Collin County Health Care Services

Epidemiology Department

What is Epidemiology?

- Study—Epidemiology is the science of public health. It's a highly quantitative discipline based on principles of statistics and research methodologies.

- Distribution—Epidemiologists study the distribution of frequencies and patterns of health events within groups in a population. To do this, they use descriptive epidemiology, which characterizes health events in terms of time, place, and person.

- Determinants—Epidemiologists also attempt to search for causes or factors that are associated with increased risk or probability of disease. This type of epidemiology, where we move from questions of "who," "what," "where," and "when" and start trying to answer "how" and "why," is referred to as analytical epidemiology.

What is Epidemiology?

- Health-related states—Epidemiology as it is practiced today is applied to the whole spectrum of health-related events, which includes chronic disease, environmental problems, behavioral problems, and injuries in addition to infectious disease.

- Populations—One of the most important distinguishing characteristics of epidemiology is that it deals with groups of people rather than with individual patients.

- Control—Finally, although epidemiology can be used simply as an analytical tool for studying diseases and their determinants, it serves a more active role. Epidemiological data steers public health decision making and aids in developing and evaluating interventions to control and prevent health problems.

Texas Notifiable Conditions List

TEXAS Department of State Health Services

Texas Notifiable Conditions

24/7 Number for Immediately Reportable – 1-800-705-8868

Report confirmed and suspected cases.

Unless noted by *, report to your local or regional health department using number above or find contact information at http://www.dshs.state.tx.us/idcu/investigation/conditions/contacts/

Reporting Contacts

A – I	When to Report	I – Y	When to Report
*Acquired immune deficiency syndrome (AIDS)[1, 2]	Within 1 week	Influenza, Novel[3]	Call Immediately
Amebiasis[3]	Within 1 week	*Lead, child blood, any level & adult blood, any level[4]	Call/Fax Immediately
Amebic meningitis and encephalitis[3]	Within 1 week	Legionellosis[3]	Within 1 week
Anaplasmosis[3]	Within 1 week	Leishmaniasis[3]	Within 1 week
Anthrax[3, 5]	Call Immediately	Listeriosis[3, 5]	Within 1 week
Arbovirus infection[3, 6]	Within 1 week	Lyme disease[3]	Within 1 week
*Asbestosis[7]	Within 1 week	Malaria[3]	Within 1 week
Babesiosis[3]	Within 1 week	Measles (rubeola)[3]	Call Immediately
*Botulism (adult and infant)[3, 5, 8]	Call Immediately	Meningococcal infections, invasive[3, 5]	Call Immediately
Brucellosis[3, 5]	Within 1 work day	Multi-drug-resistant *Acinetobacter* (MDR-A)[9, 10]	Call Immediately
Campylobacteriosis[3]	Within 1 week	Mumps[3]	Within 1 week
*Cancer[11]	See rules[11]	Pertussis[3]	Within 1 work day
Carbapenem resistant *Enterobacteriaceae* (CRE)[9, 12]	Call Immediately	*Pesticide poisoning, acute occupational[13]	Within 1 week
Chagas' disease[3]	Within 1 week	Plague (*Yersinia pestis*)[3, 5]	Call Immediately
*Chancroid[1]	Within 1 week	Poliomyelitis, acute paralytic[3]	Call Immediately
Chickenpox (varicella)[14]	Within 1 week	Poliovirus infection, non-paralytic[3]	Within 1 work day
Chlamydia trachomatis infection[1]	Within 1 week	Q fever[3]	Within 1 work day
*Contaminated sharps injury[15]	Within 1 week	Rabies, human[3]	Call Immediately
*Controlled substance overdose[16]	Call Immediately	Relapsing fever[3]	Within 1 week
Creutzfeldt-Jakob disease (CJD)[3]	Within 1 week	Rubella (including congenital)[3]	Within 1 work day
Coronavirus, novel causing severe acute respiratory disease[3, 17]	Call Immediately	Salmonellosis, including typhoid fever[3]	Within 1 week
Cryptosporidiosis[3]	Within 1 week	Shigellosis[3]	Within 1 week
Cyclosporiasis[3]	Within 1 week	*Silicosis[18]	Within 1 week
Cysticercosis[3]	Within 1 week	Smallpox[3]	Call Immediately
*Cytogenetic results (fetus and infant only)[19]	See rules[19]	*Spinal cord injury[20]	Within 10 work days
Dengue[3]	Within 1 week	Spotted fever group rickettsioses[3]	Within 1 week
Diphtheria[3]	Call Immediately	*Staph. aureus*, vancomycin-resistant (VISA and VRSA)[3, 5]	Call Immediately
*Drowning/near drowning[20]	Within 10 work days	Streptococcal disease (group A, B, *S. pneumo*), invasive[3]	Within 1 week
Ehrlichiosis[3]	Within 1 week	*Syphilis – primary and secondary stages[1, 21]	Within 1 work day
Escherichia coli infection, Shiga toxin-producing[3, 5]	Within 1 week	*Syphilis – all other stages[1, 21]	Within 1 week
*Gonorrhea[1]	Within 1 week	*Taenia solium* and undifferentiated *Taenia* infection[3]	Within 1 week
Haemophilus influenzae type b infections, invasive[3]	Within 1 week	Tetanus[3]	Within 1 week
Hansen's disease (leprosy)[3]	Within 1 week	*Traumatic brain injury[20]	Within 10 work days
Hantavirus infection[3]	Within 1 week	Trichinosis[3]	Within 1 week
Hemolytic Uremic Syndrome (HUS)[3]	Within 1 week	Tuberculosis (includes all *M. tuberculosis* complex)[3, 22]	Within 1 work day
Hepatitis A (acute)[3]	Within 1 work day	Tularemia[3, 5]	Call Immediately
Hepatitis B, C, and E (acute)[3]	Within 1 week	Typhus[3]	Within 1 week
Hepatitis B identified prenatally or at delivery (acute & chronic)[3]	Within 1 week	*Vibrio* infection, including cholera[3, 5]	Within 1 work day
Hepatitis B, perinatal (HBsAg+ < 24 months old)[3]	Within 1 work day	Viral hemorrhagic fever, including Ebola[3]	Call Immediately
*Human immunodeficiency virus (HIV) infection[1, 2]	Within 1 week	Yellow fever[3]	Call Immediately
Influenza-associated pediatric mortality[3]	Within 1 work day	Yersiniosis[3]	Within 1 week

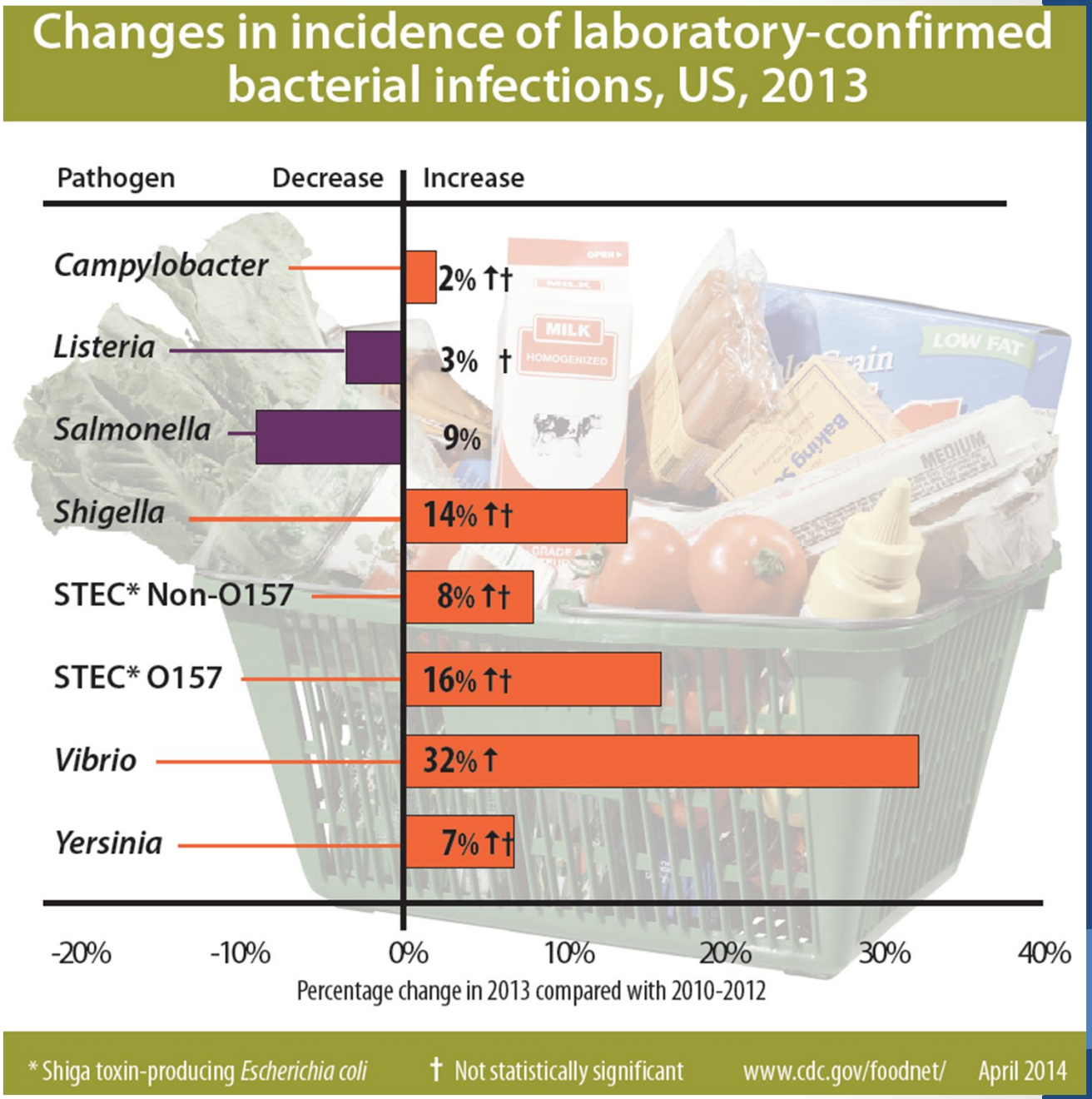
In addition to specified reportable conditions, ***any outbreak, exotic disease, or unusual group expression of disease that may be of public health concern should be reported*** *by the most expeditious means available.*

Foodborne and Waterborne Illnesses

- The CDC estimates 48 million Americans domestically acquire a foodborne or waterborne illness each year
- There are 31 identified pathogens along with a broad category of unspecified agents
- It is a foodborne/waterborne disease epidemiologists' role to:
  - Monitor human illness
  - Define the burden of foodborne and waterborne illness, especially those due to bacteria
  - Attribute illness to transmission routes and to specific foods, water sources and environmental settings
  - Target prevention measures to meet food safety goals
  - Provide data and analyses that inform food safety action and policy

The Centers for Disease Control and Prevention. (2013). Division of Foodborne, Waterborne, and Environmental Diseases. Retrieved on April 28, 2014 from: http://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/size-extent.html

Laboratory Confirmation: Changes in Incidence



The Centers for Disease Control and Prevention. (2014). Changes in incidence of laboratory-confirmed bacterial infections, US, 2013. Retrieved on May 13, 2014 from: http://www.cdc.gov/foodborneburden/estimates-overview.html

Progress Report on Six Key Pathogens

FOOD SAFETY PROGRESS REPORT FOR 2013

Disease Agents	Percentage change in 2013 compared with 2006–2008	2013 rate per 100,000 Population	2020 target rate per 100,000 Population	CDC estimates that...
Campylobacter	13% increase	13.82	8.5	For every *Campylobacter* case reported, there are 30 cases not diagnosed
Escherichia coli O157	No change	1.15	0.6	For every *E. coli* O157 case reported, there are 26 cases not diagnosed
Listeria	No change	0.26	0.2	For every *Listeria* case reported, there are 2 cases not diagnosed
Salmonella	No change	15.19	11.4	For every *Salmonella* case reported, there are 29 cases not diagnosed
Vibrio	75% increase	0.51	0.2	For every *Vibrio parahaemolyticus* case reported, there are 142 cases not diagnosed
Yersinia	No change	0.36	0.3	For every *Yersinia* case reported, there are 123 cases not diagnosed

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

For more information, see http://www.cdc.gov/foodnet/

Preliminary FoodNet 2013 Data

The Centers for Disease Control and Prevention. (2014). Foodborne Diseases Active Surveillance Networks (Food Net). Retrieved on May 8, 2014 from: http://www.cdc.gov/foodnet/data/trends/trends-2013-progress.html

Epidemiology Foodborne and Waterborne Disease Investigation

- Foodborne and waterborne disease reports come in on a daily basis
  - Individual disease reports are investigated and determined to be confirmed, probable or not a case
  - Can takes hours – months to fully complete and close
- Individual investigations can be linked to multi-state outbreaks
  - Multi-state outbreaks require further investigation through hypothesis generating questionnaire
  - Investigations and source identification leads to recalls.
- Facility illnesses (nursing home/assisted living, schools, daycares, etc.) report small outbreaks on a weekly basis
  - Reports are investigated as an entity, partnering with environmental health to determine source of illness. Individual investigations are then conducted on ill persons by CCHCS

Foodborne and Waterborne Illness Outbreaks

- When two or more people get the same illness from the same contaminated food or drink, the event is called a foodborne outbreak
- Illnesses that are not part of outbreaks are called "sporadic." Public health officials investigate outbreaks to control them, so more people do not get sick in the outbreak, and to learn how to prevent similar outbreaks from happening in the future

The Centers for Disease Control and Prevention. (2013). Size and Extent of Foodborne Outbreaks. Retrieved on April 28, 2014 from: http://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/size-extent.html

Foodborne and Waterborne Illness Outbreaks

- The size and scope of a foodborne outbreak can vary based on which pathogen or toxin is involved, how much food is contaminated, where in the food production chain contamination occurs, where the food is served, and how many people eat it. For example:
  - Small, local outbreak—A contaminated casserole served at a church supper may cause a small outbreak among church members who know each other
  - Statewide or regional outbreak—A contaminated batch of ground beef sold at several locations of a grocery store chain may lead to illnesses in several counties or even in neighboring states
  - Nationwide outbreak—Contaminated produce from one farm may be shipped to grocery stores nationwide and make hundreds of people sick in many states

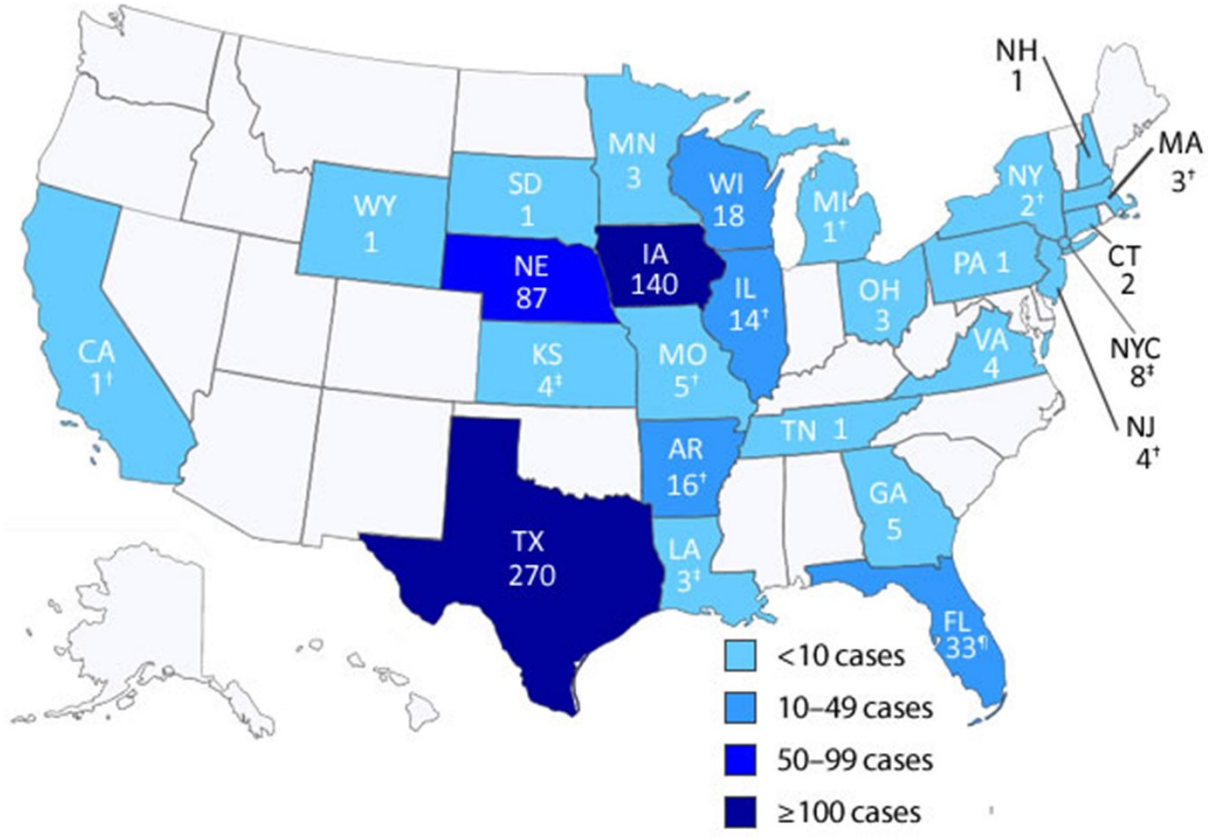
The Centers for Disease Control and Prevention. (2013). Size and Extent of Foodborne Outbreaks. Retrieved on April 28, 2014 from: http://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/size-extent.html

In The News

- 2013 Multistate Outbreak of *Salmonella* Infections Linked to Tahini Sesame Paste
  - Involved nine states, 43.8 % of the cases were in Texas
  - Ended in a recall of tahini paste
- 2013 Multistate Outbreak of *Salmonella* Infections Linked to Imported Cucumbers
  - Involved 18 states, 8.3% of the cases were in Texas
  - Cucumber suppliers were put on Import Alert
- 2014 Richardson, TX High School Norovirus Outbreak
  - More than 675 students absent with the illness

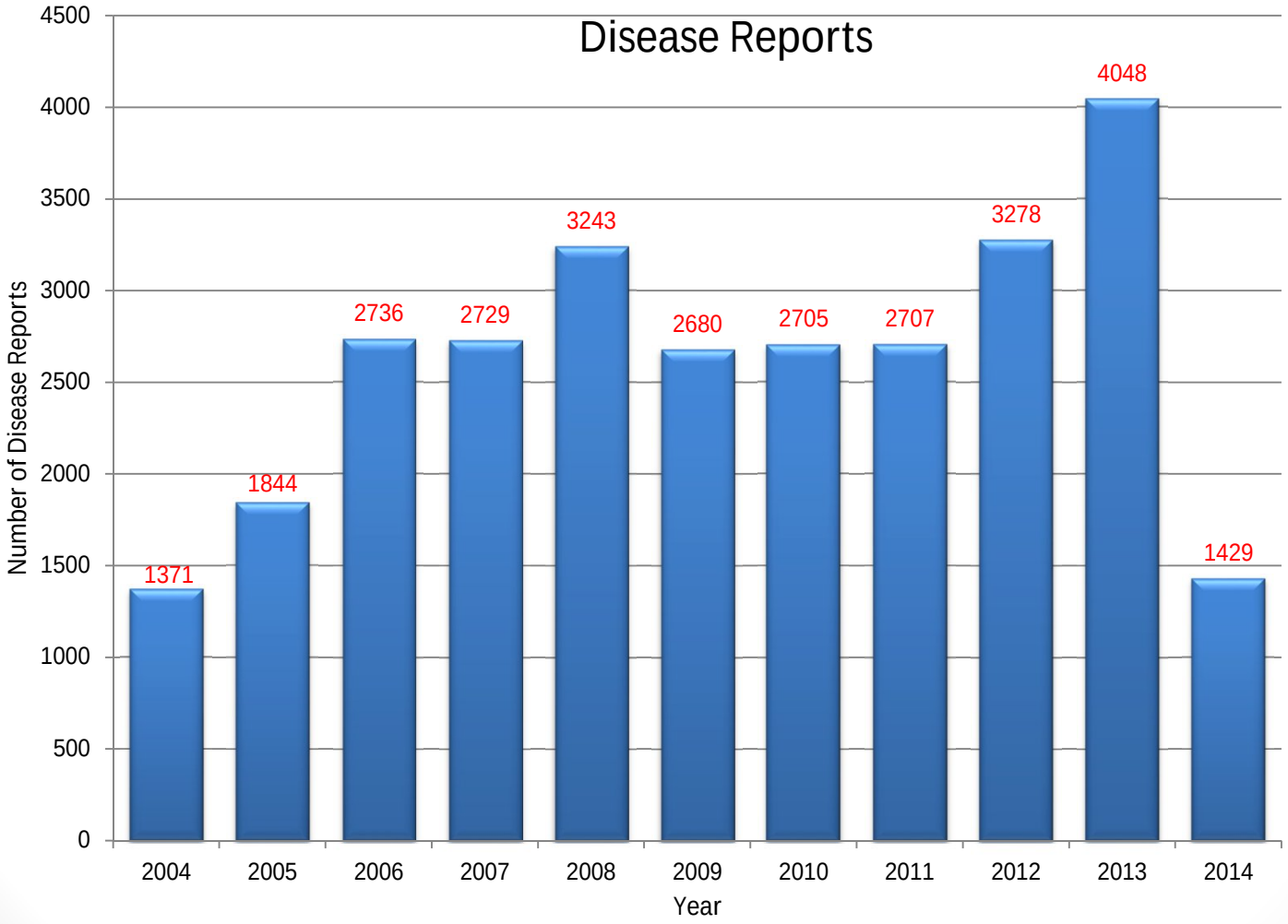
In The News

- 2013 Cyclosporiasis Multi-State Outbreak – 25 states
  - Total of 631 people ill; Texas had the largest proportion of cases with 270 – 43 (15.9%)of those cases were in Collin County



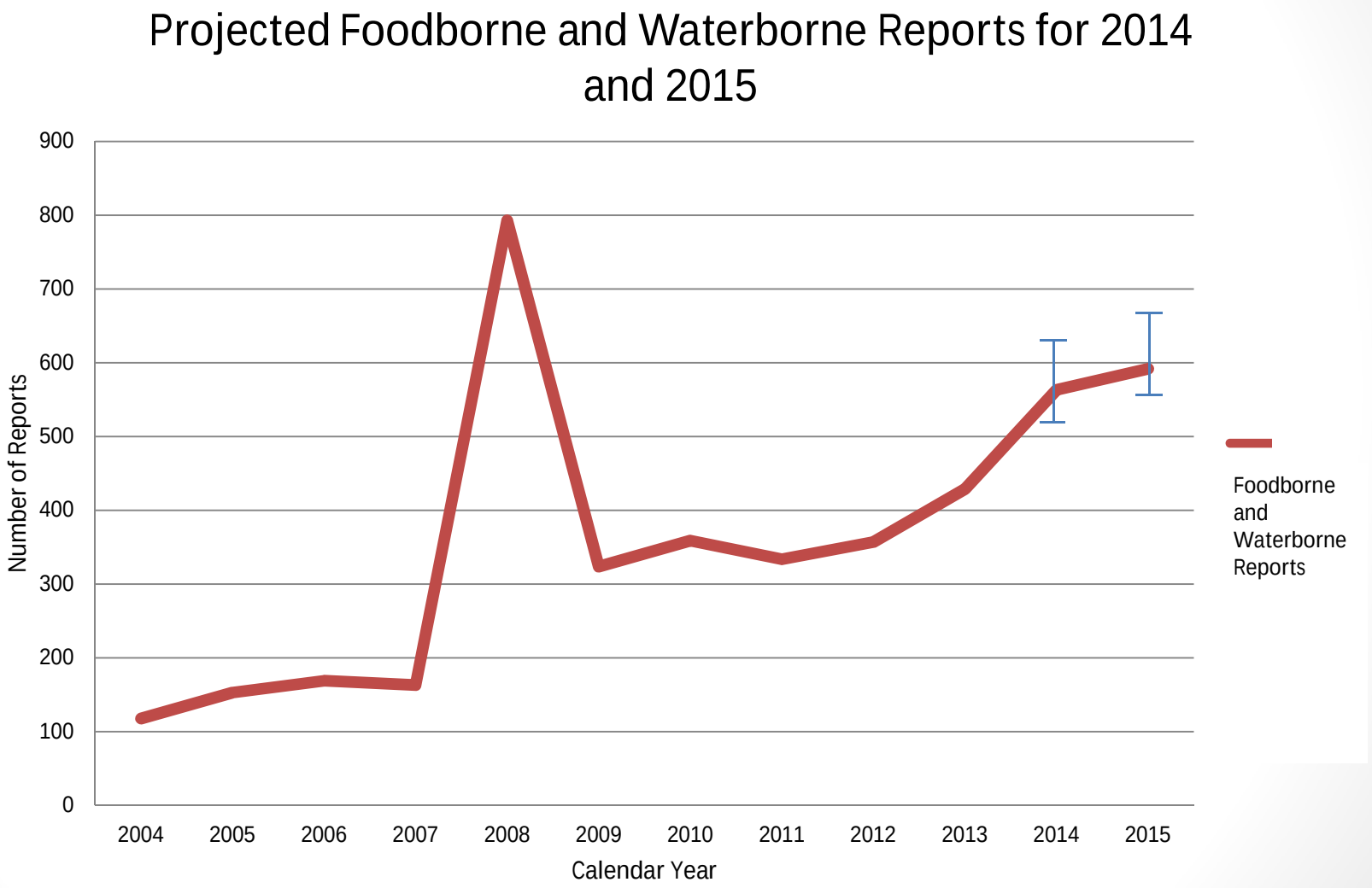
Centers for Disease Control and Prevention. (2013). *Cyclosporiasis Outbreak Investigation: Map – United States, 2013 (Final Update)* [Photograph], Retrieved April 28, 2014 from: http://www.cdc.gov/parasites/cyclosporiasis/outbreaks/investigation-2013-maps.html

Collin County Disease Reports



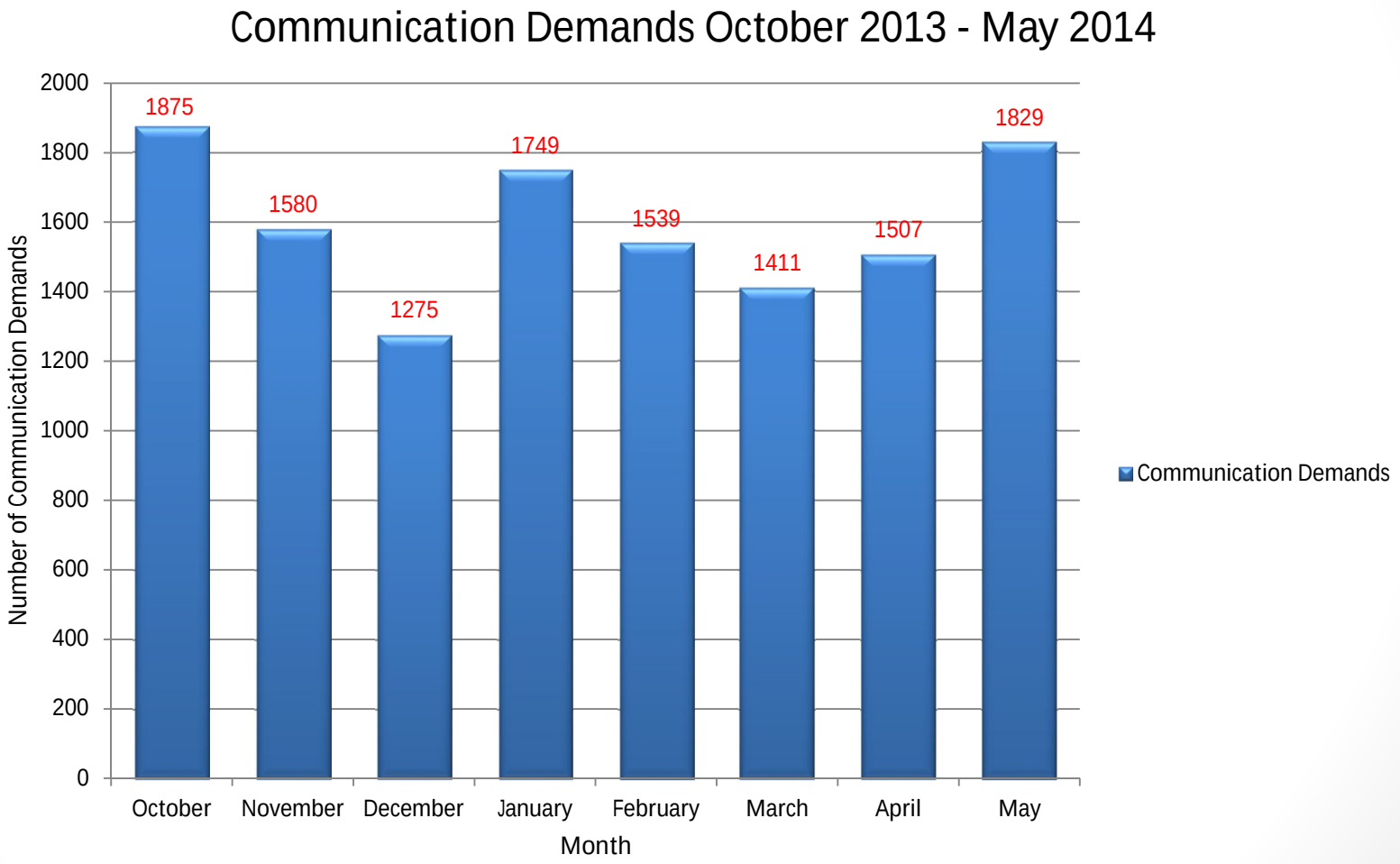
* Cases are per calendar year; 2014 includes cases up to June 9, 2014

Forecasted Statistics



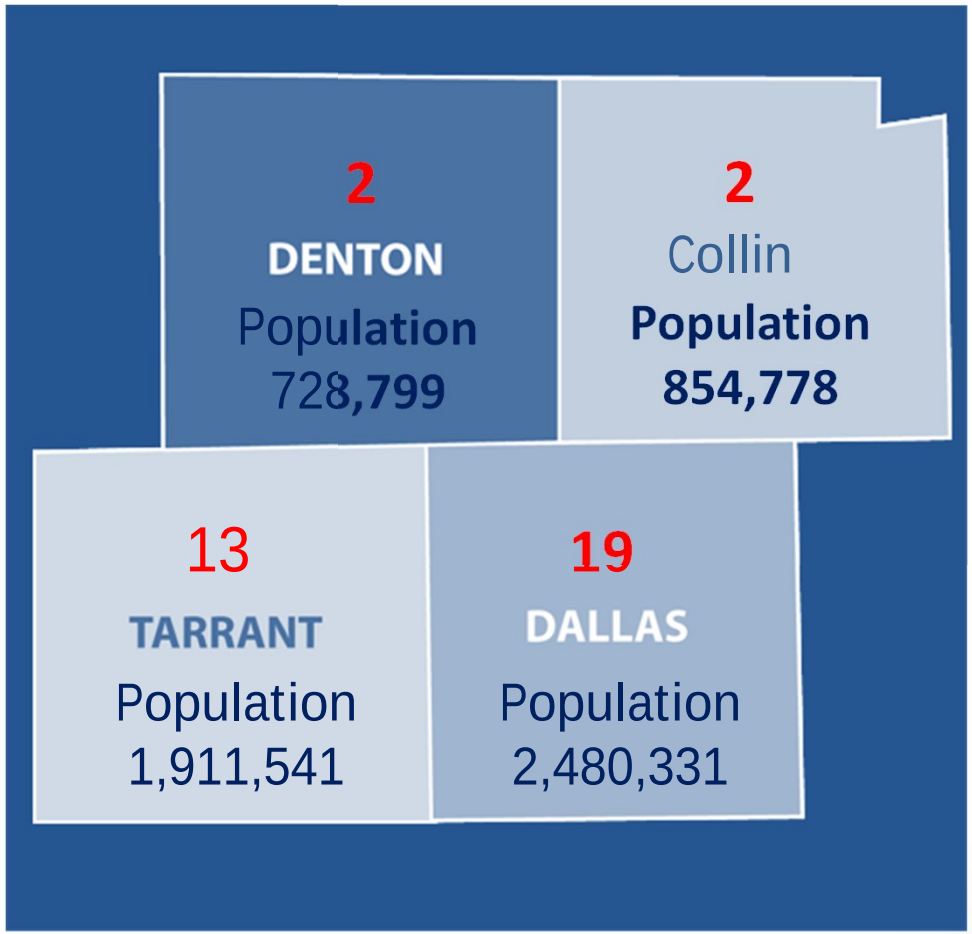
*Projected statistics (Number of Disease Reports) are calculated using population estimates obtained from US Census and past percentages of all disease reports.

Epidemiology Department Communication Demands



DFW Area Epidemiology Staff

- Collin – 2
- Dallas – 19
- Denton – 2
- Tarrant – 13



U.S. Census, (2014). State and County Quick Facts. Dallas County, Collin County, Tarrant County, Denton County. Retrieved on May 8, 2014 from: http://quickfacts.census.gov/qfd/states/48/48113.html

Costs of an Outbreak

- Using a cost-of-illness model from the CDC, associated foodborne and waterborne illness costs can be estimated
  - The average cost of these illnesses in the U.S. was $1,626 (90% credible interval [CI], $607 to $3,073)
  - Aggregated annual cost of these illnesses in the U.S. was $77.7 billion(90% CI, $28.6 to $144.6 billion)
- Foodborne and waterborne illnesses create an economic burden in the communities they infect

Scharff R. L., (2012). Economic burden from health losses due to foodborne illness in the United States. Journal of Food Protection. Jan;75(1):123-31. doi: 10.4315/0362-028X.JFP-11-058.

Collin County Epidemiologist

- Department of State Health and Human Services (DSHS) Has Offered To Fund (1) Collin County Epidemiologist Position for Foodborne and Waterborne Illness
  - Full-time funded epidemiologist beginning May 1, 2014 – August 31, 2014
  - Continued funding for an epidemiologist September 1, 2014 – August 31, 2015
  - Funding includes salary and fringe benefits and all related expenses
  - Funding may continue from DSHS after 2015
  - Position is needed regardless due to the ongoing need to control and prevent public health diseases in our growing community
  - Due to the availability of this funding I was able to remove a request for (1) FTE epidemiologist position in the 2015 budget