



EUCAST

European Committee
on Antimicrobial
Susceptibility Testing

Enterobacterales

Calibration of zone diameter
breakpoints to MIC values

Version 14.0
January 2026

Enterobacterales

MIC and zone diameter correlates

- The following histograms present inhibition zone diameter distributions from EUCAST antimicrobial susceptibility testing. In most, the different colours of the bars indicate different MIC values. In some, the colours of the bars indicate a resistance gene or a resistance mechanism.
- The distributions include data for wild-type isolates and for isolates with acquired resistance mechanisms. A large number of isolates with MIC values close to the edge of the wild-type distribution and/or close to EUCAST clinical breakpoints were intentionally included. These distributions can not be used to infer resistance rates or the performance of the tests with routine isolates.
- For some agents, isolates were tested on more than one occasion, including parallel tests with disks and media from several manufacturers. When this is the case, data are presented as both the “number of isolates tested” and the “total number of MIC-zone diameter correlates”, including replicate tests and parallel tests with disks and media from different sources.

Enterobacterales

Materials and methods

- Antimicrobial susceptibility testing was performed on clinical isolates of *Enterobacterales*. Disk diffusion was performed according to EUCAST methodology and MIC determination was performed with broth microdilution or gradient tests.
- The distributions of MIC vs. zone diameter in this presentation are the result of a collaboration between EUCAST and several other laboratories (K-res, Tromsø, Norway; KS, Stockholm, Sweden; RIVM, Bilthoven, the Netherlands; Laboratory Specialists Inc., USA; Hospital Universitario Ramón y Cajal, Madrid, Spain; University Hospital of Wales, Cardiff, UK; DTU, Lyngby, Denmark; Herlev and Gentofte Hospital, Herlev, Denmark and University Hospital Shefqet Ndroqi, Tirana, Albania).
- The distributions contain a large proportion of resistant isolates and isolates close to the MIC breakpoint. Many ESBL producers are included, and for carbapenems also carbapenemase-producing isolates. Distributions are shown for *Enterobacterales* (several species aggregated) and for specific species separately.
- This presentation is based on EUCAST Clinical Breakpoint Table v. 16.0.

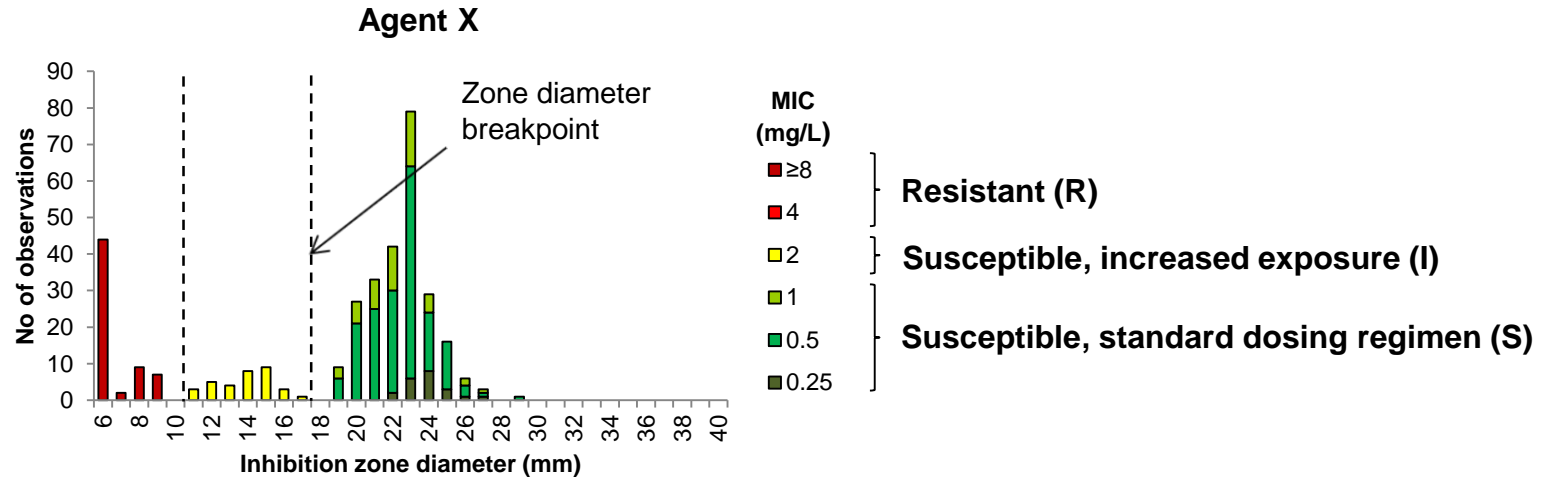
Changes from previous version (13.0)

Changes

- MIC breakpoints changed for trimethoprim.
- MIC and zone diameter breakpoints changed for trimethoprim-sulfamethoxazole.
- Information on species for trimethoprim and trimethoprim-sulfamethoxazole updated.

Explanation of graphs:

- These graphs show zone diameter distributions with MIC values or resistance mechanisms as coloured bars. Colours are related to current EUCAST MIC breakpoints.



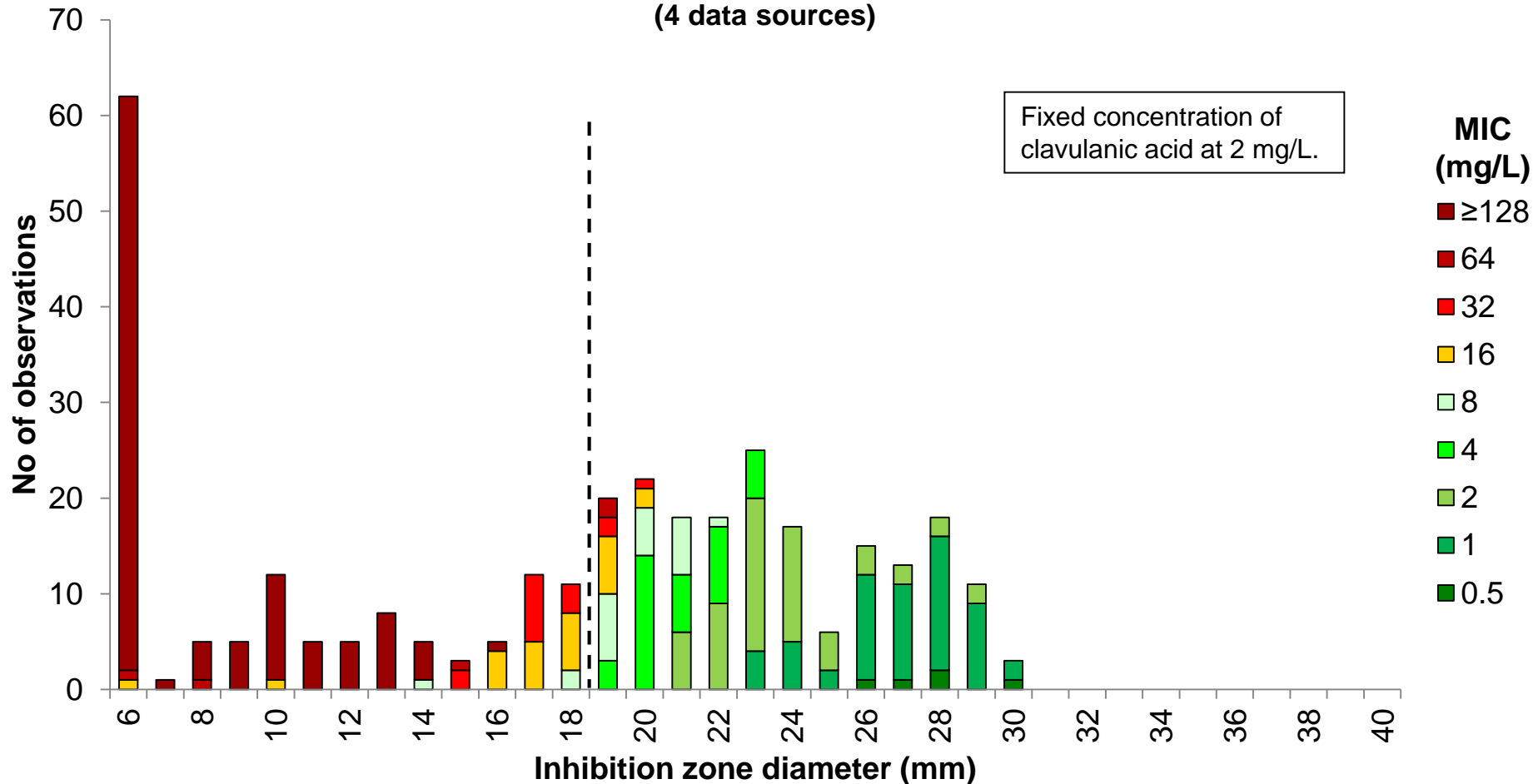
Number of different species represented in *Enterobacteriales* graphs

Antimicrobial agent	No of species											Total no
	<i>Escherichia coli</i>	<i>Klebsiella pneumoniae</i>	<i>Klebsiella oxytoca</i>	<i>Klebsiella aerogenes</i>	<i>Proteus mirabilis</i>	<i>Morganella morganii</i>	<i>Enterobacter cloacae</i>	<i>Citrobacter freundii</i>	<i>Citrobacter koseri</i>	<i>Serratia marcescens</i>	Other ¹	
Amoxicillin-clavulanic acid	149	86	3	2	58	4	7	4	2	6	4	325
Piperacillin-tazobactam	311	137	15	8	8	8	11	20	2	11		531
Temocillin	70	19			8							97
Mecillinam	1103	42	42	65			46	41	49			1388
Cefepime	176	118	18	16	15	7	20	13	10	9	18	420
Cefepime-enmetazobactam	75	55	7	12	7	4	12	8	4	5	11	200
Cefiderocol	93	103	16	8	8	7	14	17	7	8	18	299
Cefotaxime	270	157	26	20	36	17	23	14	5	5		573
Ceftaroline	110	61	18	8	14	9	10	11	2	1	5	249
Ceftazidime	342	149	32	12	29	15	25	20	9	18	28	679
Ceftazidime-avibactam	124	89	14	13	2	11	11	17		12		293
Ceftobiprole	74	73	14	3	15	5	5	6	2	1		198
Ceftolozane-tazobactam	191	116	19	25	30	15	28	12	5	7	11	459
Ceftriaxone	115	41	2	3	16	1	11	4	2	7		202
Cefuroxime	93	46							2			141
Ertapenem	88	28						2	2	2		122
Imipenem	160	64	16	13			13	12	2	10		290
Imipenem-relebactam	72	49	15	13			13	10		8		180
Meropenem	280	124	28	28	45	11	29	16	3	12		576
Meropenem-vaborbactam	42	32	11		10		9					104
Aztreonam	137	46	9	9	9	6	12	8	6	6	15	263
Aztreonam-avibactam	76	45	9	9	10	6	12	8	6	6	14	201
Ciprofloxacin	378	75	1	1	5	1	2	4	2	2		471
Pefloxacin vs. Ciprofloxacin	137	46			56							239
Levofloxacin	76	7										83
Amikacin	95	17						2	2	2		118
Gentamicin	173	60	1		2			2	2	2		242
Tobramycin	170	66	1	1	5	1	2	4	2	2		254
Trimethoprim-sulfamethoxazole	92	13	1		1							107

1. Including *Citrobacter amalonaticus*, *Citrobacter braaki*, *Citrobacter sedlakii*, *Citrobacter youngae*, *Enterobacter asburiae*, *Enterobacter hormaechei*, *Enterobacter kobei*, *Enterobacter xiangfangensis*, *Proteus vulgaris*, *Providencia rettgeri* and *Serratia liquefaciens*.

Amoxicillin-clavulanic acid 20-10 µg vs MIC *Enterobacteriales*, 325 isolates

(4 data sources)



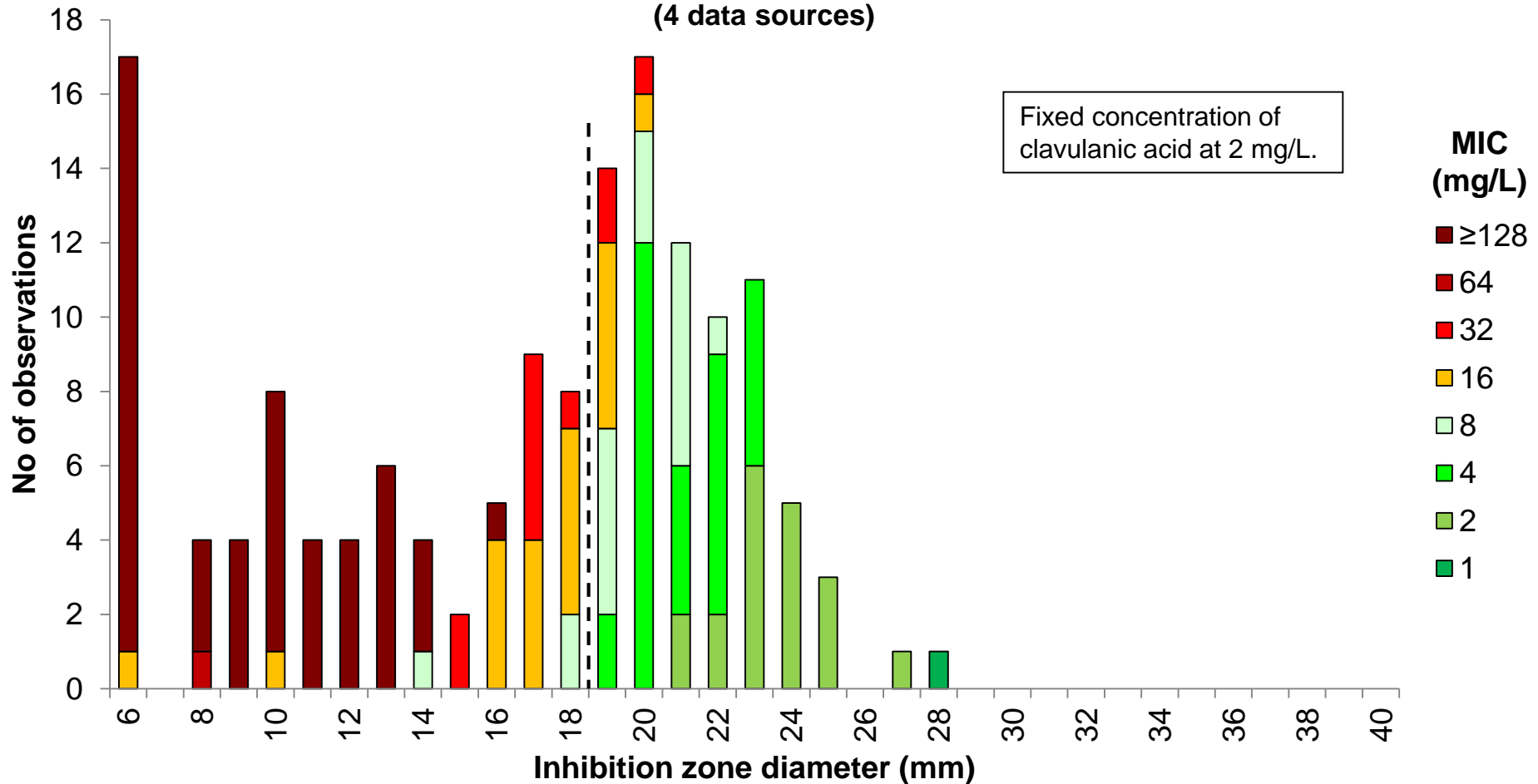
Breakpoints (iv)

MIC $S \leq 8$, $R > 8$ mg/L

Zone diameter $S \geq 19$, $R < 19$ mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *E. coli*, 149 isolates

(4 data sources)



Breakpoints (iv)

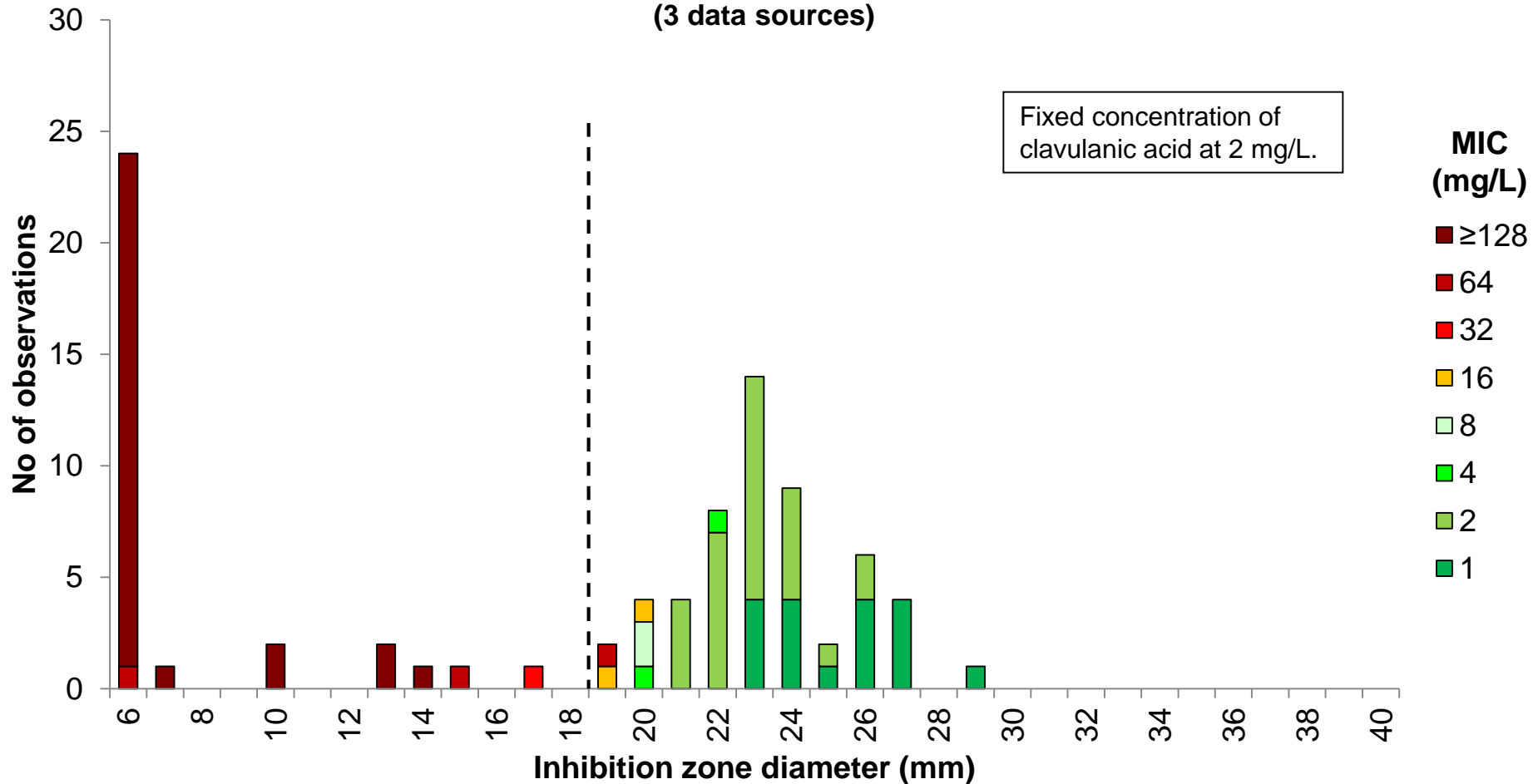
MIC $S \leq 8$, $R > 8$ mg/L

Zone diameter $S \geq 19$, $R < 19$ mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC

K. pneumoniae, 86 isolates

(3 data sources)



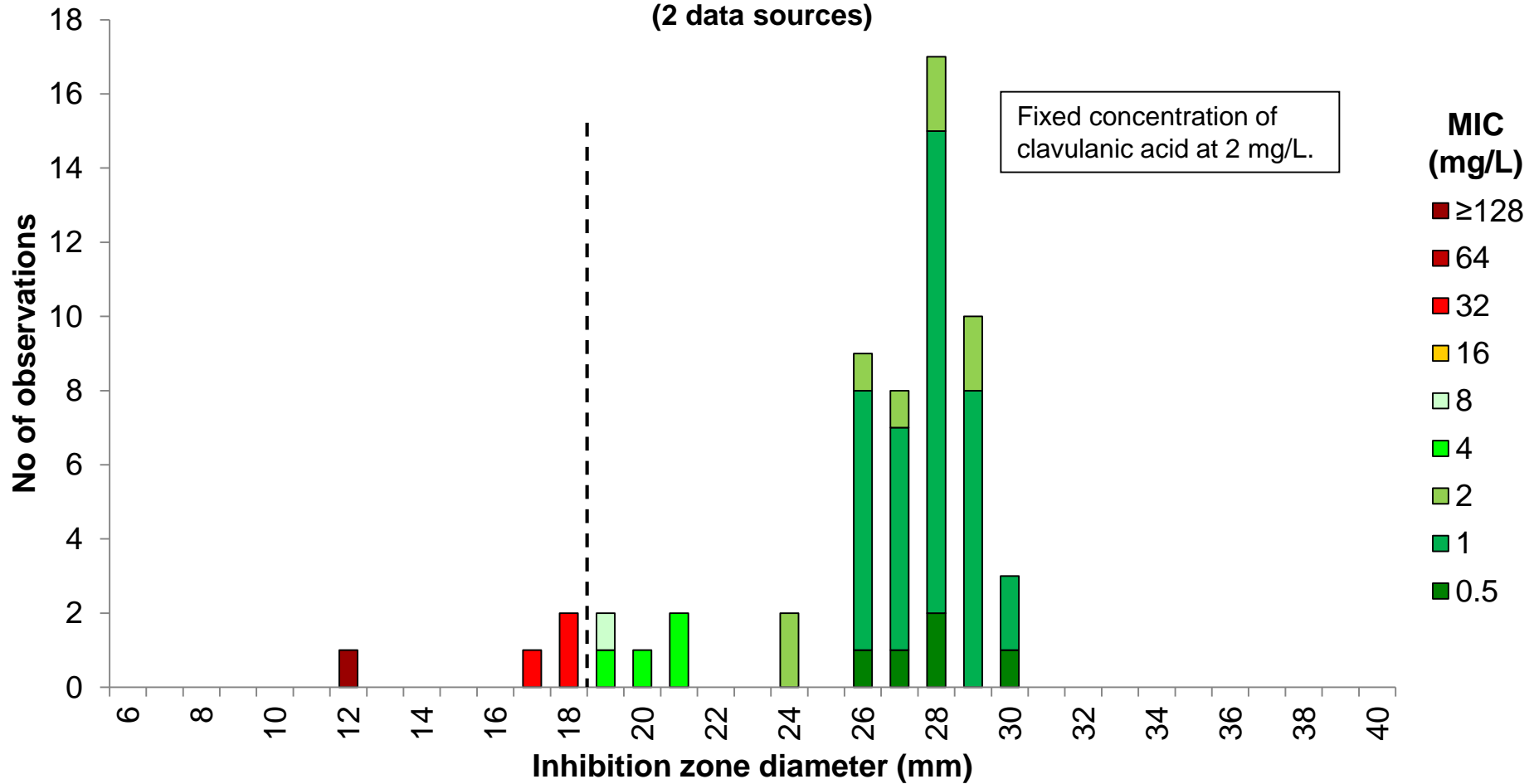
Breakpoints (iv)

MIC $S \leq 8, R > 8$ mg/L

Zone diameter $S \geq 19, R < 19$ mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *P. mirabilis*, 58 isolates

(2 data sources)



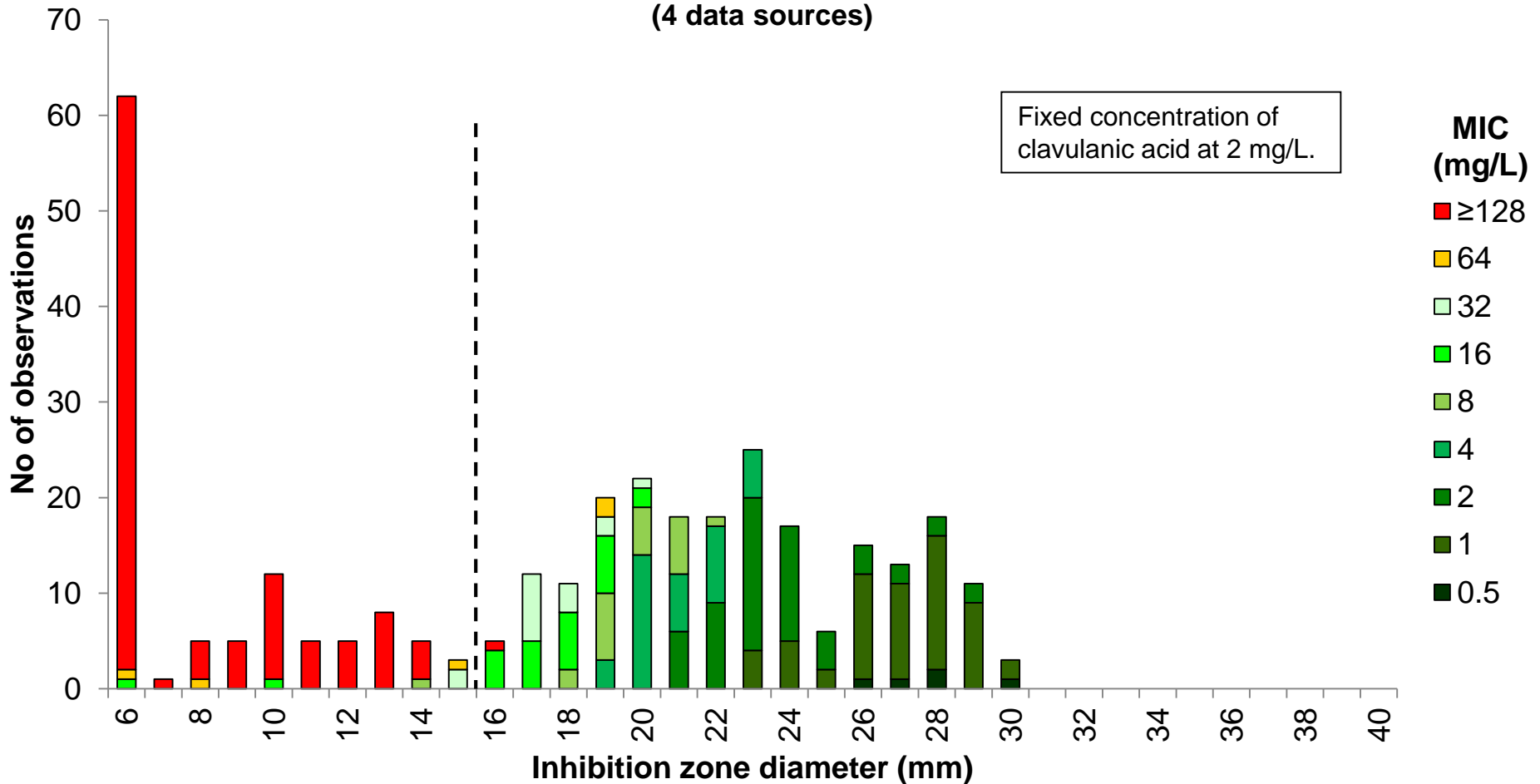
Breakpoints (iv)

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Zone diameter $S \geq 19$, $R < 19$ mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *Enterobacteriales*, 325 isolates

(4 data sources)



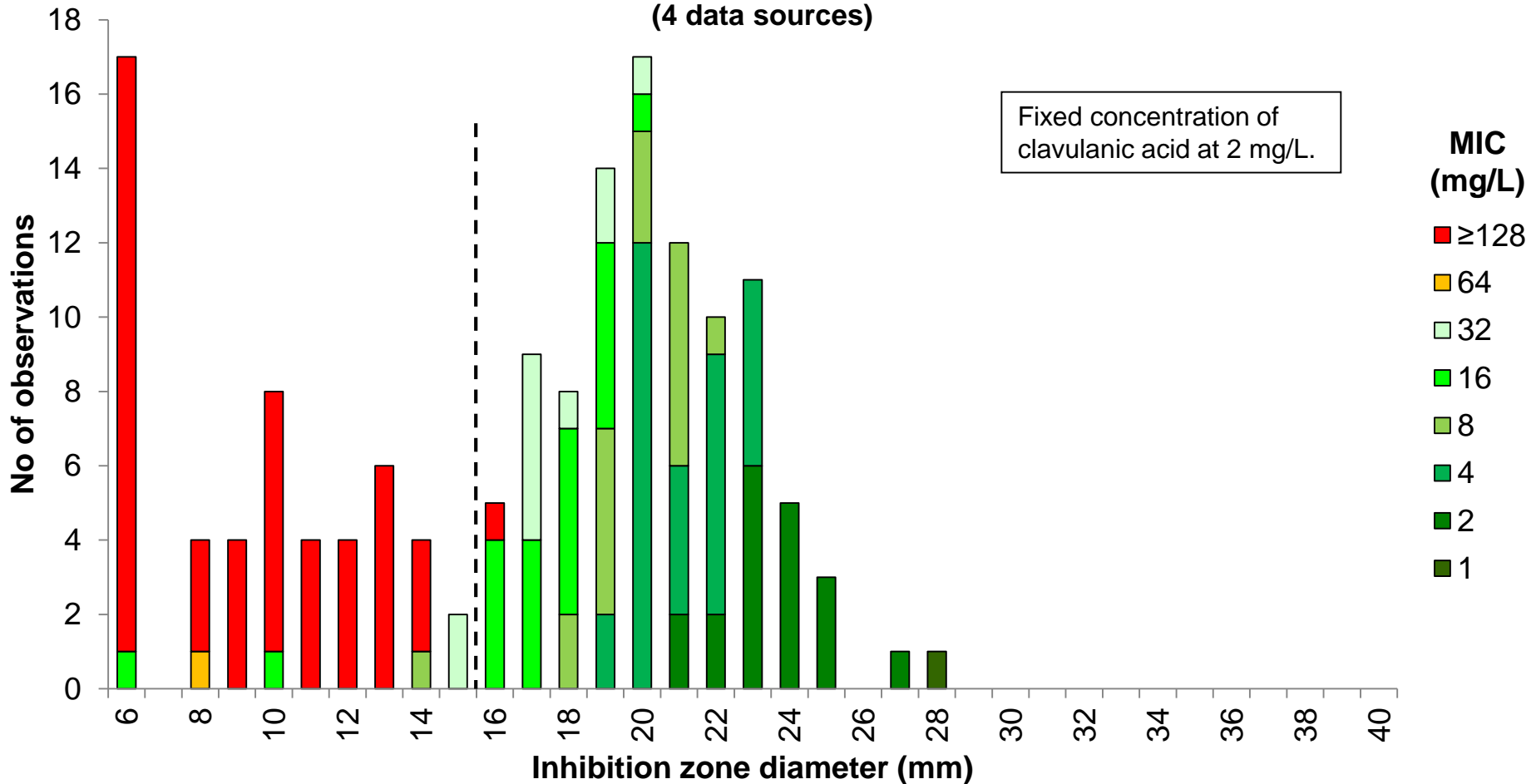
Breakpoints (oral, uncomplicated UTI)

MIC S ≤ 32, R > 32 mg/L

Zone diameter S ≥ 16, R < 16 mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *E. coli*, 149 isolates

(4 data sources)



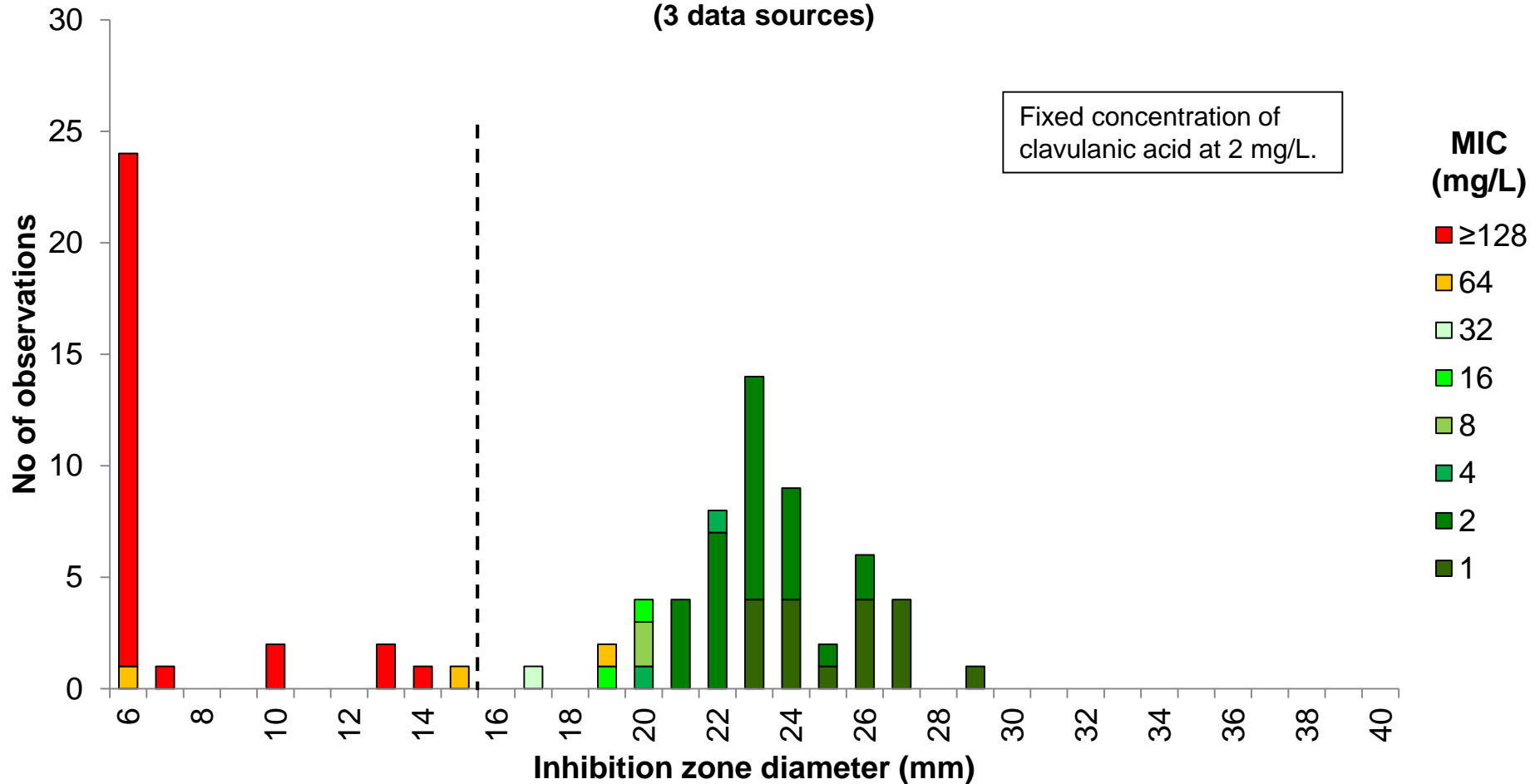
Breakpoints (oral, uncomplicated UTI)

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Zone diameter S ≥ 16, R < 16 mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *K. pneumoniae*, 86 isolates

(3 data sources)



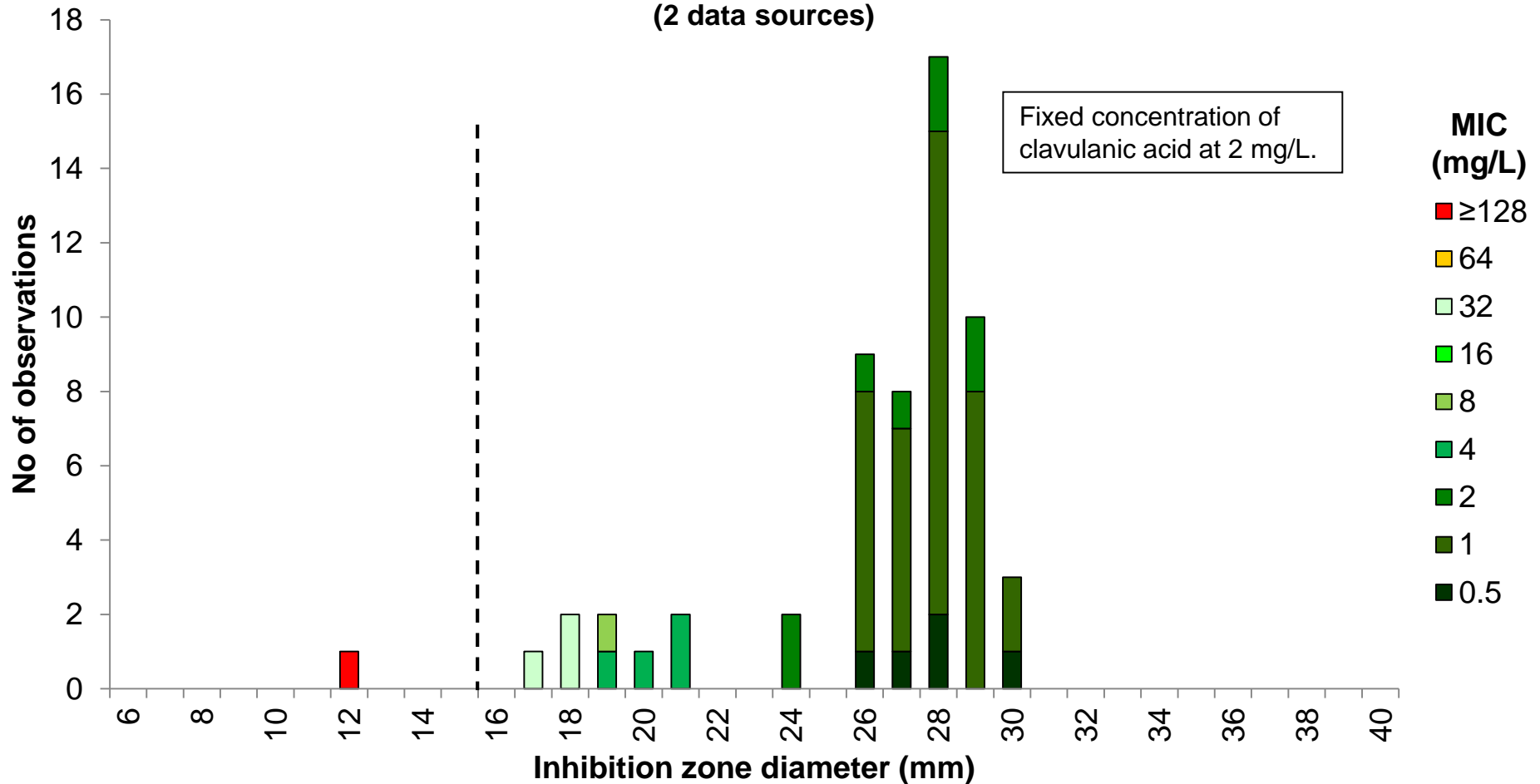
Breakpoints (oral, uncomplicated UTI)

MIC S ≤ 32, R > 32 mg/L

Zone diameter S ≥ 16, R < 16 mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *P. mirabilis*, 58 isolates

(2 data sources)



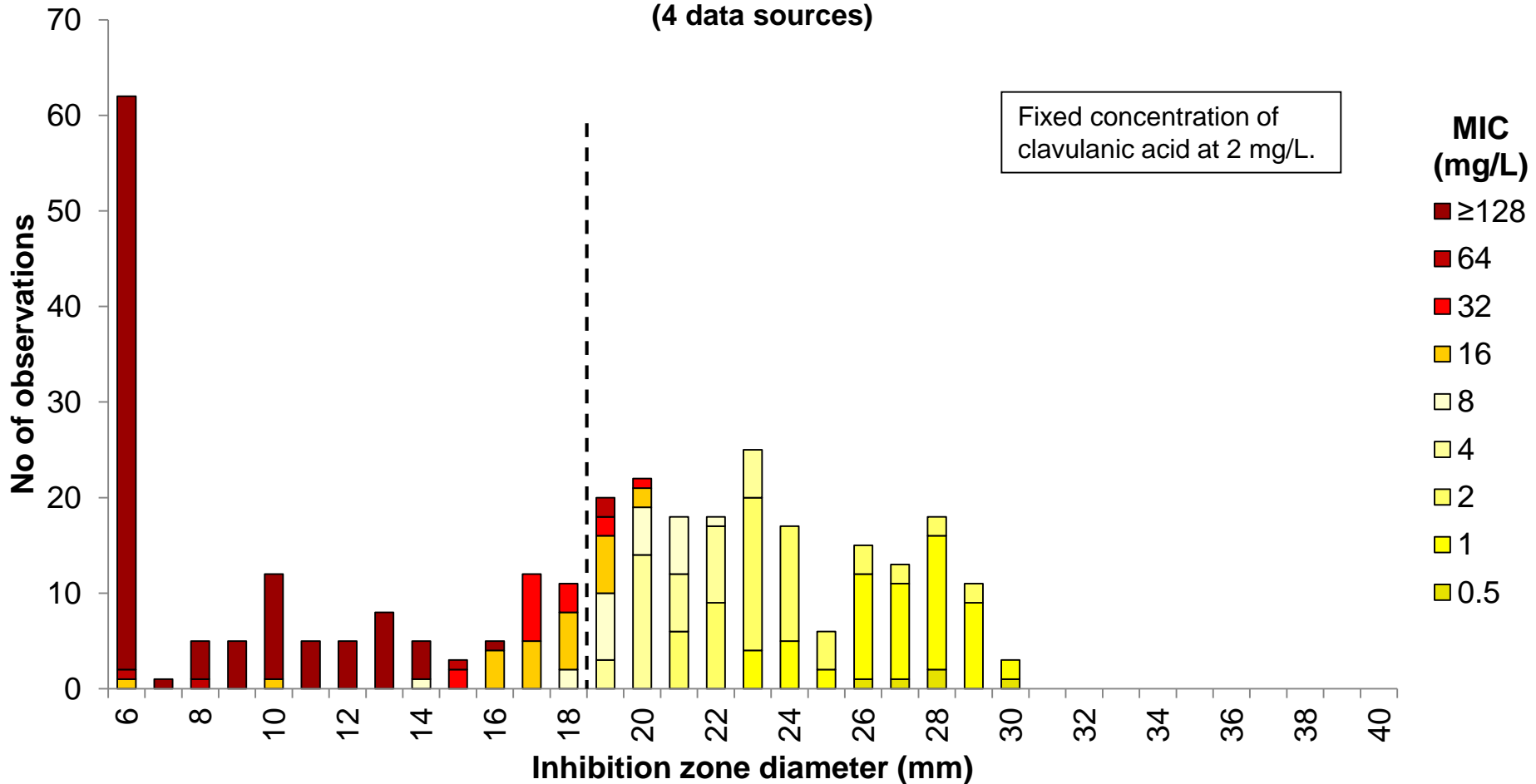
Breakpoints (oral, uncomplicated UTI)

MIC S ≤ 32, R > 32 mg/L

Zone diameter S ≥ 16, R < 16 mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *Enterobacteriales*, 325 isolates

(4 data sources)



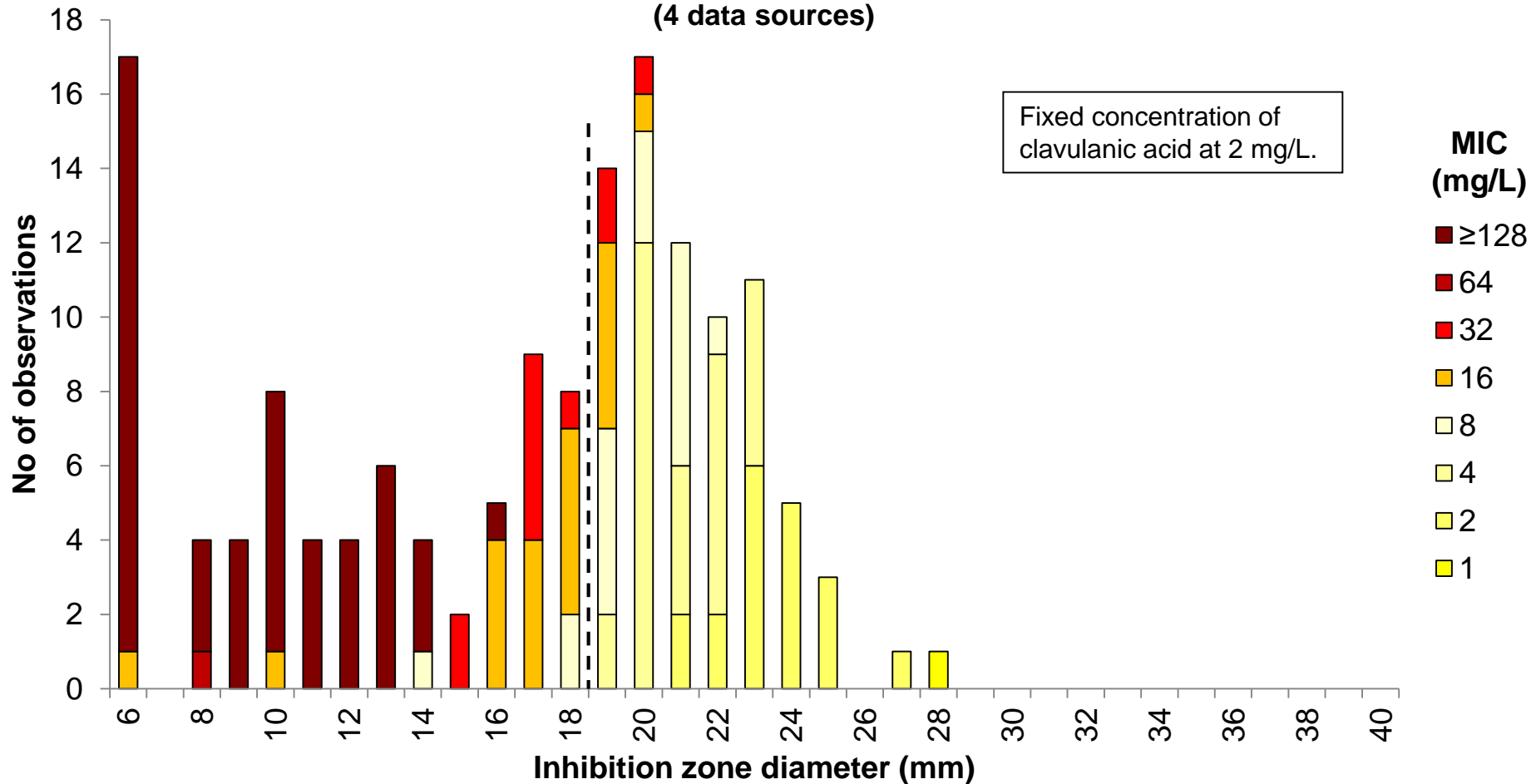
Breakpoints (oral, inf originating from the urinary tract and other indications)

MIC $S \leq 0.001$, $R > 8$ mg/L

Zone diameter $S \geq 50$, $R < 19$ mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *E. coli*, 149 isolates

(4 data sources)



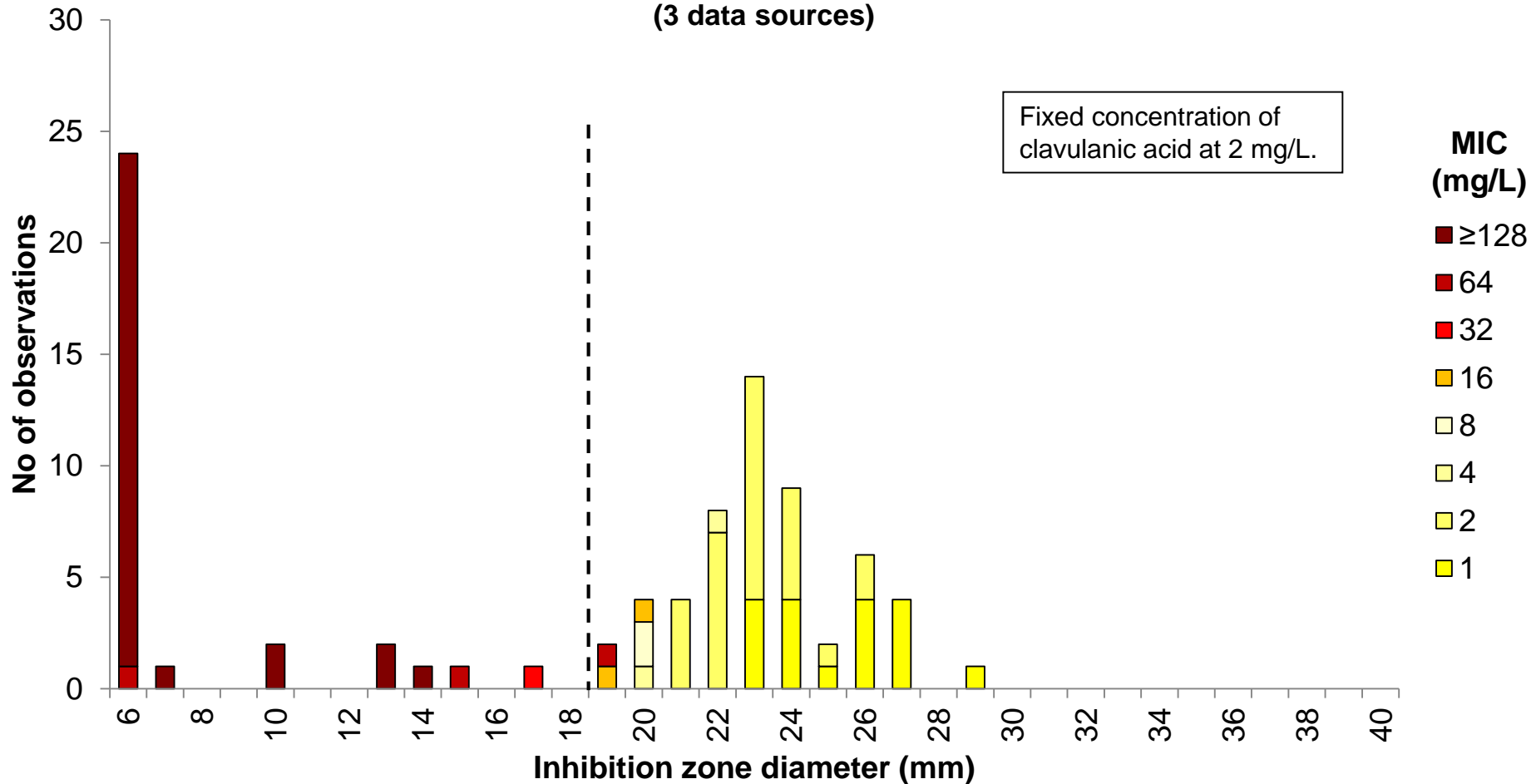
Breakpoints (oral, inf originating from the urinary tract and other indications)

MIC $S \leq 0.001$, $R > 8$ mg/L

Zone diameter $S \geq 50$, $R < 19$ mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *K. pneumoniae*, 86 isolates

(3 data sources)

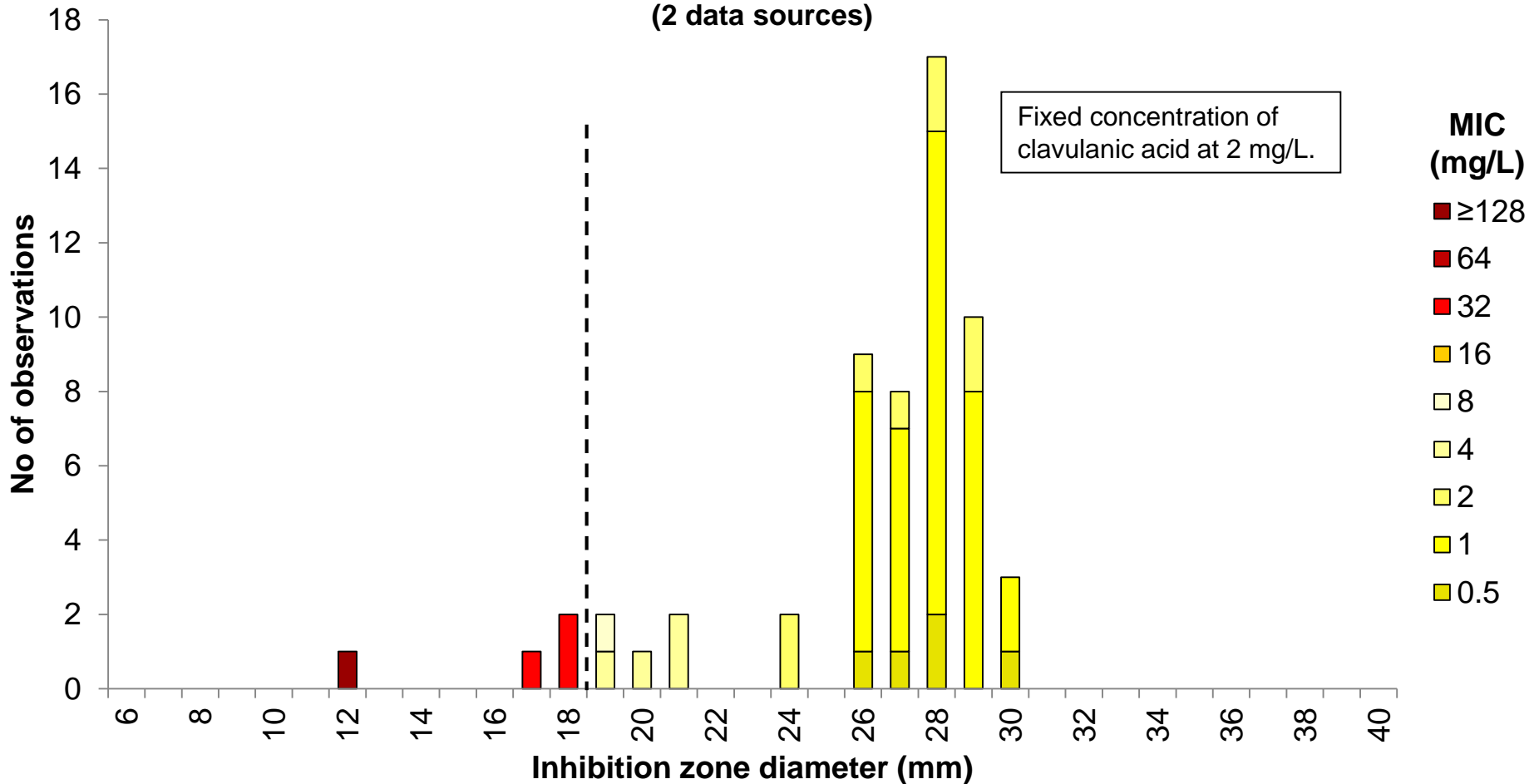


Breakpoints (oral, inf originating from the urinary tract and other indications)

MIC	S ≤ 0.001, R > 8 mg/L
Zone diameter	S ≥ 50, R < 19 mm

Amoxicillin-clavulanic acid 20-10 µg vs MIC *P. mirabilis*, 58 isolates

(2 data sources)



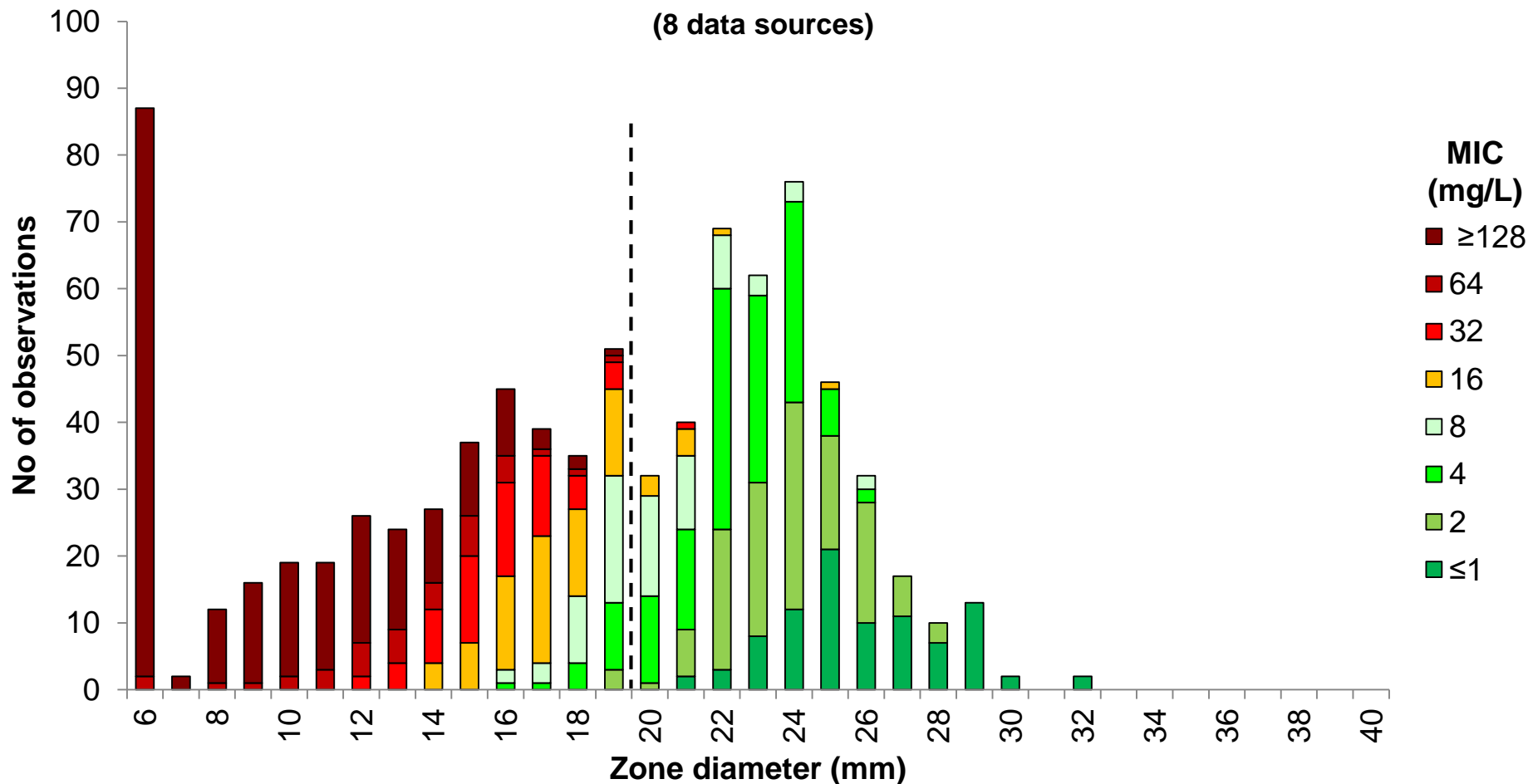
Breakpoints (oral, inf originating from the urinary tract and other indications)

MIC $S \leq 0.001$, $R > 8$ mg/L

Zone diameter $S \geq 50$, $R < 19$ mm

Piperacillin-tazobactam 30-6 μg vs. MIC *Enterobacterales*, 531 isolates (840 correlates)

(8 data sources)



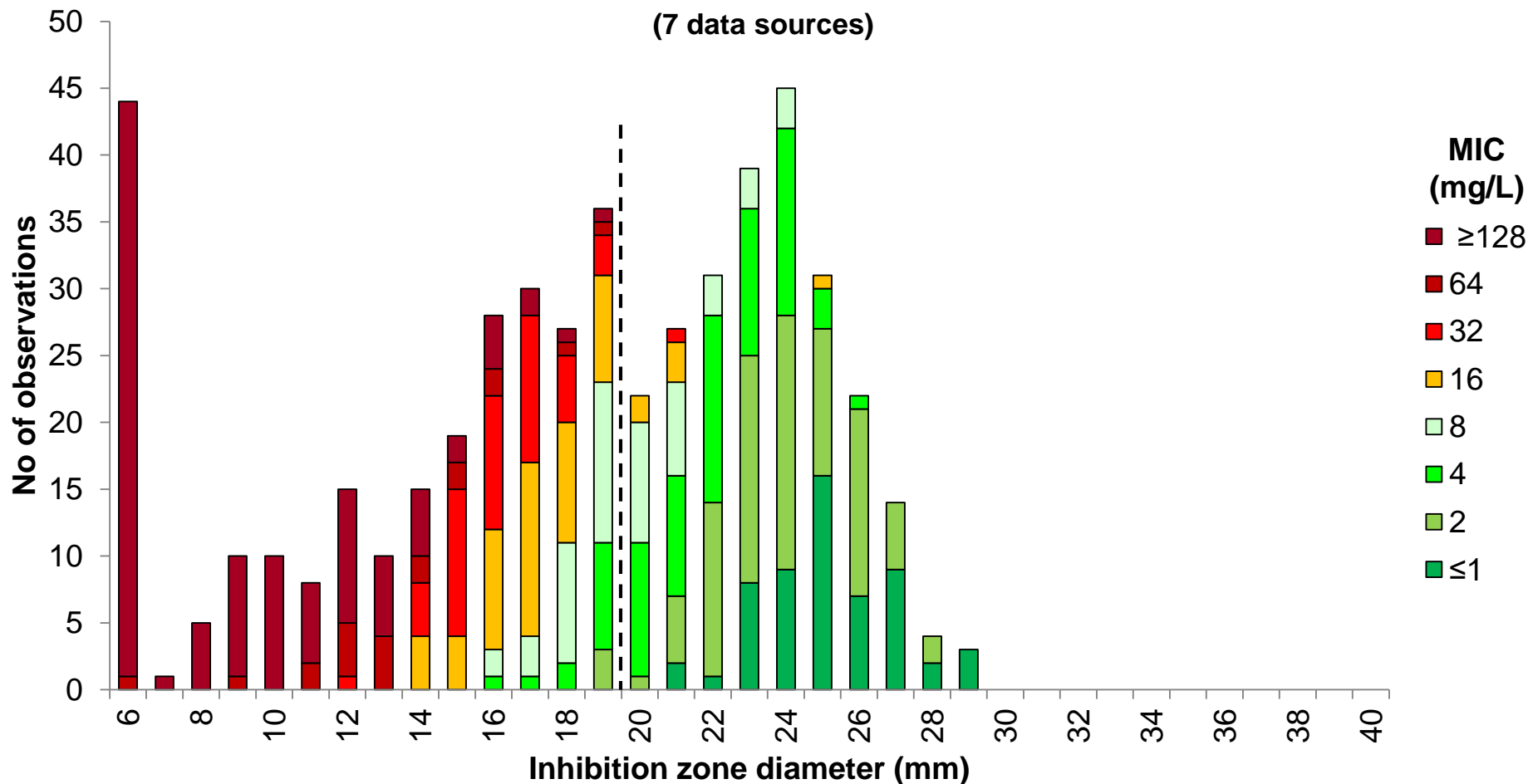
Breakpoints

MIC $S \leq 8$, $R > 8$ mg/L

Zone diameter $S \geq 20$, $R < 20$ mm

Piperacillin-tazobactam 30-6 μg vs. MIC *E. coli*, 294 isolates (496 correlates)

(7 data sources)



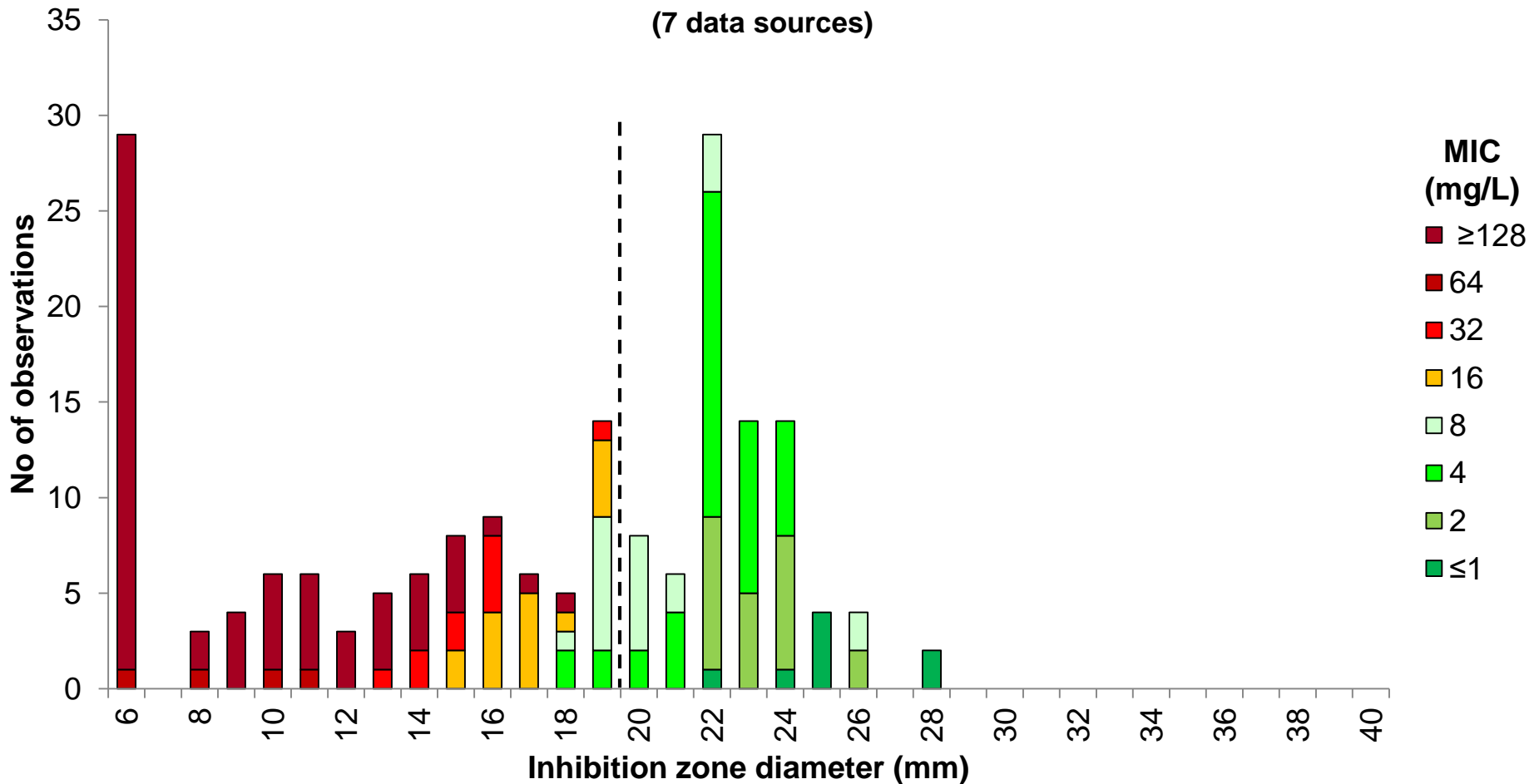
Breakpoints

MIC $S \leq 8, R > 8$ mg/L

Zone diameter $S \geq 20, R < 20$ mm

Piperacillin-tazobactam 30-6 μg vs. MIC *K. pneumoniae*, 123 isolates (185 correlates)

(7 data sources)



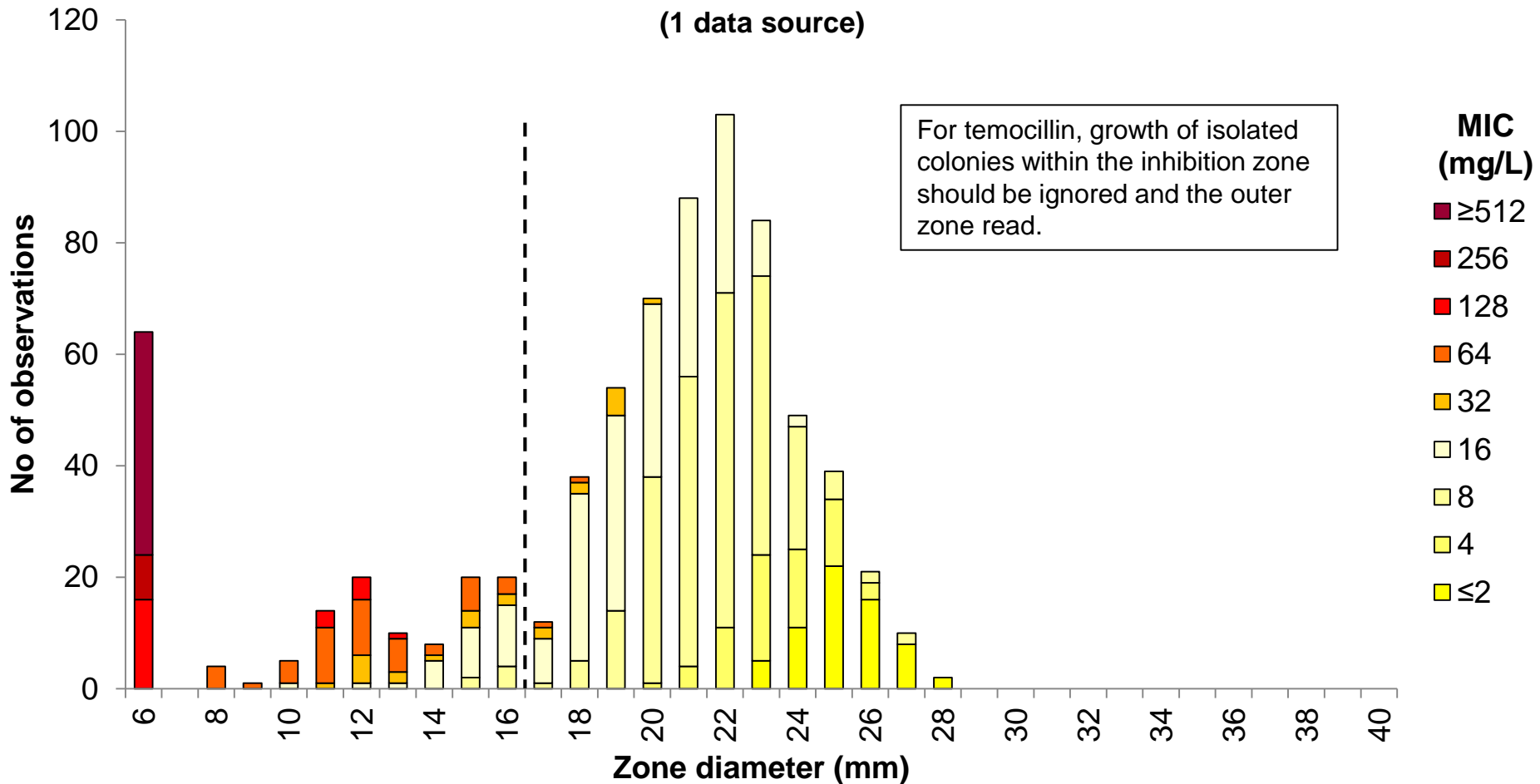
Breakpoints

MIC $S \leq 8, R > 8$ mg/L

Zone diameter $S \geq 20, R < 20$ mm

Temocillin 30 µg vs. MIC

Enterobacterales, 97 isolates (736 correlates)



Breakpoints (infections originating from the urinary tract)

MIC

$S \leq 0.001$, $R > 16$ mg/L

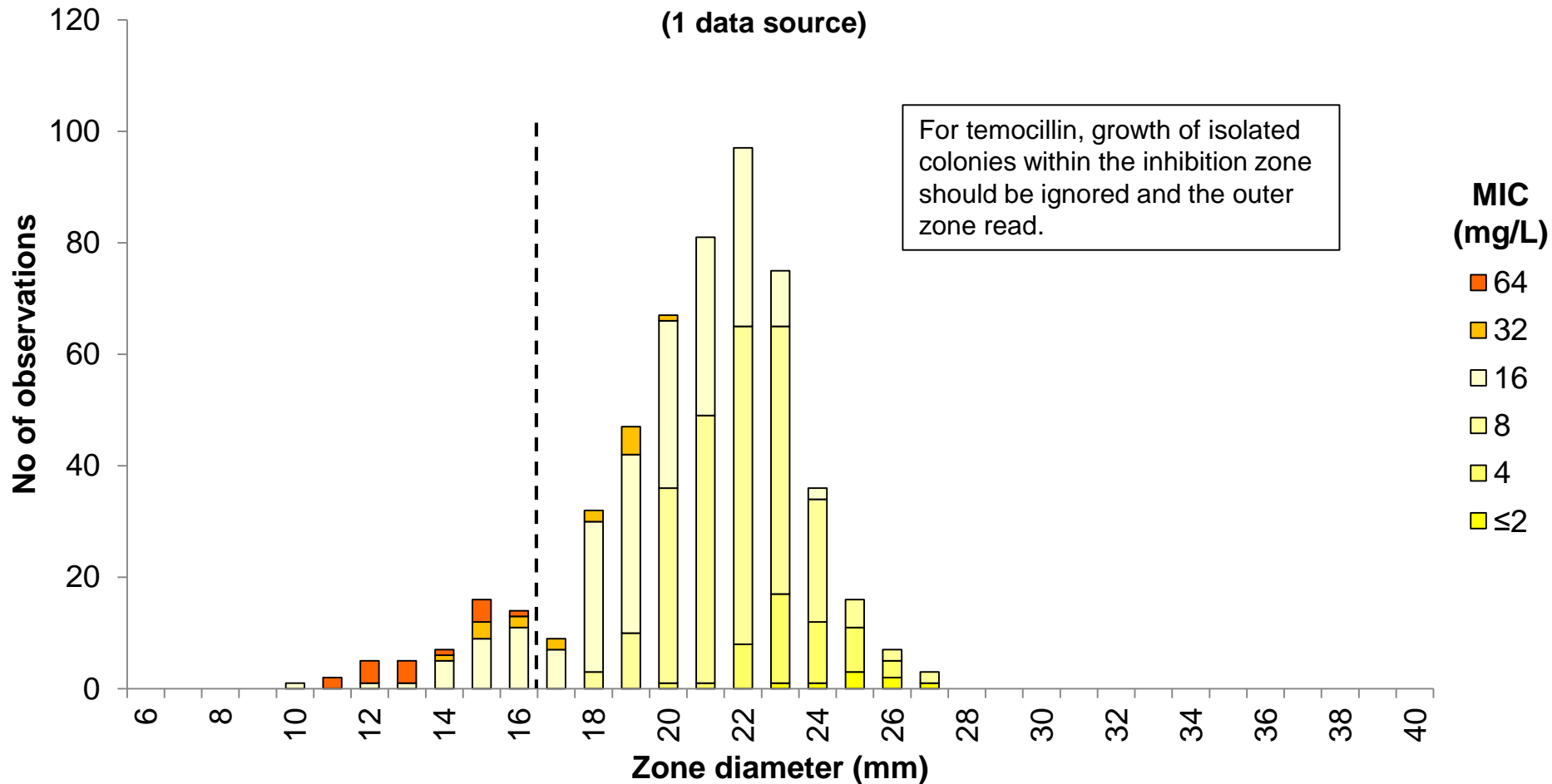
Zone diameter

$S \geq 50$, $R < 17$ mm

Temocillin 30 µg vs. MIC

E. coli, 70 isolates (520 correlates)

(1 data source)



Breakpoints (infections originating from the urinary tract)

MIC

S ≤ 0.001, R > 16 mg/L

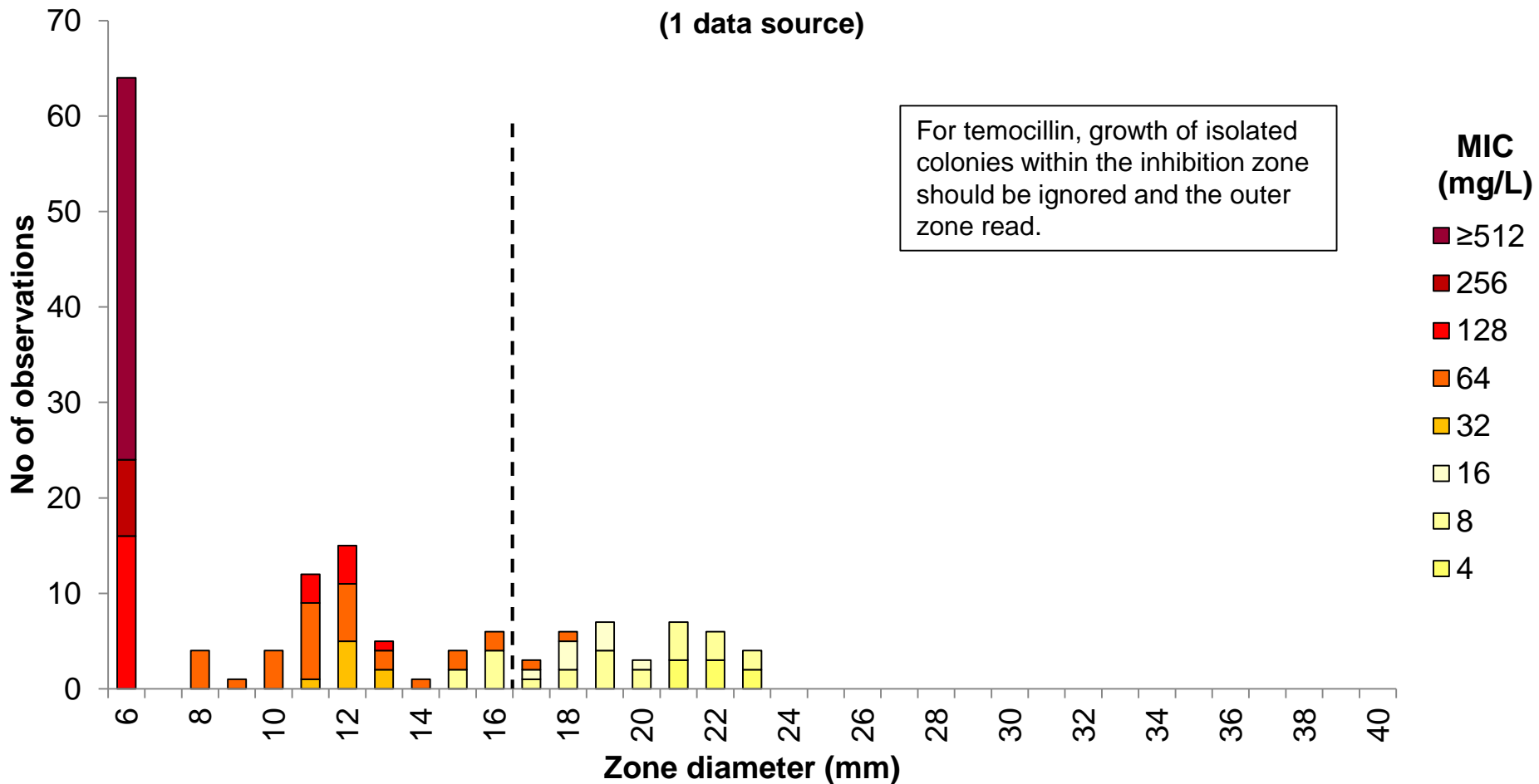
Zone diameter

S ≥ 50, R < 17 mm

Temocillin 30 µg vs. MIC

K. pneumoniae, 19 isolates (152 correlates)

(1 data source)



Breakpoints (infections originating from the urinary tract)

MIC

S ≤ 0.001, R > 16 mg/L

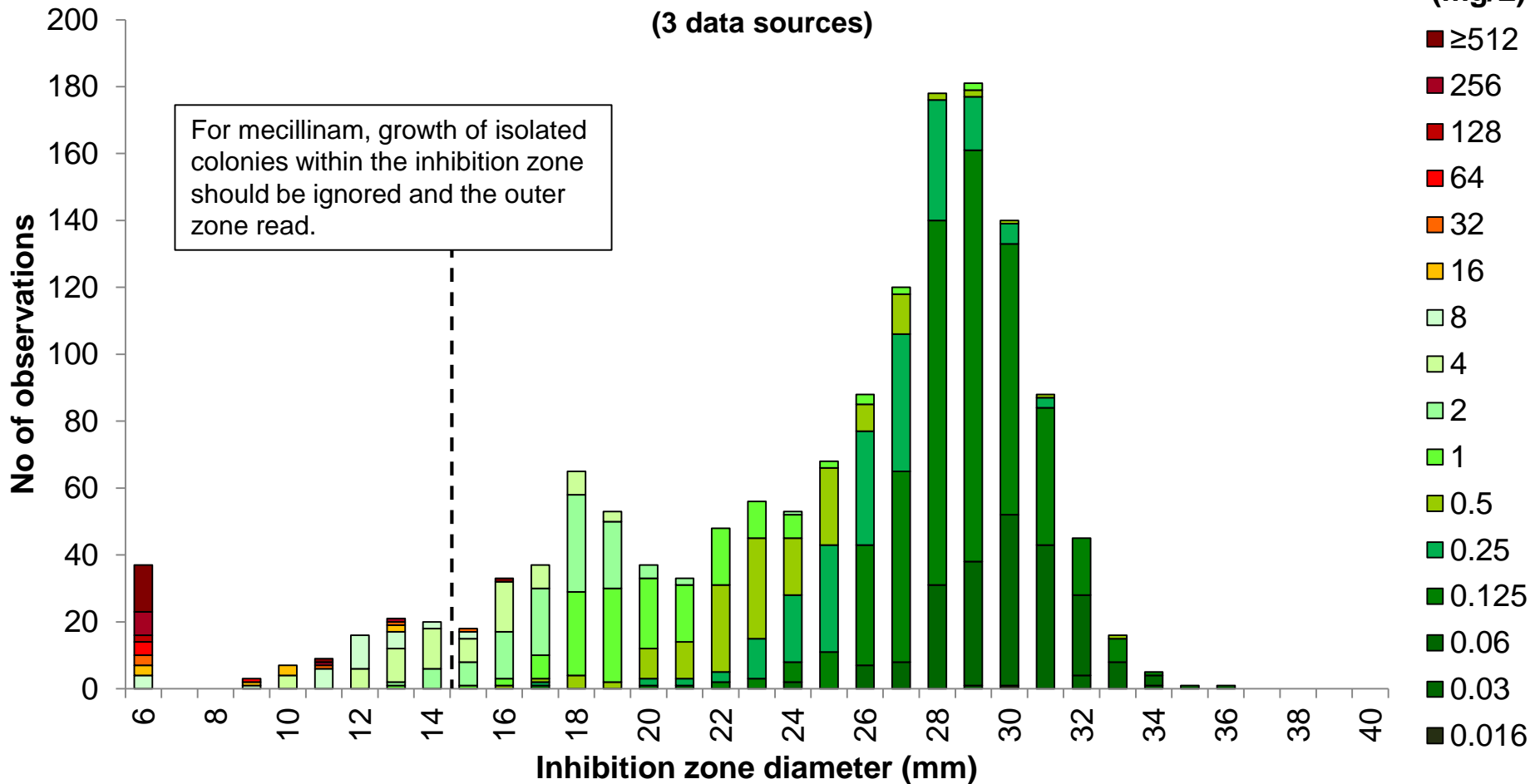
Zone diameter

S ≥ 50, R < 17 mm

Mecillinam 10 µg vs. MIC

Enterobacterales, 1388 isolates (1477 correlates)

(3 data sources)

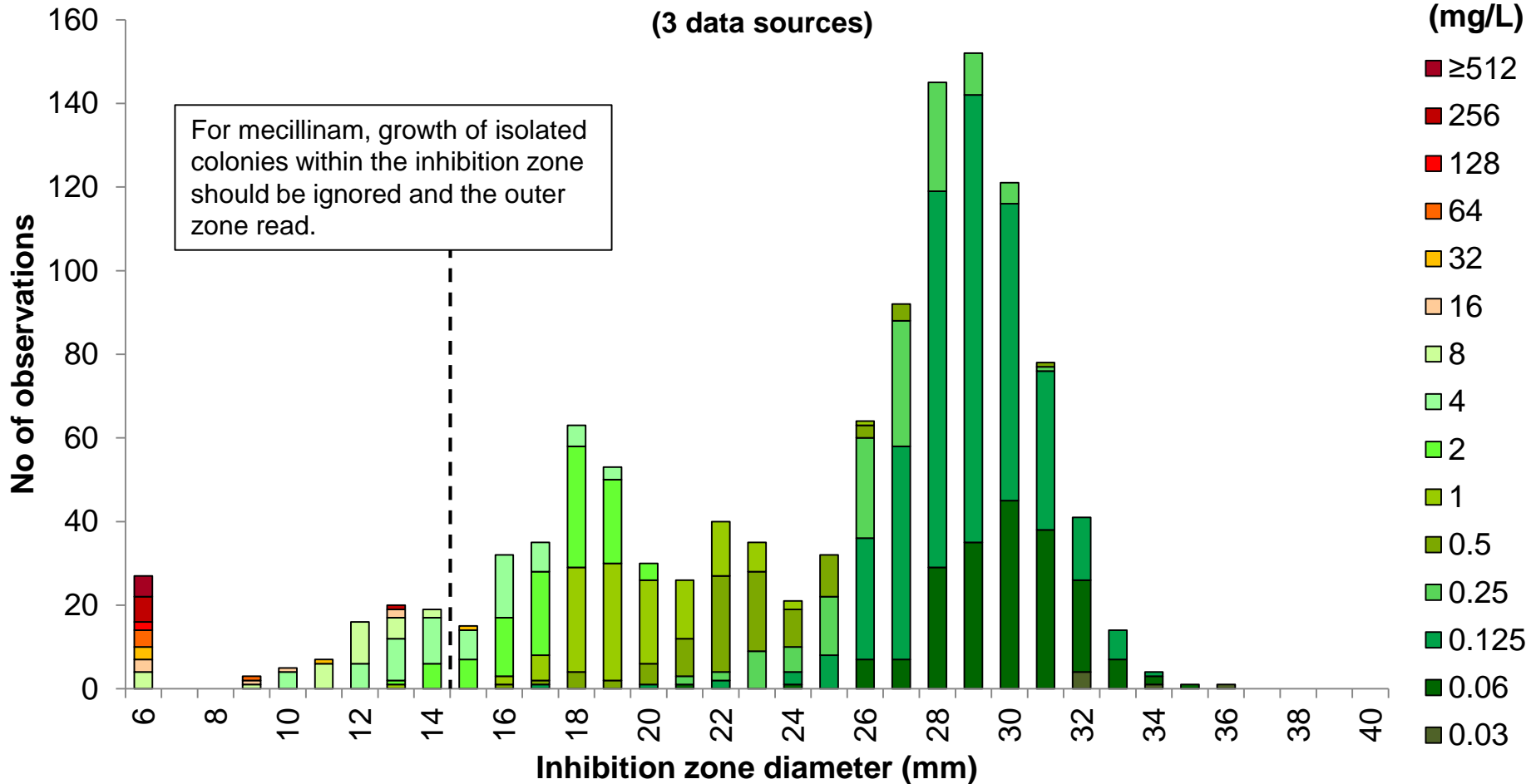


Breakpoints (oral, uncomplicated UTI)

MIC	S ≤ 8, R > 8 mg/L
Zone diameter	S ≥ 15, R < 15 mm

Mecillinam 10 µg vs. MIC *E. coli*, 1103 isolates (1192 correlates)

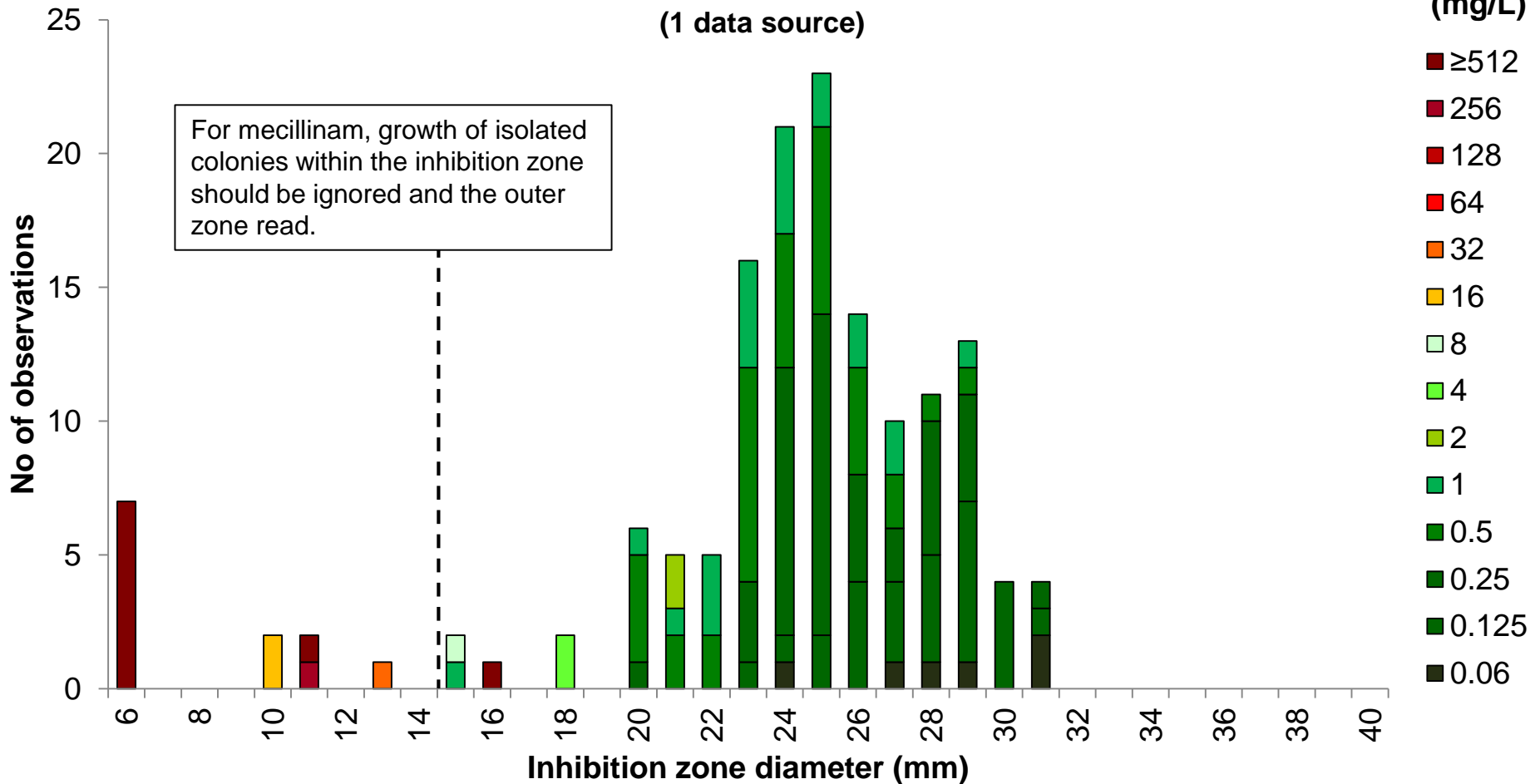
(3 data sources)



Breakpoints (oral, uncomplicated UTI)
 MIC S ≤ 8, R > 8 mg/L
 Zone diameter S ≥ 15, R < 15 mm

Mecillinam 10 µg vs. MIC *Klebsiella* spp., 149 isolates

(1 data source)



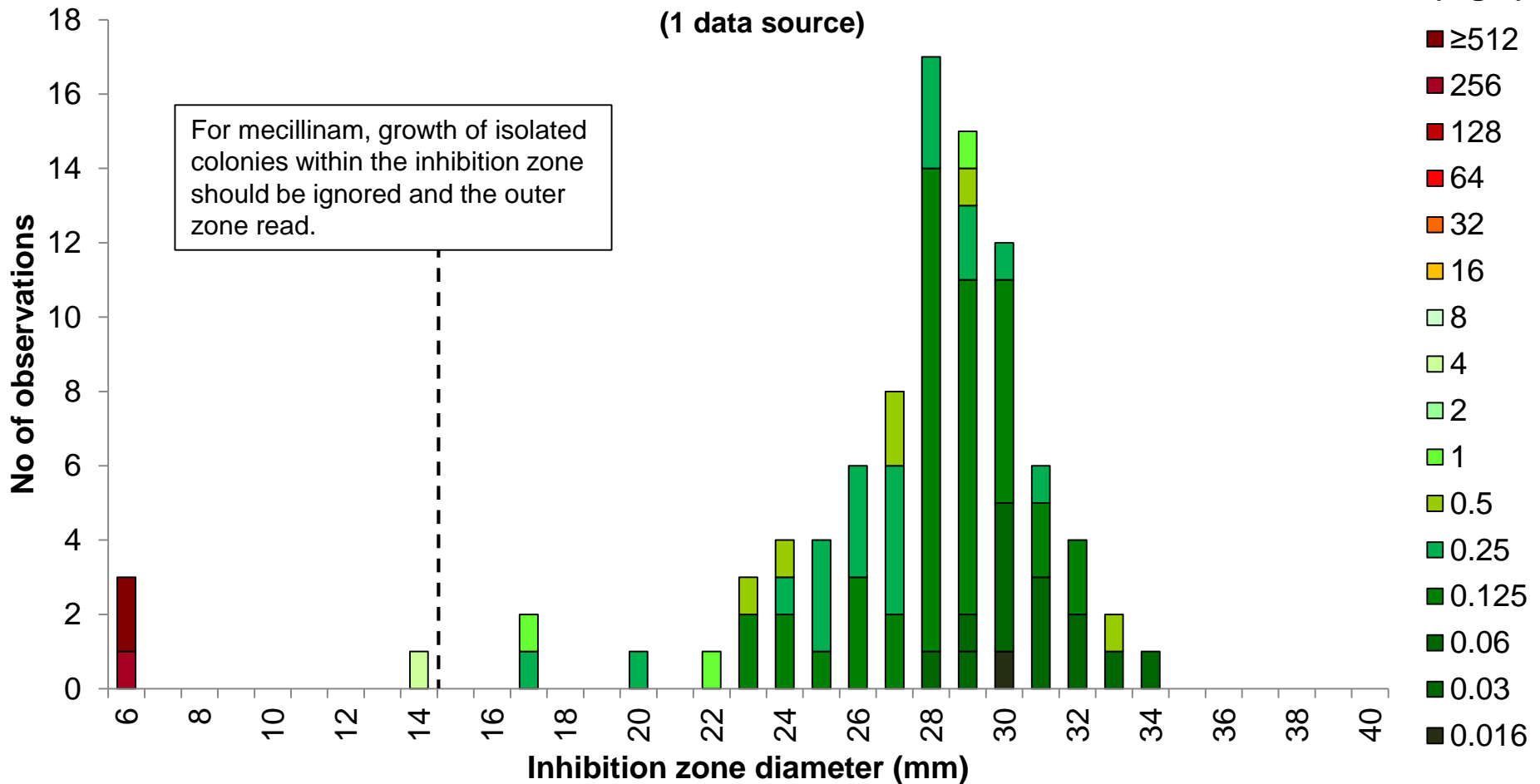
Breakpoints (oral, uncomplicated UTI)

MIC S ≤ 8, R > 8 mg/L

Zone diameter S ≥ 15, R < 15 mm

Mecillinam 10 µg vs. MIC *Citrobacter* spp., 90 isolates

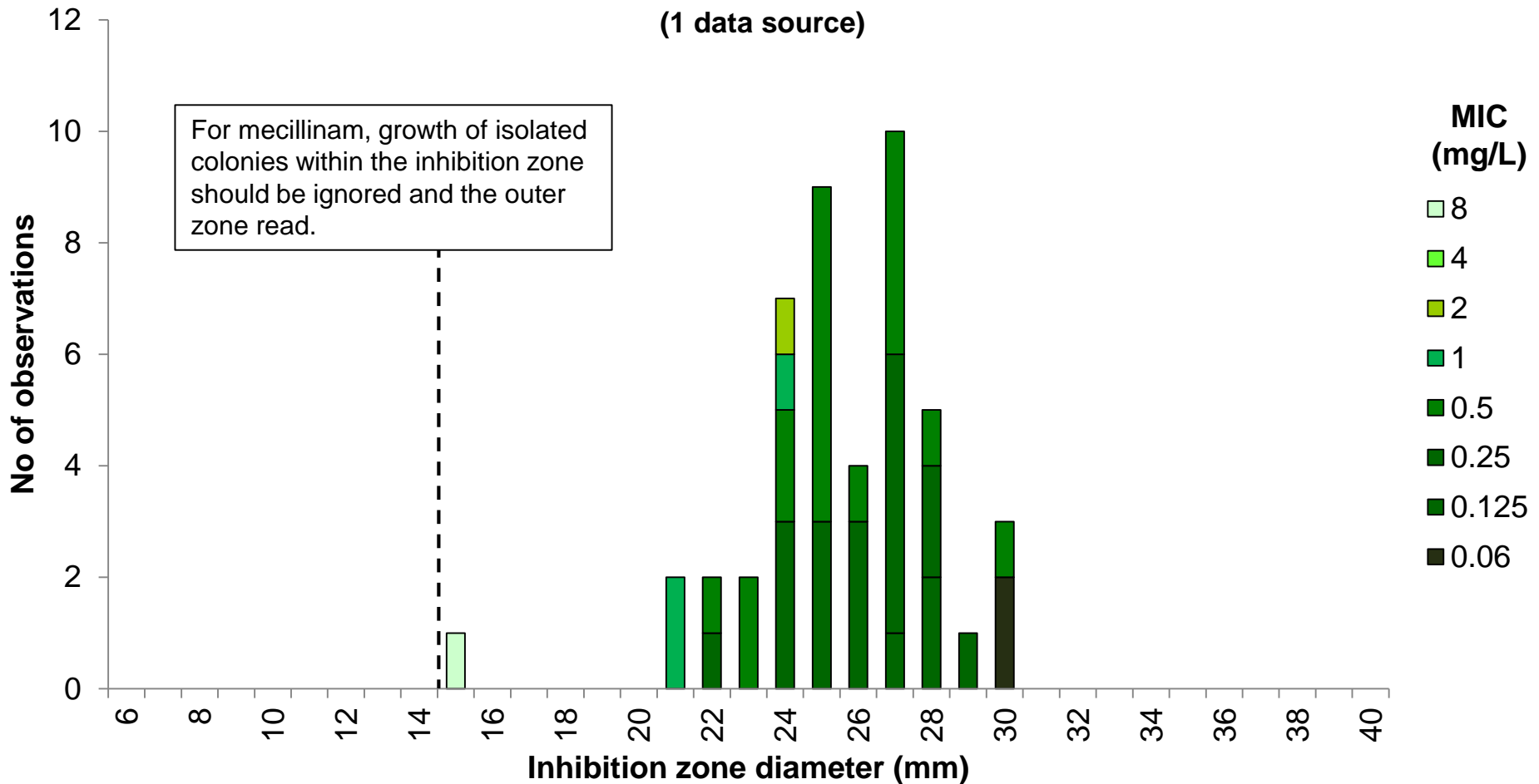
(1 data source)



Breakpoints (oral, uncomplicated UTI)
 MIC S ≤ 8, R > 8 mg/L
 Zone diameter S ≥ 15, R < 15 mm

Mecillinam 10 µg vs. MIC *Enterobacter cloacae*, 46 isolates

(1 data source)



Breakpoints (oral, uncomplicated UTI)

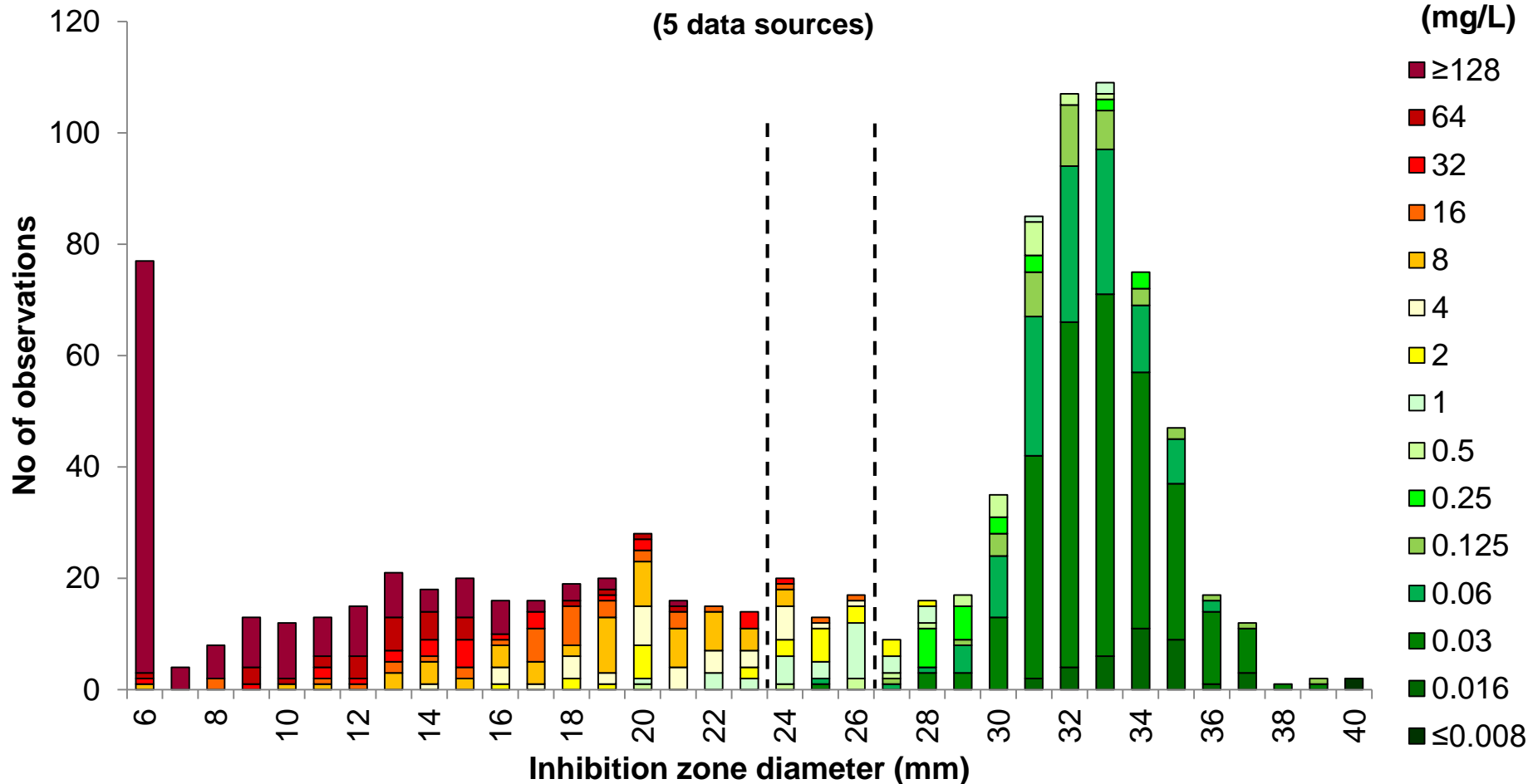
MIC S ≤ 8, R > 8 mg/L

Zone diameter S ≥ 15, R < 15 mm

Cefepime 30 μ g vs. MIC

Enterobacteriales, 420 isolates (929 correlates)

(5 data sources)



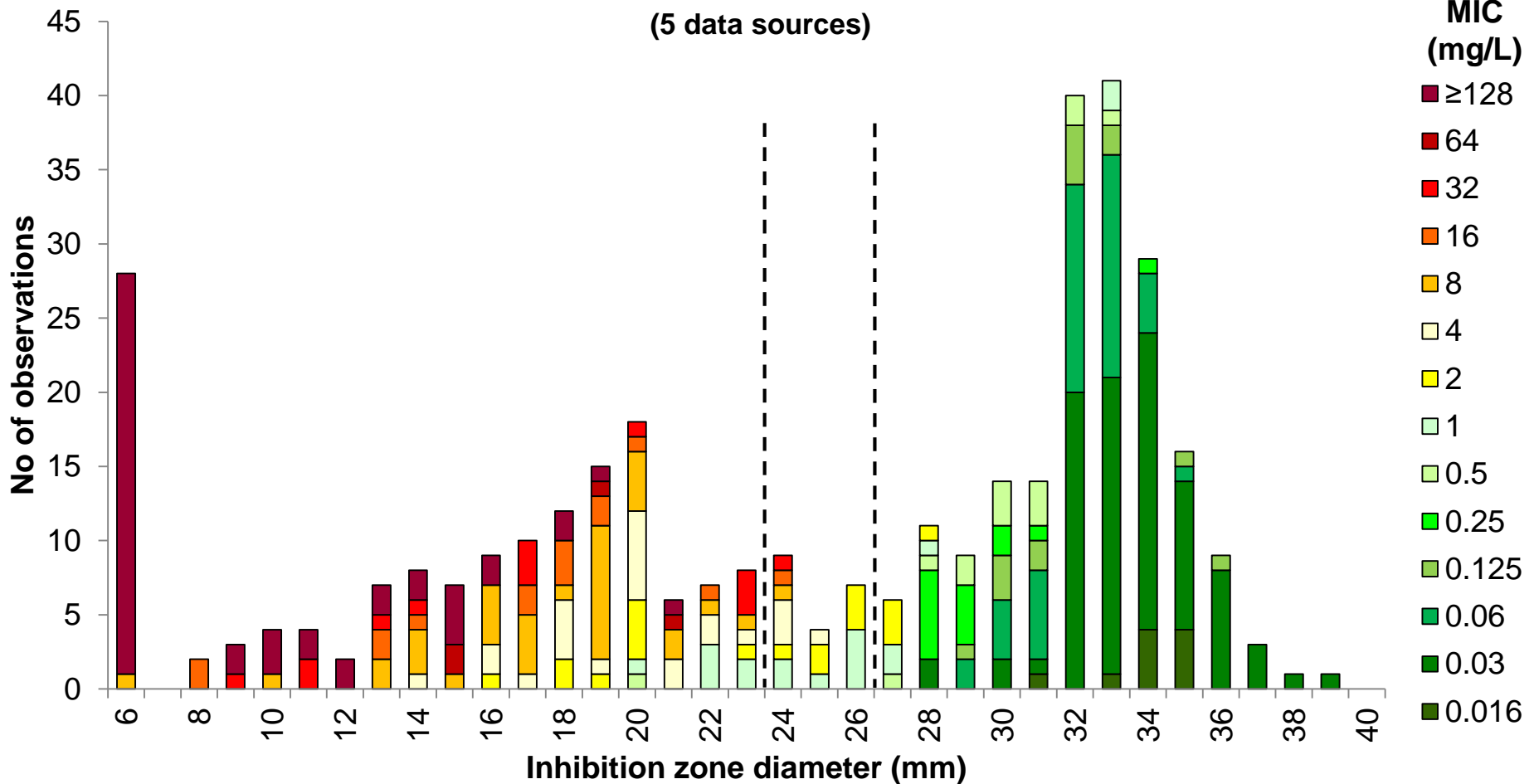
Breakpoints

MIC $S \leq 1, R > 4$ mg/L

Zone diameter $S \geq 27, R < 24$ mm

Cefepime 30 µg vs. MIC *E. coli*, 176 isolates (364 correlates)

(5 data sources)



Breakpoints

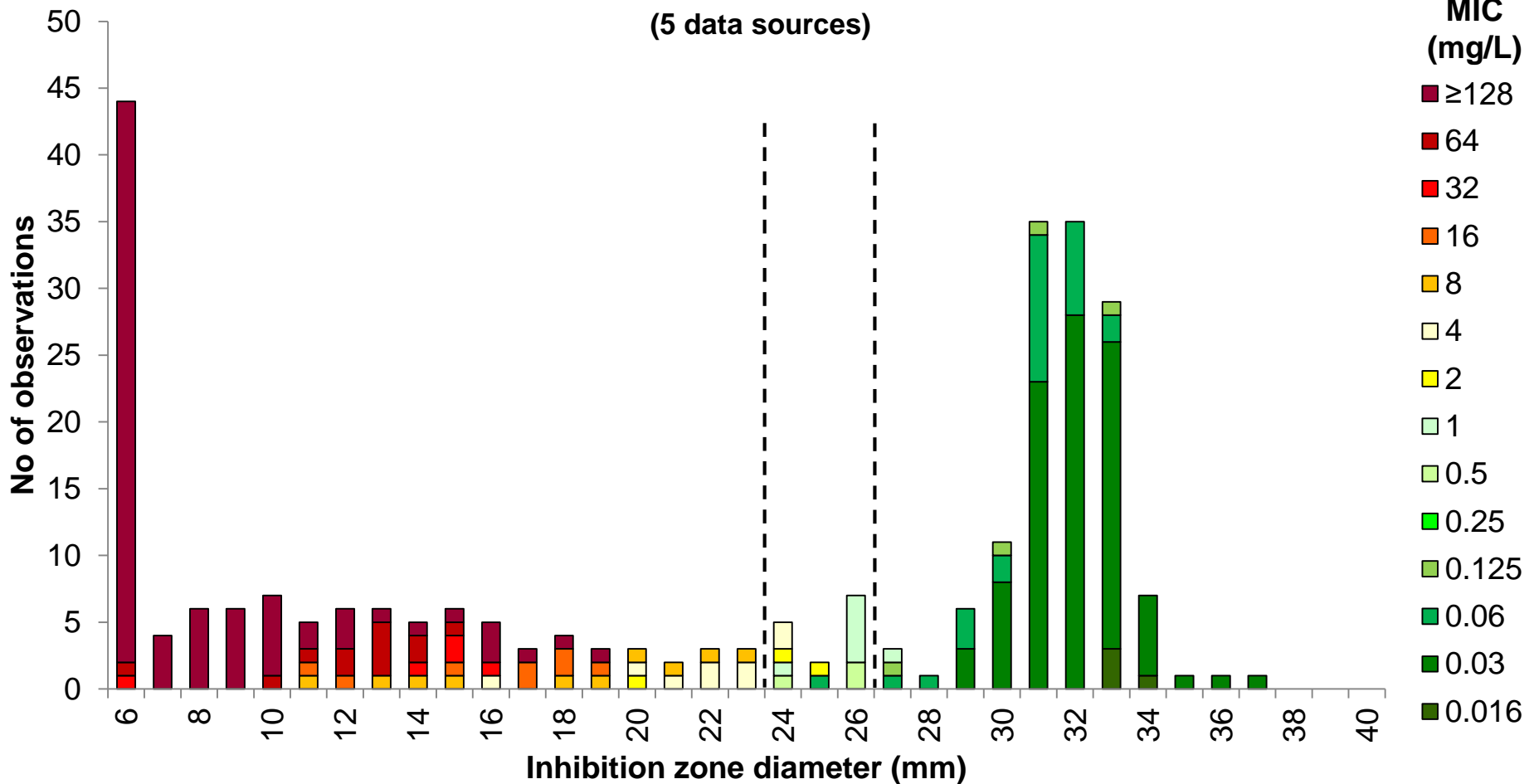
MIC $S \leq 1, R > 4$ mg/L

Zone diameter $S \geq 27, R < 24$ mm

Cefepime 30 µg vs. MIC

K. pneumoniae, 118 isolates (265 correlates)

(5 data sources)

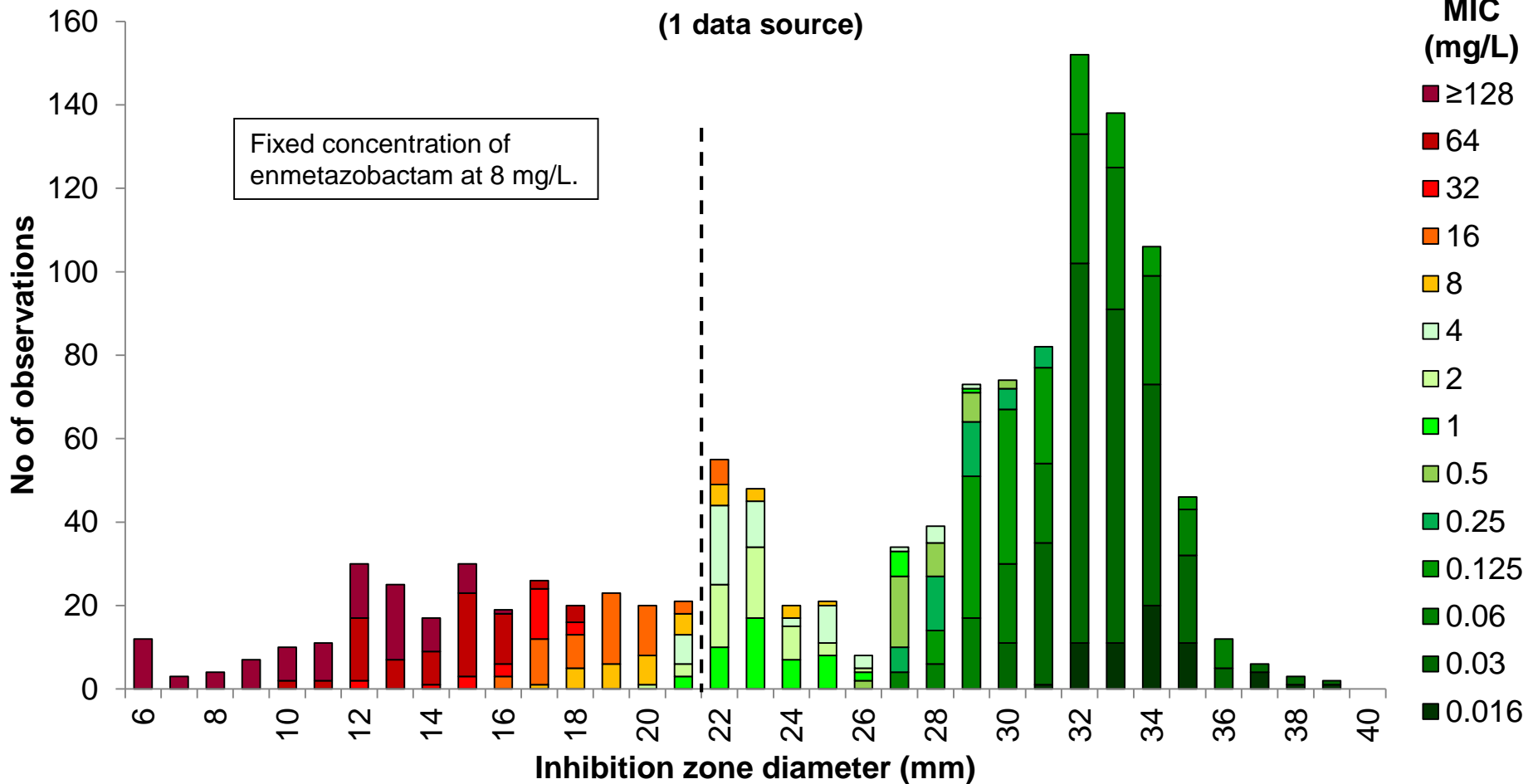


Breakpoints

MIC $S \leq 1$, $R > 4$ mg/L

Zone diameter $S \geq 27$, $R < 24$ mm

Cefepime-enmetazobactam 30-20 μg vs. MIC *Enterobacterales*, 200 isolates (1197 correlates)

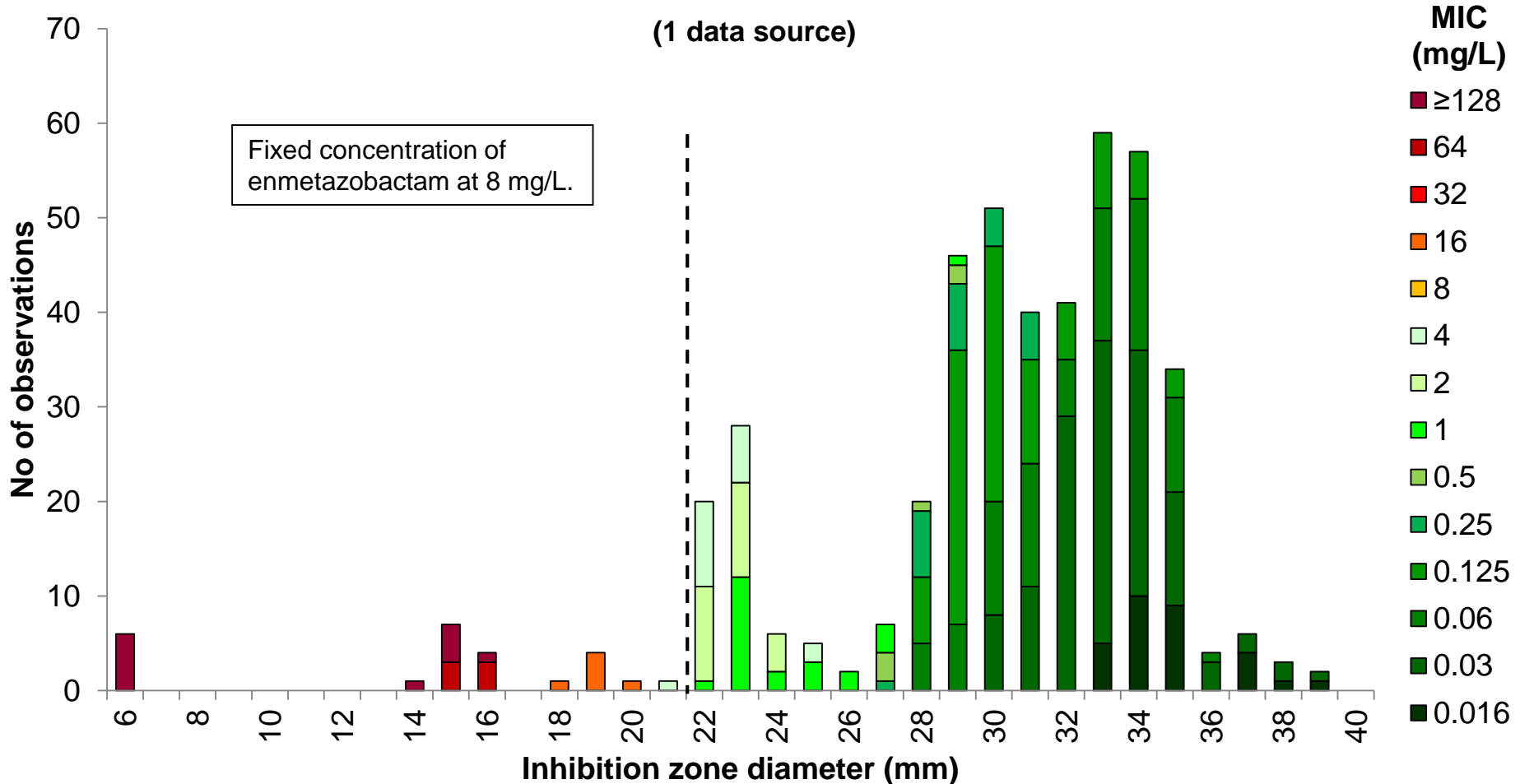


Breakpoints

MIC $S \leq 4, R > 4$ mg/L

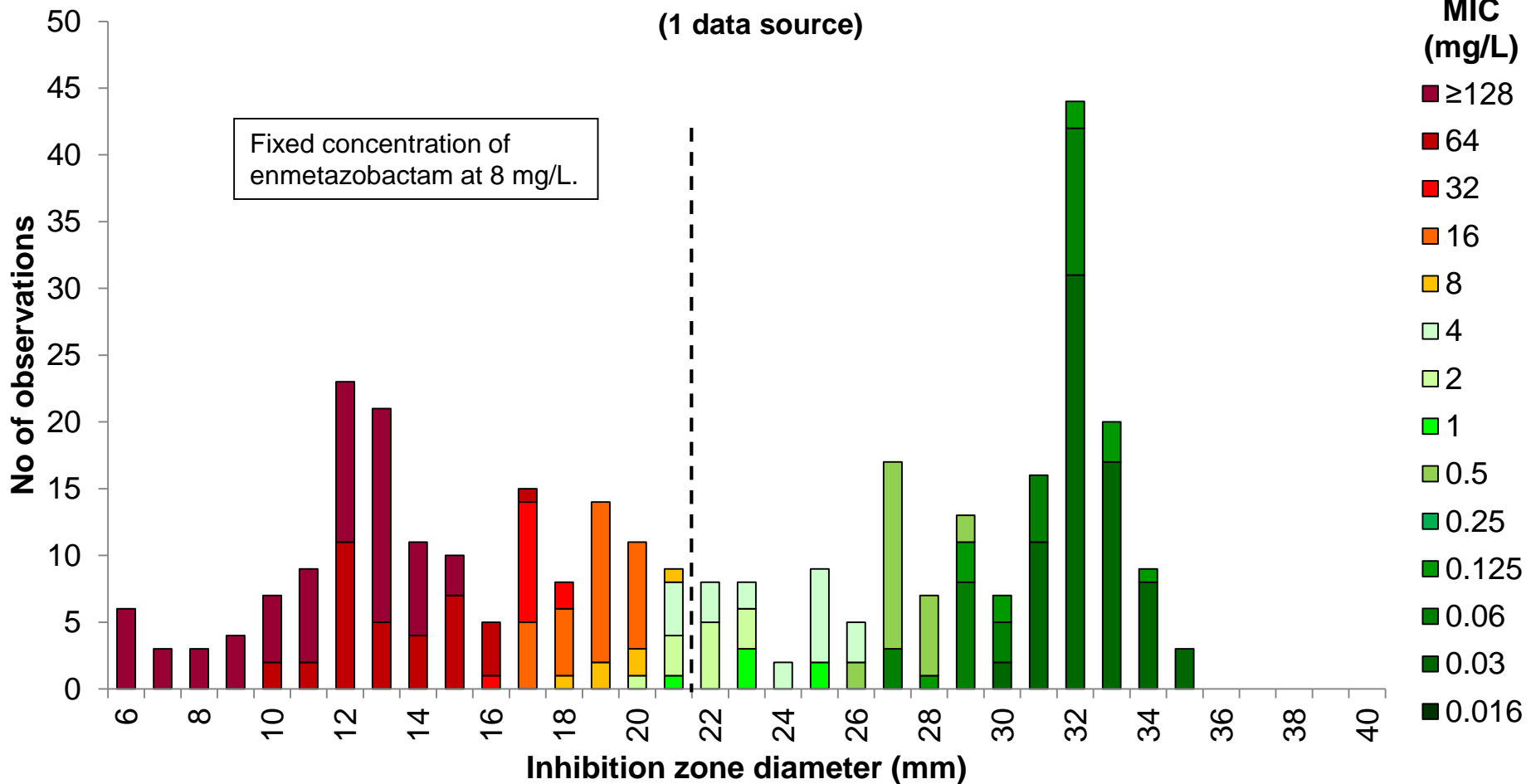
Zone diameter $S \geq 22, R < 22$ mm

Cefepime-enmetazobactam 30-20 µg vs. MIC *E. coli*, 75 isolates (456 correlates)



Breakpoints	
MIC	$S \leq 4, R > 4$ mg/L
Zone diameter	$S \geq 22, R < 22$ mm

Cefepime-enmetazobactam 30-20 µg vs. MIC *K. pneumoniae*, 55 isolates (327 correlates)



Breakpoints

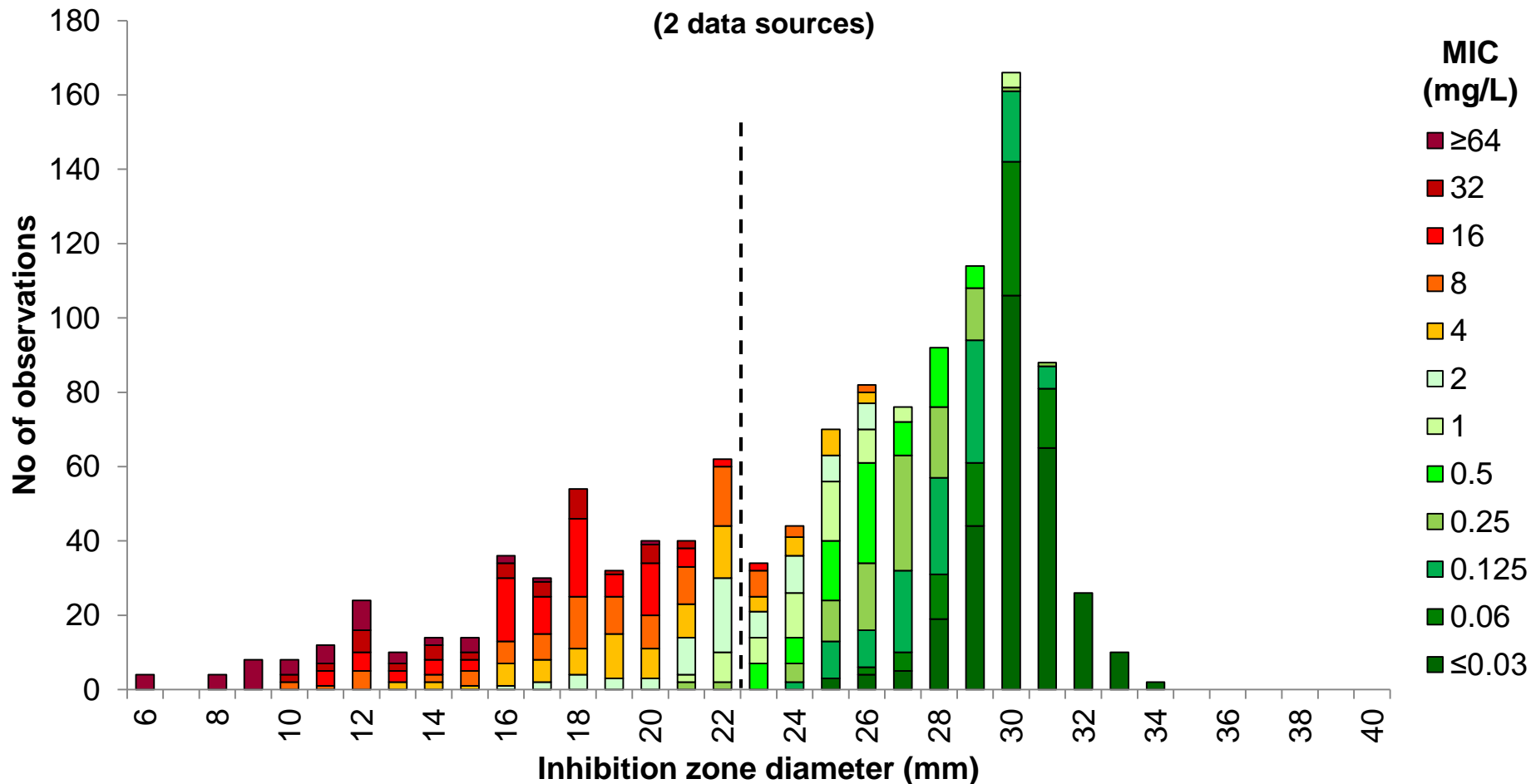
MIC $S \leq 4$, $R > 4$ mg/L

Zone diameter $S \geq 22$, $R < 22$ mm

Cefiderocol 30 µg vs. MIC

Enterobacterales, 299 isolates (1196 correlates)

(2 data sources)

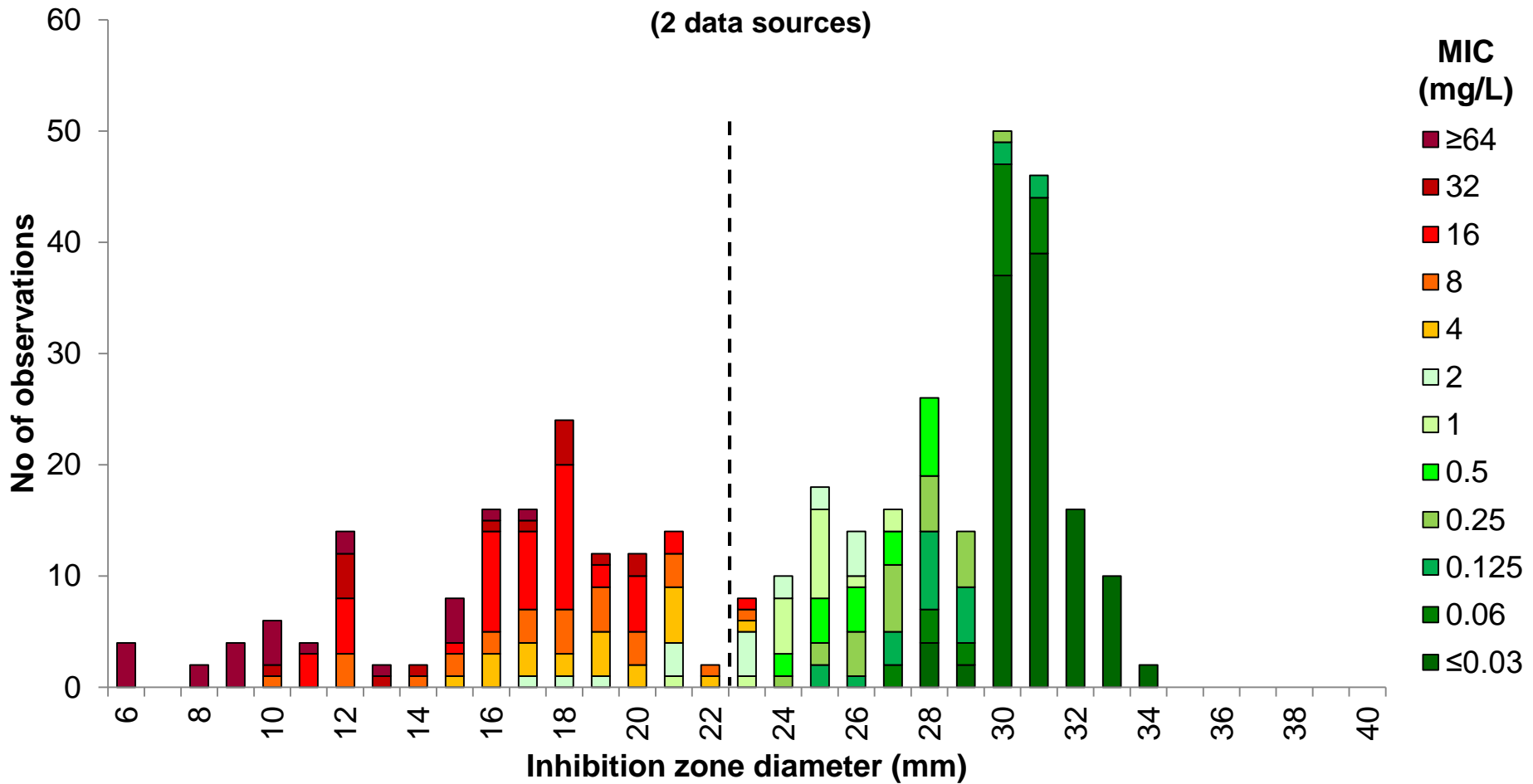


Breakpoints	
MIC	$S \leq 2$, $R > 2$ mg/L
Zone diameter	$S \geq 23$, $R < 23$ mm

Cefiderocol 30 µg vs. MIC

E. coli, 93 isolates (372 correlates)

(2 data sources)



Breakpoints

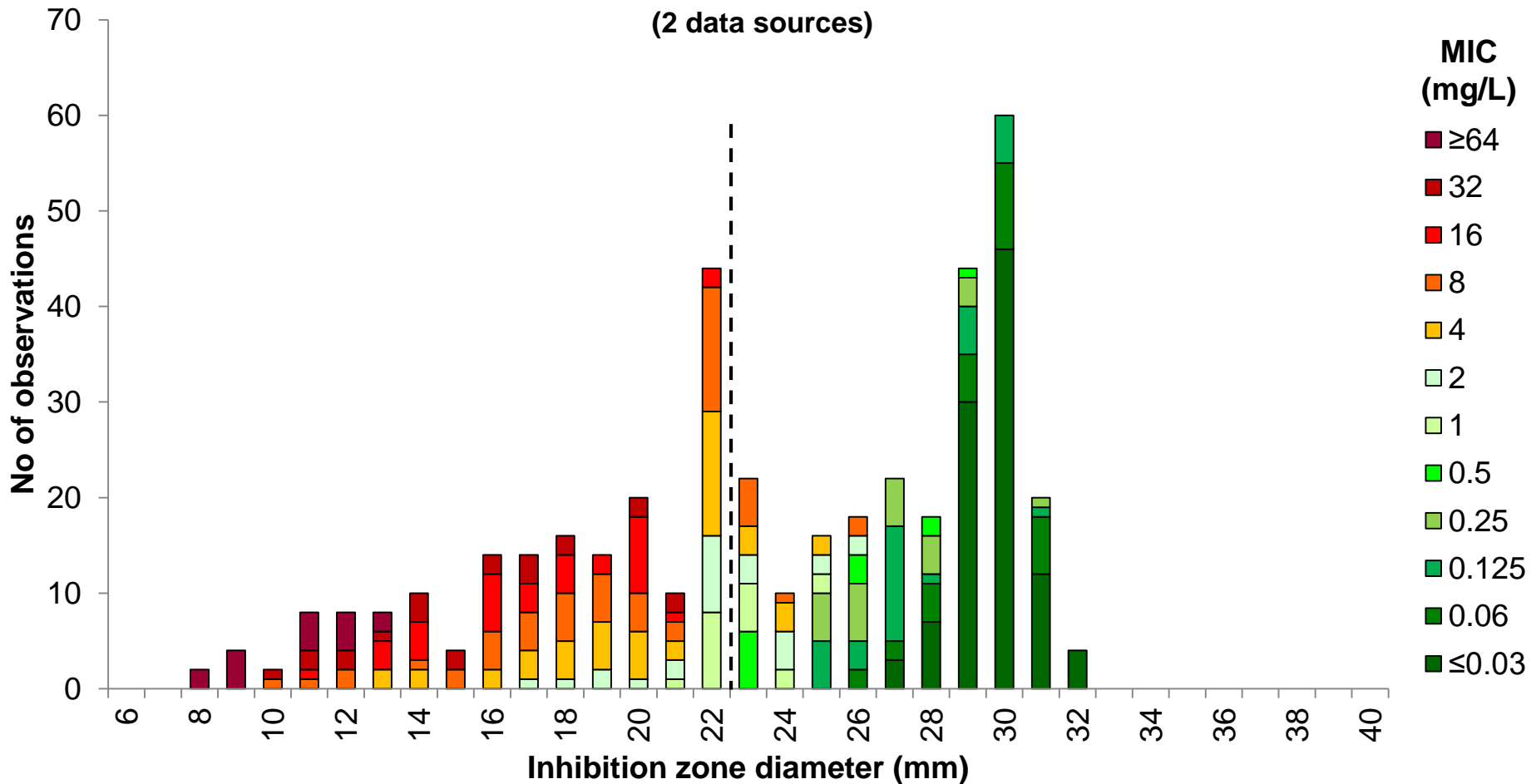
MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 23, R < 23 mm

Cefiderocol 30 µg vs. MIC

K. pneumoniae, 103 isolates (412 correlates)

(2 data sources)

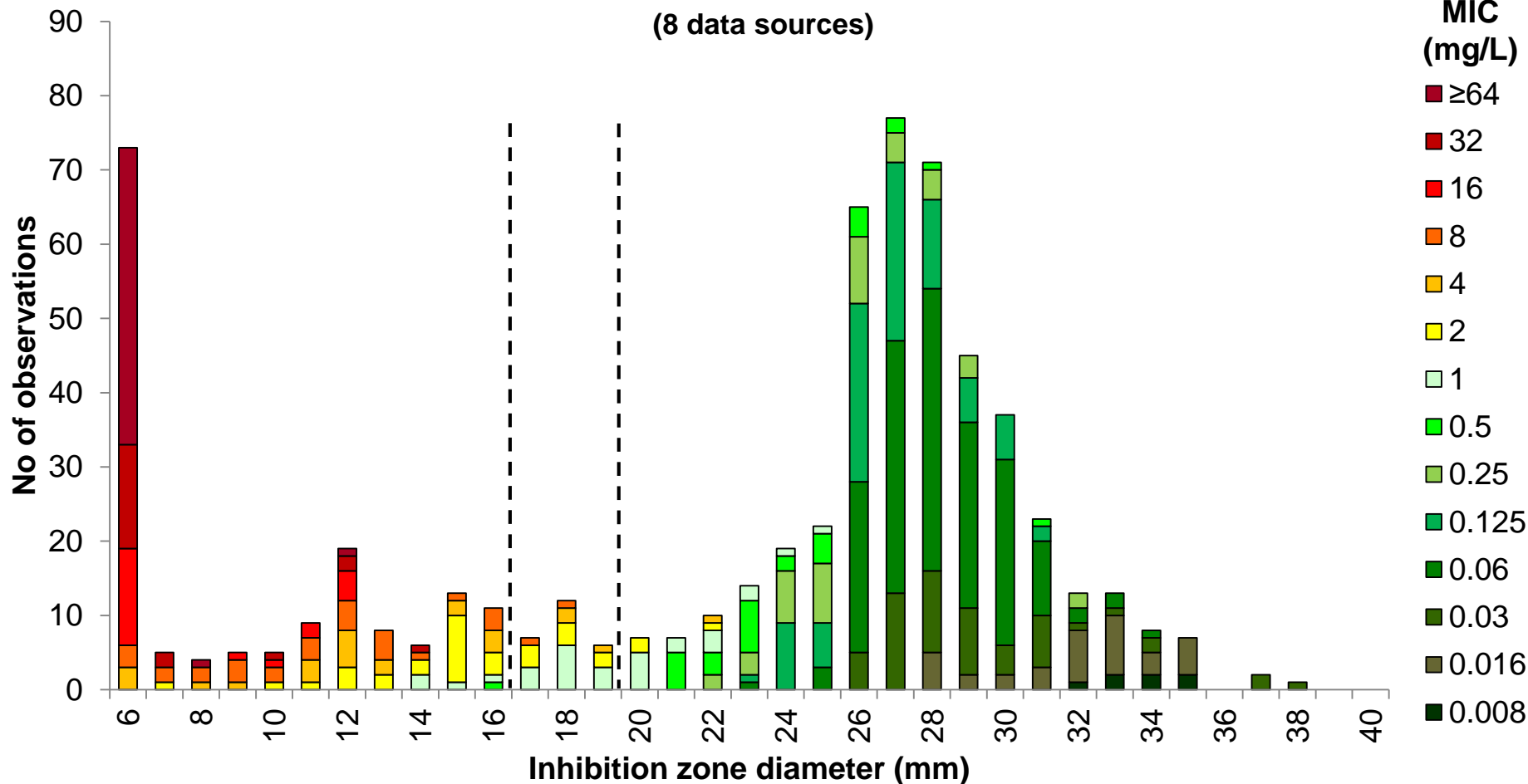


Breakpoints	
MIC	S ≤ 2, R > 2 mg/L
Zone diameter	S ≥ 23, R < 23 mm

Cefotaxime 5 µg vs. MIC

Enterobacteriales, 573 isolates (624 correlates)

(8 data sources)



Breakpoints (non-meningitis)

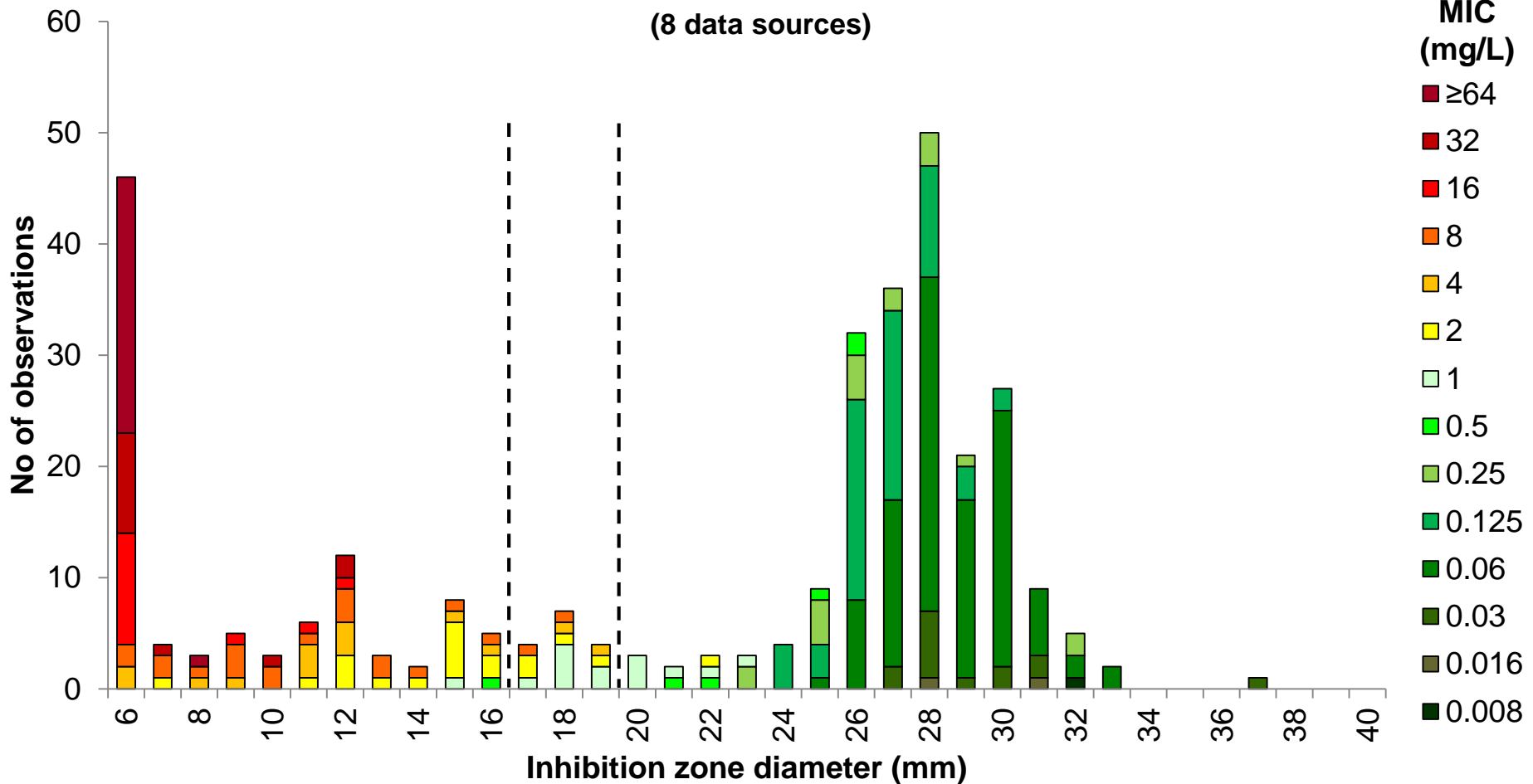
MIC $S \leq 1$, $R > 2$ mg/L

Zone diameter $S \geq 20$, $R < 17$ mm

Cefotaxime 5 µg vs. MIC

E. coli, 288 isolates (319 correlates)

(8 data sources)



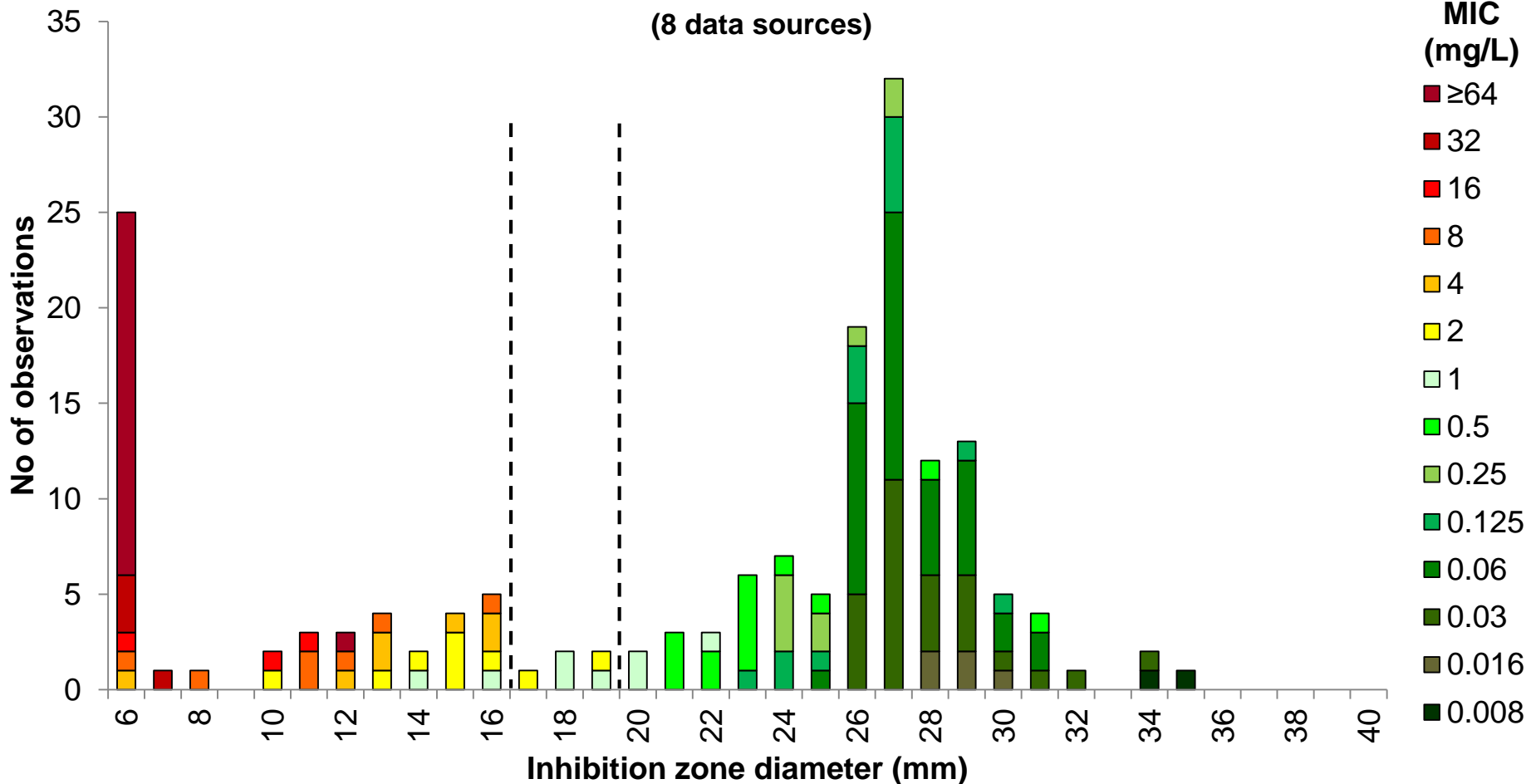
Breakpoints (non-meningitis)

MIC $S \leq 1$, $R > 2$ mg/L

Zone diameter $S \geq 20$, $R < 17$ mm

Cefotaxime 5 µg vs. MIC

K. pneumoniae, 151 isolates (170 correlates)

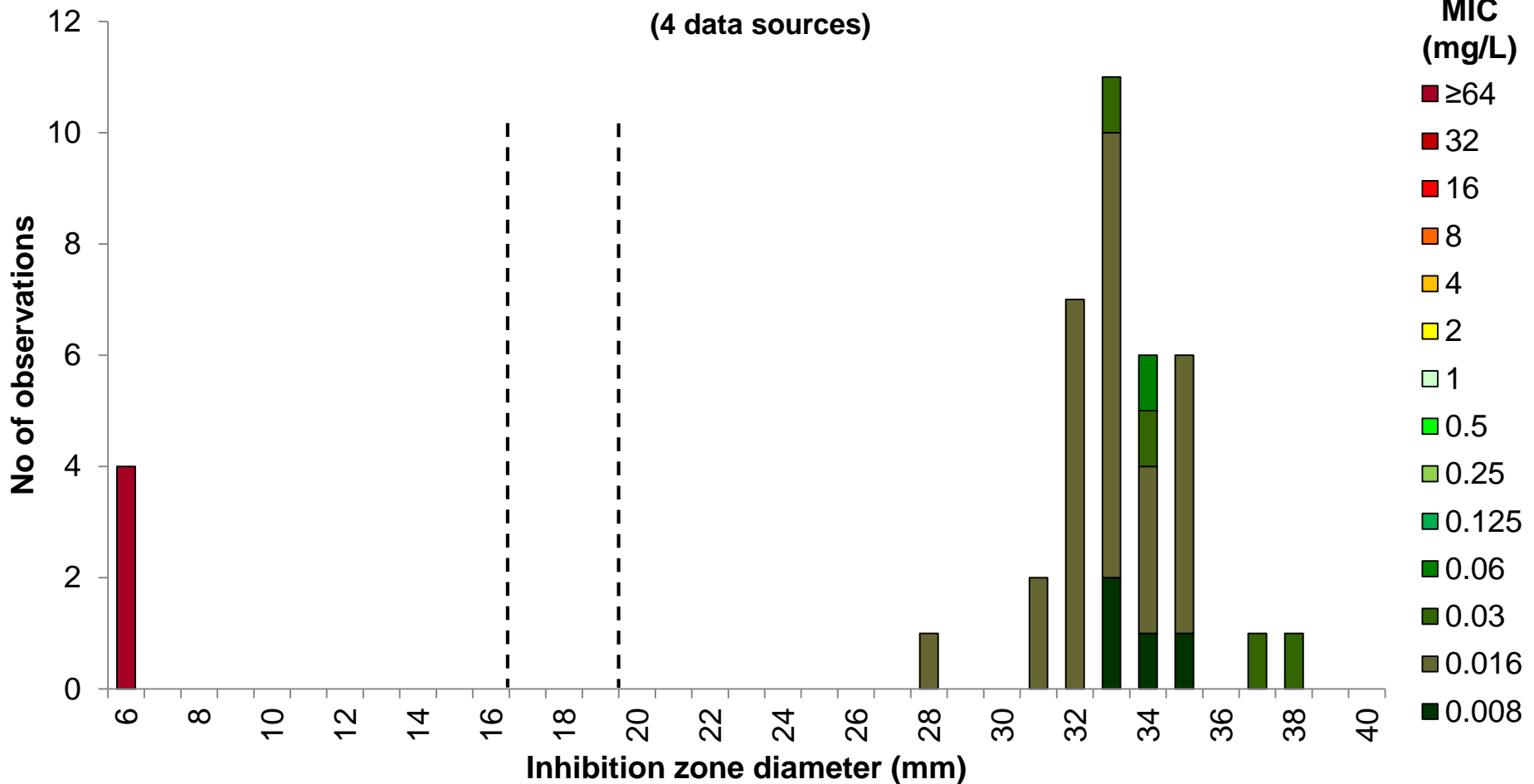


Breakpoints (non-meningitis)	
MIC	S ≤ 1, R > 2 mg/L
Zone diameter	S ≥ 20, R < 17 mm

Cefotaxime 5 µg vs. MIC

P. mirabilis, 37 isolates (39 correlates)

(4 data sources)

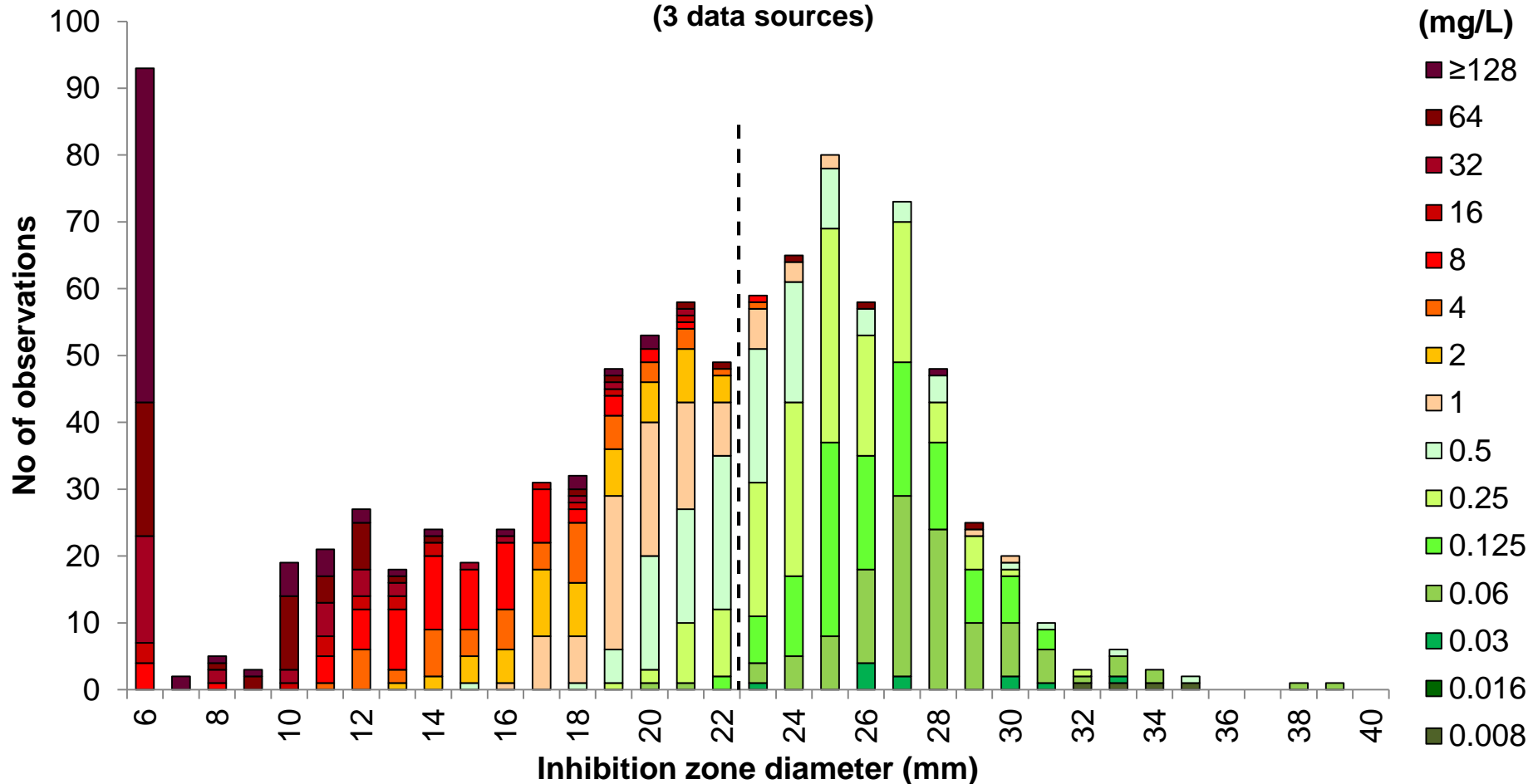


Breakpoints (non-meningitis)	
MIC	S ≤ 1, R > 2 mg/L
Zone diameter	S ≥ 20, R < 17 mm

Ceftaroline 5 μ g vs. MIC

Enterobacteriales, 249 isolates (980 correlates)

(3 data sources)

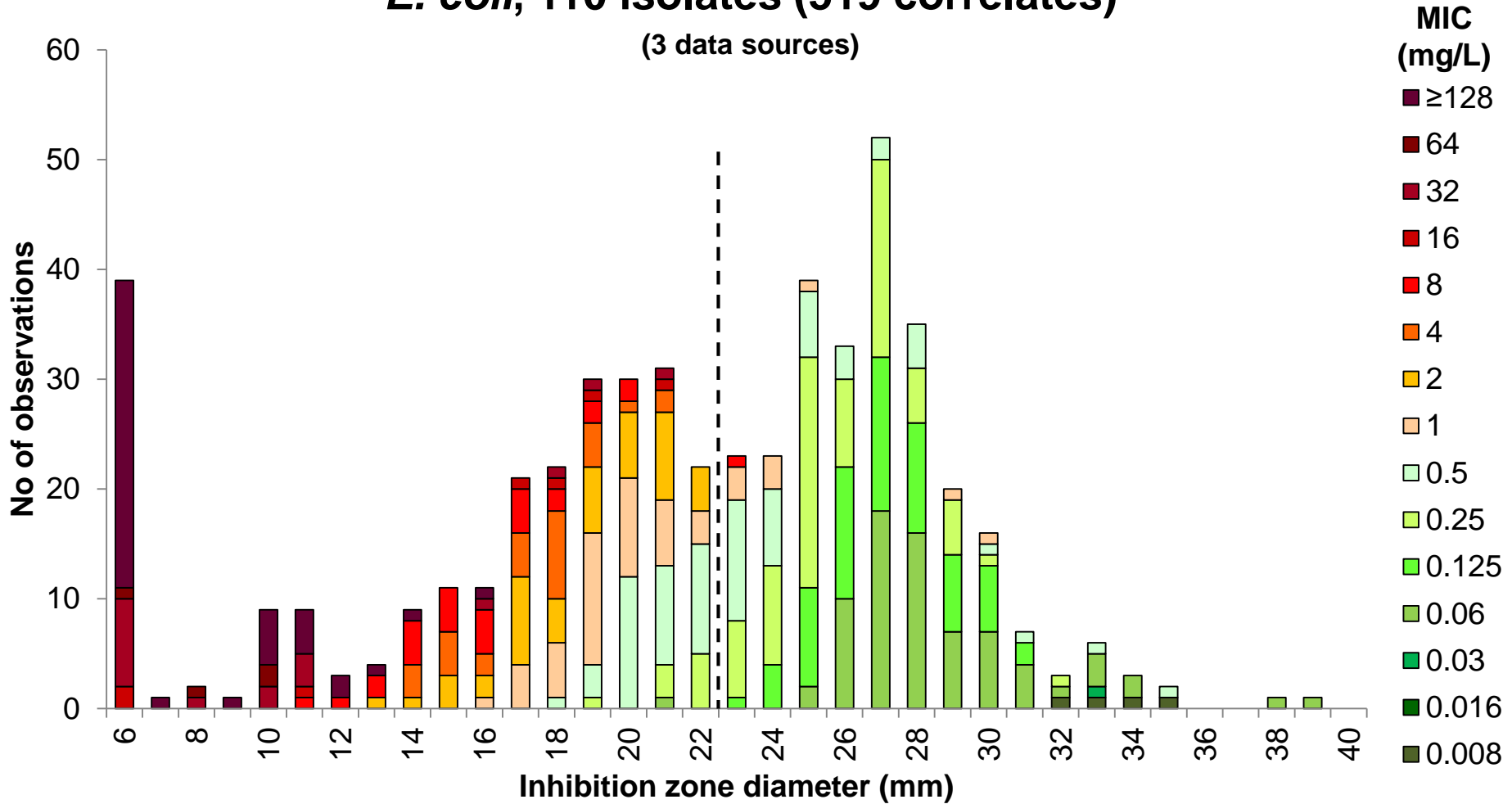


Breakpoints	
MIC	$S \leq 0.5, R > 0.5$ mg/L
Zone diameter	$S \geq 23, R < 23$ mm

Ceftaroline 5 µg vs. MIC

E. coli, 110 isolates (519 correlates)

(3 data sources)



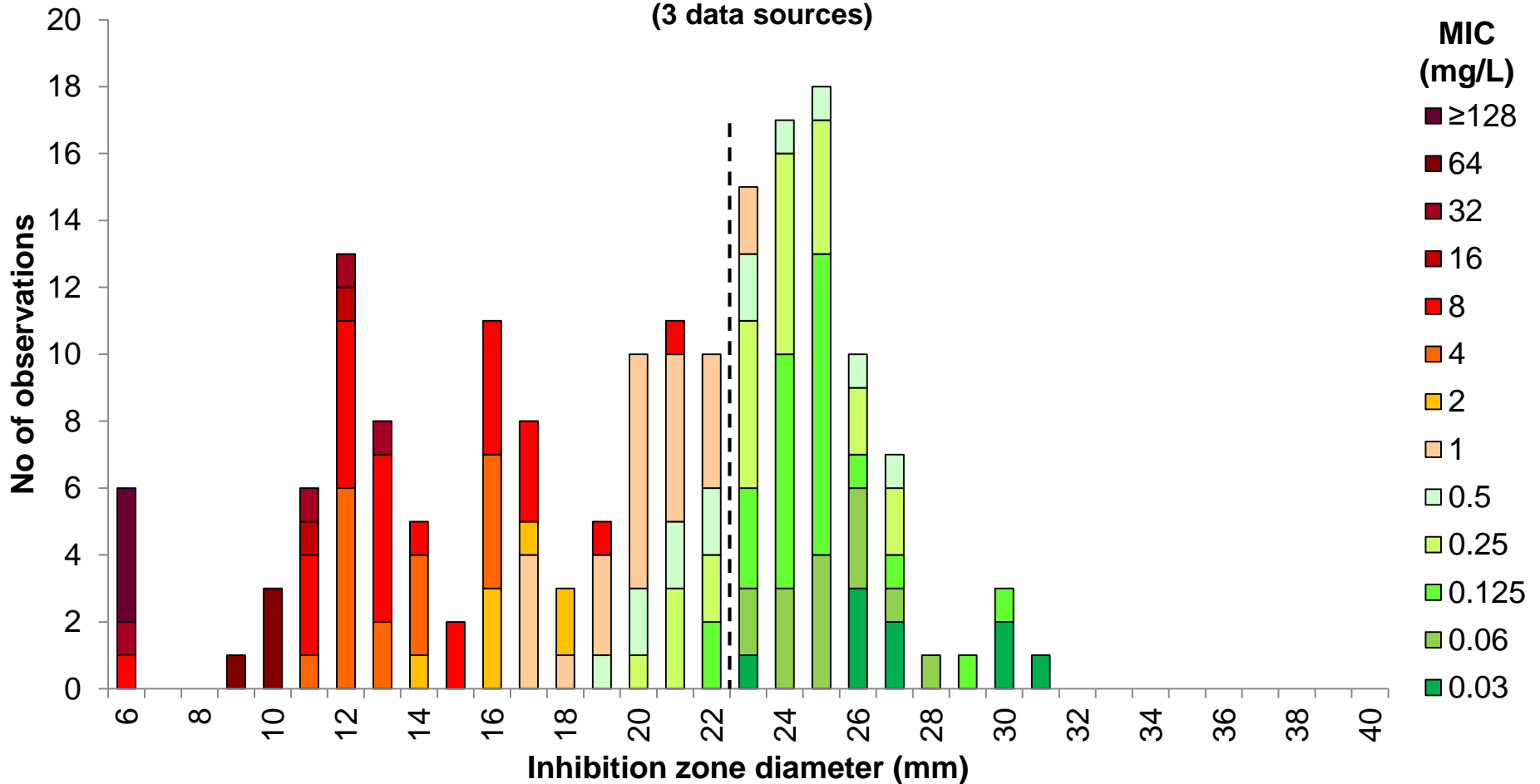
Breakpoints

MIC	S ≤ 0.5, R > 0.5 mg/L
Zone diameter	S ≥ 23, R < 23 mm

Ceftaroline 5 µg vs. MIC

K. pneumoniae, 61 isolates (175 correlates)

(3 data sources)

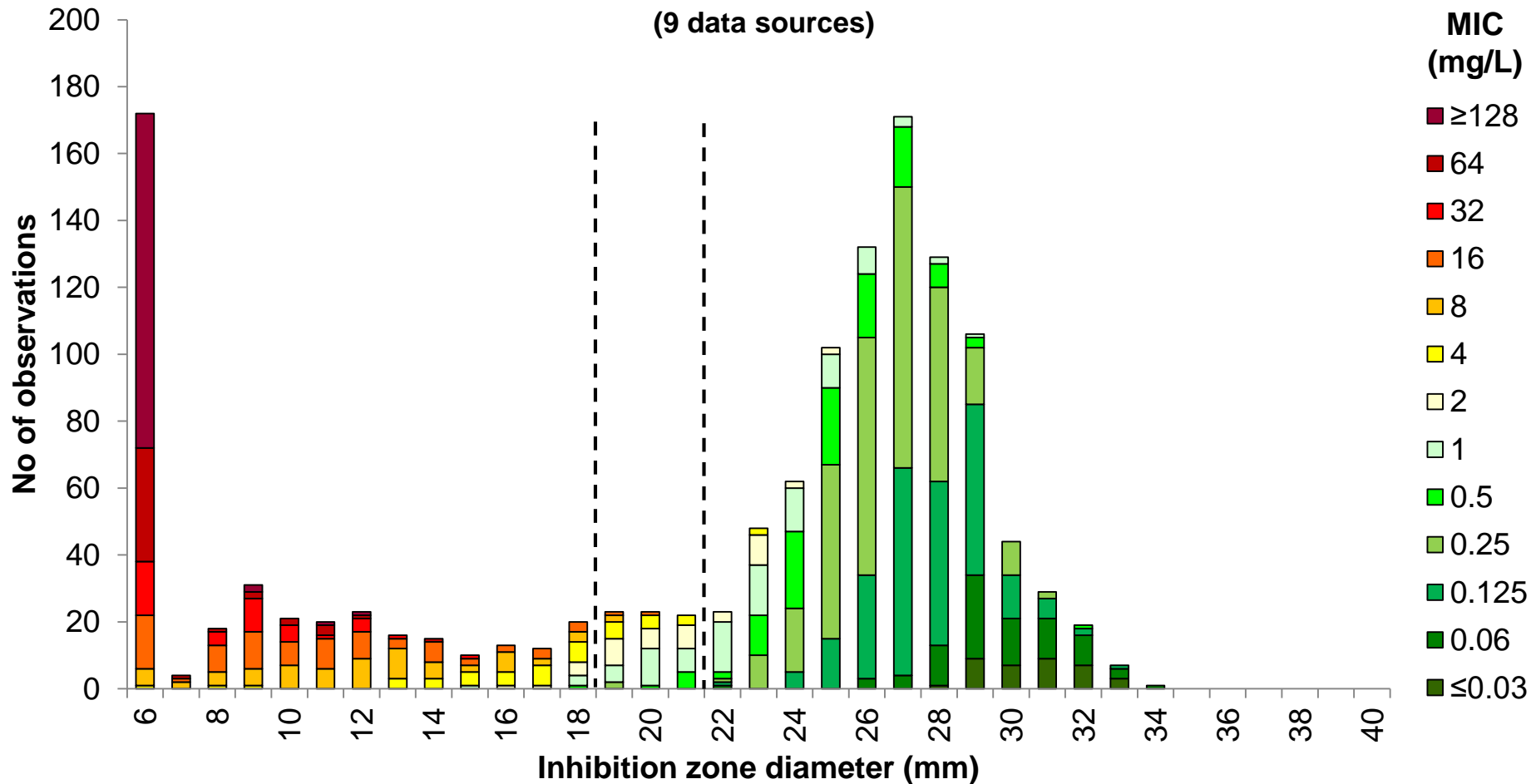


Breakpoints

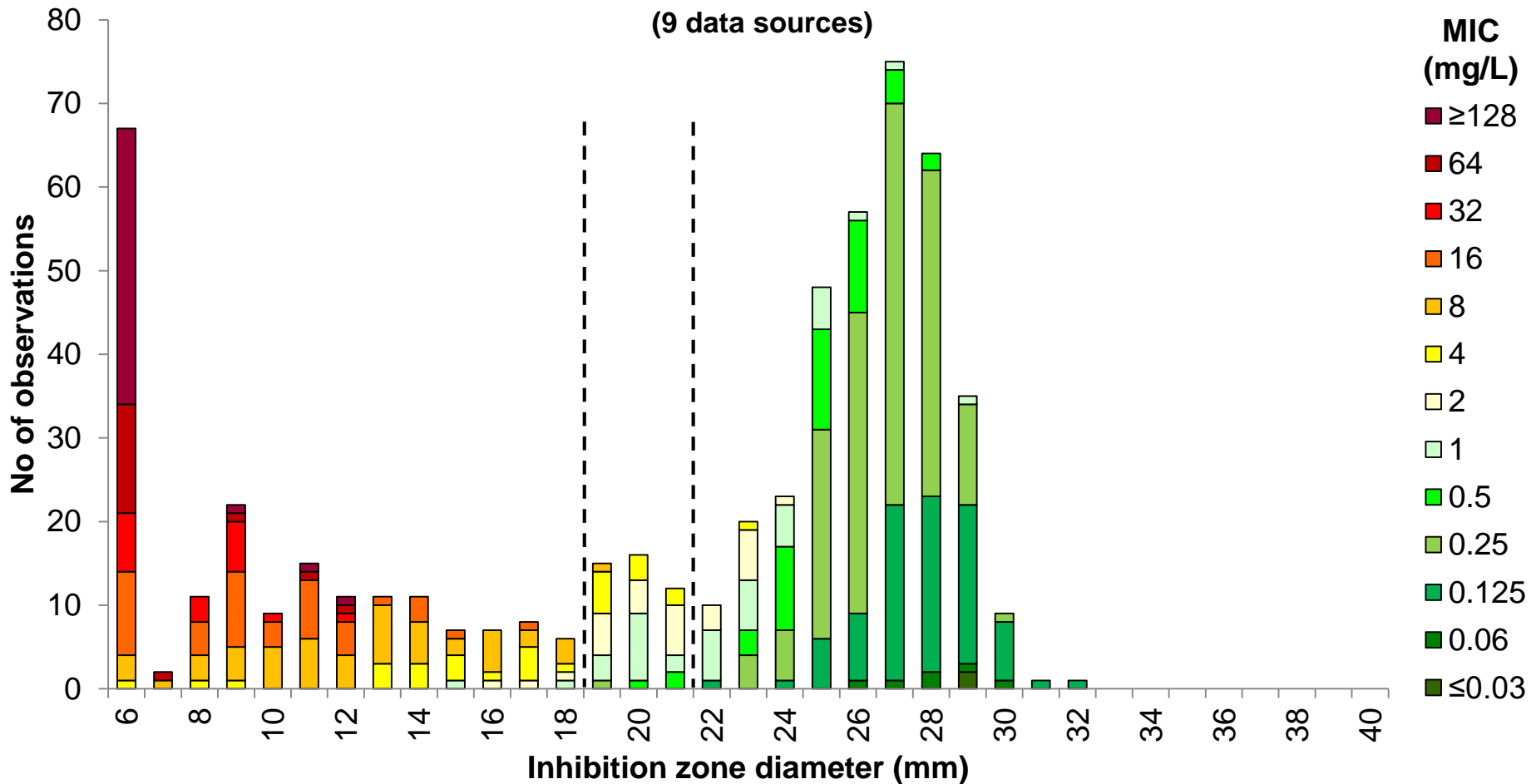
MIC	S ≤ 0.5, R > 0.5 mg/L
Zone diameter	S ≥ 23, R < 23 mm

Ceftazidime 10 µg vs. MIC

Enterobacterales, 679 isolates (1316 correlates)



Ceftazidime 10 µg vs. MIC *E. coli*, 406 isolates (573 correlates)



Breakpoints

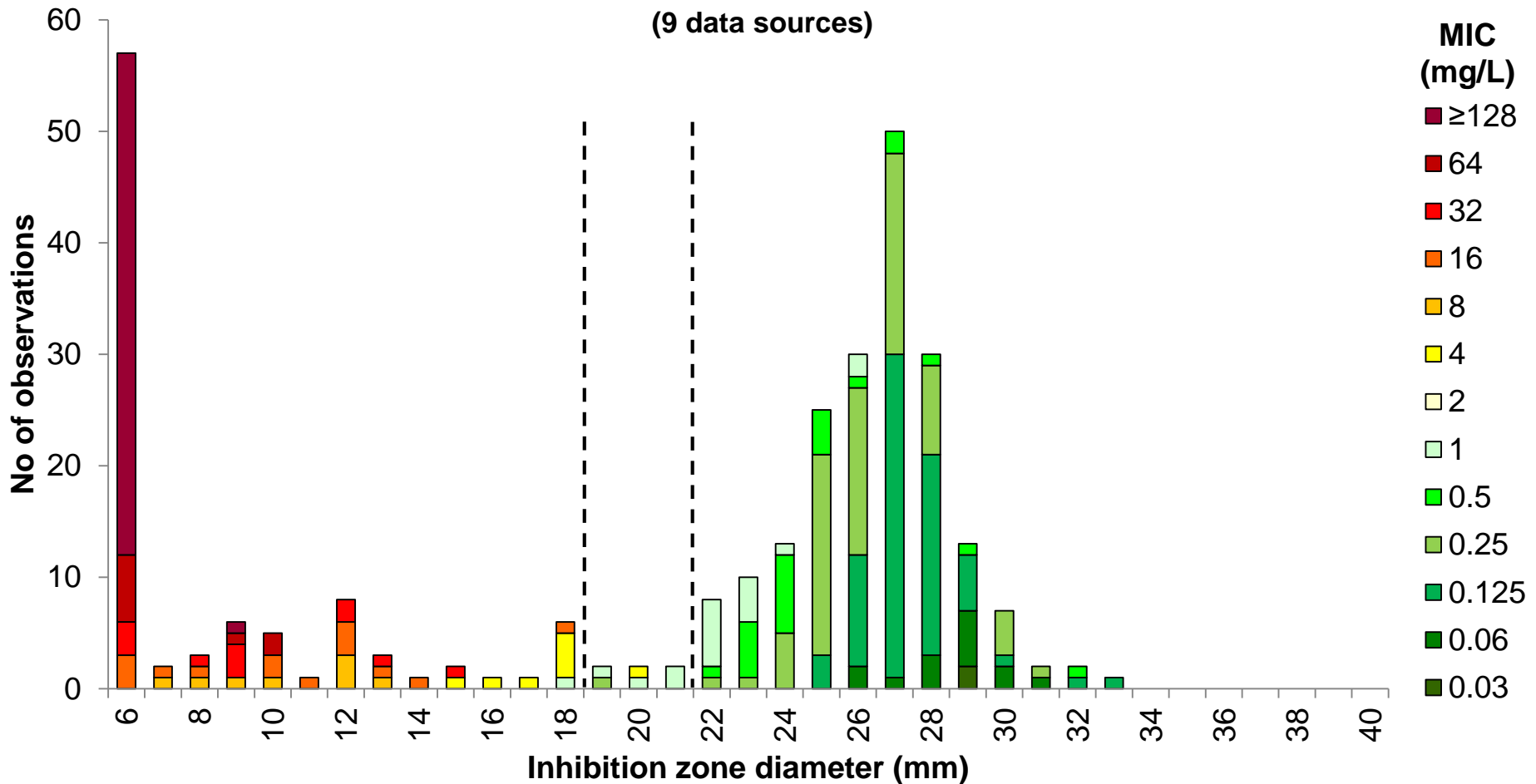
MIC S ≤ 1, R > 4 mg/L

Zone diameter S ≥ 22, R < 19 mm

Ceftazidime 10 µg vs. MIC

K. pneumoniae, 137 isolates (293 correlates)

(9 data sources)



Breakpoints

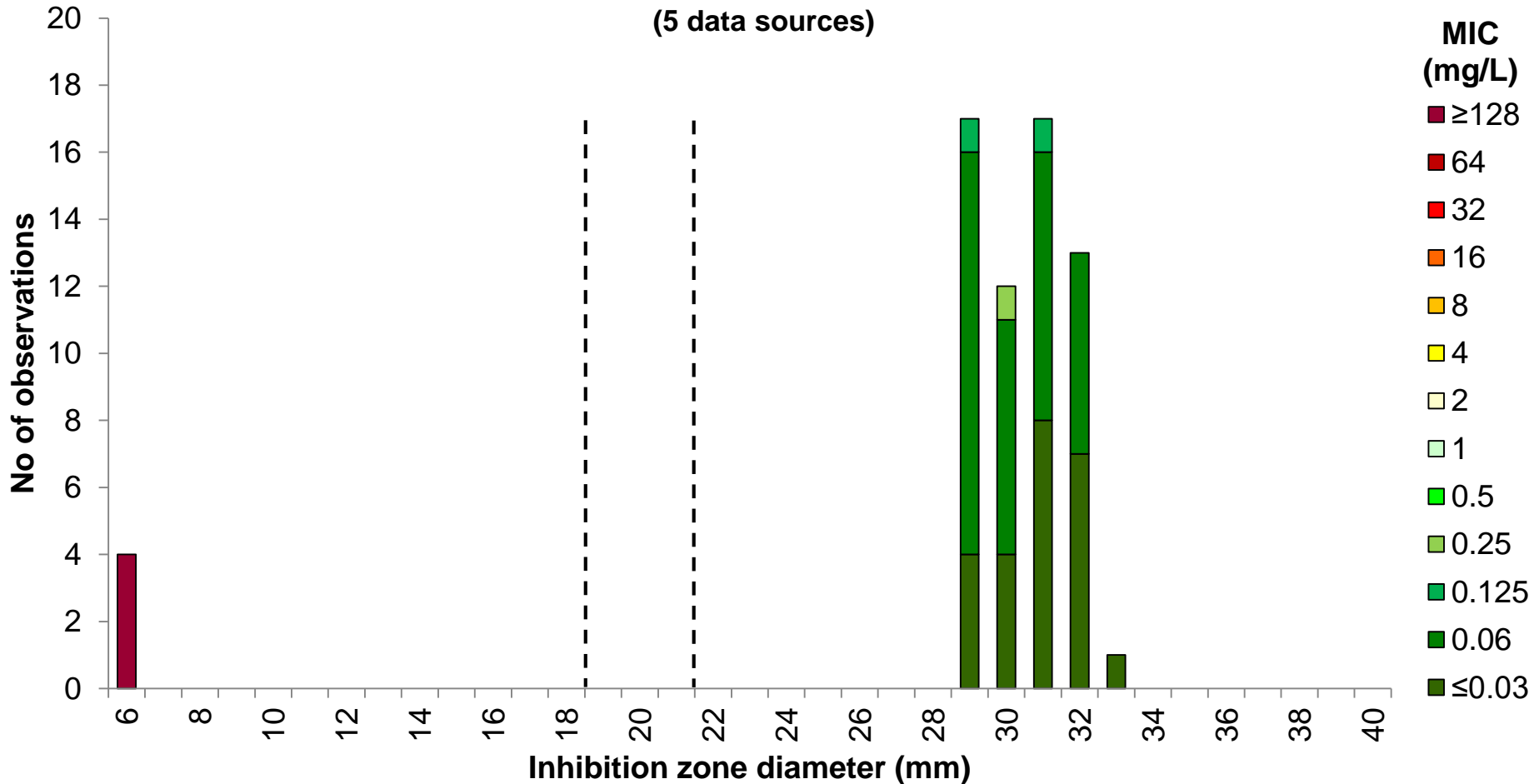
MIC $S \leq 1$, $R > 4$ mg/L

Zone diameter $S \geq 22$, $R < 19$ mm

Ceftazidime 10 µg vs. MIC

P. mirabilis, 31 isolates (64 correlates)

(5 data sources)

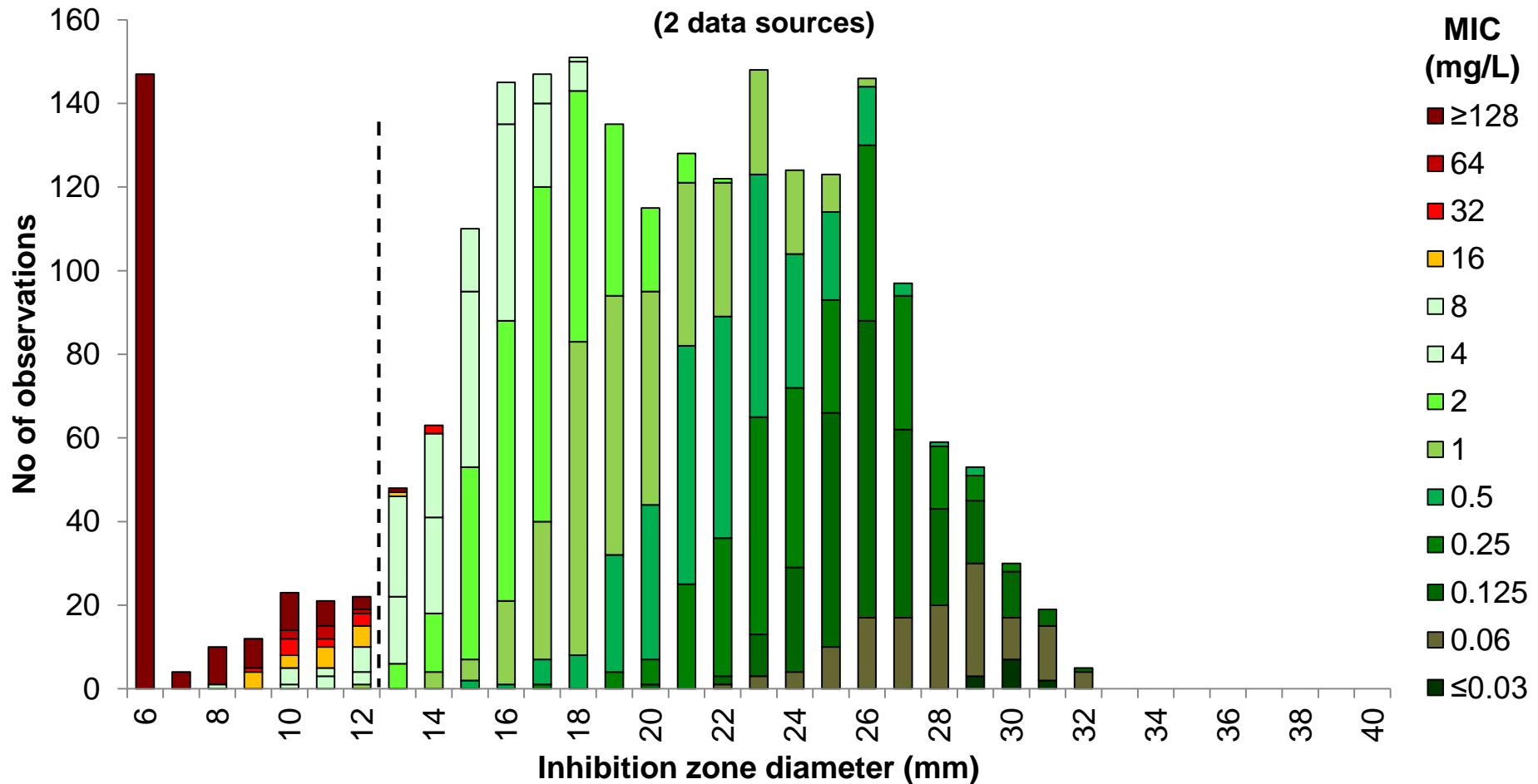


Breakpoints

MIC $S \leq 1, R > 4$ mg/L

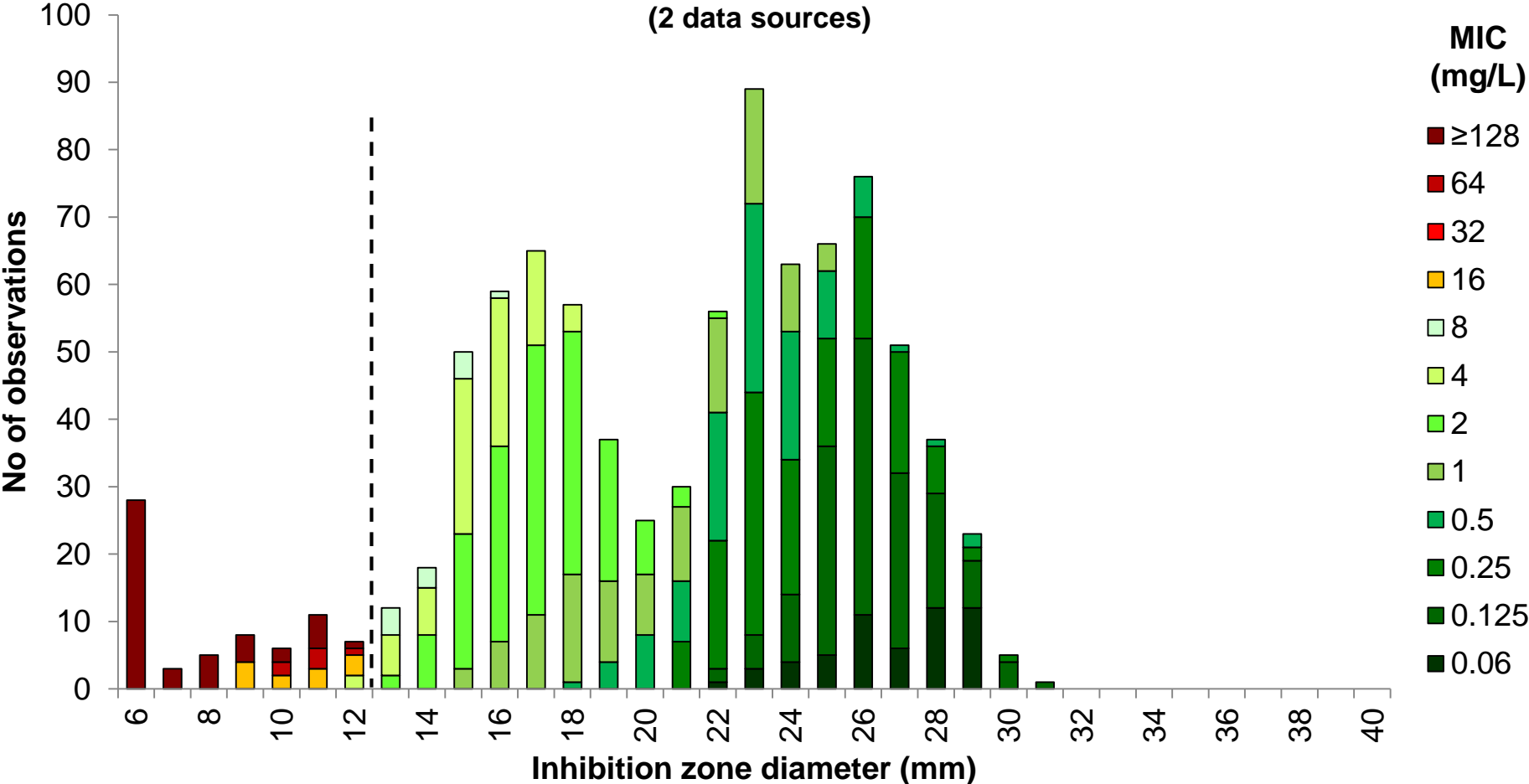
Zone diameter $S \geq 22, R < 19$ mm

Ceftazidime-avibactam 10-4 µg vs. MIC *Enterobacterales*, 293 isolates (2207 correlates)



Breakpoints	
MIC	S ≤ 8, R > 8 mg/L
Zone diameter	S ≥ 13, R < 13 mm

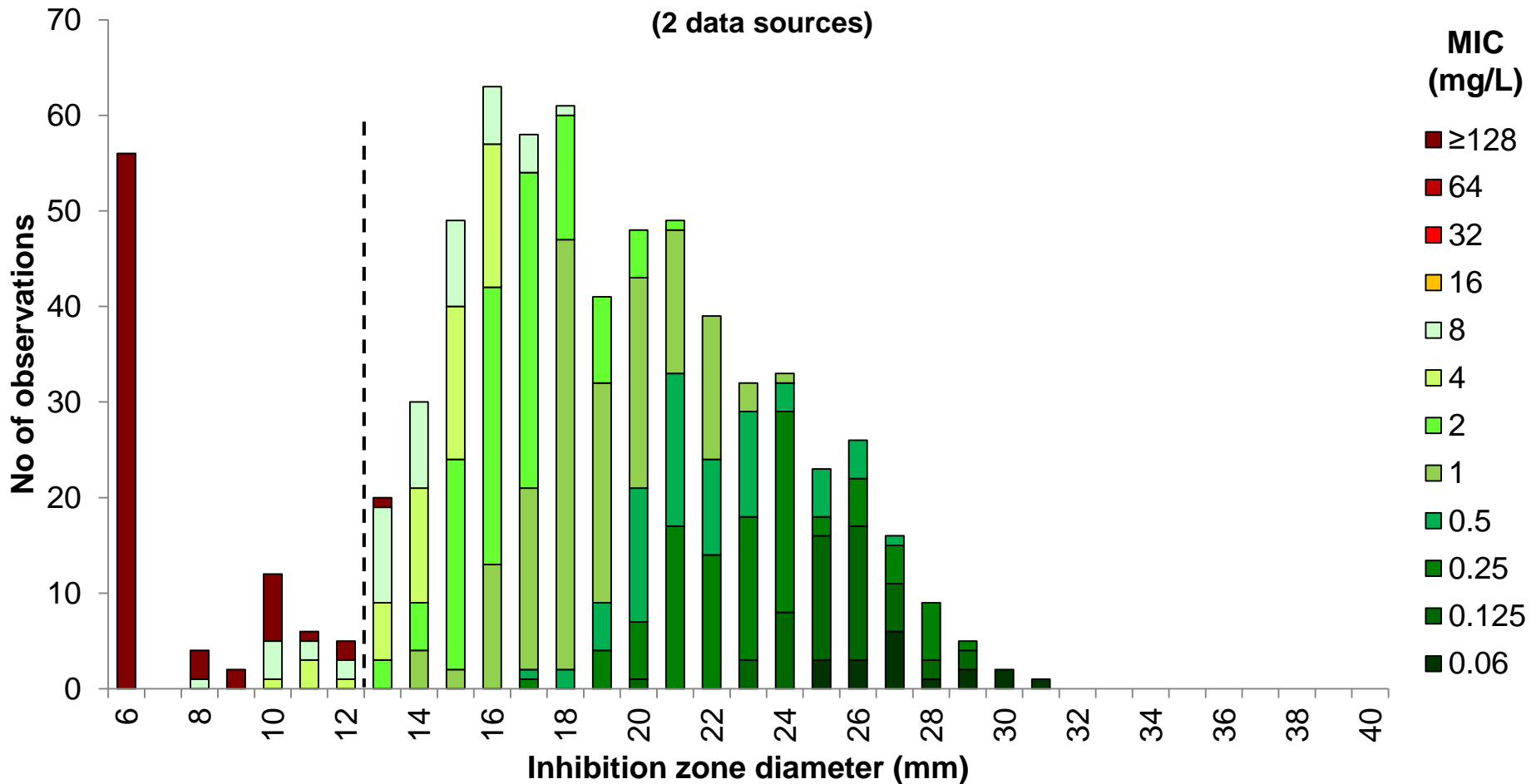
Ceftazidime-avibactam 10-4 µg vs. MIC *E. coli*, 124 isolates (888 correlates)



Breakpoints	
MIC	S ≤ 8, R > 8 mg/L
Zone diameter	S ≥ 13, R < 13 mm

Ceftazidime-avibactam 10-4 µg vs. MIC *K. pneumoniae*, 89 isolates (690 correlates)

(2 data sources)

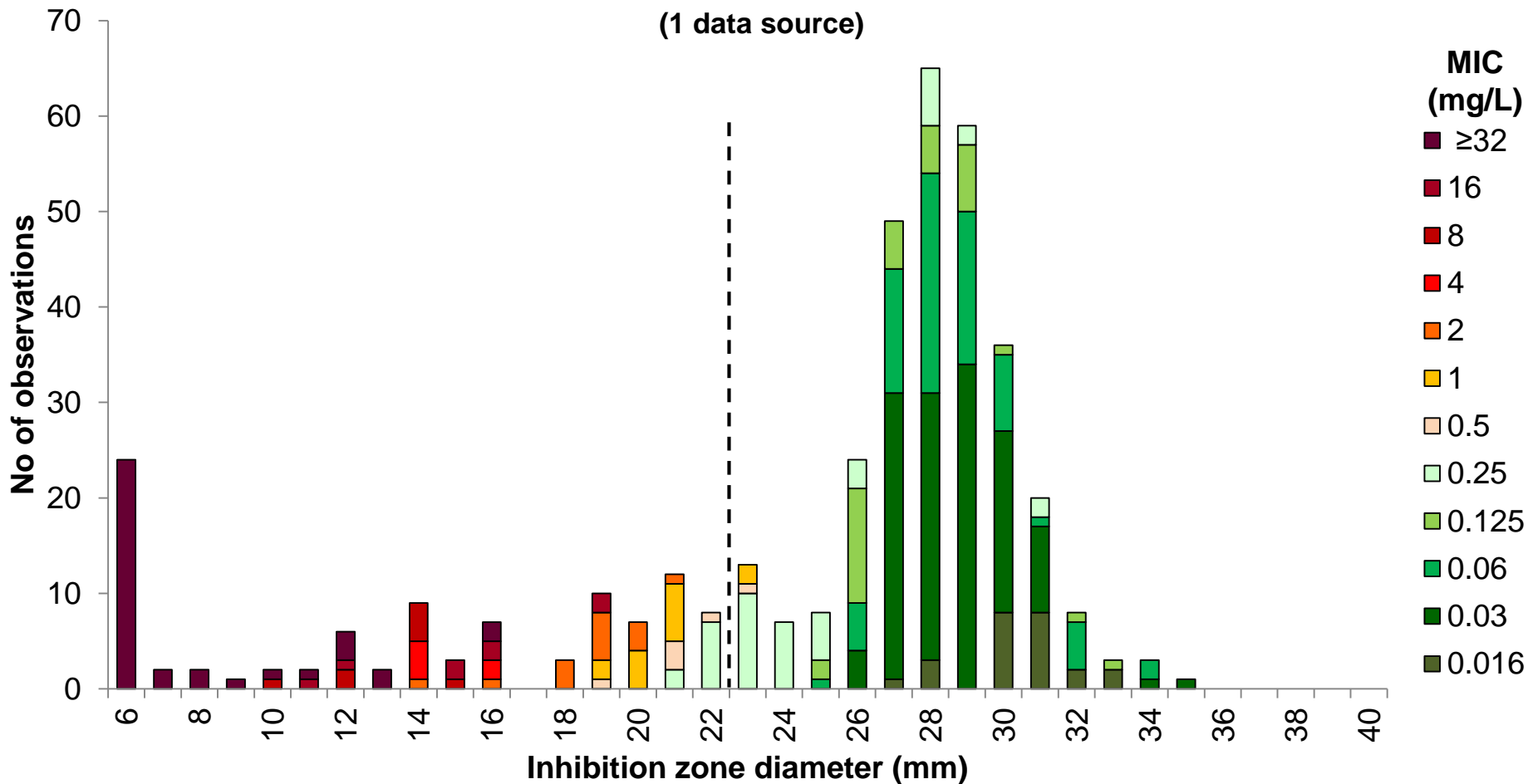


Breakpoints
 MIC S ≤ 8, R > 8 mg/L
 Zone diameter S ≥ 13, R < 13 mm

Ceftobiprole 5 µg vs. MIC

Enterobacterales, 198 isolates (396 correlates)

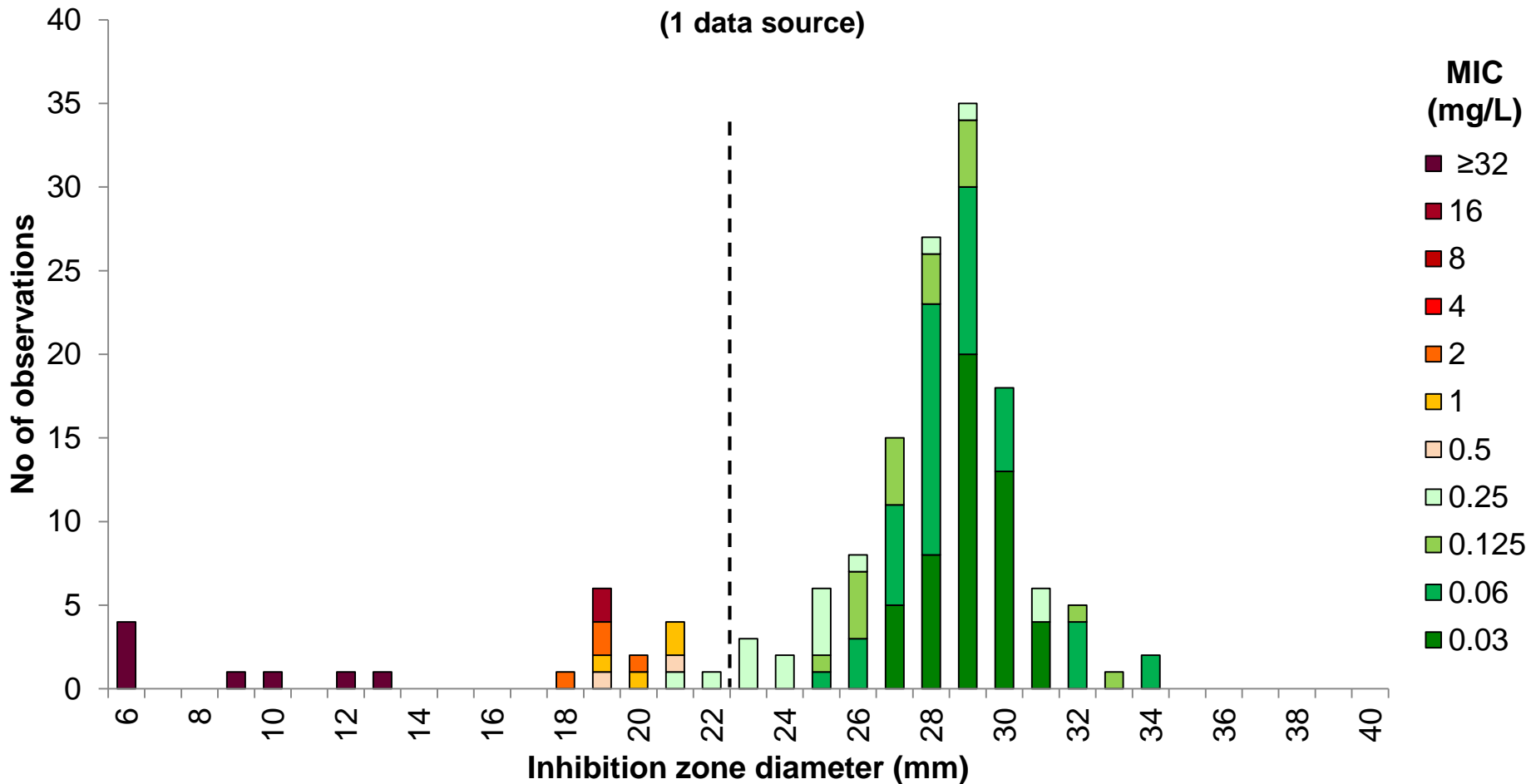
(1 data source)



Breakpoints	
MIC	$S \leq 0.25$ $R > 0.25$ mg/L
Zone diameter	$S \geq 23$, $R < 23$ mm

Ceftobiprole 5 µg vs. MIC *E. coli*, 75 isolates (150 correlates)

(1 data source)



Breakpoints

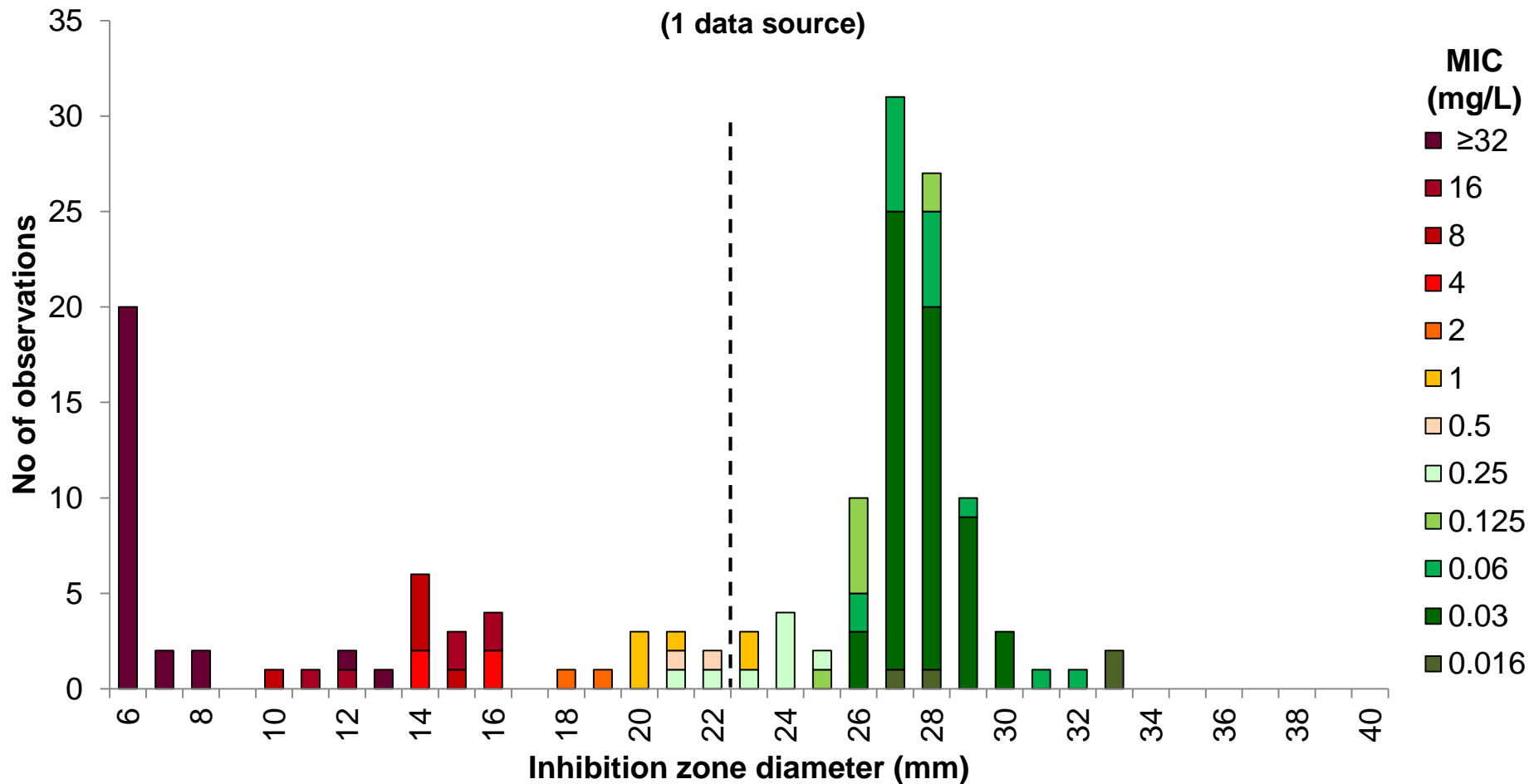
MIC $S \leq 0.25$ $R > 0.25$ mg/L

Zone diameter $S \geq 23$, $R < 23$ mm

Ceftobiprole 5 µg vs. MIC

K. pneumoniae, 73 isolates (146 correlates)

(1 data source)

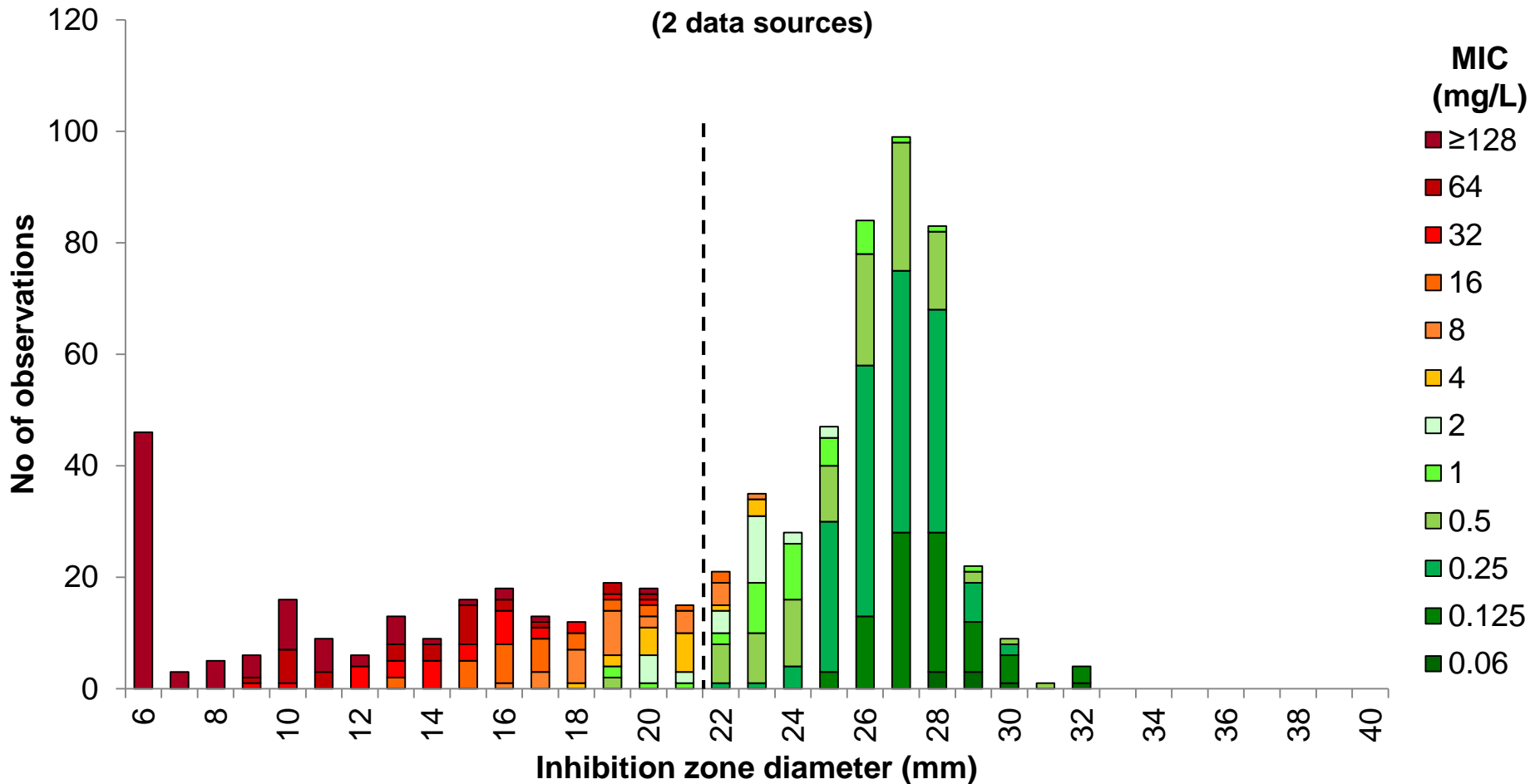


Breakpoints

MIC $S \leq 0.25$ $R > 0.25$ mg/L

Zone diameter $S \geq 23$, $R < 23$ mm

Ceftolozane-tazobactam 30-10 µg vs. MIC *Enterobacteriales*, 459 isolates (657 isolates)



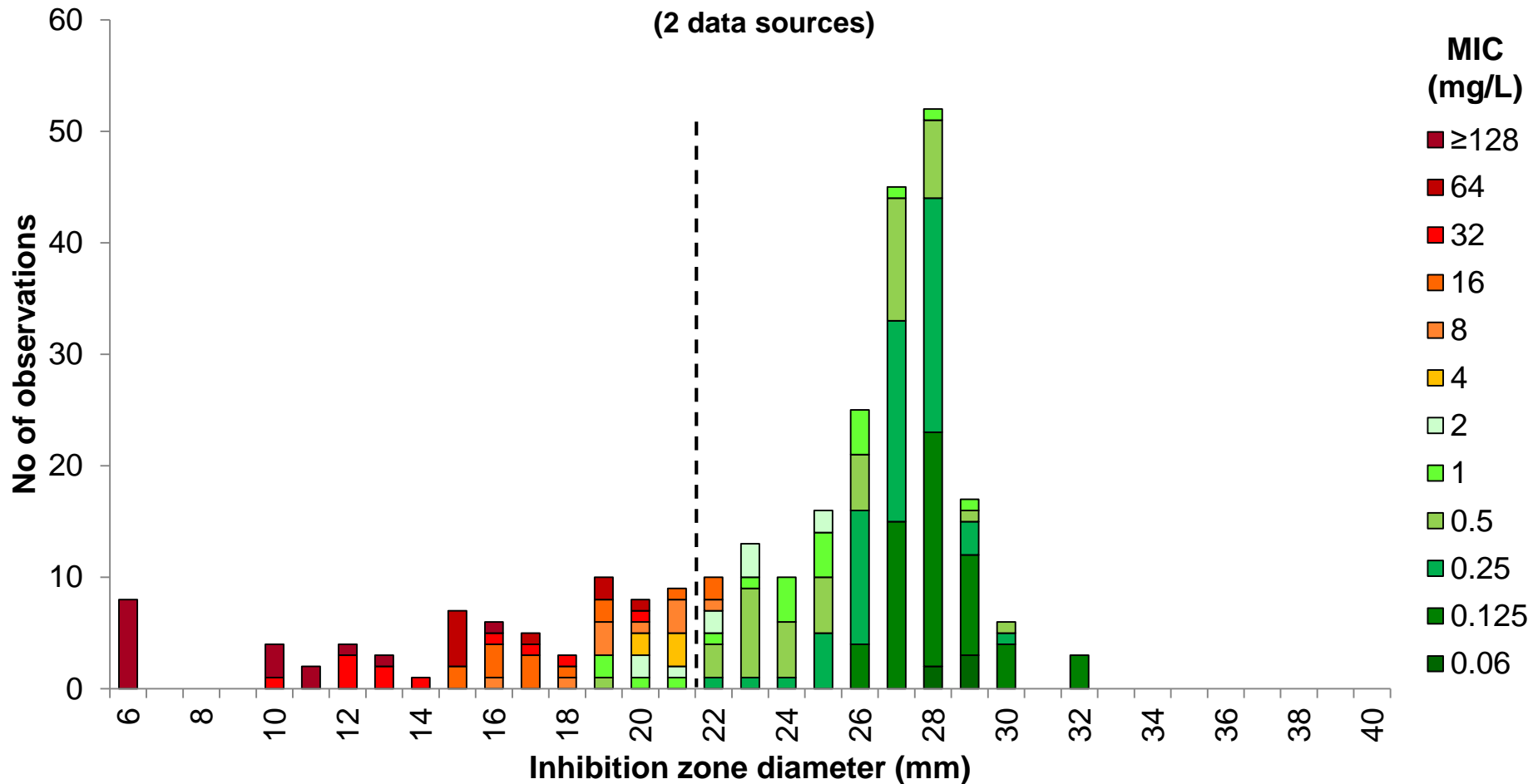
Breakpoints

MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 22, R < 22 mm

Ceftolozane-tazobactam 30-10 µg vs. MIC *E. coli*, 191 isolates (267 correlates)

(2 data sources)

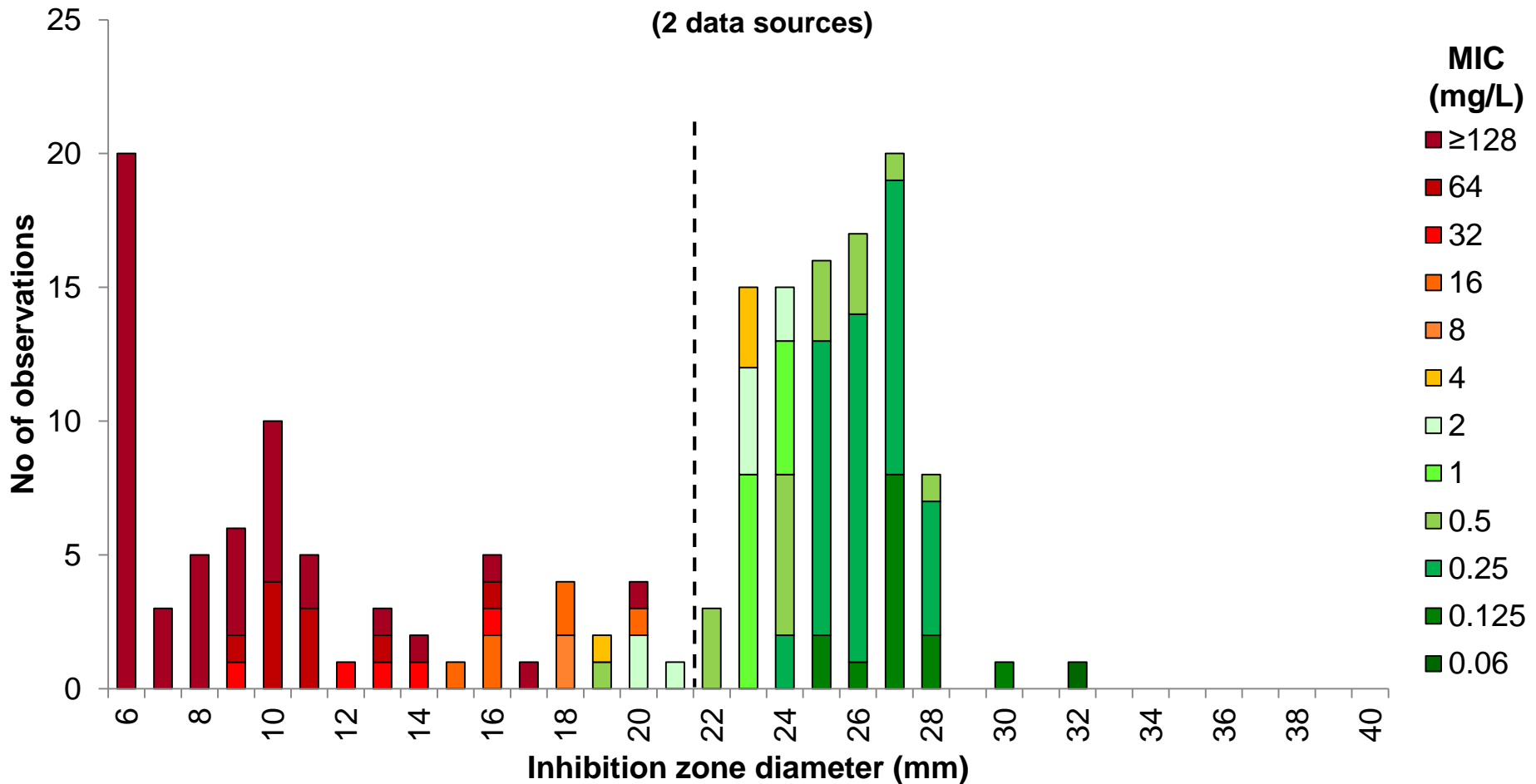


Breakpoints

MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 22, R < 22 mm

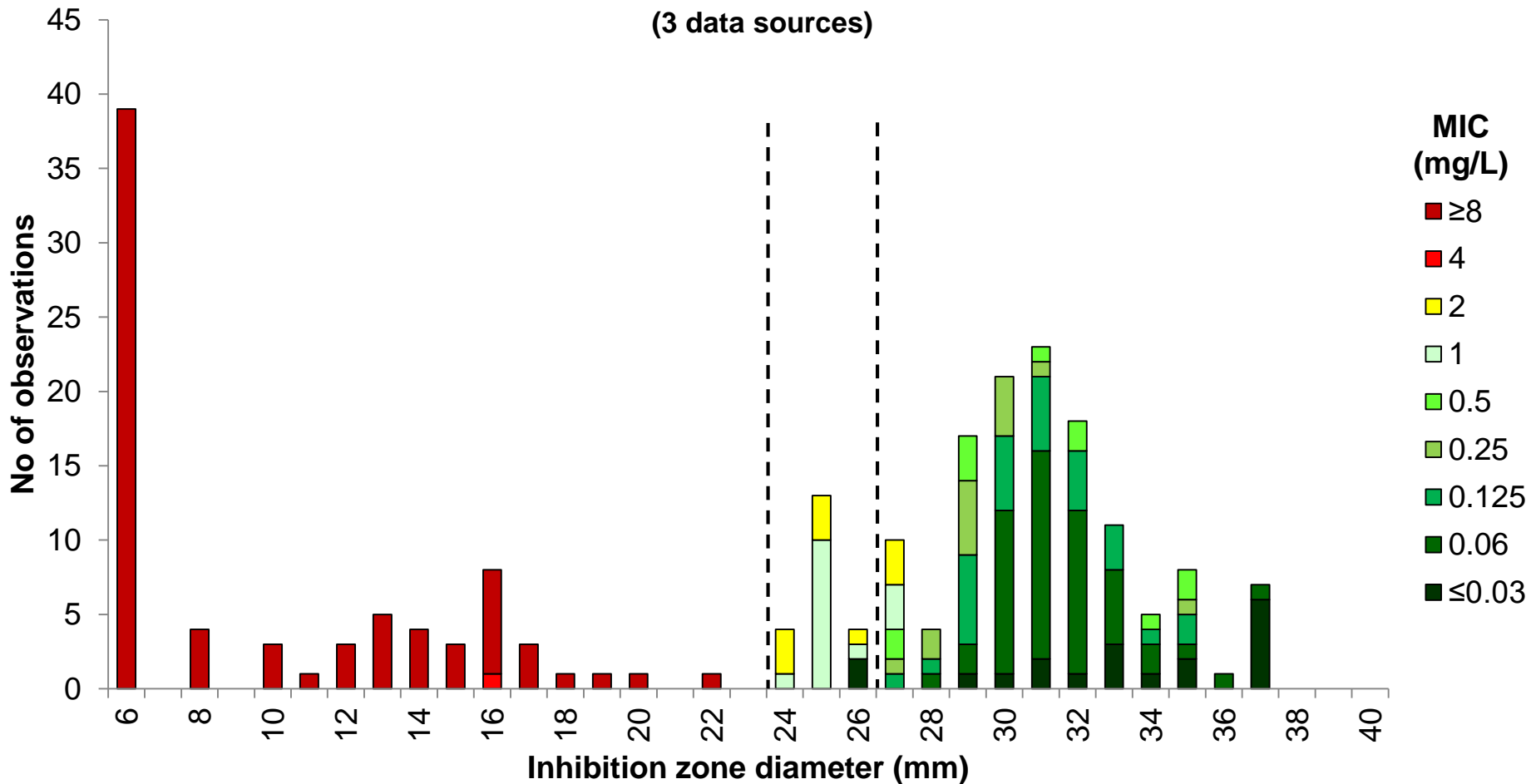
Ceftolozane-tazobactam 30-10 µg vs. MIC *K. pneumoniae*, 116 isolates (169 correlates)



Breakpoints	
MIC	S ≤ 2, R > 2 mg/L
Zone diameter	S ≥ 22, R < 22 mm

Ceftriaxone 30 µg vs. MIC *Enterobacteriales*, 202 isolates (223 correlates)

(3 data sources)



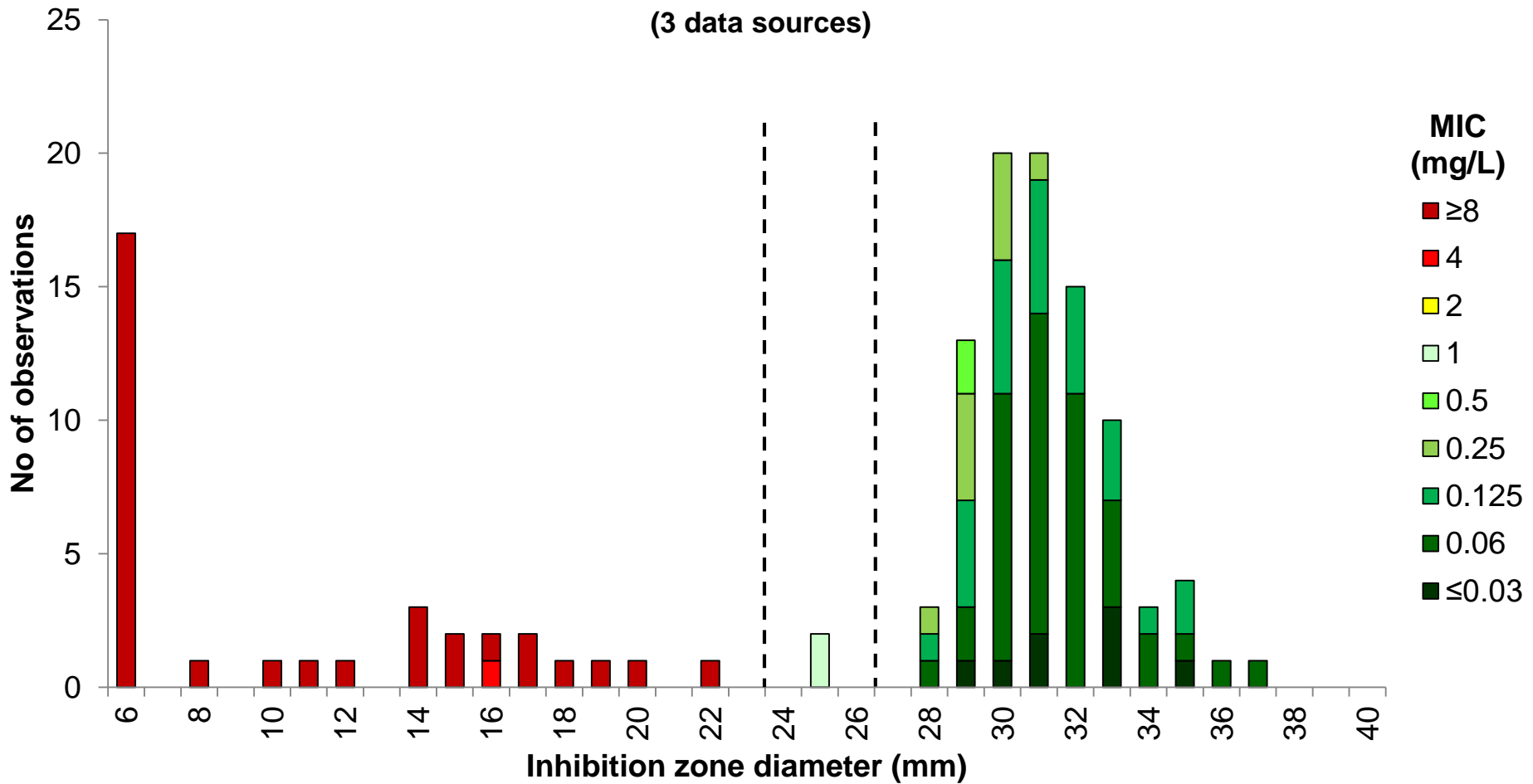
Breakpoints (non-meningitis)

MIC $S \leq 1$, $R > 2$ mg/L

Zone diameter $S \geq 27$, $R < 24$ mm

Ceftriaxone 30 µg vs. MIC *E. coli*, 115 isolates (126 correlates)

(3 data sources)

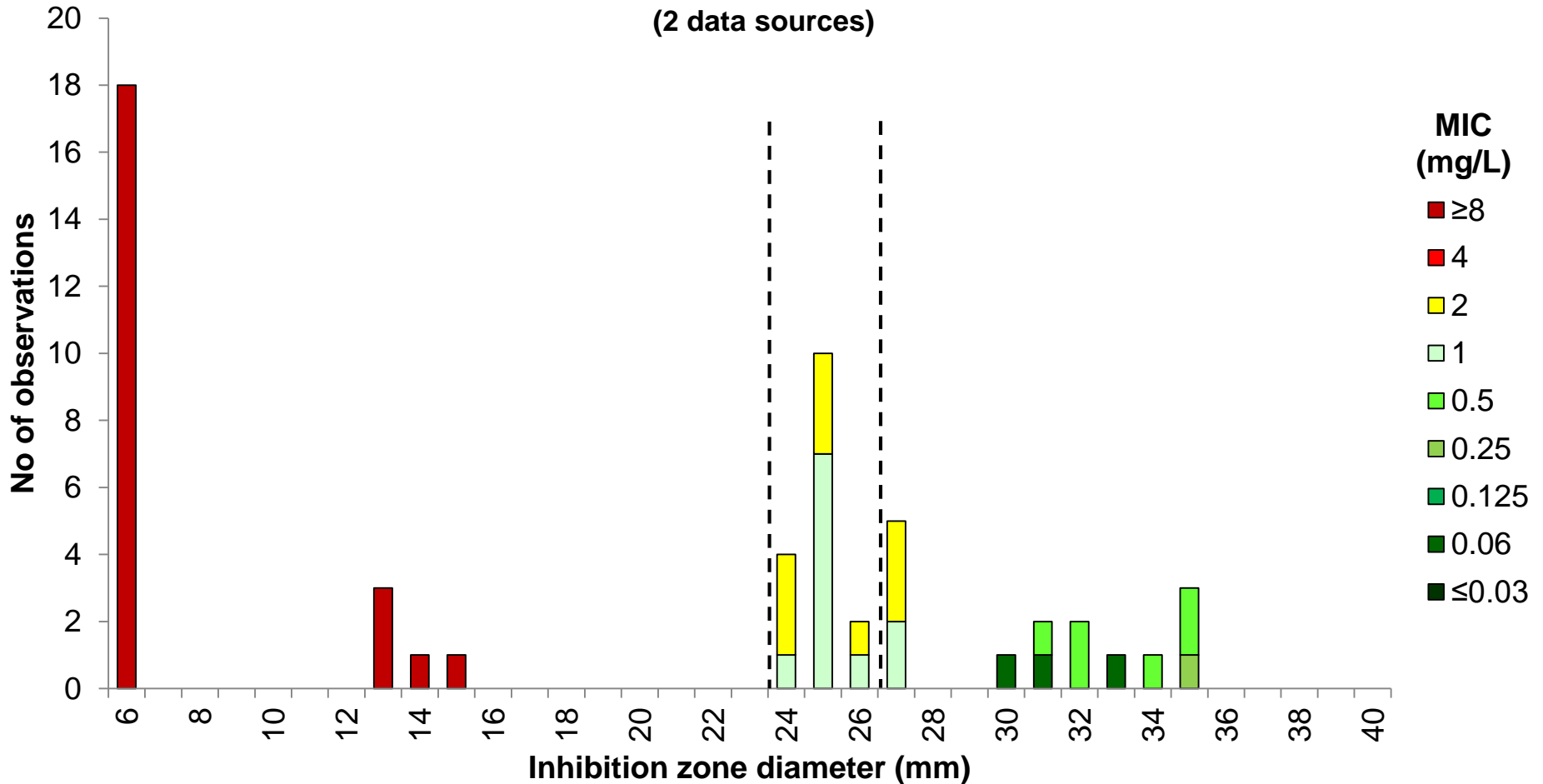


Breakpoints (non-meningitis)
 MIC S≤1, R>2 mg/L
 Zone diameter S≥27, R<24 mm

Ceftriaxone 30 µg vs. MIC

K. pneumoniae, 47 isolates (54 correlates)

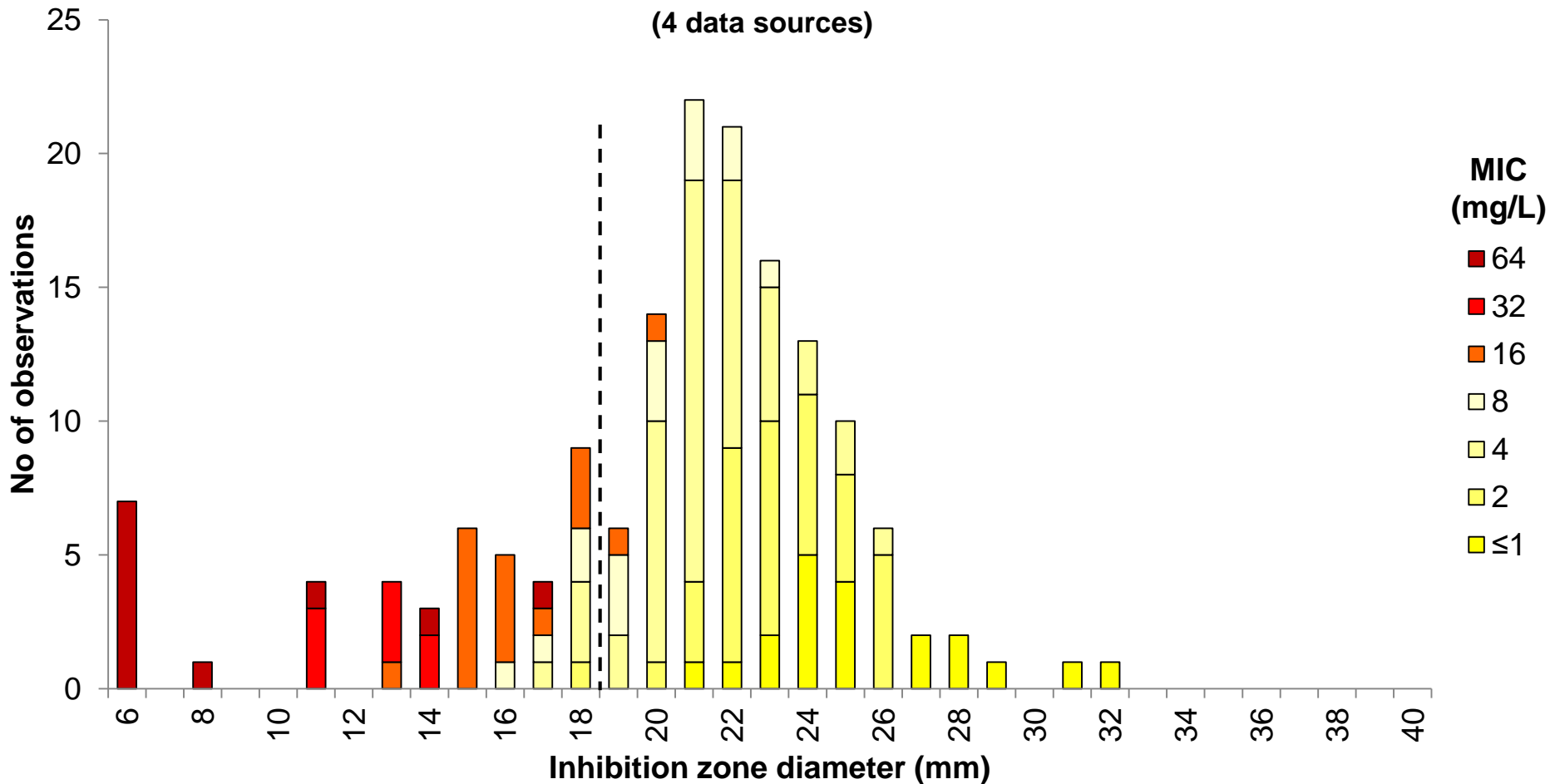
(2 data sources)



Breakpoints (non-meningitis)	
MIC	S ≤ 1, R > 2 mg/L
Zone diameter	S ≥ 27, R < 24 mm

Cefuroxime 30 μ g vs. MIC *Enterobacterales*, 141 isolates (158 correlates)

(4 data sources)



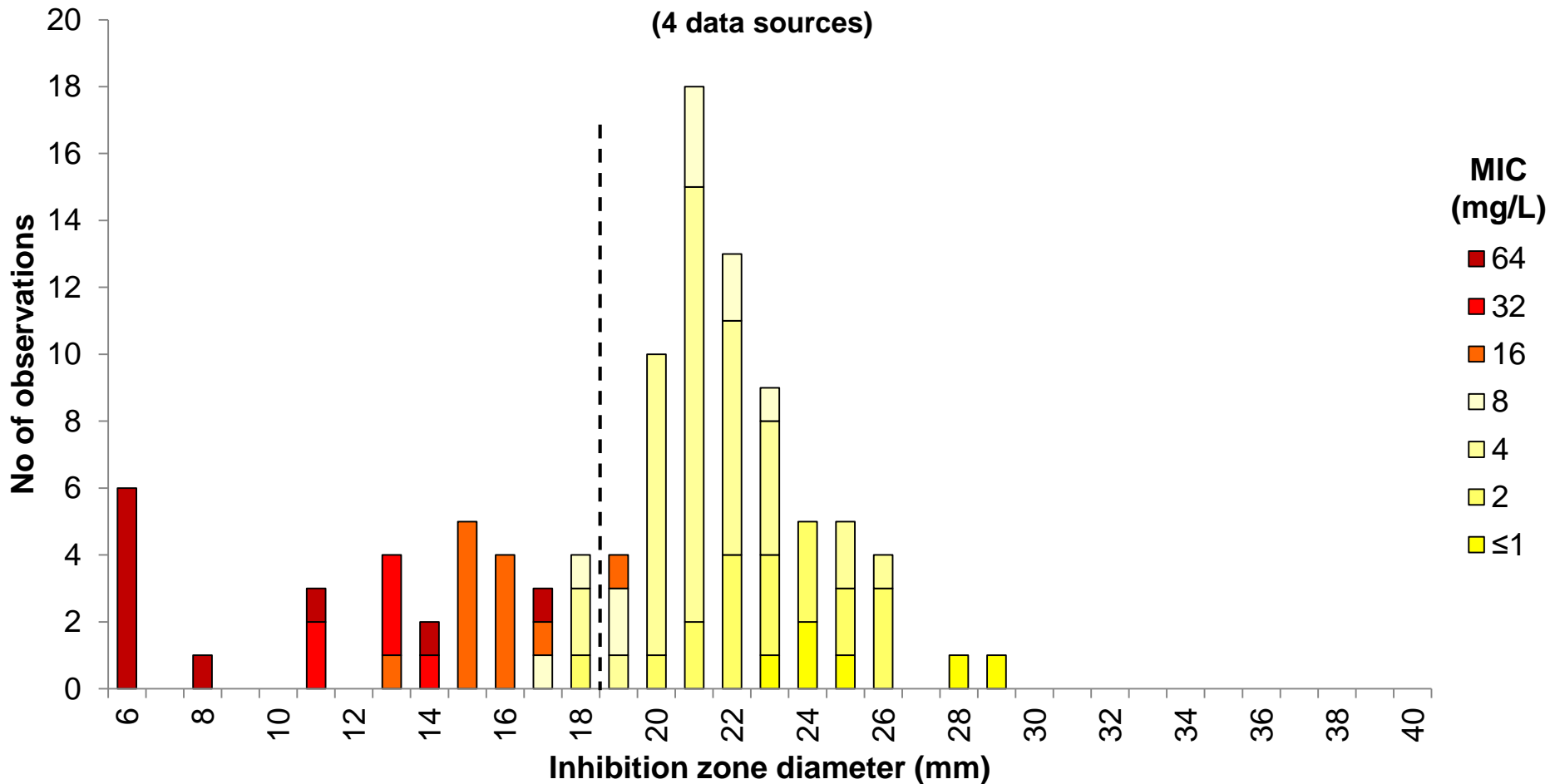
Breakpoints (iv)

MIC $S \leq 0.001$, $R > 8$ mg/L

Zone diameter $S \geq 50$, $R < 19$ mm

Cefuroxime 30 µg vs. MIC *E. coli*, 93 isolates (102 correlates)

(4 data sources)



Breakpoints (iv)

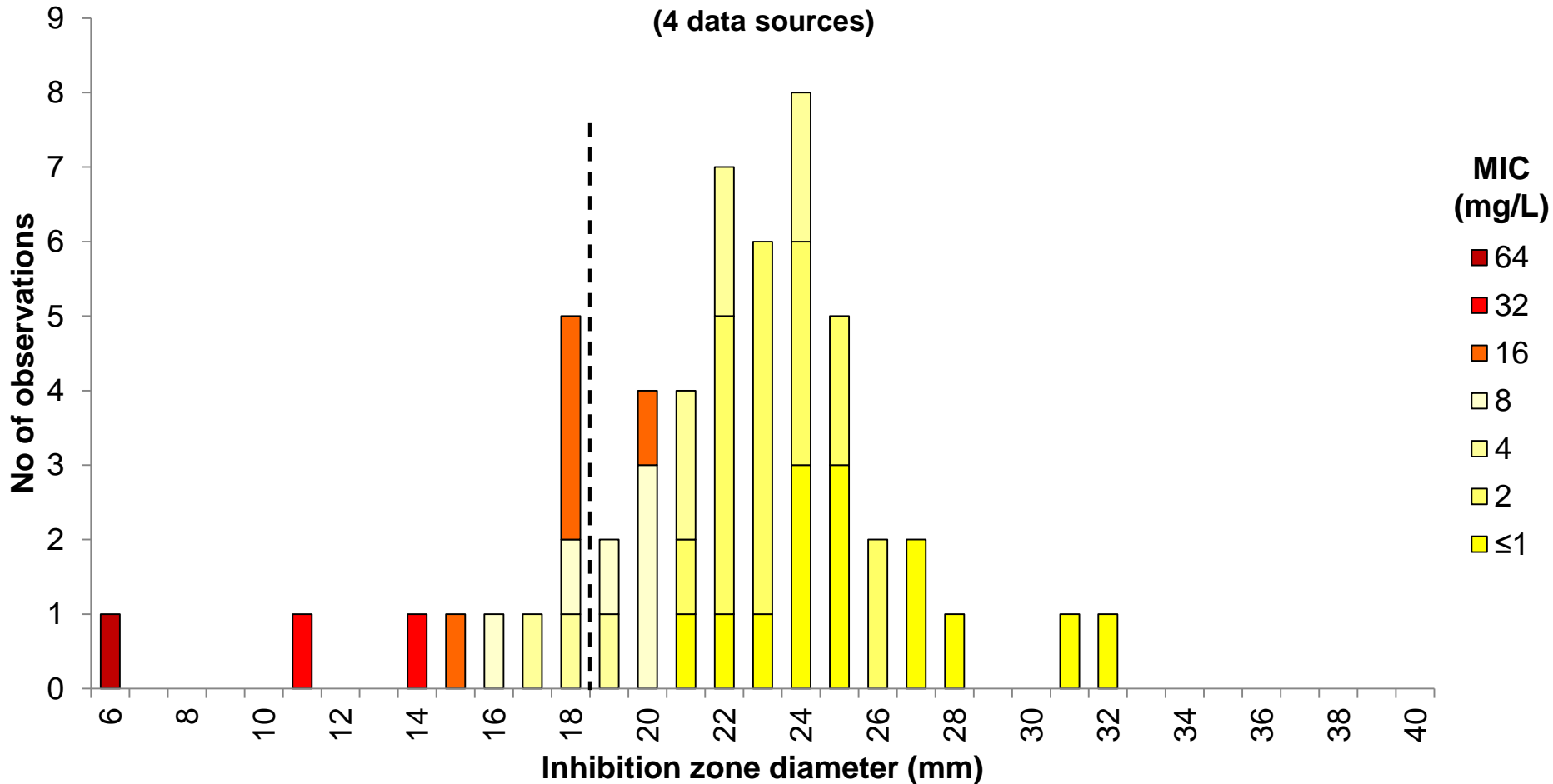
MIC $S \leq 0.001$, $R > 8$ mg/L

Zone diameter $S \geq 50$, $R < 19$ mm

Cefuroxime 30 µg vs. MIC

K. pneumoniae, 46 isolates (54 correlates)

(4 data sources)

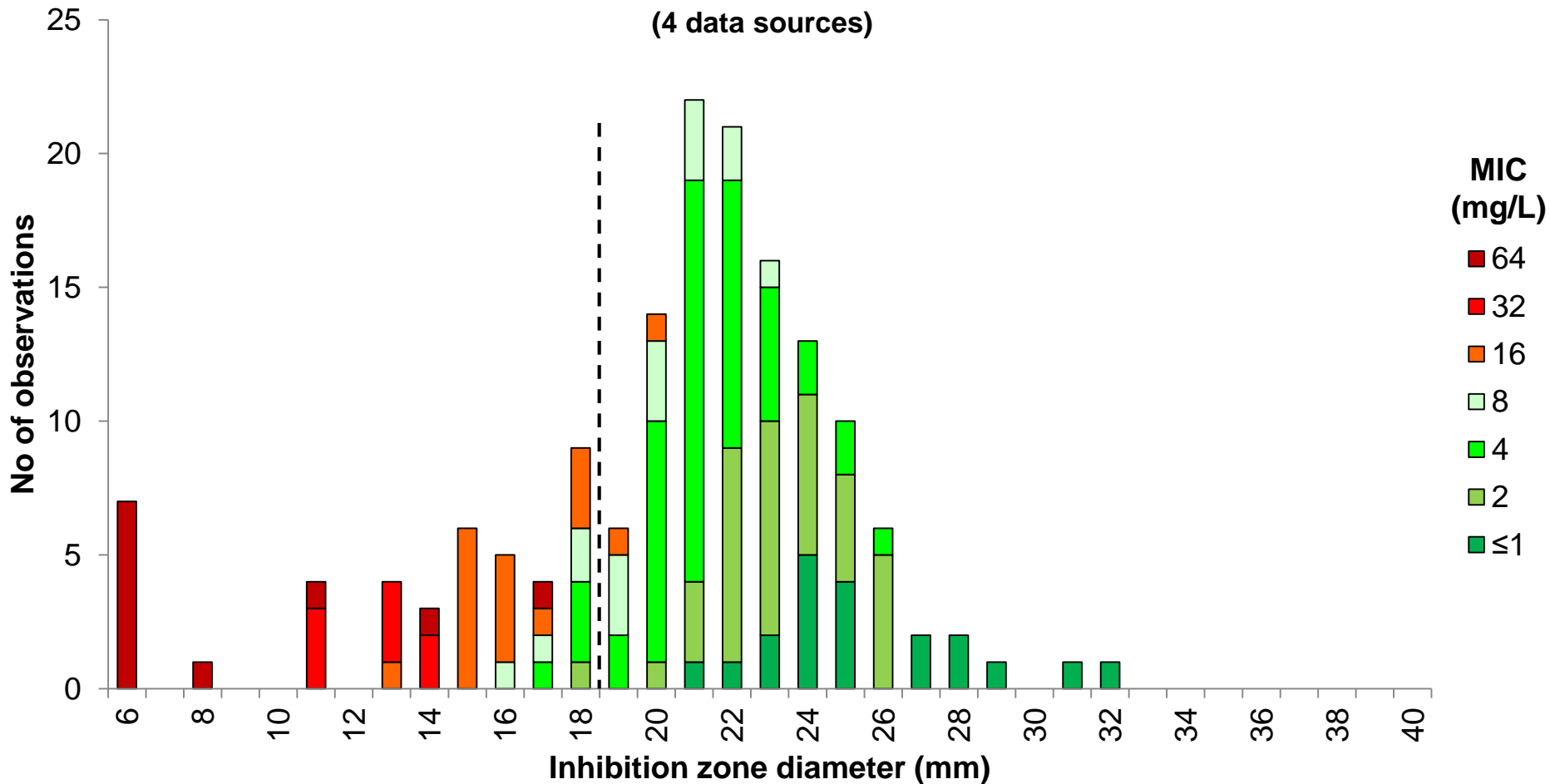


Breakpoints (iv)	
MIC	S ≤ 0.001, R > 8 mg/L
Zone diameter	S ≥ 50, R < 19 mm

Cefuroxime 30 μ g vs. MIC

Enterobacterales, 141 isolates (158 correlates)

(4 data sources)



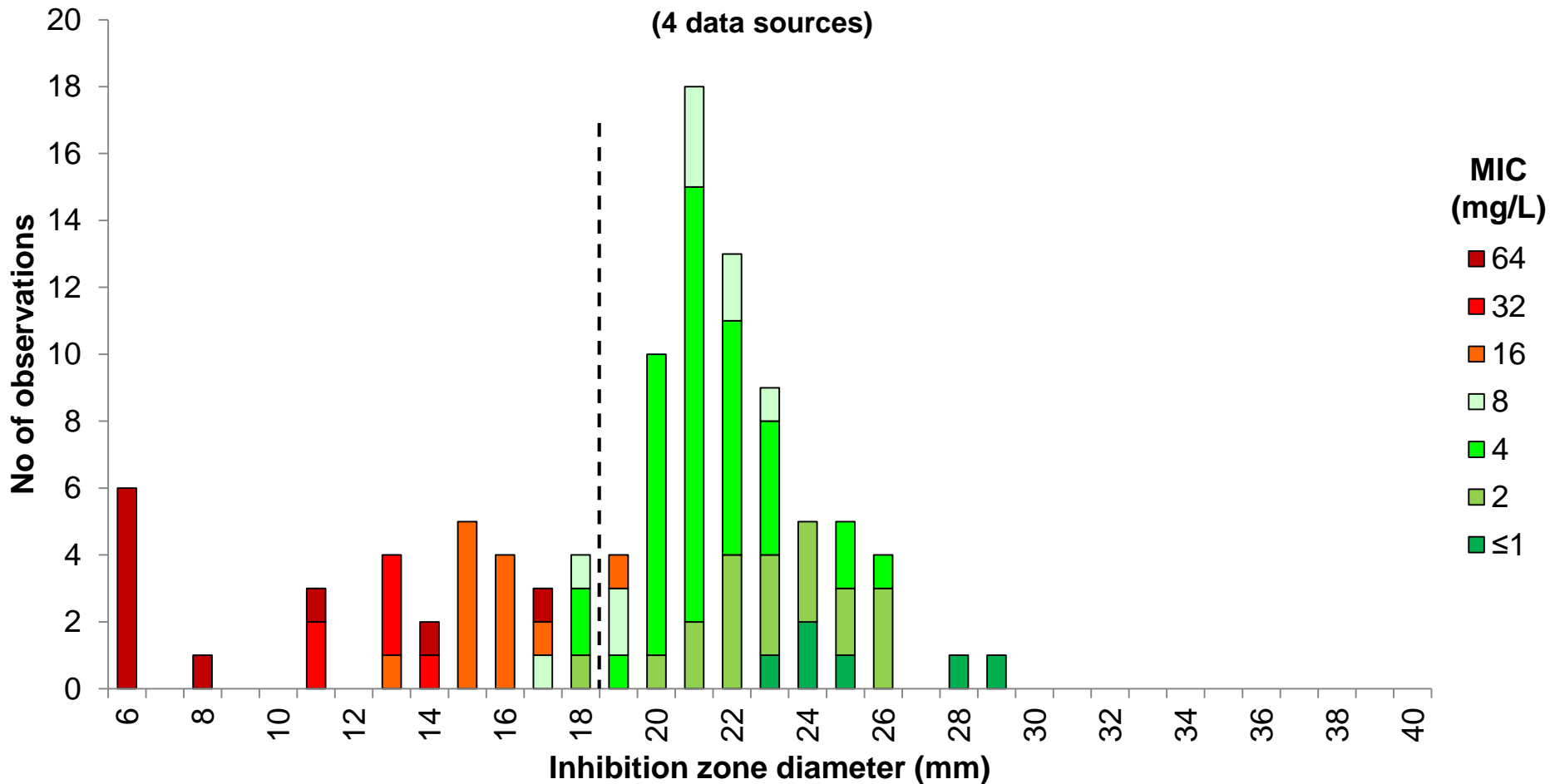
Breakpoints (oral, uncomplicated UTI)

MIC $S \leq 8$, $R > 8$ mg/L

Zone diameter $S \geq 19$, $R < 19$ mm

Cefuroxime 30 µg vs. MIC *E. coli*, 93 isolates (102 correlates)

(4 data sources)



Breakpoints (oral, uncomplicated UTI)

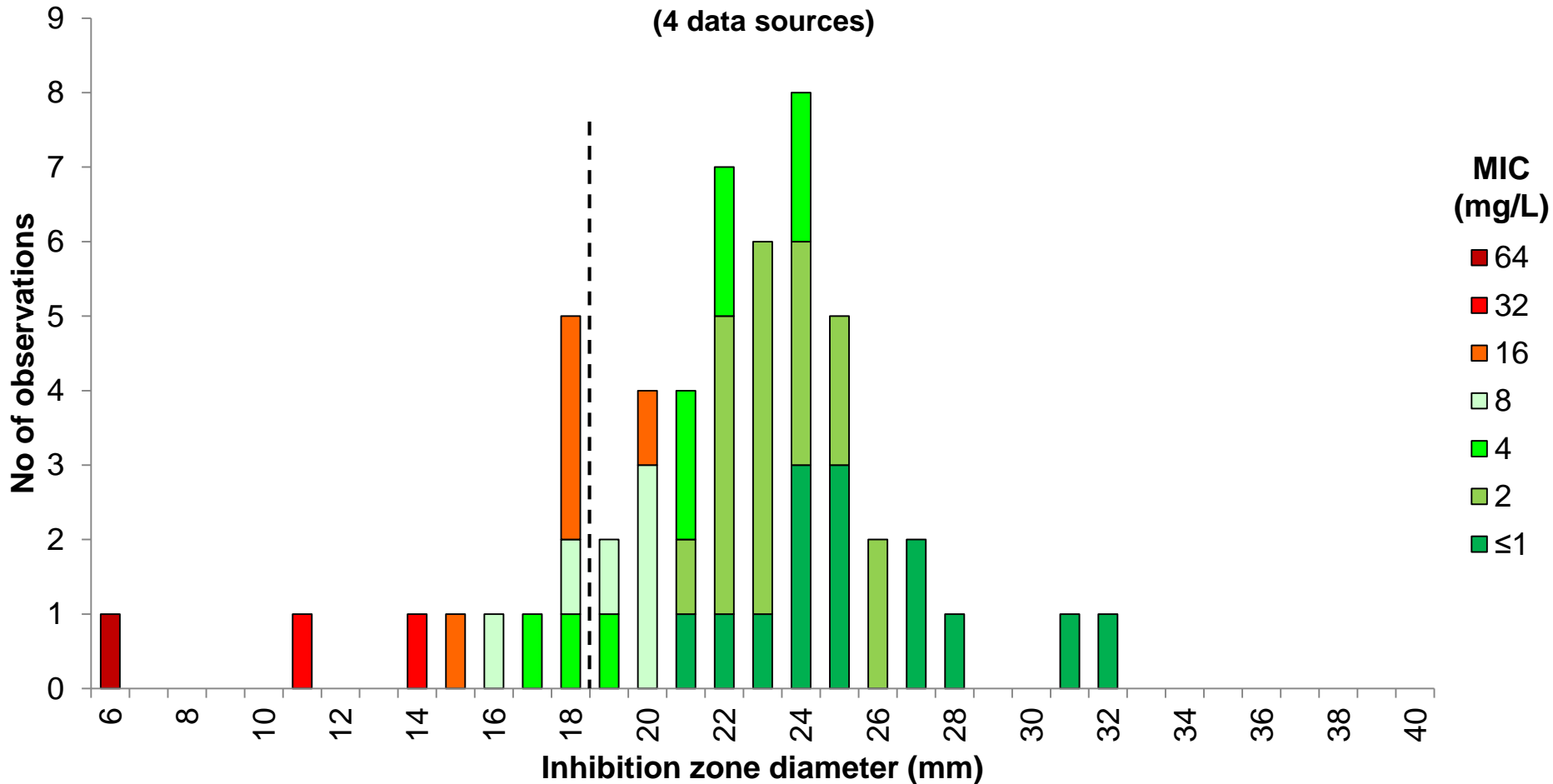
MIC S ≤ 8, R > 8 mg/L

Zone diameter S ≥ 19, R < 19 mm

Cefuroxime 30 µg vs. MIC

K. pneumoniae, 46 isolates (54 correlates)

(4 data sources)



Breakpoints (oral, uncomplicated UTI)

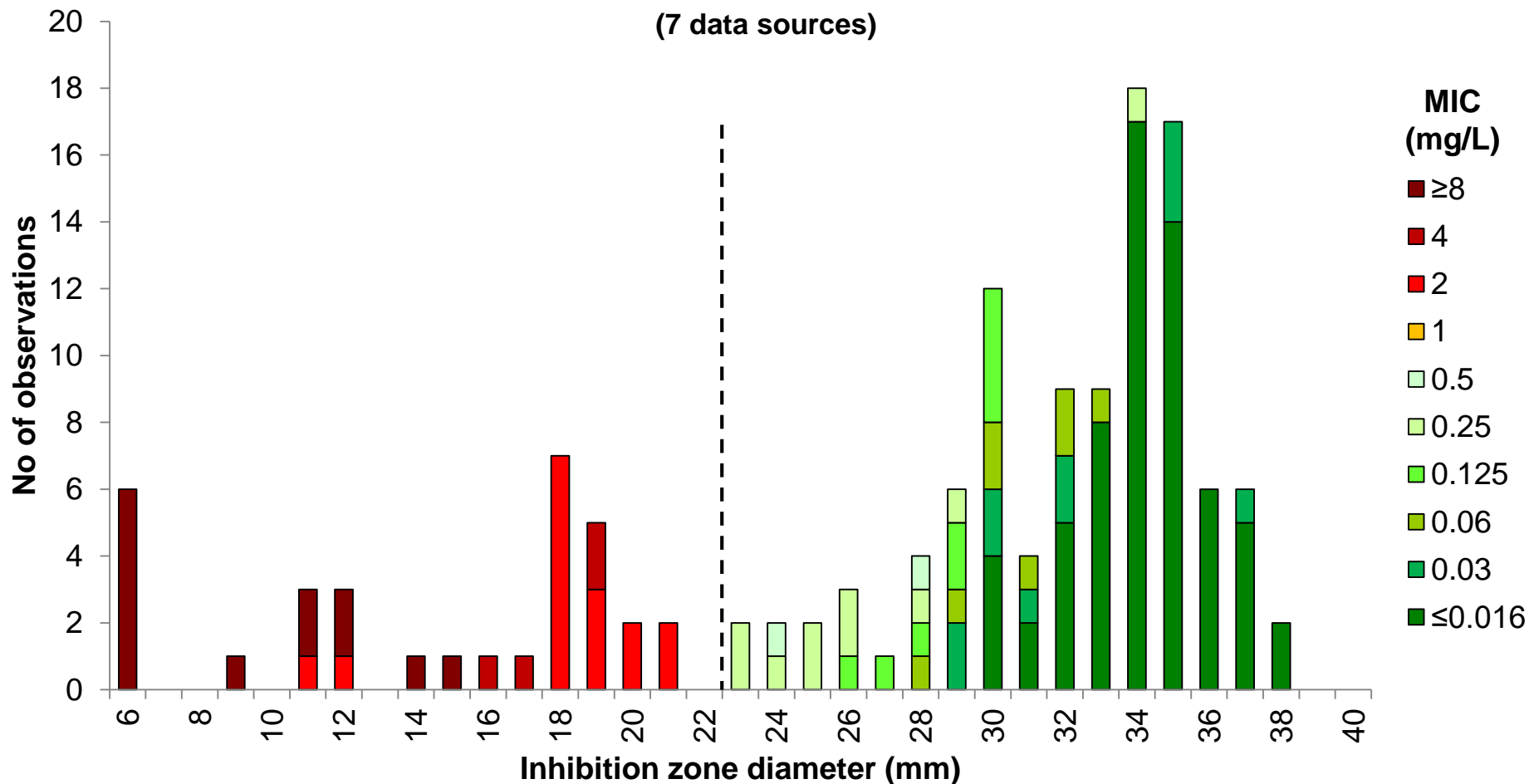
MIC S ≤ 8, R > 8 mg/L

Zone diameter S ≥ 19, R < 19 mm

Ertapenem 10 µg vs. MIC

Enterobacteriales, 122 isolates (136 correlates)

(7 data sources)

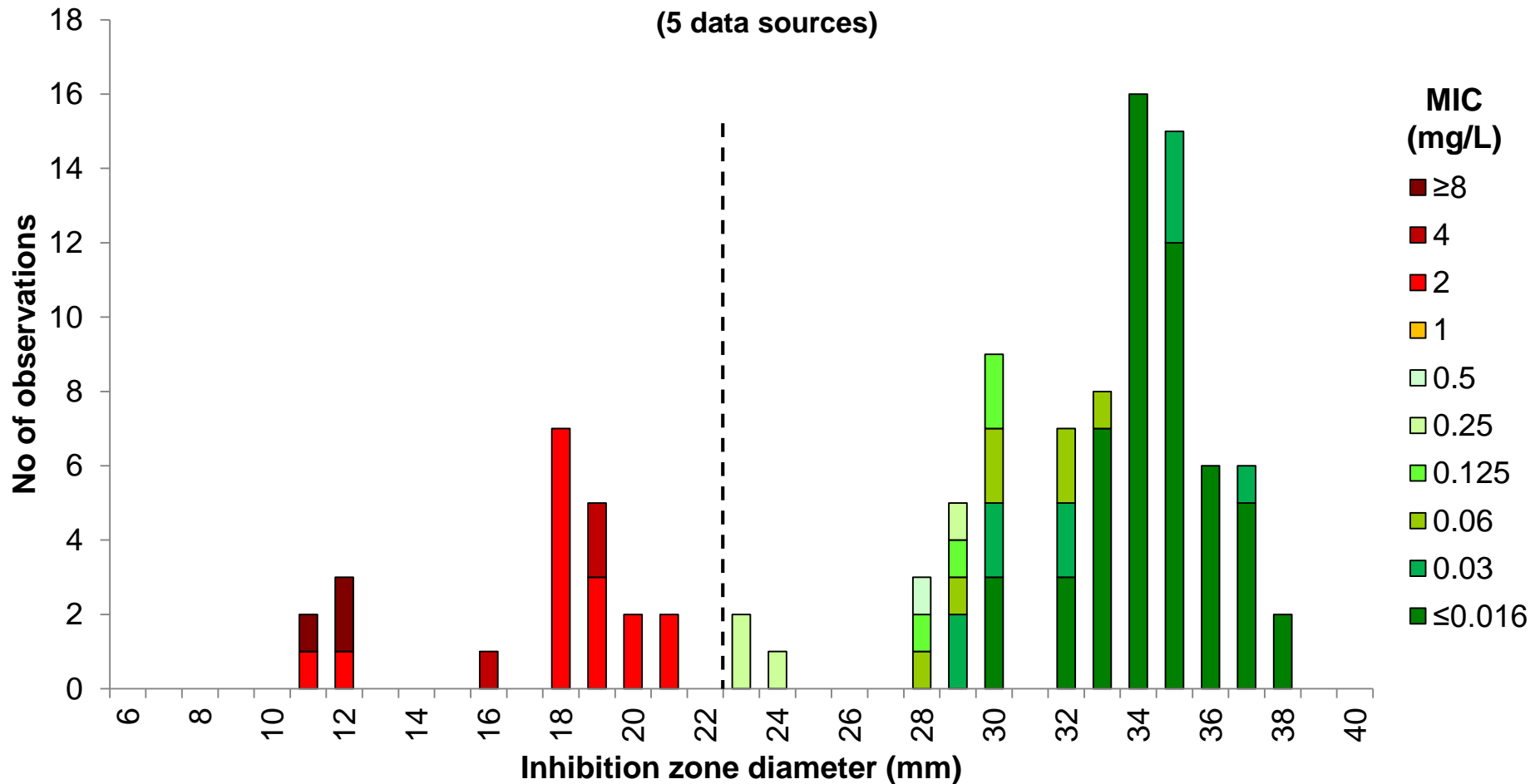


Breakpoints	
MIC	S ≤ 0.5, R > 0.5 mg/L
Zone diameter	S ≥ 23, R < 23 mm

Ertapenem 10 µg vs. MIC

E. coli, 88 isolates (102 correlates)

(5 data sources)



Breakpoints

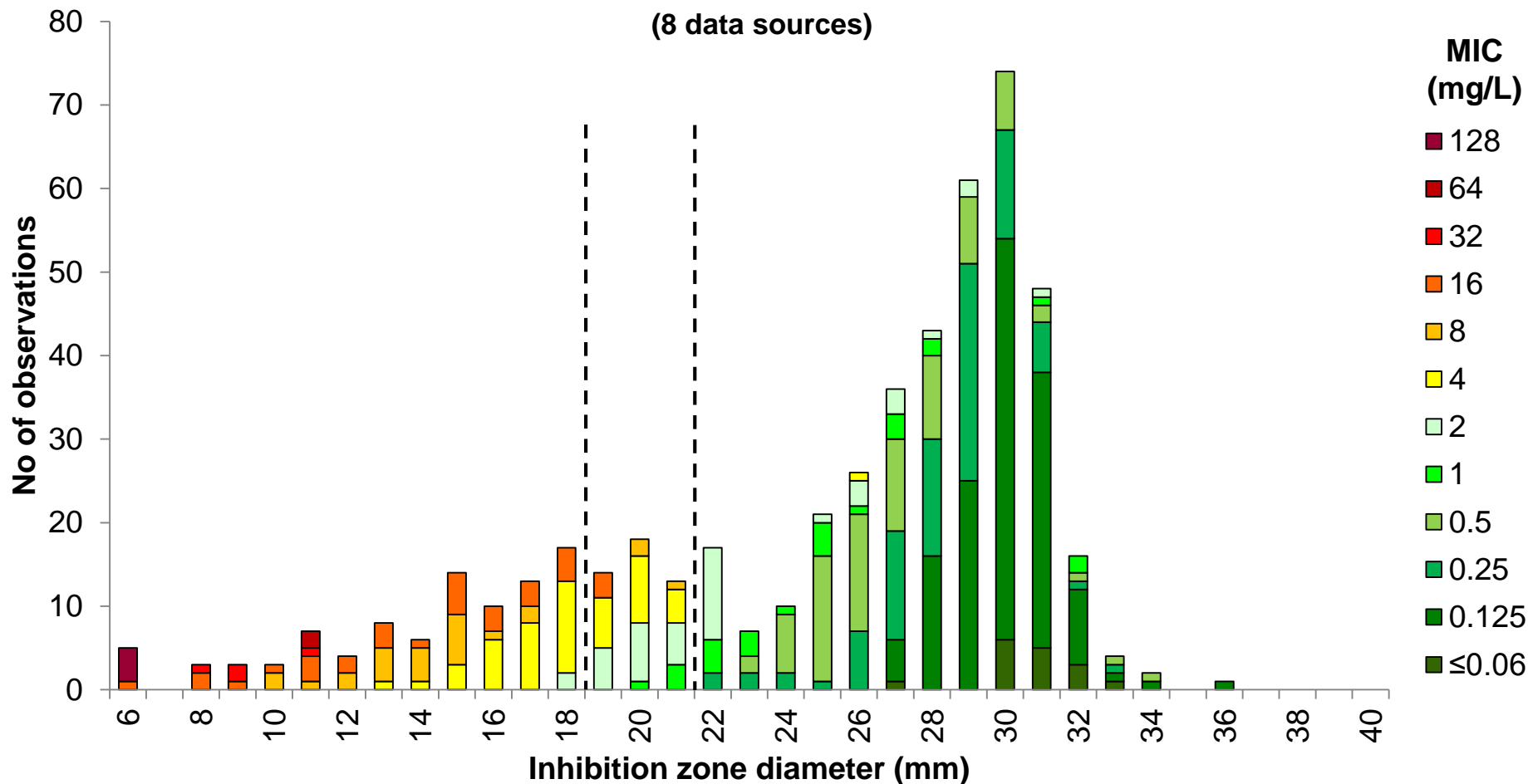
MIC S ≤ 0.5, R > 0.5 mg/L

Zone diameter S ≥ 23, R < 23 mm

Imipenem 10 µg vs. MIC

Enterobacteriales, 290 isolates (504 correlates)

(8 data sources)



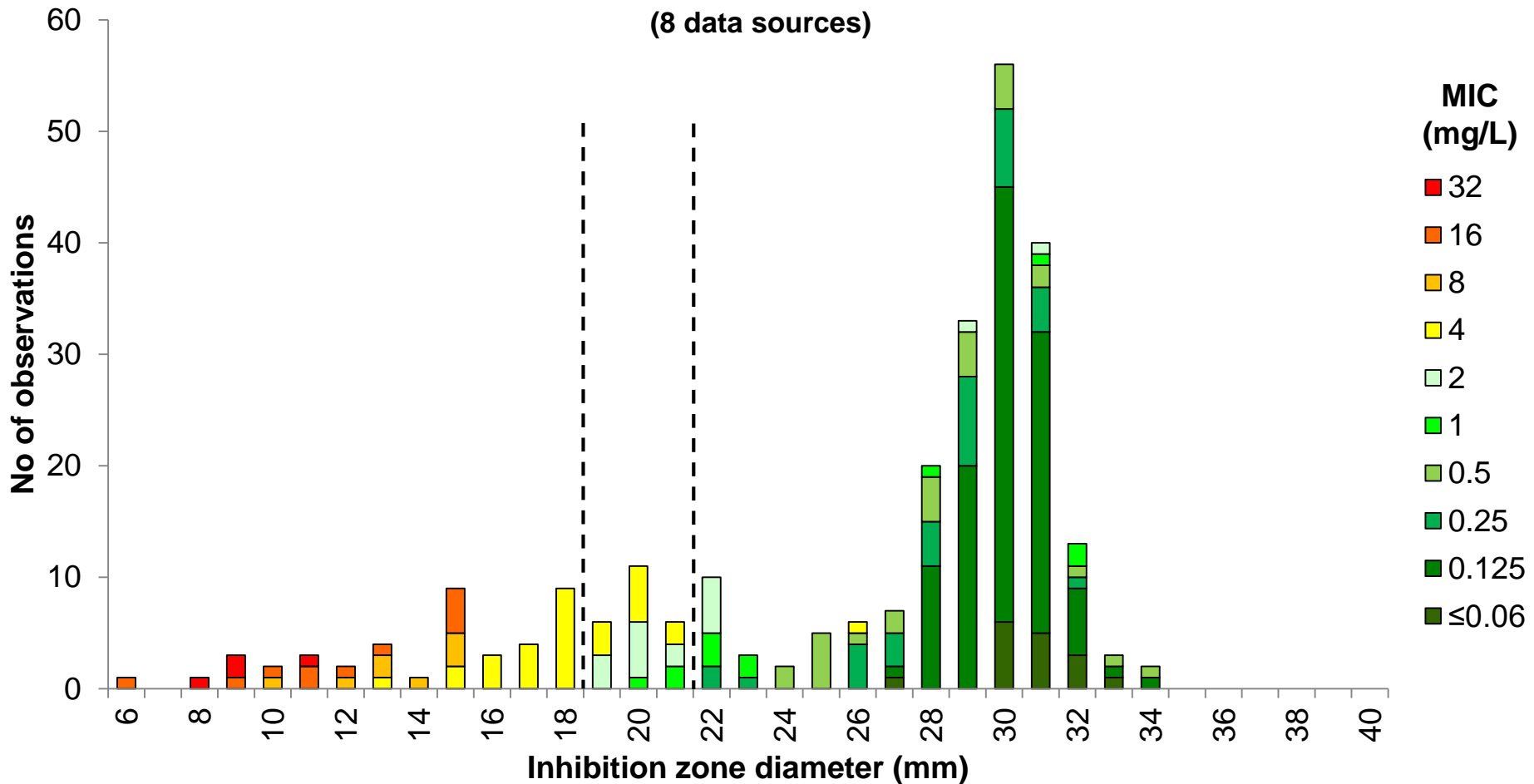
Breakpoints

MIC S ≤ 2, R > 4 mg/L

Zone diameter S ≥ 22, R < 19 mm

Imipenem 10 µg vs. MIC *E. coli*, 160 isolates (265 correlates)

(8 data sources)



Breakpoints

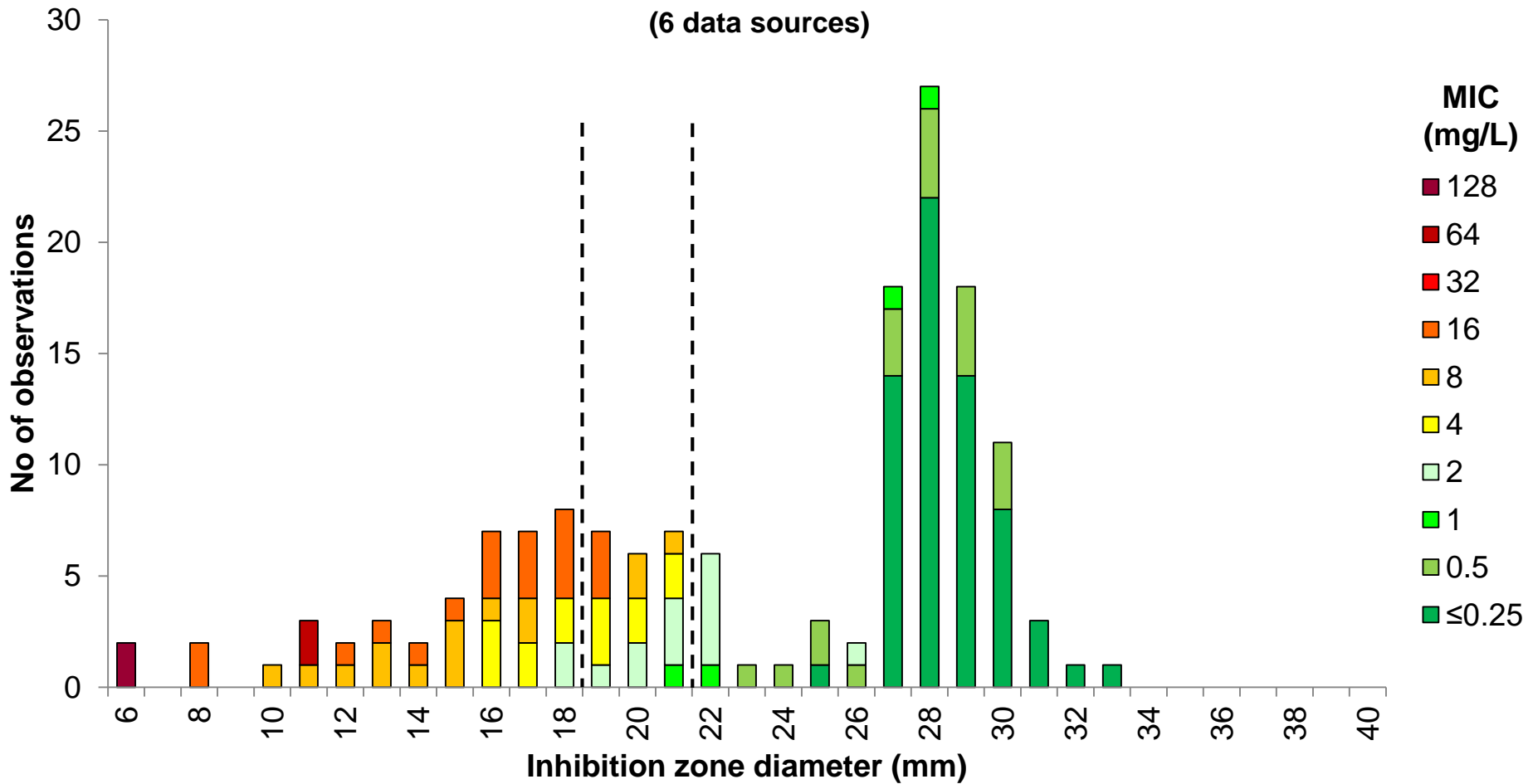
MIC $S \leq 2$, $R > 4$ mg/L

Zone diameter $S \geq 22$, $R < 19$ mm

Imipenem 10 µg vs. MIC

K. pneumoniae, 104 isolates (153 correlates)

(6 data sources)



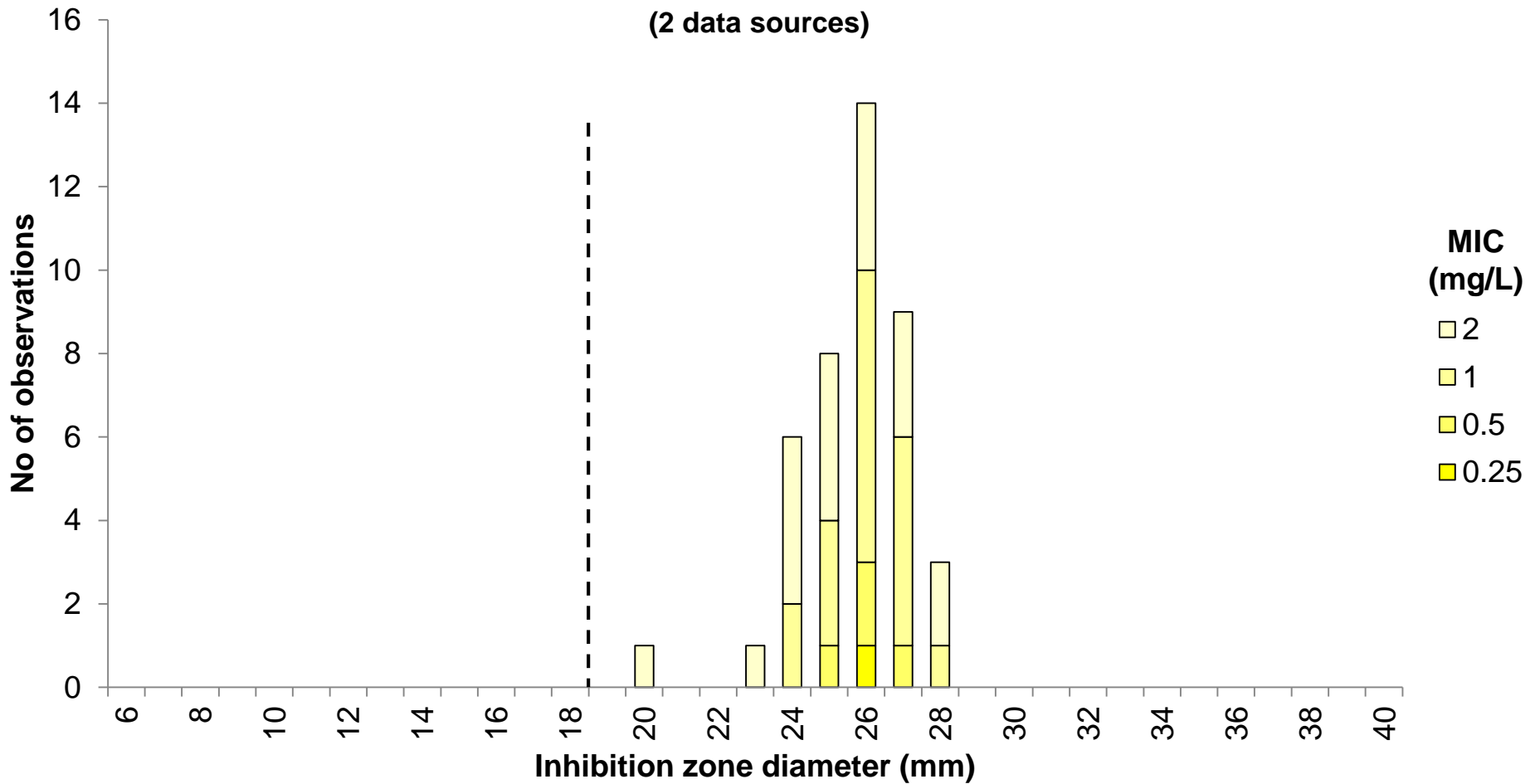
Breakpoints

MIC $S \leq 2, R > 4$ mg/L

Zone diameter $S \geq 22, R < 19$ mm

Imipenem 10 µg vs. MIC *P. mirabilis*, 22 isolates (42 correlates)

(2 data sources)



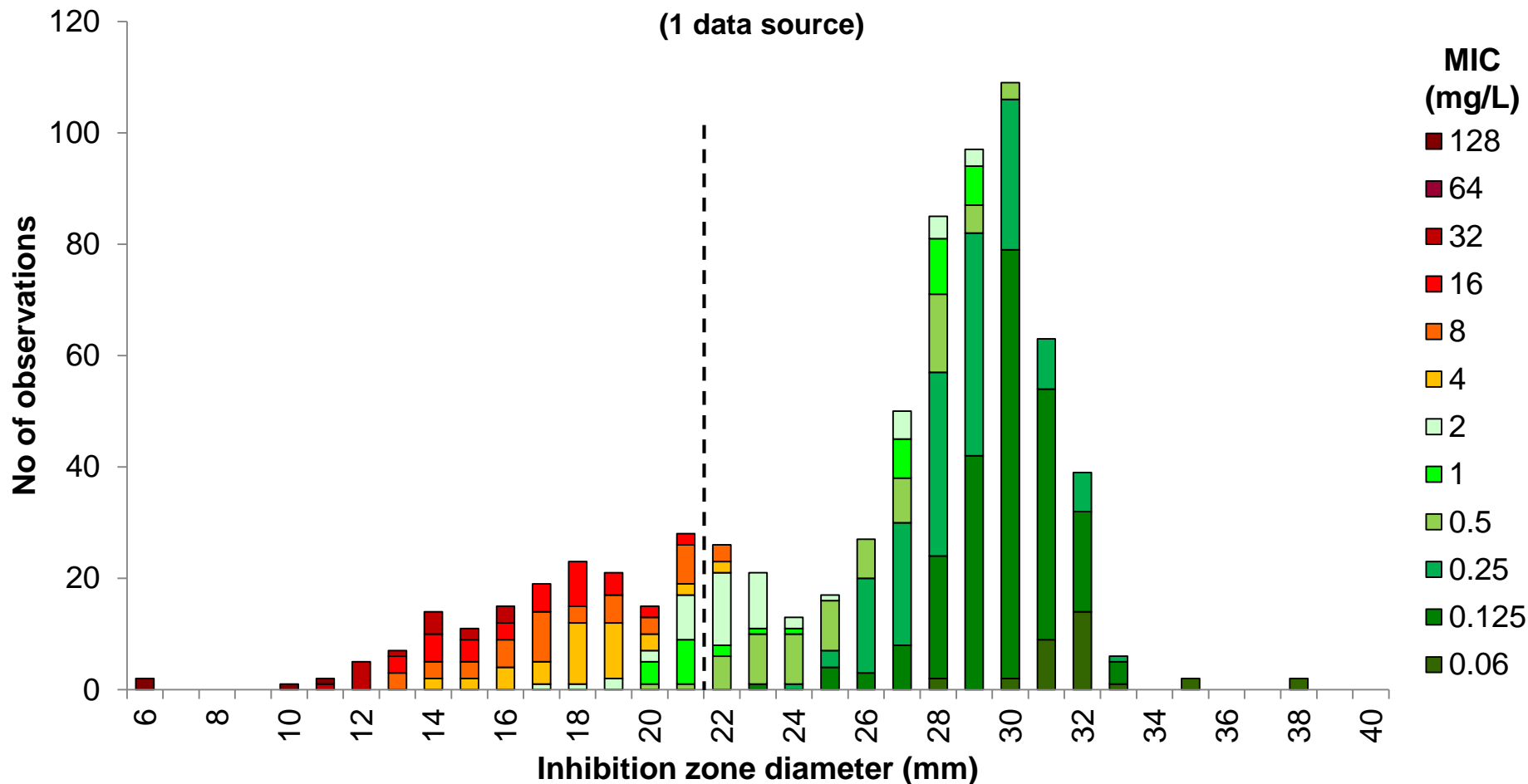
Breakpoints (*Morganellaceae*)

MIC $S \leq 0.001$, $R > 4$ mg/L

Zone diameter $S \geq 50$, $R < 19$ mm

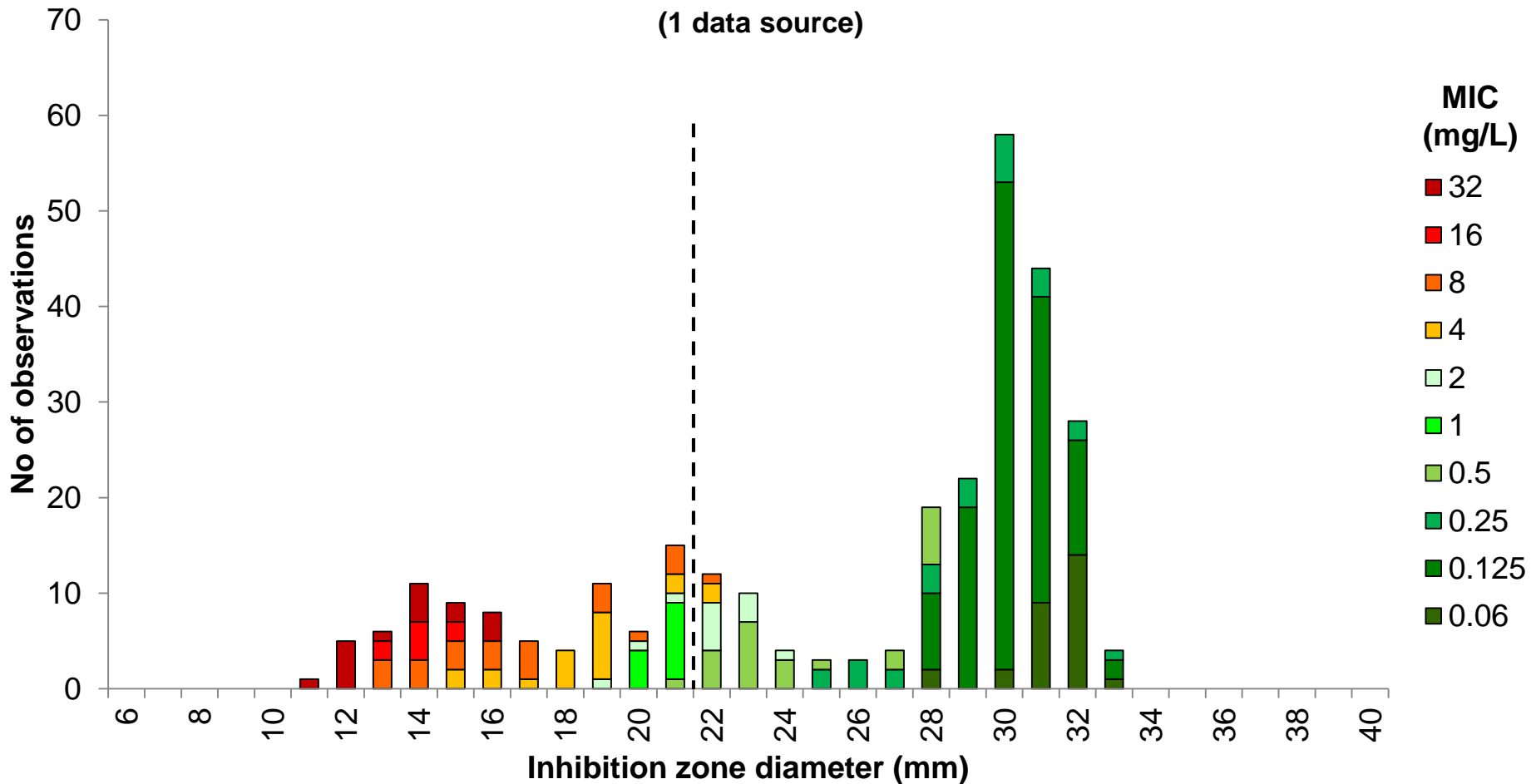
Imipenem-relebactam 10-25 µg vs. MIC *Enterobacterales*, 180 isolates (720 correlates)

(1 data source)



Imipenem-relebactam 10-25 μg vs. MIC *E. coli*, 73 isolates (292 correlates)

(1 data source)



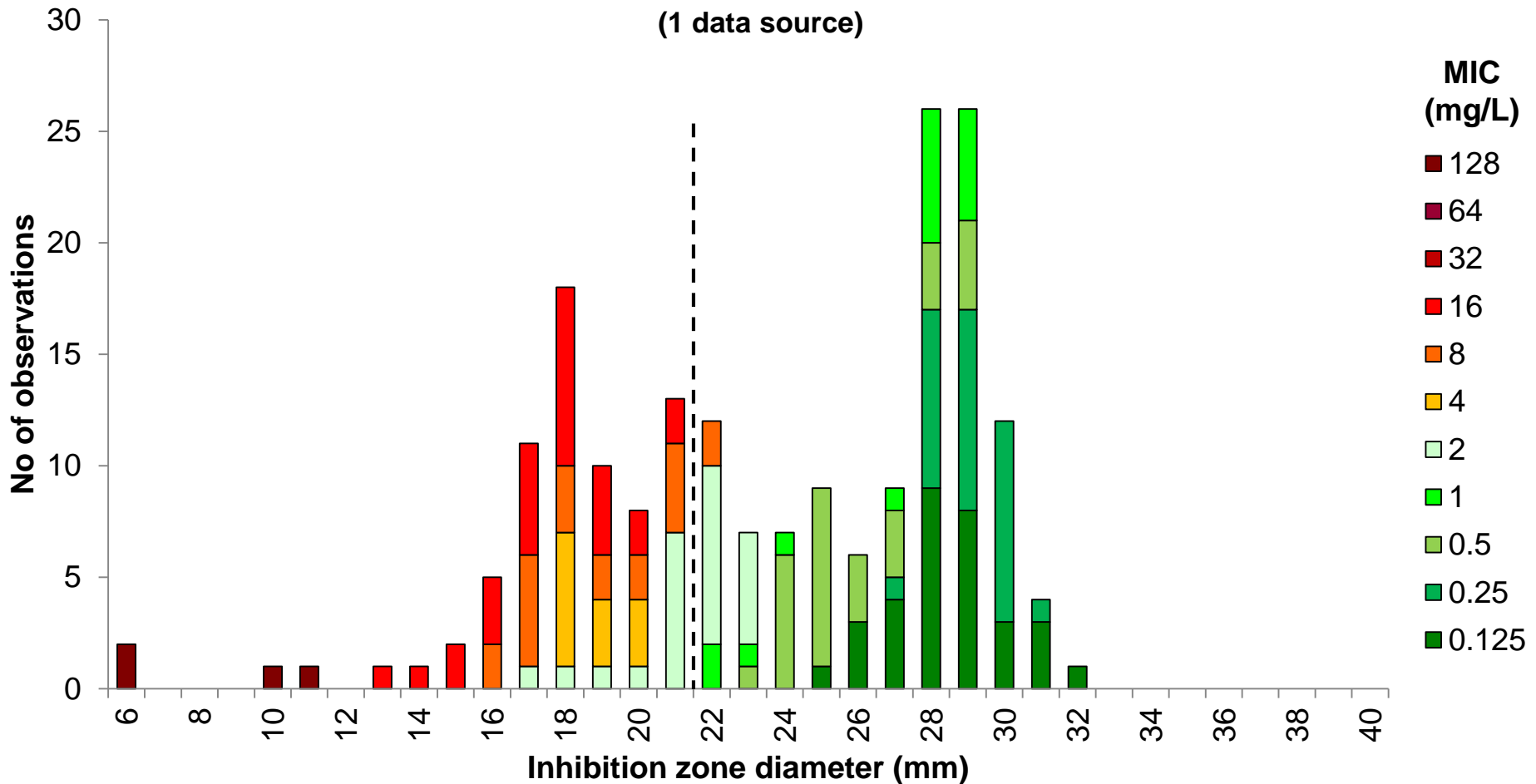
Breakpoints

MIC $S \leq 2, R > 2$ mg/L

Zone diameter $S \geq 22, R < 22$ mm

Imipenem-relebactam 10-25 µg vs. MIC *K. pneumoniae*, 48 isolates (192 correlates)

(1 data source)



Breakpoints

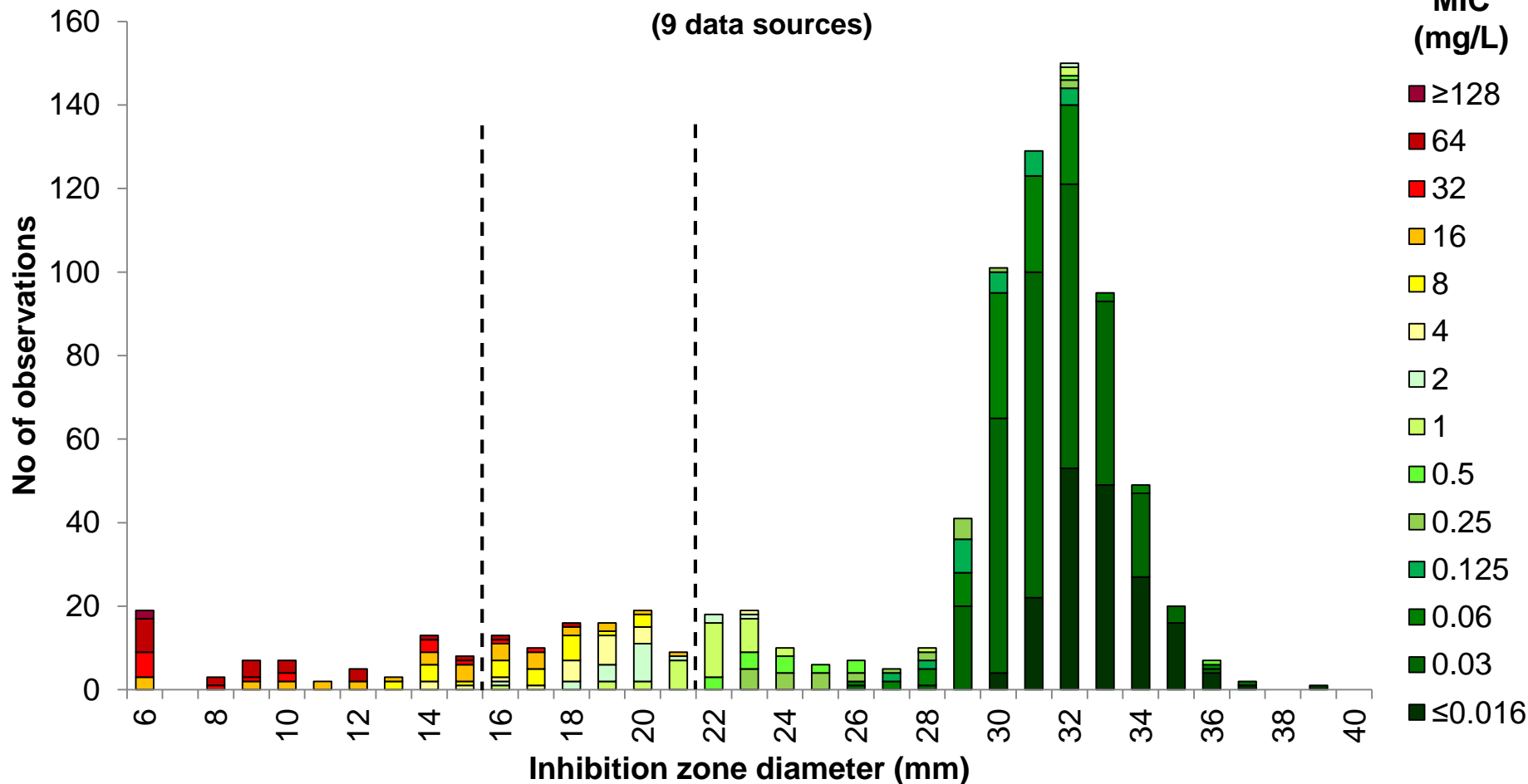
MIC $S \leq 2, R > 2$ mg/L

Zone diameter $S \geq 22, R < 22$ mm

Meropenem 10 µg vs. MIC

Enterobacteriales, 576 isolates (820 correlates)

(9 data sources)



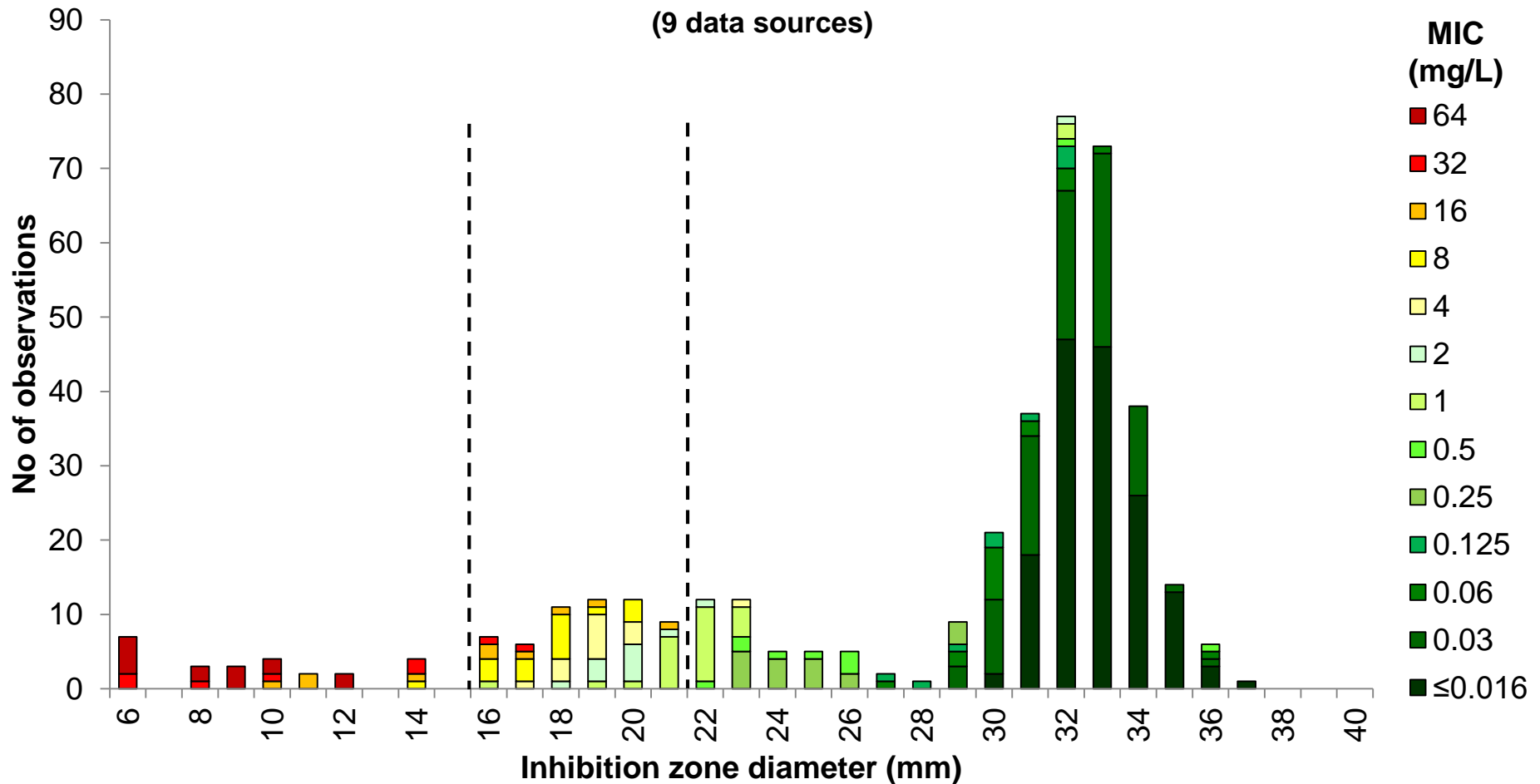
Breakpoints (non-meningitis)

MIC $S \leq 2$, $R > 8$ mg/L

Zone diameter $S \geq 22$, $R < 16$ mm

Meropenem 10 µg vs. MIC *E. coli*, 280 isolates (400 correlates)

(9 data sources)



Breakpoints (non-meningitis)

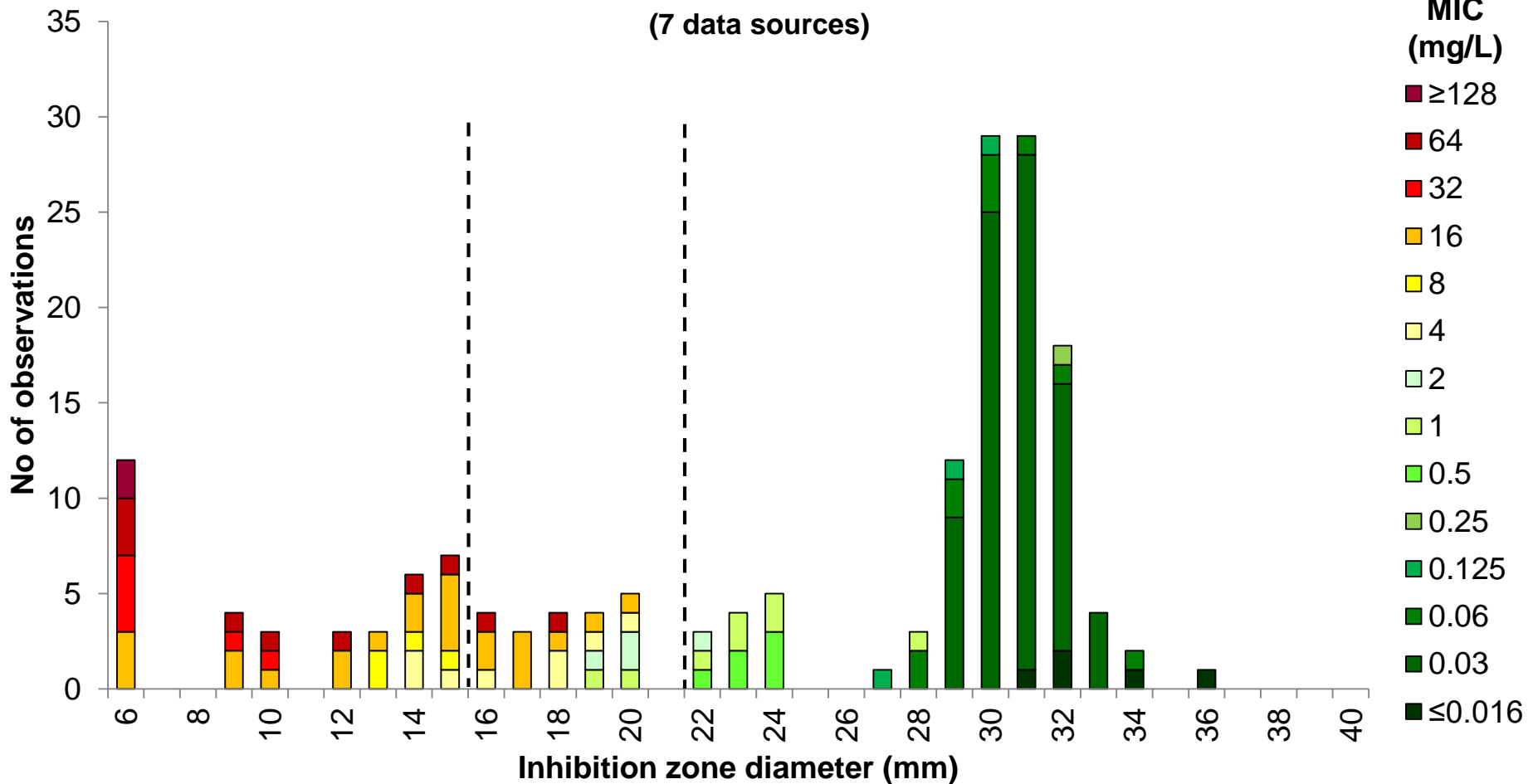
MIC $S \leq 2$, $R > 8$ mg/L

Zone diameter $S \geq 22$, $R < 16$ mm

Meropenem 10 µg vs. MIC

K. pneumoniae, 124 isolates (169 correlates)

(7 data sources)



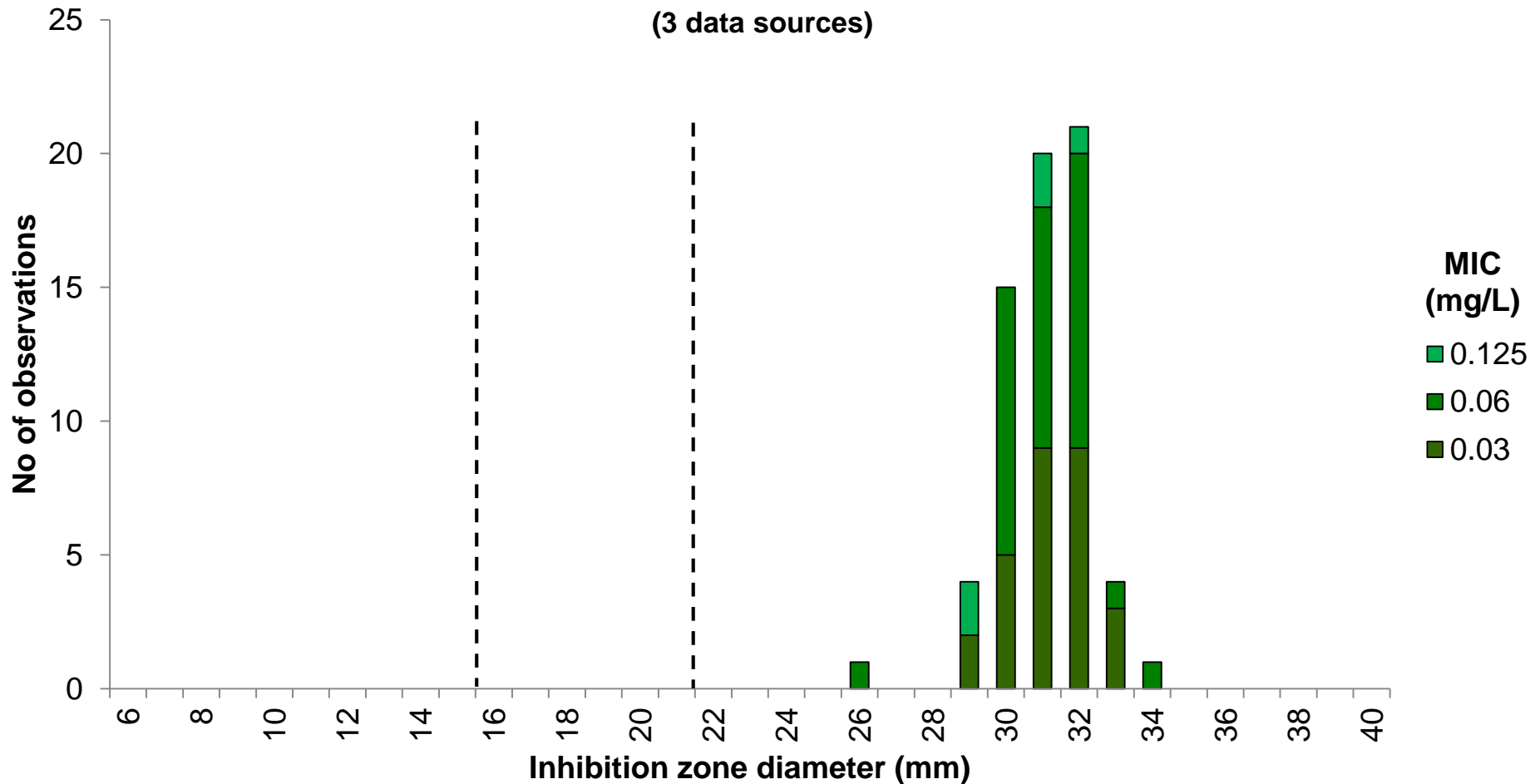
Breakpoints (non-meningitis)

MIC $S \leq 2$, $R > 8$ mg/L

Zone diameter $S \geq 22$, $R < 16$ mm

Meropenem 10 µg vs. MIC *P. mirabilis*, 45 isolates (66 correlates)

(3 data sources)

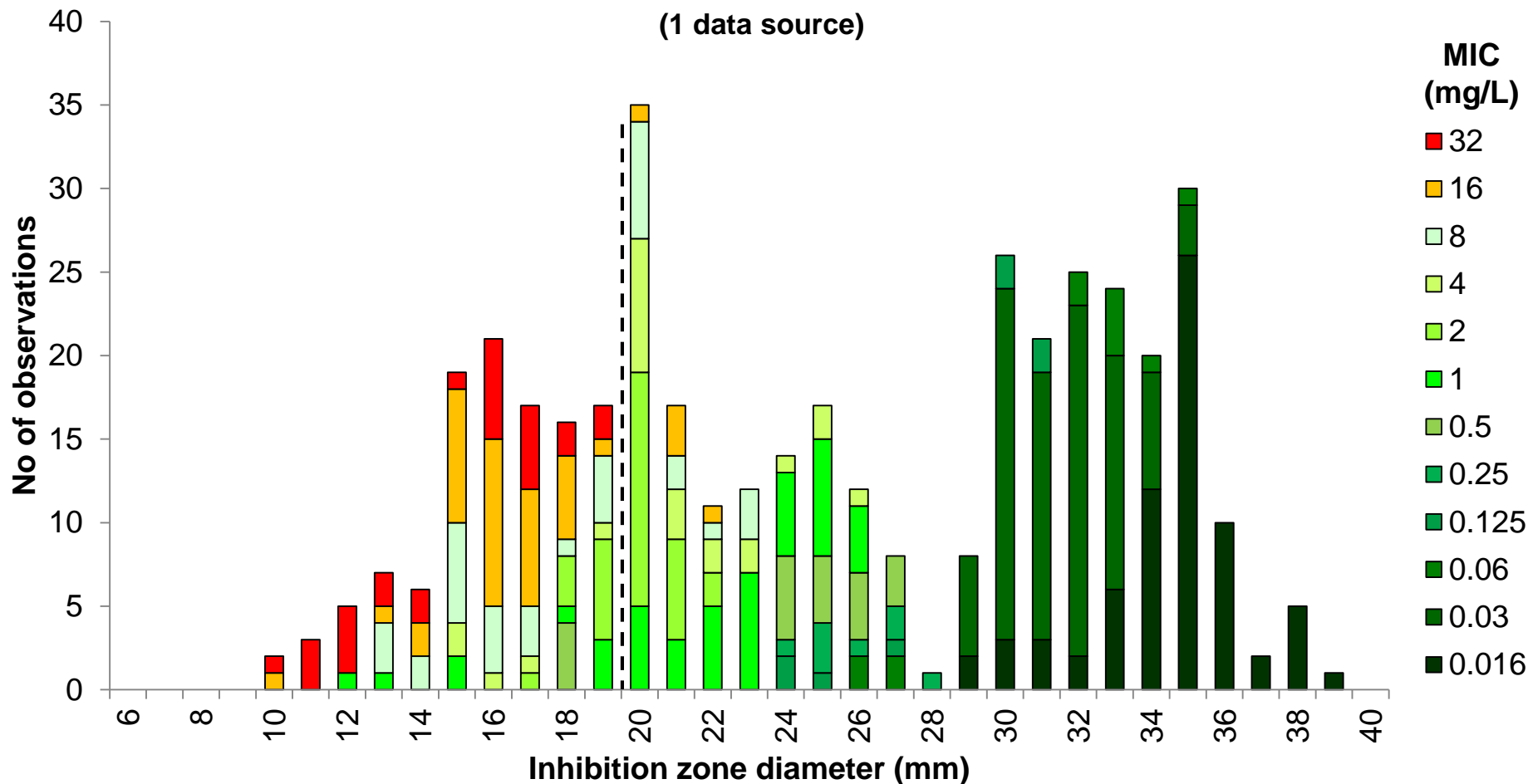


Breakpoints (non-meningitis)

MIC $S \leq 2$, $R > 8$ mg/L

Zone diameter $S \geq 22$, $R < 16$ mm

Meropenem-vaborbactam 20-10 µg vs. MIC *Enterobacterales*, 104 isolates (412 correlates)



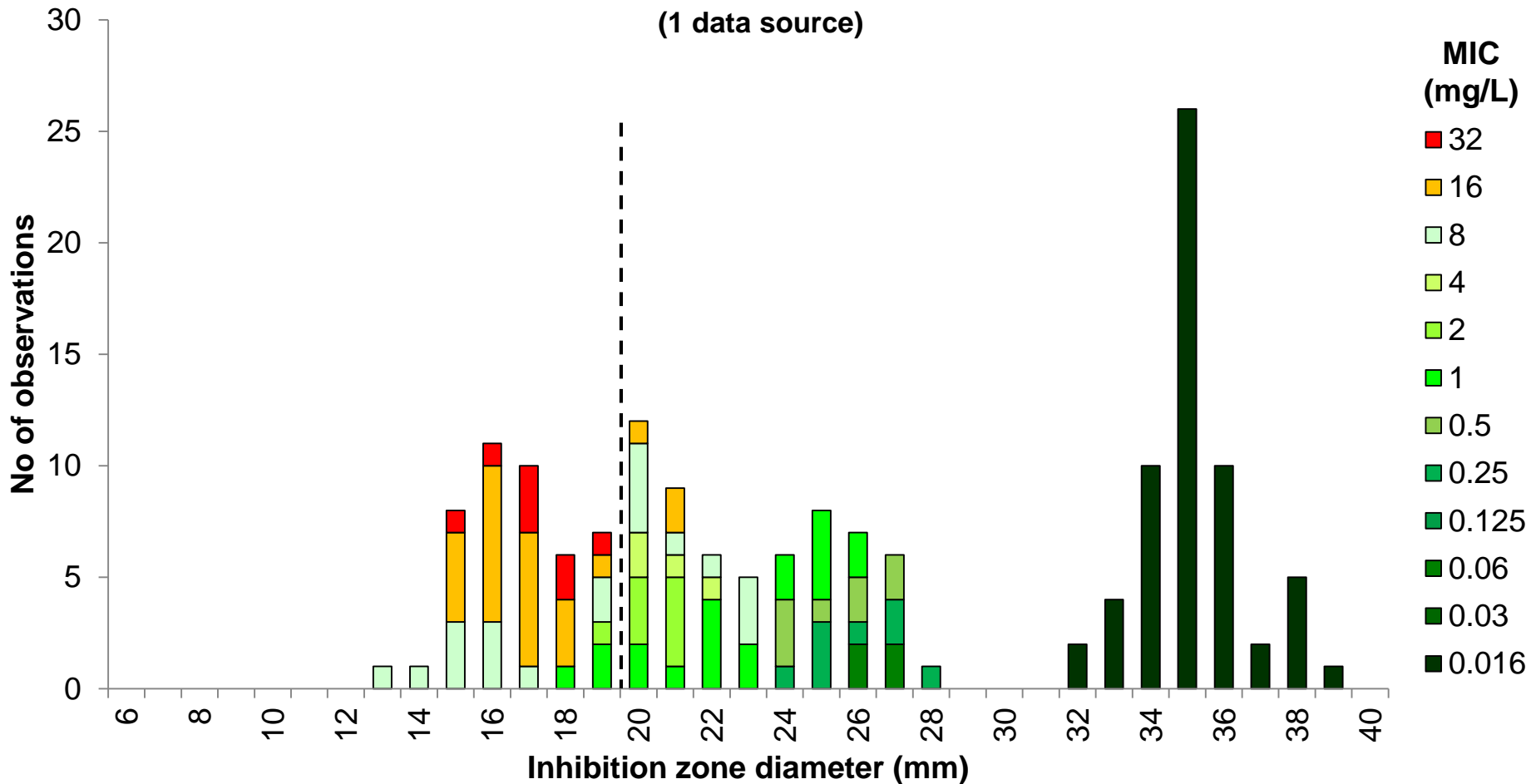
Breakpoints

MIC $S \leq 8, R > 8$ mg/L

Zone diameter $S \geq 20, R < 20$ mm

Meropenem-vaborbactam 20-10 µg vs. MIC *E. coli*, 42 isolates (164 correlates)

(1 data source)



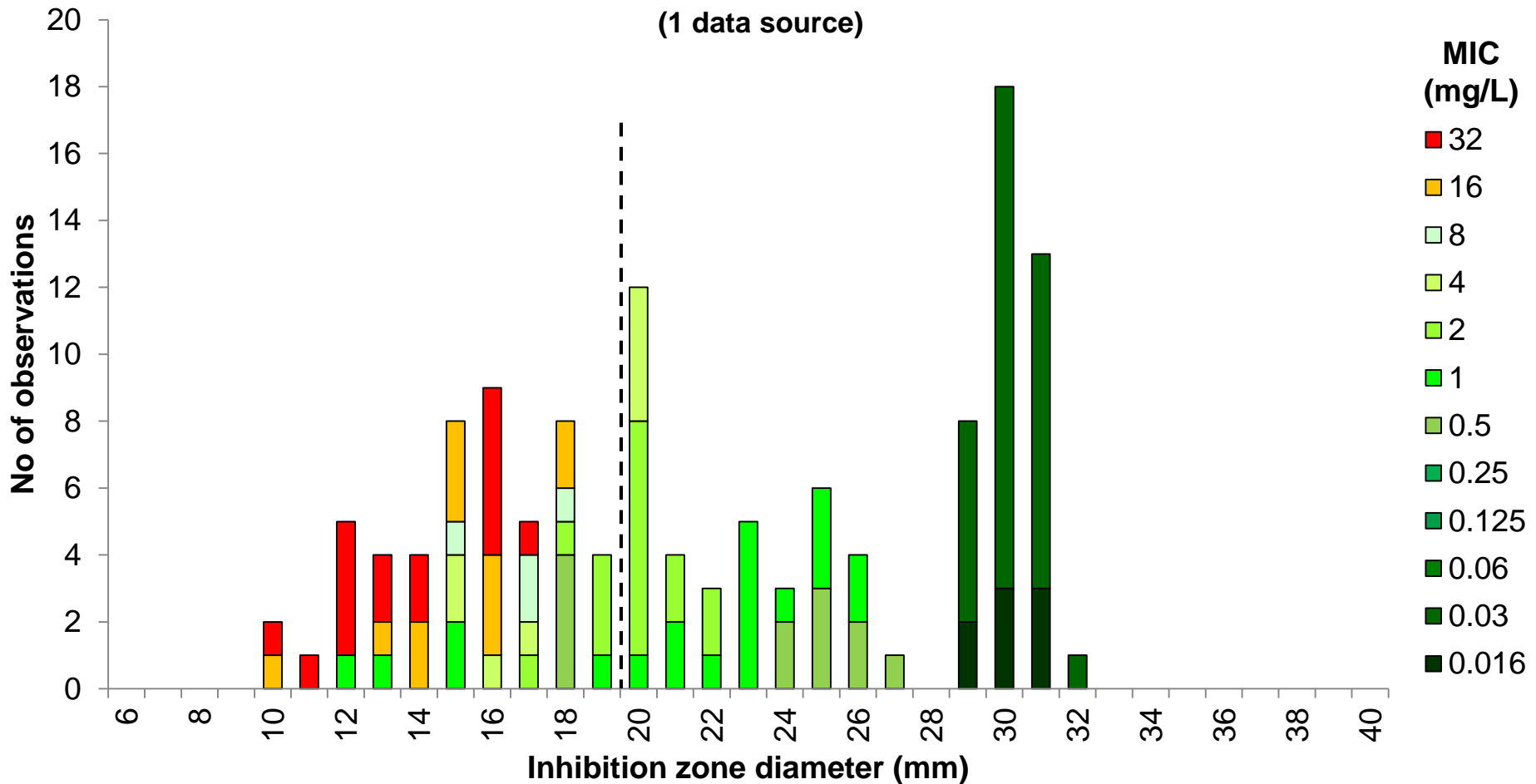
Breakpoints

MIC $S \leq 8$, $R > 8$ mg/L

Zone diameter $S \geq 20$, $R < 20$ mm

Meropenem-vaborbactam 20-10 µg vs. MIC *K. pneumoniae*, 32 isolates (128 correlates)

(1 data source)



Breakpoints

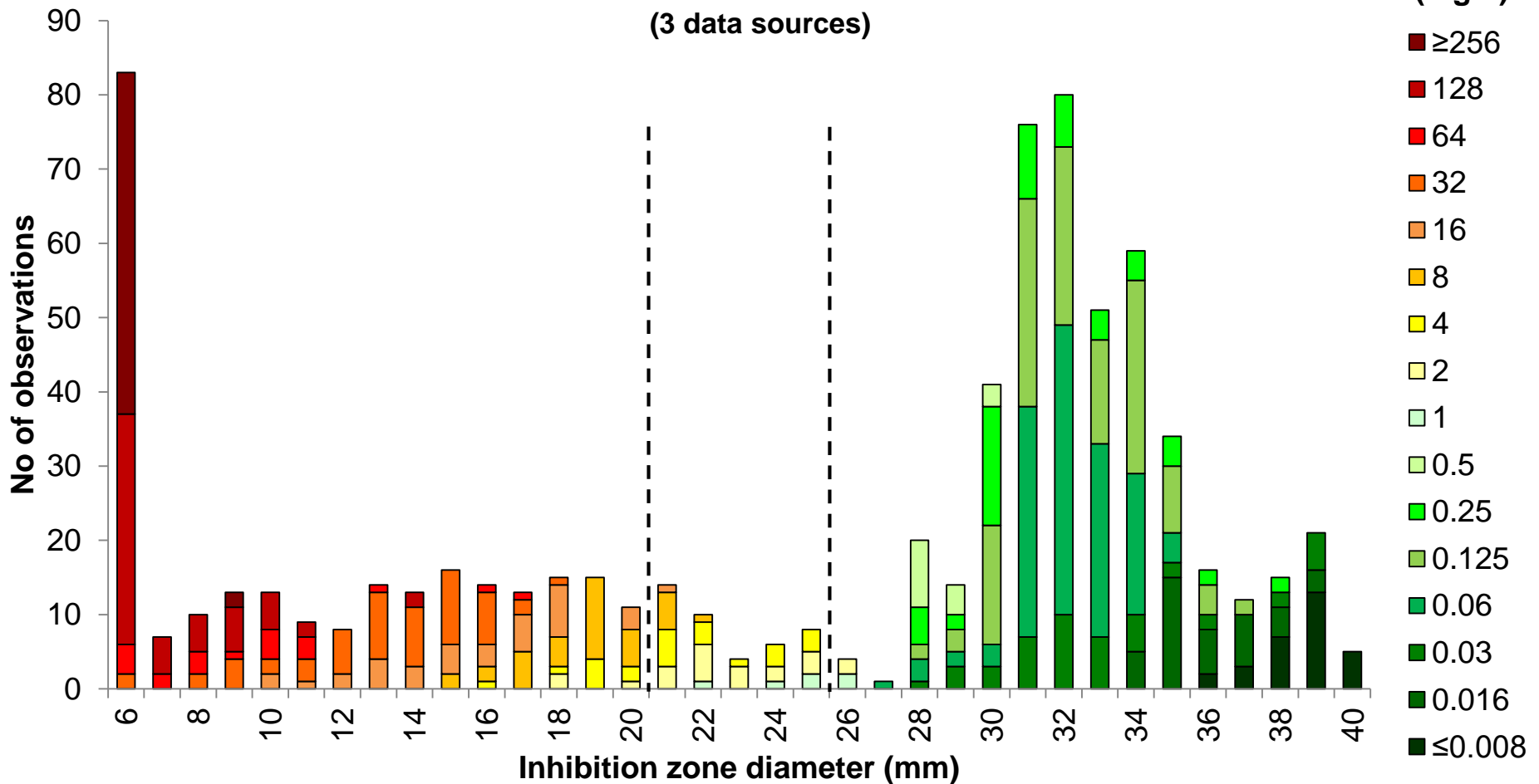
MIC $S \leq 8, R > 8$ mg/L

Zone diameter $S \geq 20, R < 20$ mm

Aztreonam 30 µg vs. MIC

Enterobacteriales, 263 isolates (745 correlates)

(3 data sources)



Breakpoints

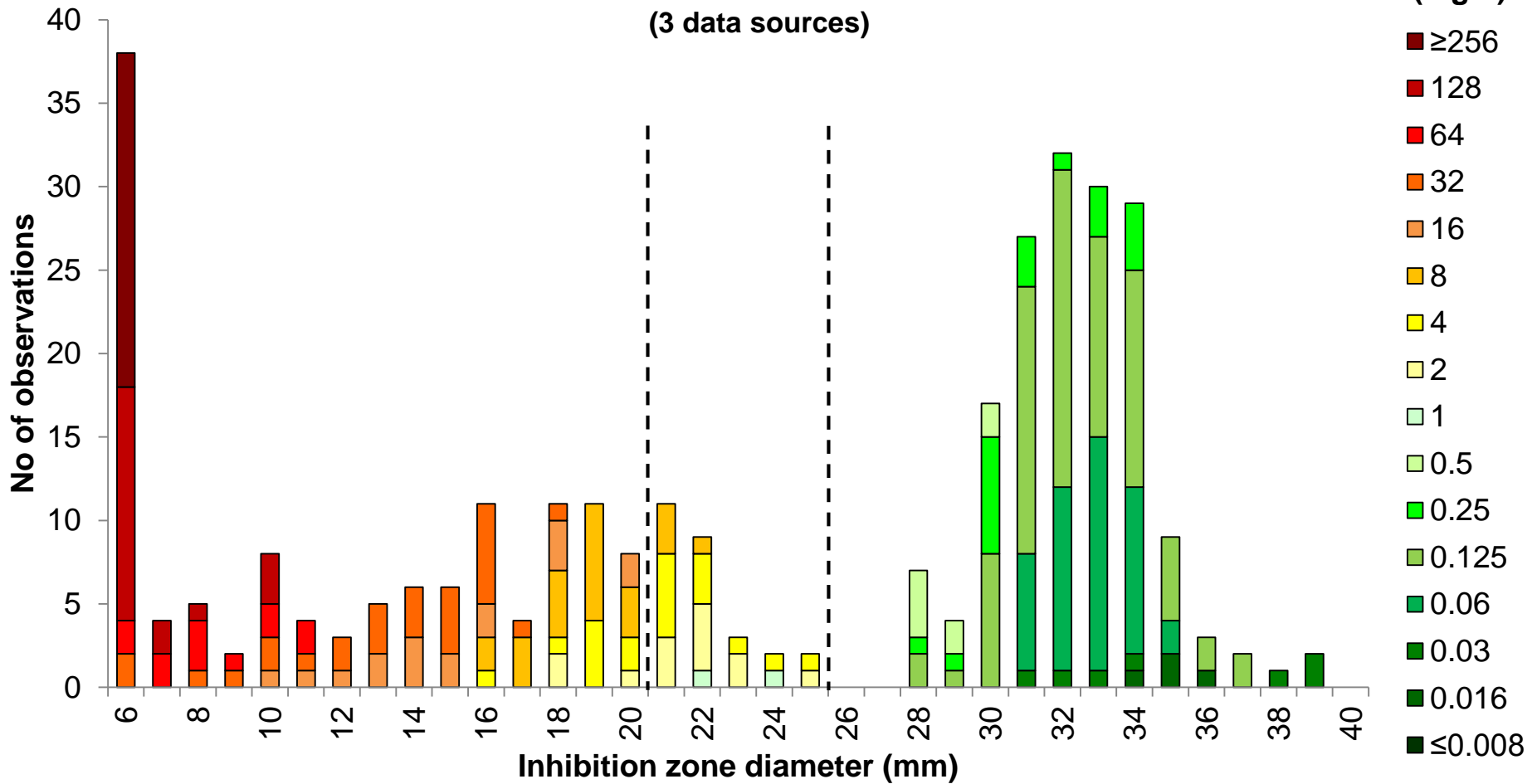
MIC $S \leq 1, R > 4$ mg/L

Zone diameter $S \geq 26, R < 21$ mm

Aztreonam 30 µg vs. MIC

E. coli, 137 isolates (316 correlates)

(3 data sources)



Breakpoints

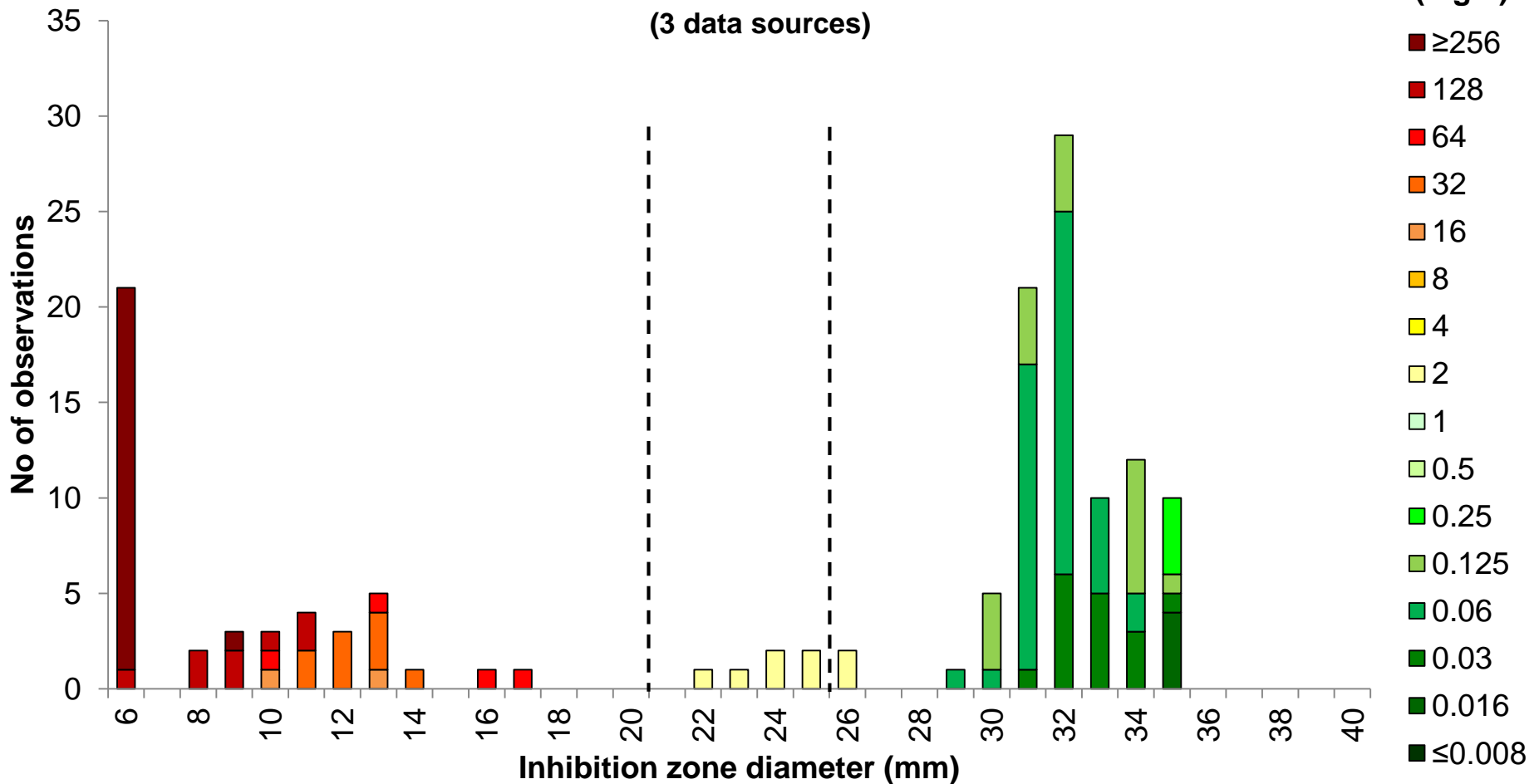
MIC S ≤ 1, R > 4 mg/L

Zone diameter S ≥ 26, R < 21 mm

Aztreonam 30 µg vs. MIC

K. pneumoniae, 46 isolates (140 correlates)

(3 data sources)



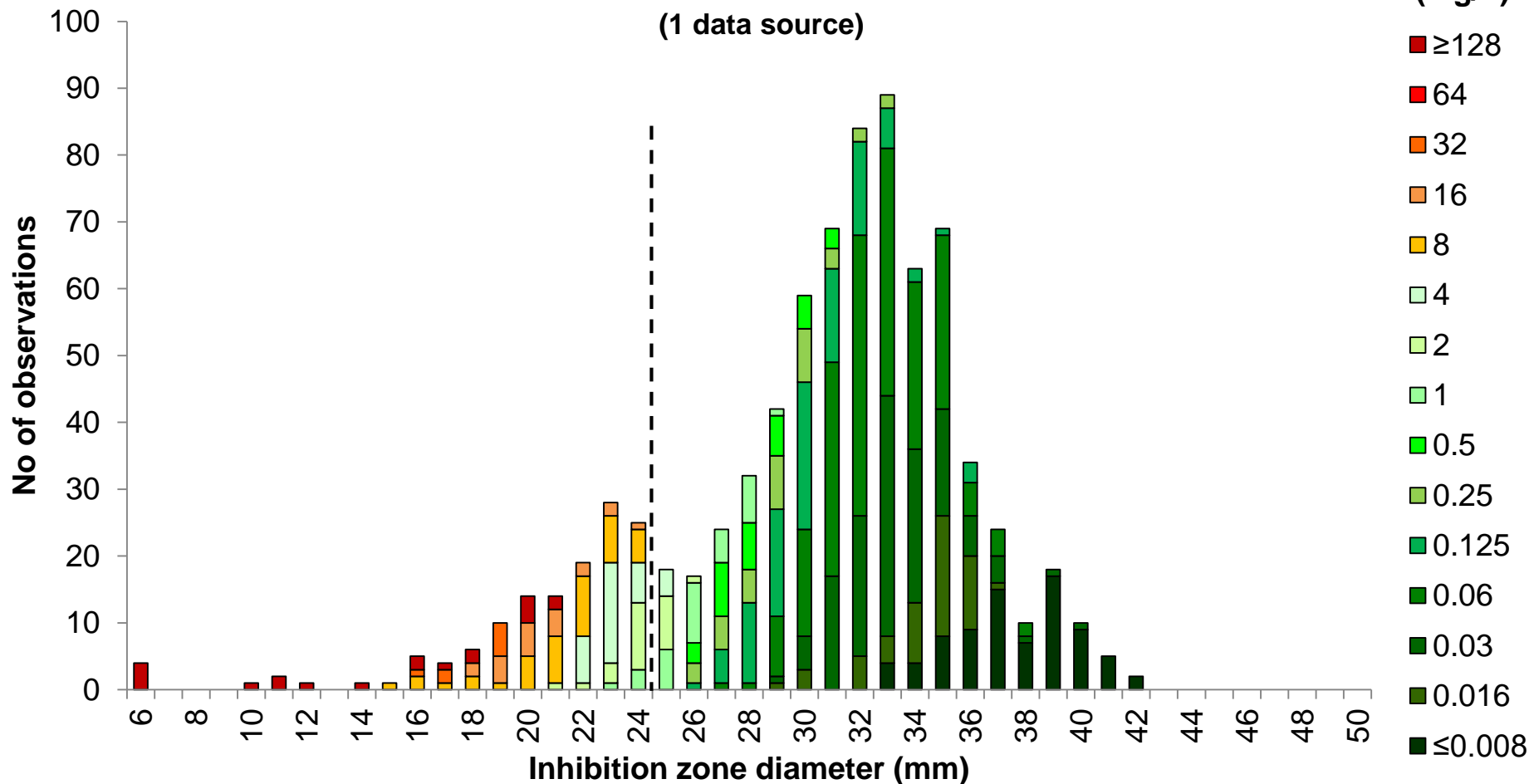
Breakpoints

MIC $S \leq 1$, $R > 4$ mg/L

Zone diameter $S \geq 26$, $R < 21$ mm

Aztreonam-avibactam 30-20 µg vs. MIC

Enterobacterales, 201 isolates (804 correlates)

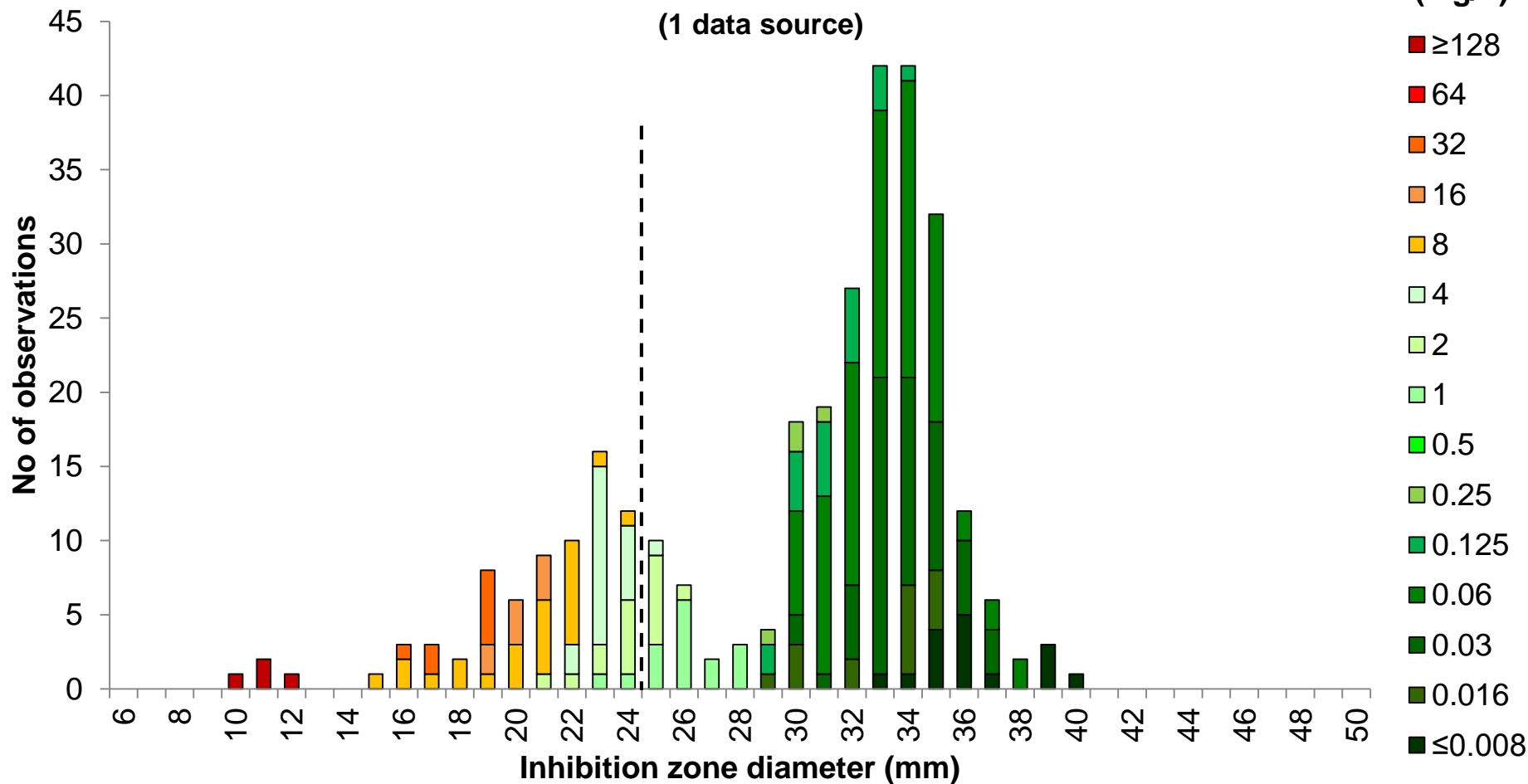


Breakpoints

MIC S≤4, R>4 mg/L

Zone diameter S≥25, R<25 mm

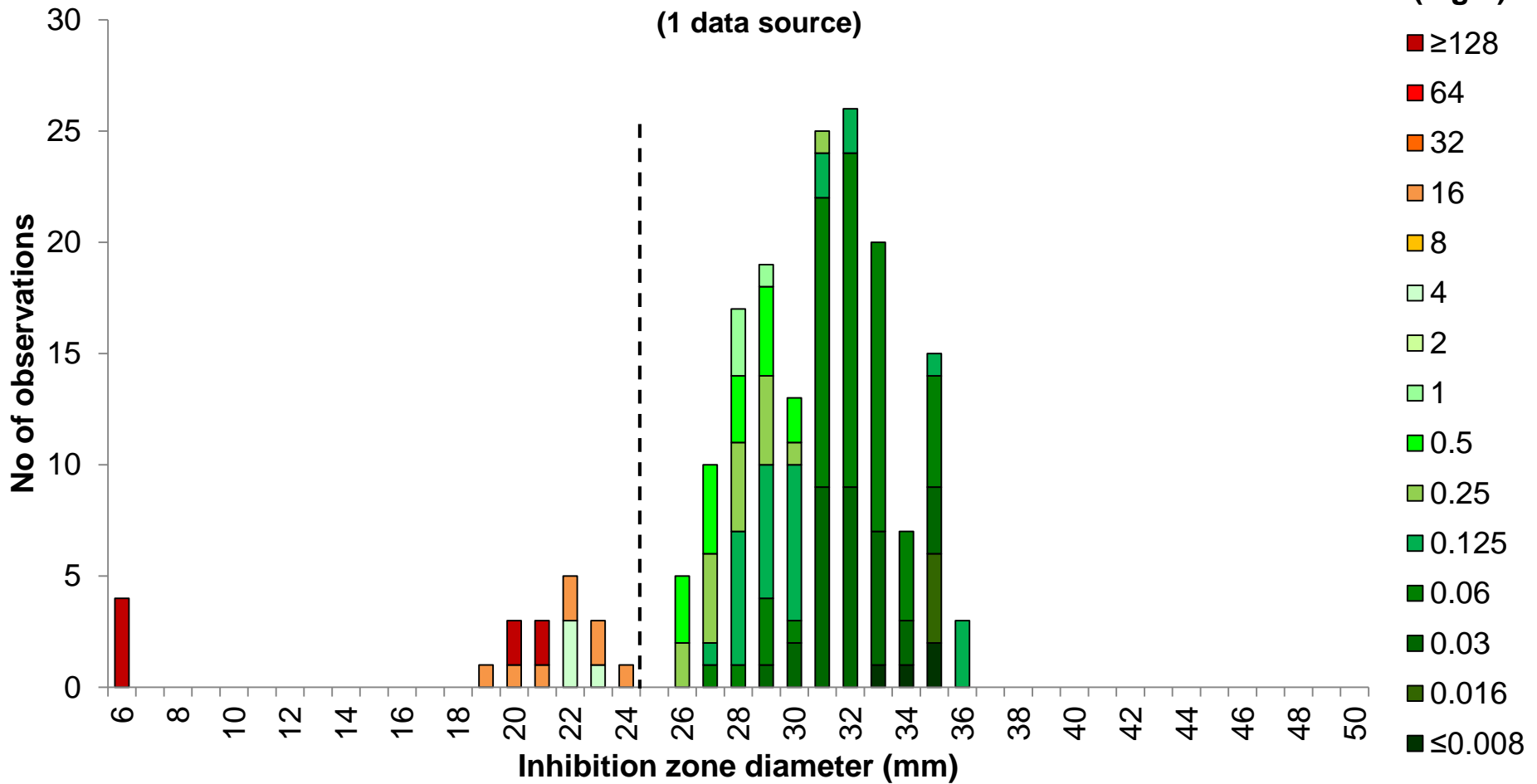
Aztreonam-avibactam 30-20 µg vs. MIC *E. coli*, 76 isolates (304 correlates)



Breakpoints	
MIC	S ≤ 4, R > 4 mg/L
Zone diameter	S ≥ 25, R < 25 mm

Aztreonam-avibactam 30-20 µg vs. MIC *K. pneumoniae*, 45 isolates (180 correlates)

(1 data source)



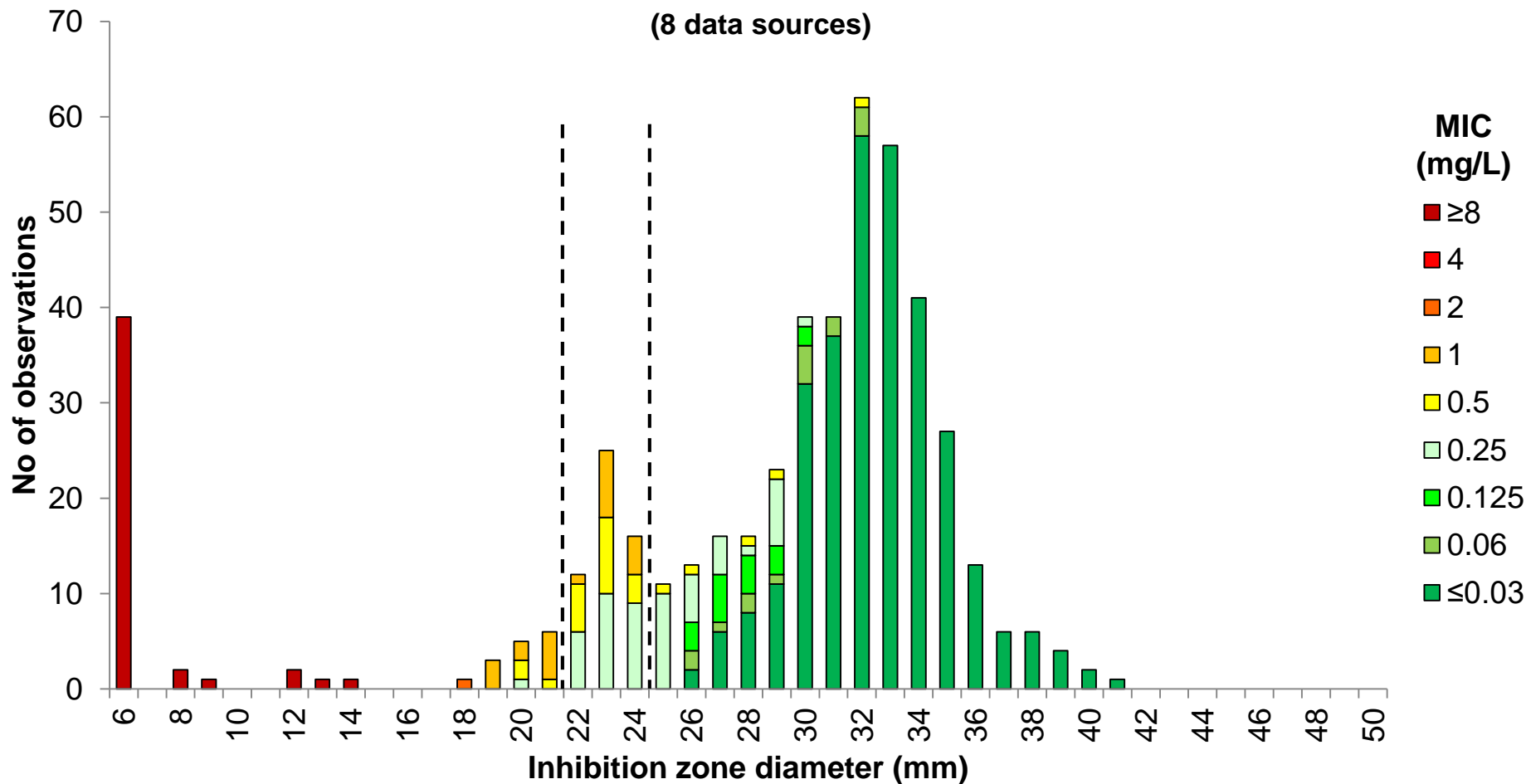
Breakpoints

MIC S ≤ 4, R > 4 mg/L

Zone diameter S ≥ 25, R < 25 mm

Ciprofloxacin 5 μ g vs. MIC

Enterobacterales, 471 isolates (490 correlates)

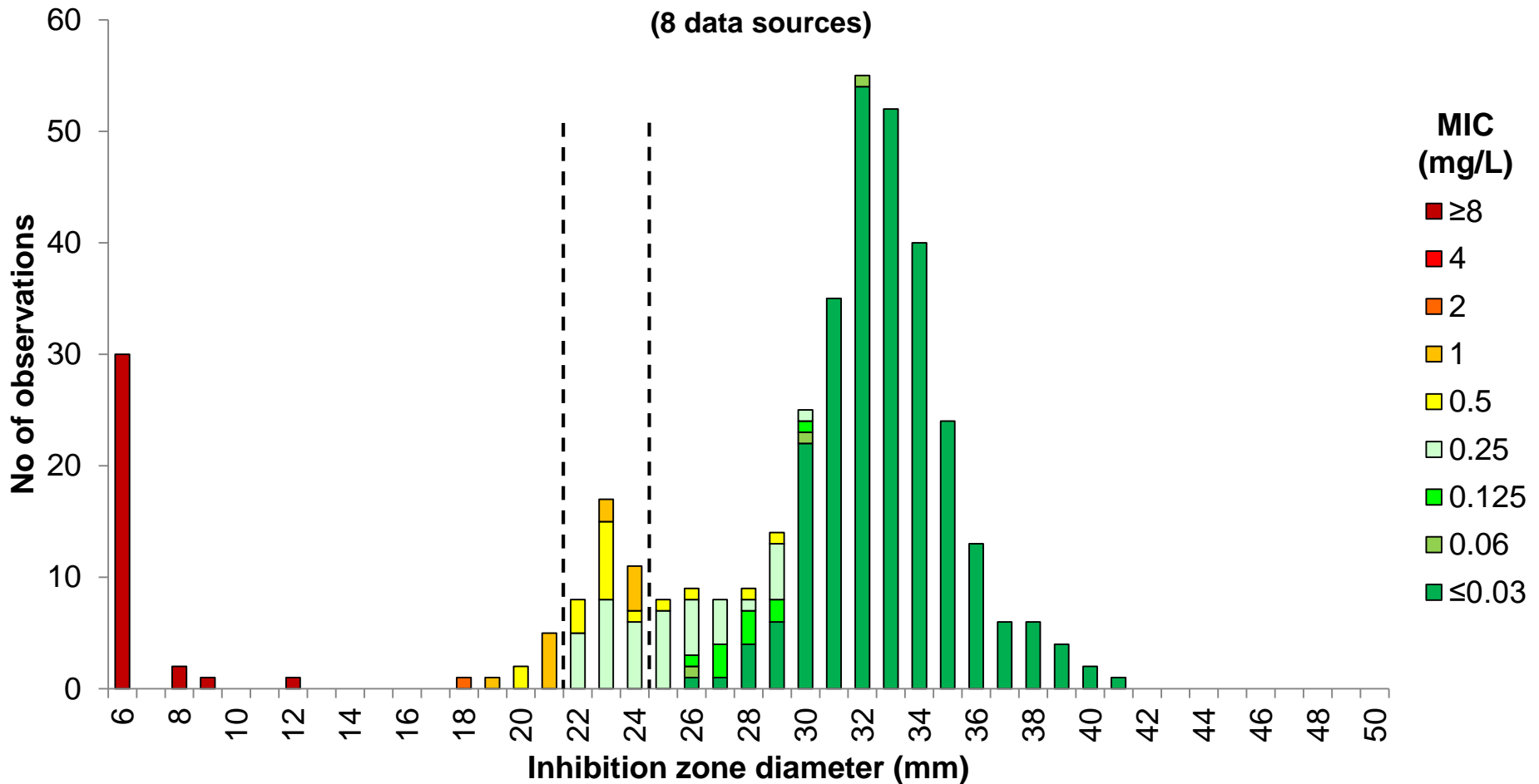


Breakpoints (non-meningitis)

MIC	S ≤ 0.25, R > 0.5 mg/L
Zone diameter	S ≥ 25, R < 22 mm

Ciprofloxacin 5 µg vs. MIC

E. coli, 376 isolates (390 correlates)



Breakpoints (non-meningitis)

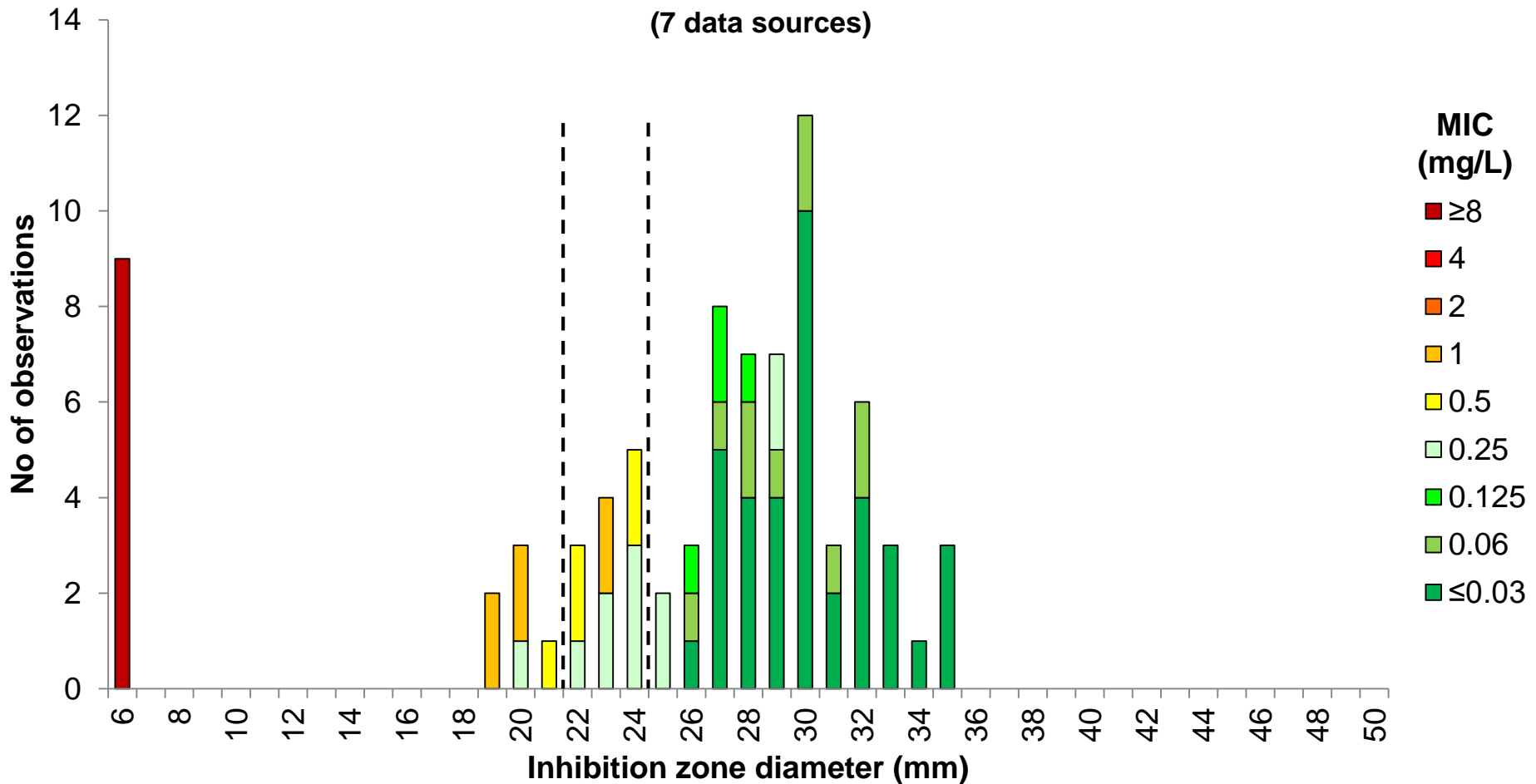
MIC S≤0.25, R>0.5 mg/L

Zone diameter S≥25, R<22 mm

Ciprofloxacin 5 µg vs. MIC

K. pneumoniae, 75 isolates (82 correlates)

(7 data sources)



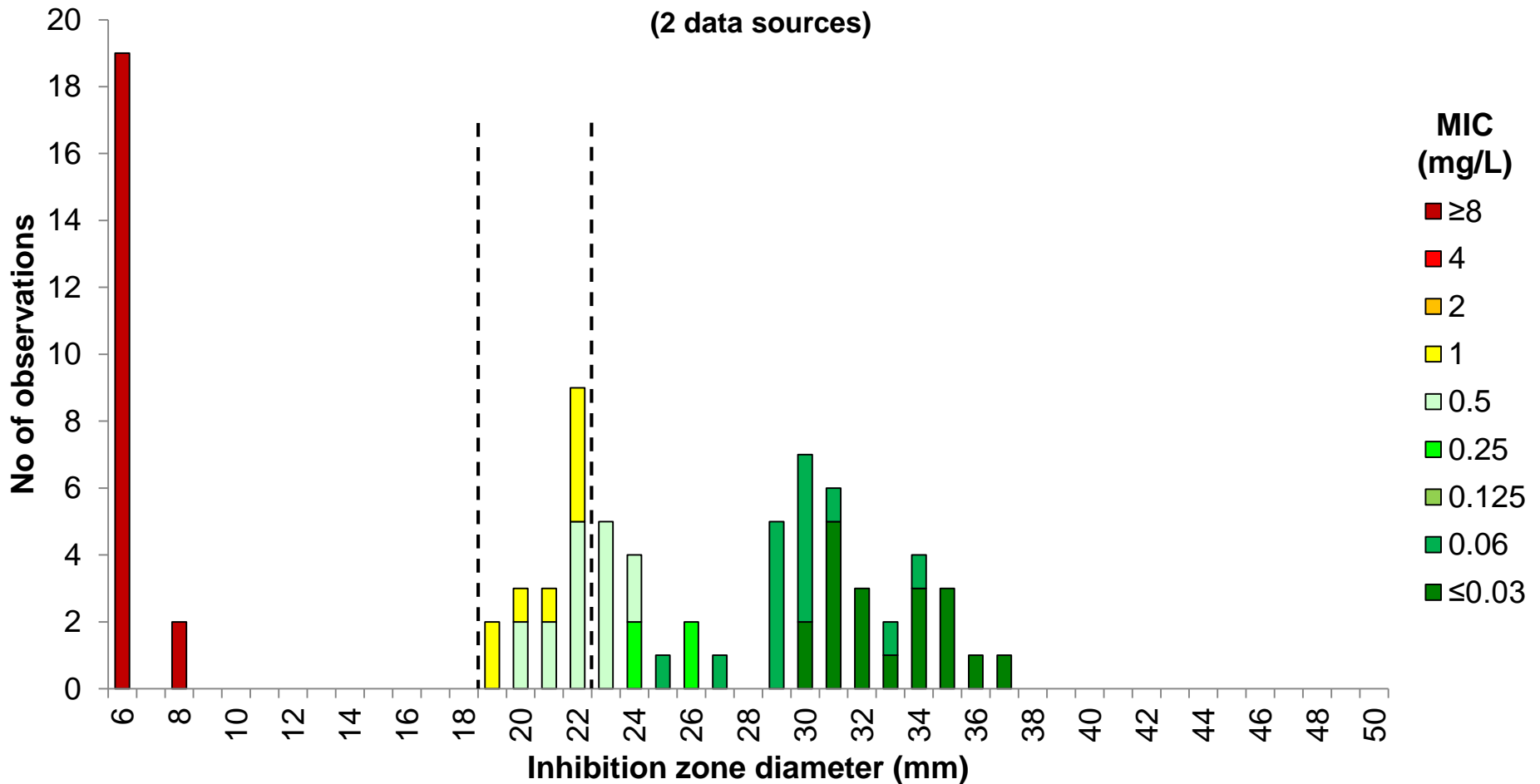
Breakpoints (non-meningitis)

MIC S ≤ 0.25, R > 0.5 mg/L

Zone diameter S ≥ 25, R < 22 mm

Levofloxacin 5 µg vs. MIC *Enterobacteriales*, 83 isolates

(2 data sources)



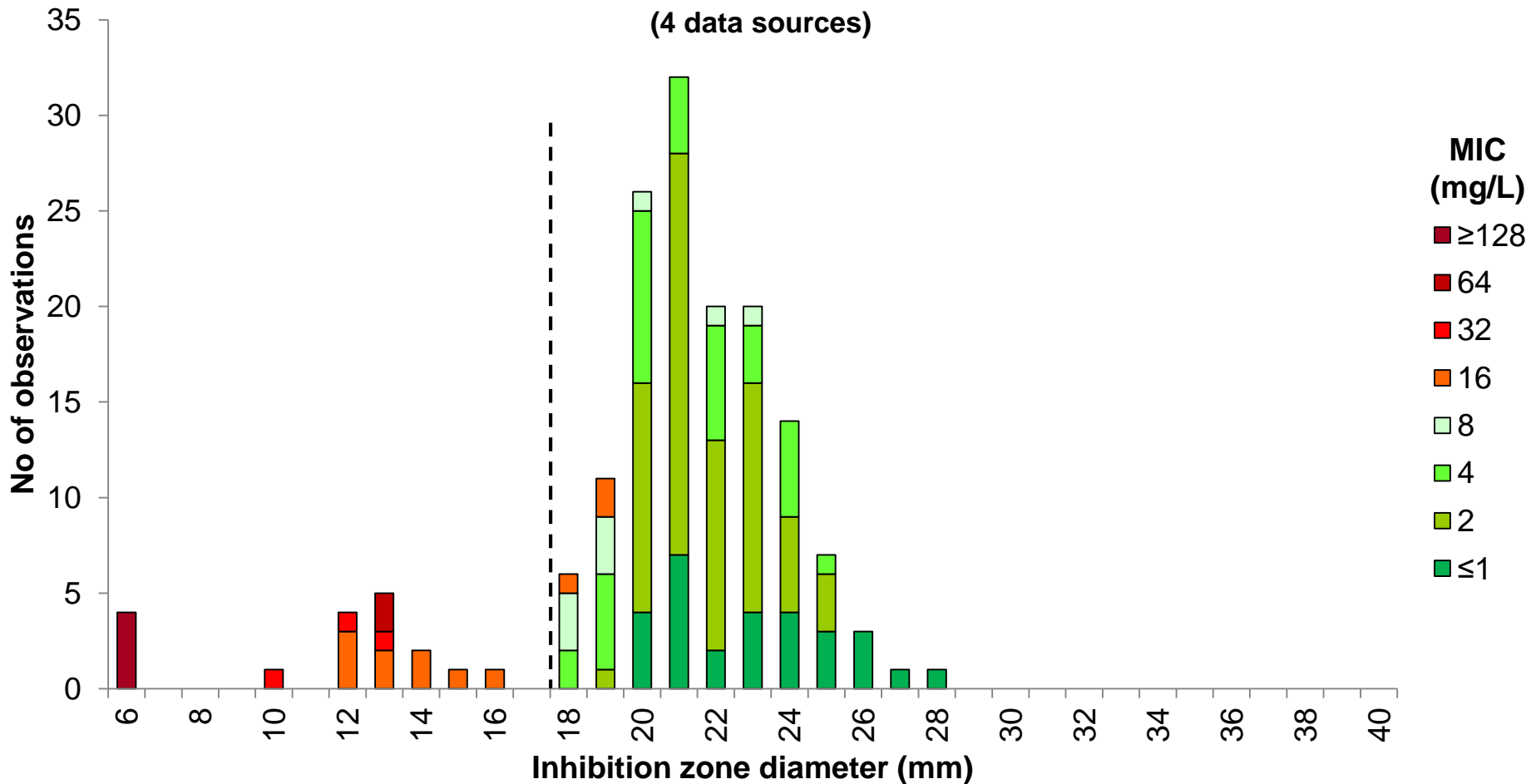
Breakpoints

MIC $S \leq 0.5$, $R > 1$ mg/L

Zone diameter $S \geq 23$, $R < 19$ mm

Amikacin 30 μg vs. MIC *Enterobacterales*, 118 isolates (159 correlates)

(4 data sources)



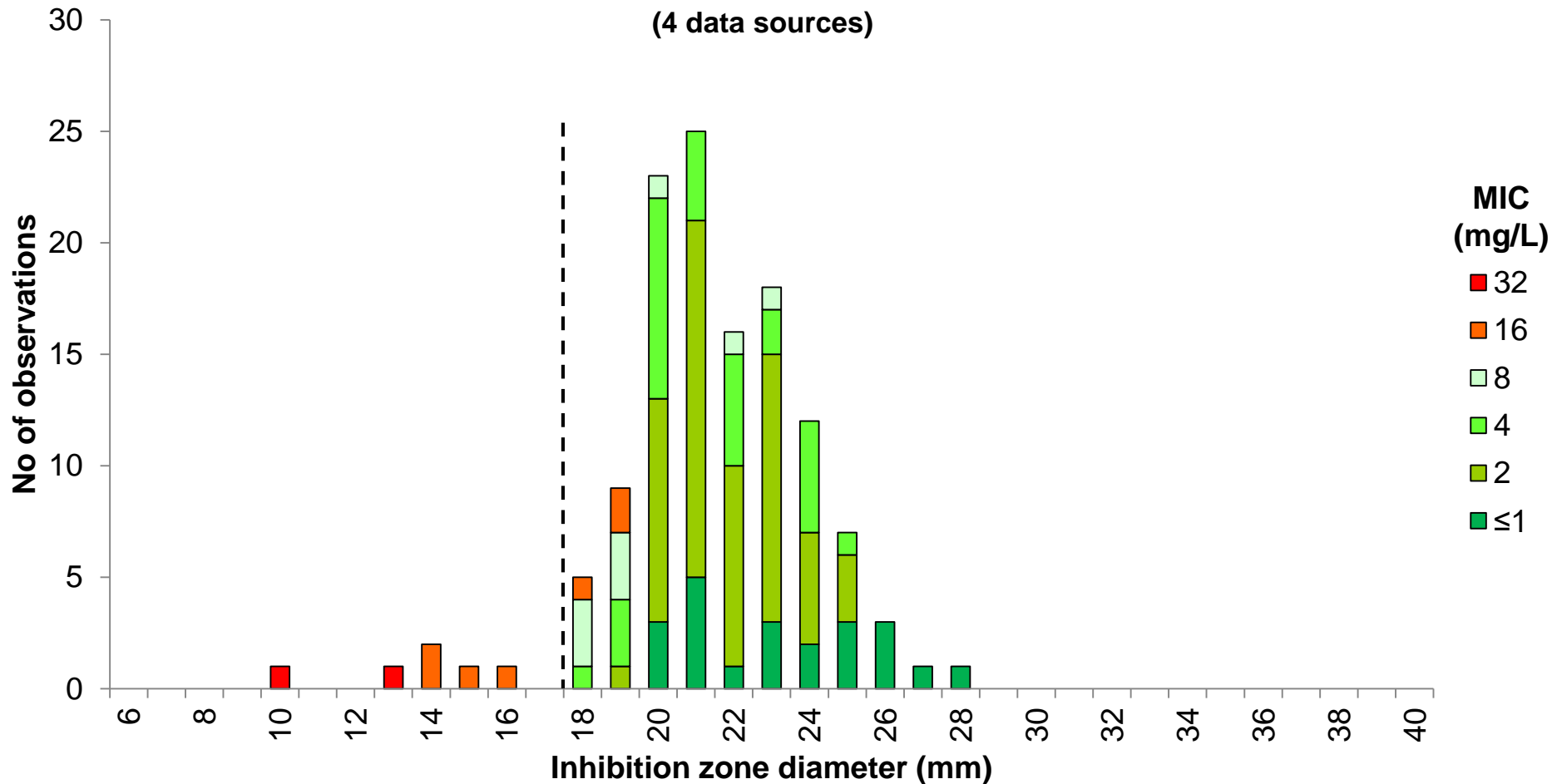
Breakpoints

MIC $S \leq 8$, $R > 8$ mg/L

Zone diameter $S \geq 18$, $R < 18$ mm

Amikacin 30 µg vs. MIC *E. coli*, 108 isolates (126 correlates)

(4 data sources)



Breakpoints

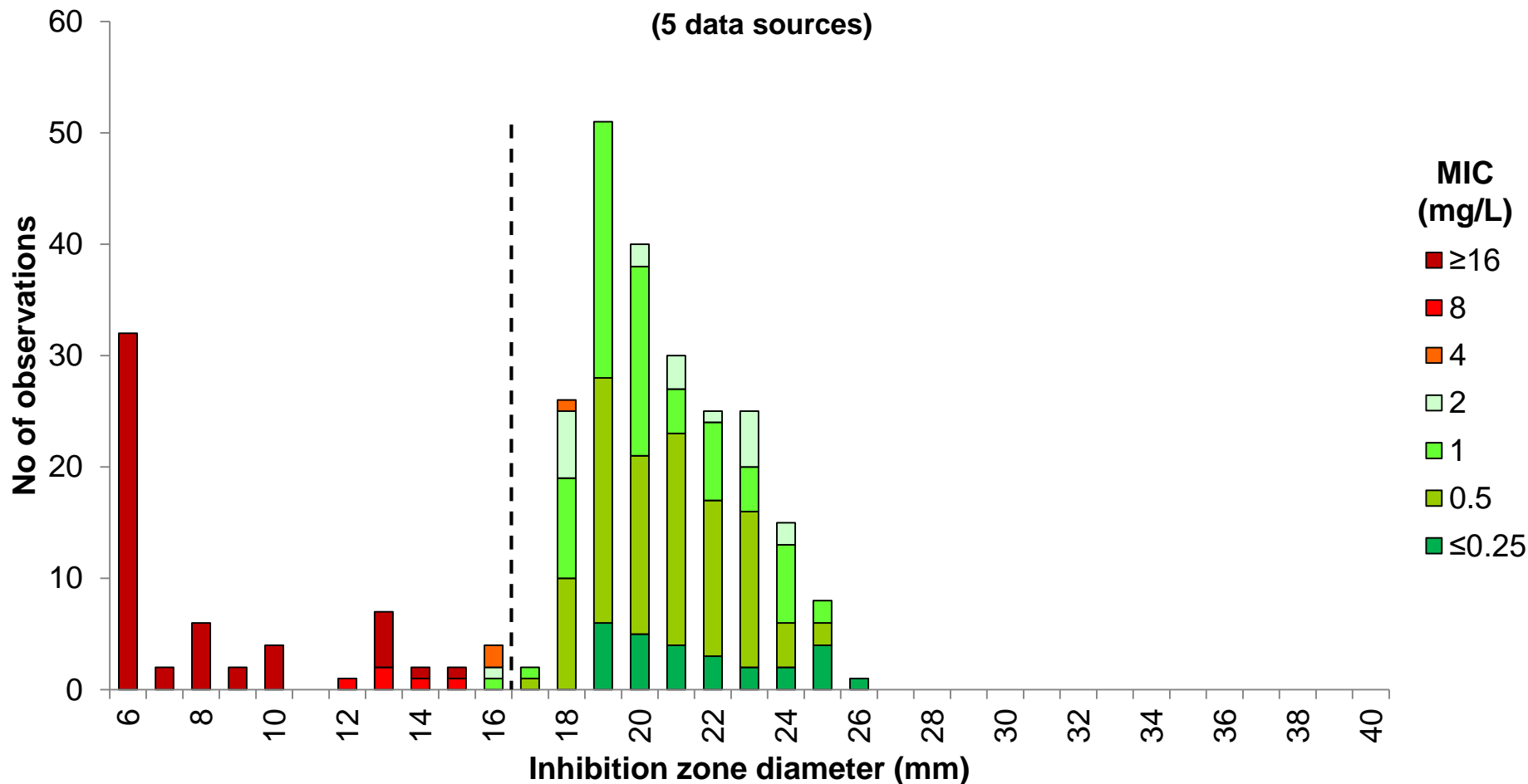
MIC S ≤ 8, R > 8 mg/L

Zone diameter S ≥ 18, R < 18 mm

Gentamicin 10 µg vs. MIC

Enterobacteriales, 242 isolates (285 correlates)

(5 data sources)



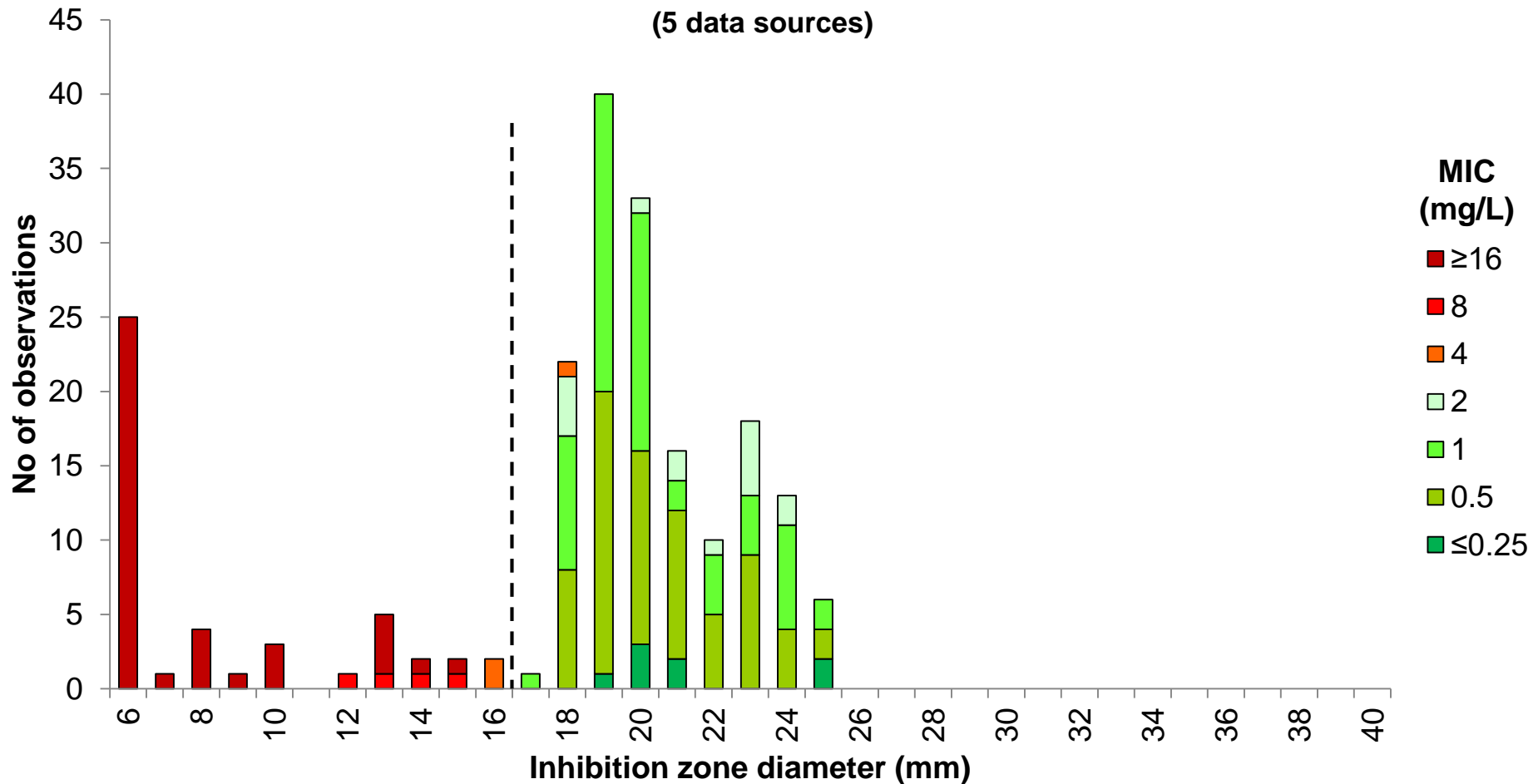
Breakpoints

MIC $S \leq 2, R > 2$ mg/L

Zone diameter $S \geq 17, R < 17$ mm

Gentamicin 10 µg vs. MIC *E. coli*, 185 isolates (205 correlates)

(5 data sources)



Breakpoints

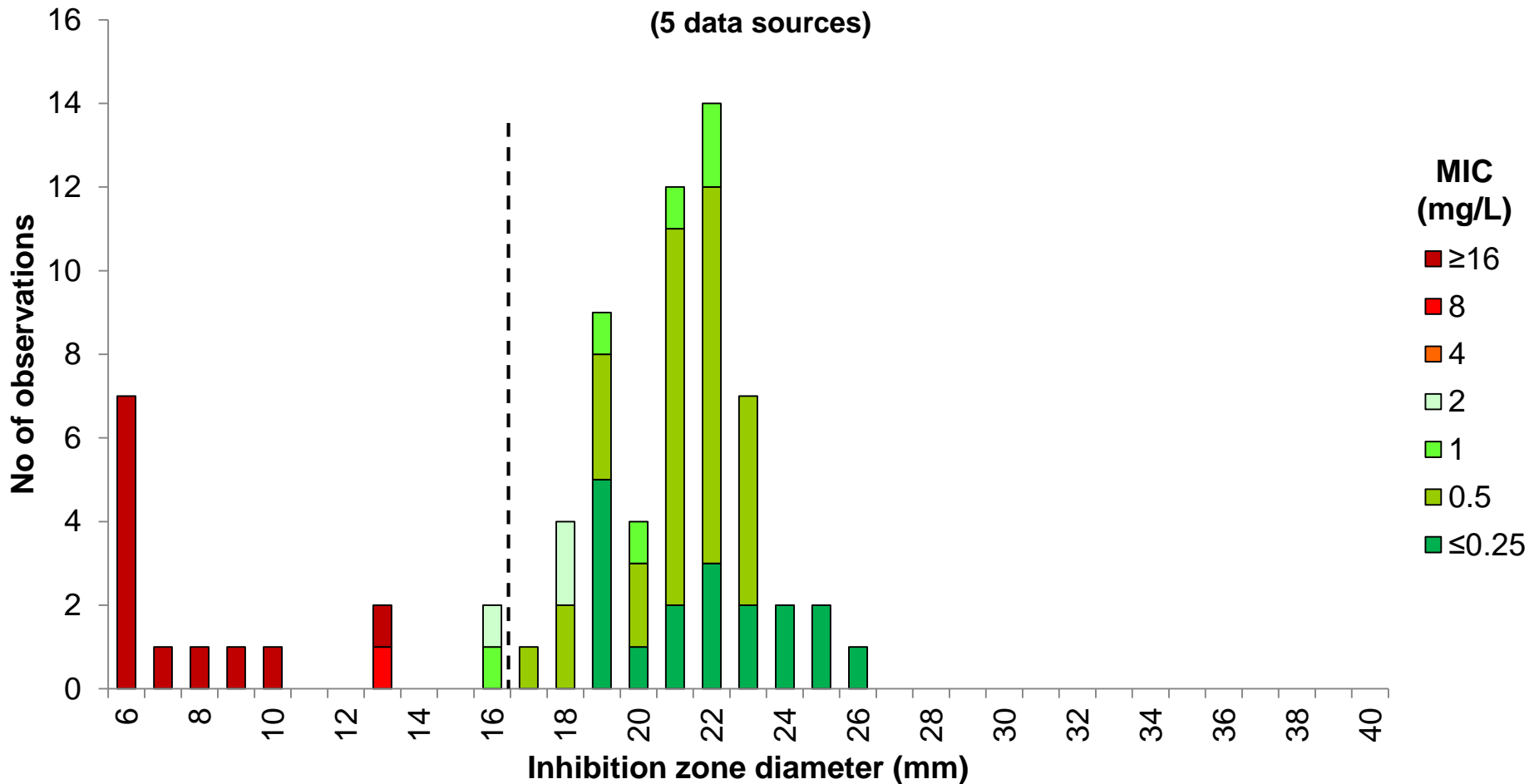
MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 17, R < 17 mm

Gentamicin 10 µg vs. MIC

K. pneumoniae, 61 isolates (71 correlates)

(5 data sources)



Breakpoints

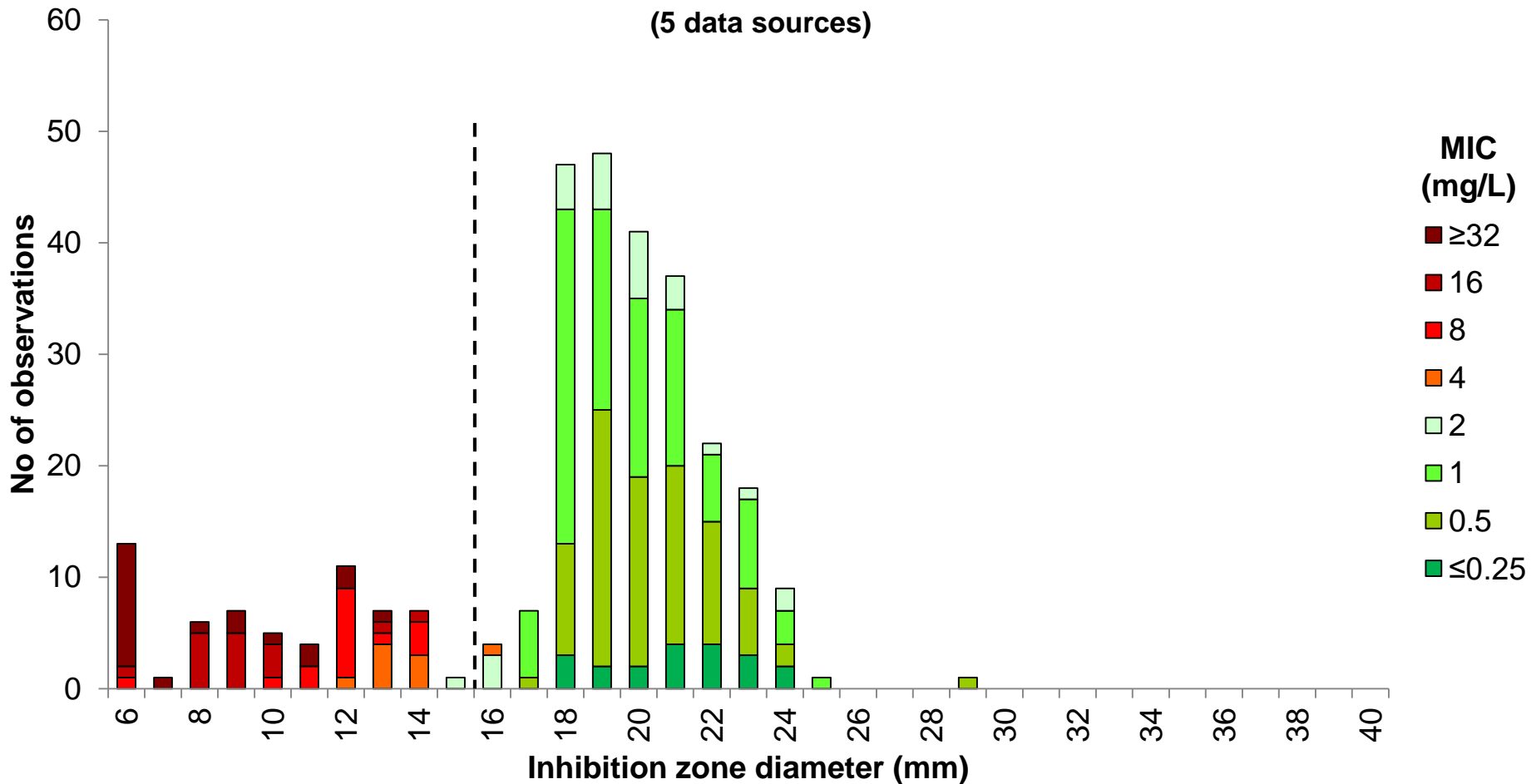
MIC $S \leq 2, R > 2$ mg/L

Zone diameter $S \geq 17, R < 17$ mm

Tobramycin 10 μ g vs. MIC

Enterobacterales, 254 isolates (297 correlates)

(5 data sources)



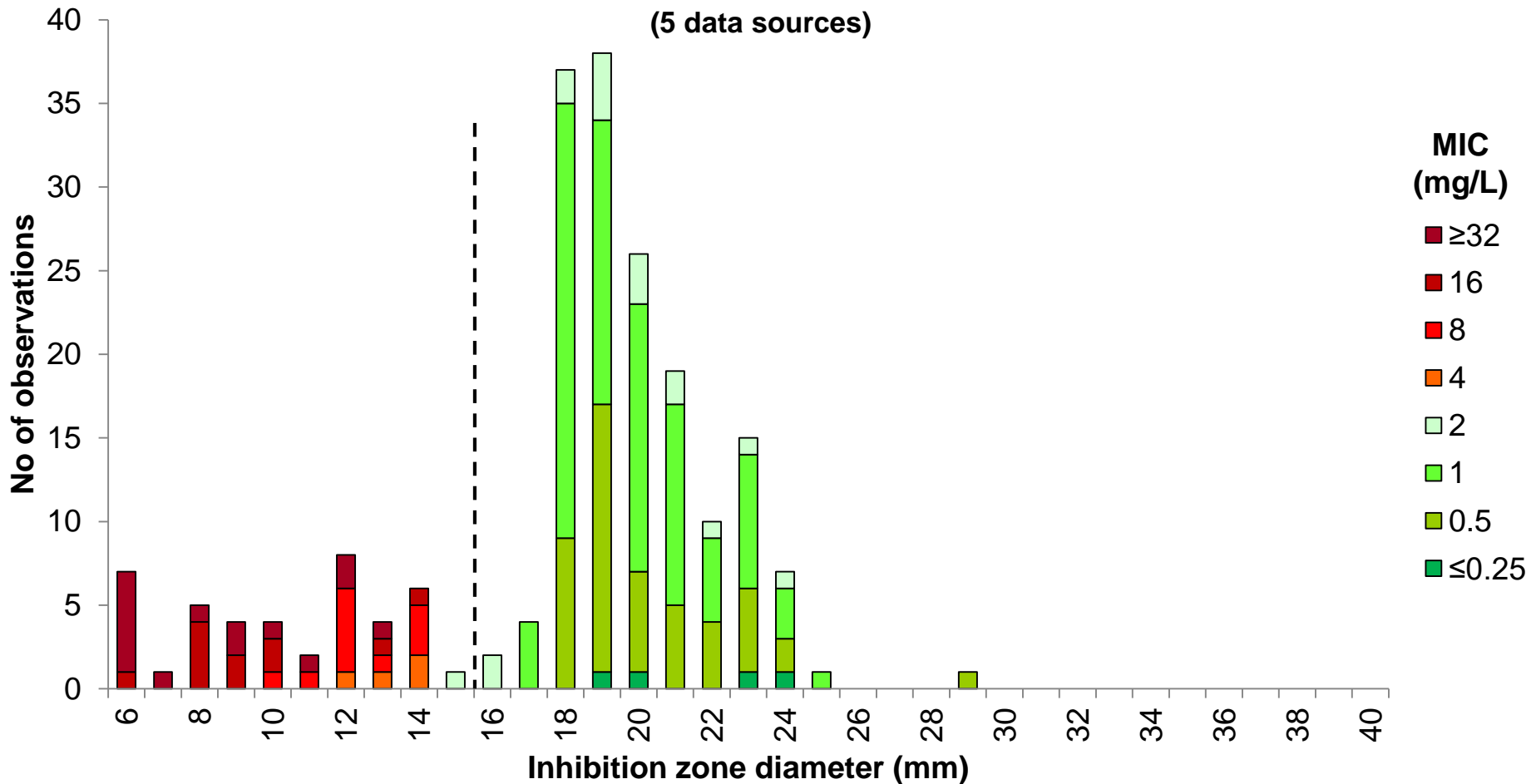
Breakpoints

MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 16$, $R < 16$ mm

Tobramycin 10 µg vs. MIC *E. coli*, 170 isolates (202 correlates)

(5 data sources)



Breakpoints

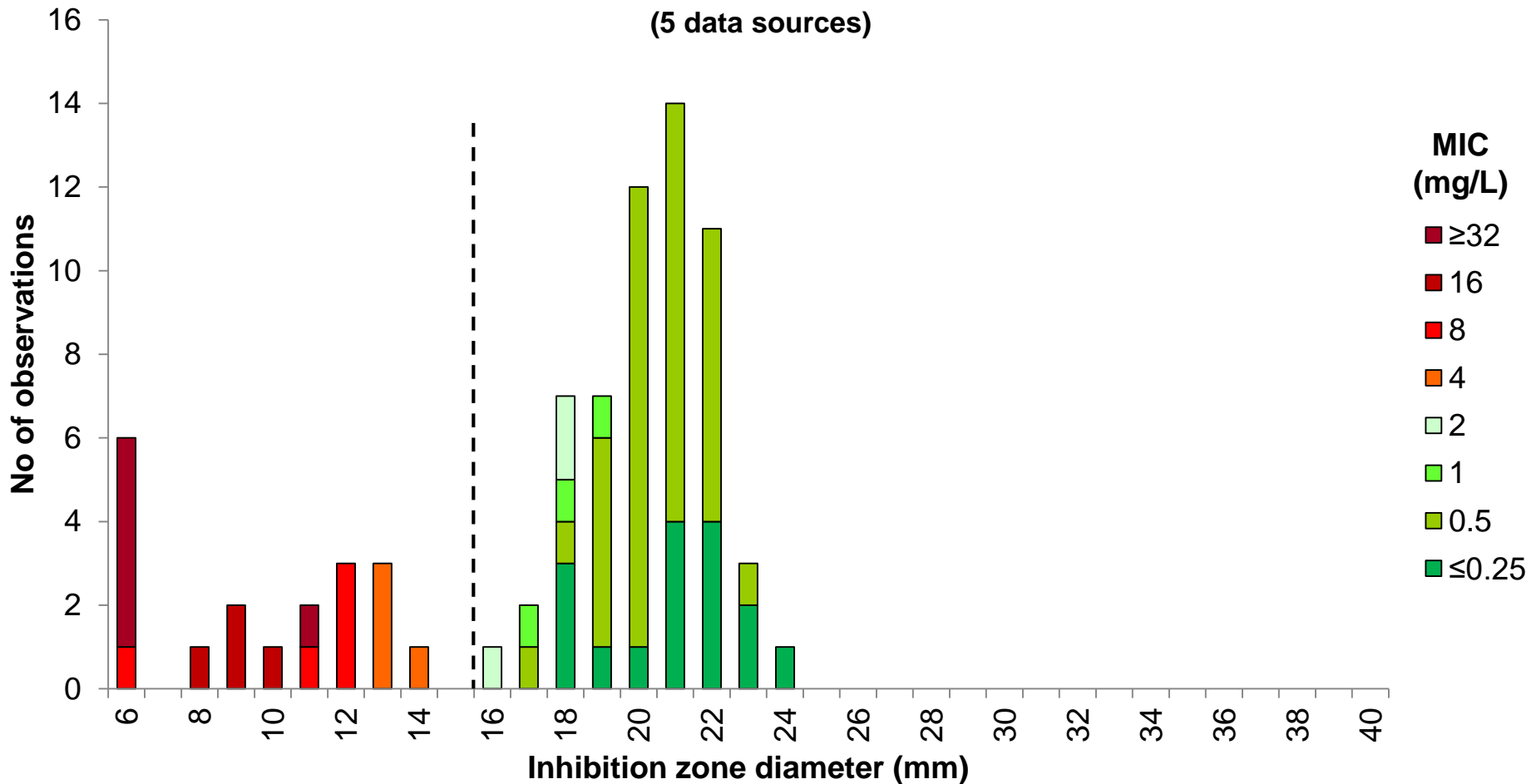
MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 16$, $R < 16$ mm

Tobramycin 10 µg vs. MIC

K. pneumoniae, 66 isolates (77 correlates)

(5 data sources)



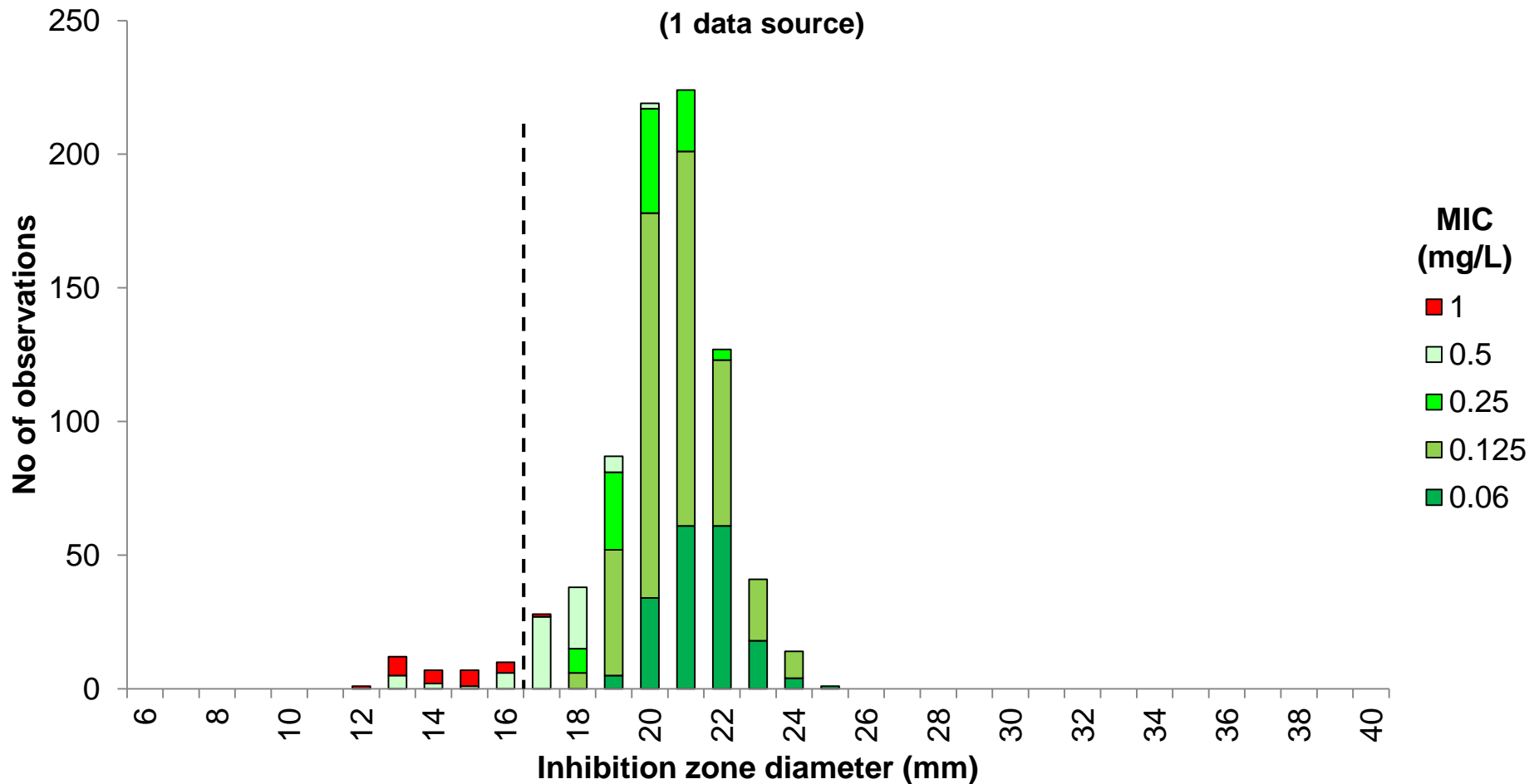
Breakpoints

MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 16$, $R < 16$ mm

Eravacycline 20 µg vs. MIC *E. coli*, 104 isolates (816 correlates)

(1 data source)



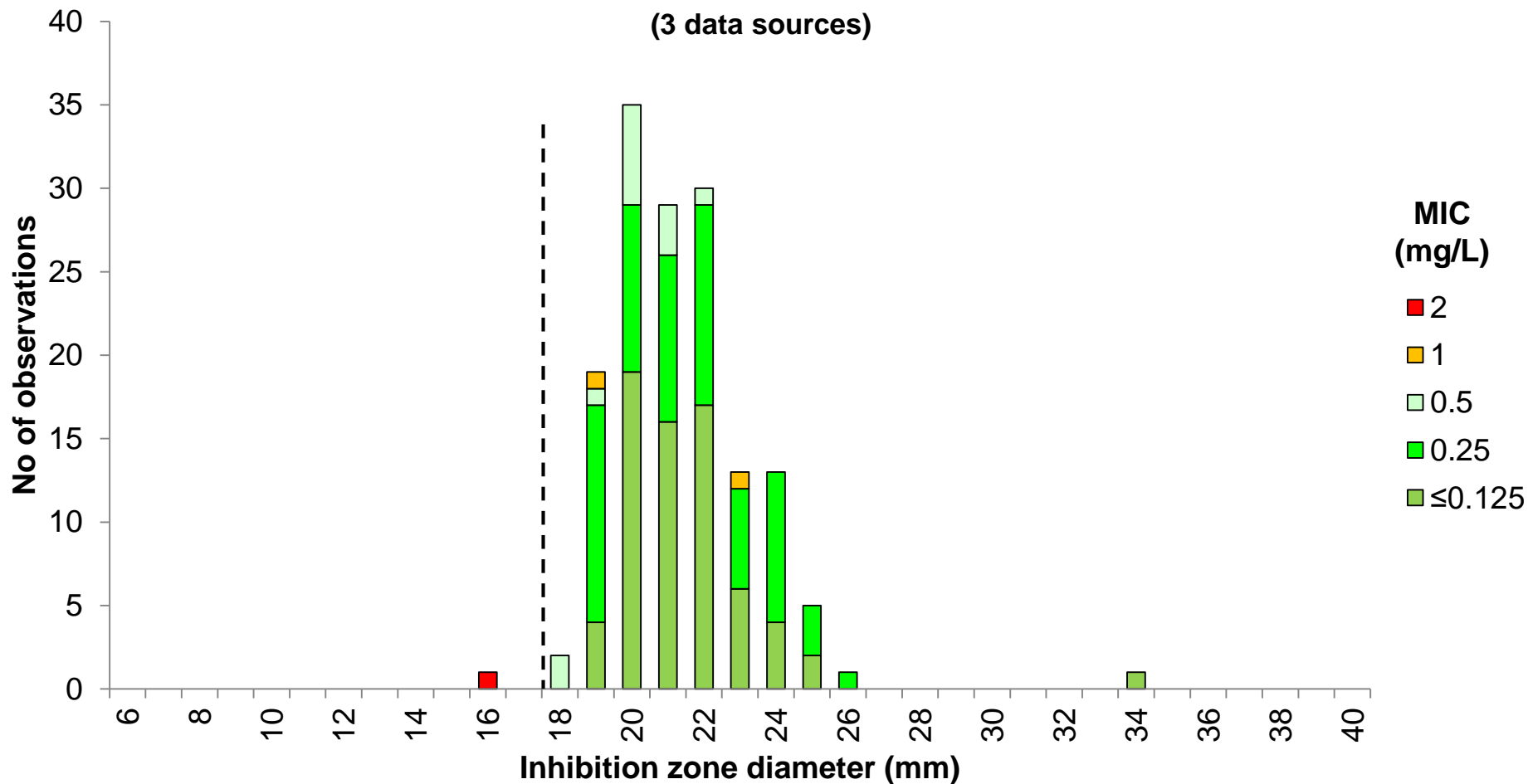
Breakpoints (*E. coli*)

MIC $S \leq 0.5$, $R > 0.5$ mg/L

Zone diameter $S \geq 17$, $R < 17$ mm

Tigecycline 15 µg vs. MIC *E. coli*, 149 isolates

(3 data sources)



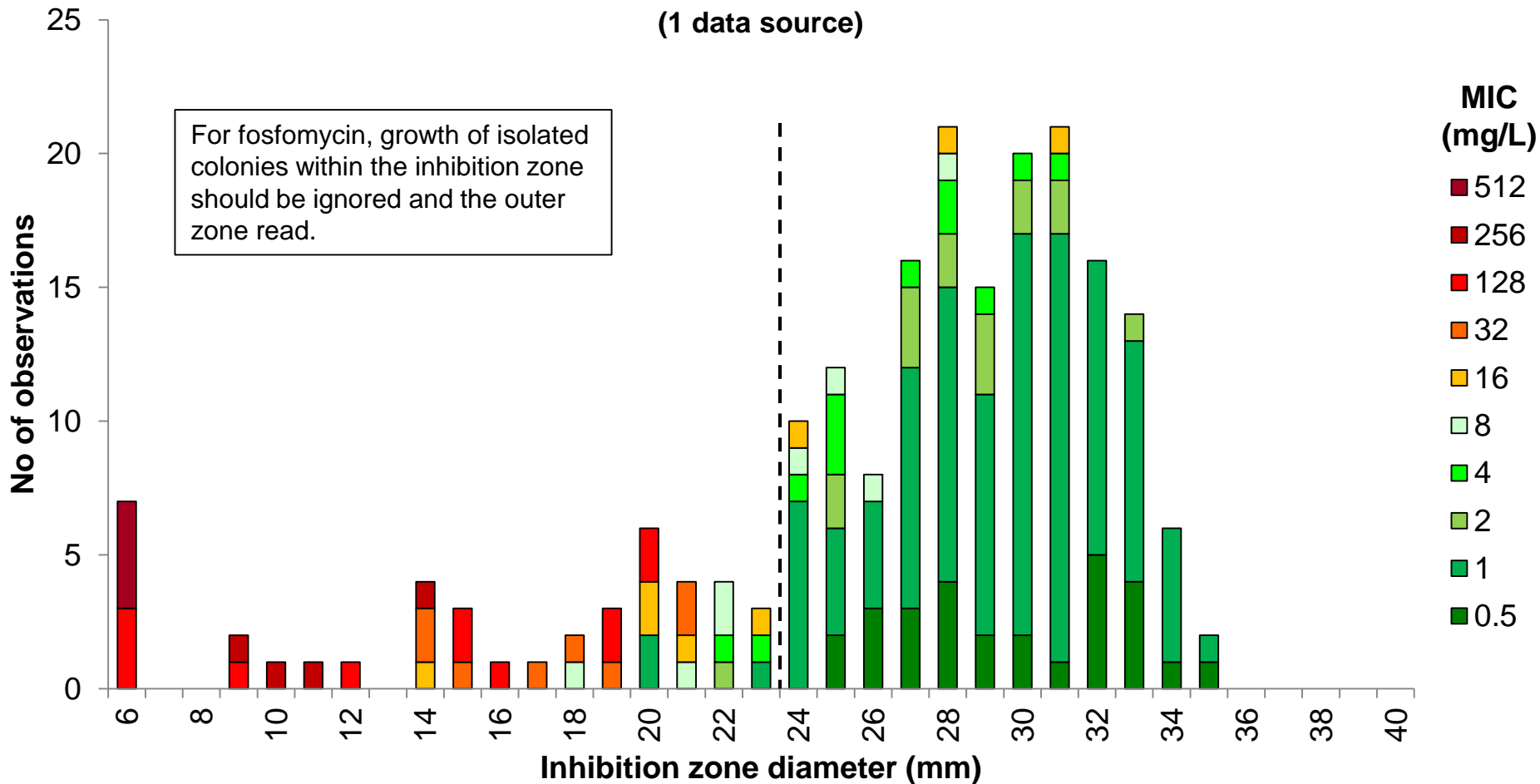
Breakpoints

MIC S ≤ 0.5, R > 0.5 mg/L

Zone diameter S ≥ 18, R < 18 mm

Fosfomycin 200 µg vs. MIC *E. coli*, 51 isolates (204 correlates)

(1 data source)



Breakpoints (iv, infections originating from the urinary tract)

MIC

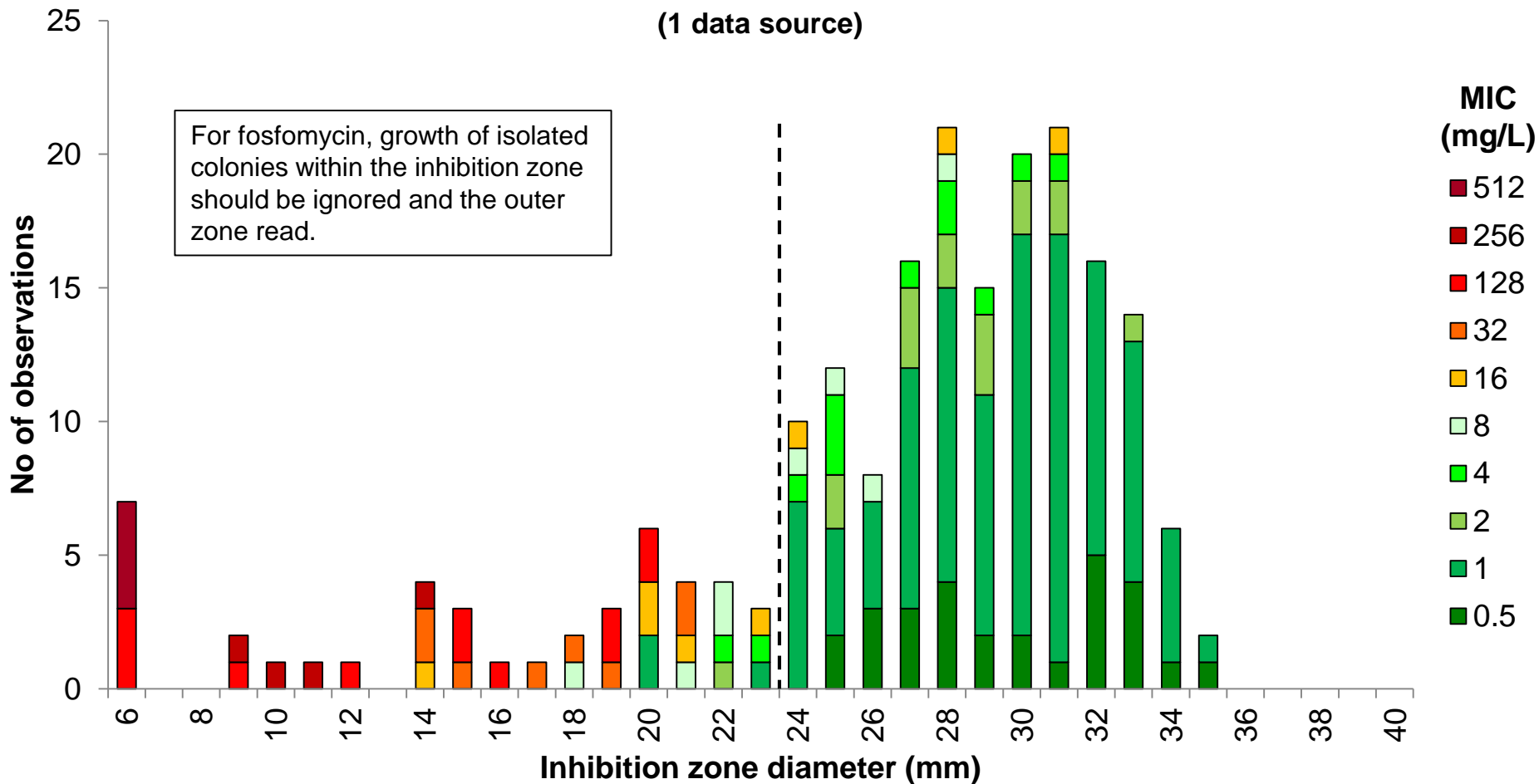
$S \leq 8, R > 8$ mg/L

Zone diameter

$S \geq 24, R < 24$ mm

Fosfomycin 200 µg vs. MIC *E. coli*, 51 isolates (204 correlates)

(1 data source)



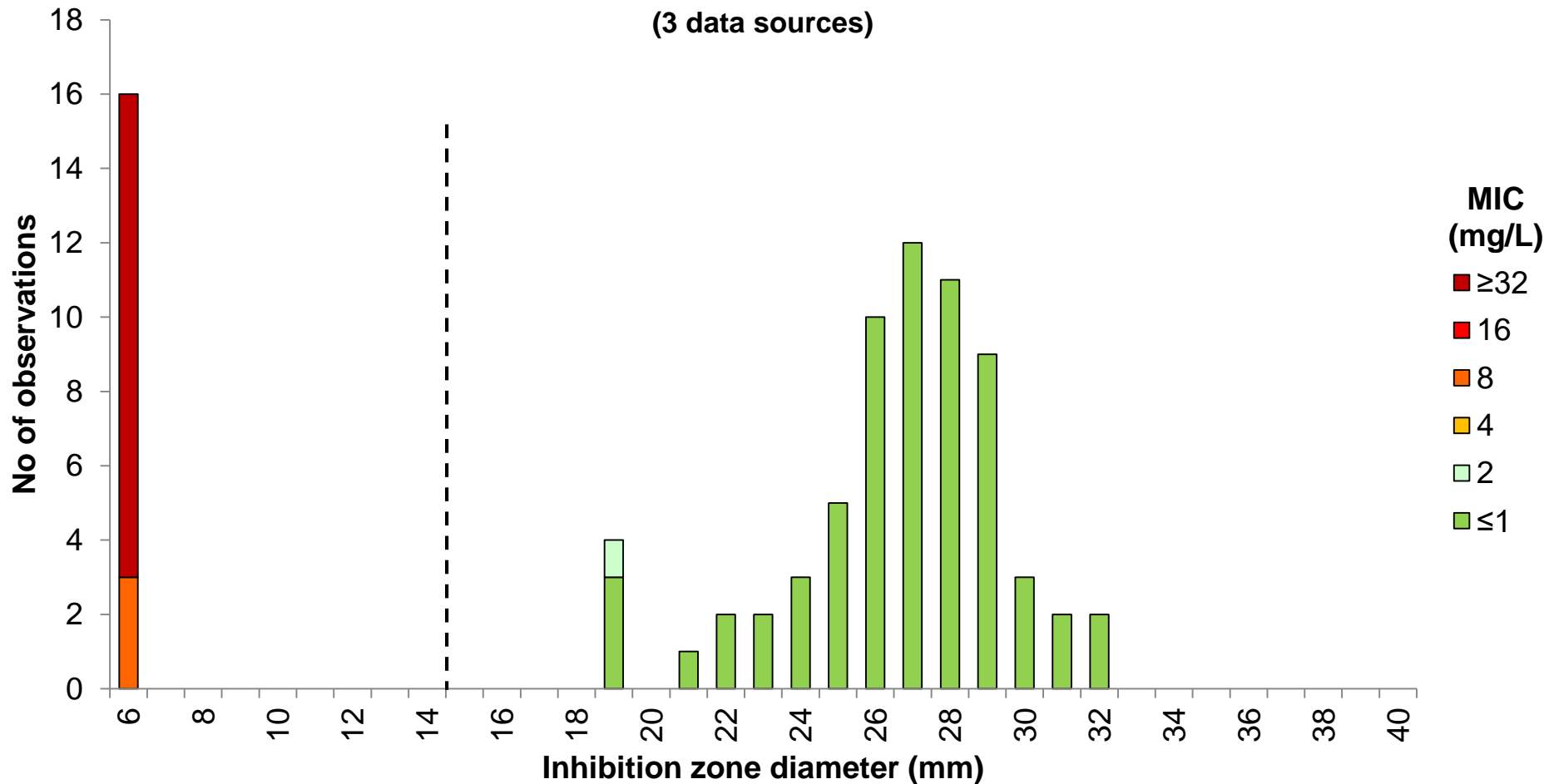
Breakpoints (oral, uncomplicated UTI)

MIC S ≤ 8, R > 8 mg/L

Zone diameter S ≥ 24, R < 24 mm

Trimethoprim 5 μ g vs. MIC *E. coli*, 74 isolates (82 correlates)

(3 data sources)



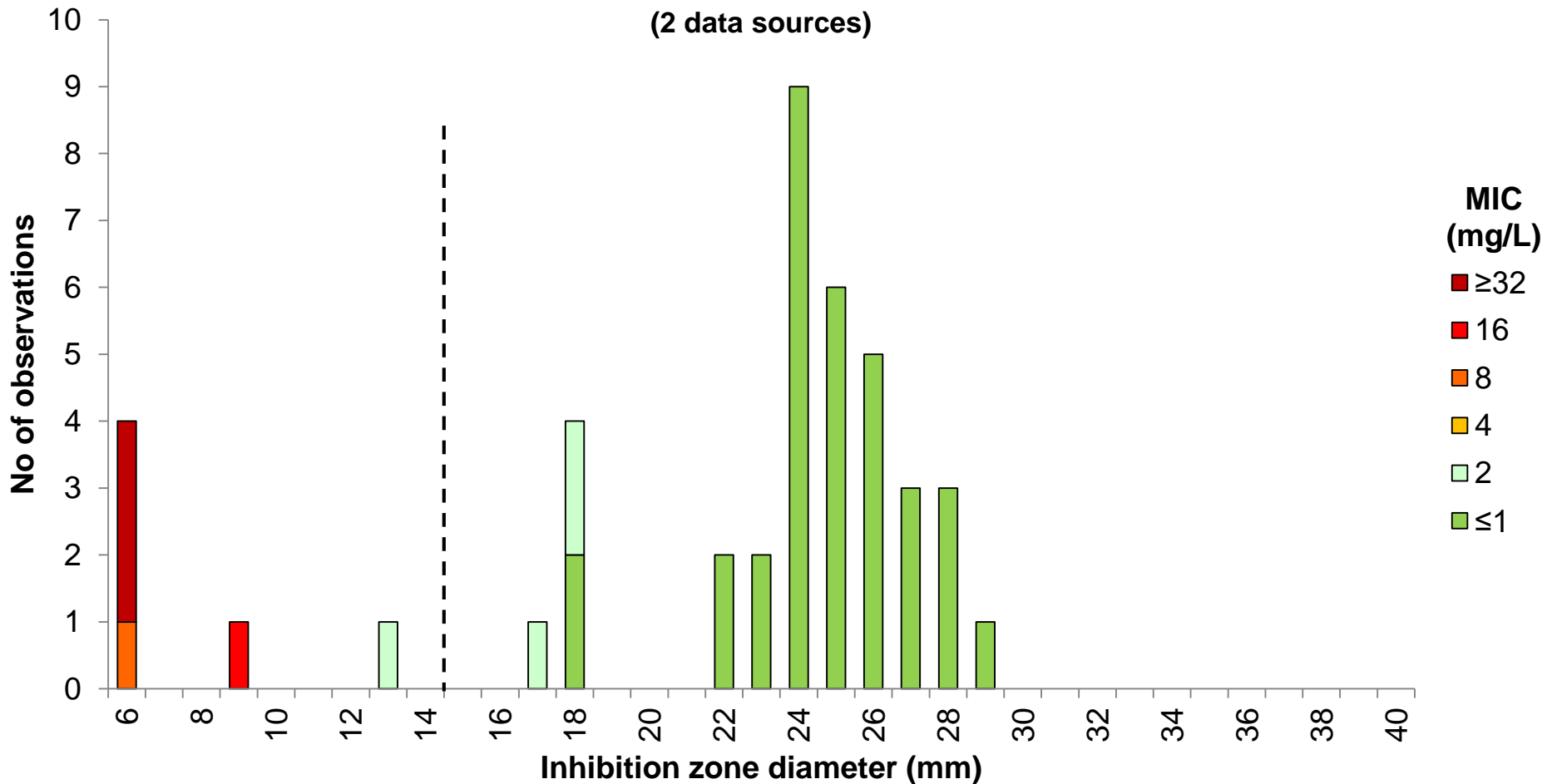
Breakpoints (*E. coli* and *Klebsiella* spp., except *K. aerogenes*)

MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 15$, $R < 15$ mm

Trimethoprim 5 μ g vs. MIC *K. pneumoniae*, 42 isolates

(2 data sources)



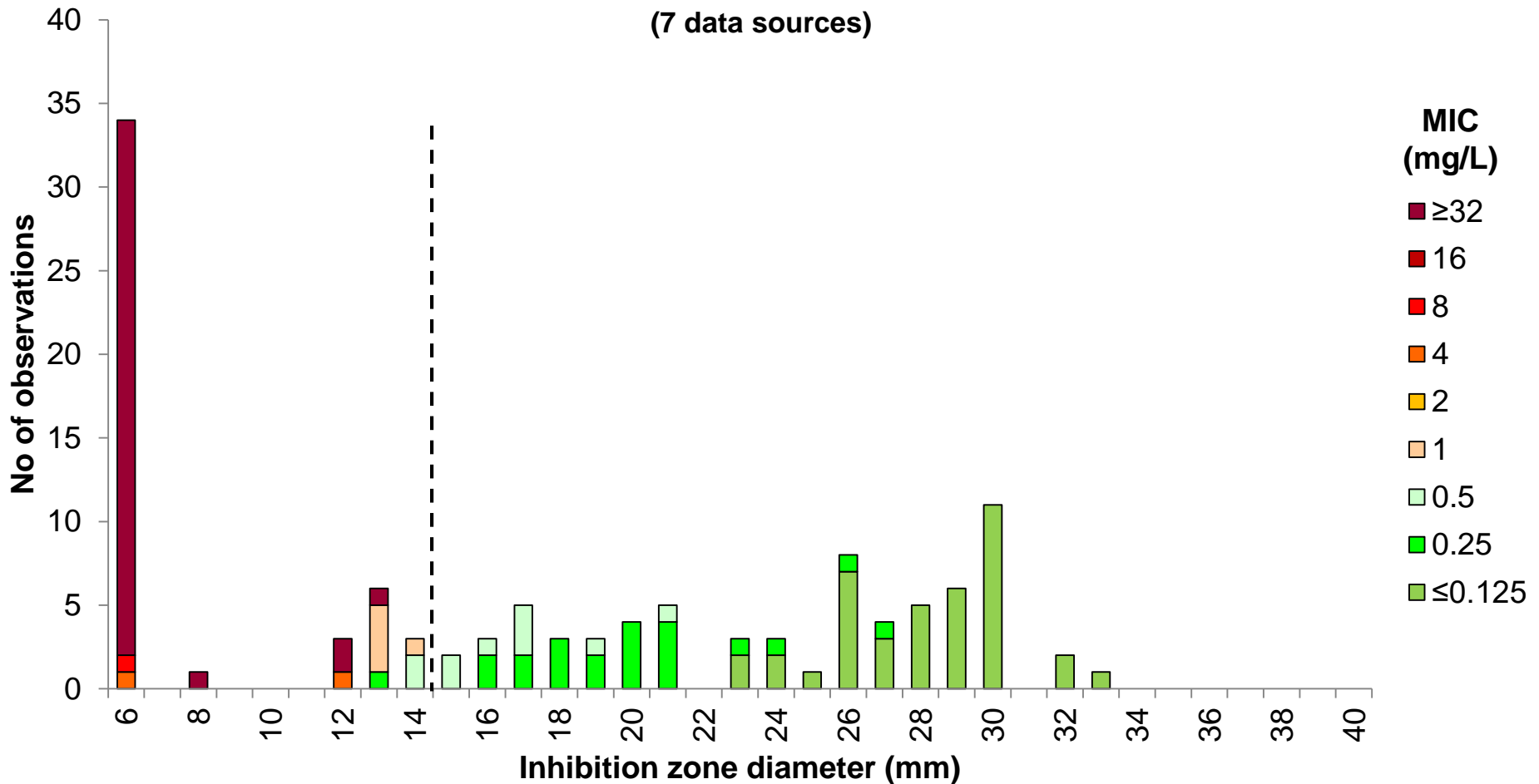
Breakpoints (*E. coli* and *Klebsiella* spp., except *K. aerogenes*)

MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 15$, $R < 15$ mm

Trimethoprim-sulfamethoxazole 1.25-23.75 μg vs. MIC *Enterobacteriales*, 107 isolates (116 correlates)

(7 data sources)



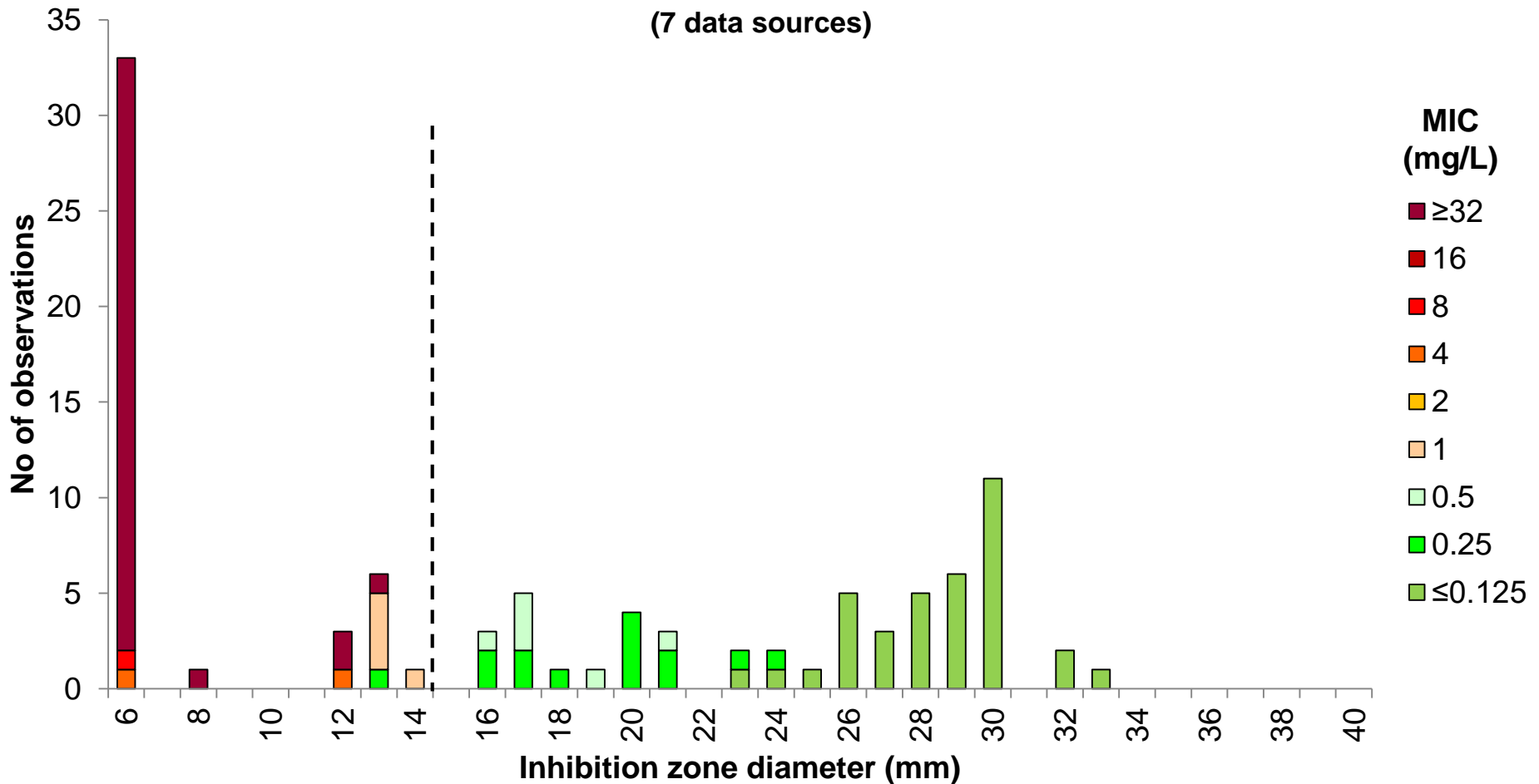
Breakpoints (*Enterobacteriales*, except *Serratia* spp.)

MIC $S \leq 0.5$, $R > 0.5$ mg/L

Zone diameter $S \geq 15$, $R < 15$ mm

Trimethoprim-sulfamethoxazole 1.25-23.75 μg vs. MIC *E. coli*, 92 isolates (99 correlates)

(7 data sources)



Breakpoints (*Enterobacteriales*, except *Serratia* spp.)

MIC $S \leq 0.5$, $R > 0.5$ mg/L

Zone diameter $S \geq 15$, $R < 15$ mm

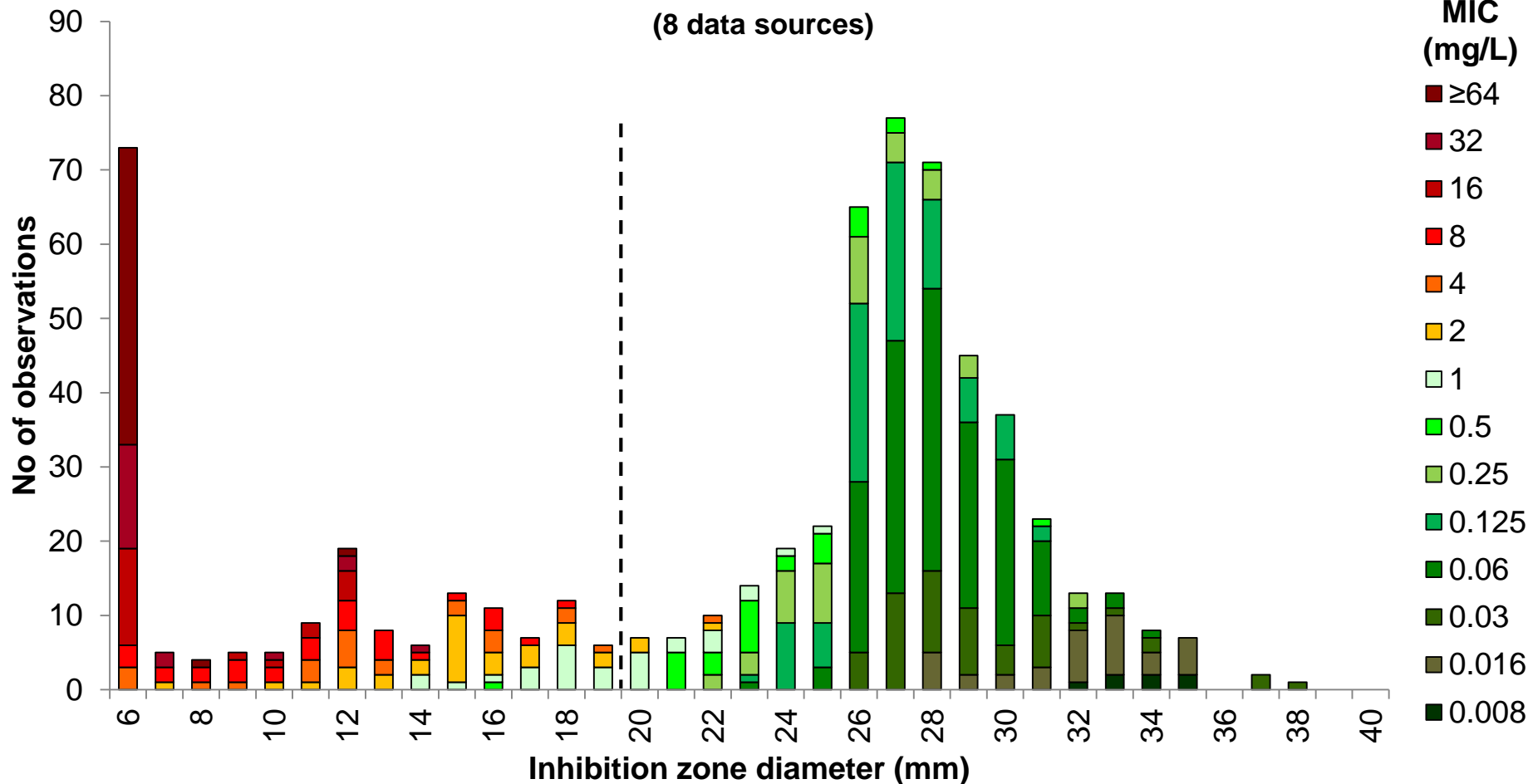
Enterobacterales

Distributions with separate
breakpoints for meningitis

Cefotaxime 5 µg vs. MIC

Enterobacteriales, 573 isolates (624 correlates)

(8 data sources)



Breakpoints (meningitis)

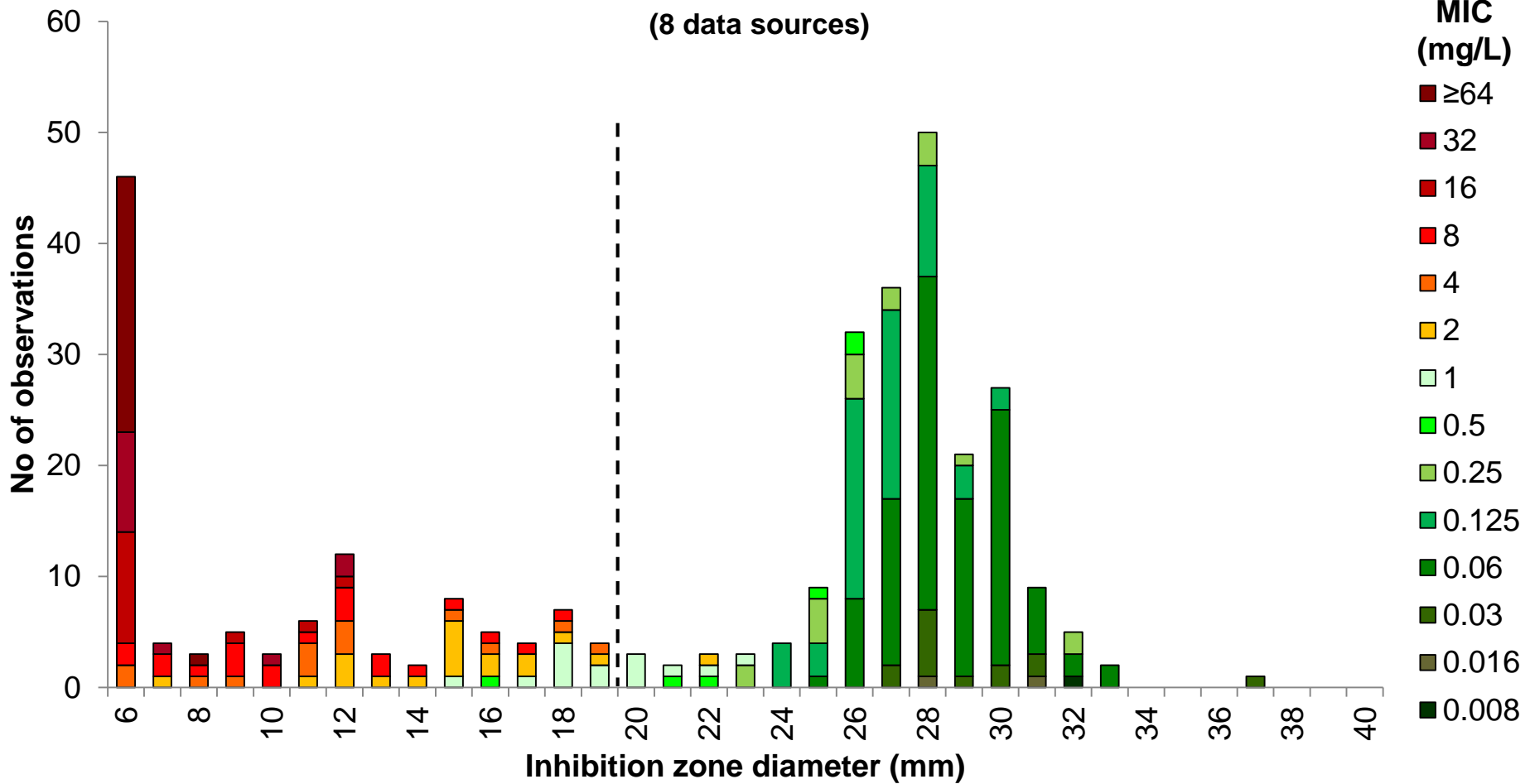
MIC $S \leq 1$, $R > 1$ mg/L

Zone diameter $S \geq 20$, $R < 20$ mm

Cefotaxime 5 µg vs. MIC

E. coli, 288 isolates (319 correlates)

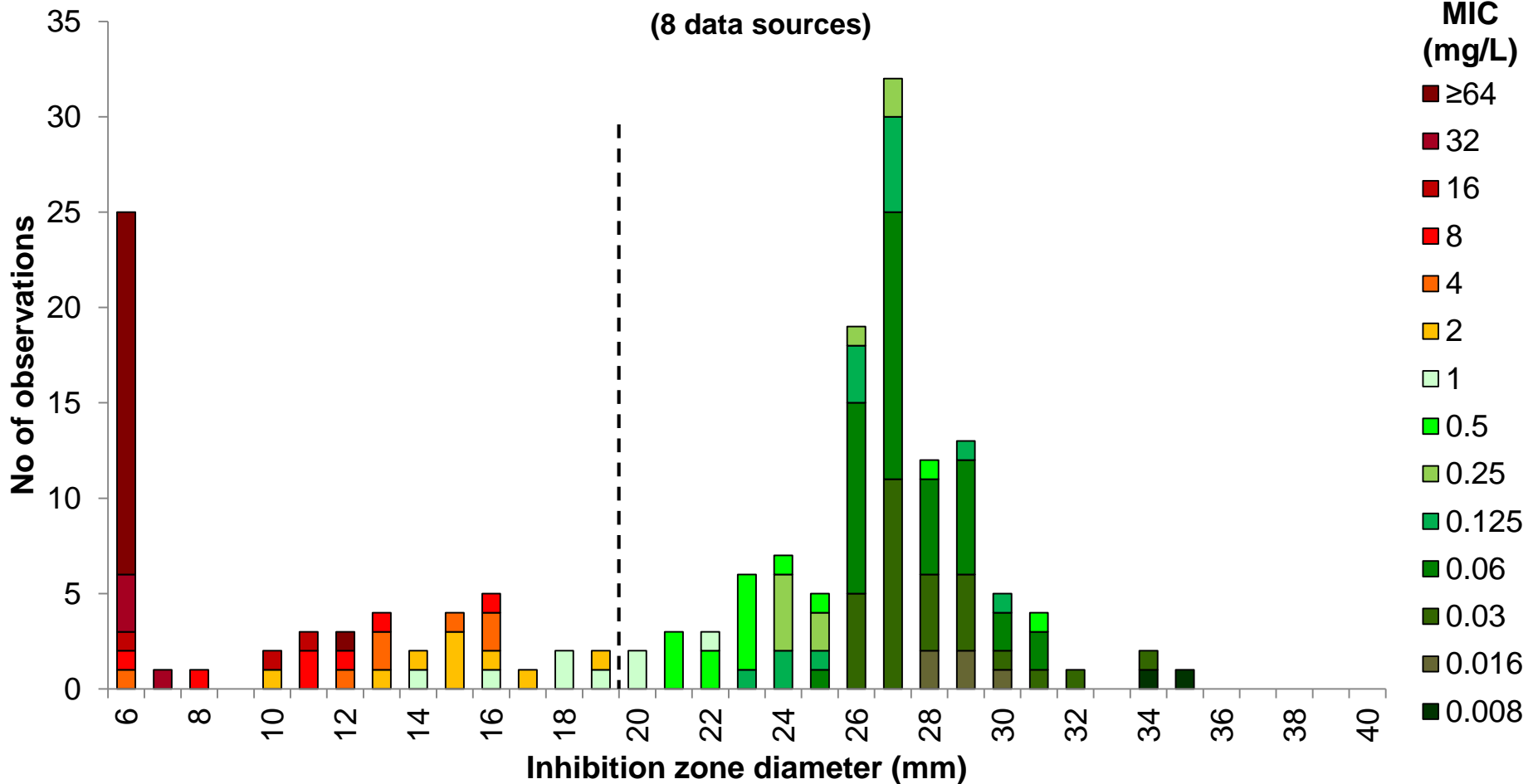
(8 data sources)



Breakpoints (meningitis)
 MIC S ≤ 1, R > 1 mg/L
 Zone diameter S ≥ 20, R < 20 mm

Cefotaxime 5 µg vs. MIC

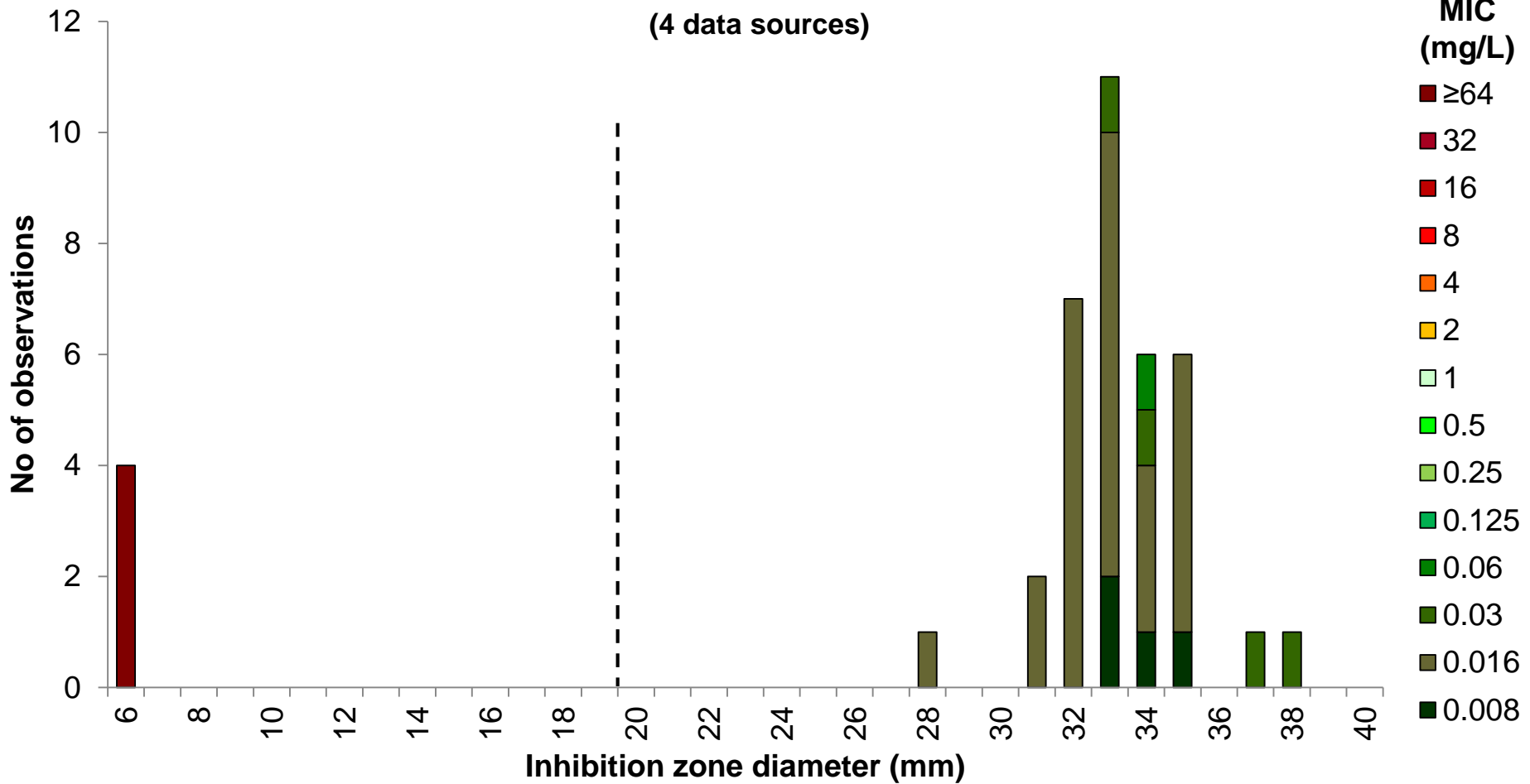
K. pneumoniae, 151 isolates (170 correlates)



Breakpoints (meningitis)	
MIC	S ≤ 1, R > 1 mg/L
Zone diameter	S ≥ 20, R < 20 mm

Cefotaxime 5 µg vs. MIC

P. mirabilis, 37 isolates (39 correlates)



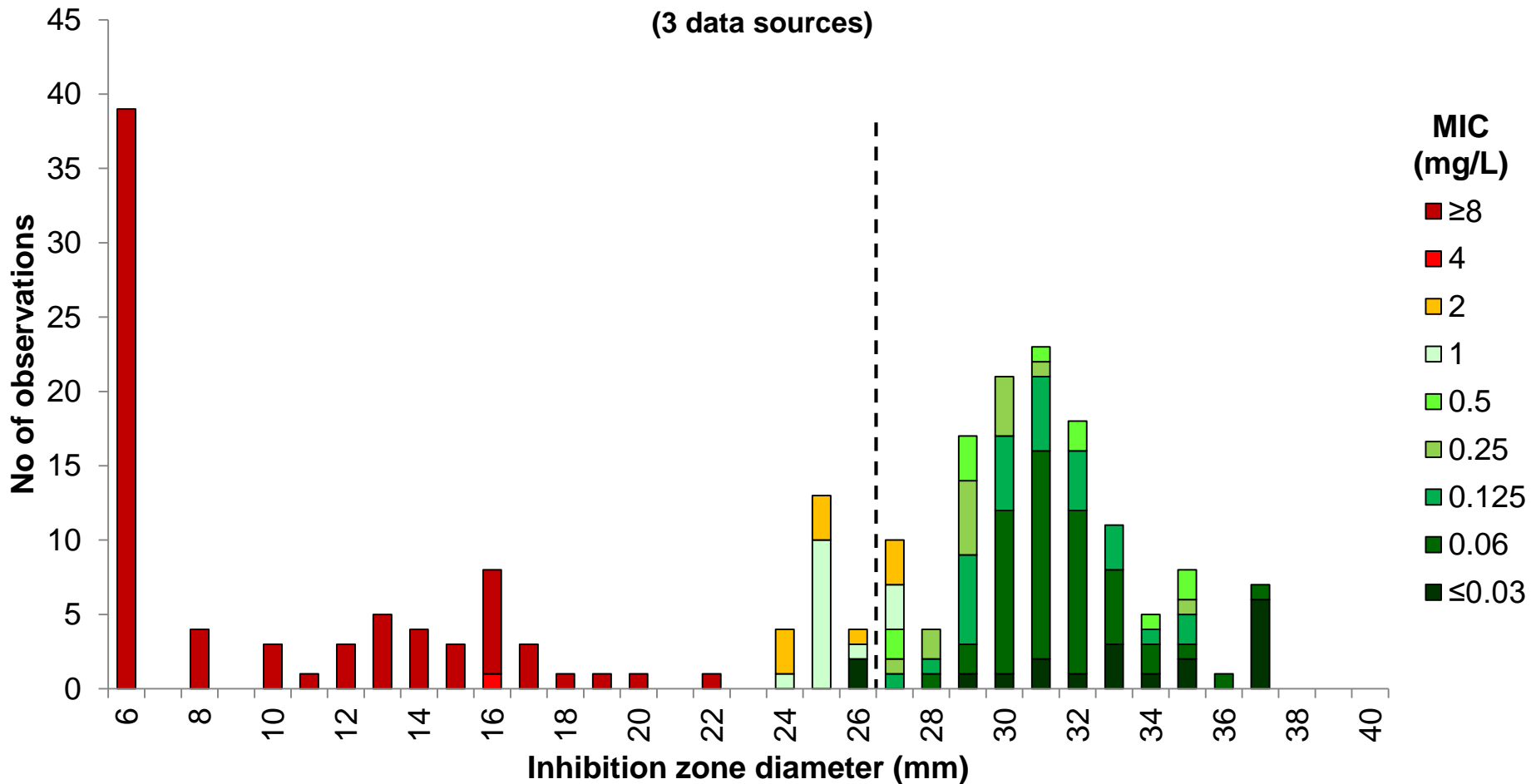
Breakpoints (meningitis)

MIC $S \leq 1, R > 1$ mg/L

Zone diameter $S \geq 20, R < 20$ mm

Ceftriaxone 30 µg vs. MIC *Enterobacteriales*, 202 isolates (223 correlates)

(3 data sources)



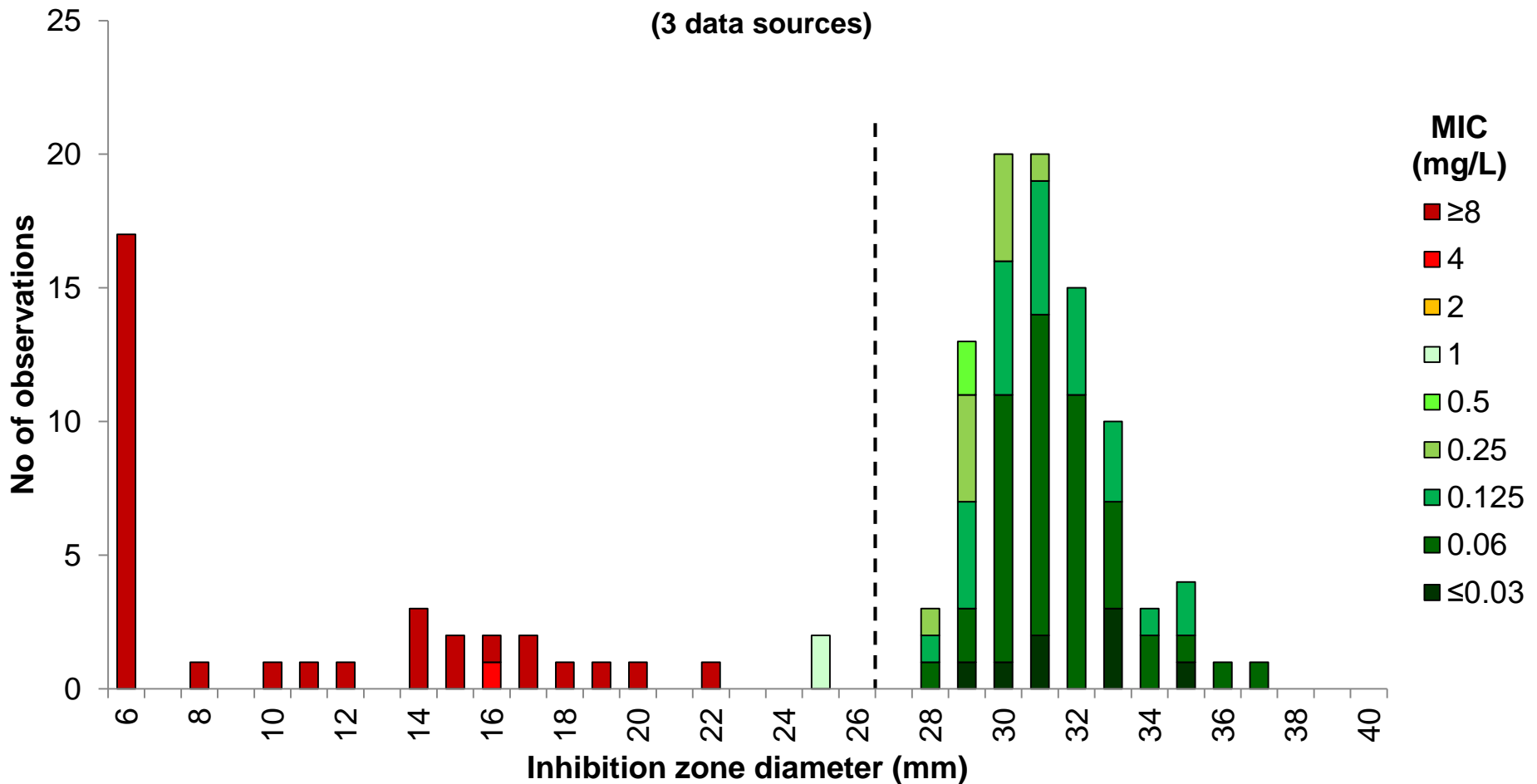
Breakpoints (meningitis)

MIC S ≤ 1, R > 1 mg/L

Zone diameter S ≥ 27, R < 27 mm

Ceftriaxone 30 µg vs. MIC *E. coli*, 115 isolates (126 correlates)

(3 data sources)



Breakpoints (meningitis)

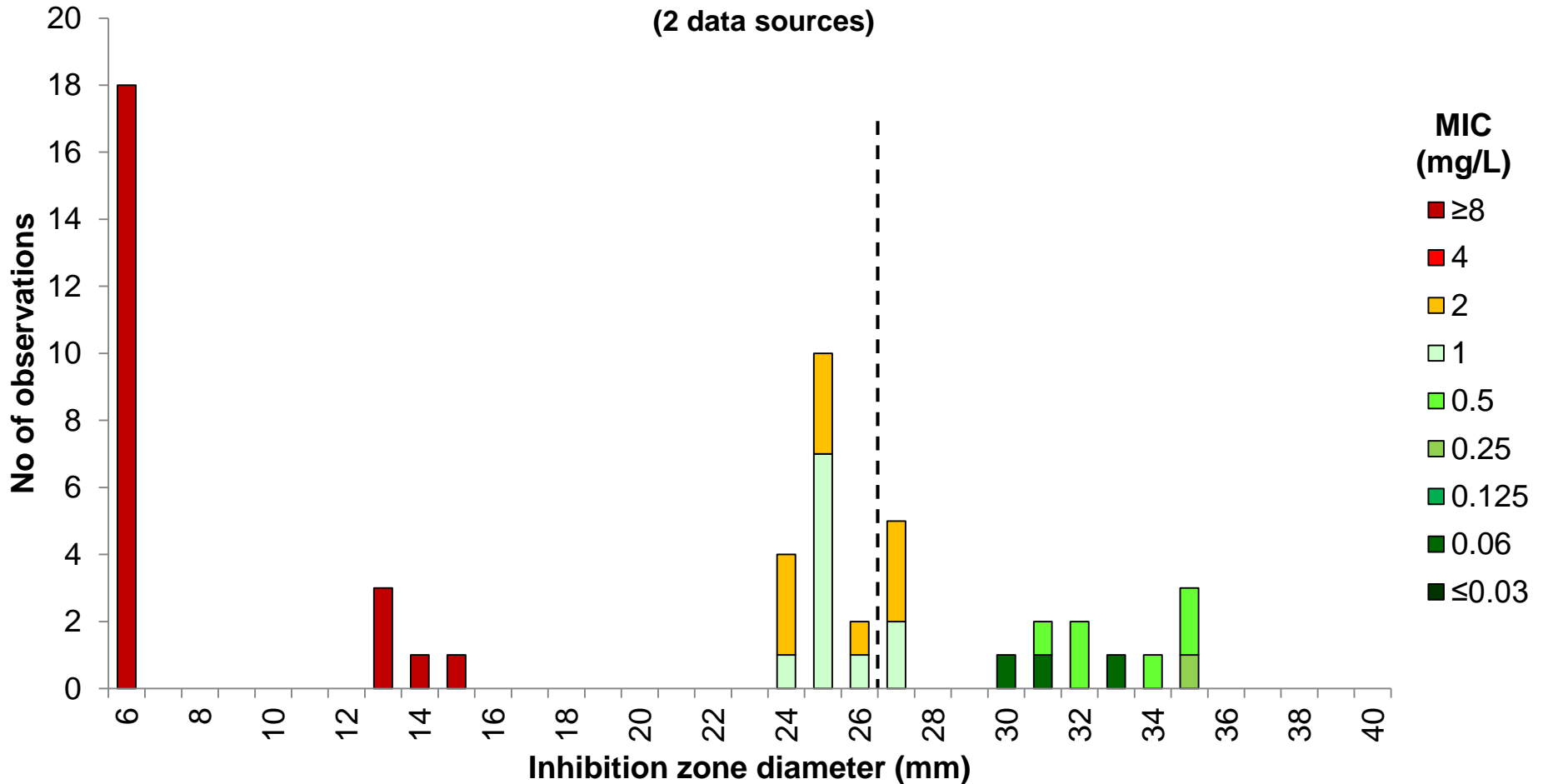
MIC $S \leq 1, R > 1$ mg/L

Zone diameter $S \geq 27, R < 27$ mm

Ceftriaxone 30 µg vs. MIC

K. pneumoniae, 47 isolates (54 correlates)

(2 data sources)



Breakpoints (meningitis)

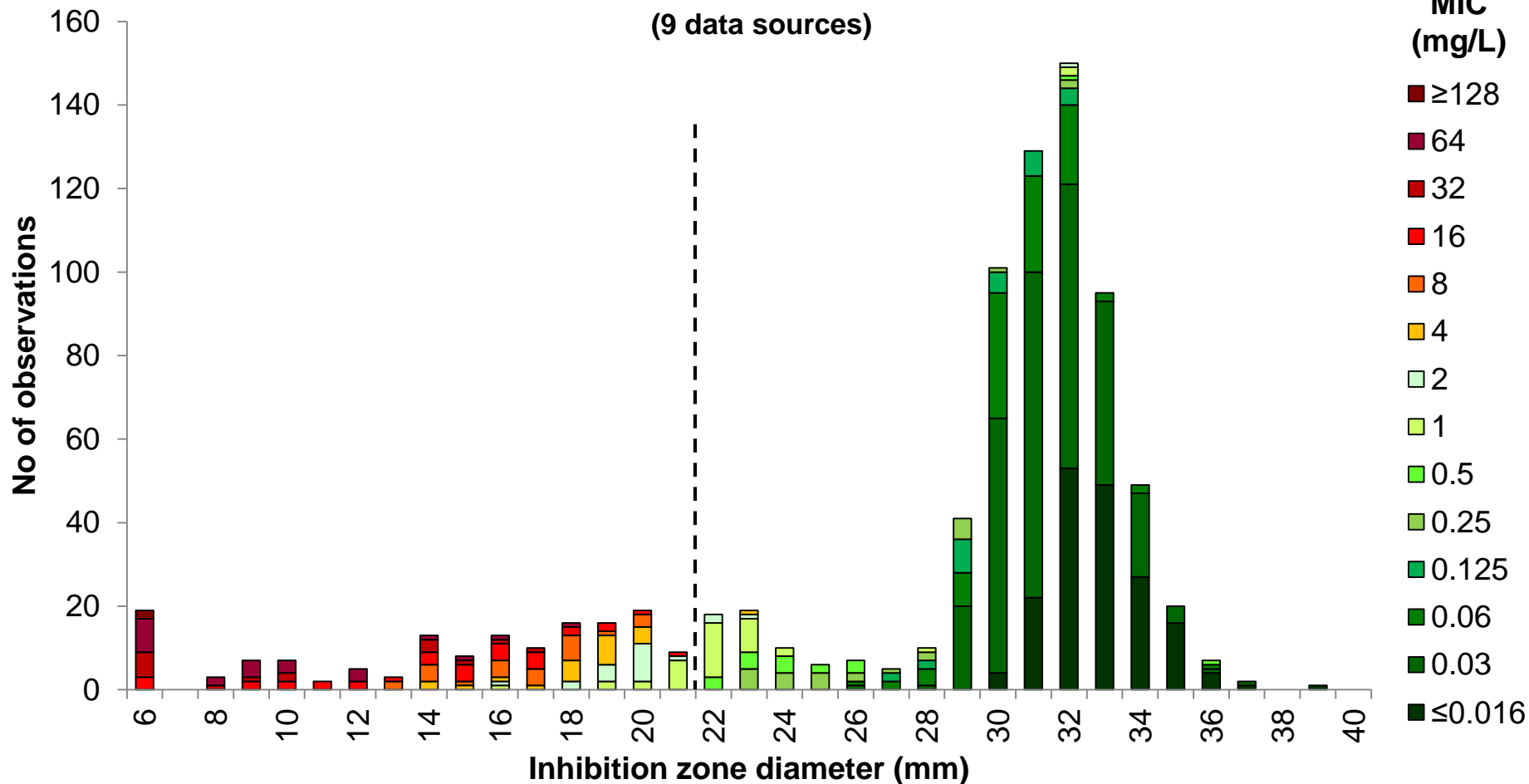
MIC $S \leq 1$, $R > 1$ mg/L

Zone diameter $S \geq 27$, $R < 27$ mm

Meropenem 10 µg vs. MIC

Enterobacteriales, 576 isolates (820 correlates)

(9 data sources)



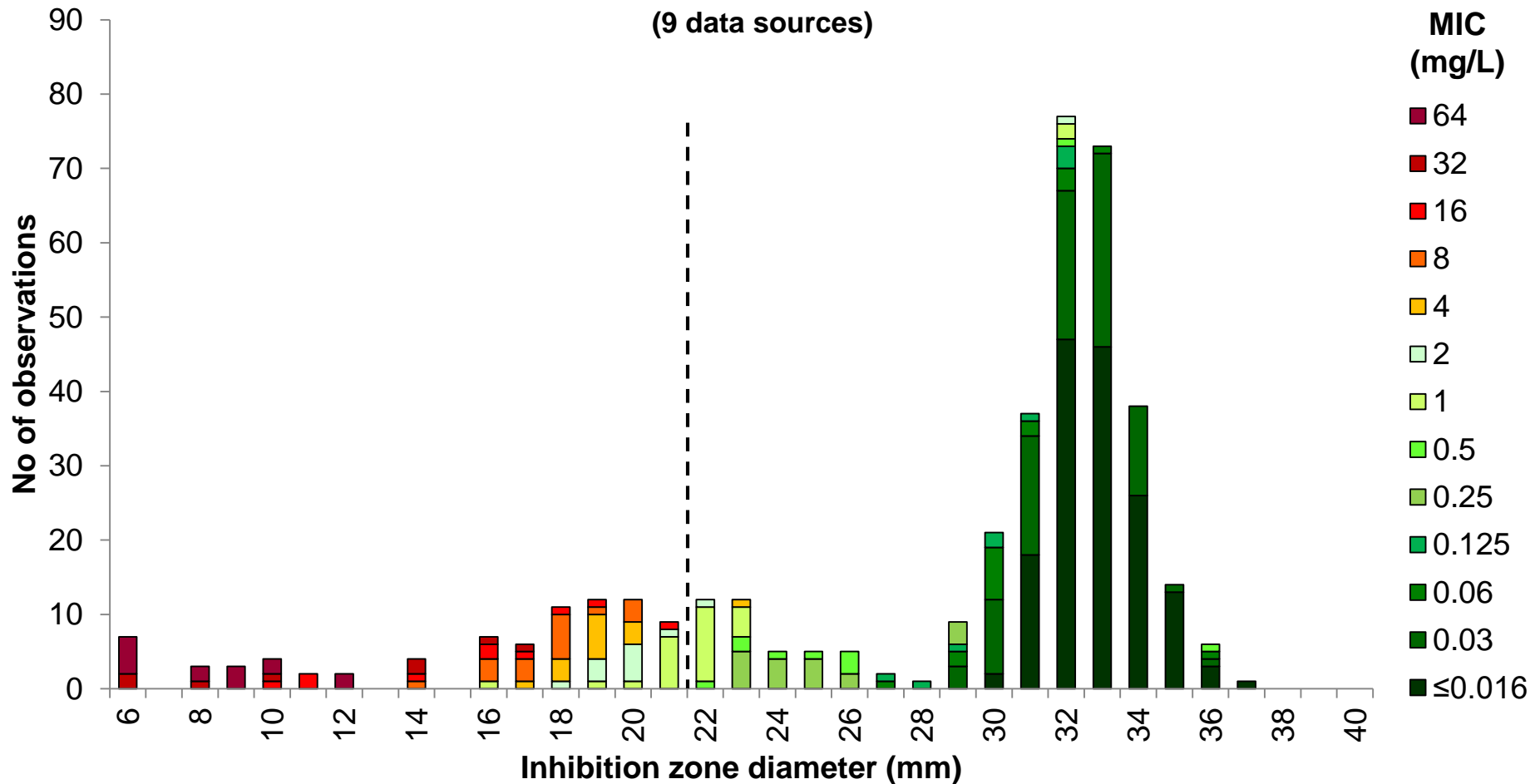
Breakpoints (meningitis)

MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 22, R < 22 mm

Meropenem 10 µg vs. MIC *E. coli*, 280 isolates (400 correlates)

(9 data sources)



Breakpoints (meningitis)

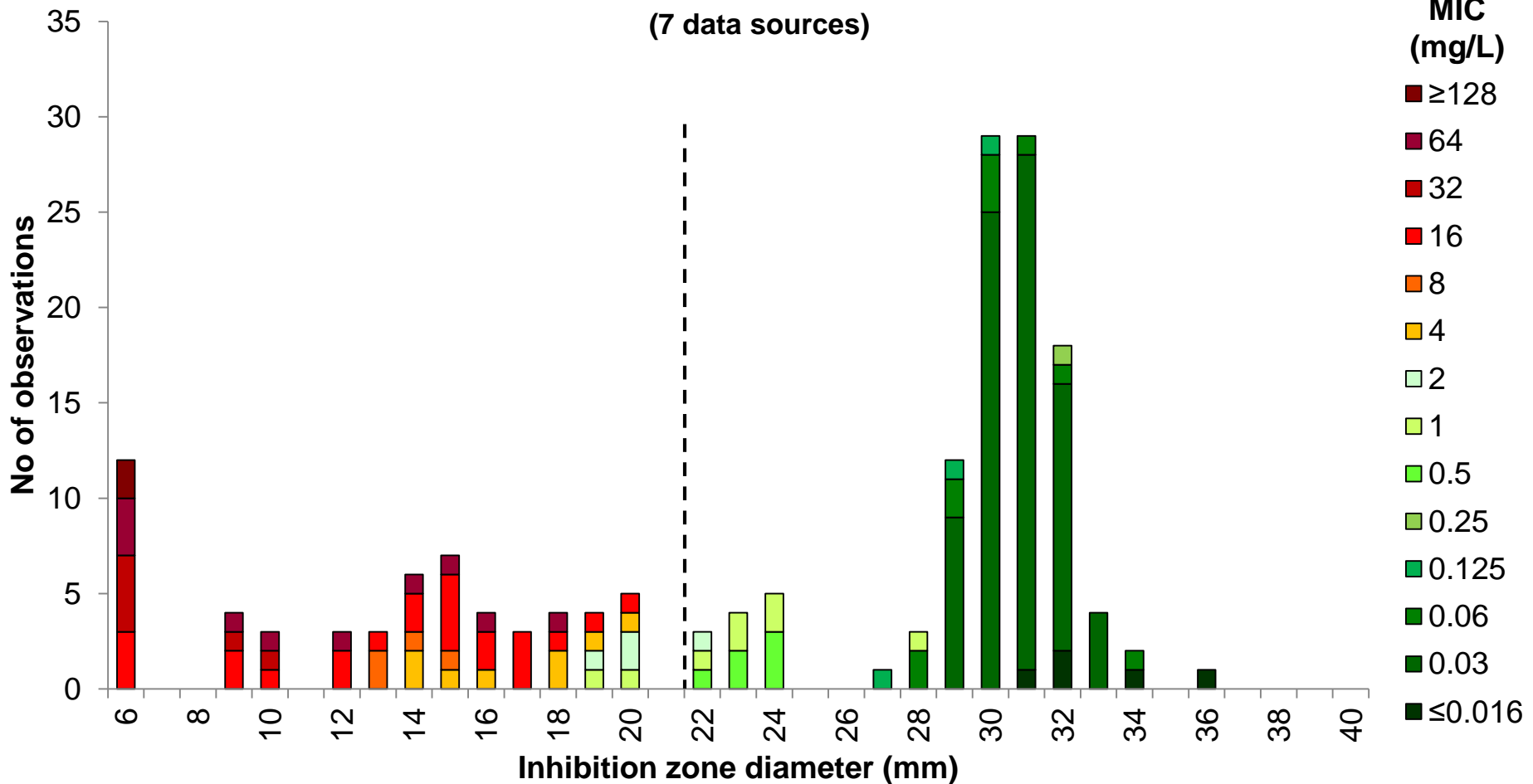
MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 22$, $R < 22$ mm

Meropenem 10 µg vs. MIC

K. pneumoniae, 124 isolates (169 correlates)

(7 data sources)



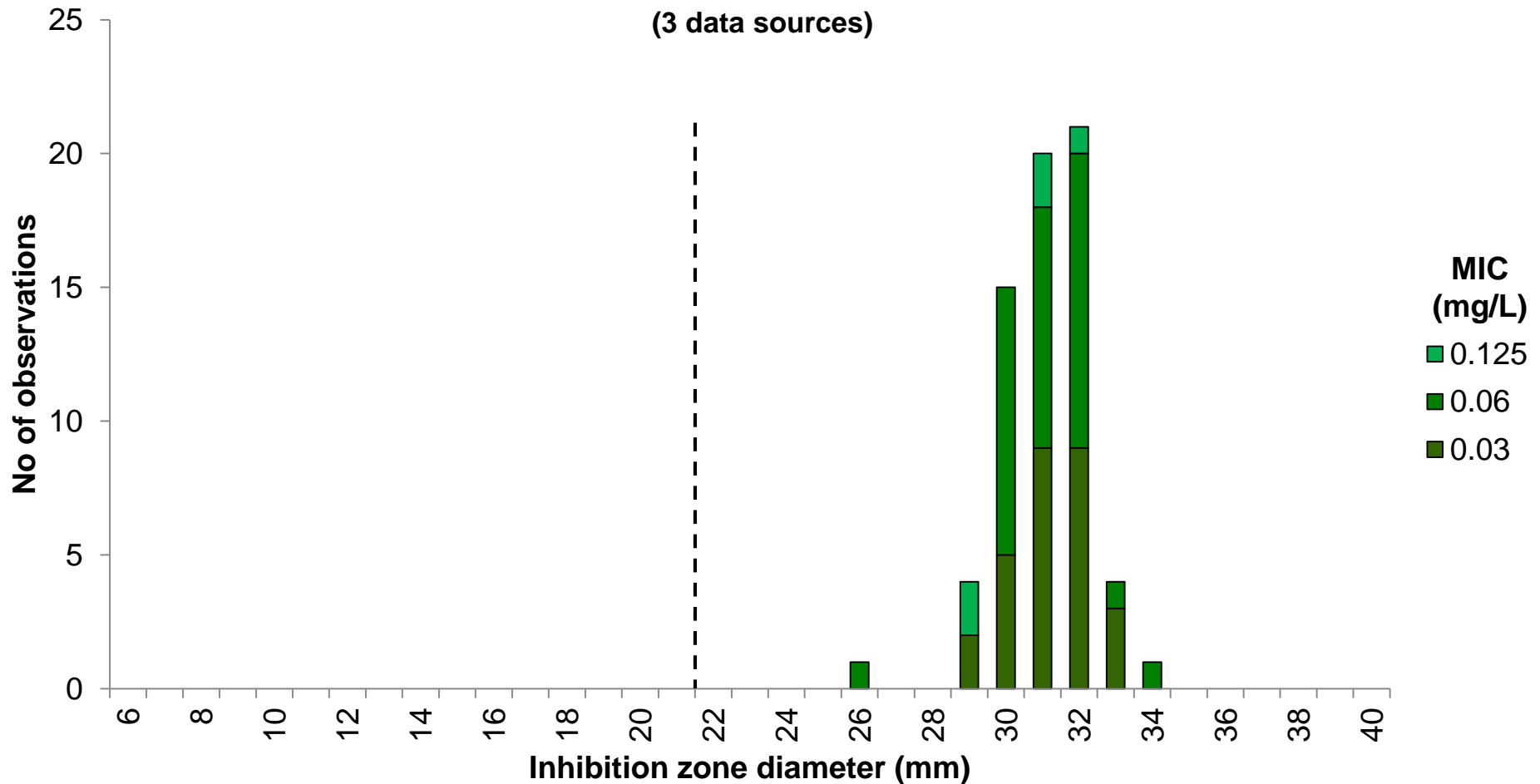
Breakpoints (meningitis)

MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 22, R < 22 mm

Meropenem 10 µg vs. MIC *P. mirabilis*, 45 isolates (66 correlates)

(3 data sources)



Breakpoints (meningitis)

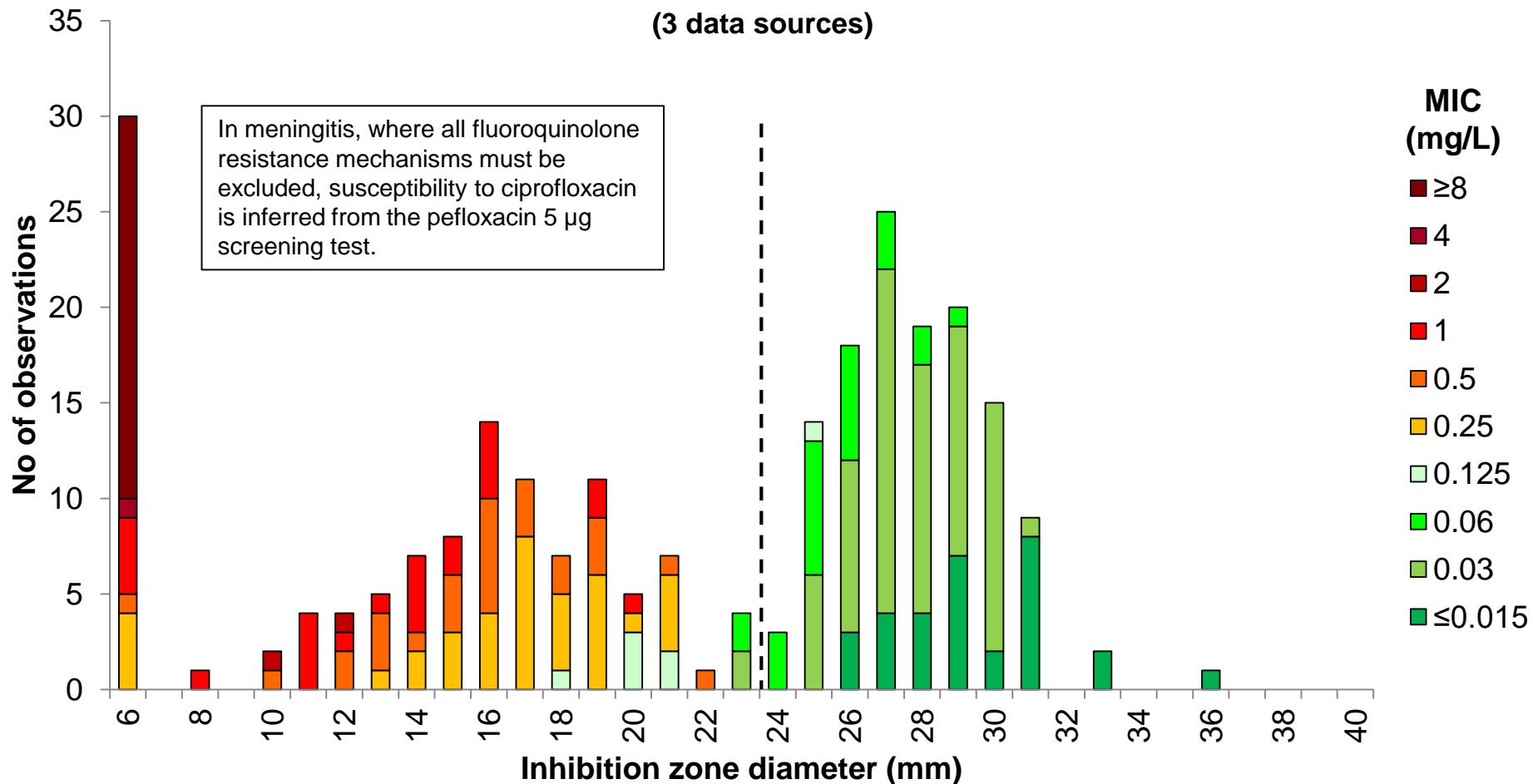
MIC $S \leq 2$, $R > 2$ mg/L

Zone diameter $S \geq 22$, $R < 22$ mm

Pefloxacin 5 μ g vs. Ciprofloxacin MIC

Enterobacterales, 239 isolates (247 correlates)

(3 data sources)



Breakpoints (meningitis)

Ciprofloxacin MIC

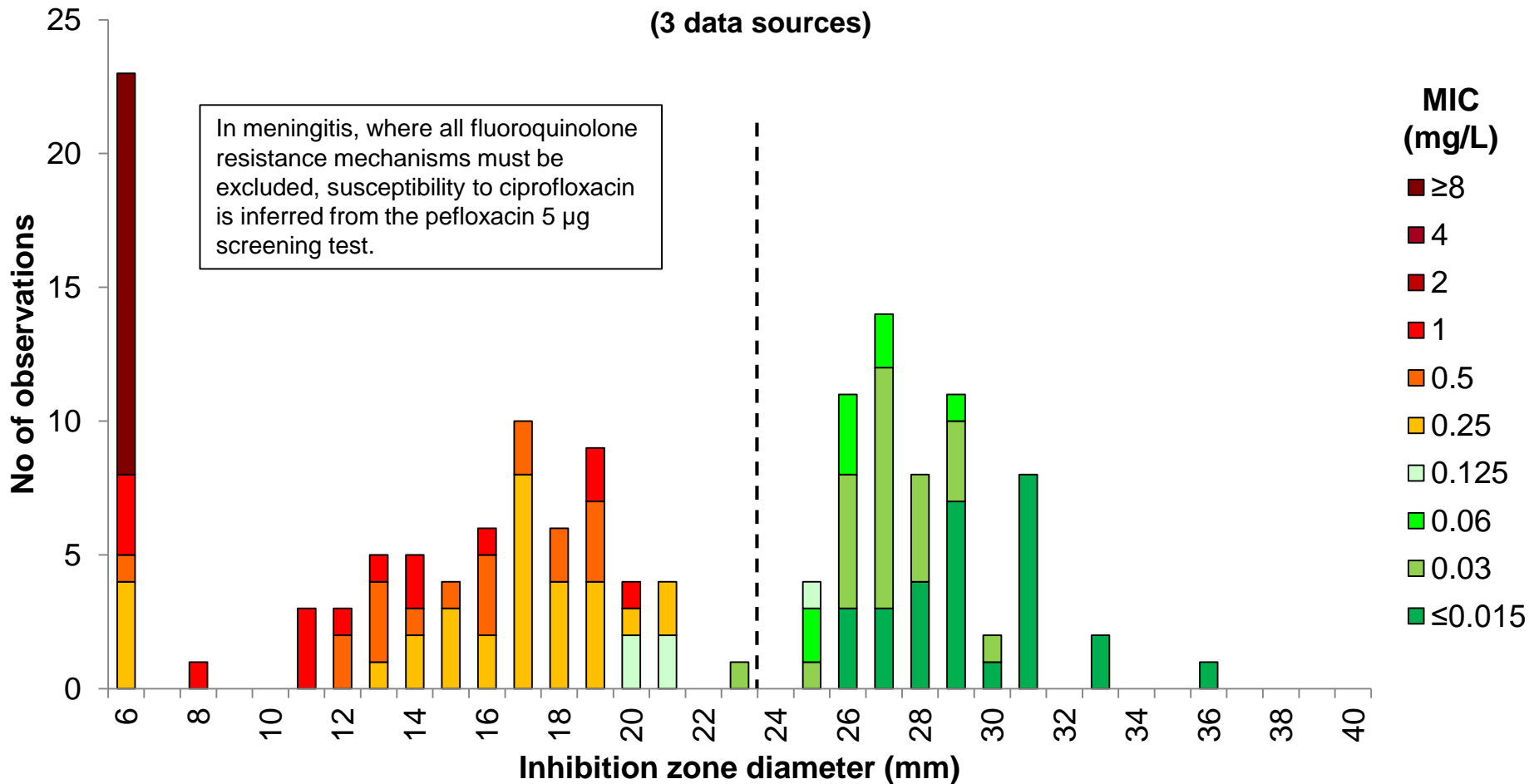
$S \leq 0.125$, $R > 0.125$ mg/L

Pefloxacin zone diameter (screen)

$S \geq 24$, $R < 24$ mm

Pefloxacin 5 µg vs. Ciprofloxacin MIC *E. coli*, 137 isolates (145 correlates)

(3 data sources)

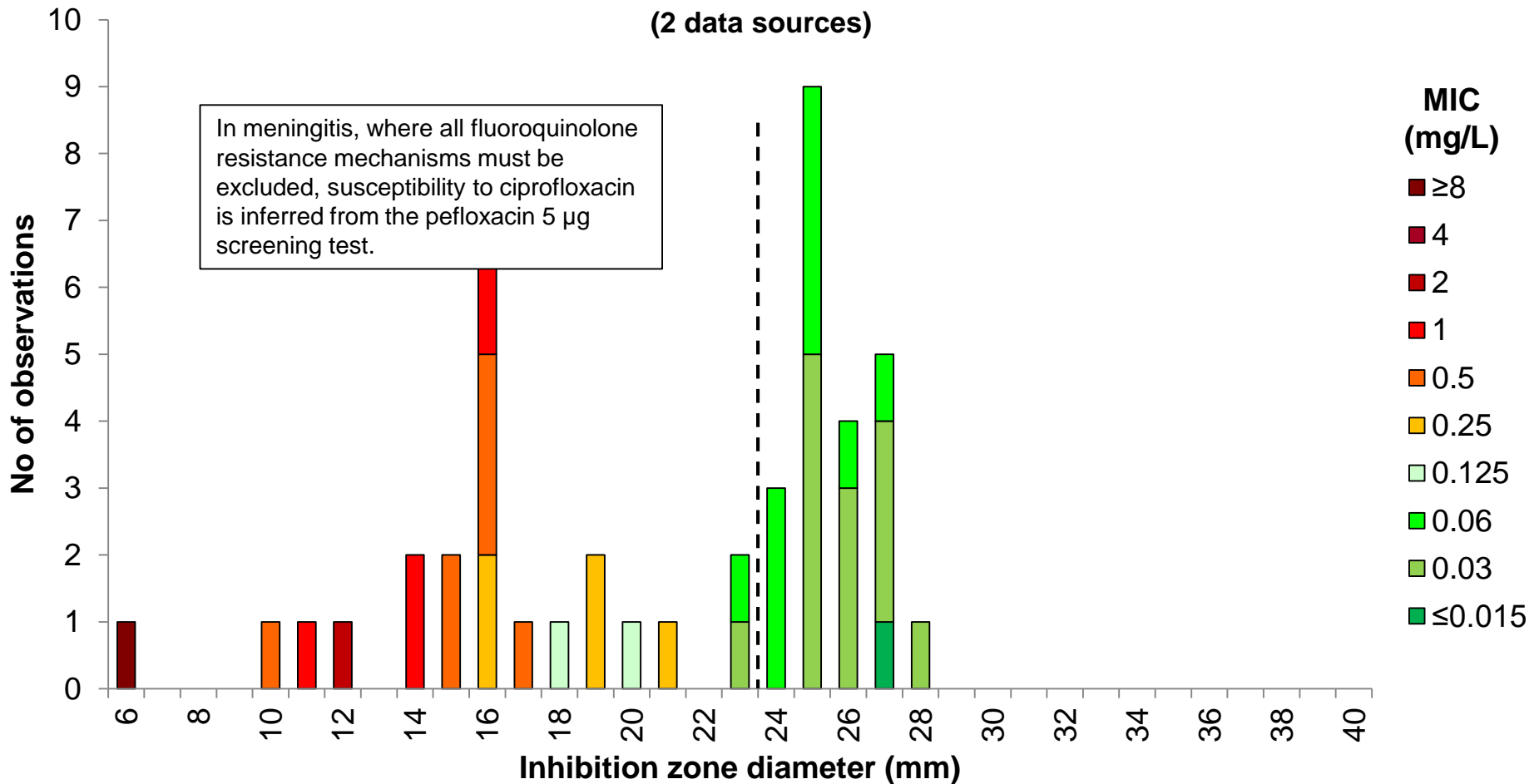


Breakpoints (meningitis)
 Ciprofloxacin MIC $S \leq 0.125$, $R > 0.125$ mg/L
 Pefloxacin zone diameter (screen) $S \geq 24$, $R < 24$ mm

Pefloxacin 5 µg vs. Ciprofloxacin MIC

K. pneumoniae, 46 isolates

(2 data sources)



Breakpoints (meningitis)

Ciprofloxacin MIC

S ≤ 0.125, R > 0.125 mg/L

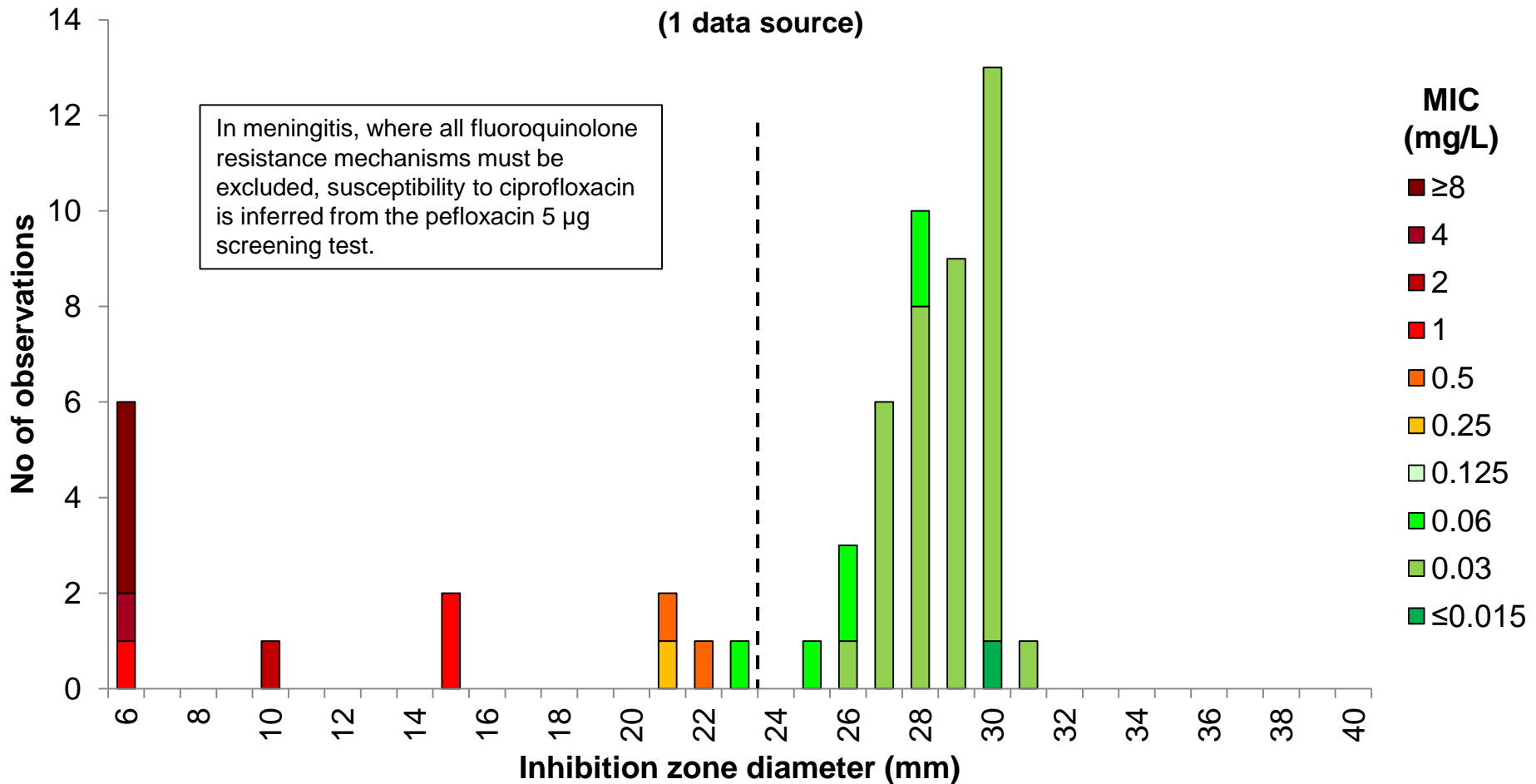
Pefloxacin zone diameter (screen)

S ≥ 24, R < 24 mm

Pefloxacin 5 µg vs. Ciprofloxacin MIC

P. mirabilis, 56 isolates

(1 data source)



Breakpoints (meningitis)

Ciprofloxacin MIC

S ≤ 0.125, R > 0.125 mg/L

Pefloxacin zone diameter (screen)

S ≥ 24, R < 24 mm



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