Standard Operating Procedure

Organisation and maintenance of the EUCAST main website and the EUCAST MIC and zone diameter distribution website

EUCAST SOP 6.1

21 November 2016
### SOP Number (number.version):

<table>
<thead>
<tr>
<th></th>
<th>6.1</th>
</tr>
</thead>
</table>

### Date of issue:

<table>
<thead>
<tr>
<th></th>
<th>21 November 2016</th>
</tr>
</thead>
</table>

### Review interval:

<table>
<thead>
<tr>
<th></th>
<th>2 years</th>
</tr>
</thead>
</table>

### Authorised by:

<table>
<thead>
<tr>
<th></th>
<th>EUCAST Steering Committee</th>
</tr>
</thead>
</table>

### Document amendment history

<table>
<thead>
<tr>
<th>Issue date</th>
<th>Version number</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 November 2016</td>
<td>6.1</td>
</tr>
<tr>
<td>2 May 2013</td>
<td>6.0</td>
</tr>
</tbody>
</table>
Foreword

The European Committee on Antimicrobial Susceptibility Testing (EUCAST) is organised by the European Society of Clinical Microbiology and Infectious Diseases (ESCMID), the European Centre for Disease Prevention and Control (ECDC), and the national antimicrobial breakpoint committees in Europe, currently in France, Norway, Sweden, The Netherlands and The United Kingdom. EUCAST was established by ESCMID in 1997, was restructured in 2001-2002 and has been in operation in its current form since 2002.

The current remit of EUCAST is to harmonise clinical breakpoints for existing drugs in Europe, to determine clinical breakpoints for new drugs, to set epidemiological cut off values, to revise breakpoints as required, to harmonise methodology for antimicrobial susceptibility testing, to develop a website with MIC and zone diameter distributions of antimicrobial agents for a wide range of organisms and to liaise with European governmental agencies and European networks involved with antimicrobial resistance and resistance surveillance.

Information on EUCAST, EUCAST breakpoints and all documents are freely available on the EUCAST website at http://www.EUCAST.org.

Citation of EUCAST documents

The copyright of all documents and data published on the EUCAST website remains with EUCAST. All are freely available for re-use if reference to the EUCAST website is given and documents and data are not resold. Any secondary publication of the data must be referenced with the declaration that "These data have (or this document has) been produced in part under ECDC service contracts and made available at no cost by EUCAST and can be accessed freely on the EUCAST website www.eucast.org. EUCAST recommendations are frequently updated and the latest versions are available at www.eucast.org."

EUCAST documents published on the EUCAST website should be cited in the following way: European Committee on Antimicrobial Susceptibility Testing. Name of document, EUCAST version number, year. Website address.

This SOP should be cited as: “Organisation and maintenance of the EUCAST main website and EUCAST MIC and zone diameter distribution website. European Committee on Antimicrobial Susceptibility Testing. EUCAST SOP 6.1, 2016. http://www.eucast.org.”
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFST</td>
<td>Antifungal Susceptibility Testing</td>
</tr>
<tr>
<td>CLSI</td>
<td>Clinical and Laboratory Standards Institute</td>
</tr>
<tr>
<td>ECOFF</td>
<td>Epidemiological Cut-Off</td>
</tr>
<tr>
<td>ECDC</td>
<td>European Centre for Disease Prevention and Control</td>
</tr>
<tr>
<td>EMA</td>
<td>European Medicines Agency</td>
</tr>
<tr>
<td>EUCAST</td>
<td>European Committee on Antimicrobial Susceptibility Testing</td>
</tr>
<tr>
<td>ESCMID</td>
<td>European Society for Clinical Microbiology and Infectious Diseases</td>
</tr>
<tr>
<td>FAQ</td>
<td>Frequently Asked Questions</td>
</tr>
<tr>
<td>ISO</td>
<td>International Standards Organisation</td>
</tr>
<tr>
<td>MIC</td>
<td>Minimum Inhibitory Concentration</td>
</tr>
<tr>
<td>NAC</td>
<td>National Antimicrobial susceptibility testing Committee</td>
</tr>
<tr>
<td>QC</td>
<td>Quality Control</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>3</td>
</tr>
<tr>
<td>Citation of EUCAST documents</td>
<td>3</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>4</td>
</tr>
<tr>
<td>Contents</td>
<td>5</td>
</tr>
<tr>
<td>1 Scope</td>
<td>6</td>
</tr>
<tr>
<td>2 Introduction</td>
<td>6</td>
</tr>
<tr>
<td>3 EUCAST main website</td>
<td>6</td>
</tr>
<tr>
<td>4 EUCAST MIC and zone diameter distribution website</td>
<td>15</td>
</tr>
</tbody>
</table>
## Organisation and maintenance of EUCAST websites

### 1 Scope

1.1 This SOP describes how the EUCAST websites are organised and maintained.

### 2 Introduction

2.1 EUCAST has two separate websites.

2.2 The main website gives a detailed description of the EUCAST structure and activities, presents news related to EUCAST activities and provides access to all EUCAST documents and other educational information.

2.3 The EUCAST MIC and zone diameter distribution website provides collated distributions of MICs (multiple MIC methods) and zone diameters (EUCAST method only).

### 3 EUCAST main website

3.1 **Location**

The main EUCAST website is part of the ESCMID website ([http://www.escmid.org](http://www.escmid.org)) but may be accessed directly at [http://www.EUCAST.org](http://www.EUCAST.org).

The server is located at the site of the ESCMID website provider, Mense Media GmbH, Düsseldorf, Germany.

The website software is the same software as used for other ESCMID websites, “Typo3” (see [http://typo3.org](http://typo3.org) for details).

The website is managed through EUCAST and the ESCMID Executive Office at:

ESCMID

Streitgasse 20 P.O. Box 214

4010 Basel

Switzerland

3.2 **Website update**

The Website Manager is currently the EUCAST Technical Data Coordinator. The website is updated by the Website Manager or by ESCMID InformationTechnology staff on direction from the EUCAST Chairman, Technical Data Coordinator or Scientific Secretary.
3.3 **Software update**
Software updates are made as part of the upgrade process for the ESCMID website through the ESCMID Executive Office.

3.4 **Organisational structure**
Pages and sub-pages are organised as follows:

- Homepage
- Organisation
  - EUCAST statutes
  - Steering Committee
  - General Committee
  - Subcommittees
    - EUCAST AFST
    - VETCAST
    - National AST Committees (NAC)
    - Development Laboratories
    - Network Laboratories
- EUCAST News
- Clinical breakpoints
  - About “clinical breakpoints”
  - Splitting MIC wild-type distributions
  - When there are no breakpoints
  - Where clinical data are lacking
- EUCAST setting breakpoints.
- Expert rules and intrinsic resistance
- Resistance mechanisms
- Guidance documents
- MIC distributions and ECOFFs
- Zone distributions and ECOFFs
- AST of bacteria
  - Media preparation
  - MIC determination
  - Disk diffusion methodology
  - Disk diffusion implementation
  - Compliance of manufacturers
  - Breakpoint tables
  - QC Tables
  - Calibration and validation
  - Warnings!
- Guidance documents
<table>
<thead>
<tr>
<th>Organisation and maintenance of EUCAST websites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects and data submission</td>
</tr>
<tr>
<td>QC data submission</td>
</tr>
<tr>
<td>MIC testing service from EUCAST</td>
</tr>
<tr>
<td>Previous versions of tables</td>
</tr>
</tbody>
</table>

AST of mycobacteria

AST of fungi
  Clinical AFST breakpoints
  MIC distributions and ECOFFs
  Methods of antifungal susceptibility testing
    Susceptibility testing of yeasts
    Susceptibility testing of moulds
  QC AFST tables
  Rationale documents for antifungals
  Documents for discussion in AFST
  Publications in journals
  Meetings and minutes
  Previous versions of documents

AFST of veterinary pathogens
  VetCAST meetings

Frequently Asked Questions (FAQ)

Meetings
  Forthcoming meetings
  Recent meeting minutes
    General Committee 2011-2015
    General Committee 2006-2010
    General Committee to 2005
    Steering Committee 2011-2014
    Steering Committee 2006-2010
    Steering Committee to 2005

Presentations and statistics
  EUCAST statistics
  EUCAST at ECCMID

Warnings!

Documents
  Rationale Documents
  Standard Operation Procedures
  Discussion documents
  Consultations
  Publications in journals
  Technical notes
  Posters
### Other Documents

- External documents
- Reports
- Videos from EUCAST
- Translations
- Information for industry
- Links
- Contacts

#### 3.5 Home page

The homepage includes the following:

- General information about EUCAST.
- A list of pages as detailed in 3.4 with links to these pages.
- A list of recent news items with links to detailed information.
- A Newsfeed link which enables anyone to provide automatic listing of EUCAST News items on their own website.
- Email addresses of the EUCAST Chairman, Scientific Secretary, Clinical Data Coordinator, Technical Data Coordinator and Webmaster.
- Logos of ESCMID, ECDC and EMA with links.
- A link to a list of all website changes.

#### 3.6 EUCAST Organisation pages

- EUCAST statutes
  - A general description of the EUCAST statutes (with the date of the last amendment) and a link to the full document.

- Steering Committee
  - A description of the committee structure and a link to the full list of committee members.

- General Committee
  - A description of the committee structure and a link to the full list of committee members.

- Subcommittees
  - A description of how EUCAST subcommittees are set up, how they operate
and links to details of current subcommittees.

National AST Committees (NAC)
A description of “National antimicrobial Susceptibility Testing Committees” and a link to more detailed information.

EUCAST Development Laboratories
A description of the EUCAST Development Laboratories and contact details.

EUCAST Network Laboratories
A description of the EUCAST AST and AFST networks of laboratories and lists of participating laboratories.

3.7 EUCAST News
A list of latest news items and updates from EUCAST, with links to detailed information.

3.8 Clinical breakpoints
An introduction to the breakpoint tables and links to the current breakpoint tables for bacteria and fungi as pdf files for printing and excel files for direct use on screen.

There are also links to the following documents:
Splitting MIC wild-type distributions
When there are no breakpoints
Where clinical data are lacking
Definitions of clinical breakpoints and epidemiological cut off values.
Previous versions of breakpoint tables.

3.9 Expert rules and intrinsic resistance
A general description of EUCAST expert rules with links to full current and previous versions of the rules.

3.10 Resistance mechanisms
An introduction to the EUCAST guideline for the detection of resistance mechanisms and specific resistances of clinical and/or epidemiological importance with a link to the current version.

3.11 Guidance documents
Links to EUCAST guidance documents:
Direct susceptibility testing (16 Feb 2012)
Oral cephalosporins and Enterobacteriaceae breakpoints (16 Feb 2012)
Stenotrophomonas maltophilia (1 Feb 2012)
Burkholderia cepacia group (20 July, 2013)

Organisation and maintenance of EUCAST websites
Breakpoints for topical use of antimicrobial agents (29 March, 2014)
Daptomycin in endocarditis caused by Enterococci (March 2016, updated 24 Sept 2016)
Recommendations for colistin (polymyxin E) MIC testing - joint EUCAST and CLSI recommendation (22 March, 2016)
What to do when there are no breakpoints in the EUCAST breakpoint table (5 July, 2016)
*Legionella pneumophila* susceptibility testing (9 September, 2016)

### 3.12 MIC distributions and ECOFFs
A general description of the MIC distributions section of the MIC and zone diameter distribution website with a link to the website.

### 3.13 Zone diameter distributions and ECOFFs
Links to the MIC and zone diameter distribution website.

### 3.14 AST of bacteria
Subsections as follows giving detailed descriptions of technical procedures for the following:

**Media preparation**
Description of EUCAST agar and broth media with links to detailed documents on media preparation. In addition to the English version, there is a link to versions in other languages. Respective NACs are responsible for maintaining the versions in languages other than English.

**MIC determination**
A note that the EUCAST recommendations for MIC determination for non-fastidious organisms are in agreement with the recommendations from the International Standards Organisation and a link to the ISO document.

A note on media recommended by EUCAST for fastidious organisms and a link to detailed instructions for preparation of media for fastidious organisms.

A link to EUCAST tables giving QC ranges for recommended QC strains.

**Disk diffusion methodology**
Links to documents giving detailed descriptions of the disk diffusion test method, a Powerpoint teaching presentation on the disk diffusion method and a reading guide to help ensure that users read tests correctly. There is a link to translations of these documents in other languages than English.

**Disk diffusion implementation**
A link to a checklist to assist in the introduction of the EUCAST disk diffusion test in the clinical laboratory. There is a link to translations of these documents in other languages than English.

**Compliance of manufacturers**
Link to a file giving details of the compliance of manufacturers of susceptibility
testing products with EUCAST recommendations. The file is based on information provided by manufacturers and not on checks by EUCAST.

**Breakpoint tables**
Links to current MIC and zone diameter breakpoint tables.

**QC Tables**
Links to EUCAST tables giving QC ranges for recommended routine QC strains and an extended set covering specific resistance mechanisms.

**Calibration and validation**
Links to a series of documents giving detailed data supporting zone diameter breakpoints for particular groups of organisms.

**Warnings**
Link to section 3.21.

**Guidance documents**
Links to documents giving guidance on particular issues in antimicrobial susceptibility testing, such as direct susceptibility testing and testing *Stenotrophomonas maltophilia*.

**Projects and data submission**
An invitation to laboratories to participate in the development and validation of the EUCAST disk diffusion method. Specific projects are listed and laboratories interested in collaborating in these projects can register their interest via a web-based form. Laboratories are also invited to submit QC data on antimicrobial susceptibility testing performed in strict accordance with EUCAST methodology and recommendations for listed species/antibiotic combinations.

**Previous versions of tables**
Links to all previous versions of EUCAST breakpoint and QC tables.

### 3.15 AST of mycobacteria
In order to help EUCAST to determine breakpoints for anti-tuberculous agents and to assess methods for MIC determination, a subcommittee on AST of mycobacteria has been established.

### 3.16 AST of fungi
The AFST subcommittee is a standing subcommittee with no time limit as it deals with all aspects of breakpoints and susceptibility testing methods for fungi on an on-going basis. Hence a separate section is provided on the website giving links to:
- Clinical AFST breakpoints
- MIC distributions and ECOFFs
- Methods in antifungal susceptibility testing

---

**Organisation and maintenance of EUCAST websites**
QCAFST Tables
Rationale documents for antifungals
Documents for discussion in AFST
Publications in journals
Meetings and Minutes
Previous versions of document

| 3.17 | **AST of veterinary pathogens**
|      | VetCAST is a EUCAST subcommittee dealing with all aspects of antimicrobial susceptibility testing of bacterial pathogens of animal origin and animal bacteria with zoonotic potential.
|      | Links to documents related to AST of veterinary pathogens are provided.

| 3.18 | **Frequently Asked Questions (FAQ)**
|      | Links to a frequently-updated file with answers to frequently asked questions covering breakpoint issues, susceptibility testing methodology and the MIC and zone diameter distribution website.

| 3.19 | **Meetings**
|      | Includes sections on the following:
|      | Forthcoming meetings including Steering Committee meetings, the next General Committee meeting and educational meetings.
|      | Links to minutes of recent General Committee meetings and summaries of recent Steering Committee meetings. Also included are sections with links to minutes or summary minutes from earlier meetings.

| 3.20 | **Presentations and statistics**
|      | Links to data on use of the websites, establishment of NACs and uptake of EUCAST guidelines and methods.
|      | Links to pdf files of available presentations from EUCAST symposia and educational workshops at ECCMID.

| 3.21 | **Warnings!**
|      | Notification of products (disks, media batches, gradient tests or procedures) which are not performing to the expected standard.

| 3.22 | **Documents**
|      | Links to pdf versions of a wide range of EUCAST documents as follows:
|      | Rationale Documents for antimicrobial agents
|      | Documents for individual agents giving the rationale for EUCAST breakpoints.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.23</td>
<td><strong>Videos from EUCAST</strong>&lt;br&gt; In collaboration with the WHO, EUCAST publishes instruction videos on how to perform antimicrobial susceptibility testing using EUCAST recommended methods and interpretation.</td>
</tr>
<tr>
<td>3.24</td>
<td><strong>Translations</strong>&lt;br&gt; Translations of EUCAST documents in several languages.</td>
</tr>
<tr>
<td>3.25</td>
<td><strong>Information for industry</strong>&lt;br&gt; Notes summarise the breakpoint setting process and the information required from pharmaceutical companies to bring new agents (or revisions of existing agents) to EUCAST.</td>
</tr>
<tr>
<td>3.26</td>
<td><strong>Links</strong>&lt;br&gt; Includes links to relevant organisations including ECDC, EMA and CLSI and the current national breakpoint committees in Europe.</td>
</tr>
<tr>
<td>3.27</td>
<td><strong>Contacts</strong>&lt;br&gt; Includes email addresses of the Chairman, Scientific Secretary, Clinical Data Coordinator, the Technical Data Coordinator and the Webmaster.</td>
</tr>
</tbody>
</table>

Organisation and maintenance of EUCAST websites
Contact details for the EUCAST Development Laboratories for Antimicrobial Susceptibility Testing of bacteria and fungi are provided.

4 EUCAST MIC and zone diameter distribution website

4.1 Location
The EUCAST MIC website is an independent website with software written by Sjölund and Tyselius Software company, Stockholm, Sweden. It may be accessed through the EUCAST main website or directly at http://mic.eucast.org/Eucast2/.

The server is located at Mense Media GmbH, Düsseldorf, Germany.

The website is managed through the EUCAST Executive at:
EUCAST Susceptibility Testing Development Laboratory.
Klinisk mikrobiologi
Centrallasarettet
351 85 Växjö
Sweden

The Website Manager is currently the EUCAST Clinical Data Coordinator. The website is updated by the Website Manager, the EUCAST Scientific Secretary or staff at the EUCAST Susceptibility Testing Development Laboratory.

4.2 Website update
The Website Manager is currently the EUCAST Technical Data Coordinator. The website is updated by the Website Manager. Directions for update may be from the EUCAST Chairman, Clinical Data Coordinator, Technical Data Coordinator or Scientific Secretary or by staff at the EUCAST Development Laboratory.

New distributions are very frequently added to the website.

4.3 Software update
Software updates are made when commissioned by EUCAST. Work is done by Sjölund & Tyselius, Stockholm, Sweden.

4.4 Organisational structure
Home page
Search selection
  MIC distributions or Zone diameter distributions
  Selection by Antimicrobial agent or Organism
MIC distribution tables
Organisation and maintenance of EUCAS T websites

4.5 **Home page**
Description of the database, presentation format and limitations of the data. A method is provided for submission of data to be considered for inclusion in the database.

4.6 **Search selection**
Buttons allow search selection for MIC or zone diameter distributions, and presentation of either distributions for all available organisms for a particular antimicrobial agent, or distributions for all available antimicrobial agents for a particular organism.

4.7 **MIC distribution tables**
MIC distributions are presented as line listings with one line for each antimicrobial agent if the search is based on a specific organism, or one line per organism if the search is based on a specific antimicrobial agent.

The MIC distribution covers a twofold dilution range from $\leq 0.002$ to $\geq 512$ mg/L and provides the total number of isolates in the database at each dilution. The numbers within the wild-type distribution are highlighted in blue (as long as the number of isolates at a dilution represents at least 1% of total number of isolates in the distribution). At the end of each distribution the clinical breakpoints and ECOFF are given.

Clicking on the name of the agent or organism at the start of the line displays a histogram of the distribution (see 4.9).

4.8 **Zone diameter distribution tables**
Zone diameter distributions are presented as line listings with one line for each antimicrobial agent if the search is based on a specific organism, or one line per organism if the search is based on a specific antimicrobial agent.

The zone diameter distribution covers a whole number range from 6 mm (no zone) to 50 mm and provides the total number of isolates in the database at each zone diameter. The numbers within the wild-type distribution are highlighted in blue. At the end of each distribution the clinical breakpoints and ECOFF value are given.

Clicking on the name of the agent or organism at the start of the line displays a histogram of the distribution (see 4.10).

4.9 **MIC distribution histograms**
MIC histograms for individual antimicrobial agent-organism combinations are presented with one bar for each twofold dilution in the range $\leq 0.008$ to $\geq 512$ mg/L. The histogram presents the percentages of isolates at each dilution.
The bars within the wild-type distribution are highlighted in blue (as long as the number of isolates at a dilution represents at least 1% of total number of isolates in the distribution) and bars representing MICs above the wild type are unfilled.

Beneath each distribution the MIC ECOFF is given, together with the total number of isolates and the number of data sources included in the distribution.

A box with any notes relating to the distribution is positioned to the right of the histogram.

The histograms may be downloaded as jpg files or printed directly.

### 4.10 Zone diameter distribution histograms

Zone diameter histograms for individual antimicrobial agent-organism combinations are presented with one bar for each mm in the range 6mm (no zone) to 50mm. The histogram presents the percentages of isolates at each zone diameter. The bars within the wild type distribution are filled in black and bars representing zone diameters below the wild type are unfilled.

Beneath each distribution the zone diameter ECOFF is given, together with the total number of isolates and the number of data sources included in the distribution.

A box with any notes relating to the distribution is positioned to the right of the histogram.

The histograms may be downloaded as jpg files or printed directly.

### 4.11 MIC and Zone diameter correlation graphs

Beneath each zone diameter distribution graph (as described in section 14.10) a button permits the display of a new graph in which the correlation between MICs and zone diameters is superimposed on the zone diameter histogram described in section 14.10. Each xy-coordinate is shown as a circle and in the circle the number 1-99 is displayed, representing the number of isolates with the same x and y values. If the number is >99 the circle is presented in red without a number.

### 4.12 Sources of data

Collated distributions include:

- Organisms of human or animal origin.
- Organisms from any part of the world.
- Organisms from normal flora and from infections.
- Organisms without and with resistance mechanisms.
Data may be from a variety of sources including:

- Published MIC distributions.
  
  Full MIC distributions provided by the authors of published studies where summary data are published.

- Published or unpublished resistance surveillance MIC data provided by the organisers.

- Published or unpublished MIC data provided by the organisers of research studies.

- Published or unpublished MIC data “on file” with pharmaceutical companies or commercial research laboratories.

- Zone diameter distributions for clinical isolates (with and without resistance mechanisms) and for quality control strains from the EUCAST susceptibility testing laboratory and generated as part of the development of the EUCAST disk diffusion method.

- Zone diameter data provided by clinical laboratories that are using the EUCAST disk diffusion method and can simultaneously provide data on EUCAST quality control strains.

### 4.13 Release of MIC and zone diameter distributions on the website

Distributions are not normally released on the website unless data are available from at least five sources and there is a total of at least 100 organisms in the distribution. Occasionally a distribution with less than five data sources will be included where data are scarce and it is considered of value to include a distribution.

Data are checked for consistency by comparing the wild type distributions from different sources. Distributions that agree (if five or more) are aggregated. Distributions clearly disagrees with the others are not aggregated and not shown but are retained in the database for comparison with distributions at a later date. MIC distributions where data is truncated at the lower end of the dilution series (interfering with the characterization of the wild type) are not added to the collated distributions. This is an issue only with MIC distributions, where ranges are often significantly restricted. MIC distributions with some truncation at higher concentrations above the wild type may be included. A warning of the effects of such truncation is included on the website.

Criteria for acceptance of MIC distributions and methods for setting ECOFFs are currently under review.

### 4.14 Information stored in relation to distributions

Where available, information is stored on the authors of the data and whether it relates to isolates from human, animal or food sources.
For zone diameters, data for the EUCAST disk diffusion method only is accepted. For MICs, details of the method used are stored, although this information is not available to users of the website.