



EUCAST

European Committee
on Antimicrobial
Susceptibility Testing

Viridans group streptococci

Calibration of zone diameter
breakpoints to MIC values

Version 7.1
January 2026

Viridans group streptococci

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.

Viridans group streptococci

Materials and methods

- Antimicrobial susceptibility testing was performed on a collection of viridans group streptococci, comprising mostly *S. mitis*, *S. oralis*, *S. anginosus*, *S. salivarius*, *S. gallolyticus*, *S. sanguinis*, *S. constellatus*, *S. bovis*, *S. gordonii*, *S. mutans*, *S. intermedius*, *S. vestibularis*, *S. parasanguinis*, *S. cristatus*, *S. infantarius*, *S. massiliensis* and *S. pasteurianus*.
- Disk diffusion was performed according to EUCAST methodology and MIC determination was performed with gradient tests or broth microdilution using the EUCAST MH-F broth.
- 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; JMI Laboratories, Iowa, USA; Vestfold Hospital, Tønsberg, Norway; Akershus University Hospital, Lørenskog, Norway; Stavanger University Hospital, Norway; Kalmar Hospital, Sweden; Linköping University Hospital, Sweden; Southmead Hospital, Bristol, UK; Analyse BioLab GmbH, Linz, Austria; Laboratory Specialists Inc., USA and Centre National de Référence des Streptocoques, Paris, France.
- This presentation is based on EUCAST Clinical Breakpoint Tables v. 16.0.

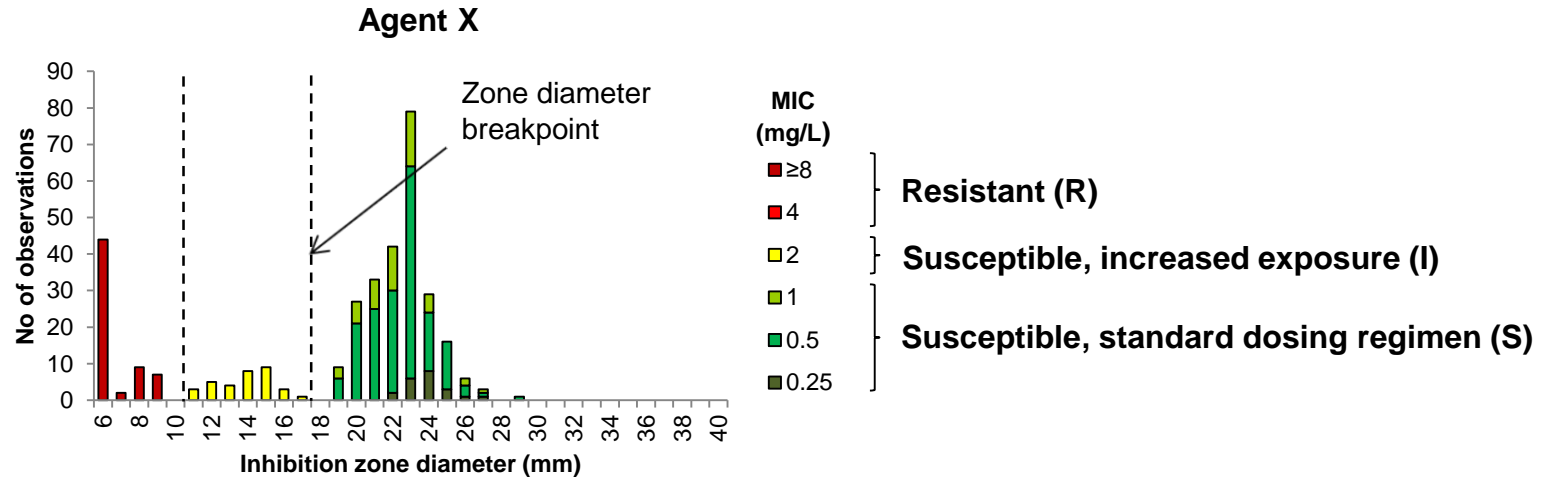
Changes from previous version (7.0)

Changes
<ul style="list-style-type: none">• No changes. Breakpoints checked against latest version of EUCAST Clinical Breakpoint Tables.

- No changes. Breakpoints checked against latest version of EUCAST Clinical Breakpoint Tables.

Explanation of graphs:

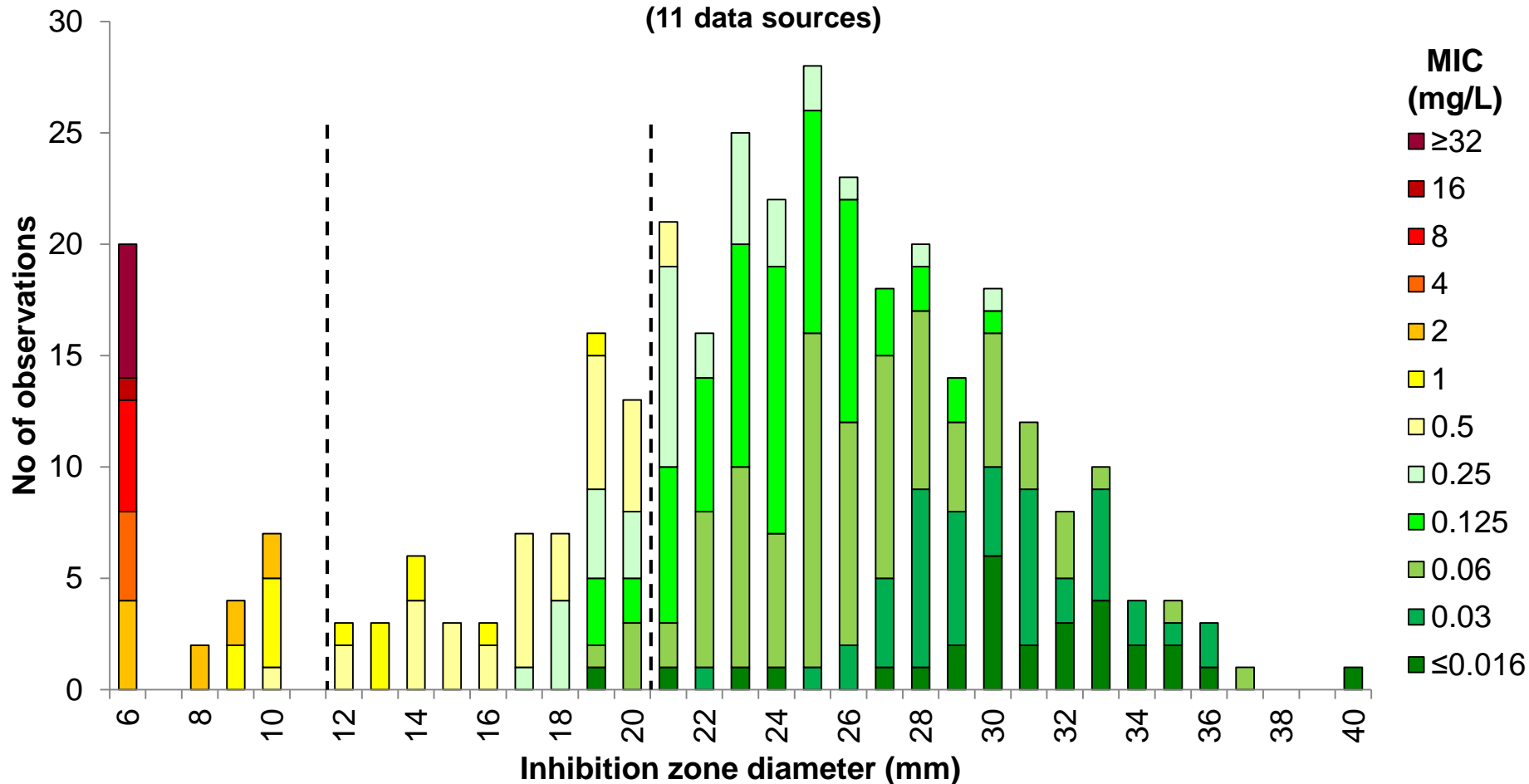
- These graphs show zone diameter distributions with MIC values or resistance mechanisms as coloured bars. Colours are related to current EUCAST MIC breakpoints.



Benzylpenicillin 1 unit vs. MIC

Viridans group streptococci, 342 isolates

(11 data sources)



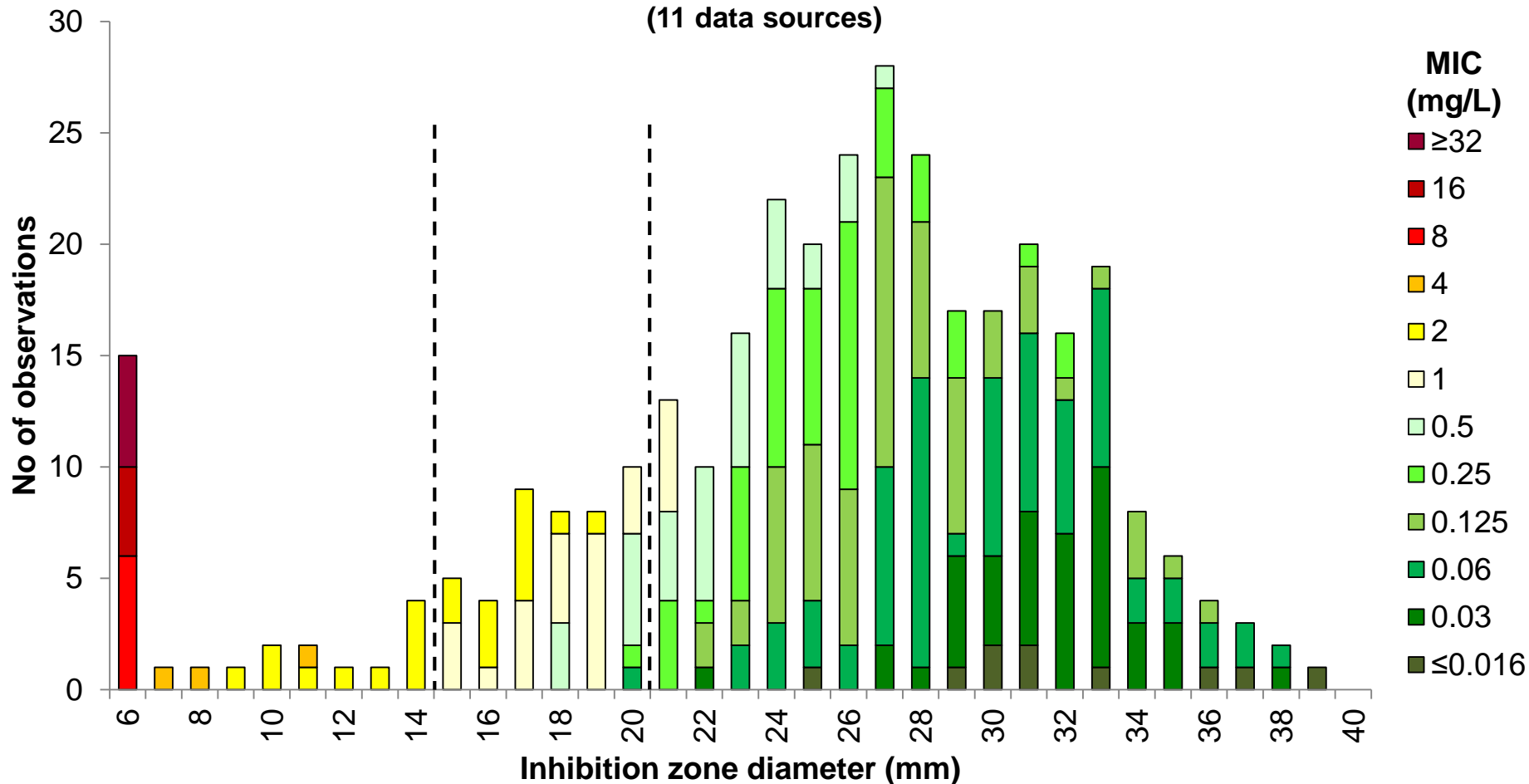
Breakpoints (non-endocarditis)

MIC	S ≤ 0.25, R > 1 mg/L
Zone diameter	S ≥ 21, R < 12 mm

Ampicillin 2 µg vs. MIC

Viridans group streptococci, 342 isolates

(11 data sources)



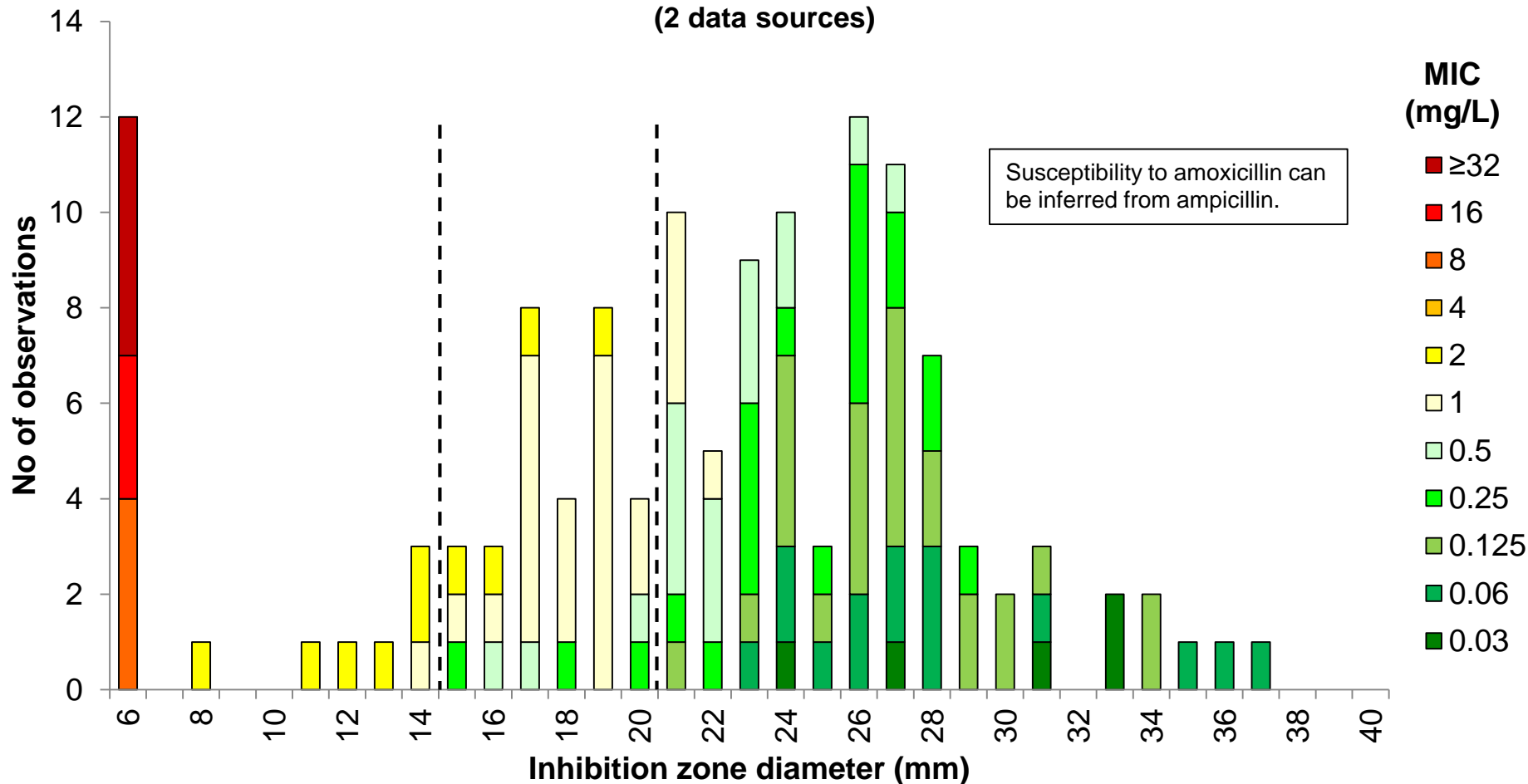
Breakpoints (non-endocarditis)

MIC	S ≤ 0.5, R > 2 mg/L
Zone diameter	S ≥ 21, R < 15 mm

Ampicillin 2 µg vs. Amoxicillin MIC

Viridans group streptococci, 131 isolates

(2 data sources)



Breakpoints (non-endocarditis)

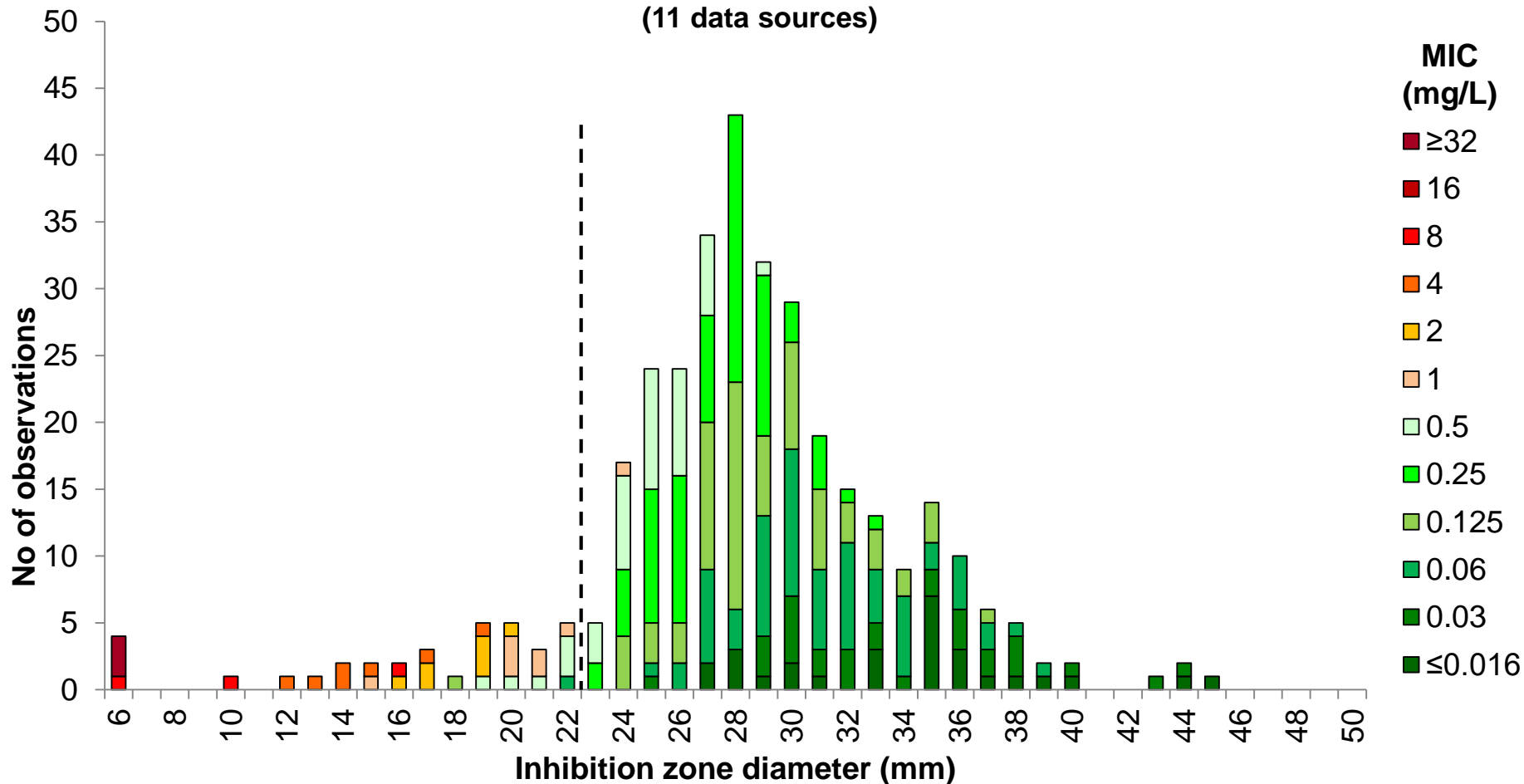
Amoxicillin MIC $S \leq 0.5$, $R > 2$ mg/L

Ampicillin zone diameter $S \geq 21$, $R < 15$ mm

Cefotaxime 5 μ g vs. MIC

Viridans group streptococci, 342 isolates

(11 data sources)

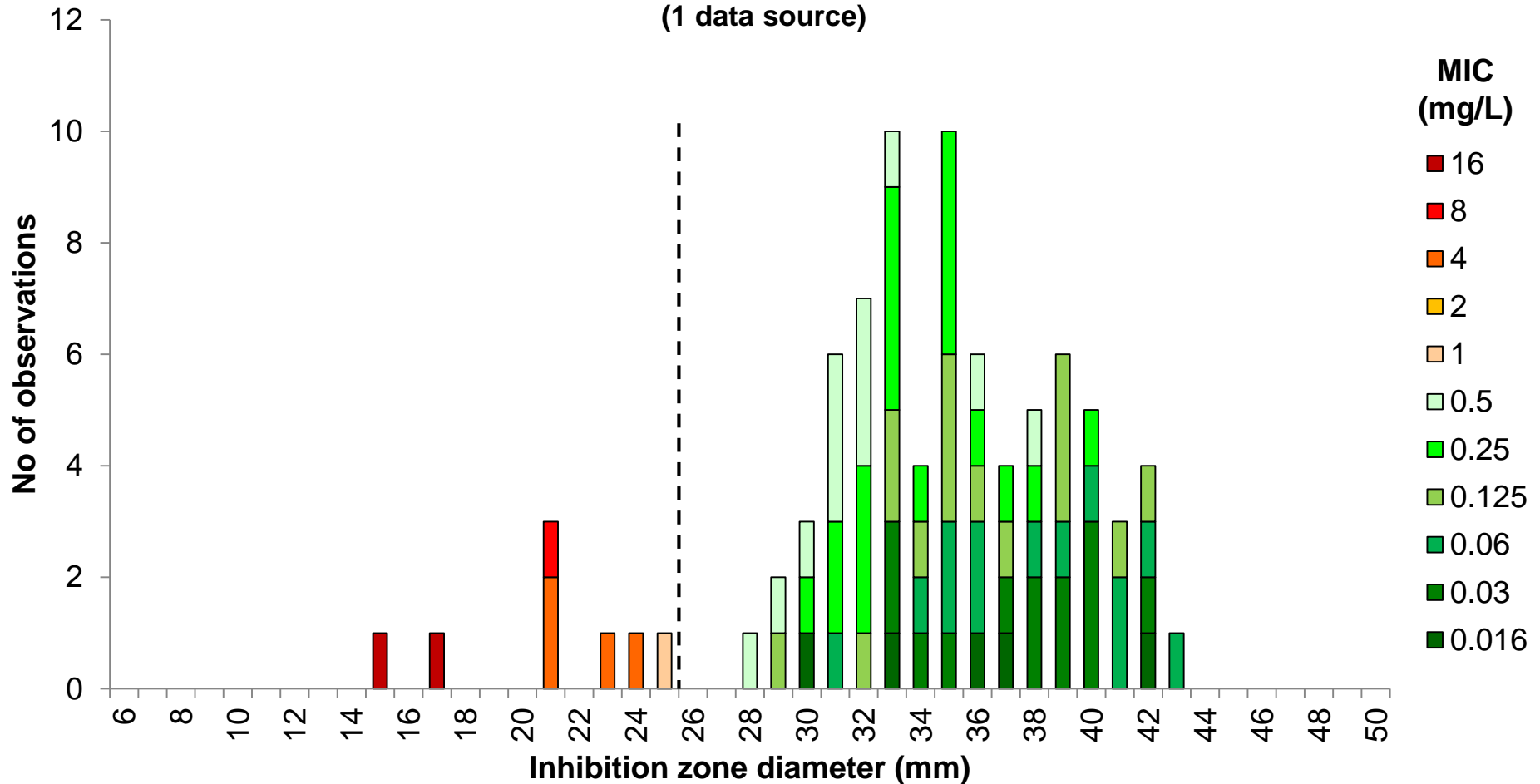


Breakpoints	
MIC	S ≤ 0.5, R > 0.5 mg/L
Zone diameter	S ≥ 23, R < 23 mm

Cefuroxime 30 µg vs. MIC

Viridans group streptococci, 85 isolates

(1 data source)



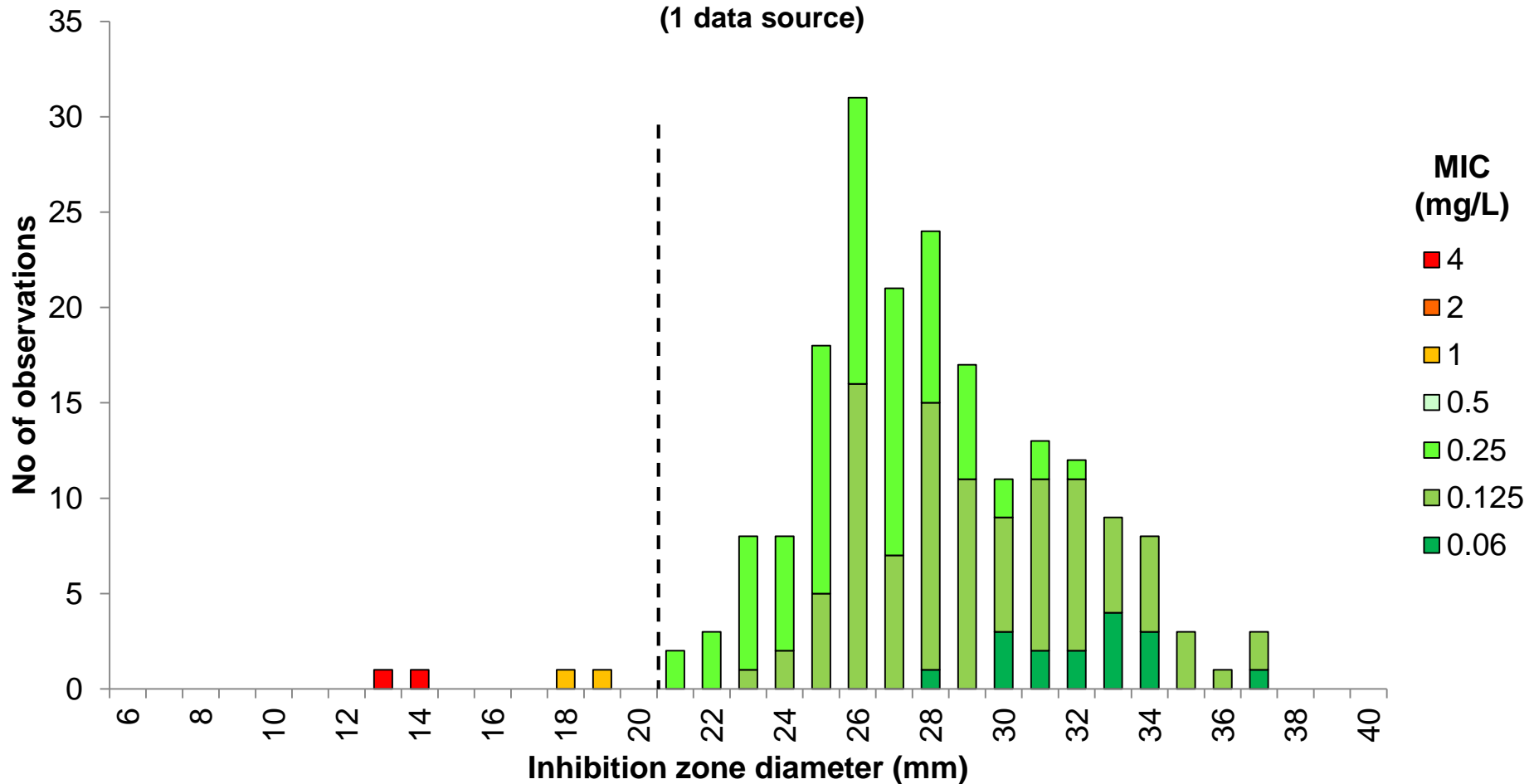
Breakpoints (iv)

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

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

Moxifloxacin 5 µg vs. MIC

Viridans group streptococci, 98 isolates (196 correlates)

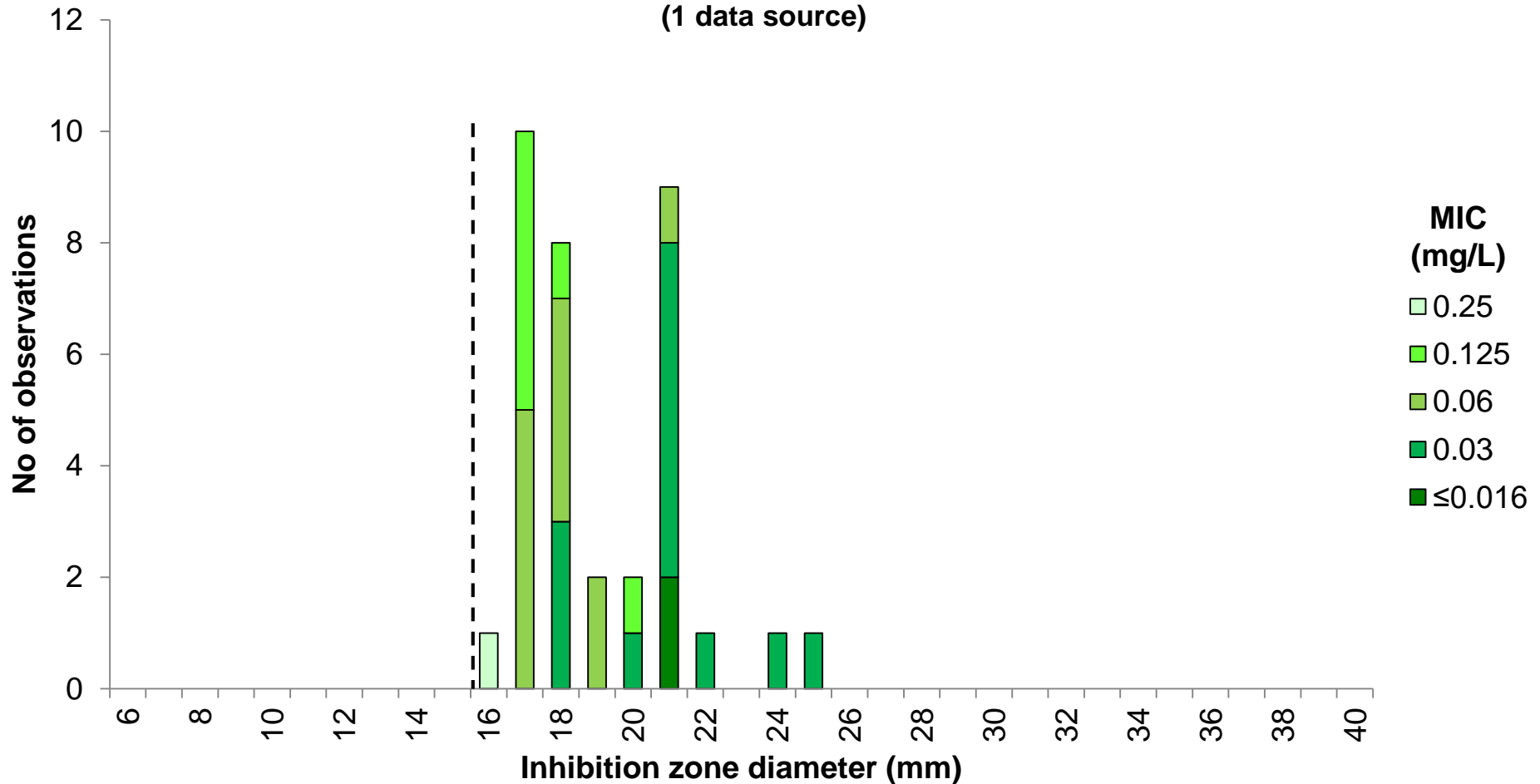


No clinical breakpoints. A cut-off of MIC 0.5 mg/L or zone diameter 21 mm can be used to distinguish wild-type isolates from isolates with acquired resistance.

Teicoplanin 30 µg vs. MIC

Viridans group streptococci, 35 isolates

(1 data source)



Breakpoints

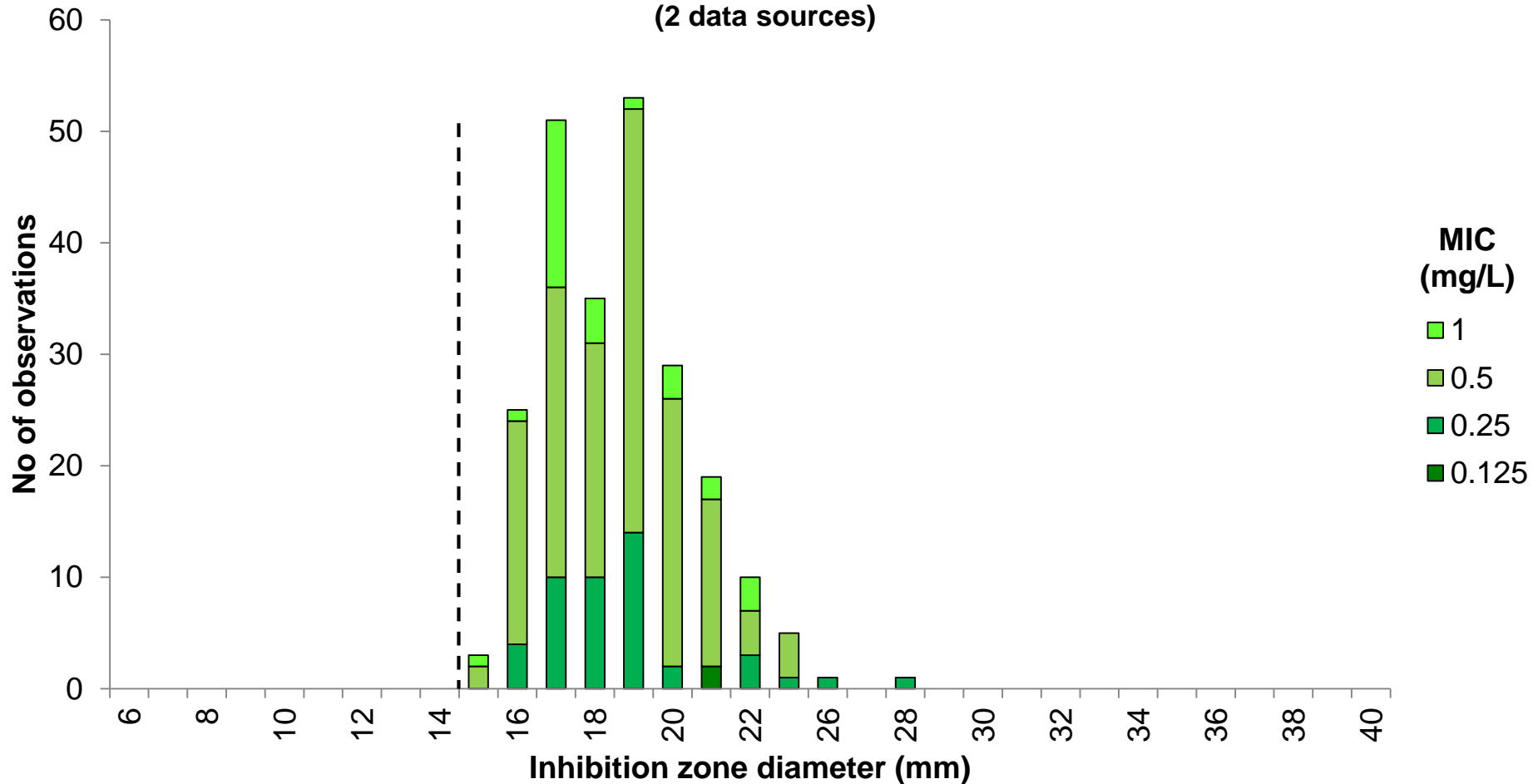
MIC S ≤ 2, R > 2 mg/L

Zone diameter S ≥ 16, R < 16 mm

Vancomycin 5 μ g vs. MIC

Viridans group streptococci, 135 isolates (232 correlates)

(2 data sources)

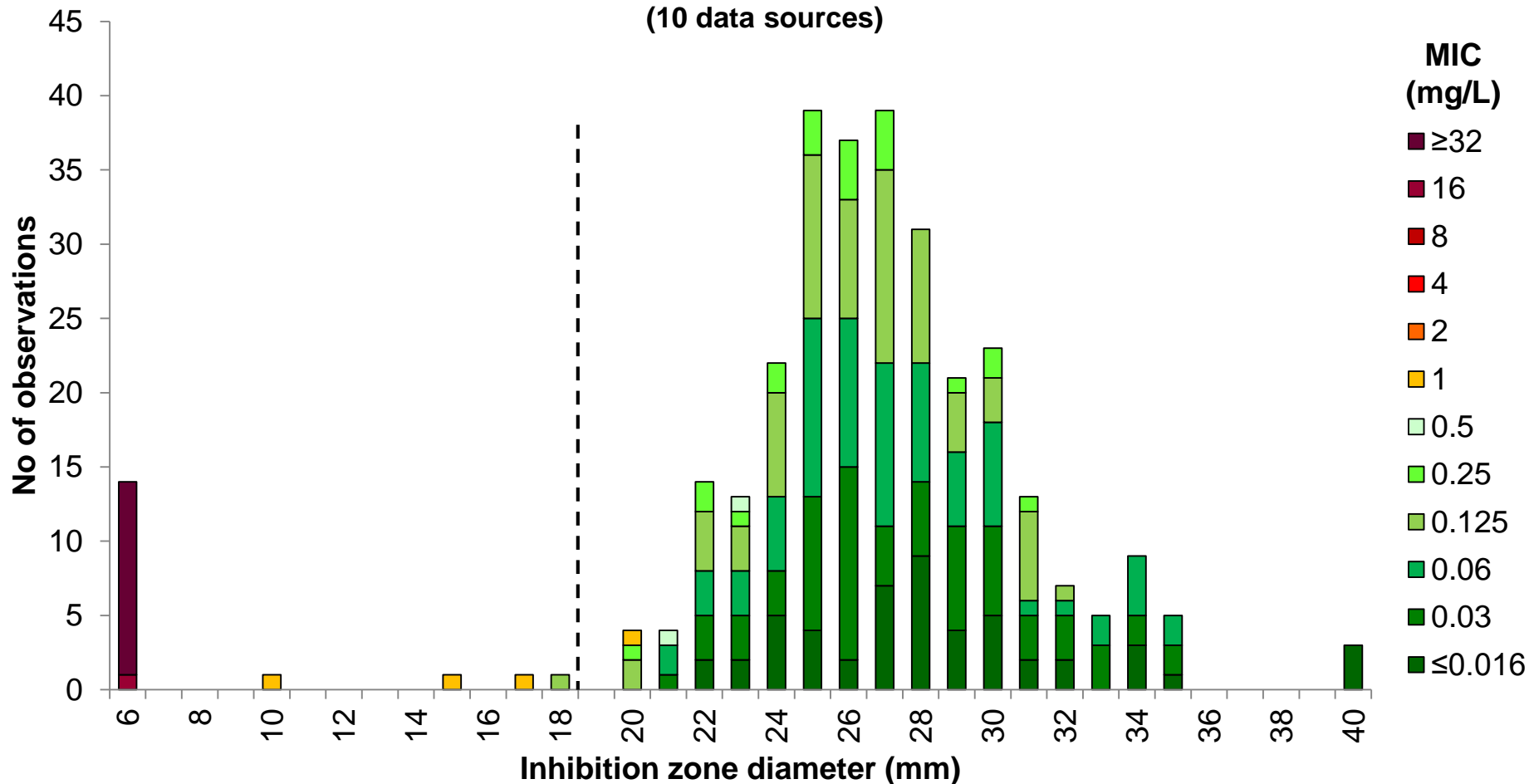


Breakpoints	
MIC	S \leq 2, R $>$ 2 mg/L
Zone diameter	S \geq 15, R $<$ 15 mm

Clindamycin 2 µg vs. MIC

Viridans group streptococci, 307 isolates

(10 data sources)

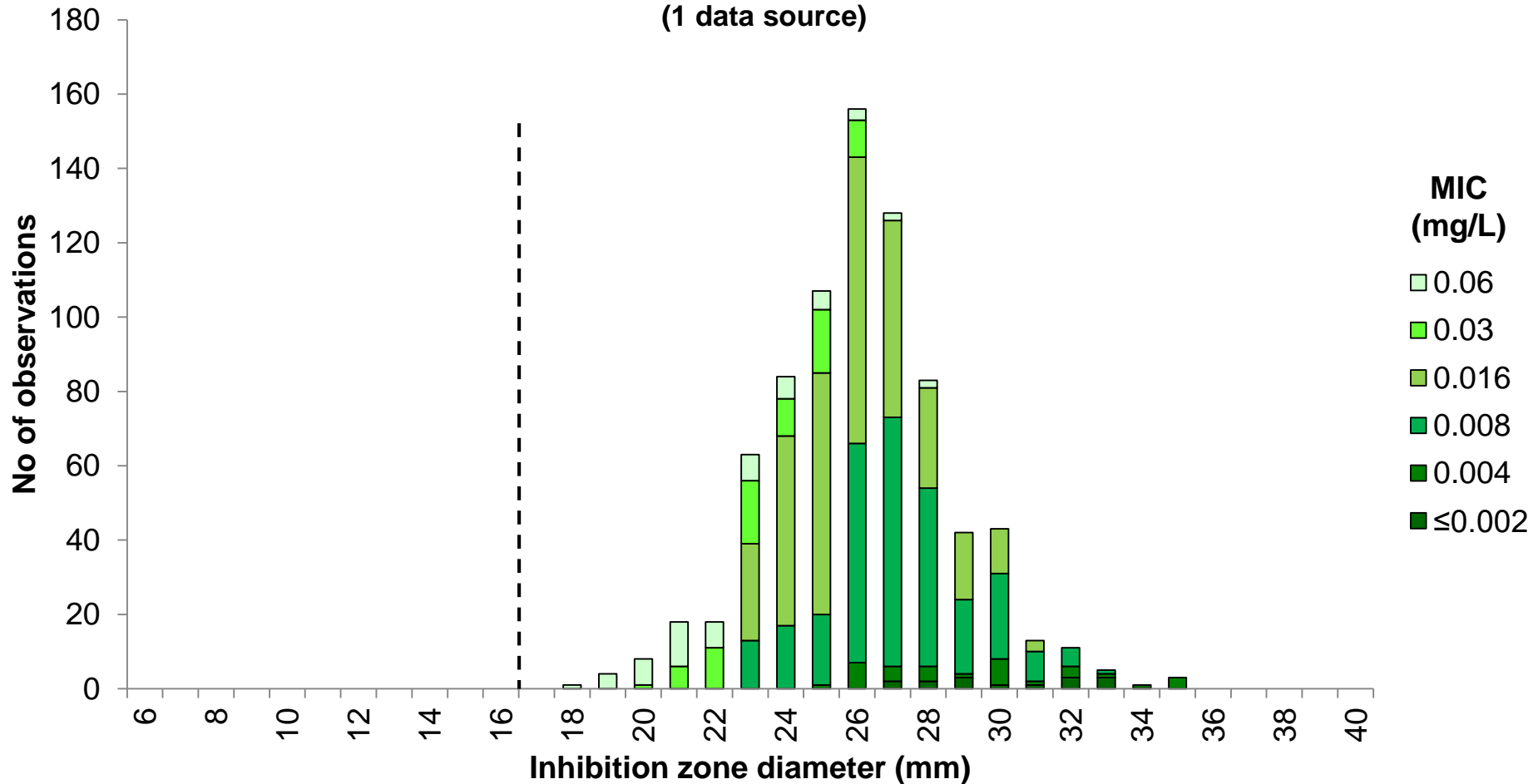


Breakpoints	
MIC	S ≤ 0.5 , R > 0.5 mg/L
Zone diameter	S ≥ 19 , R < 19 mm

Eravacycline 20 µg vs. MIC

Viridans group streptococci, 103 isolates (788 correlates)

(1 data source)

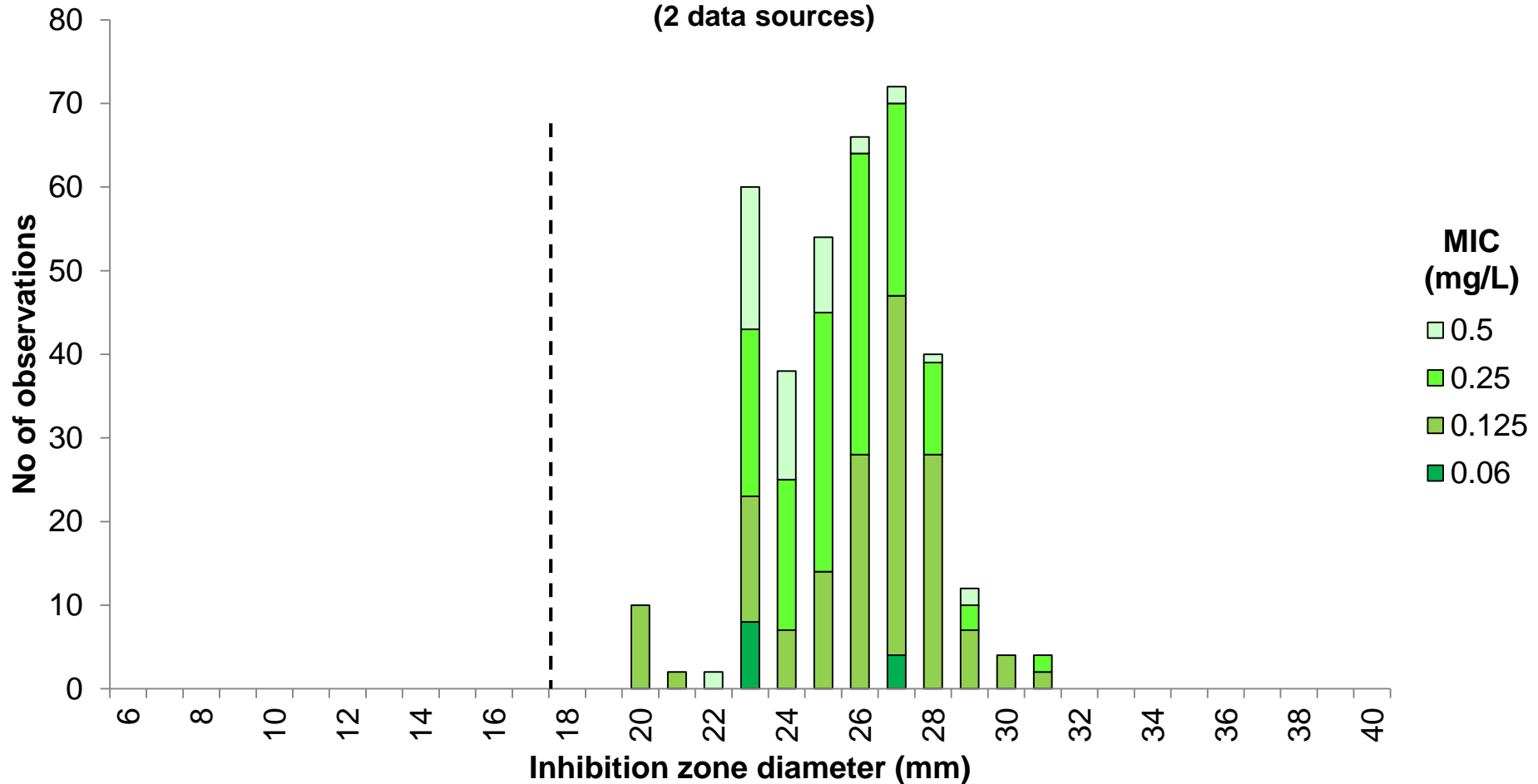


Breakpoints	
MIC	S ≤ 0.125, R > 0.125 mg/L
Zone diameter	S ≥ 17, R < 17 mm

Tedizolid 2 µg vs. MIC

S. anginosus group, 50 isolates (364 correlates)

(2 data sources)



Breakpoints (*S. anginosus* group)

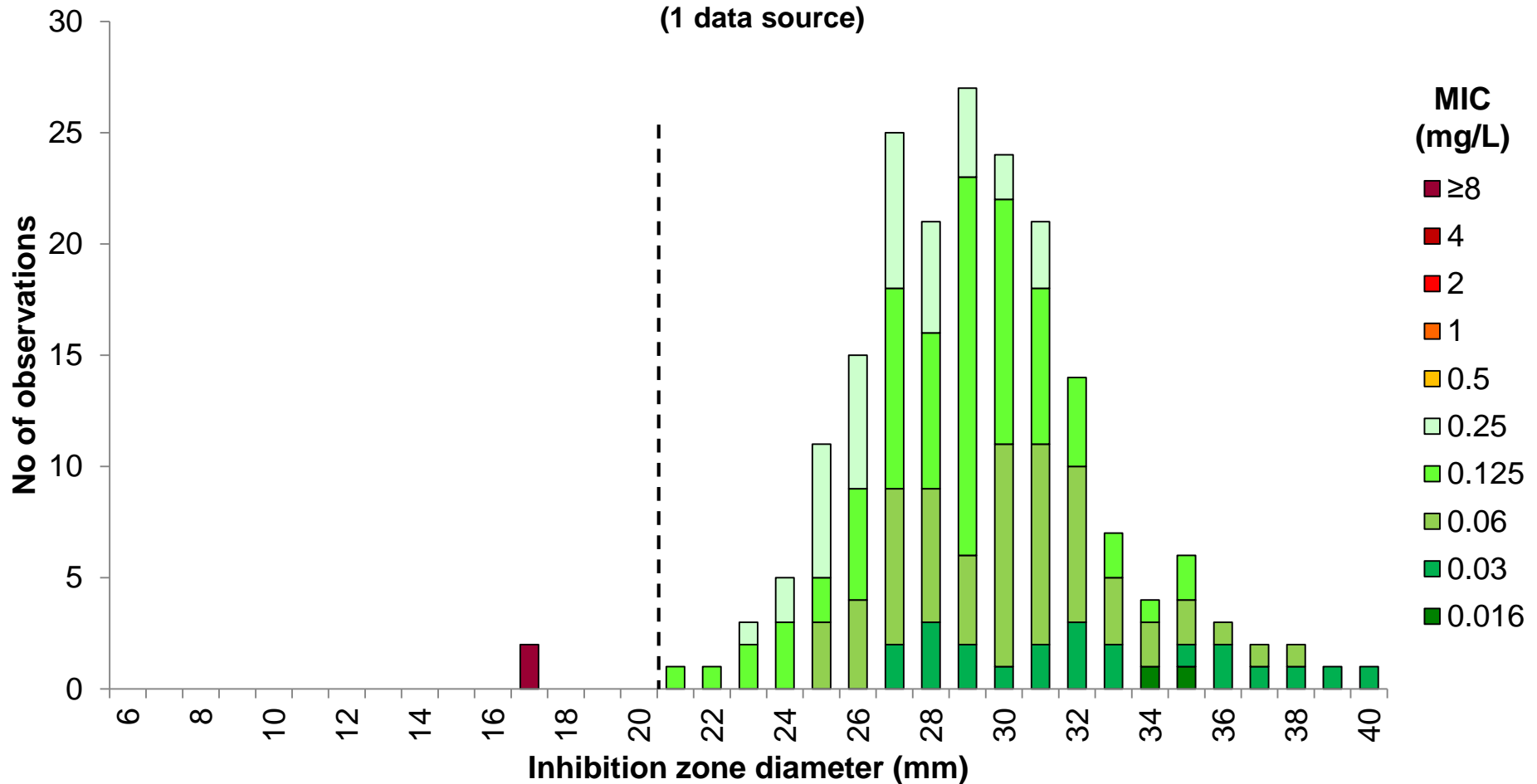
MIC S ≤ 0.5, R > 0.5 mg/L

Zone diameter S ≥ 18, R < 18 mm

Rifampicin 5 µg vs. MIC

Viridans group streptococci, 98 isolates (196 correlates)

(1 data source)



No clinical breakpoints. A cut-off of MIC 0.25 mg/L or zone diameter 21 mm can be used to distinguish wild-type isolates from isolates with acquired resistance.

Viridans group streptococci

Benzylopenicillin 1 unit as screen for
beta-lactam resistance

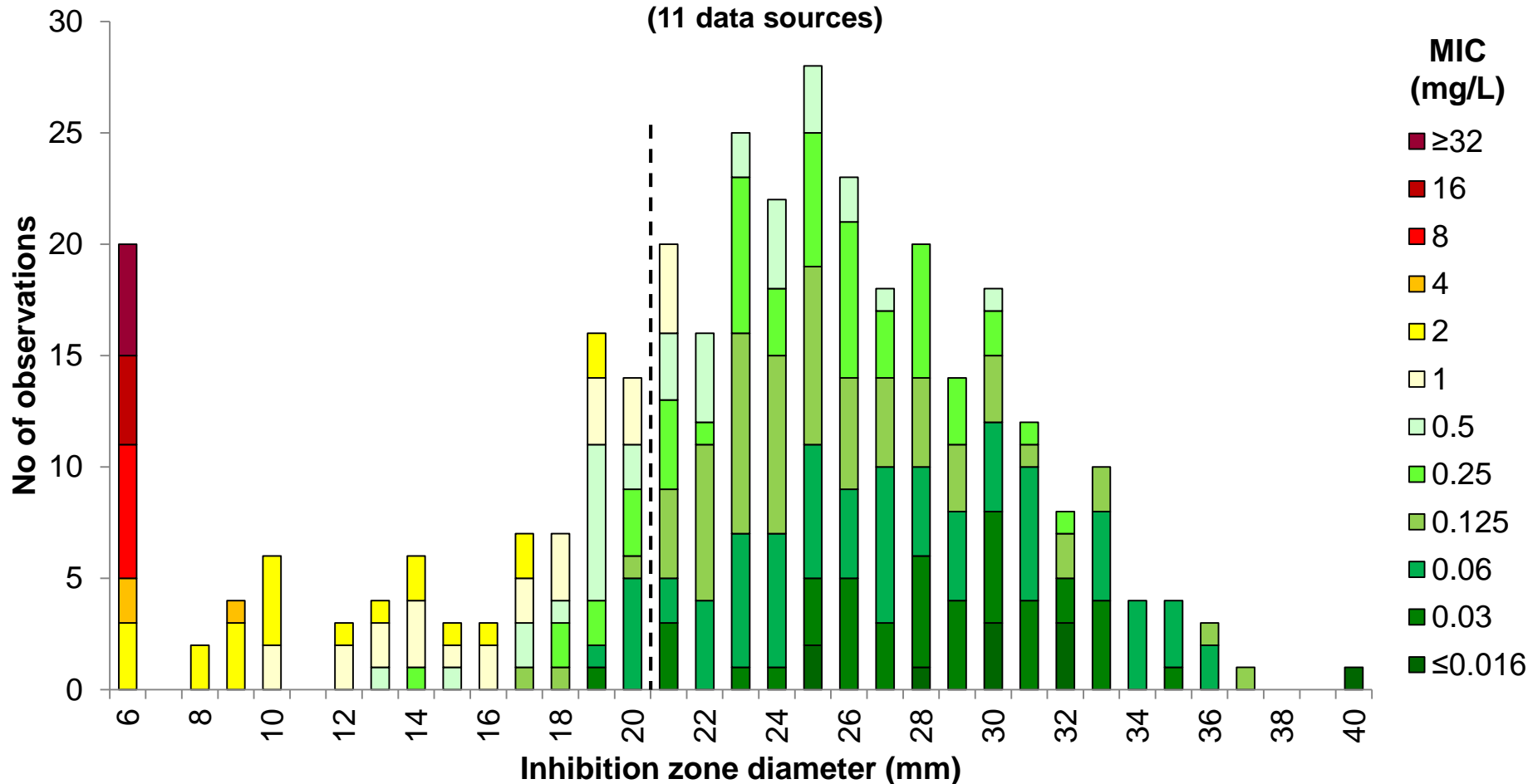
Viridans group streptococci

- Benzylpenicillin (MIC or disk diffusion) can be used to screen for beta-lactam resistance.
- The screening breakpoint for benzylpenicillin 1 unit is $S \geq 21$ mm and for benzylpenicillin MIC $S \leq 0.25$ mg/L.
- Isolates categorised as screen negative can be reported susceptible to beta-lactam agents for which clinical breakpoints are listed (including those with “Note”).
- Isolates categorised as screen positive should be tested for susceptibility to individual agents or reported resistant.

Benzylpenicillin 1 unit vs. Ampicillin MIC

Viridans group streptococci, 342 isolates

(11 data sources)



Breakpoints (non-endocarditis)

Ampicillin MIC

S ≤ 0.5, R > 2 mg/L

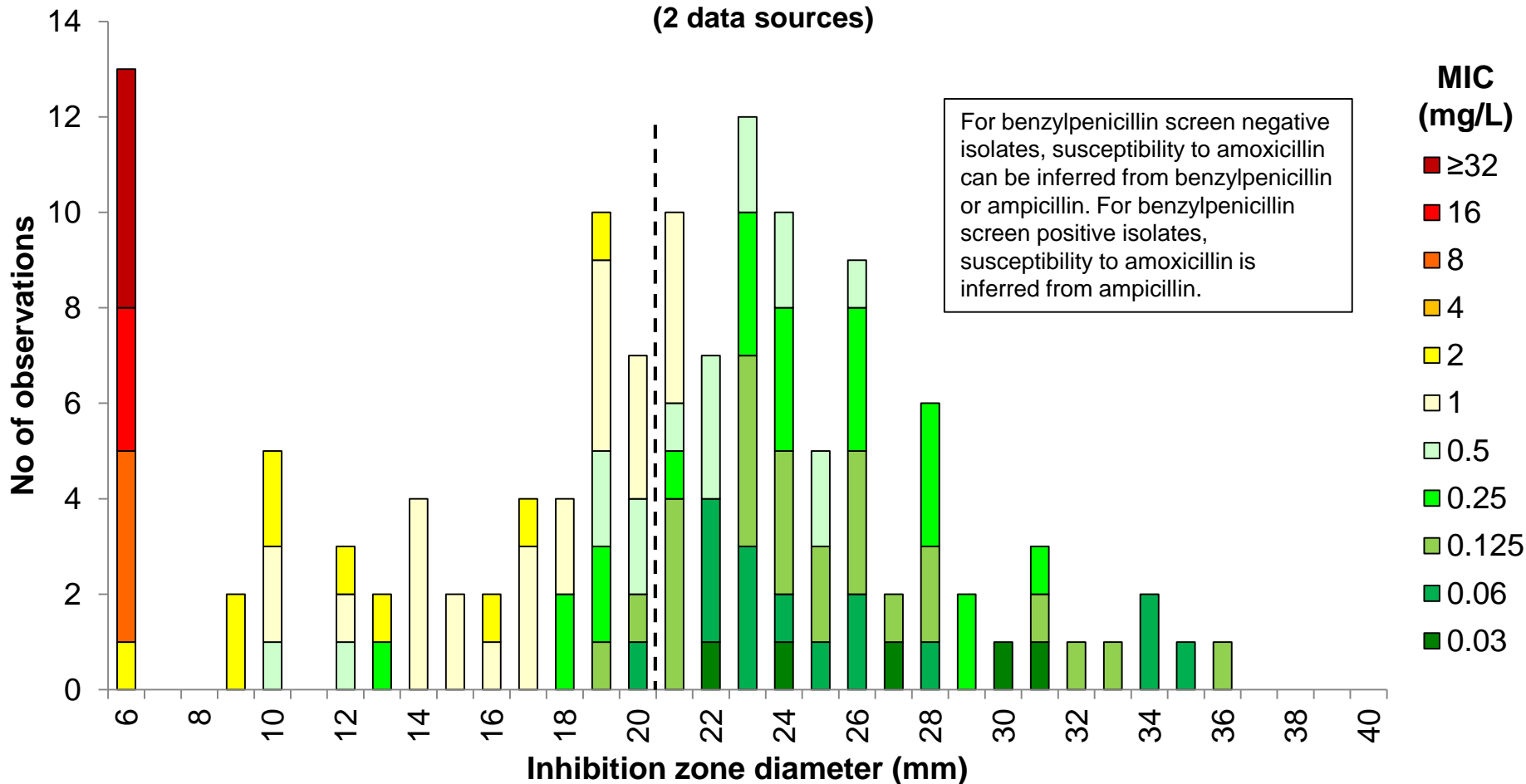
Benzylpenicillin zone diameter (screen)

S ≥ 21, R < 21 mm

Benzylpenicillin 1 unit vs. Amoxicillin MIC

Viridans group streptococci, 131 isolates

(2 data sources)



Breakpoints (non-endocarditis)

Amoxicillin MIC

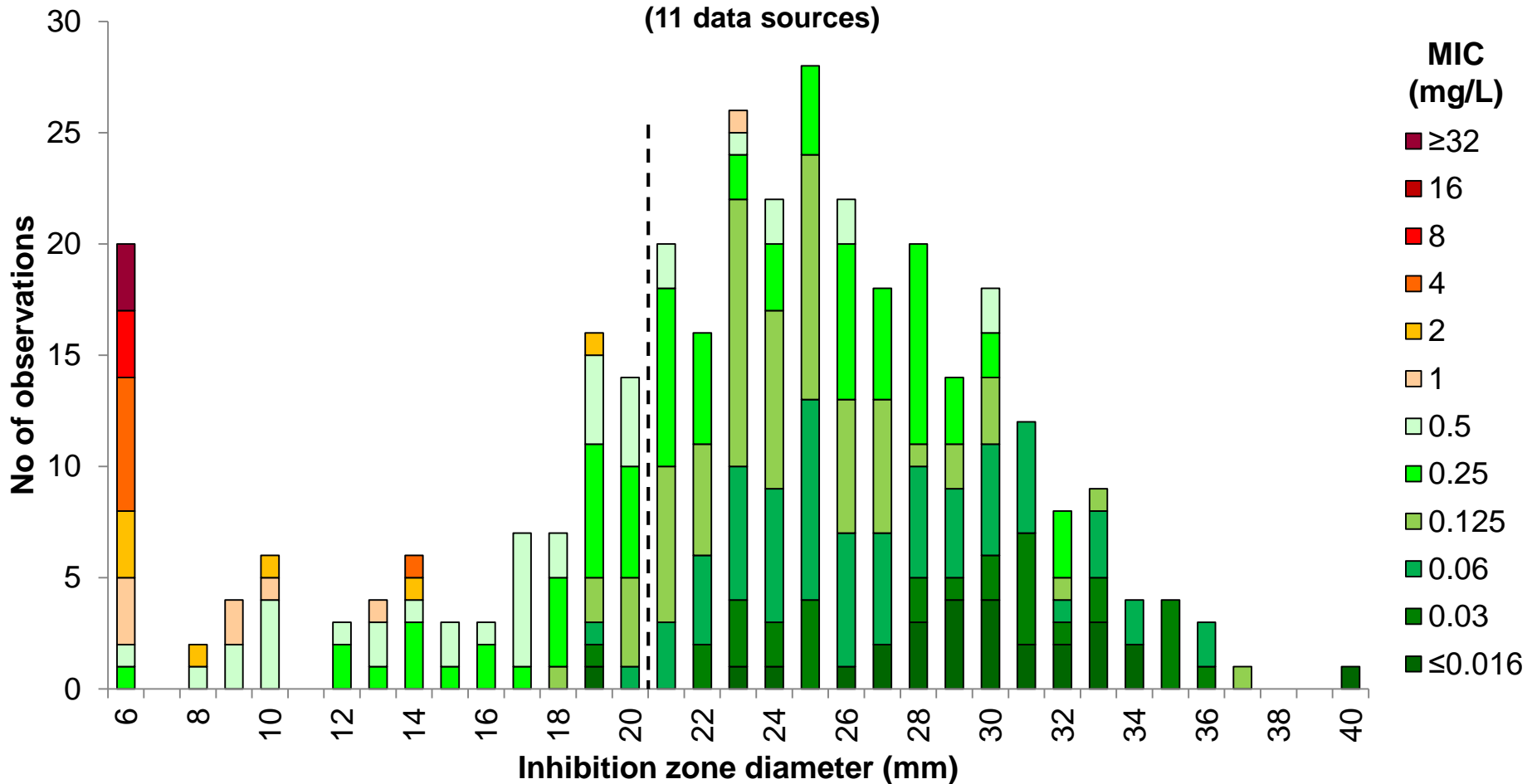
$S \leq 0.5$, $R > 2$ mg/L

Benzylpenicillin zone diameter (screen)

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

Benzylpenicillin 1 unit vs. Cefotaxime MIC

Viridans group streptococci, 341 isolates



Breakpoints

Cefotaxime MIC

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

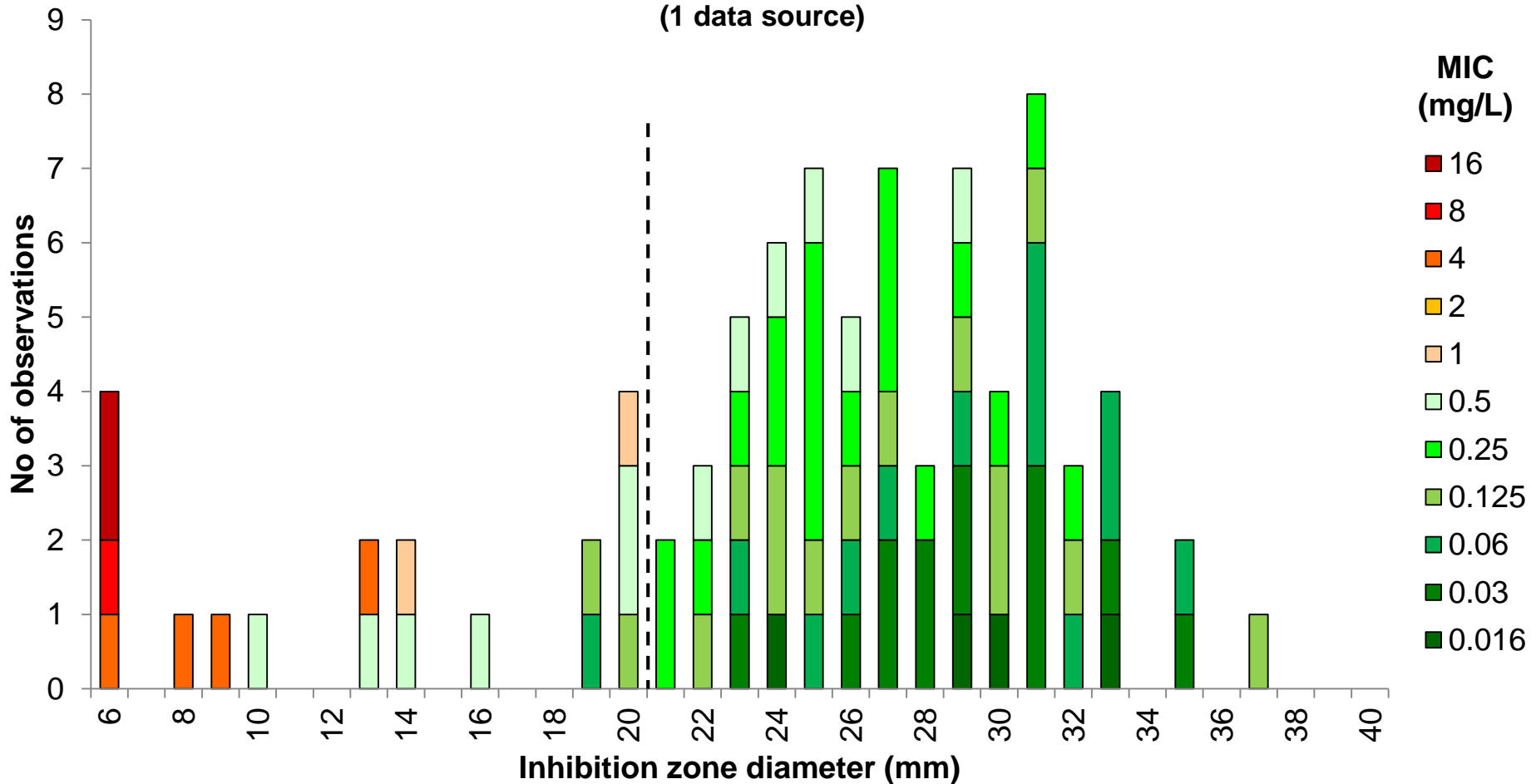
Benzylpenicillin zone diameter (screen)

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

Benzylpenicillin 1 unit vs. Cefuroxime MIC

Viridans group streptococci, 85 isolates

(1 data source)



Breakpoints (iv)

Cefuroxime MIC

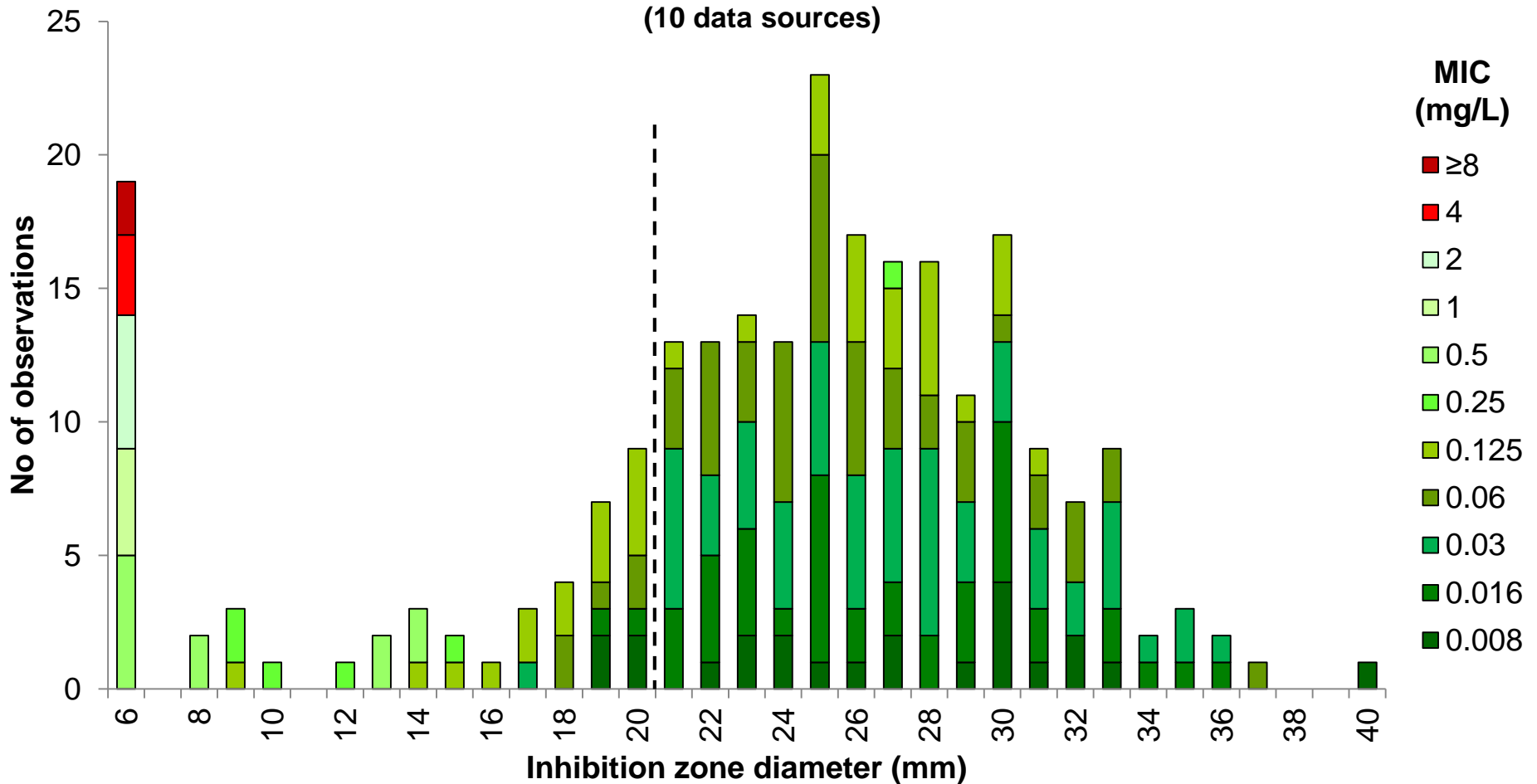
$S \leq 0.5$, $R > 0.5$ mg/L

Benzylpenicillin zone diameter (screen)

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

Benzylpenicillin 1 unit vs. Meropenem MIC

Viridans group streptococci, 244 isolates



Breakpoints

Meropenem MIC

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

Benzylpenicillin zone diameter (screen)

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

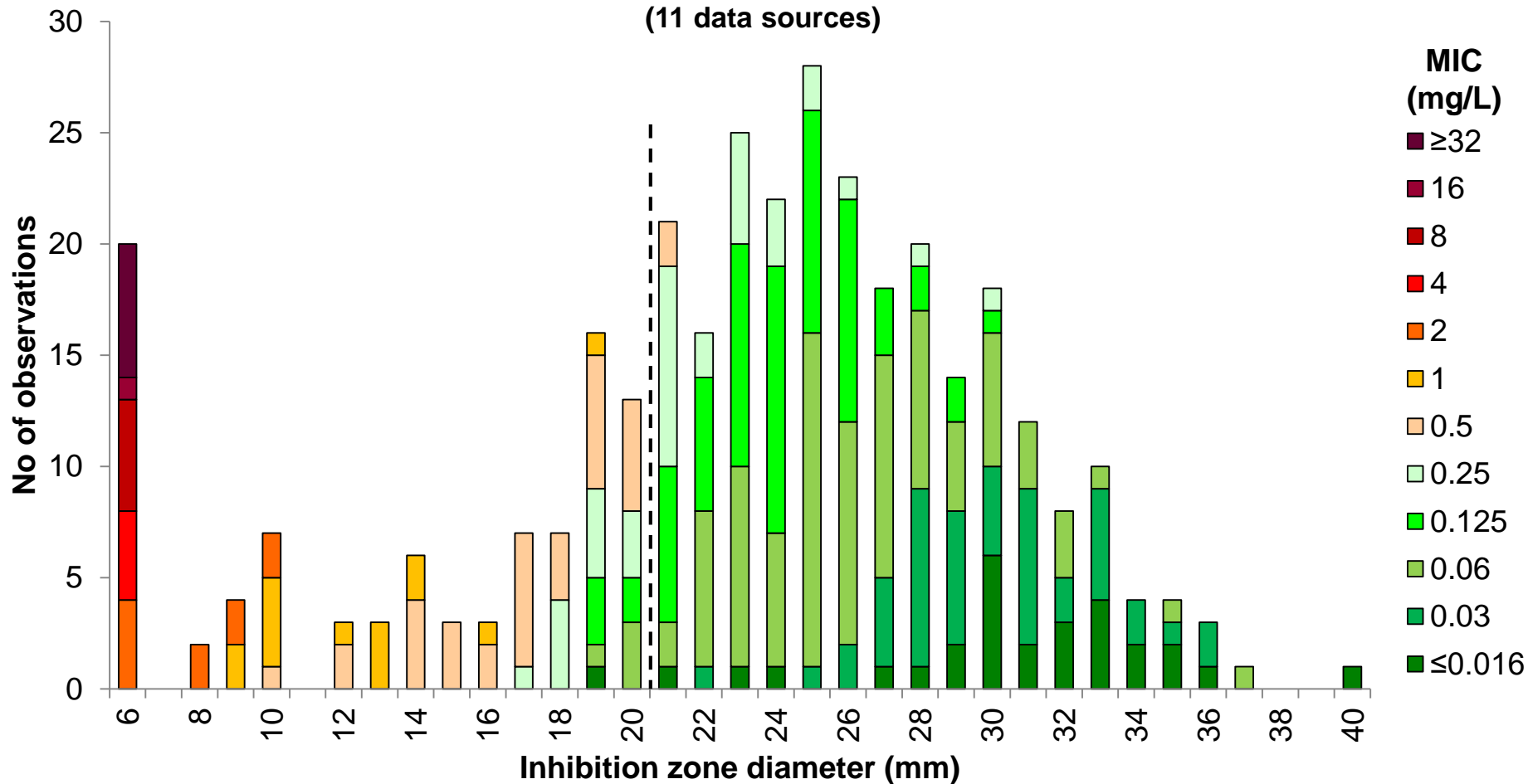
Viridans group streptococci

Distributions with separate
breakpoints for endocarditis

Benzylpenicillin 1 unit vs. MIC

Viridans group streptococci, 342 isolates

(11 data sources)



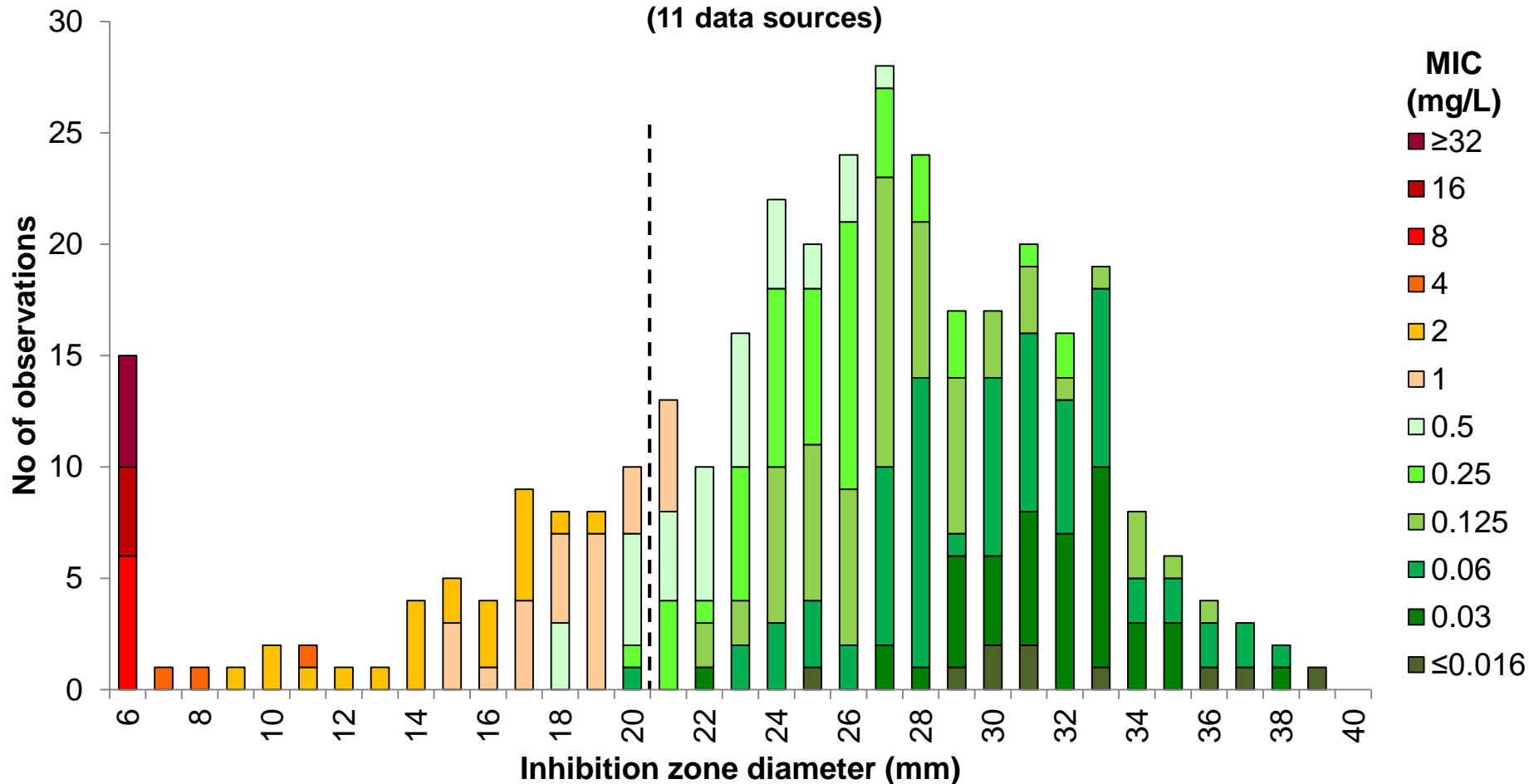
Breakpoints (endocarditis)

MIC	S ≤ 0.25, R > 0.25 mg/L
Zone diameter	S ≥ 21, R < 21 mm

Ampicillin 2 µg vs. MIC

Viridans group streptococci, 342 isolates

(11 data sources)

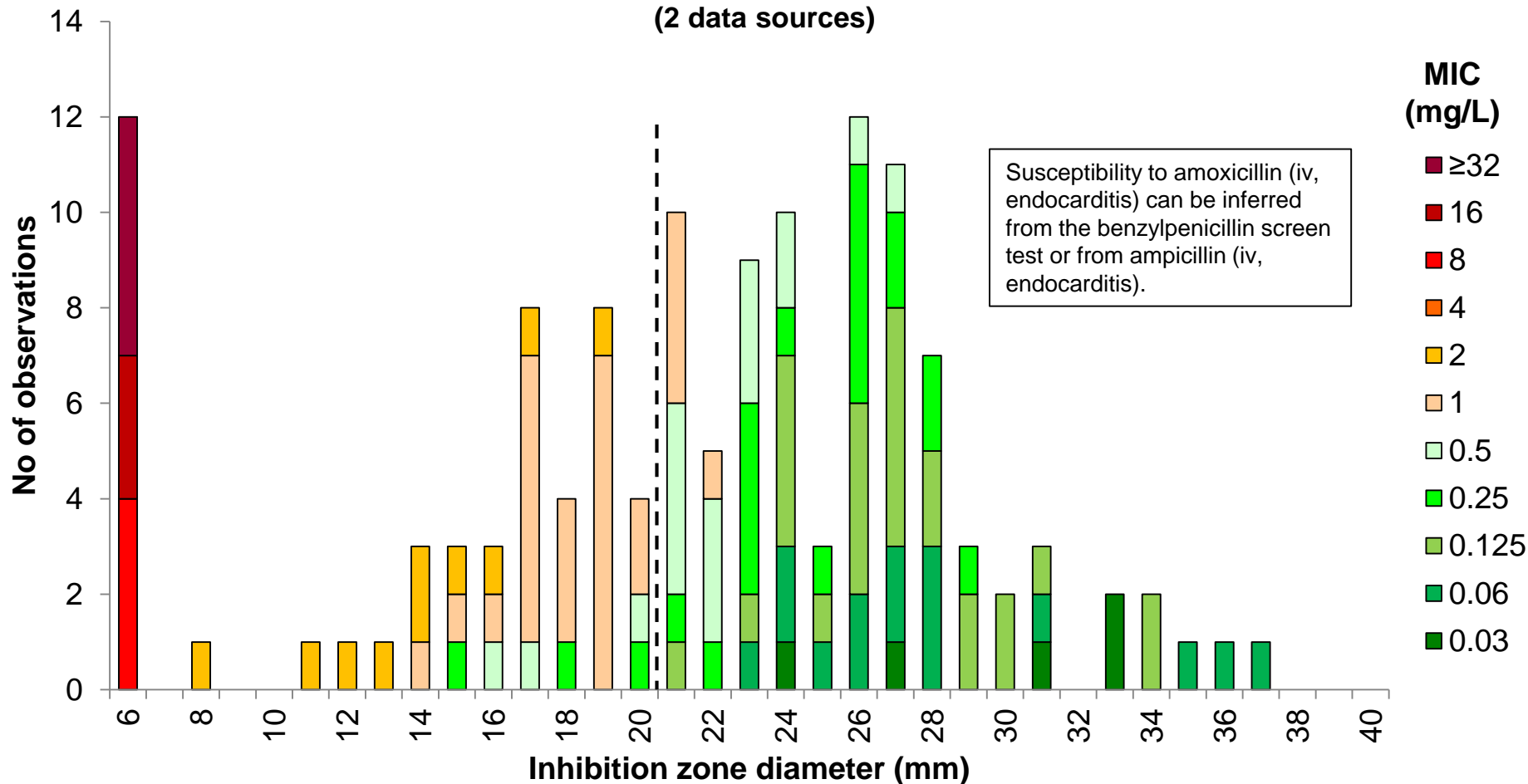


Breakpoints (iv, endocarditis)
 MIC $S \leq 0.5$, $R > 0.5$ mg/L
 Zone diameter $S \geq 21$, $R < 21$ mm

Ampicillin 2 µg vs. Amoxicillin MIC

Viridans group streptococci, 131 isolates

(2 data sources)



Breakpoints (iv, endocarditis)

Amoxicillin MIC

S ≤ 0.5, R > 0.5 mg/L

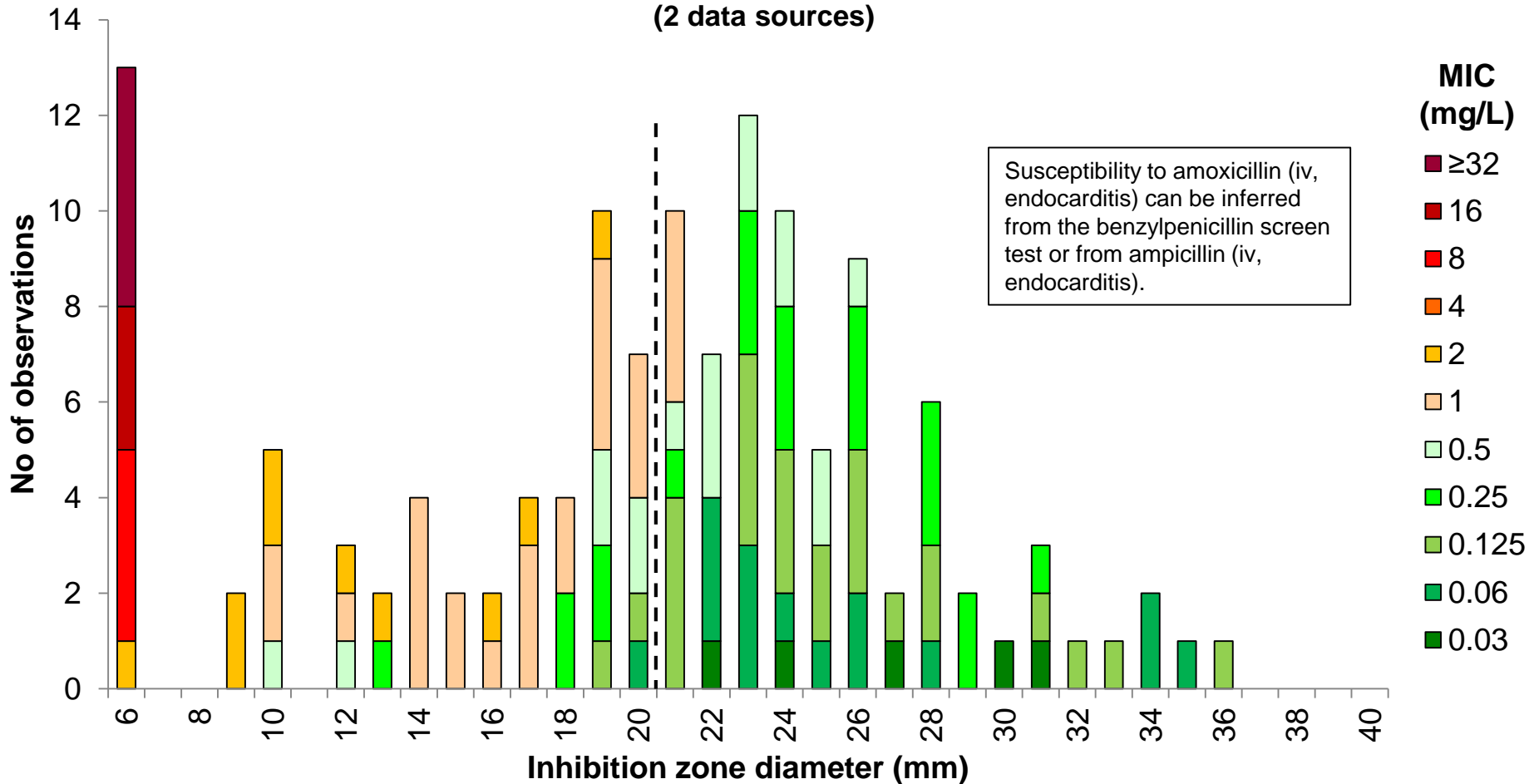
Ampicillin (iv, endocarditis) zone diameter

S ≥ 21, R < 21 mm

Benzylpenicillin 1 unit vs. Amoxicillin MIC

Viridans group streptococci, 131 isolates

(2 data sources)



Breakpoints (iv, endocarditis)

Amoxicillin MIC

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

Benzylpenicillin zone diameter (screen)

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



EUCAST

European Committee
on Antimicrobial
Susceptibility Testing