Bureau of Infectious Disease and Laboratory Sciences

## 2017 Statewide Antibiogram Report

**Bureau of Infectious Disease and Laboratory Sciences**

Massachusetts State Public Health Laboratory **Requests for additional data can be emailed to:**

305 South Street [dph-antibiogram@state.ma.us](mailto:dph-antibiogram@state.ma.us)

Jamaica Plain, MA 02130 Tel: (617) 983-6550

Fax: (617) 983-6925 **Acknowledgements:**

Quynh Vo, MPH

Kerri Barton, MPH

**To speak to the on-call epidemiologist:** Evan Caten, MS

(617) 983-6800 Melissa Cumming, MPH

Jessica Fisler, MPH

Jessica Leaf, MPH

Scott Troppy, MPH

Alfred DeMaria, Jr., MD

In 2017, antibiogram data representing 72 (97%) acute-care hospitals was reported and is included in this statewide report. Each page of this eleven page report displays the average percent susceptibility (red dots) and standard deviation (red bars) of bacterial isolates to relevant antibiotics. These data are representative of antibiotic susceptibility data for 244,918 inpatient and outpatient bacterial isolates, and does not represent the full extent of antibiotic resistance in Massachusetts.

## Table of Contents

*Acinetobacter baumannii* Susceptibility Rates………………………………………………………………………………….1 *Pseudomonas aeruginosa* Susceptibility Rates…………………………………………………………………………………2 *Enterobacter aerogenes* Susceptibility Rates……………………………………………………………………………………3 *Enterobacter cloacae* Susceptibility Rates………………………………………………………………………………………..4 *Escherichia coli* Susceptibility Rates…………………………………………………………………………………………………5 *Klebsiella pneumoniae* Susceptibility Rates………………………………………………………………………………………6 *Stenotrophomonas maltophilia* Susceptibility Rates………………………………………………………………………..7 *Serratia marcescens* Susceptibility Rates………………………………………………………………………………………….8 *Klebsiella oxytoca* Susceptibility Rates……………………………………………………………………………………………..9 *Staphylococcus aureus* Susceptibility Rates……………………………………………………………………………………10 *Streptococcus pneumoniae* Susceptibility Rates…………………………………………………………………………….11 Antibiogram data collection tool …………………………………………………………………………………………………..12 List of reporting hospitals………………………………………………………………………………………………………………13 Antibiotic susceptibility testing guidelines…..…………………………………………………………………………………14

1

% Susceptible

90

93

94

89

95

96

88

83

84

84

81

79

79

76

71

44

30

26

80

70

60

50

40

30

20

10

0

AMIKACIN

AMP/SUL

CEFEPIME

CEFOTAXIME

CEFTAZIDIME

CEFTRIAXONE

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

MEROPENEM

PIP/TAZO

TETRACYCLINE

TIGECYCLINE

TMS

TOBRAMYCIN

2

% Susceptible

100

96

91

92

89

89

89

87

85

78

74

70

0

90

80

70

60

50

40

30

20

10

0

AMIKACIN

AZTREONAM

CEFEPIME

CEFTAZIDIME

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

MEROPENEM

PIP/TAZO

TOBRAMYCIN

3

% Susceptible

90

100

98

98

98

98

97

96

88

88

84 84

73

11

2

0

80

70

60

50

40

30

20

10

0

AMIKACIN

AMOX/CLAV

AZTREONAM

CEFEPIME

CEFOTAXIME

CEFOXITIN

CEFTRIAXONE

CEFUROXIME

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

PIP/TAZO

TMS

% Susceptible

# Susceptibility Rates - 2017

4

Hospital=STATEWIDE

100

100

94

95

96

96

97

96

91

86

87

81

68

1

2

0

90

80

70

60

50

40

30

20

10

0

AMIKACIN

AMOX/CLAV

AZTREONAM

CEFEPIME

CEFOTAXIME

CEFOXITIN

CEFTRIAXONE

CEFUROXIME

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

PIP/TAZO

TMS

% Susceptible

# Susceptibility Rates - 2017

5

Hospital=STATEWIDE

100

100

100

97

93

99

89

90

90

80

81

78

78

75

71

61

53

90

80

70

60

50

40

30

20

10

0

AMIKACIN

AMOX/CLAV

AMP/SUL

AMPICILLIN

CEFEPIME

CEFOTAXIME

CEFOTETAN

CEFOXITIN

CEFTRIAXONE

CEFUROXIME

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

TMS

% Susceptible

# Susceptibility Rates - 2017

6

Hospital=STATEWIDE

100

99

94

99

94

94

99

100

94

92

92

90

95

87

88

84

74

90

80

70

60

50

40

30

20

10

0

AMIKACIN

AMOX/CLAV

AMP/SUL

CEFEPIME

CEFOTAXIME

CEFOTETAN

CEFOXITIN

CEFTRIAXONE

CEFUROXIME

CEPHALOTHIN

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

TMS

7

Hospital=STATEWIDE

# Susceptibility Rates - 2017

% Susceptible

100

94

85

53

0

90

80

70

60

50

40

30

20

10

0

CEFTAZIDIME

ERTAPENEM

LEVOFLOXACIN

TMS

% Susceptible

# Susceptibility Rates - 2017

8

Hospital=STATEWIDE

100

100

99

94

100

99

99

96

97

96

77

1

~~1~~

0

90

80

70

60

50

40

30

20

10

0

AMIKACIN

AMOX/CLAV

CEFEPIME

CEFOTAXIME

CEFOXITIN

CEFTRIAXONE

CEFUROXIME

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

TMS

% Susceptible

# Susceptibility Rates - 2017

9

Hospital=STATEWIDE

100

100

100

100

100

92

98

97

98

98

94

95

96

89

75

71

57

90

80

70

60

50

40

30

20

10

0

AMIKACIN

AMOX/CLAV

AMP/SUL

CEFEPIME

CEFOTAXIME

CEFOTETAN

CEFOXITIN

CEFTRIAXONE

CEFUROXIME

CEPHALOTHIN

CIPROFLOXACIN

ERTAPENEM

GENTAMICIN

IMIPENEM

LEVOFLOXACIN

TMS

% Susceptible

# Susceptibility Rates - 2017

10

Hospital=STATEWIDE

100

100

100

93

97

72

73

64

49

44

90

80

70

60

50

40

30

20

10

0

Hospital=STATEWIDE

# Susceptibility Rates - 2017

11

% Susceptible

100

100

100

93

99

92

97

95

87

86

83

80

75

76

59

90

80

70

60

50

40

30

20

10

0

AMOX/CLAV

CLINDAMYCIN

CRO <=0.5 ug/ml

CRO <=1 ug/ml

CTX <=0.5 ug/ml

CTX <=1 ug/ml

ERYTHROMYCIN

LEVOFLOXACIN

LINEZOLID

PEN <=0.06 ug/ml

PEN <=2 ug/ml

TETRACYCLINE

TMS

VANCOMYCIN

Variable N (Yes/No)

Amikacin

Amoxicillin +Clavulanate

Ampicillin

Ampicillin+Sulbactam

Aztreonam

Cefazolin

Cefepime

Cefotaxime

Cefotetan

Cefoxitin

Ceftazidime

Ceftriaxone

Cefuroxime

Cephalothin

Ciprofloxacin

Doripenem

Ertapenem

Gentamicin

Imipenem

Levofloxacin

Meropenem

Moxifloxacin

Nitrofurantoin

Piperacillin +Tazobactam

Sulfamethoxazole

Tetracycline

Ticarcillin+Clavulanate

Tigecycline

Tobramycin

Trimethoprim

+Sulfamethoxazole

Variable N (expand/collapse)



**Massachusetts Department of Public Health Bureau of Infectious Disease**

305 South Street, Jamaica Plain, MA 02130 / Phone: 617-983-6800

Save As

EMail Submit

Hospital:

From:

To:

Duplicates Excluded?:

Patient Population:

Specify (if other):

**Percent Susceptibilities**

Gram Negative Organisms

N \*

N

*A. baumannii*

*E. aerogenes*

N

*E. cloacae*

N

*E. coli*

N

N

*K. oxytoca*

*K. pneumoniae*

N

*P. aeruginosa*

N

*S. marcescens*

N

*S. maltophilia*

N

12

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *S. pneumoniae* | MSSA | MRSA | ALL *S. aureus* | Gram Positive Organisms |
| N | N | N | N | Variable N (Yes/No) |
|  |  |  |  | N \* |
|  |  |  |  | Amoxicilin +Clavulanate |
|  |  |  |  | Ampicillin |
|  |  |  |  | Ampicillin+Sulbactam |
|  |  |  |  | Azithromycin |
|  |  |  |  | Cefazolin |
|  |  |  |  | Cefotaxime <=1 ug/ml |
|  |  |  |  | Cefotaxime <=0.5 ug/ml |
|  |  |  |  | Ceftriaxone<=1 ug/ml |
|  |  |  |  | Ceftriaxone<=0.5 ug/ml |
|  |  |  |  | Ciprofloxacin |
|  |  |  |  | Clindamycin |
|  |  |  |  | Daptomycin |
|  |  |  |  | Erythromycin |
|  |  |  |  | Gentamicin |
|  |  |  |  | Levofloxacin |
|  |  |  |  | Linezolid |
|  |  |  |  | Moxifloxacin |
|  |  |  |  | Nitrofurantoin |
|  |  |  |  | Oxacillin |
|  |  |  |  | Penicillin <=2ug/ml |
|  |  |  |  | Penicillin <=0.06 ug/ml |
|  |  |  |  | Quinupristin+Dalfopristin |
|  |  |  |  | Rifampin |
|  |  |  |  | Sulfamethoxazole |
|  |  |  |  | Tetracycline |
|  |  |  |  | Tigecycline |
|  |  |  |  | Trimethoprim  +Sulfamethoxazole |
|  |  |  |  | Vancomycin |
|  |  |  |  | Variable N (expand/collapse) |

13

### Hospitals that reported 2017 antibiogram data in accordance with regulations (105 CMR 300.000) by reporting deadline:

Anna Jaques Hospital Lowell General Hospital - Main Campus

Athol Memorial Hospital Lowell General Hospital - Saints Campus

Baystate Franklin Medical Center Martha's Vineyard Hospital

Baystate Medical Center Massachusetts Eye and Ear Infirmary

Baystate Noble Hospital Massachusetts General Hospital

Baystate Wing Hospital Mercy Medical Center

Berkshire Health Systems - Berkshire Medical Center MetroWest Medical Center - Framingham Union Hospital

Berkshire Health Systems - Fairview Hospital MetroWest Medical Center - Leonard Morse Hospital

Beth Israel Deaconess Hospital - Milton Milford Regional Medical Center

Beth Israel Deaconess Hospital - Needham Mount Auburn Hospital

Beth Israel Deaconess Hospital - Plymouth Nantucket Cape Cod Hospital

Beth Israel Deaconess Medical Center New England Baptist Hospital

Boston Children's Hospital Newton-Wellesley Hospital

Boston Medical Center Saint Vincent Hospital

Boston Medical Center - East Newton campus Shriners Hospital for Children - Boston

Brigham and Women’s Faulkner Hospital Signature Healthcare - Brockton Hospital

Brigham and Women's Hospital South Shore Hospital

Cambridge Health Alliance - Cambridge Hospital Southcoast Health - Charlton Memorial Hospital

Cambridge Health Alliance - Somerville Hospital Southcoast Health - St. Luke's Hospital

Cambridge Health Alliance - Everett Hospital Southcoast Health - Tobey Hospital

Cape Cod Healthcare - Cape Cod Hospital Steward Health Care - Carney Hospital

Cape Cod Healthcare - Falmouth Hospital Steward Health Care - Good Samaritan Medical Center

Cooley Dickinson Hospital Steward Health Care - Holy Family Hospital

Dana-Farber Cancer Institute Steward Health Care - Holy Family Hospital at Merrimack Valley

Emerson Hospital Steward Health Care - Morton Hospital

Hallmark Health System - Lawrence Memorial Hospital of Medford Steward Health Care - Nashoba Valley Medical Center Hallmark Health System - Melrose-Wakefield Hospital Steward Health Care - Norwood Hospital

Harrington Memorial Hospital Steward Health Care - Saint Anne's Hospital Heywood Hospital Steward Health Care - St. Elizabeth's Medical Center

Holyoke Medical Center Sturdy Memorial Hospital

Lahey Health - Addison Gilbert Hospital The Veteran’s Administration Boston Healthcare System

Lahey Health – Beverly Hospital Tufts Medical Center

Lahey Health - Lahey Hospital & Medical Center UMass Memorial Health Care – HealthAlliance Hospital Leominster Lahey Health – Lahey Medical Center, Peabody UMass Memorial Health Care – Umass Memorial Medical Center

Lahey Health – Winchester Hospital UMass Memorial Health Care – Clinton Hospital

Lawrence General Hospital UMass Memorial Health Care – Marlborough Hospital

14

### Antibiotic susceptibility testing guidelines

Antibiotic susceptibility testing is conducted in microbiology laboratories. Microbiologists utilize standardized guidelines, such as those distributed by Clinical and Laboratory Standards Institute (CLSI)\* to determine whether a bacterial isolate is susceptible, intermediate, or resistant to an antibiotic. These guidelines are typically updated periodically. The extent to which clinical microbiology laboratories across Massachusetts follow the most recently updated guidelines is not well established.

\* Clinical and Laboratory Standards Institute (CLSI). *Performance Standards for Antimicrobial Susceptibility Testing*, 26th Edition. CLSI Supplement M100-S6. Published December 22, 2015.