



EUCAST

European Committee
on Antimicrobial
Susceptibility Testing

Staphylococcus aureus

Calibration of zone diameter
breakpoints to MIC values and/or
resistance mechanisms

Version 12.0
January 2026

Staphylococcus aureus

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.

Staphylococcus aureus

Materials and methods

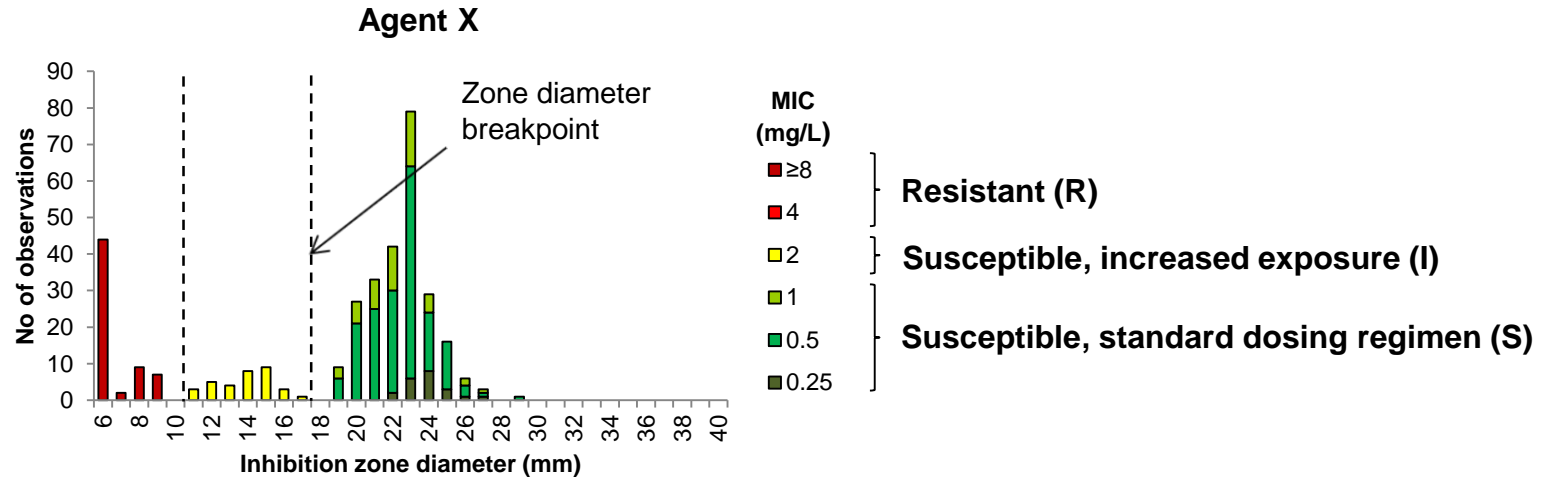
- Antimicrobial susceptibility testing was performed on clinical isolates of *S. aureus*, mostly originating from the worldwide SENTRY Antimicrobial Resistance Surveillance Program (JMI Laboratories, USA). Disk diffusion tests were performed according to EUCAST methodology and simultaneously MICs were determined with the ISO broth microdilution method.
- The distributions of MIC vs. zone diameter in this presentation are the result of a collaboration between EUCAST, JMI Laboratories (USA), Statens Serum Institut (Denmark), Laboratory Specialists Inc. (USA), the National Institute for Public Health and the Environment and RIVM (The Netherlands). The second distribution of cefoxitin vs. *mecA* status is a summary of 11 published studies.
- This presentation is based on EUCAST Clinical Breakpoint Tables v. 16.0.

Changes from previous version (11.1)

Changes
<ul style="list-style-type: none">• MIC and zone diameter breakpoints changed for trimethoprim and trimethoprim-sulfamethoxazole.

Explanation of graphs:

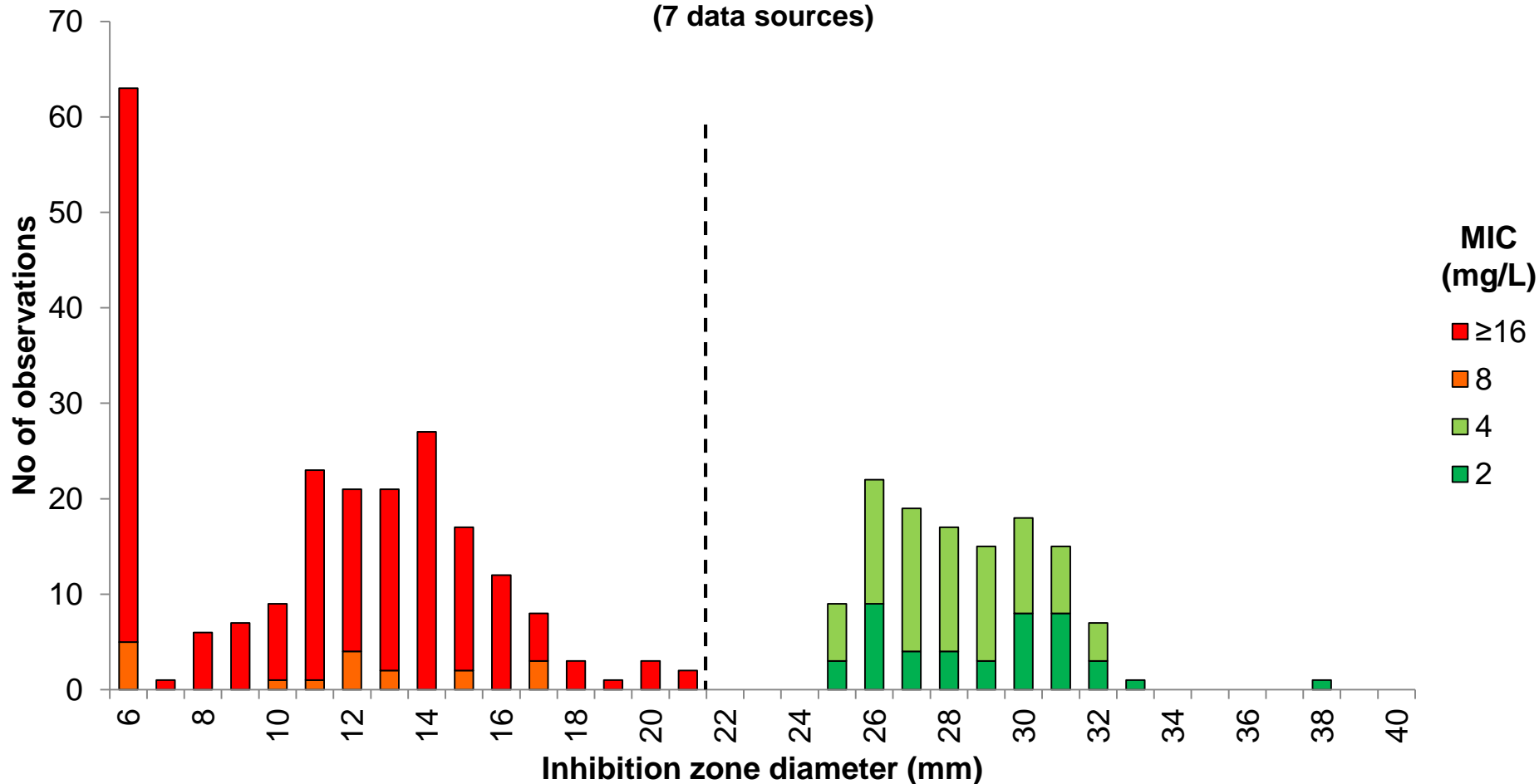
- These graphs show zone diameter distributions with MIC values or resistance mechanisms as coloured bars. Colours are related to current EUCAST MIC breakpoints.



Cefoxitin 30 µg vs. MIC

S. aureus, 287 isolates (348 correlates)

(7 data sources)



Breakpoints

MIC (screen)

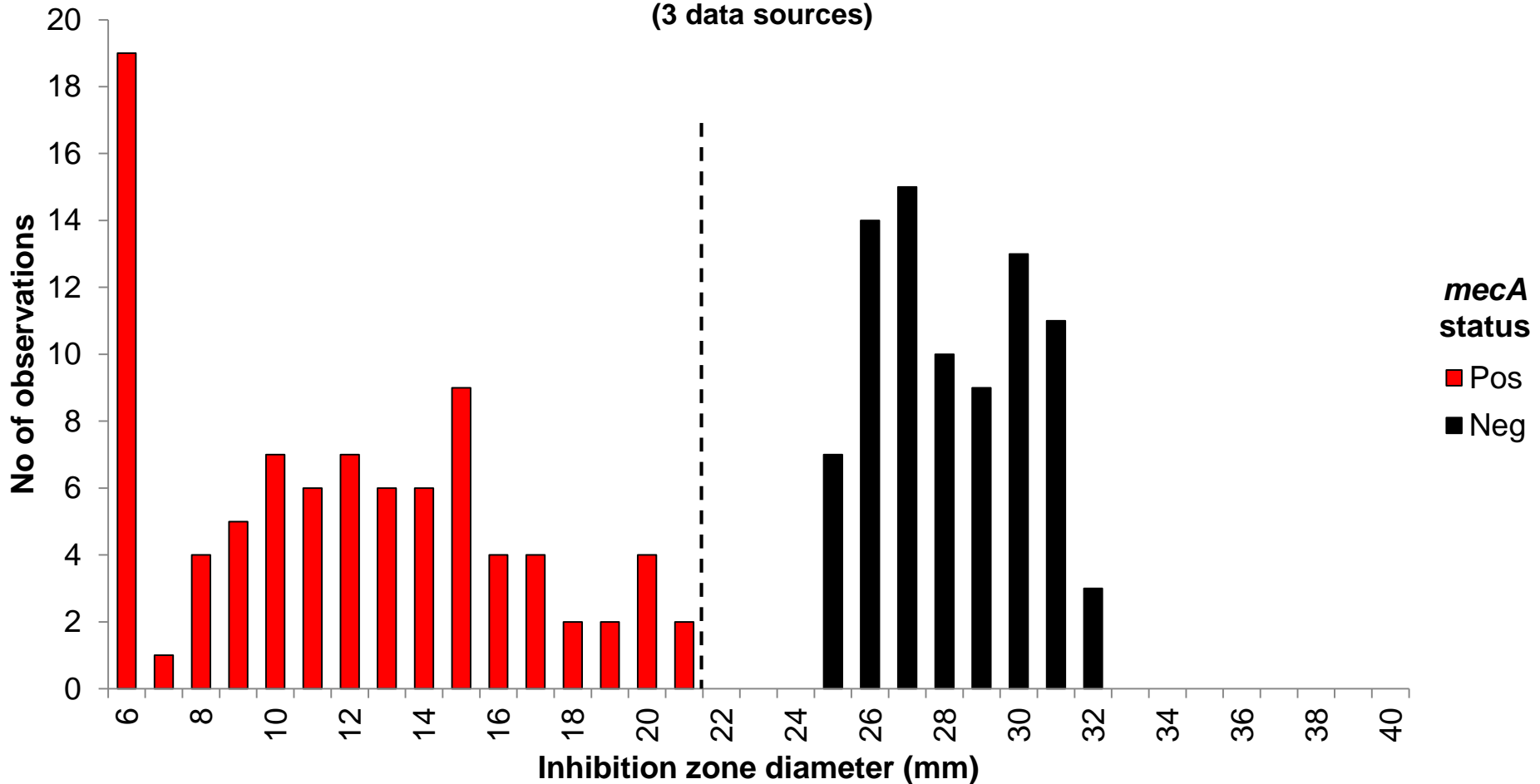
S ≤ 4, R > 4 mg/L

Zone diameter (screen)

S ≥ 22, R < 22 mm

Cefoxitin 30 µg vs. *mecA* status *S. aureus*, 170 isolates

(3 data sources)

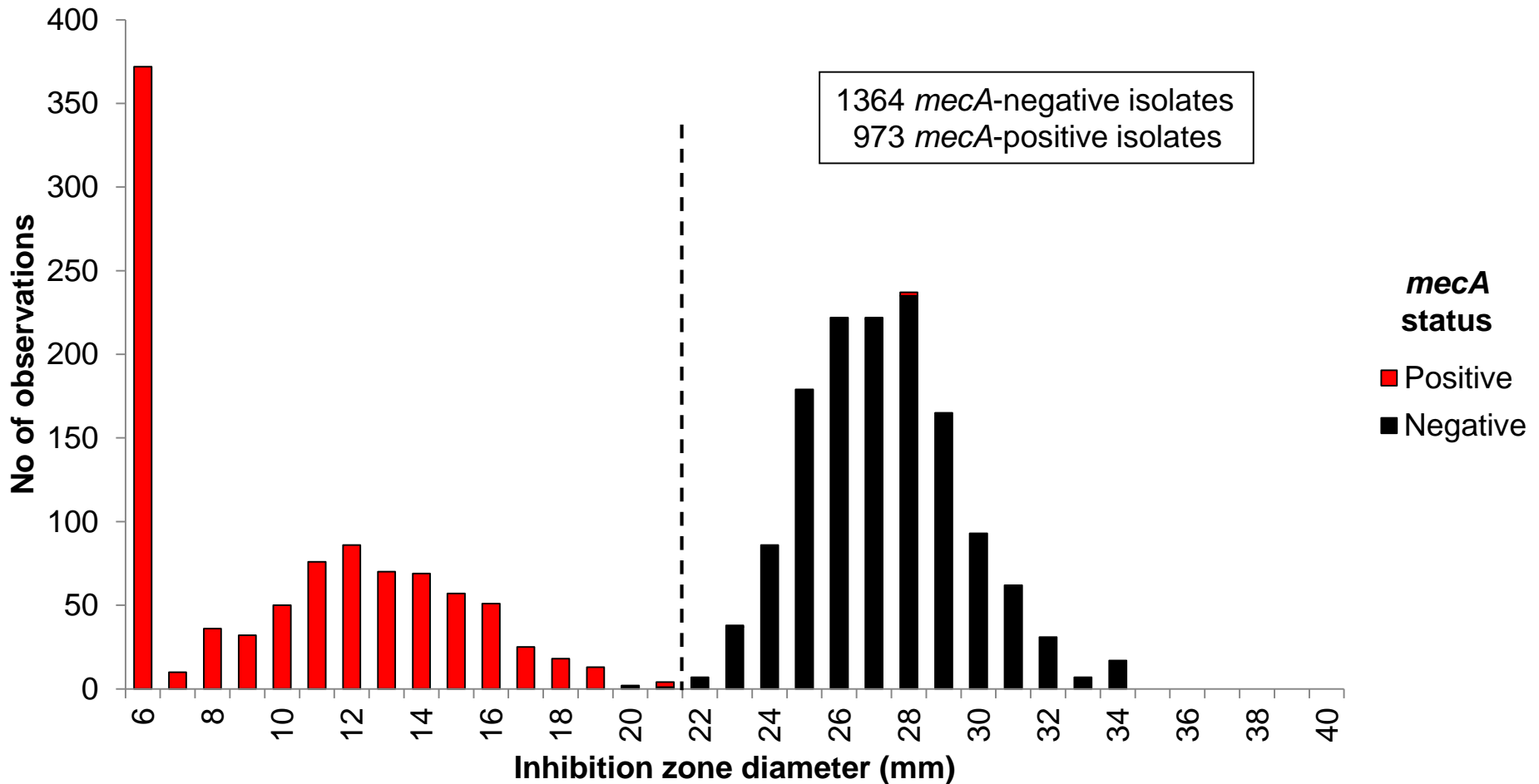


Breakpoints

Zone diameter (screen)

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

Cefoxitin 30 µg vs. *mecA* status *S. aureus* from 11 published studies



Breakpoints

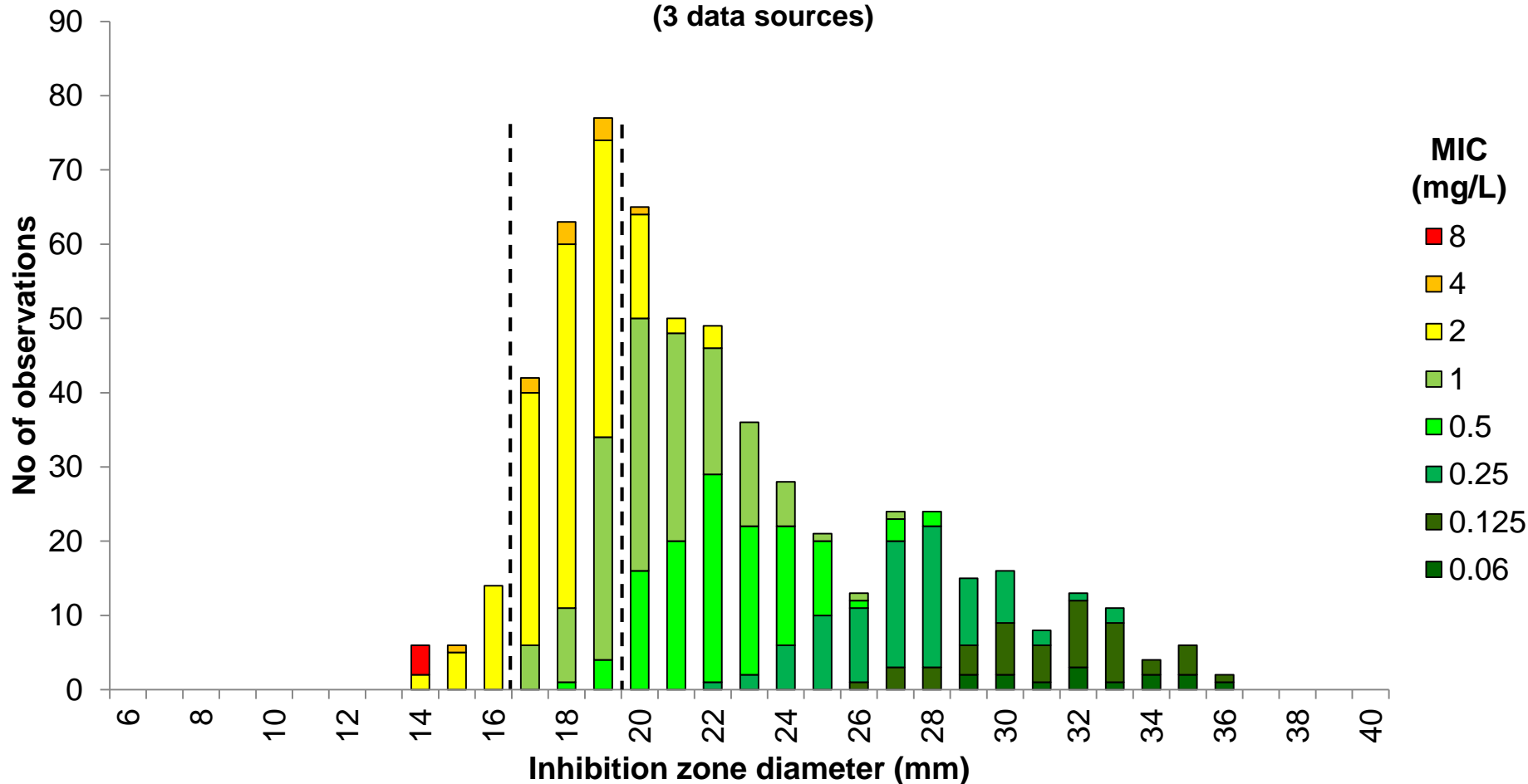
Zone diameter (screen)

S \geq 22, R<22 mm

Ceftaroline 5 µg vs. MIC

S. aureus, 216 isolates (593 correlates)

(3 data sources)



Breakpoints (non-pneumonia)

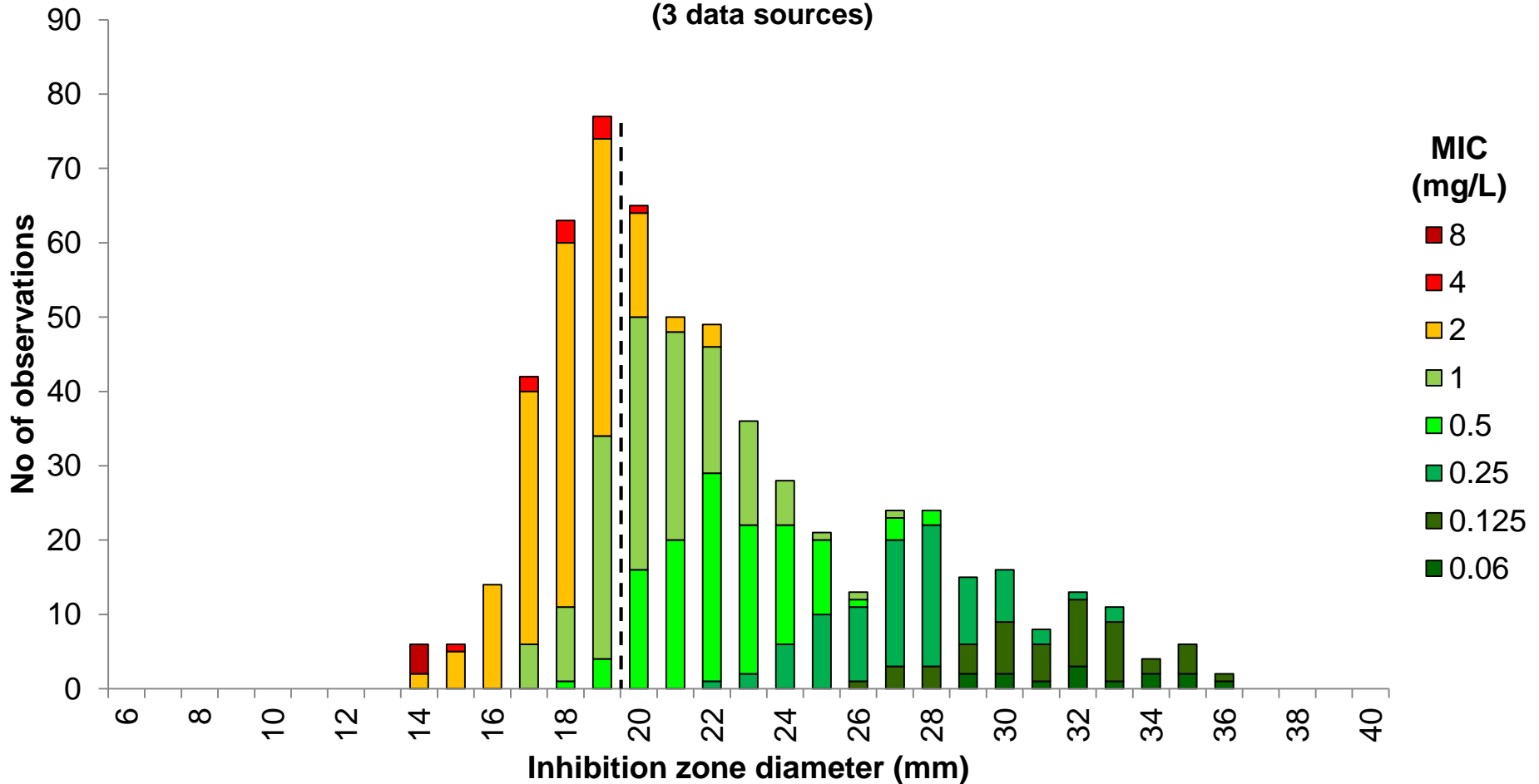
MIC $S \leq 1$, $R > 2$ mg/L

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

Ceftaroline 5 µg vs. MIC

S. aureus, 216 isolates (593 correlates)

(3 data sources)



Breakpoints (pneumonia)

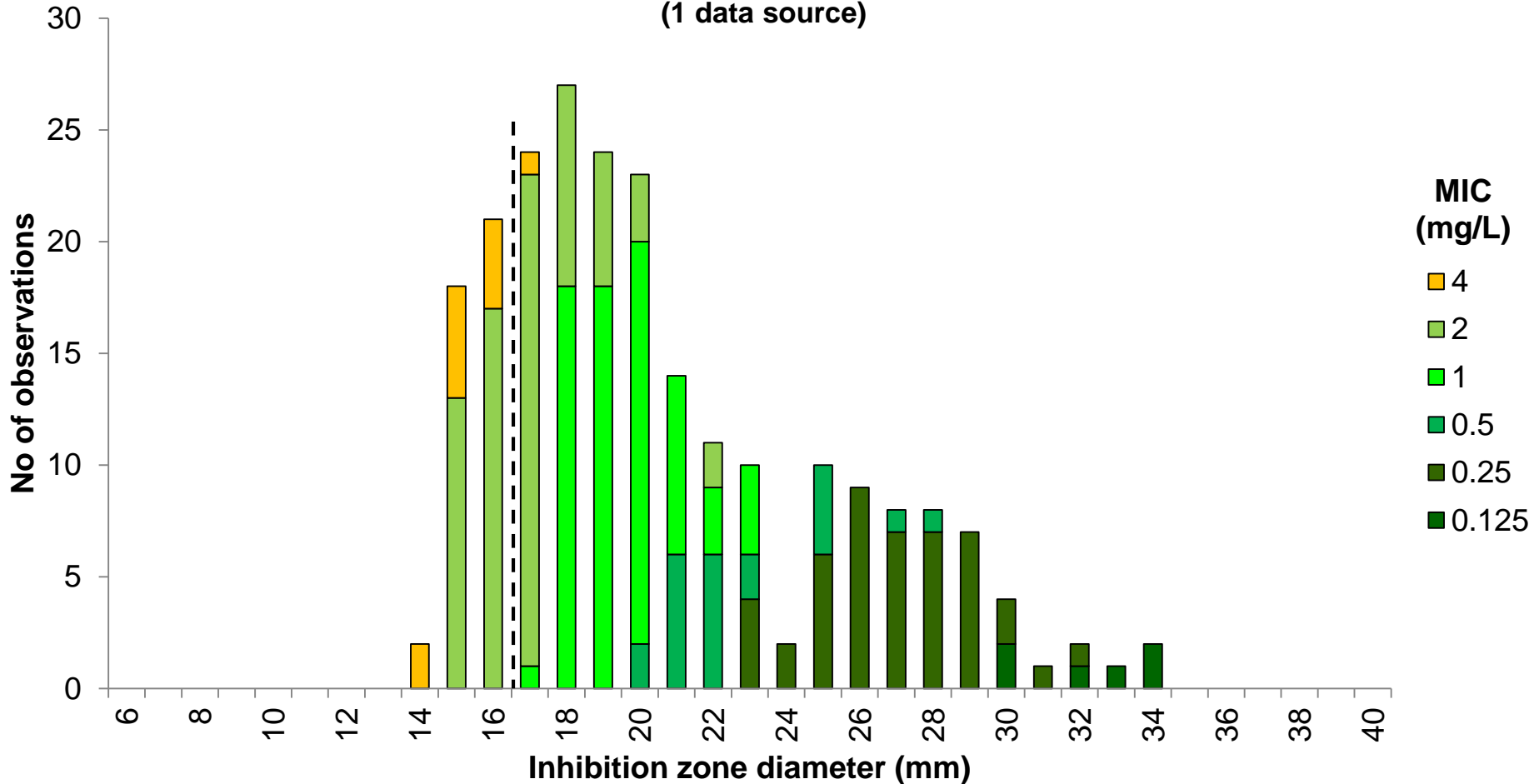
MIC $S \leq 1, R > 1$ mg/L

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

Ceftobiprole 5 µg vs. MIC

S. aureus, 114 isolates (228 correlates)

(1 data source)



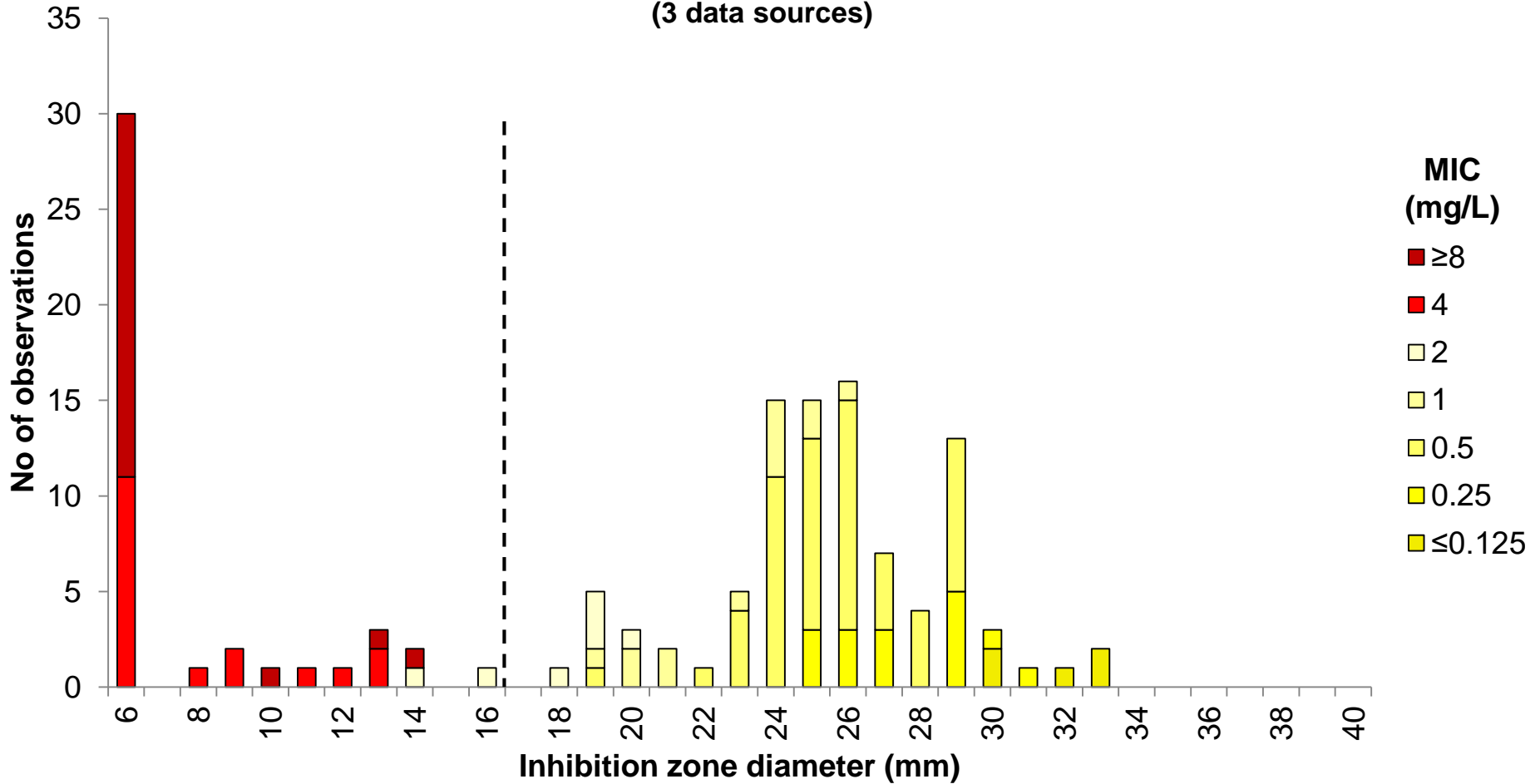
Breakpoints

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

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

Ciprofloxacin 5 µg vs. MIC *S. aureus*, 136 isolates

(3 data sources)



Breakpoints

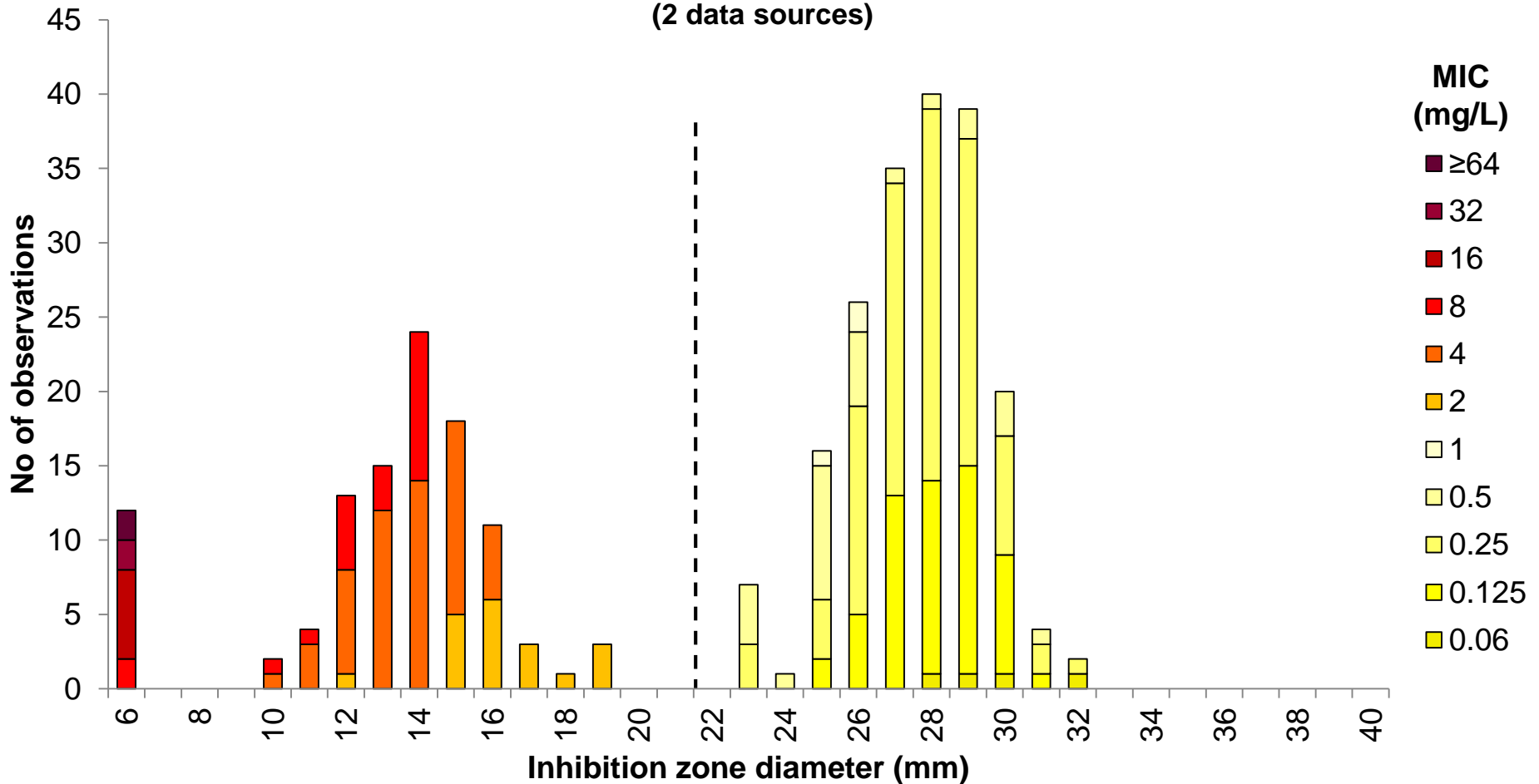
MIC $S \leq 0.001$, $R > 2$ mg/L

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

Levofloxacin 5 µg vs. MIC

S. aureus, 129 isolates (296 correlates)

(2 data sources)



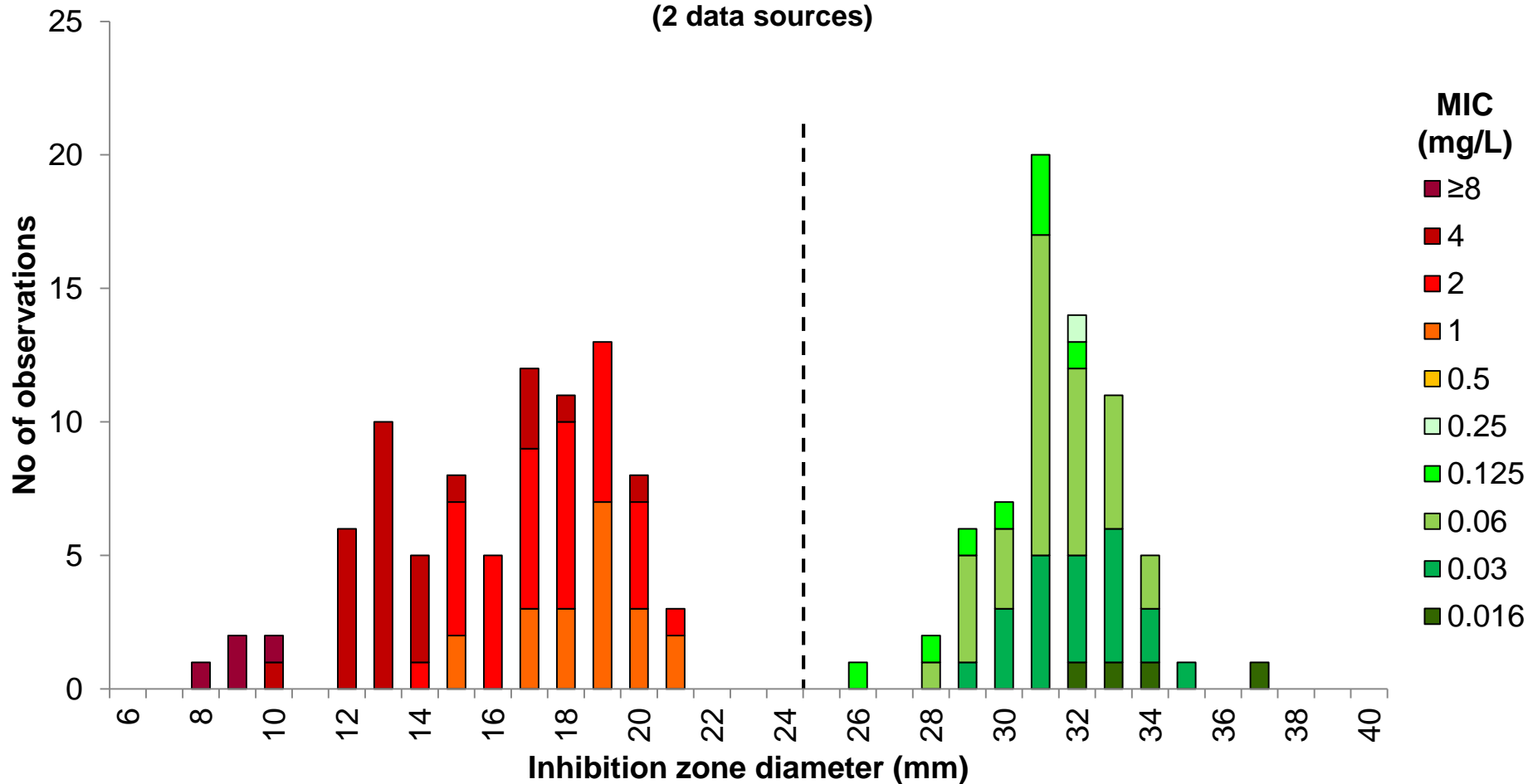
Breakpoints

MIC $S \leq 0.001$, $R > 1$ mg/L

Zone diameter $S \geq 50$, $R < 22$ mm

Moxifloxacin 5 μg vs. MIC *S. aureus*, 154 isolates

(2 data sources)

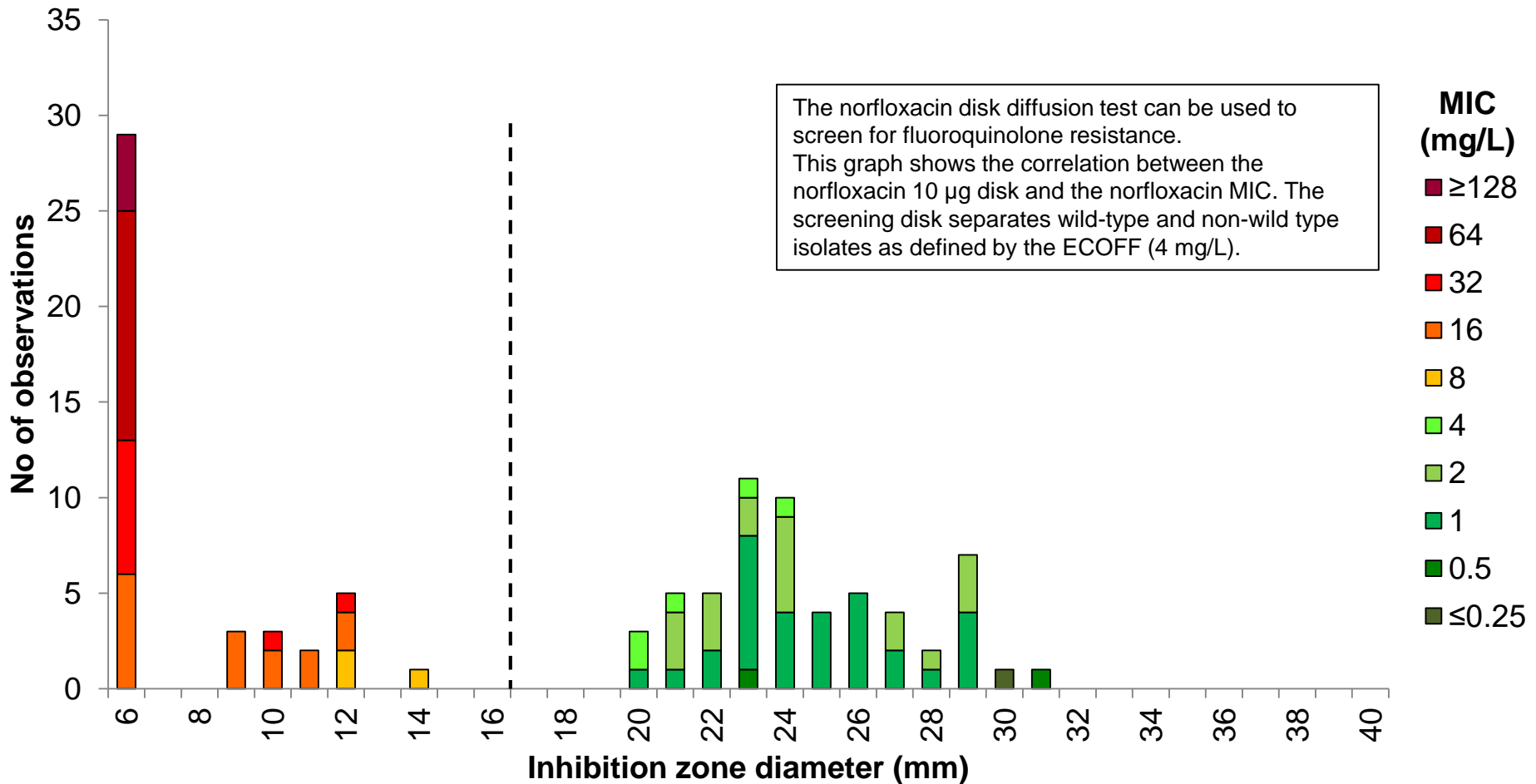


Breakpoints

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

Zone diameter $S \geq 25, R < 25$ mm

Norfloxacin 10 µg vs. MIC *S. aureus*, 101 isolates

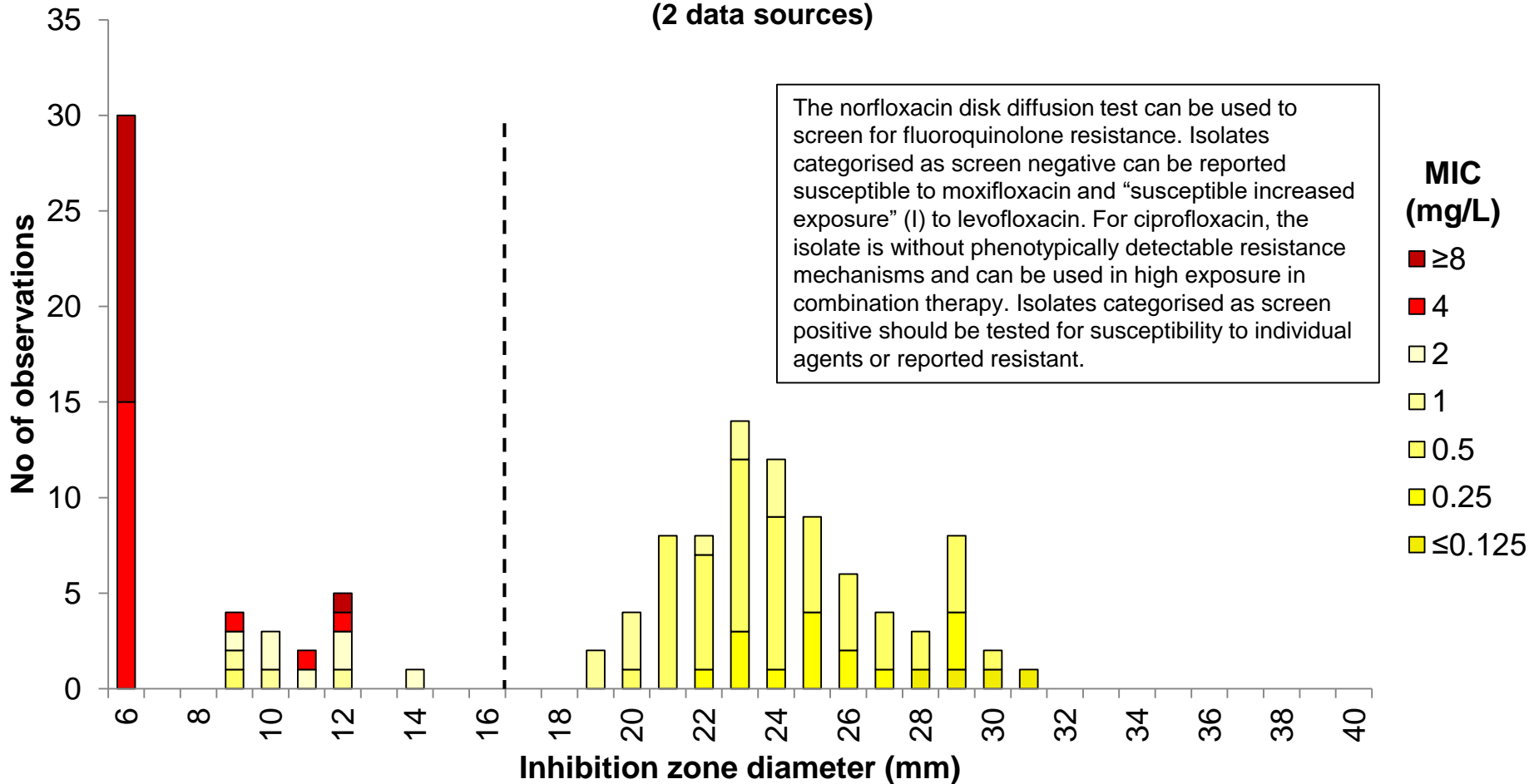


Breakpoints	
MIC	NA
Zone diameter (screen)	S≥17, R<17 mm

Norfloxacin 10 µg vs. Ciprofloxacin MIC

S. aureus, 126 isolates

(2 data sources)



Breakpoints

Ciprofloxacin MIC

$S \leq 0.001$, $R > 2$ mg/L

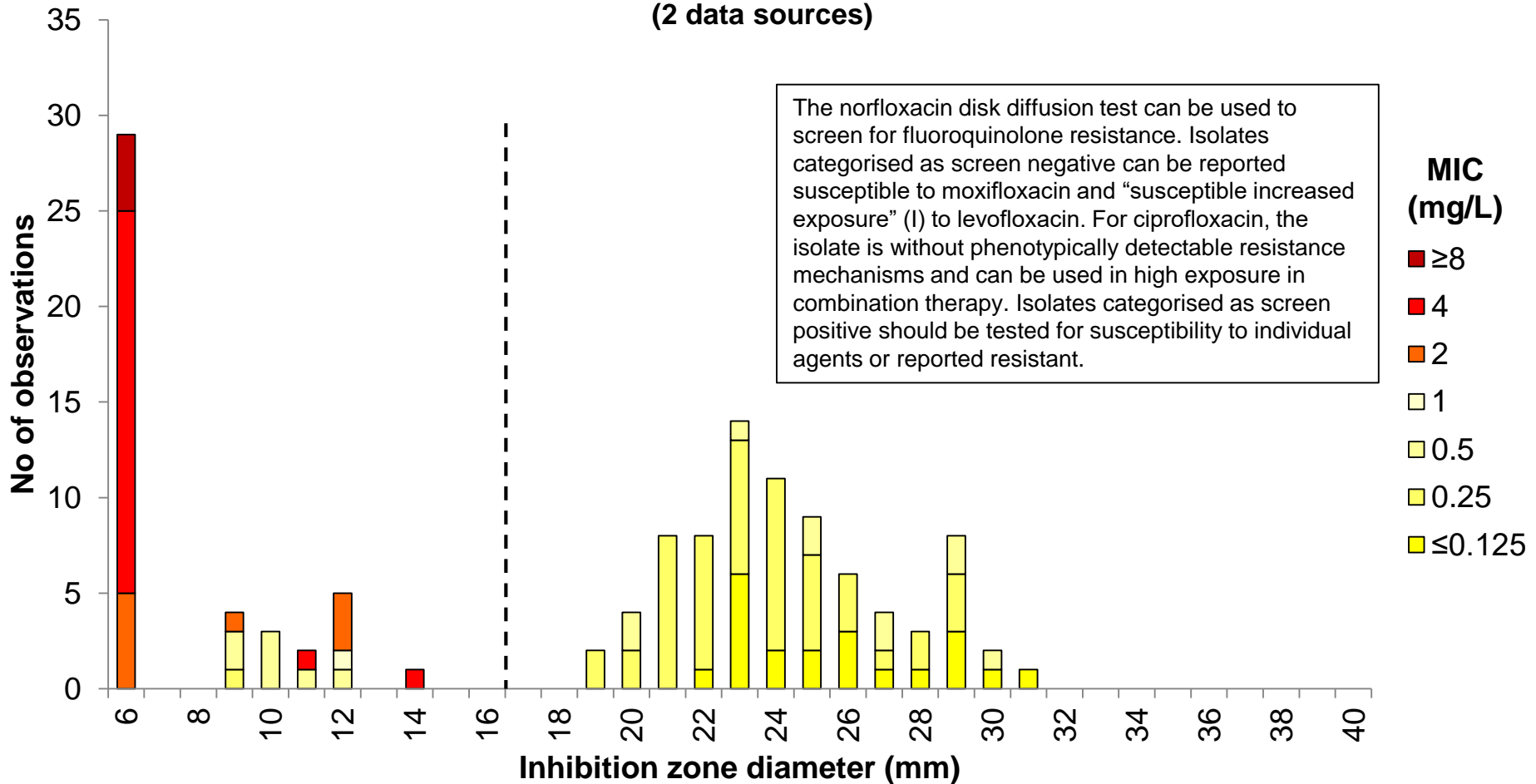
Norfloxacin zone diameter (screen)

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

Norfloxacin 10 µg vs. Levofloxacin MIC

S. aureus, 120 isolates

(2 data sources)



Breakpoints

Levofloxacin MIC

$S \leq 0.001$, $R > 1$ mg/L

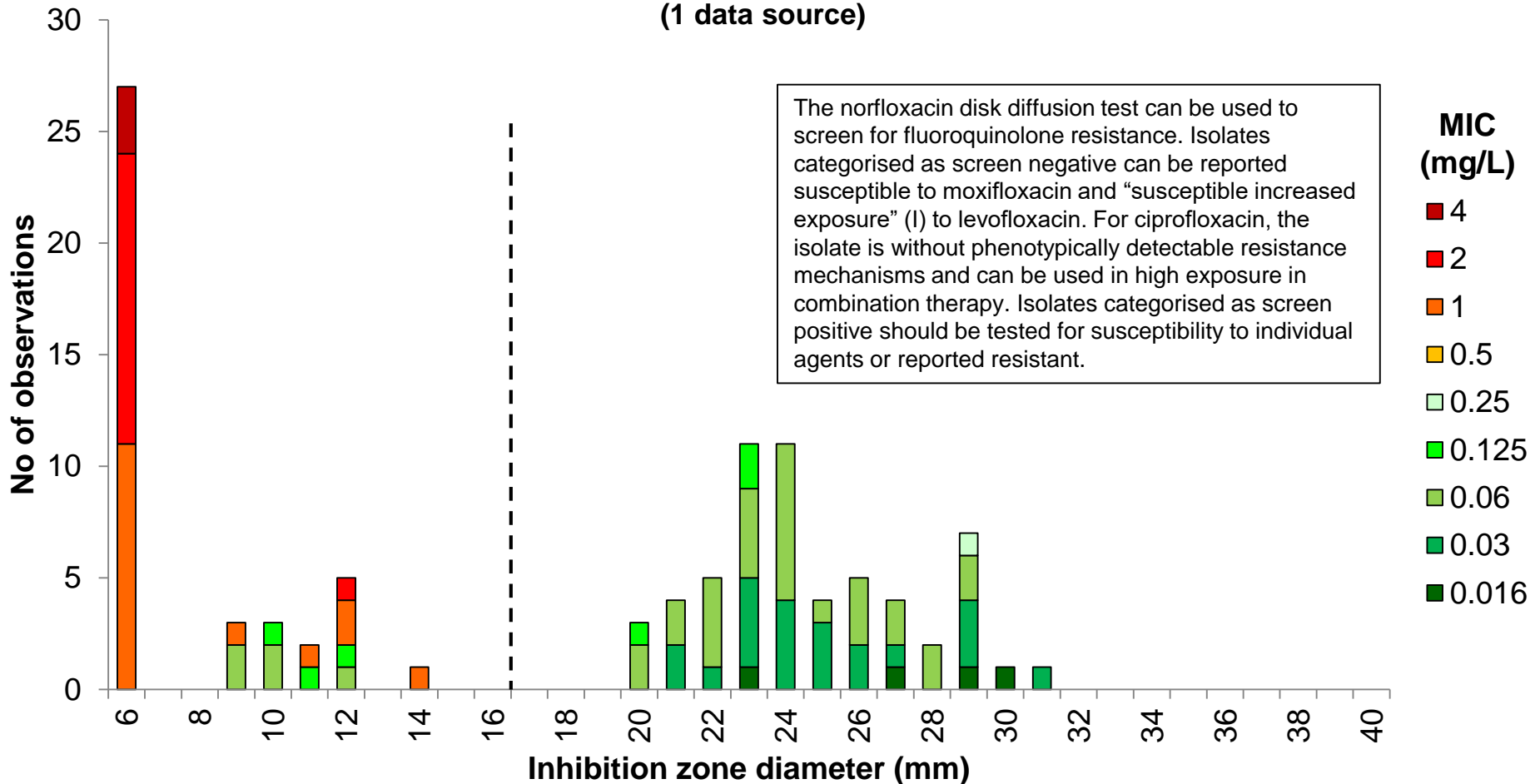
Norfloxacin zone diameter (screen)

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

Norfloxacin 10 µg vs. Moxifloxacin MIC

S. aureus, 99 isolates

(1 data source)



Breakpoints

Moxifloxacin MIC

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

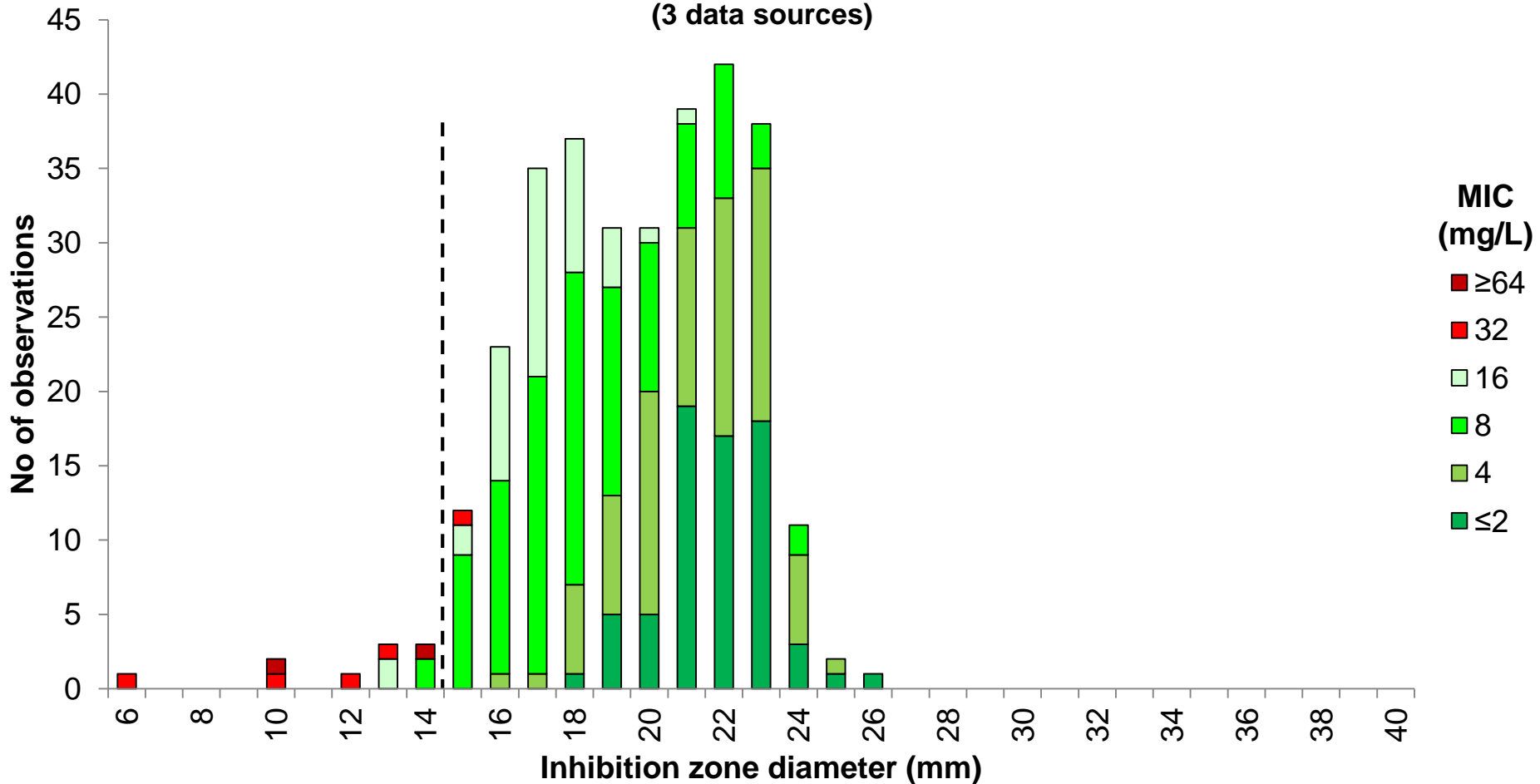
Norfloxacin zone diameter (screen)

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

Amikacin 30 μg vs. MIC

S. aureus, 173 isolates (312 correlates)

(3 data sources)



Breakpoints

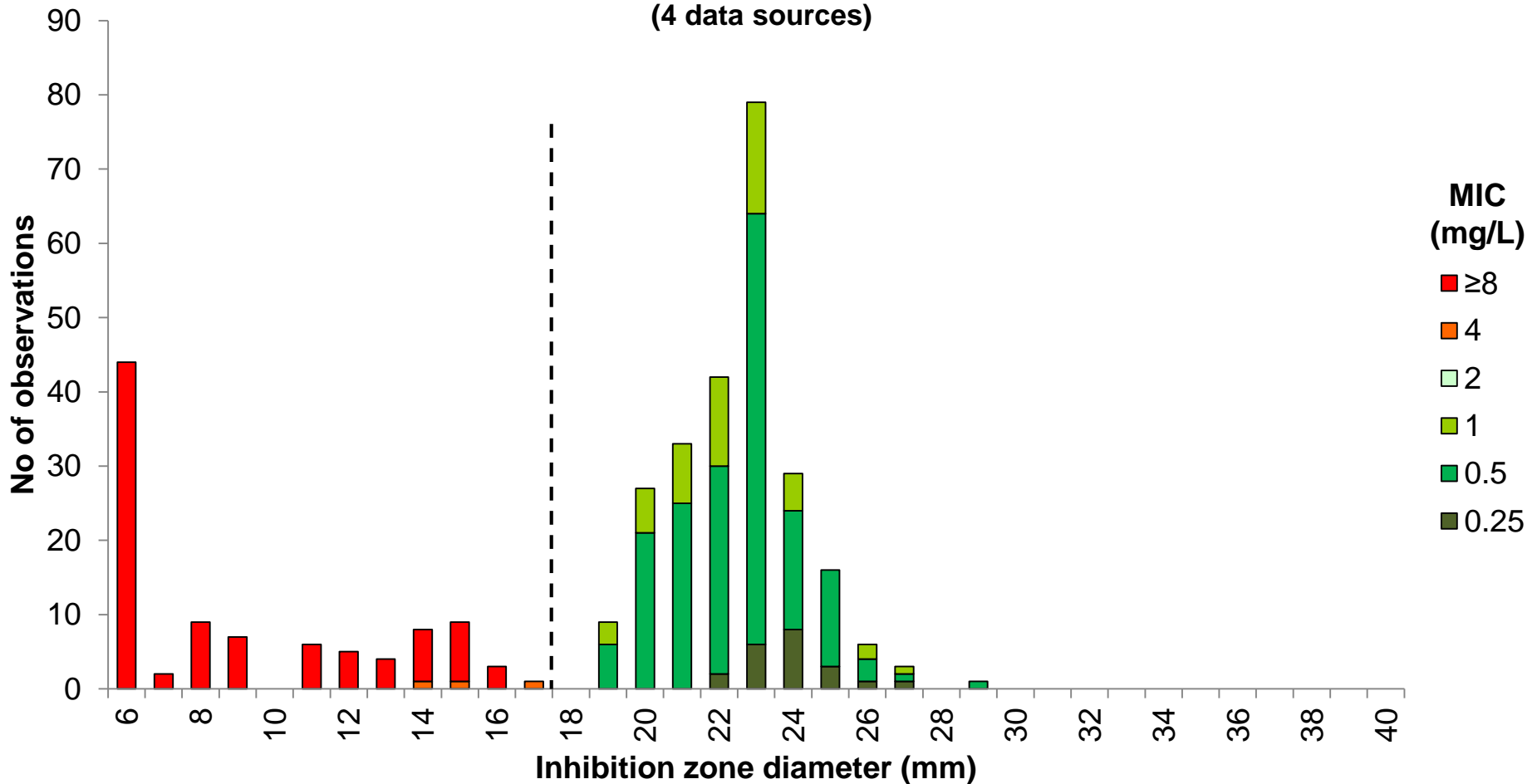
MIC $S \leq 16$, $R > 16$ mg/L

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

Gentamicin 10 µg vs. MIC

S. aureus, 203 isolates (343 correlates)

(4 data sources)



Breakpoints

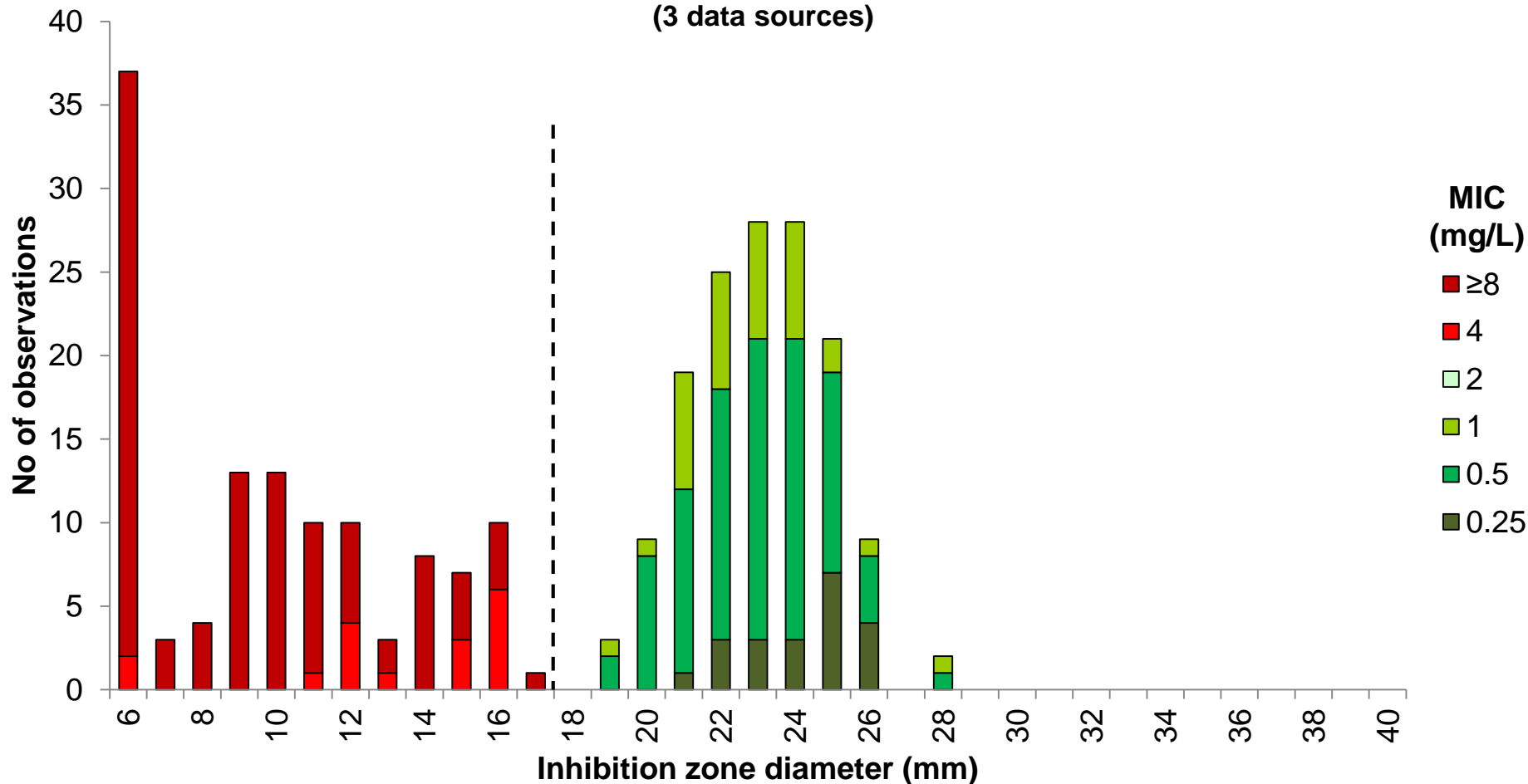
MIC $S \leq 2, R > 2$ mg/L

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

Tobramycin 10 µg vs. MIC

S. aureus, 195 isolates (263 correlates)

(3 data sources)



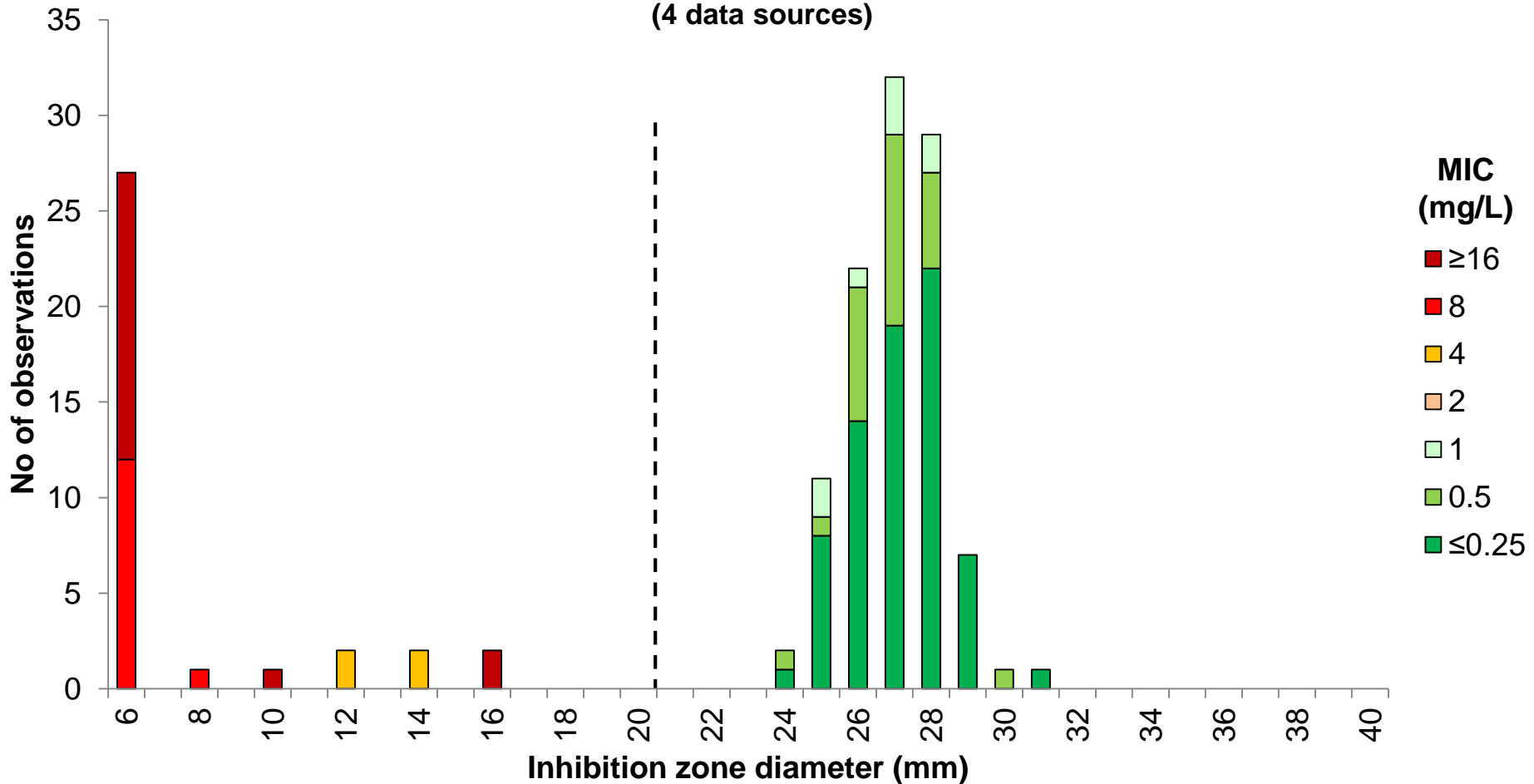
Breakpoints

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

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

Erythromycin 15 µg vs. MIC *S. aureus*, 140 isolates

(4 data sources)



Breakpoints

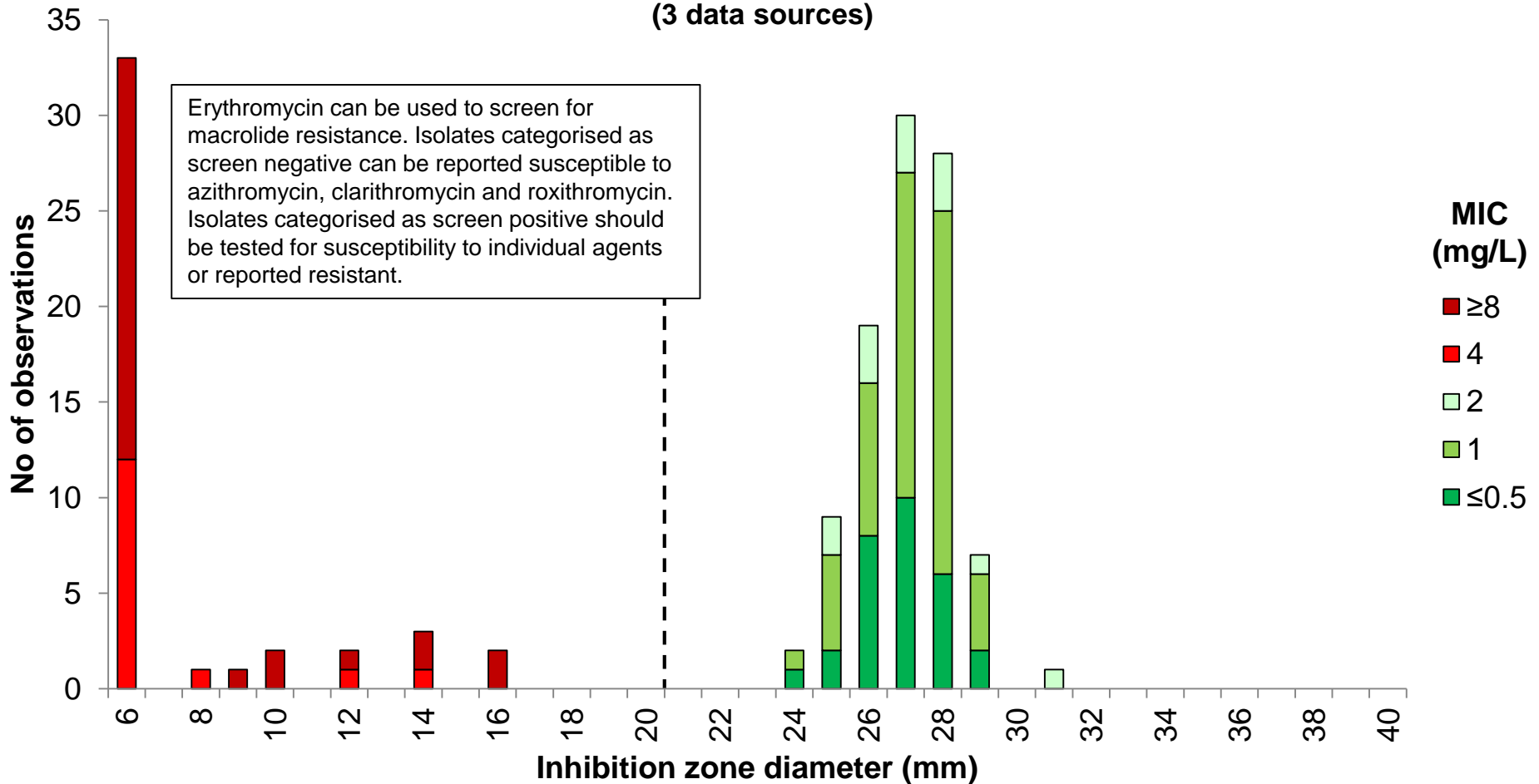
MIC $S \leq 1$, $R > 1$ mg/L

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

Erythromycin 15 µg vs. Azithromycin MIC

S. aureus, 140 isolates

(3 data sources)



Breakpoints

Azithromycin MIC

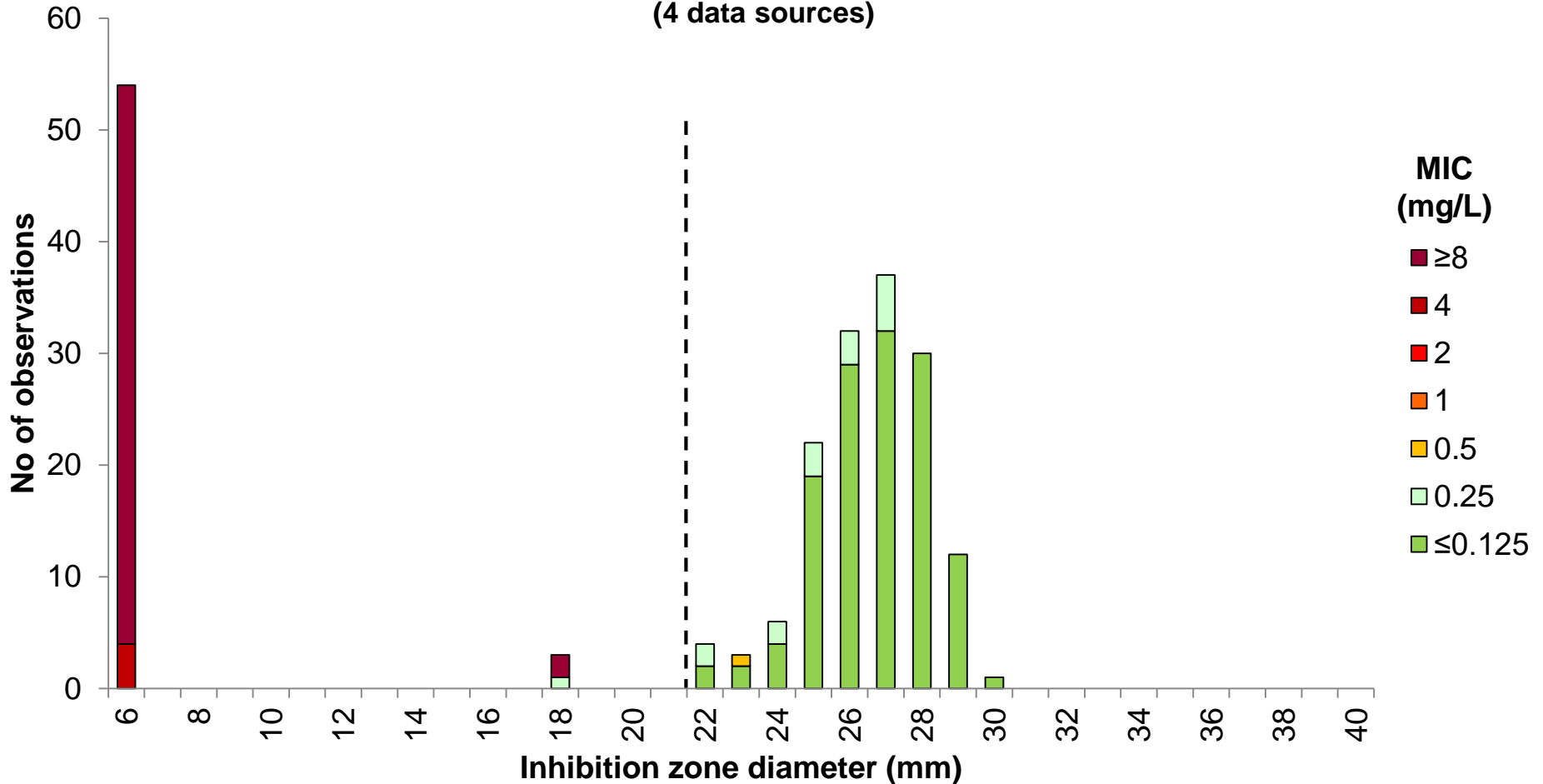
S ≤ 2, R > 2 mg/L

Erythromycin zone diameter

S ≥ 21, R < 21 mm

Clindamycin 2 µg vs. MIC *S. aureus*, 204 isolates

(4 data sources)



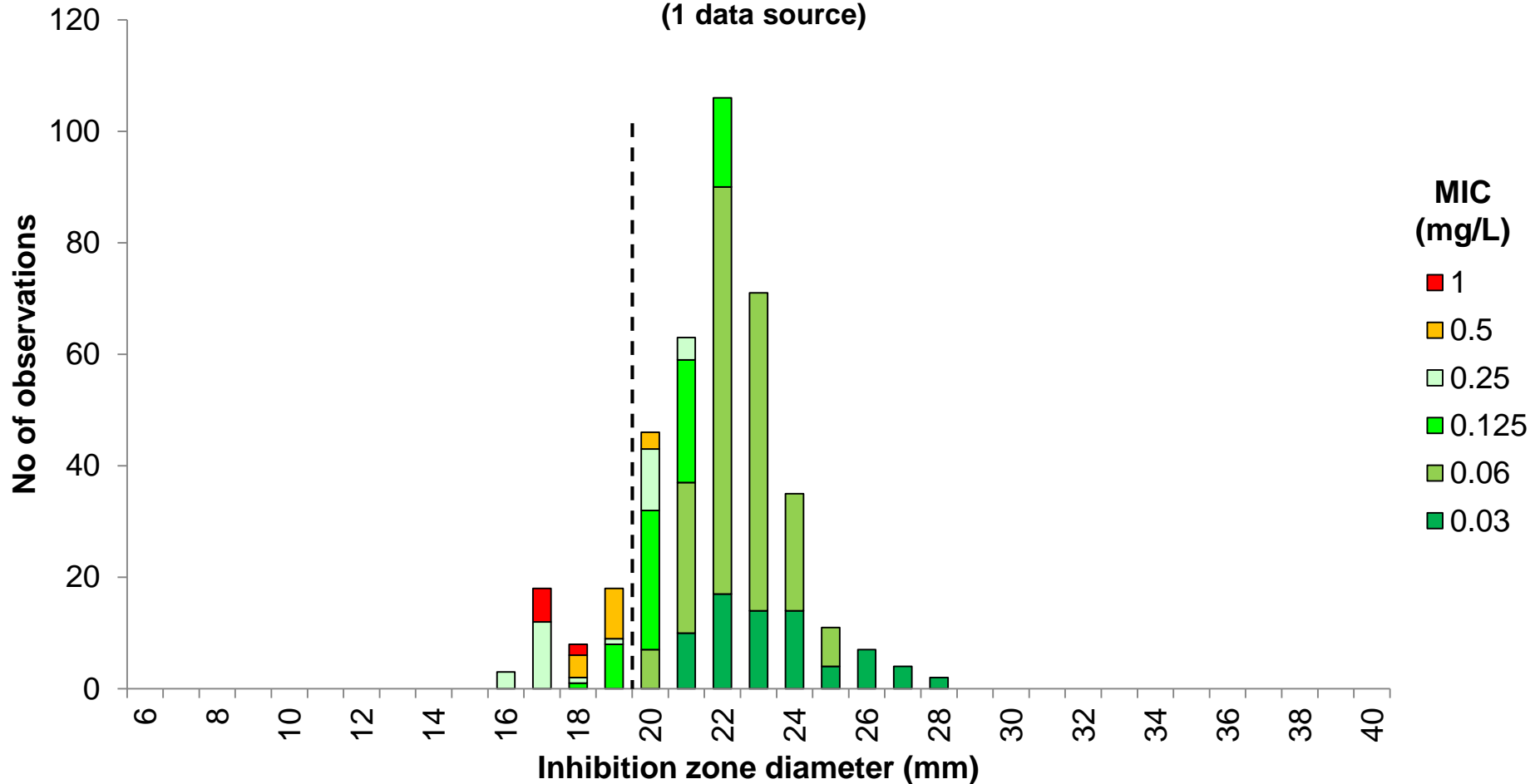
Breakpoints

MIC S ≤ 0.25, R > 0.25 mg/L

Zone diameter S ≥ 22, R < 22 mm

Eravacycline 20 µg vs. MIC *S. aureus* (MSSA), 63 isolates (392 correlates)

(1 data source)



Breakpoints

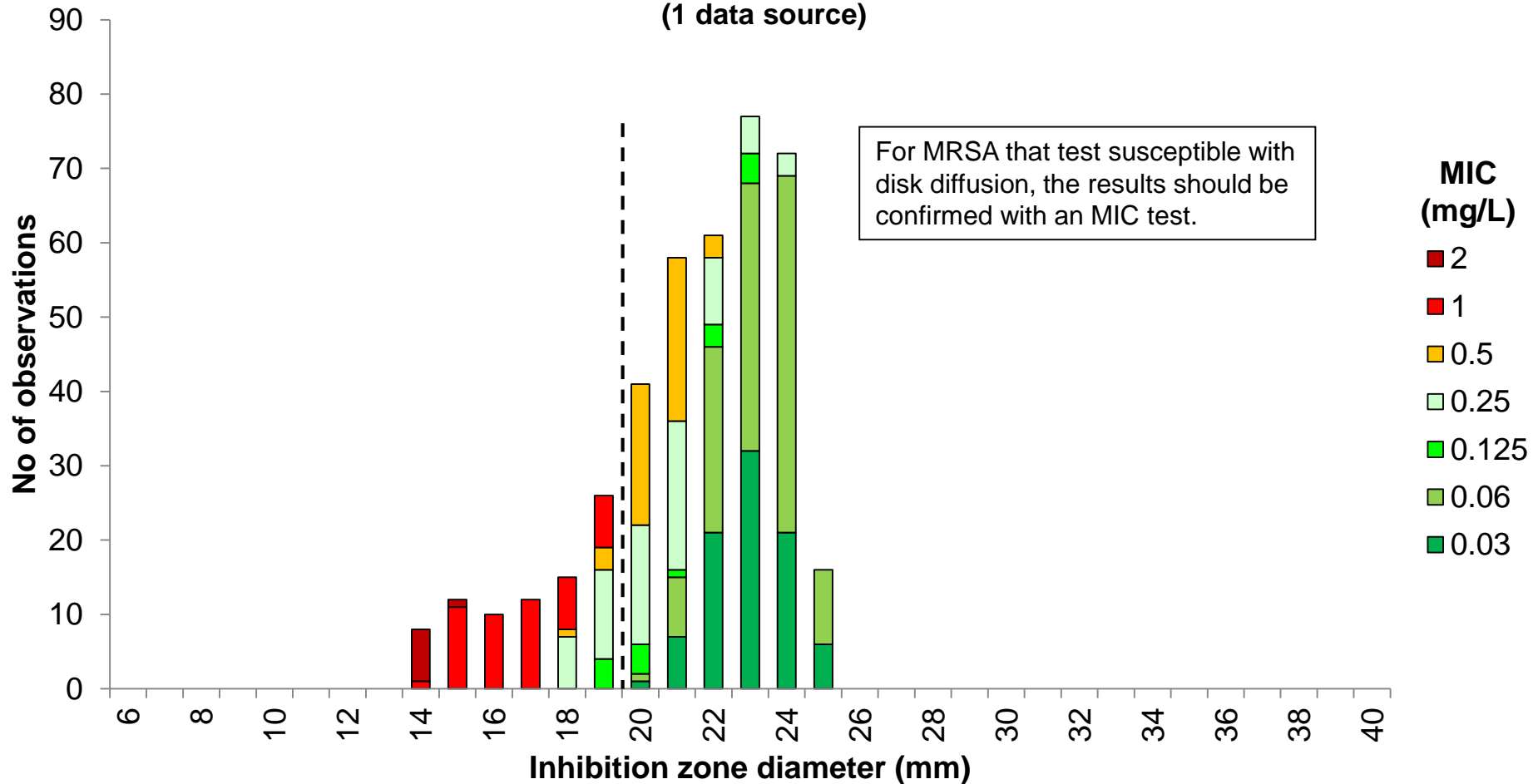
MIC S ≤ 0.25, R > 0.25 mg/L

Zone diameter S ≥ 20, R < 20 mm

Eravacycline 20 µg vs. MIC

S. aureus (MRSA), 47 isolates (408 correlates)

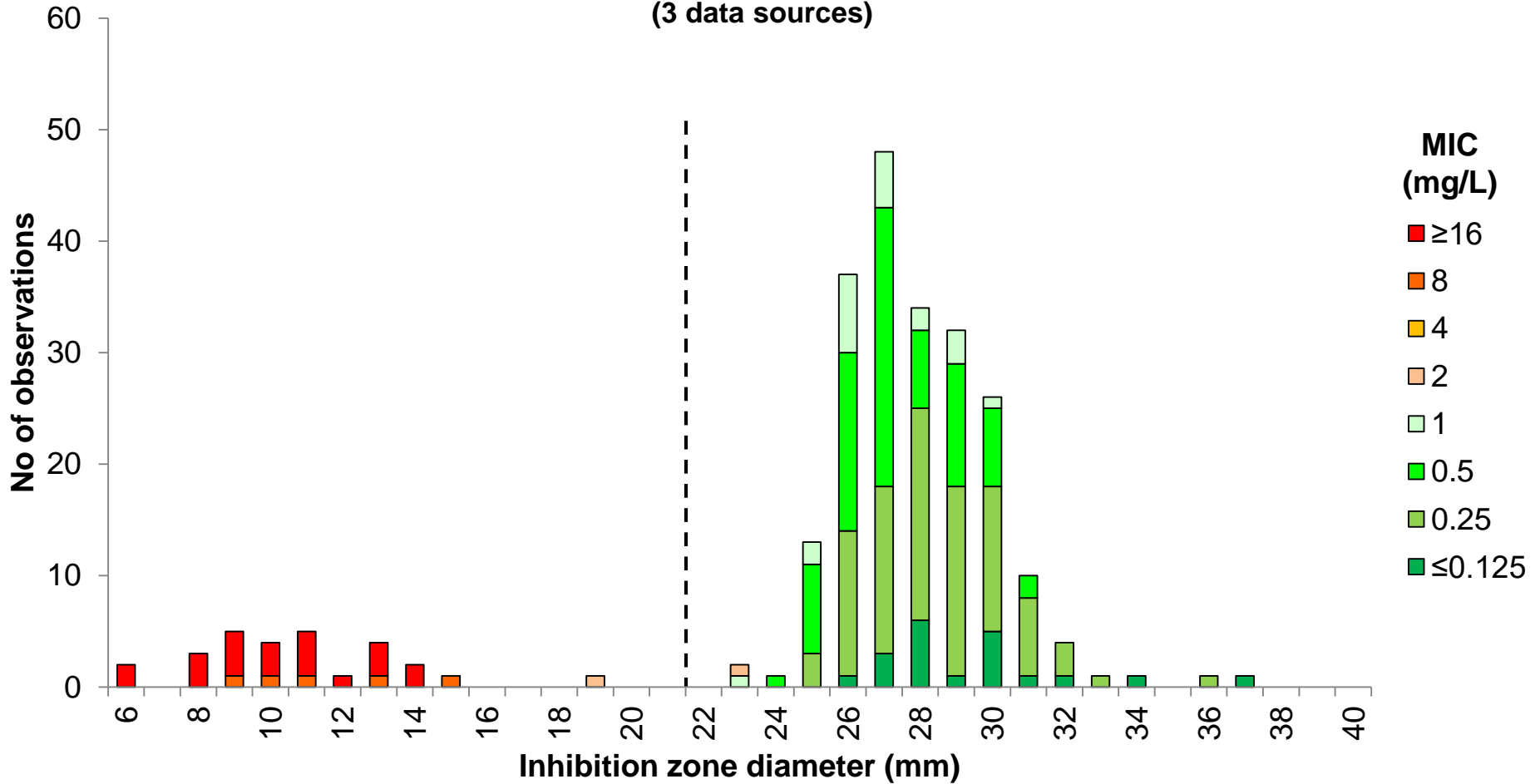
(1 data source)



Breakpoints	
MIC	S ≤ 0.25, R > 0.25 mg/L
Zone diameter	S ≥ 20, R < 20 mm

Tetracycline 30 µg vs. MIC *S. aureus*, 239 isolates

(3 data sources)



Breakpoints

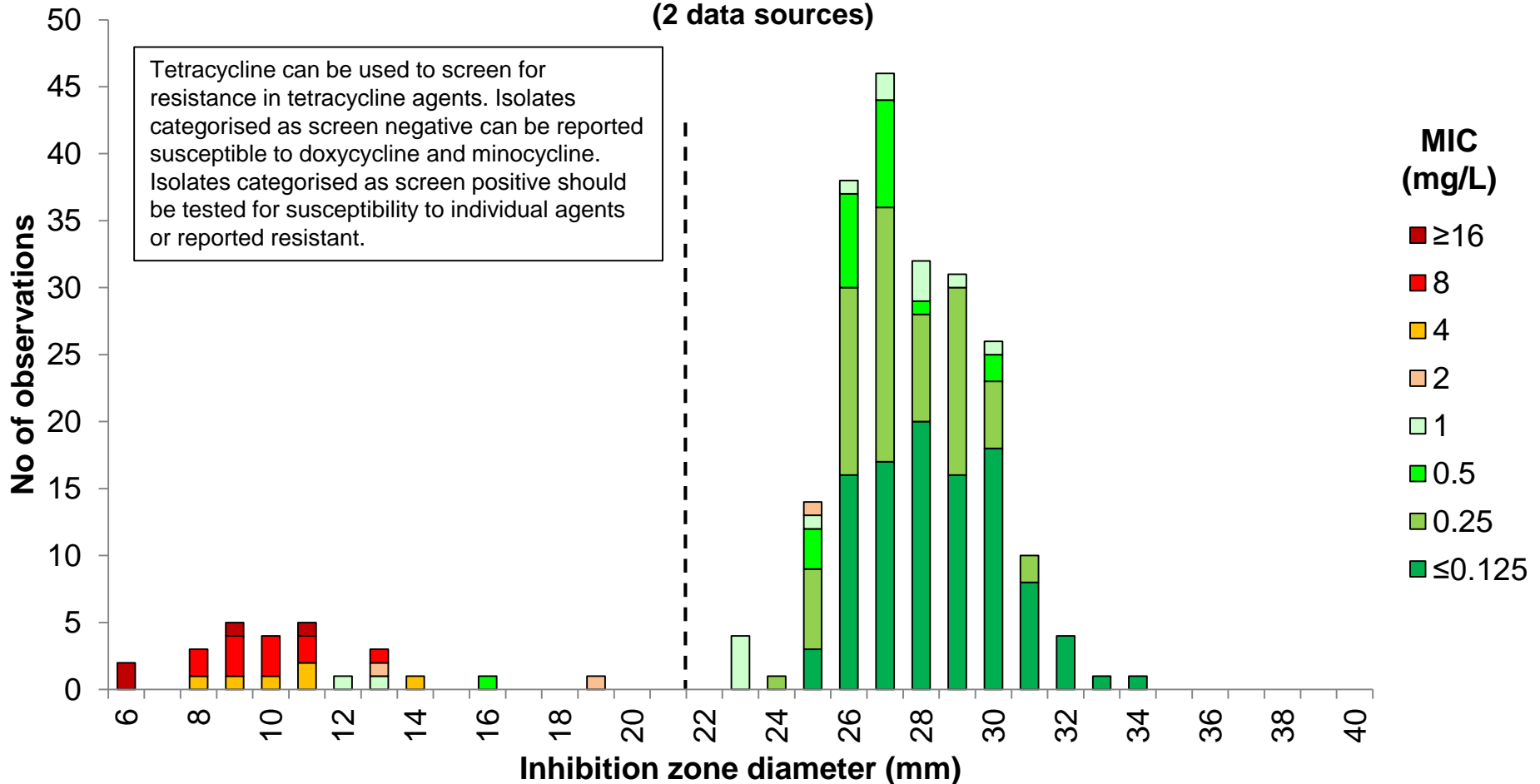
MIC $S \leq 1$, $R > 1$ mg/L

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

Tetracycline 30 µg vs. Doxycycline MIC

S. aureus, 234 isolates

(2 data sources)

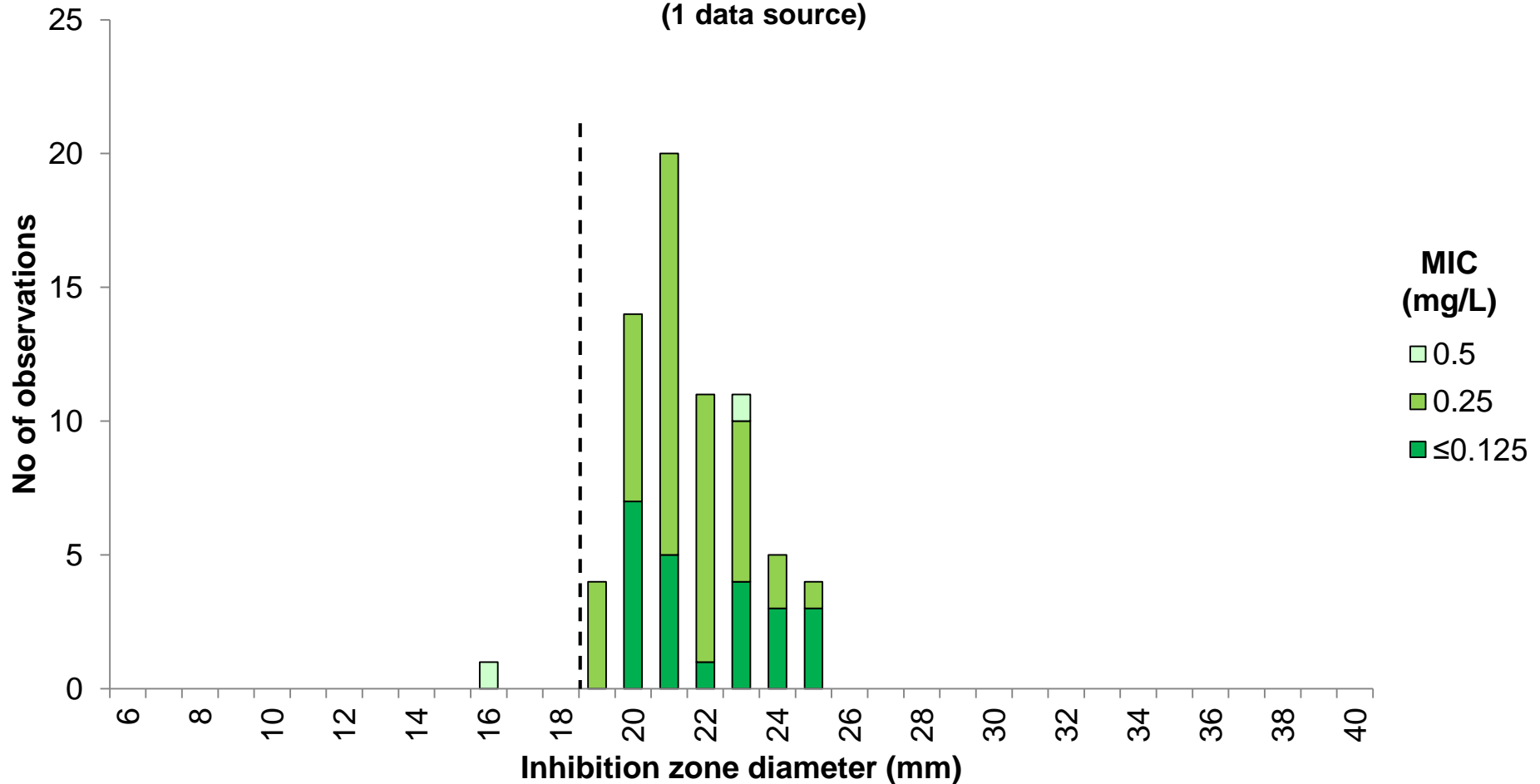


Tetracycline can be used to screen for resistance in tetracycline agents. Isolates categorised as screen negative can be reported susceptible to doxycycline and minocycline. Isolates categorised as screen positive should be tested for susceptibility to individual agents or reported resistant.

Breakpoints
 Doxycycline MIC $S \leq 1, R > 1$ mg/L
 Tetracycline zone diameter $S \geq 22, R < 22$ mm

Tigecycline 15 µg vs. MIC *S. aureus*, 70 isolates

(1 data source)



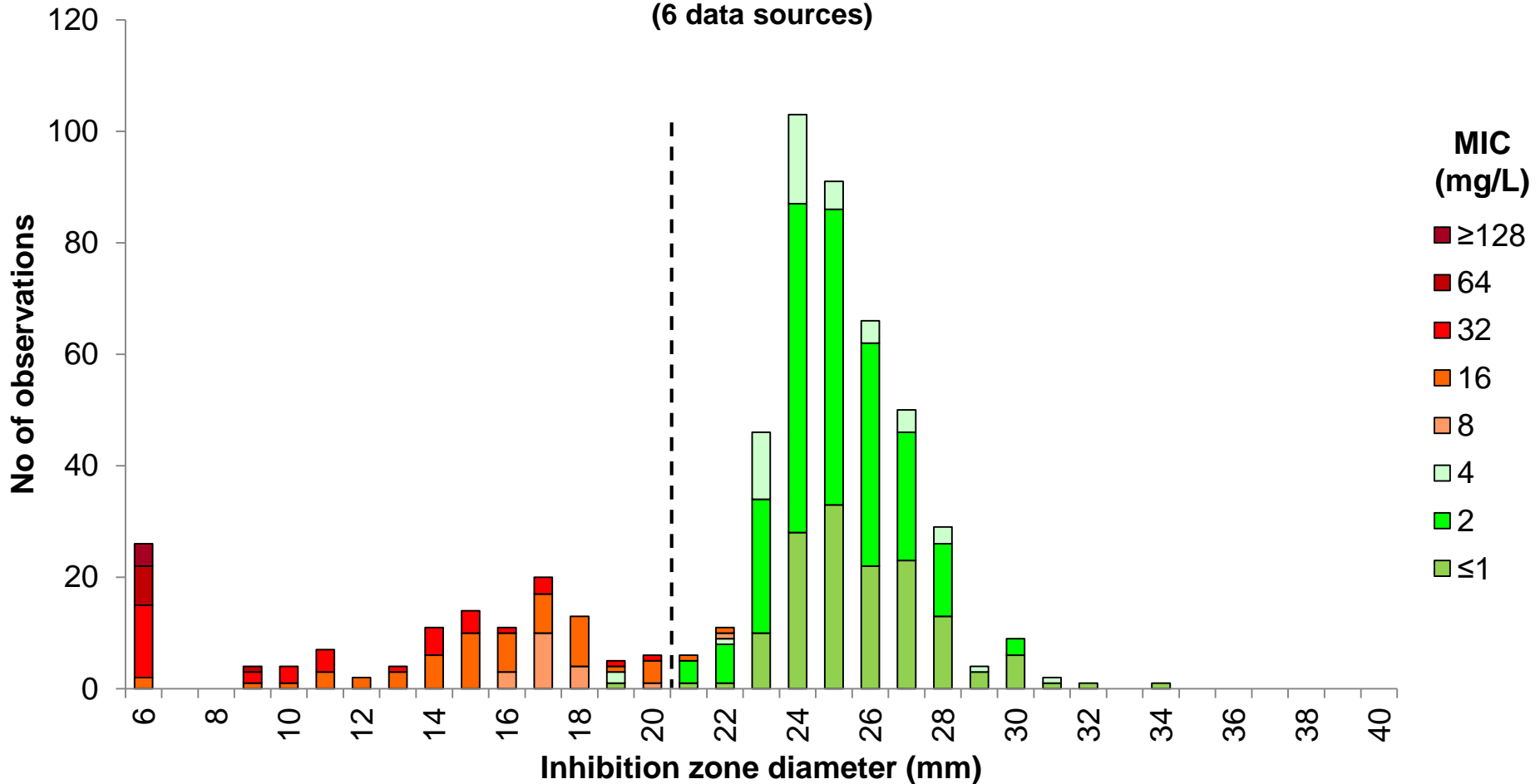
Breakpoints

MIC	S ≤ 0.5, R > 0.5 mg/L
Zone diameter	S ≥ 19, R < 19 mm

Linezolid 10 µg vs. MIC

S. aureus, 373 isolates (546 correlates)

(6 data sources)



Breakpoints

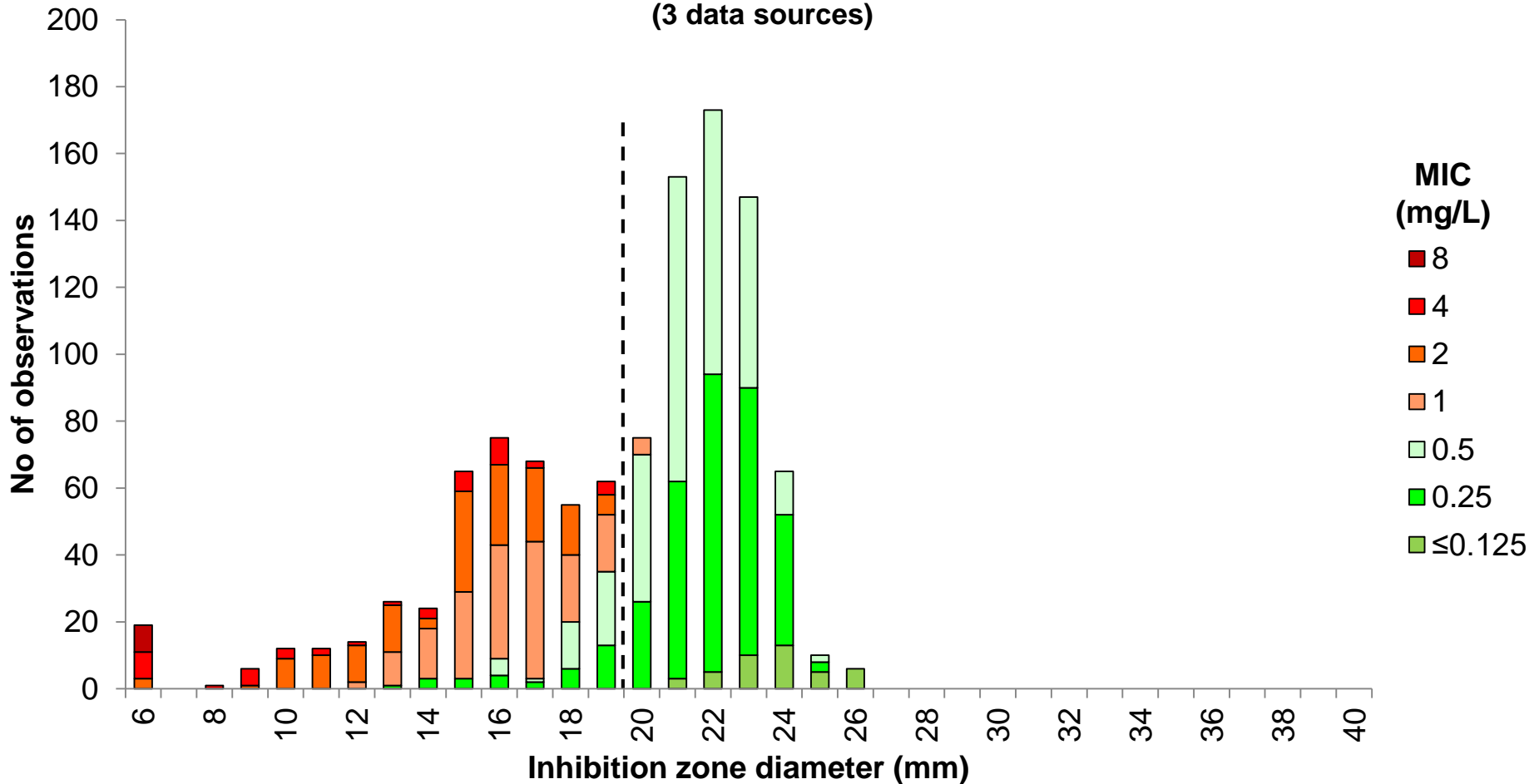
MIC $S \leq 4$, $R > 4$ mg/L

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

Tedizolid 2 µg vs. MIC

S. aureus, 110 isolates (1068 correlates)

(3 data sources)



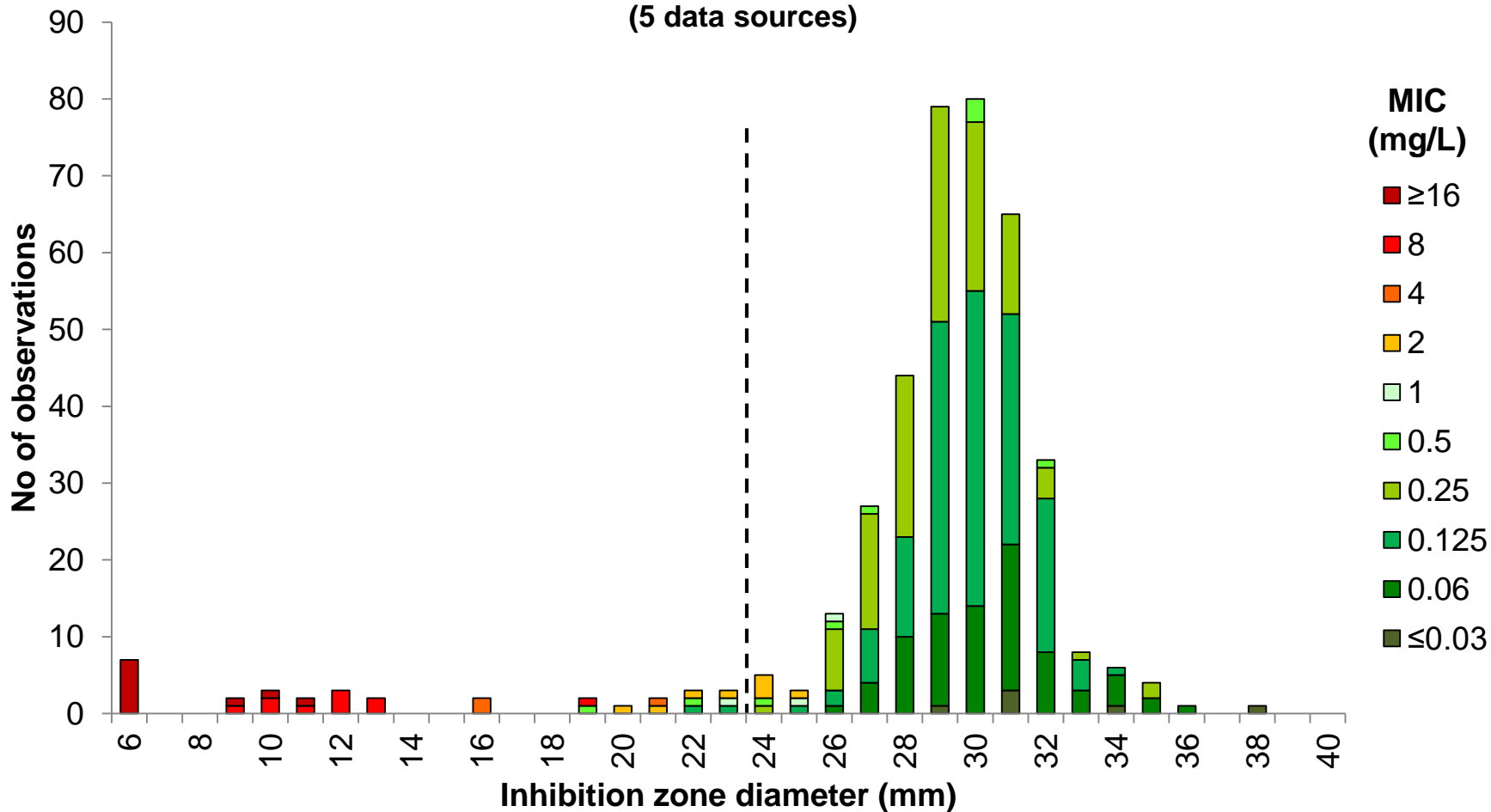
Breakpoints

MIC	S ≤ 0.5, R > 0.5 mg/L
Zone diameter	S ≥ 20, R < 20 mm

Fusidic acid 10 µg vs. MIC

S. aureus, 368 isolates (401 correlates)

(5 data sources)



Breakpoints

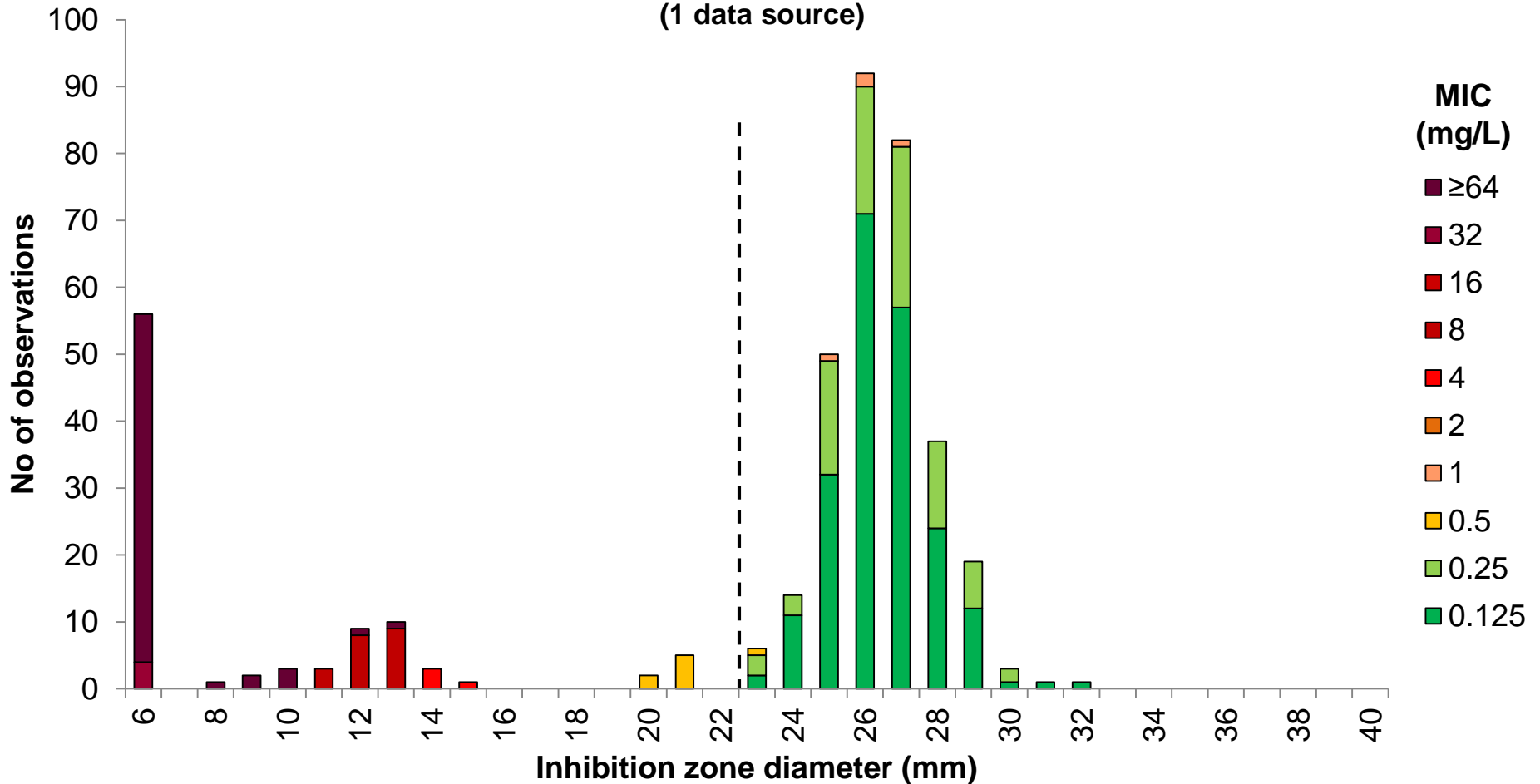
MIC $S \leq 1, R > 1$ mg/L

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

Lefamulin 5 μ g vs. MIC

S. aureus, 100 isolates (400 correlates)

(1 data source)



Breakpoints

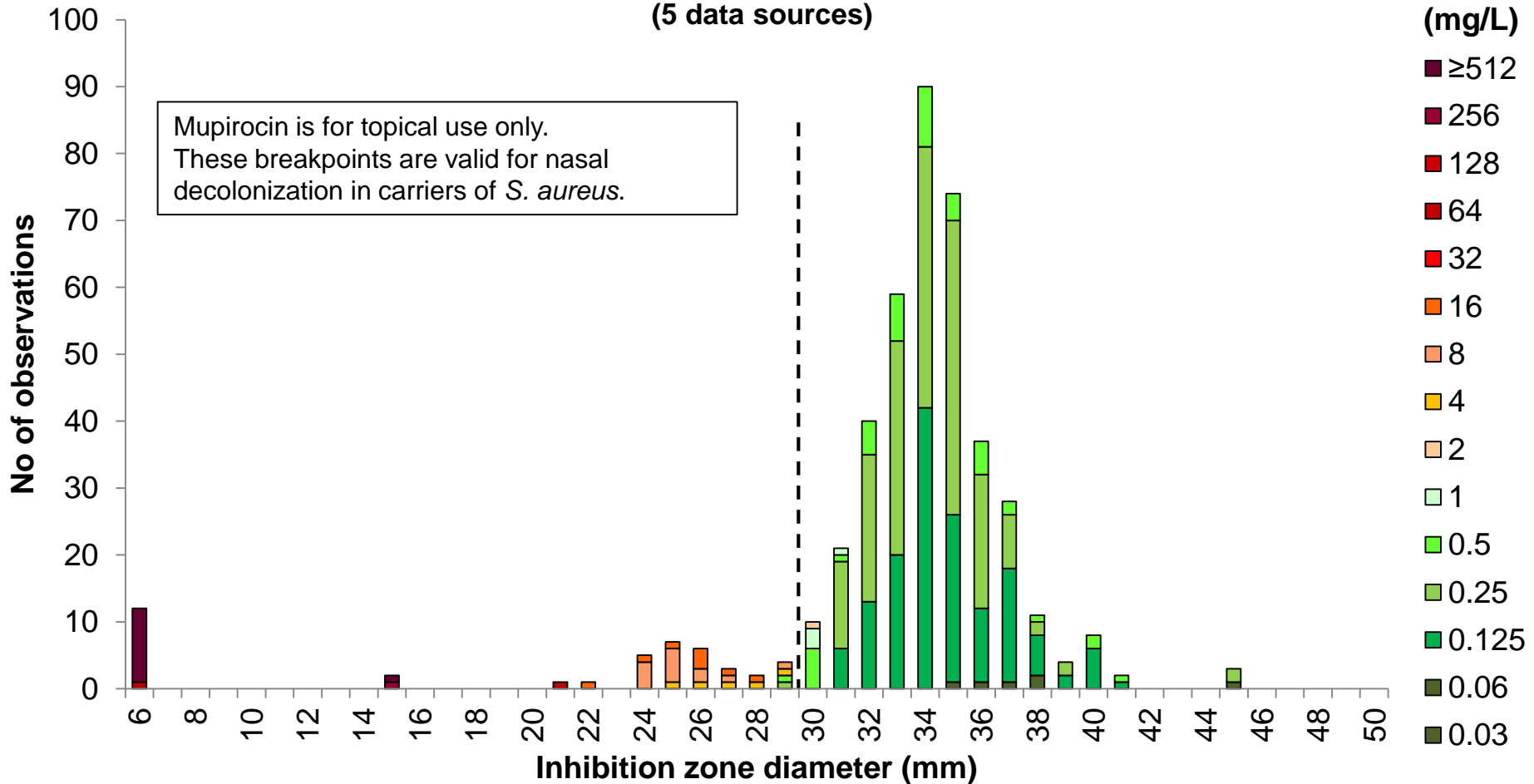
MIC S ≤ 0.25, R > 0.25 mg/L

Zone diameter S ≥ 23, R < 23 mm

Mupirocin 200 µg vs. MIC

S. aureus, 394 isolates (430 correlates)

(5 data sources)



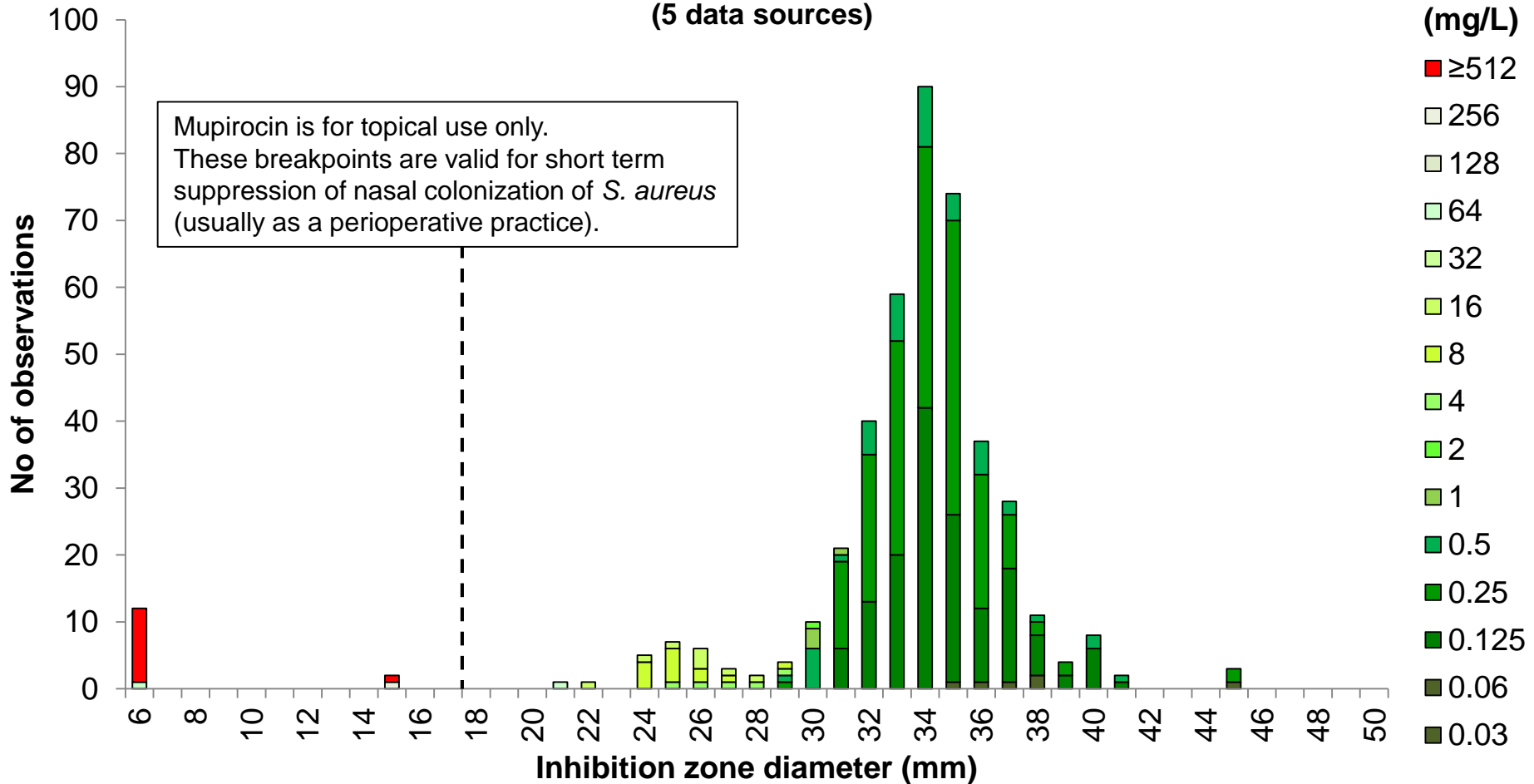
Breakpoints (nasal decolonization in carriers)

MIC	S ≤ 1, R > 1 mg/L
Zone diameter	S ≥ 30, R < 30 mm

Mupirocin 200 µg vs. MIC

S. aureus, 394 isolates (430 correlates)

(5 data sources)



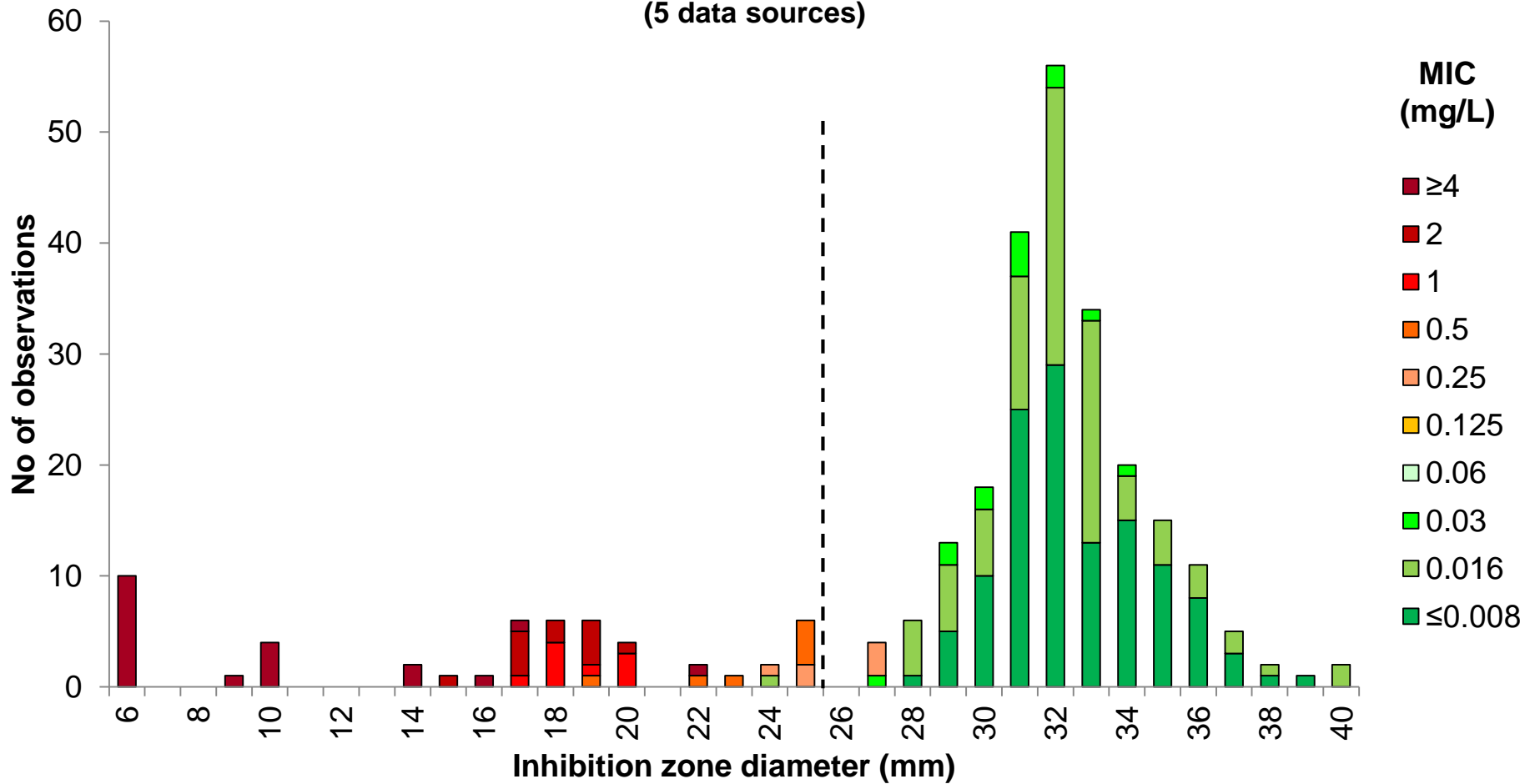
Breakpoints (short term suppression of nasal colonization)

MIC S ≤ 256, R > 256 mg/L

Zone diameter S ≥ 18, R < 18 mm

Rifampicin 5 μ g vs. MIC *S. aureus*, 280 isolates

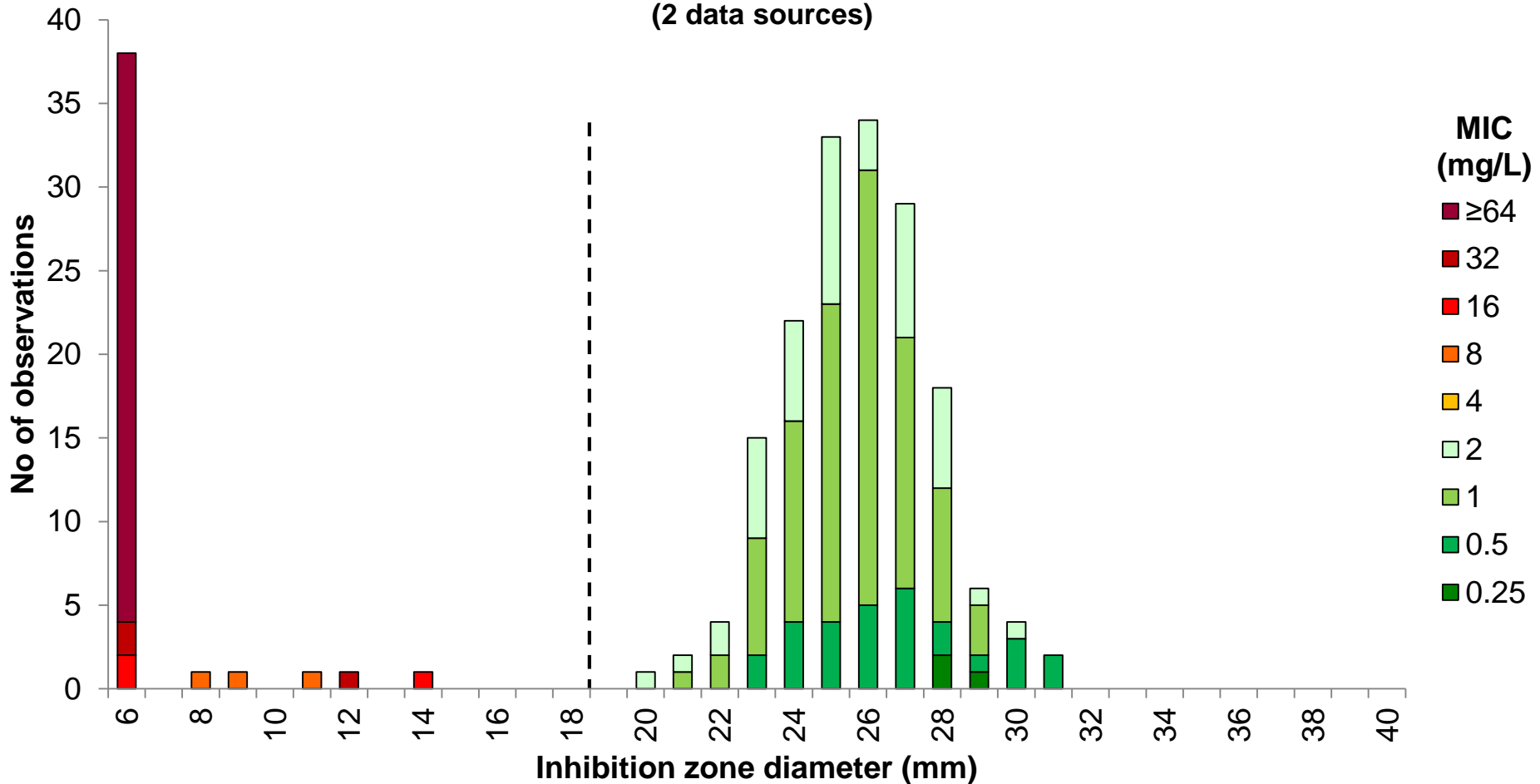
(5 data sources)



Breakpoints	
MIC	$S \leq 0.06$, $R > 0.06$
Zone diameter	$S \geq 26$, $R < 26$ mm

Trimethoprim 5 µg vs. MIC *S. aureus*, 213 isolates

(2 data sources)



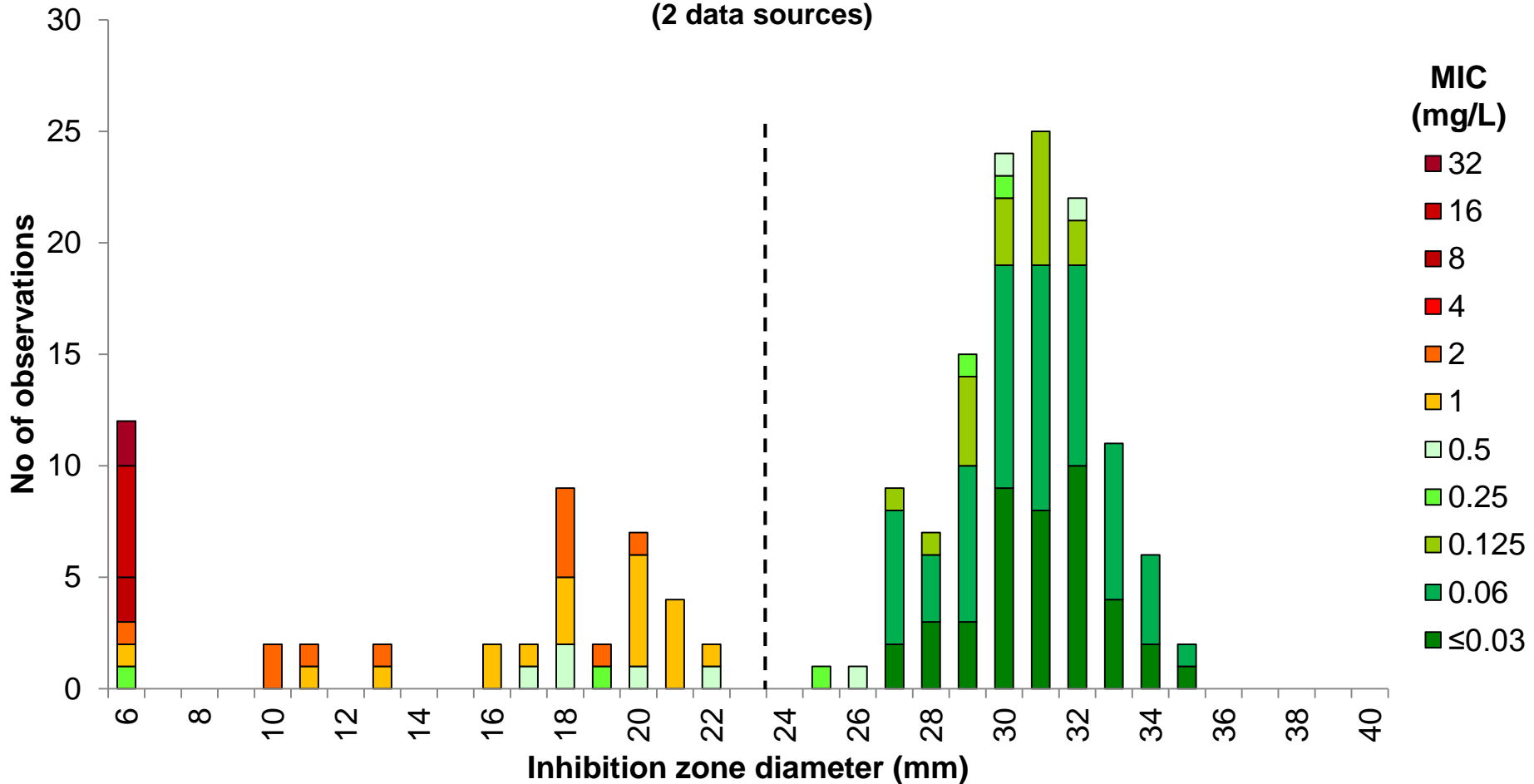
Breakpoints

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

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

Trimethoprim-sulfamethoxazole 1.25-23.75 μg vs. MIC *S. aureus*, 169 isolates

(2 data sources)



Breakpoints

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

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



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