



**Evaluation of New Mexico Foodborne Illness and Outbreak Response
Using the Council to Improve Foodborne Outbreak and Response (CIFOR)
Proposed Performance Measures**

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Background:

The Council to Improve Foodborne Outbreak Response (CIFOR) was established in 2006 to improve methods at the local, state, and federal levels to detect, investigate, control, and prevent foodborne disease outbreaks. In 2009, CIFOR released “Guidelines for Foodborne Disease Outbreak Detection and Response” (Guidelines)¹. Chapter 8 of the Guidelines lists over 100 performance measures for foodborne disease programs. These measures are divided into foodborne disease program objectives and indicators (short-term, intermediate, and long-term) and major performance measures and metrics for program evaluation (for local and state communicable disease, environmental health, and laboratory programs).

The CIFOR Metrics Working Group identified 20 key performance measures from Chapter 8 of Guidelines and suggested target ranges for the measures. In 2013, states were asked to assess which metrics could be calculated with available state data, the difficulty of obtaining and calculating data, and value of the performance measures in evaluating foodborne disease programs performance. Based on feedback from thirteen states, the CIFOR Metric Working Group eliminated some performance measures and updated the remaining 16 measures and their target ranges. This evaluation uses the updated performance measures that are included in the second edition of the Guidelines.

Methods:

To evaluate New Mexico performance on the 16 performance measures, the following data were used:

- Reportable condition data—Salmonella, E. coli and Listeria case data were extracted using SAS.
- National Outbreak Reporting System (NORS)—managed by the Centers for Disease Control and Prevention (CDC), designated staff of the New Mexico Department of Health report outbreaks to CDC using NORS.
- American Fact Finder population estimates based on 2010 Census Data.
- Cluster worksheets completed by New Mexico Department of Health staff.

Enteric disease case data from 2010-2014 were analyzed unless otherwise noted. NORS data from 2010-2014 were analyzed. Only 2014 data were used for lab and cluster indicators.

Results:

Below, table 1 describes the 16 CIFOR performance measures, the target ranges suggested by the CIFOR Metrics Working Group, New Mexico findings, and the target ranges achieved by New Mexico.

Table 1: CIFOR Performance Measures and New Mexico Performance:

CIFOR Performance Measures		New Mexico Performance	
Performance Measure	Target Range	Findings for Each Performance Measure	Target Range Achieved
<p>1. Foodborne illness complaint reporting system: Agency maintains logs or databases for all complaints or referral reports from other sources alleging food-related illness, food-related injury or intentional food contamination, and routinely reviews data to identify clusters of illnesses requiring investigation.</p>	<p>Preferable: database Acceptable: system to log complaints</p>	2010-2014 data Foodborne illness complaint system is managed in a hard copy form.	Acceptable
<p>2. Outbreaks detected from complaints: Number of outbreaks detected as a result of foodborne illness complaints. Rate of outbreaks detected per 1,000 complaints received.</p>	<p>Preferable: > 20 outbreaks / 1,000 complaints Acceptable: 10-20 outbreaks/ 1,000 complaints</p>	Unknown. Data not currently collected	
<p>3. Foodborne illness outbreak rate: Number of foodborne outbreaks reported, all agents. Rate of outbreaks reported / 1,000,000 population.</p>	<p>Preferable: >6 outbreaks / 1,000,000 population Acceptable: 1-6 outbreaks / 1,000,000 population</p>	2010= 2.91 (6/2064950) 2011= 1.92 (4/2078407) 2012= 1.92 (4/2084594) 2013= 3.35 (7/2086895) 2014= 1.44 (3/2085572)	Acceptable
<p>4. Confirmed cases with exposure history obtained: Number and percentage of confirmed <i>Salmonella</i>,</p>	<p>Preferable: > 75% of cases Acceptable: 50-75% of cases</p>	2010-2014 data Salmonella: 77% (1321/1714) STEC: 90% (201/224) Listeria: 92% (36/39)	Preferable

CIFOR Performance Measures		New Mexico Performance	
Performance Measure	Target Range	Findings for Each Performance Measure	Target Range Achieved
<i>Shiga-toxin producing E. coli</i> (STEC), and <i>Listeria</i> cases with exposure history obtained			
5. Isolate submissions to Public Health Laboratory: Number and percentage of isolates from confirmed <i>Salmonella</i> , STEC, and <i>Listeria</i> cases submitted to Public Health Laboratory	Preferable: > 90% of isolates Acceptable: 60-90% of isolates	2014 data Salmonella: 88% (340/385) STEC: 53% (56/105) Listeria: 100% (13/13)	Salmonella: Acceptable STEC: out of range Listeria: Preferable
6. Pulsed Field Gel Electrophoresis (PFGE) subtyping of isolates: Number and percentage of <i>Salmonella</i> , STEC, and <i>Listeria</i> isolates with PFGE information.	Preferable: > 90% of isolates Acceptable: 60-90% of isolates	2014 data Salmonella: 95.3% (324/340) STEC: 83.9% (47/56) Listeria: Not done at NM Public Health Lab.	Salmonella: Preferable STEC: Acceptable
7. Isolate submission interval: Median number of days from report of clinical findings to receipt of <i>Salmonella</i> , STEC, and <i>Listeria</i> isolate at PHL	Preferable: <7 days Acceptable: 7-8 days	Unable to calculate with available data. This calculation requires merging epi data (report to public health date) and lab data (isolate receipt date). Currently, NM does not integrate this data.	
8. Isolate subtyping interval: Median number days from receipt of <i>Salmonella</i> , STEC, and <i>Listeria</i> isolates to serotyping or subtyping results	Preferable: ≤4 days Acceptable: 5-6 days	2014 data Salmonella: 11 days STEC: 10.5 days Listeria: Not done at NM Public Health Lab.	Out of range
9. PFGE <i>E. coli</i> O157 and <i>Listeria</i> subtyping interval: Percent of pulsed-field gel electrophoresis (PFGE) subtyping data results for <i>E. coli</i> O157:H7 and <i>Listeria</i> submitted to the PulseNet national database within four working days of receiving isolate at the PFGE laboratory	Acceptable: ≥90% of PFGE subtyping results submitted to PulseNet within 4 working days.	2014 Data <i>E. coli</i> O157: 100% (16 out of 16 uploaded) Listeria: not done at NM Public Health Lab.	Acceptable

CIFOR Performance Measures		New Mexico Performance	
Performance Measure	Target Range	Findings for Each Performance Measure	Target Range Achieved
10. Outbreak clinical specimen collections: Number and percentage of outbreak investigations with clinical specimens collected and submitted to PHL from 2 or more people	Preferable: > 75% of outbreaks Acceptable: 50-75% of outbreaks	2010-2014 NORS data 73% (16/22 outbreaks)	Acceptable
11. Cluster investigation interval: Median no. days from initiation of investigation to identification of a source.	Preferable: < 7 days Acceptable: 7-21 days	Unknown. Date for identification of source not collected	
12. Complaint investigation interval: Median no. days from initiation of investigation to implementation of intervention.	Preferable: < 7 days Acceptable: 7-21 days	Unknown. Intervention implementation date not collected	
13. Cluster source identification: Number and percentage of clusters with more than 5 cases in which a source was identified.	Preferable: >20% of clusters with >5 cases Acceptable: 10-20% of clusters with >5 cases	2014 cluster data 0% (0/16 clusters)	Out of range
14. Outbreak etiology reported to NORS: Number and percentage of outbreaks for which etiology was identified and reported to NORS.	Preferable: > 68% of outbreaks Acceptable: 44-68% of outbreaks	2010-2014 NORS data 77% (17/22 outbreaks)	Preferable
15. Outbreak vehicle reported to NORS: Number and percentage of outbreaks for which a vehicle was identified and reported to NORS.	Preferable: > 60% of outbreaks Acceptable: 48-60% of outbreaks	2010-2014 NORS data 18% (4/22 outbreaks)	Out of range
16. Outbreak contributing factor reported to NORS: Number and percentage of outbreaks for which contributing factors were identified and reported to NORS.	Preferable: >55% of outbreaks Acceptable: 33-55% of outbreaks	2010-2014 NORS data 50% (11/22 outbreaks)	Acceptable

Discussion:

Of the 16 performance indicators, 12 could be evaluated using available New Mexico data. Of those, preferable target ranges were achieved for 2, acceptable ranges were achieved for 5, 2 had mixed ranges depending on the pathogen, and 3 were out of range. Four out of 16 indicators could not be evaluated due to data not being collected.

Exposure histories obtained for confirmed cases of STEC, salmonella, and Listeria were all at preferable ranges -above 75%. The number of outbreaks reported per 10 million was at acceptable ranges for all 5 years. The percentage of outbreaks for which clinical specimens were collected and submitted to the lab from more than 2 people also had an acceptable range.

The cluster investigation numbers however seem out of range mostly, but that could be because of the way New Mexico categorizes their outbreaks and clusters. Clusters which had a source identified were counted as outbreaks and those that did not were counted as clusters. Henceforth, cluster data collection cannot be considered incomplete since clusters wherein sources were identified were included as outbreaks.

Regarding lab data- percentage of isolate submissions to the lab after collection, percentage that was PFGE subtyped and time frame within which results were uploaded onto PulseNET, all had either preferable or acceptable ranges depending on the pathogen. However, their subtyping interval, i.e. the time taken from receipt of isolates at the lab to subtyping them are not as timely as is preferred.

Recommendations:

- Increase documentation to facilitate calculation of additional cluster metrics. Consider adding intervention implementation date and the date a source was identified.
- Increase documentation to facilitate calculation of complaint metrics. For example, document if any of the complaints resulted in outbreak investigations.
- Continue obtaining exposure histories from confirmed cases of outbreaks.
- Continue uploading PFGE subtyping results into PulseNET within acceptable time frames.
- Consider ways to integrate epi and lab data to facilitate calculation of median number of days from reporting clinical findings to receipt of isolates at PHL.
- Accelerate the subtyping interval after isolates are received at the PHL.
- Consider reporting suspected outbreak vehicles to NORS.
- Ensure that NORS data entry is complete and updated at the end of each outbreak.

References:

¹Council to Improve Foodborne Outbreak Response (CIFOR). Guidelines for Foodborne Disease Outbreak Response. Atlanta: Council of State and Territorial Epidemiologists, 2009