



**ANTIMICROBIAL
RESISTANCE
SOLUTIONS**

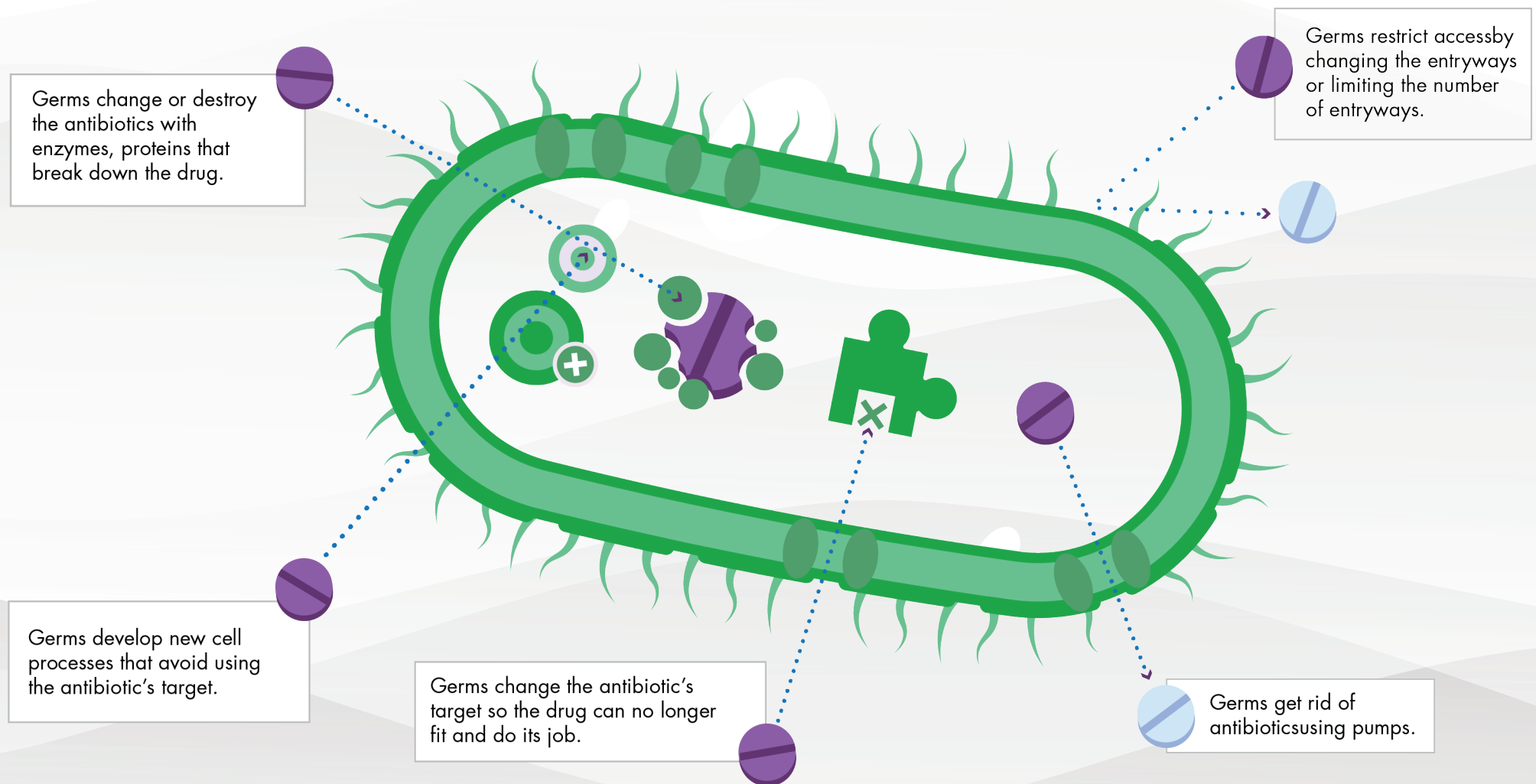
Inspired by knowledge

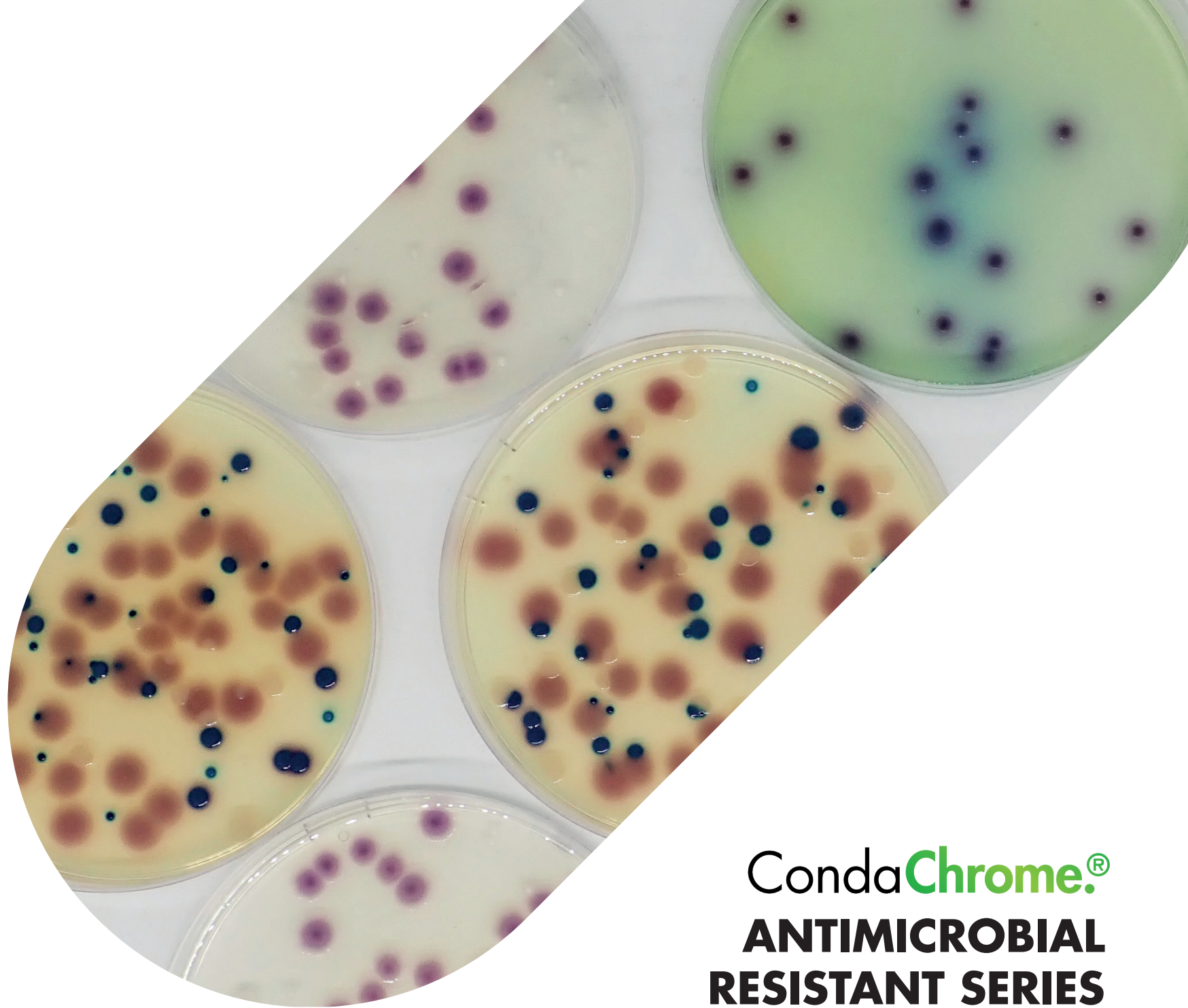
Antimicrobial resistance: a global issue

Antibiotic resistance (AR) is one of the most urgent threats to public health, encompassing the concept of “one health” by connecting human, animal and environmental health.

In the US, about 2.8 million people are infected each year by resistant strains, causing at least 35,000 deaths according to the Center for Disease Control (CDC). Its European counterpart (ECDC) estimates that 33,000 people die each year in Europe due to antibiotic resistance.

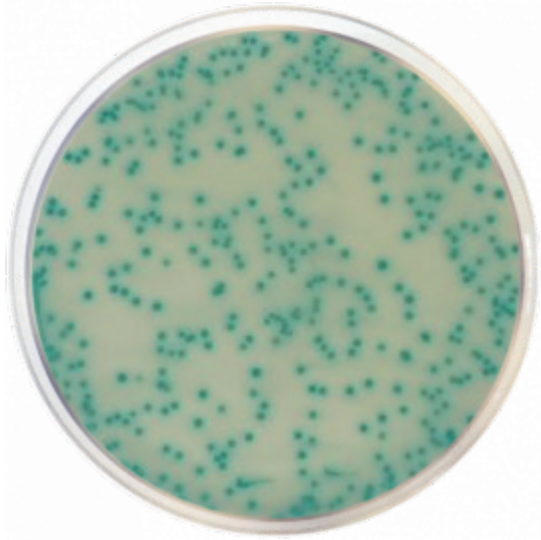
How is antibiotic resistance developed?





Conda**Chrome**.[®]
**ANTIMICROBIAL
RESISTANT SERIES**

CondaChrome[®] MRSA



CE IVD

For the detection of methicillin-resistant *Staphylococcus aureus* from clinical samples.

*Requires supplement CAT. 6069



Plate reading:
• Blue colonies



Incubation:
35 ± 2° C



Results:
24/48 h

What do we know about MRSA bacteria?

- *Staphylococcus aureus* is a very common bacteria that spreads through healthcare facilities and personnel. The methicillin-resistant *S. aureus* (MRSA) strains are difficult to treat because of their resistance to some antibiotics.
- Although there are still many treatments to fight them, they have begun to show resistance to many of the first-line antibiotics
- Although MRSA infections in general are declining, progress in preventing sepsis infections in hospitals is not.



323,700

Estimated cases in hospitalized patients in 2017



10,600

Estimated deaths in 2017

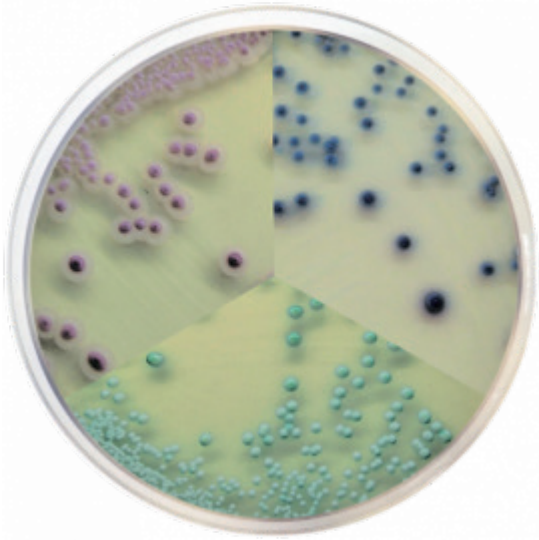


\$1.7B

Estimated attributable healthcare costs in 2017

Source: U.S Department of Health and Human Services.
Center of Disease Control and Prevention

CondaChrome.® *Candida*



CE IVD

Selective and differential chromogenic medium for the isolation and rapid identification of *Candida spp.* of clinical significance.



Plate reading:

- Green: *Candida albicans*
- Blue: *Candida tropicalis*
- Light white/purple: *Candida glabrata*
- Pink/purple: *C. krusei*



Incubation:
 $35 \pm 2^\circ \text{C}$



Results:
24/72 h

What do we know about the *Candida* genus?

- Dozens of species in the *Candida* group are responsible for human infections, from oral to vaginal and invasive infections. Many are resistant to the antifungal medications used to treat them.
- There are only three antifungal medication groups available to treat these infections: azoles, echinocandins and amphotericin B.
- *Candida* species are a common cause of sepsis to hospitalized patients. One in four patients dies, and 7% of these sepsis are caused by resistant strains.



34,800

Estimated cases in hospitalized patients in 2017

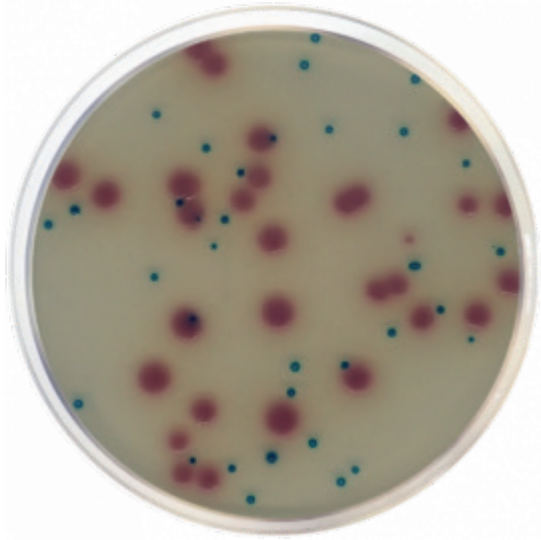


1,700

Estimated deaths in 2017

Source: U.S Department of Health and Human Services.
Center of Disease Control and Prevention

CondaChrome.® ESBL Agar



CE IVD

Chromogenic medium for the overnight detection of gram-negative bacteria that produce extended spectrum beta lactamase.

*Requires supplement CAT. 6042



Plate reading:

- Pink: ESBL strains
- Light blue: *Enterococcus* (partially inhibited)



Incubation:
35 ± 2° C



Results:
15/24 h

What do we know about ESBL-producing bacteria?

- ESBL-producing enterobacteriaceae (a family of different types of bacteria) represent a major concern for the health community. They can spread rapidly and cause complicated infections to healthy people.
- ESBLs are enzymes that degrade widely used antibiotics such as penicillins and cephalosporins, rendering them ineffective.
- There are limited options for treating these types of strains using antibiotics. The health personnel must use intravenous carbapenems for infections that should be treated orally.



197,400

Estimated cases in hospitalized patients in 2017



9,100

Estimated deaths in 2017

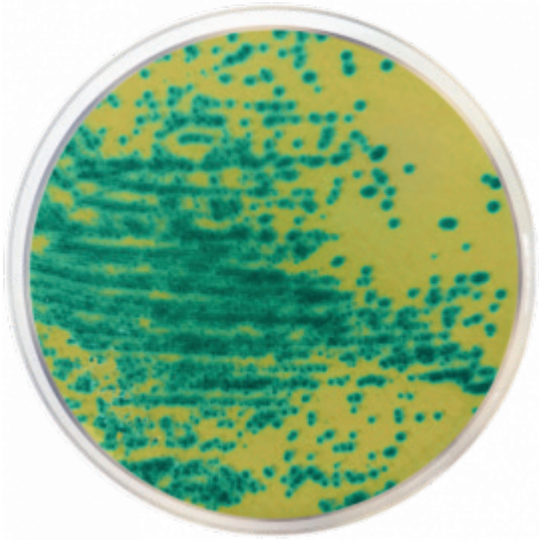


\$1.2B

Estimated attributable healthcare costs in 2017

Source: U.S Department of Health and Human Services.
Center of Disease Control and Prevention

CondaChrome[®] VRE



CE IVD

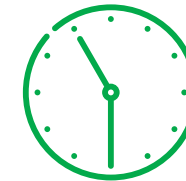
Chromogenic medium for vancomycin-resistant *Enterococcus* detection.



Plate reading:
• Blue-green colonies



Incubation:
35 ± 2° C



Results:
18/24h

What do we know about the VRE?

- Enterococci can cause major infections to hospitalized patients, including blood, nosocomial, and urinary tract infections.
- About 30% of all nosocomial enterococci infections are vancomycin-resistant, reducing treatment options.
- Long hospital admissions, periods in intensive care units, organ transplants or treatments for certain types of cancer are risk factors for these types of infections.



54,500

Estimated cases in hospitalized patients in 2017



5,400

Estimated deaths in 2017

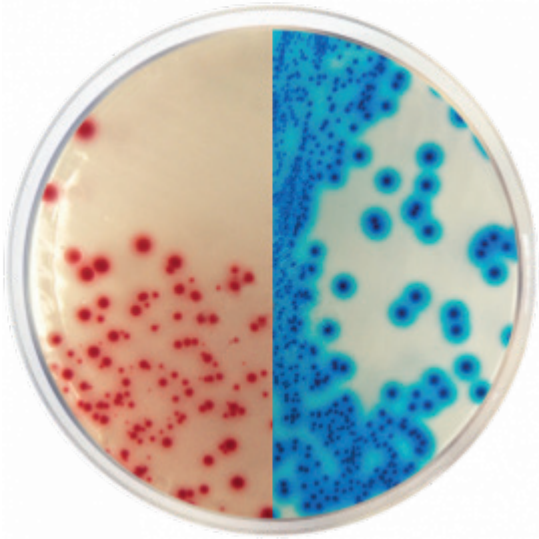


\$539M

Estimated attributable healthcare costs in 2017

Source: U.S Department of Health and Human Services.
Center of Disease Control and Prevention

CondaChrome® KPC



CE IVD

Chromogenic medium for the detection of Gram-negative bacteria with reduced susceptibility to most carbapenems.



Plate reading:

- Blue: *Klebsiella*
- Light blue: *Enterococcus* (partially inhibited)
- Pink: *Escherichia coli*



Incubation:
35 ± 2° C



Results:
18/24h

What do we know about the CRE?

- The Carbapenem-resistant Enterobacteriaceae (CRE) group represents the greatest risk for patients in health facilities. Some of these bacteria are resistant to almost all antibiotics, resulting in more toxic or less effective treatments.
- Patients who require medical devices such as catheters or patients who receive long treatments of some antibiotics are the highest risk groups for CRE infections
- CRE have genetic-mobile elements that can be exchanged between different bacteria. This characteristic causes the rapid spread of this resistance, leading to the degradation of the medications given to patients.



13,100

Estimated cases in hospitalized patients in 2017



1,100

Estimated deaths in 2017



\$130M

Estimated attributable healthcare costs in 2017

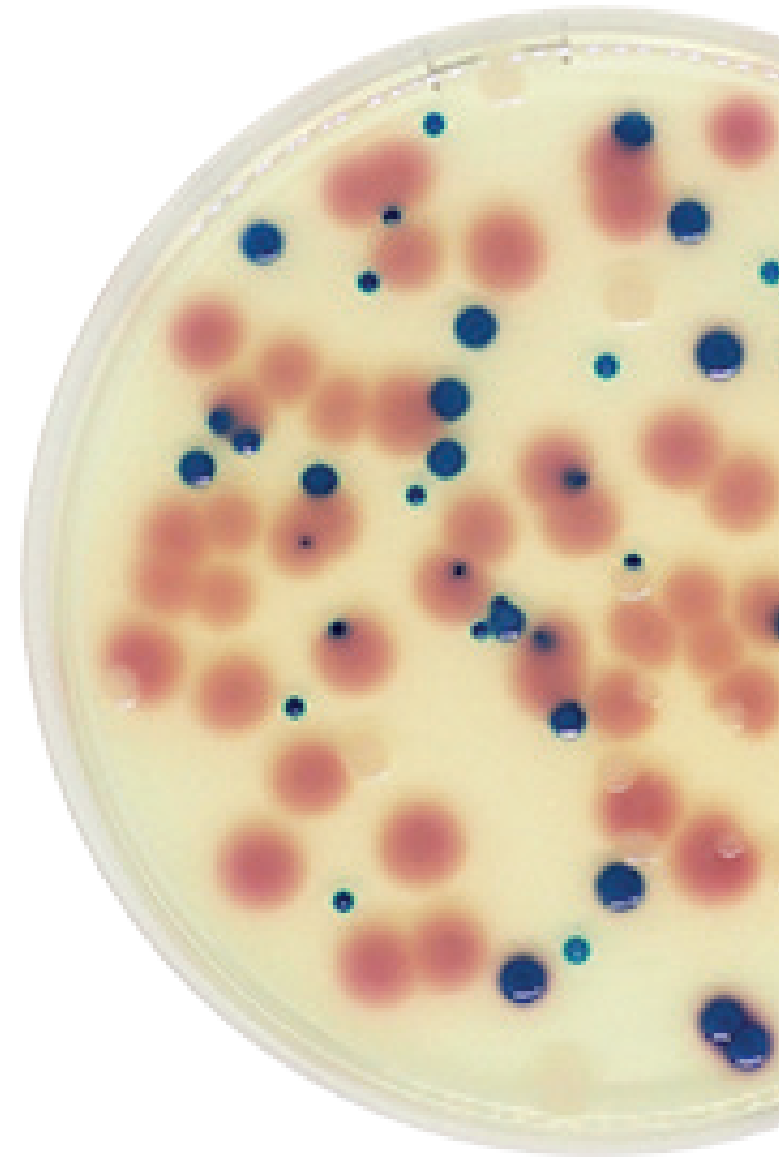
Source: U.S Department of Health and Human Services.
Center of Disease Control and Prevention

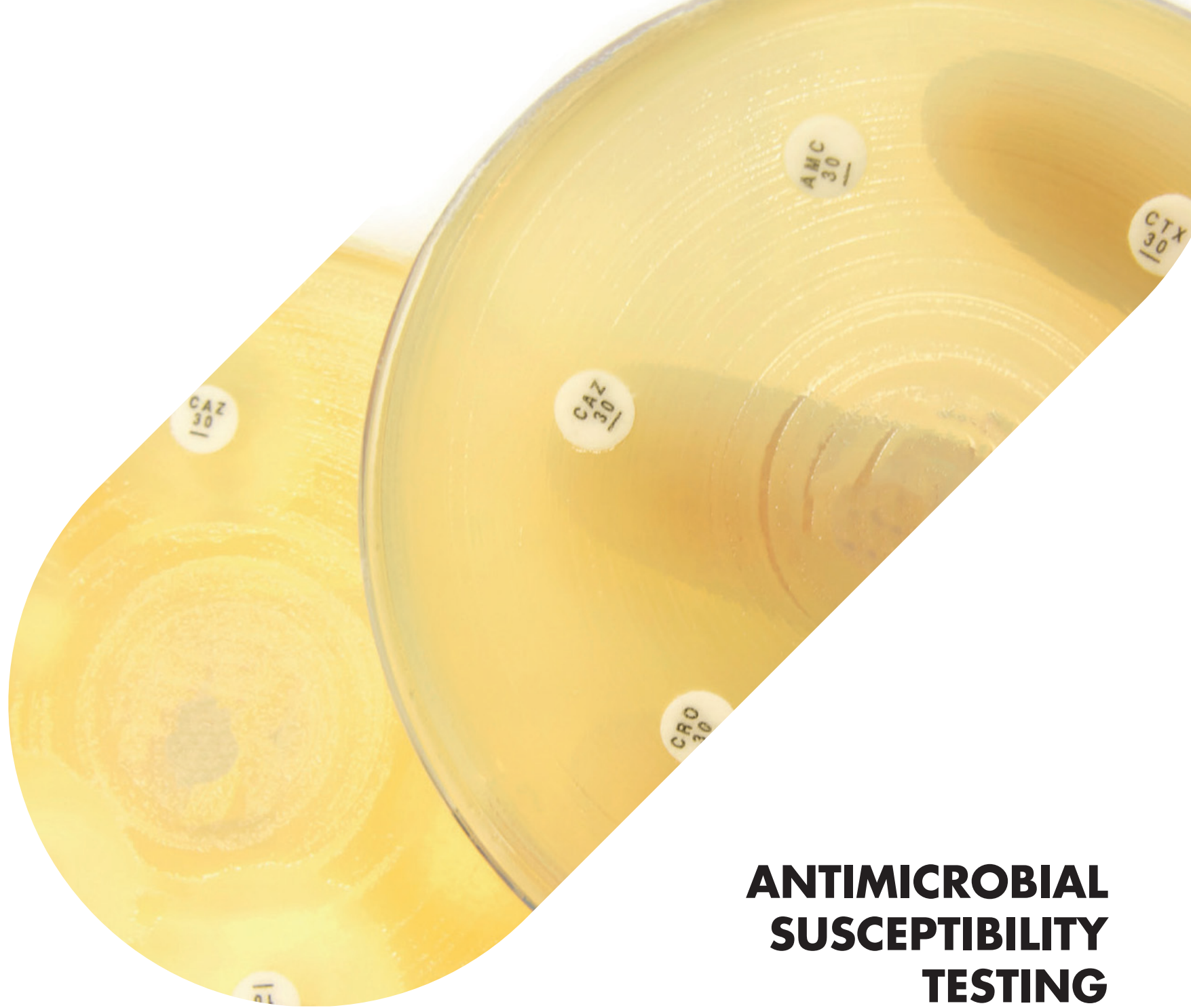
Emerging microbial resistance

At Condalab, together with the scientific community, we are committed to this global issue, and we continue to develop new chromogenic culture media that enable for the rapid identification of these new resistant strains.

The list of antibiotics-resistant microorganisms grows day after day. And what concerns the health community the most is that these are common pathogens involved in infections with a low mortality rate thanks to the current treatments. Bacteria such as the *Salmonella*, *Campylobacter* or *Streptococcus* have begun showing the first signs of resistance to first line treatments.

An early diagnosis is the most useful and effective tool for this new battle we are facing.





**ANTIMICROBIAL
SUSCEPTIBILITY
TESTING**

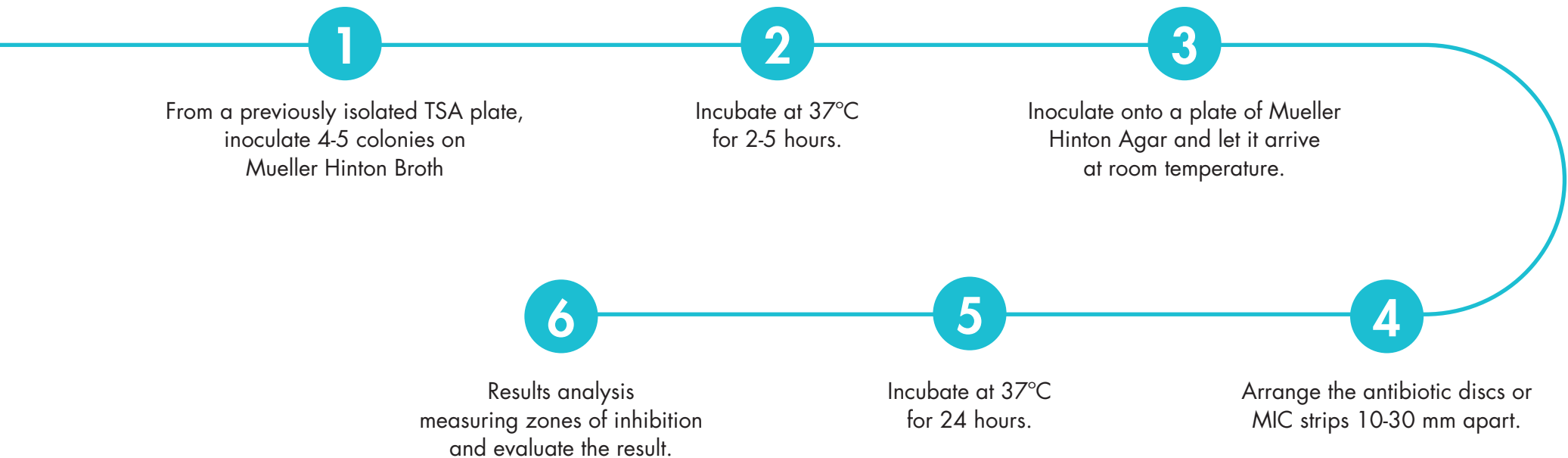
What are sensitivity tests?

Antibiotic susceptibility testing is carried out by the antibiogram, which is used to measure the sensitivity of a bacterial strain to one or more antibiotics.

The *in vitro* sensitivity study is one of the prerequisites for the efficacy of the *in vivo* antibiotic treatment.

The determination of the Minimum Inhibitory Concentration (MIC) measures this sensitivity. It is the minimum amount of antimicrobial capable of preventing the growth of a microorganism. It is the common method used in Clinical Microbiology laboratories. To carry it out, controlled strains must be used so that results can be reproduced and compared. This method gives information on the sensitivity of the bacteria, classified as S (sensitive), I (intermediate) and R (resistant).

How do I perform a sensitivity test?



Products for conducting sensitivity tests.

Culture media.

Antibiotic discs.

MIC test strips.



Culture media.

CAT.	PRODUCT NAME	PACK SIZE
1372	Bile Esculin Azide Agar	500 g
1108	Blood Agar Base	500 g
1048	Brain Heart Infusion Agar (BHI Agar)	500 g
1400	Brain Heart Infusion Broth (BHI Broth)	500 g
1301	Chloramphenicol Agar (YGC Agar) ISO	500 g
1152	Columbia CNA Agar Base	500 g
1164	Corn Meal Agar	500 g
1015	Czapek-Dox Modified Agar	500 g
1157	Dermatophytes Agar Base	500 g
1161	Dichloran Glycerol Agar (DG 18) ISO	500 g
1464	Haemophilus Test Medium	500 g
1052	Macconkey Agar EP/USP/ISO	500 g
1062	Mannitol Salt Agar (MSA) (Chapman Medium) EP/USP/ISO	500 g
2116	Motility Test Medium	500 g
1058	Mueller Hinton Agar	500 g

CAT.	PRODUCT NAME	PACK SIZE
1055	Mueller Hinton Agar II	500 g
1214	Mueller Hinton Broth (cation adjusted)	500 g
1500	OF Basal Medium (Hugh And Leifson)	500 g
1527	OGA Medium (Oxytetracycline Glucose Agar Base) (OGYE)	500 g
1022	Potato Dextrose Agar EP/USP	500 g
1160	Rose Bengal Agar + Chloramphenicol + Dichloran (DRBC Agar) ISO	500 g
1090	Sabouraud Dextrose Agar + Chloramphenicol	500 g
1089	Sabouraud Dextrose Agar + Chloramphenicol + Cycloheximide	500 g
1134	Sabouraud Dextrose Agar + Chloramphenicol EP/USP/ISO	500 g
1088	Sabouraud Dextrose Agar + Cycloheximide	500 g
1024	Sabouraud Dextrose Agar EP/USP/ISO	500 g
1046	Triple Sugar Iron Agar (TSI)	500 g
1224	Trypticasein Soy Broth (TSB) EP/USP/ISO	500 g
2180	Urea Agar Base (Christensen) ISO	500 g



Condalab

Inspired by knowledge

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**If you need further information about products and techniques
for antimicrobial susceptibility testing, please do not hesitate to contact us.**