitis B immunity through a blood test. Collaboration with local providers and hospitals is essential for the success of this program.

In a normal year, 54 to 55 infants are born to hepatitis B positive mothers in Multnomah County. Of the infants who reached 18 months old in 2015, 93% received testing to see if they had been infected and were immune. (Table 3) Of 108 infants born after January 1st, 2013 and tested in Multnomah County, only one has developed hepatitis B.

Emerging Infectious Diseases and the Ebola Response

While Ebola got most of the press in 2015, we remain vigilant for a number of life-threatening emerging infectious diseases. Our goals for tracking these diseases include assuring provider-access to laboratory testing, and preventing local transmission. The main threats tracked in 2015 were Ebola and Middle Eastern Respiratory Syndrome (MERS-CoV). We did not have cases of either, though we did facilitate clinical assessments or lab testing for persons meeting nationally-defined suspect case definitions (Table 4).

Communicable Disease Investigations and Case Management

Disease Specific Programs

In October 2014, the U.S. national response to the Ebola epidemic in West Africa expanded to include screening of travelers from the affected West African nations, with referral of these travelers to local health departments for 21 days of monitoring after entry. CDS provided this local monitoring. Travelers from affected countries were diverted to

specific U.S. airports, where they were screened for Ebola symptoms and risk factors by federal employees. Travelers' risk levels were categorized based on likelihood of exposure to a person ill with Ebola. Federal notification to the Oregon Health Authority (OHA) was passed along to CDS for travelers coming to Multnomah County. This program

Table 3

Perinatal Hepatitis B Prevention, Infants Reaching 18 Months of Age in 2015 (N = 59¹). Multnomah County Health Department, Communicable Disease Services.

Level of Completion	Number	Percent
Infants Receiving Hepatitis B Immune Globulin and Hepatitis B Vaccine At Birth	59	100%
Infants completing 3-dose Hepatitis B vaccine series by 12 months old ²	58	98%
Infants receiving Hepatitis B post-serological testing by 18 months old ³	55	93%

¹ One infant who died and two infants who moved out of state prior to 18 month of age are excluded from analysis.

² One infant was lost to follow up prior to 12 months of age.

³ Four infants were lost to follow up prior to 18 months of age.

Table 4

Emerging Infectious Diseases, 2015. Multnomah County Health Department, Communicable Disease Services

Disease	Persons Followed
Ebola, Persons under monitoring ¹	66
Ebola, Persons under investigation ²	3
MERS-CoV, Suspect cases receiving laboratory testing	2

¹ Asymptomatic person who recently traveled to an affected country or had contact with an Ebola patient.

² Person under monitoring who develops symptoms consistent with Ebola.

Communicable Disease Investigations and Case Management

Disease Specific Programs

referred travelers to us through December 2015, and our last traveler finished monitoring in January 2016.

CDS and local Health Officers collaborated closely with OHA in creating and maintaining local protocols for Ebola monitoring. During the 21 days of monitoring, we stayed connected to travelers and assured prompt assessment of any symptoms—mostly fevers in our jurisdiction. Ebola is only contagious after the onset of symptoms. Based on continually-updated assessments of scientific evidence and CDC guidelines, we did not restrict the movement of healthy persons under monitoring (PUMs).

During the entire monitoring period (October 2014–January 2016), we monitored 78 people: 71 “low risk” and seven “some risk” people. This was roughly half of all the 154 people monitored in Oregon. Four people developed fevers during their monitoring periods. We were the only county in Oregon to have persons under monitoring who required evaluation for a fever. In each case, the Multnomah County Health Officer coordinated the medical evaluation with an Ebola Assessment Hospital, and, as needed, transportation with emergency medical services. CDS staff supported these situations through the patient relationship built during the monitoring process. Three of four febrile patients were diagnosed and treated for malaria; all four recovered.

TB Case Management

Our Tuberculosis (TB) prevention work occurs in both the CDS Investigations

and Case Management Team and CDS Clinic. Through the close coordination of these two teams, we provide evaluation and treatment of active and latent TB for Multnomah County residents, and serve as a regional support for neighboring counties.



The TB Case Managers in the ICM team focus their attention on all of our County's active cases of TB Disease, and on the contacts of these cases. Most of our TB cases come in through local physician reporting. These cases are assigned to a Nurse Case Manager. The assigned Case Manager discusses treatment plans with the physician and assists with the management of the patient. Milestones in case management include determining infectivity as well as when the person ceases to be infectious (because of treatment). These Nurse Case Managers also work with Community Health Workers to deliver directly observed therapy, and evaluate people under treatment for possible medication side-effects—all of this through the months to years it takes to complete treatment. TB Case Managers also assure that contacts to infectious active cases are identified, screened, and offered treatment for latent TB infection as needed.

Communicable Disease Investigations and Case Management

Disease Specific Programs

In 2015, CDS TB Nurse Case Managers evaluated 71 reports of active TB disease. This included sometimes providing screening and laboratory testing for patients seen by outside providers. From these reports, we identified 26 people with active TB disease, most of whom were infectious when they were identified. One of these cases was identified at autopsy.

It takes time to work through a TB case: screening extends to eight weeks after last exposure and treatment of the case can go on for months or even years. Because of this, we will not know how well

we did on these cases until a year or two from now. However, for the 28 cases identified in 2014, TB Case Managers identified 173 contacts, 13 of whom were newly diagnosed with latent TB infection. The new infections are used to assess program performance. Of these 13 people, 12 started treatment for their latent infection, and nine completed that treatment. While we want everyone to complete treatment, our latent infection treatment initiation (92%) and completion (75%) rates exceed national averages (68-71% and 44-46%, respectively).



Communicable Disease Services Clinic



The CDS Clinic plays a key role in preventing TB by providing screening, evaluation, and treatment for people at high risk of developing TB disease. These people include the sheltered homeless; persons arriving in the U.S. in the past five years from a country where TB is common; and contacts of local active cases. Our TB Case Managers and TB Medical Director also see patients with active TB in the clinic.

Clinic-based field workers assure directly observed treatment for TB and engage refugees in TB treatment.

Our clinic also serve as a “provider of last resort” for anyone needing immunization services, and provides occupational infectious disease screenings and trainings for Health Department employees. The work in our clinic is closely coordinated with that in both the ICM team and the Community Immunizations Program, to provide a full-spectrum of services — population-based and clinical — that prevent the spread of preventable, life-threatening communicable diseases in our County.

Across all of these services, CDS Clinic staff saw a total of 5,880 clients in 2015. During this year, we screened, evaluated, or treated 2,939 clients for TB, 193 of whom initiated treatment

for latent TB infection. We immunized over 1,600 children and adults; and provided occupational health screening services for 1,340 county employees.

TB Screening, Evaluation, and Treatment for Persons in Shelter Settings

TB Shelter Screening is the largest program within the CDS Clinic, serving 2,601 persons experiencing homelessness (Table 5), the majority of whom live in dormitory-style shelters. TB can spread explosively in this type of setting, exposing large numbers of people sleeping in the same space. Individuals experiencing homelessness are initially seen by the CDS Clinic's outreach staff at a site hosted by Transition Projects Inc. There, a TB skin test is planted and read. If the skin test is negative, the person is issued a TB clearance card called a “Blue Card.” If the skin test is positive, clients are given additional information on TB and encouraged to come to the CDS Clinic for further evaluation. People who we know



Communicable Disease Services Clinic

Population Specific Programs

screened positive in the past may come directly to the clinic for evaluation. The evaluation process includes a symptom assessment and a chest x-ray as needed. Clients who are evaluated and found to have no indications of active, infectious TB disease, are given a Blue Card.

TB Evaluations and Treatment for Recently-Arrived Refugees and Immigrants

Globally, TB is among the leading causes of death. Thus, another important component to the CDS Clinic's work is providing TB evaluations and latent TB infection (LTBI) treatment (see box) for persons arriving from parts of the world where TB is still a relatively-common concern. We see refugees referred to us from the MCHD Mid-County Clinic refugee screening program, where they receive initial TB screening. We also see people arriving through other immigration visa programs who had a suspicious TB finding on an overseas screening (usually latent or past TB infection, as persons with active infectious TB disease are not allowed to travel to the US until their disease is treated). Our evaluations range from

What is Latent TB Infection?

Persons with latent TB infection (LTBI) do not feel sick and do not have any symptoms. They are infected with *Mycobacterium tuberculosis*, but do not have TB disease. The only sign of TB infection is a positive reaction to the tuberculin skin test or TB blood test. Persons with latent TB infection are not infectious and cannot spread TB infection to others. Without treatment, 5–10% of people with LTBI will develop active, (infectious) TB disease at some time in their lives.

Source: www.cdc.gov

a chart review through an additional round of screening tests and chest x-rays. In 2015, we evaluated 284 refugees referred from Mid-County Clinic, and 54 immigrants referred directly from an overseas screening.

A grant from the federal Office of Refugee Resettlement supports follow-up with refugees who initiate LTBI treatment, to improve the numbers who complete the weeks to months of treatment. The Community Health Worker in this role is also actively engaged with IRCO and other local refugee service providers

Table 5

TB Screening, Evaluation and LTBI Treatment. Multnomah County Health Department Communicable Disease Services Clinic, January 1–December 31, 2015.

Description	Clients
Homeless Shelter Screening and Evaluation	2,601
Refugees Evaluated	284
Class B Immigrants Evaluated (non-refugees)	54
Clients Initiating LTBI Treatment	193

Communicable Disease Services Clinic

Population Specific Programs

in conducting general health education classes for newly arrived refugees and immigrants.

Immunizations for Children and Adults

The immunizations we provide through the CDS Clinic are usually for children needing vaccines to attend school



or a daycare. We also immunize people who are at risk because of exposure to a person with a disease like Hepatitis B. These clients are never turned away due to inability to pay. Altogether in 2015, we immunized 1,136 children (≤ 18 years old) and 465 adults (1,601 total). These clients received 4,694 doses of vaccine — almost three shots each on average (≤ 18 years of age, 3,687

doses; >18 years of age, 1,007 doses). The vaccines provided covered eighteen combinations of vaccine antigens (Appendix Table A2 on page 32). Pertussis was the most common disease protected against from these combinations of vaccines, with 1,354 Pertussis-antigen containing immunizations provided.

Occupational Infectious Disease Program

The Oregon Occupational Safety and Health Administration provides a legal framework and guidance for assuring worker safety in all industries; the national Centers for Disease Control and Prevention provides many related best practice recommendations.

Specific regulations and guidelines exist for health care workers and others with a high risk of exposure to infectious diseases because of their work. Our Occupational Infectious Disease Program provides services that assure the County meets or exceeds these requirements for the protection of our workforce. The two main components of this program cover blood-borne pathogens and specified respiratory pathogens, like measles. We provide worker training, screening, and immunization services related to these components. Our Occupational Health staff also participate on Departmental committees, like Safer Sharps, that seek to prevent workplace exposures; and work closely with the Health Department Infection Control and County Risk Management in areas where worker safety and clinic infection control overlap, like blood-borne pathogen exposures and influenza vaccine access.

Community Immunization Program

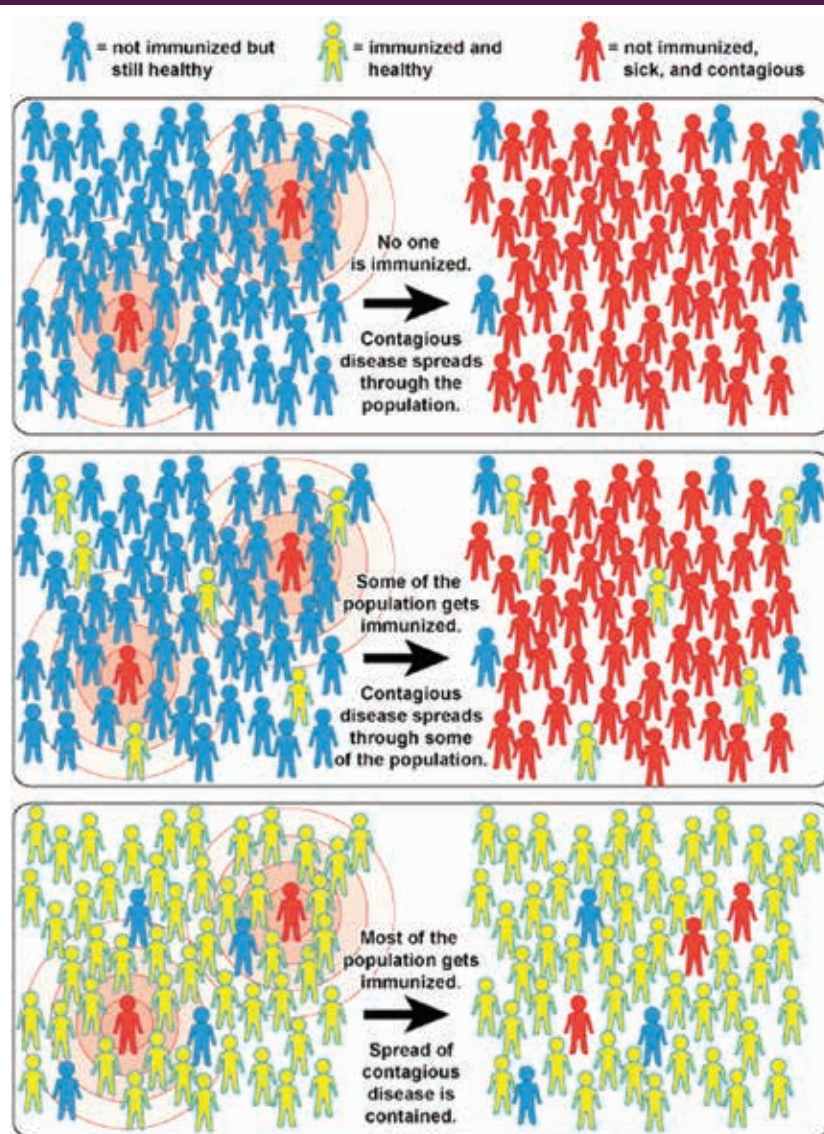
Our Community Immunizations Program (CIP) makes sure that we have the infrastructure to protect people in our community from vaccine-preventable diseases. This infrastructure includes implementation of Oregon rules related to school immunizations. The importance of protecting the whole community by keeping vaccination rates high is illustrated in Figure 3. Because vaccines lose their effectiveness if they are not handled appropriately, we also provide technical assistance to medical providers for safe vaccine storage and handling. And finally, we directly assure access to the vaccines themselves. This work is done in close collaboration with our own CDS Clinic and community vaccination providers, and through partnership with the MCHD clinical system.

By law, all schools and child care facilities in the State of Oregon must report their immunization and non-medical exemption rates to their County Health Departments. When a day care or school can not document a child's vaccination status through immunization records or an exemption, that child must be excluded from the facility until that documentation is made available. This requirement means two things: it is important to help schools get the reports right, and children need the opportunity to get caught up on vaccinations to stay in school. Both of these implications drive our work.

CIP staff work closely with over 600 schools and facilities in Multnomah

County to accomplish getting their immunization and non-medical exemption rates reported. We also contract with the Multnomah Educational Service District (MESD) to do similar work for our public schools. In addition to keeping kids in school, this information provides the State and CDC with the immunization status of three primary age groups: Preschool, Kindergarten

Figure 3



Credit: NIAID

and 7th graders. This data also helps assess the status of “herd immunity” (See Figure 3) for various vaccine preventable diseases that could affect



our community, which in turn helps the ICM team in determining the best course of action for preventing spread of the disease.

Another important role for CIP around school exclusion time is to provide last-minute vaccinations for kids who need to catch up to stay in school. After letters go out to parents that their children might be at risk of being kept out of school, we provide

outreach clinics at multiple sites across the county to make it easier for parents to get their kids vaccinated. In Winter 2015, we vaccinated 537 children across four different locations (Table 7).

During the 2015 legislative session, Senate Bill 895 was passed and

took effect at the beginning of the 2015-2016 school year. It mandated several new immunization requirements including:

- Anyone with a Religious Exemption signed before March 2014 would need to follow a new procedure to obtain a Non-Medical Exemption;
- All schools and programs with any children in grades K-12 must complete a report that collects the vaccination and exemption rates for all children/students in attendance;
- Schools and childcare facilities must share their vaccination and exemption rates on their website, in their main office, and to parents in a paper or electronic format (e.g. newsletter). The posting of immunization and exemption rates by schools and facilities is intended to provide parents information on the immunization status of the schools/facilities that their children attend.

Table 7

2015 School Exclusion Immunization Clinics. Multnomah County Health Department, Communicable Disease Services.

Clinic Date	Clinic Location	Clients	Doses
2/7/2015	Reynolds Middle School	73	160
2/14/2015	David Douglas Administration Building	155	373
2/17/2015	Portland State Office Building	92	210
2/18/2015	MCHD East County Services Building	217	523
Total		537	1,266

Tuberculosis

Cysticercosis

Cryptosporidiosis

Hepatitis

Why This Work Matters

Vibriosis

Listeriosis

Ehrlichiosis/Anaplasmosis

Typhus

Yersinia

Polio

Mumps

Shigella

Meningococcal disease

Cryptococcus

Salmonellosis

Hemolytic uremic syndrome

Taeniasis

Why This Work Matters

Infant Meningococcal Disease Investigation

In November 2015, CDS was notified of a 5 month old child, hospitalized at a local hospital, who tested positive for *Neisseria meningitidis*, a bacterial

meningitis known as meningococcal disease. Meningococcal disease is a contagious infection spread by close contact, such as living together or kissing an infected person.



The case went to our CDS nurse, Sherri Salas, who immediately began a contact investigation, including interviews with immediate family, to determine those who were exposed to this child's saliva. This is the groundwork needed to know for whom antibiotic

prophylaxis would be recommended. The interview with the mother provided Sherri with 23 contacts who reported spending several hours in close contact during the child's contagious period. She, along with two other investigators—Taylor Pinsent and Joanie Coleman—promptly notified all 23 contacts of their exposure to meningococcal disease, signs and symptoms of the disease, and recommended they immediately see their providers to receive antibiotic prophylaxis. Out of the identified contacts, ten were children under the age of 18, eight were under the age of ten, one of which was immunocompromised, and one was a pregnant woman who was to be induced the same day we made our recommendation. The team collaborated with the pregnant woman's healthcare provider as well as the immunocompromised child's pediatrician to ensure both were promptly and properly treated with antibiotics. Within 24 hours of notification, all identified contacts received the recommended prophylaxis.

Sherri also reviewed with the mother two social events this child attended. After determining there was minimal contact at these events, no antibiotics were recommended for these contacts. The child also visited a healthcare provider's office prior to arriving at the emergency department. Sherri worked with the nursing supervisor at the provider's office and determined that no antibiotics were needed for their staff or for the ambulance staff. Decisions to not recommend antibiotic prophylaxis are based on years—usually decades—of information about who is at risk.

What is a Serotype?

A serotype is a group within a single species of microorganisms which shares distinctive surface features with others in that group. Serotypes help us determine the specific type of illness someone has and whether others may be at an increased risk of illness if they are not immunized for that specific serotype. Serotypes of meningococcal disease commonly seen in the United States are **B, C, & Y**. Serotype B was identified in the 7 cases of meningococcal disease during the 2015 University of Oregon outbreak. All preteens and teens are recommended to receive meningococcal vaccines that protect from illness from serotypes **A, C, W, & Y**. Certain people at increased risk of meningococcal disease are recommended to receive serotype B meningococcal vaccines.

Source: CDC

Why This Work Matters

Because over use of antibiotics can also be a problem, careful questioning in these situations is essential.

No other reports of illness were received among contacts who received prophylaxis nor anyone in the community who could have been exposed to the child. The type of *Neisseria meningitis* was determined to be group C, a serotype frequently found in the community. This timely investigation was successful due to teamwork among CDS staff and collaboration with several healthcare providers.

Salmonella Typhimurium Outbreak at an International Technology Conference

In July 2015, CDS investigated an outbreak of *Salmonella typhimurium* (*S. typhimurium*) among attendees of a four day International Technology Conference. Taylor Pinsent was the lead epidemiologist over the course of this outbreak. This outbreak is featured in the "Disease Detectives" cover story from the Spring 2016 Multco Magazine (<https://multco.us>).

Over 200 conference attendees who answered our questionnaire about what they ate during the conference. Analyzing their responses, we found a ten-fold increase in risk of illness for people who ate a conference meal on June 25th. Those who ate two specific dishes served as part of that meal were 57 times more likely to develop illness than people who didn't eat these dishes. Also clearly

What is Salmonella Typhimurium?

Salmonella typhimurium is a bacteria that makes people sick by causing diarrhea, fever, and abdominal cramps. The illness usually lasts 4 to 7 days, and most individuals recover without treatment. In some cases, diarrhea may be so severe that the patient needs to be hospitalized. *Salmonella* live in the intestinal tracts of humans and animals. You can get *Salmonella* infection from a variety of sources, including eating contaminated food or drinking contaminated water. There are many different kinds of *Salmonella* bacteria.

Source: CDC

implicating these foods was the story of a person who didn't attend the conference. She became ill on June 28th after eating food that her roommate brought back to her from that lunch on June 25th. A Community Health Specialist, David Cuevas, helped coordinate getting a specimen from this woman to the state's Public Health Laboratory, where they found she had the exact type of bacteria that made the conference attendees ill. Given that one meal from a specific caterer was so strongly associated with illness, we considered this a "point source" outbreak (see box).

What is a Point Source Outbreak?

An outbreak where persons are exposed to the same source over a brief time, such as through a single meal or at an event. The number of cases rises rapidly to a peak and falls gradually.

Source: www.cdc.gov

Why This Work Matters

The success of this large investigation involved cooperation of the conference organizers and the caterer. We see investigations like this as part of a system to continuously improve the quality and safety of food handling practices that benefit everyone, businesses and consumers alike. Teamwork on the public health side is also essential to do a comprehensive investigation and assure there is no ongoing threat to the community.

Pertussis in a High School

The last reported outbreak of Pertussis in 2015 occurred in a private high school in Multnomah County. By the end of the outbreak, 11 people were confirmed to have Pertussis, with 10 cases from the tri-county area and one case residing in another county.



When the outbreak was first detected, Joanie Coleman, the MAPS nurse, worked with the school to get letters about the exposure to the school community. The school independently took a proactive approach when

the outbreak was identified. With the help of the school's student nurse, school administration and Joanie, the school staff was asked to participate in active case finding of ill students and other staff members. That meant the school staff were working to identify students or staff with a pertussis-like illness. After being identified as ill, the student nurse

and school registrar reached out to the student and their parents to strongly encourage seeking care from providers, including testing and treatment, as indicated. In addition, the student nurse and school registrar updated student immunization records and encouraged staff members to update their own immunizations. Joanie attended a staff meeting at the school; this provided the opportunity for additional education for staff members. This meeting also afforded the opportunity for Joanie to learn more about the school and its environment, and to improve the growing relationship between the school community and the local health department. This outbreak allowed Joanie to provide additional outbreak support and proved to be a successful outreach mechanism to the school community due to the small student and staff population, the close-knit community, and the invitation from the school administration for transparent involvement.

Perinatal Hepatitis B in an Infant with Club Foot

The Perinatal Hepatitis B Prevention Program collaborates with providers to ensure that infants born to hepatitis B positive mothers are vaccinated on schedule and tested for immunity. This is especially important for infants who have other health issues. For example, when Marta Fisher inquired after one infant's 2 month vaccination, the primary care provider told her they were not able to vaccinate because the infant had club foot in both feet. Club foot treatment involves repositioning the infant's feet with a series of full leg

Why This Work Matters

casts. The casts prevented the infant from getting vaccinated in the thigh. The orthopedic surgeon who was treating the club foot was not aware of the baby's hepatitis B exposure. Marta coordinated between the primary care provider and the orthopedic surgeon. The surgeon put a special cast on one leg which allowed the primary care provider to successfully immunize the infant. Subsequent blood testing showed the infant is immune to hepatitis B. This demonstrates how coordinated transfer of information between healthcare providers, hospitals, laboratories, state and local health departments allows families in the most susceptible populations a fresh start free from chronic disease.

Ebola Monitoring and a Letter to the Editor

In July 2014, a devastating Ebola outbreak that claimed thousands of lives was beginning to gain international notoriety. We began reaching out to leaders in the West African community and non-governmental aid agencies, to make sure they had the information and support they needed. Melissa McKinney, our Community Liaison, played a critical role in these early days. By late summer and early fall, multiple CDS staff, County Health Officers, and our Public Information Officers (PIOs), had become involved in conducting community meetings. In these discussions, we saw the human dimension of this crisis. As the national monitoring program started in October 2014, we prioritized the health, privacy, and autonomy of persons under monitoring.

During 2015, monitoring through our local program began for each traveler when we were notified by the Oregon Health Authority that a person from an affected country was on their way here. We contacted each person to be monitored within 24 hours of their arrival. The following people did most of the initial calls and intake interviews: Marta Fisher, Thomas Jeanne, Taylor Pinsent, Maayan Simckes, and Amy Zlot. During each interview, they explained the purpose of monitoring, gathered information on risk factors, asked about communication preferences, and answered questions. With help of the Health Officers, Drs. Jennifer Vines and Paul Lewis, each person under monitoring was linked to one of the three local health systems that had an Ebola Assessment Hospital. With our PIOs, Maayan and Amy Sullivan developed a packet for people entering the monitoring program with detailed information on the monitoring process, including what to expect if symptoms developed



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and photos showing health care providers in full personal protective equipment.

Everyone under monitoring checked their temperature twice a day. People in the lowest risk group reported morning and evening temperatures once a day, usually by text message. For people at slightly higher risk, we added once-daily visual monitoring, observing each person take his or her temperature and asking about symptoms. After a Health Officer did a face-to-face initial assessment, this visual monitoring was primarily done using Google Hangouts -- allowing for

secure video calls on mobile devices, and making monitoring quick and convenient for everyone involved.

We concluded monitoring travelers from West Africa on January 14, 2016. No cases of Ebola were found in Multnomah County during the monitoring period. Below is a view of our response provided by one of the people we monitored, related to a New York Times editorial critical of the national response.

Preparing Before a Problem Hits: Regional Measles Protocol Development

From October 2014 to September 2015, Maayan Simckes, a CDC/CSTE Applied Epidemiology Fellow shared between CDS and Community Epidemiology Services, led a project to develop a response protocol for measles in schools and childcare facilities. The need for this plan was prompted by on-going tracking of the vaccine exemption rates in our local daycares and schools. Maayan brought together Multnomah County CDS, Health Officers, and Public Health Preparedness; Communicable Disease programs in Clackamas, Washington, and Clark Counties; the MESD; the Oregon Health Authority (OHA); and representatives from daycares and private schools. The project began with a Measles Outbreak Tabletop Exercise hosted by CDS and MCHD Emergency Preparedness and Response. The scenario was a measles outbreak in a school where a high proportion of children were not vaccinated for measles,

RE: Ebola Crisis Passes, but Questions on Quarantines Persist (12/2/2015)

As a nurse responding to Ebola in Sierra Leone, my return home to Oregon was radically different than the quarantined Yale students. I never worried about what would happen if I developed a fever or whether police would be patrolling my Portland home.

Oregon developed a plan for local health departments using the science of Ebola transmission. A county epidemiologist, Maayan Simckes, tailored my monitoring based on my level of risk. We arranged safe and convenient twice daily check-ins of my temperature and symptoms using phone, text, video chats, and emails. As I had no symptoms, I was free to go about my business.

The Multnomah County Health Department monitored 77 people and treated five ill travelers without resorting to quarantine. Portland area hospitals were ready to evaluate and treat ill travelers. Elected officials did not interfere.

No aid worker should be deterred from volunteering for fear of hostility and panic at home. In Oregon, county health departments will keep using science and trust, not fear and politics, to protect the health of the community.

Aaron Highfill, RN.

Why This Work Matters

emphasizing the health implications of a measles case in this setting.

The After Action Report from this exercise identified next steps for developing a community-wide measles outbreak protocol. Over the following six months, Maayan coordinated multi-county and multi-agency work groups to develop protocol materials. These work groups produced agreements on communication, authority, and information sharing that without prior agreement could delay an outbreak response.

In June 2015, to review the near-final product, participants went through the theoretical outbreak scenario from the initial exercise, and provided feedback on the usefulness of the protocol. The finalized protocol was shared among local health departments. Other key stakeholders were briefed and encouraged to develop complementary protocols. Kelly Howard, our CDC Public Health Associate, and Melissa McKinney presented the protocol at an MESD School Health Services' Advisory Meeting, and the communications section was discussed at a Regional Public Information Officers forum. This protocol development process was recently named a Model Practice by the National Association of City and County Health Officials (NACCHO). Overall, this protocol development process helped promote regional consistency in responding to local outbreaks of measles in schools and child care facilities.

Large TB Contact Investigation Involving Multiple Healthcare Facilities

In August 2015, Meredith Jones, a CDS TB Nurse Case Manager, received a call from a local area hospital reporting that one of their patients had a confirmed case of pulmonary TB. The client was a man in his 40's, originally from Southeast Asia. Several years prior, when the client moved from Southeast Asia to the United States, he was diagnosed with latent TB infection. At that time the client chose not to take treatment for the infection. Left untreated, the latent TB infection developed into active TB disease.

The man was very sick when he was admitted to the hospital and considered to be highly infectious. He had been experiencing a cough with sometimes-bloody phlegm for six weeks. Additionally, he had been losing weight and experiencing night sweats, as well as significant fatigue. Laboratory samples of the client's phlegm showed high levels of TB bacteria and his chest x-ray showed pockets of TB disease in his lungs. While in the hospital, the patient began standard TB therapy, which includes four different antibiotics. After a week in the hospital, he was well enough to return home. After two months of TB treatment most of his symptoms were resolved. After three months, he was no longer infectious. He experienced fatigue up to the sixth month of treatment. Due to the severity of his illness, he needed to complete nine months of TB treatment.

Why This Work Matters

In addition to providing case management and medication for the patient, Meredith also conducted a contact investigation to determine if he had infected anyone with TB. After an in-depth interview with the man, two groups of contacts were identified: at his home and at his place of work. All four household members were fully evaluated. Three had been diagnosed with latent TB infection previously and had elected not to take treatment. One member had no previous diagnosis of TB and converted from a negative TB skin test to a positive TB skin test. All household members started treatment for latent TB infection.

Identifying work contacts involved a significant amount of coordination because the man worked at several medical facilities in the Portland Metro area. It was determined that he potentially exposed both patients and healthcare providers in the months before his diagnosis. After establishing an infectious period, Meredith determined that he had close, face-to-face contact at more than 80 medical appointments across 8 different health facilities. Providers at risk for exposure were screened for TB by their institution's occupational health programs. Meredith and other case managers screened patients from these facilities who were determined to be at risk. Among the patients, screening was prioritized by medical risk. Children under five and immunocompromised patients were notified of their potential for exposure first and offered TB testing, either at the CDS Clinic or with their primary care provider.

Of the individuals evaluated for the work place exposures, none of the healthcare providers converted to a positive TB test. Eight patients -- all of whom had additional risks for TB -- were diagnosed with latent TB infection. No one had active TB disease. Meredith made sure that everyone diagnosed with latent TB infection was offered treatment.

Treatment of latent TB infection is important because it prevents the latent infection from becoming active TB disease. For the contacts who developed latent TB and chose to take treatment, they are taking the necessary measure to keep their infections from turning into active and potentially infectious TB disease.

TB in a Person with Unstable Housing

In late 2014, a 40 year old man who was homeless developed a cough that did not resolve. He also noticed he was sweating in the middle of the night. Around this time, he was arrested in Eastern Oregon. While in jail, he realized he was losing weight, but attributed his weight loss to changes in his diet. He then started coughing up blood. The jail sent him to the local emergency department where he was prescribed treatment for pneumonia.

In February 2015, the man was released from jail. Unfortunately, although he completed treatment for pneumonia, his cough continued, and he still occasionally coughed up blood. He and his domestic partner decided to drive their motor home to Multnomah County to visit an ill friend

Why This Work Matters

in the hospital. While visiting his friend, the man went to the emergency department there: he wasn't feeling well and was unable to catch his breath. The emergency department provider took the man's medical history and decided to admit him, believing he may have TB.

TB is initially treated with four different antibiotics until either two months of treatment is completed, or the effectiveness of those antibiotics against the particular strain of TB infecting the client is determined. The hospital started the patient on this therapy and called CDS. Upon receiving the provider's telephone call, Rita McConathy, the CDS TB Nurse Case Manager assigned to the case, visited the client in the hospital and provided education about how the rest of his treatment would proceed.

After several days in the hospital, the client was determined well enough to return home. He returned to his motor home with his domestic partner. Since he was still contagious, he was asked to stay home and avoid stores, doctor's offices, and social gatherings -- any place where new people could be exposed to TB.

After six weeks of treatment, the drug sensitivity testing on the TB bacteria came back, and Rita learned the client's TB was drug resistant. His therapy was changed. Several weeks later he was determined to no longer be infectious, and was able to resume his usual daily activities. His treatment continued without incident for the next few months. During this time, he and his domestic partner, who tested positive for latent TB, continued to live in the motor home in Multnomah County.

What is Drug-Resistant TB?

Sometimes TB bacteria become resistant to the drugs used to treat TB. This means that the drug can no longer kill the bacteria. Drug-resistant TB is spread the same way that drug susceptible TB is spread. There is also Multidrug-Resistant TB (resistant to the two most potent TB drugs) and Extensively Drug-Resistant TB (resistant to first and second line TB drugs).

Source: www.cdc.gov

After about four months into treatment, the client's domestic situation deteriorated. He was in and out of jail, traveling to other counties without notice, without a reliable form of communication, and living in various homeless camps. Fortunately he was no longer infectious at this time. However, getting him to where he could complete treatment was challenging. Because his TB was already resistant to some of the front-line TB drugs used, it was especially important for him to complete treatment, so his disease would not reactivate and be a source of resistant TB in the future. During the course of her work with this case, Rita partnered with several different county health departments, the staff of two jails in Multnomah County, and the staff of jails in other counties in order to help our client complete treatment. Rita's efforts were successful, and this case completed treatment in a little over a year.

Why This Work Matters

Latent Tuberculosis Infection Found During Homeless Shelter Screening

In 2015, a man tested positive for TB during routine screening at a local homeless shelter. After further assessment at the CDS TB Clinic, he began six months of Directly Observed Therapy with Community Health Nurse

(CHN) Thato Mbaki Masotja. The client's case was not clinically complicated, but during his six months of twice weekly visits the clinic staff learned more about this man's history.

This client had immigrated to the U.S. over 15 years ago with a background in engineering. He had

been living his ideal life, with his family and new job. In 2008, when the economy began to decline, he lost his job, his home, and eventually his family's apartment. These difficult financial times stressed his family and they eventually separated. By the time he had come to our clinic, he still hadn't been able to secure full time employment or a permanent residence. Through these hard times, he always maintained a smile, a positive attitude, and a kind nature as he continued on his TB treatment. He developed friendships with Mbaki and many other clinic staff who always looked forward to seeing him.

During his treatment, he was able to gain employment through two part time positions, though he was still frequently homeless. His new work schedule combined with his on-going housing challenges made it complicated for him to find time to come to the CDS TB clinic for his treatment. Mbaki and other clinic staff worked with him to encourage his on-going treatment for his latent TB infection. With this support and through his own commitment, this client did finally complete treatment. He still stops by the clinic to visit and share good news about his life and pictures of his children.

New Learning Opportunities for Childcare Facilities and Private Schools

In 2015, nurse Kristen Merryman and Kristin Kelly of CIP led the collection and processing of immunization reports from over 450 preschools, Head Starts, child care centers, and private schools serving many thousands of children. This process gained some notoriety in this year due to media coverage of the Disneyland measles outbreak and Oregon Senate legislation on school exclusion. The process of assessing and reporting on all these children is complex, and is required by School Immunization Law statutes. School administrators and daycare providers struggle to remember the nuances of the critical steps they must take each reporting season. This year we offered a blend of learning opportunities to meet the needs of these busy, non-medical professionals.



Why This Work Matters



In 2015, CIP staff and Kristin Kelly offered four two-hour, classroom-based workshops around the county. These workshops covered the entirety of the process—from collecting records to finalizing the last of the two reports. On average, we trained about 10 students per workshop. These are useful trainings, but not everyone can spare a half a day out of the office or away from their facility.

For this reason, CIP also produced a series of seven educational videos for learners who prefer a self-paced approach. Each video covers a key component of the reporting process. On average, each video logged 125-150 views this year.

In addition to our in-class and video options, CIP designed a series of 30-minute webinars. Partnering with the OHA for the webinar technology, CIP hosted more than 30 learners in the first round. The feedback was positive and more webinars are in production for 2016. In follow-up surveys of the webinars, 79% of the respondents said they would attend a similar event again in the future and 91% rated their usefulness as excellent or very good. One attendee commented, “Please continue to offer these events again. It’s nice to have

this option that fits so well into busy schedules.”

These training programs will further empower the facilities to take ownership and pride in their own immunization and exemption rates. It only serves to make our communities safer and healthier for everyone.

School Immunization Community Outreach

During the summer of 2015, Multnomah County Health Officers Dr. Paul Lewis and Dr. Jennifer Vines, along with CIP staff met to strategize outreach efforts to bring “high-exempting” Multnomah County schools into compliance.



Three high-exempting schools were chosen as pilot schools for the initial outreach. The first step in the outreach effort was to coordinate a meeting between MCHD and school administrators to understand their communities’ challenges and perspectives on immunization.

One of the outreach meetings occurred at a private school where,

What is a “High-Exempting” School?

In Oregon we generally consider a “high-exempting” school to be any school with less than 95% of children vaccinated against each vaccine preventable disease, corresponding to the Healthy People 2020 objectives.

Source: OHA Public Health Division Immunization School Law Program

Why This Work Matters

during 2014-2015, 29% of the students had at least one exemption for a vaccine. The Health Officers, along with Kelly Howard, met with the administrators, who were very engaged, and brought up the ethical challenges of vaccine exemption and non-vaccinating parents' responsibility to community health. They expressed interest in learning how to protect their staff from disease and were also cognizant of the potential for disease spread considering the building's open layout. The three participating administrators responded positively to our efforts to establish a relationship with them, and appreciated the invitation to call MCHD with any health concerns or questions. As a follow up to this meeting, CIP worked with school staff and provided an on-site immunization reporting training.

The second outreach meeting occurred at another private school where, in 2014-2015, 44% of their students had at least one vaccine exemption. The administrators were very open to our outreach,

and appreciated receiving acknowledgment for their diligent reporting: three hundred students were enrolled and no exclusion orders needed to be sent in the previous year—meaning all children had either complete immunization records or completed exemptions in place. Administrators engaged in the discussion, asking questions about vaccine safety and recent legislation. The school's goal is to continue to not need to send any exclusion orders. Notably, the administrators have educated parents on exclusion procedures, most recently proactively contacting parents during the California measles outbreak and explaining that exclusion of all measles, mumps and rubella (MMR) unvaccinated children would be enforced should the outbreak reach their community.

The meetings allowed CIP to provide an overview of the updated school immunization law, exclusion procedures, immunization priorities, importance of immunization record reporting and tracking, as well as vaccine safety. CIP also discussed vaccine preventable communicable disease information and how MCHD is a partner and health resource for school administration.



What We are Watching in 2016

Several great on-going stories remain to be told. These include Eugene Sadiki's health education classes for recently-arrived refugees, and David Cuevas's insights on the TB Shelter Screening program. Also in 2016, we will be following outbreaks and newly emerging international situations.

An outbreak that has crossed over into 2016 is on an on-going outbreak of Shigellosis in people experiencing homelessness. *Shigella* is an easily transmitted bacterium that causes painful gastrointestinal illness with cramps and diarrhea that can last several days. For people experiencing homelessness, self-care during such illness is a challenge. Also because of unstable housing situations, it is difficult to find ill people for the interviews about shared activities-- information that can guide interventions for interrupting the spread of this disease.



Working with our Deputy Health Officer, Emergency Preparedness program staff, the Oregon Health Authority, and County and City homeless advocates, we have increased community access to general information about *Shigella* and hand-hygiene options. The numbers of new cases have been decreasing in the first quarter of 2016, and we continue to seek better options to protect the people affected.

We are tracking the Zika virus epidemic that started in Brazil and has been spreading north. Local transmission of this mosquito-borne disease is unlikely because the virus isn't well-adapted to mosquitoes species that are most common here. Should that change, we want to be ready. Currently, we are coordinating Zika virus testing for providers with patients returning from affected countries: with no available commercial test, we provide a link between OHA and providers to get patient specimens to the CDC for testing. Trends in hospital-acquired infections are also a global concern that is hitting close to home. We plan to work more closely with OHA in 2016, to determine what our local role needs to be on this front.



Finally, CDS will be changing the way we work with the roll-out of a TB-specific Electronic Health Record (EHR). We believe this EHR to be the first of its kind for a TB specialty clinic in the United States. Seattle, Wash. and Houston, Tex. plan to join this project by late spring 2016. In addition to building functionality for our CDS TB clinical and reporting roles, we will also implement existing immunizations capabilities, to improve our efficiency in scheduling, billing, and reporting on these visits.

We look forward to telling you about this work and more in the future.

In recognition of the CDS staff,
Amy Sullivan
CDS Director

Appendix

Table A1

Reportable Disease Reports and Investigations for Cases Investigated in 2015.* Case Reports Found to be Confirmed or Presumptive Cases.

Disease	2015 Total (Number of Confirmed or Presumptive Cases)	Previous 5-year average (Number of Confirmed or Presumptive Cases)
Total	2579	2296
Routinely Investigated, Cases in 2015		
Cryptococcus	11	**
Cryptosporidiosis	50	47
E. coli (STEC)	17	21.8
Ehrlichiosis/Anaplasma	1	0
Haemophilus influenzae	23	14.6
Hemolytic uremic syndrome	4	1.8
Hepatitis A	2	3
Hepatitis B (acute)	8	9.6
Legionellosis	14	8.4
Listeriosis	4	2
Lyme Disease	6	10.8
Malaria	7	7.2
Meningococcal disease	3	3.4
Mumps	1	0.8
Pertussis	72	122
Rocky Mountain Spotted Fever	1	0.4
Salmonella (typhoidal)	1	0.8
Salmonellosis	111	81.4
Shigellosis	69	20.4
Taeniasis/Cysticercosis	1	1.8
Tuberculosis	26	28.6
Tularemia	1	0.4
Typhus (murine)	1	0
Vibriosis	6	6
Yersiniosis	9	6.4
Limited Investigation or Intervention		
Campylobacteriosis	220	214.2
Carbapenem-Resistant	16	**
Enterobacteriaceae	3	0
Coccidioidomycosis	137	148.8
Giardiasis	219	208.4
Hepatitis B (chronic)	1525	1312.2
Hepatitis C (chronic)	7	**
Non-TB Mycobacterium - extrapulmonary		

* The following are diseases that we usually see once or twice every five years, but had no cases in 2015: Babesiosis, Borrelia (tick borne relapsing fever), Botulism, Brucellosis, Chikungunya, Ciguatera, Cyclosporiasis, Dengue, Hepatitis C (acute), Hepatitis D, Hepatitis E, Leishmaniasis, Leptospirosis, Measles (rubeola), Q Fever, West Nile Virus.

** 5 Year Average not available.

Appendix

Table A2

**Immunizations Administered in the CDS Clinic,
January 1, 2015 - December 31, 2015. Multnomah County
Health Department, Communicable Disease Services.**

Vaccine Doses	Client Age		Total Doses
	(<= 18 yrs.)	(> 18 yrs.)	
Diphtheria / Tetanus / Pertussis (DTaP)	133	0	133
DTaP / Polio	240	0	240
DTaP / Polio / Hepatitis B	345	0	345
DtaP / Polio / Hib	141	0	141
Hepatitis A	454	35	489
Hepatitis A / Hepatitis B (Twinrix)	0	180	180
Hepatitis B	263	177	440
Hib (Haemophilus influenzae Type B)	149	0	149
Human Papilloma Virus (HPV)	80	24	104
Influenza Seasonal	99	63	162
Measles, Mumps, Rubella	420	164	584
Meningococcal Meningitis	72	5	77
Pneumococcal Pneumonia	166	4	170
Polio	234	31	265
Rotavirus	67	0	67
Tetanus / Diphtheria (Td)	67	39	106
Tetanus / Diphtheria / Pertussis (DTaP)	344	151	495
Varicella (Chickenpox)	413	134	547
Total	3,687	1,007	4,694

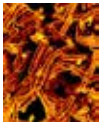
Photo credits



National Institute of Allergy and Infectious Diseases (NIAID)



CDC-Frederick A. Murphy



National Institute of Allergy and Infectious Diseases (NIAID)



CDC-James Volk



CDC-Dr. Erskine Palmer



CDC



Randy Cox-Multnomah County



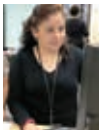
Randy Cox-Multnomah County



Melissa McKinney-Multnomah County



Melissa McKinney-Multnomah County



Melissa McKinney-Multnomah County



Melissa McKinney-Multnomah County



Randy Cox-Multnomah County



Melissa McKinney-Multnomah County



Kate Willson-Multnomah County



Kate Willson-Multnomah County



Melissa McKinney-Multnomah County



Melissa McKinney-Multnomah County



Kate Willson-Multnomah County



CDC-Judy Schmidt



Randy Cox-Multnomah County



If you have any questions please contact your state or local health department:

Multnomah County Health Department
Communicable Disease Services
426 SW Stark Street
Portland, OR 97204
503-988-3406

Oregon Health Authority
Acute and Communicable Disease Prevention
800 NE Oregon Street, Suite 772
Portland, OR 97232
971-673-1111



Tuberculosis

Cystic

Cryptosporidiosis

Vibriosis

Listeriosis

Ehrlichio

Typhus

Yersiniosis

Mumps

Shigellosis

Cryptococcus

Salmonellos

Meningococcal dis

Hemolytic uremic syndro

Taeniasis