Prossimità e organizzazione delle cure: la medicina generale di domani tra demografia e cronicità

Uso appropriato degli antibiotici

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Tanka Village - Villasimius (CA)

FIMMG Federazione Italiana Medici di Famiglia

Metis Società Scientifica di Medici

Pre-antibiotic era

- Era of pus drainage, amputations and laudable pus…
- Wards full of suppurating wounds…
- Mortuary filled with victims who had been felled by organisms that we often disregard these days e.g. *Streptococcus pneumoniae* and *Streptococcus pyogens.*

Semmelweiss (1818-1865)

Nel 1850 dimostrò l'importanza dell'igiene delle mani nella trasmissione delle infezioni negli ospedali: Tra marzo e l'agosto del 1848, riuscì con tale approccio a ridurre immediatamente il tasso di mortalità dal 18.3% all' 1.3%

Antibiotic Era

- Antibiotics were hailed as "*miracle drugs*" after their initial introduction in 1940s.
- Penicillin, the wonder drug, saved millions of lives in the 2nd world war and many mothers were saved from puerperal sepsis.
- Their widespread availability and success led to such dramatic reduction in the morbidity and mortality caused by infectious diseases that many thought it was time to "close the book" on infectious diseases.

Introduction

- As if proving Darwin's theory of "Survival of the fittest", the bacteria underwent a rapid hitherto unprecedented evolution to circumvent this menace to their survival.
- Being single celled and endowed with the ability to multiply rapidly, the change was almost natural and spontaneous.

RESISTANCE !!!

"Drug resistance follows the drug like a faithful shadow."

- Paul Erhlich 1854-1915

"It is not difficult to make microbes resistant to penicillin in the laboratory by exposing them to concentrations not sufficient to kill them, and the same thing has occasionally happened in the body…there is the danger that the ignorant man may easily under-dose himself and by exposing his microbes to non-lethal quantities of the drug make them resistant."

-Alexander Fleming, Nobel prize lecture, 1945

Infectious Diseases Society of America Superbug Hit List

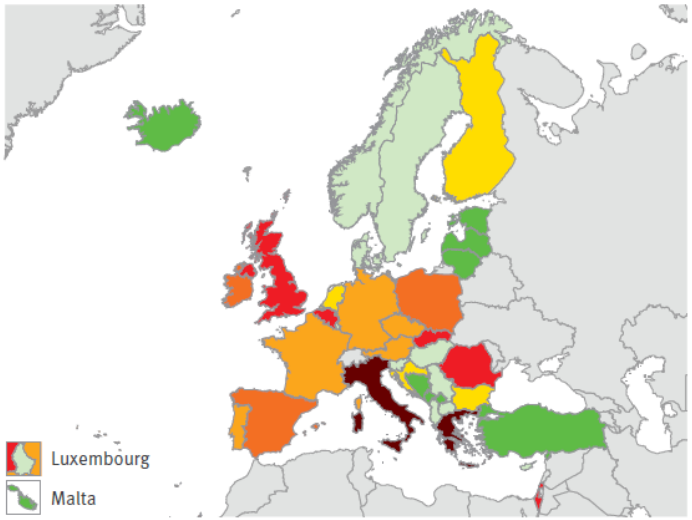
- Methicillin-resistant *Staphylococcus aureus*
- Vancomycin-resistant *Enterococcus faecium* (VRE)
- *ESBL producing Escherichia coli and Klebsiella spp.*
- *Carbapenem resistant Acinetobacter baumannii*
- *MDR Pseudomonas aeruginosa*

Carbapenemase-producing *Enterobacteriaceae* in Europe: assessment by national experts from 38 countries, May 2015

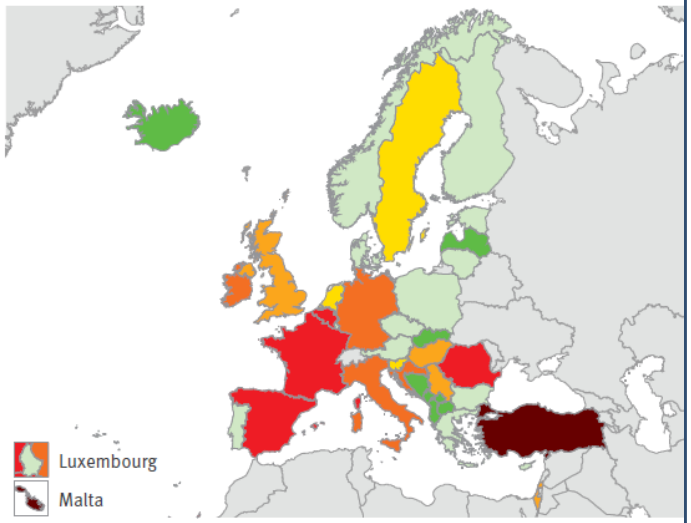
Epidemiological stages, 2014-2015

- Countries not participating
- No case reported (Stage 0)
- Sporadic occurence (Stage 1)
- Single hospital outbreak (Stage 2a)
- Sporadic hospital outbreaks (Stage 2b)
- Regional spread (Stage 3)
- Inter-regional spread (Stage 4)
- Endemic situation (Stage 5)

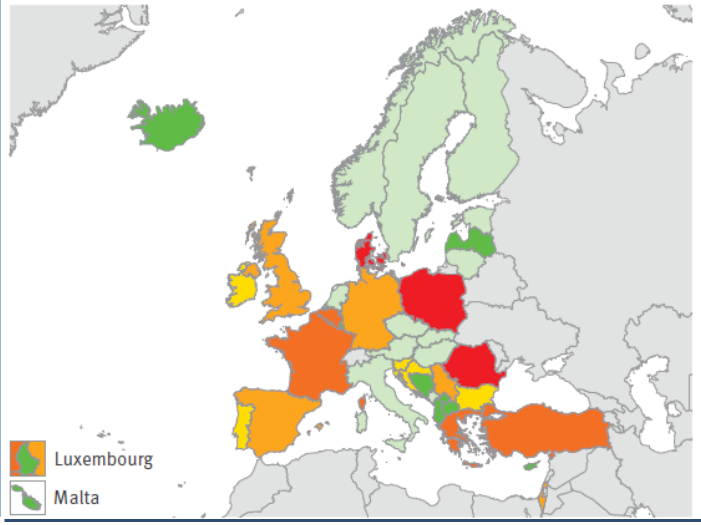
A. *Klebsiella pneumoniae* carbapenemase (KPC)



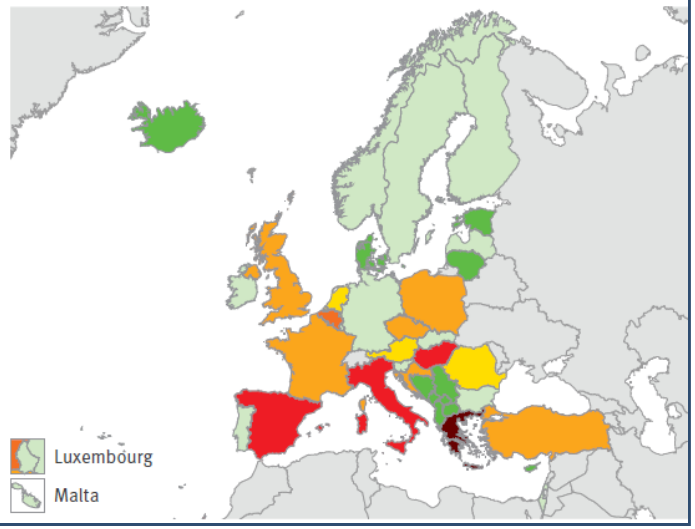
B. Oxacillinase-48 (OXA-48)



C. New Delhi metallo-beta-lactamase (NDM)



D. Verona integron-encoded metallo-beta-lactamase (VIM)



STUDIO BRITANNICO

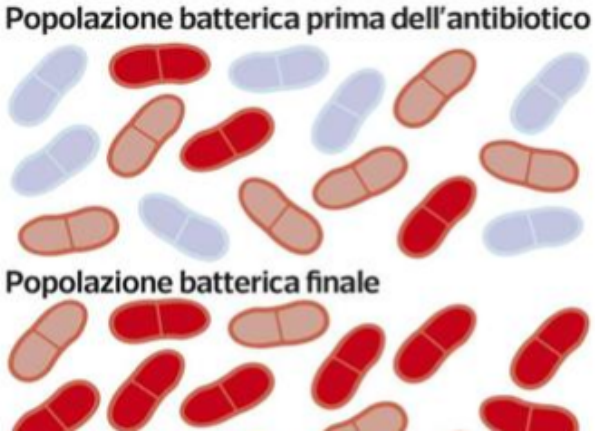
“Apocalisse” antibiotici: «Dal 2050 avremo 10 milioni di vittime l’anno»

L’allarme lanciato dal Regno Unito dopo la presentazione di un report al governo. Il capo del servizio sanitario inglese prospetta gravi rischi per le operazioni chirurgiche di routine se non si invertirà il trend con interventi mirati: la proposta di una tassa

di Silvia Turin

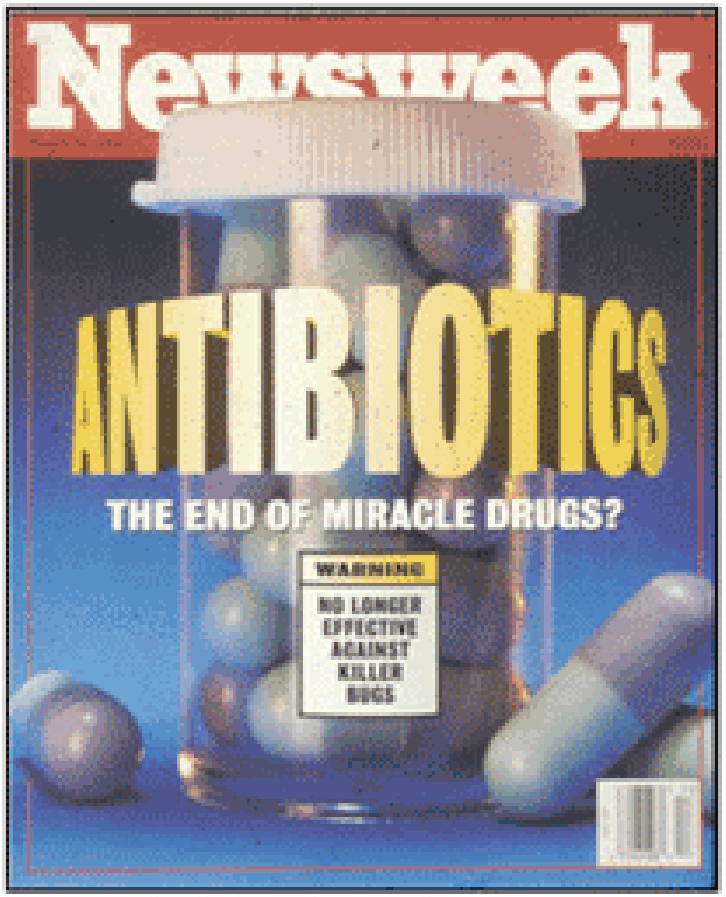
Il meccanismo

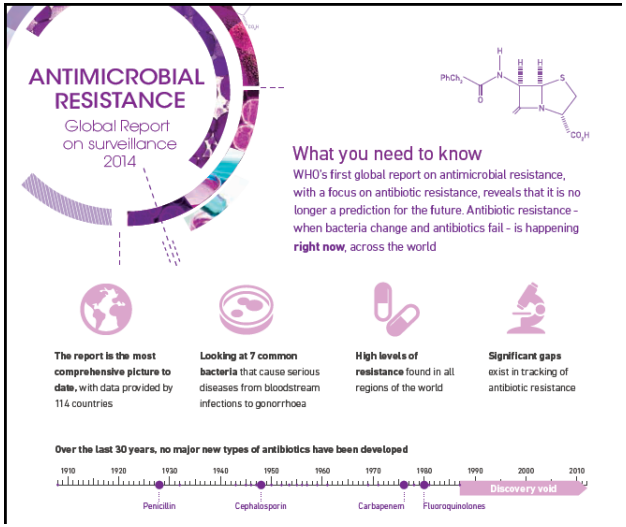
Ogni volta che si assume un antibiotico si uccidono i batteri che sono «sensibili», cioè vulnerabili al farmaco. Se nell’organismo ci sono batteri che sono «resistenti» a quell’antibiotico, una volta liberati dalla «concorrenza»



Antibiotics:

The more you use it, the faster you lose it!
But doctors can improve prescribing.





TACKLING DRUG-RESISTANT INFECTIONS GLOBALLY:

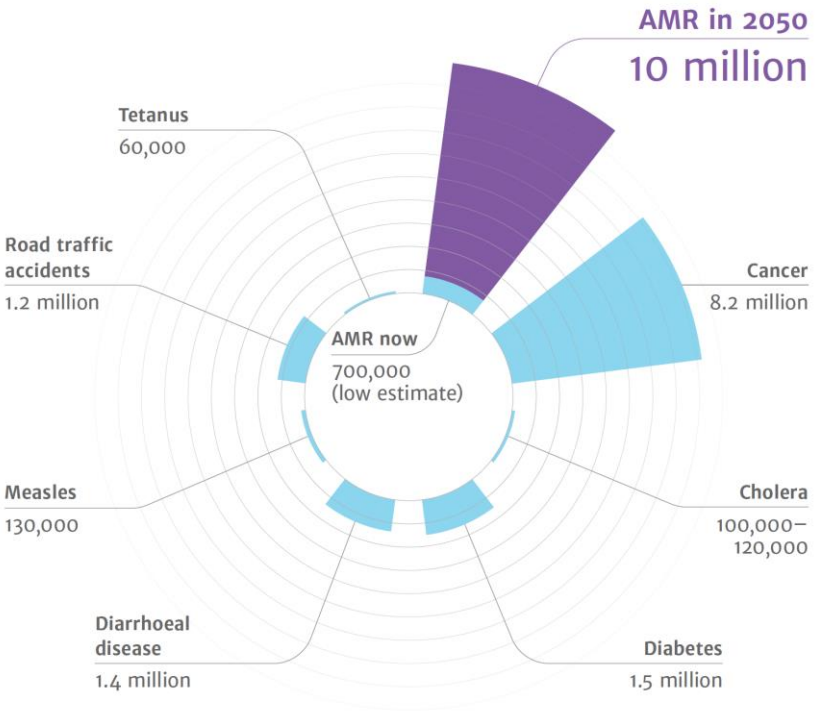
FINAL REPORT AND RECOMMENDATIONS

THE REVIEW ON ANTIMICROBIAL RESISTANCE

CHAIRED BY JIM O'NEILL

MAY 2016

DEATHS ATTRIBUTABLE TO AMR EVERY YEAR



LOWERING DEMAND FOR ANTIMICROBIALS AND REDUCING UNNECESSARY USE

Public awareness

Sanitation and hygiene

Antibiotics in agriculture and the environment

Vaccines and alternatives

Rapid diagnostics

Human capital

Magnitude of Antimicrobial Use

- Antibiotics are the second most commonly used class of drugs in the United States
- More than 8.5 billion dollars are spent on anti - infectives annually
  - 200-300 million antimicrobials prescribed annually
  - 53% for outpatient use
- 30-50% of all hospitalized patients receive antibiotics
- Studies estimate up to **50%** of antibiotic use is either unnecessary or inappropriate across all type of health care settings

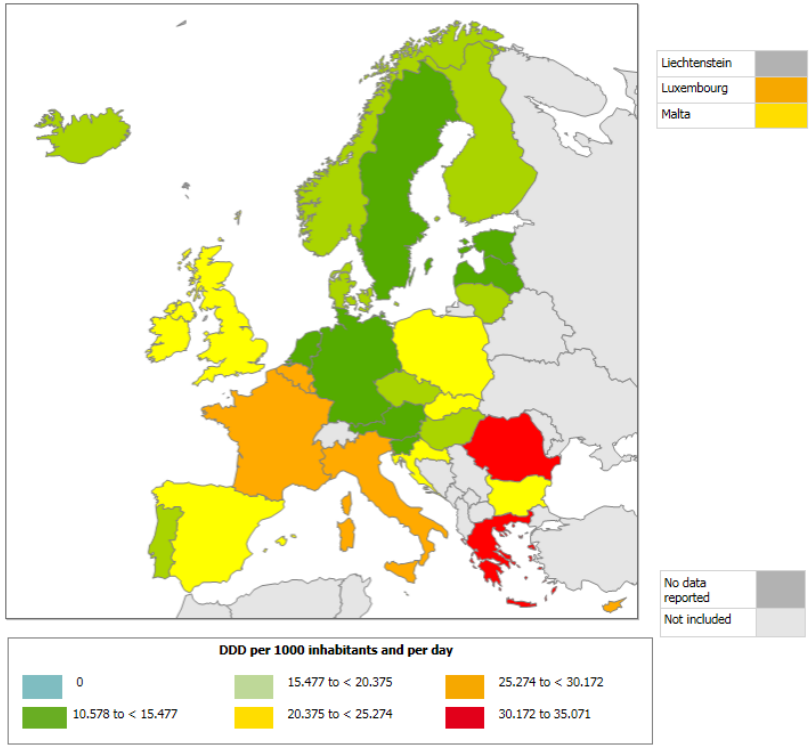
Clin Infect Dis 2007; 44:159-177

Antibiotic are misused in a variety of ways

- Given when they are not needed
- Continued when they are no longer necessary-duration
- Given at the wrong dose-renal and weight-based dosing
- Broad spectrum agents are used to treat very susceptible bacteria
- The wrong antibiotic is given to treat an infection

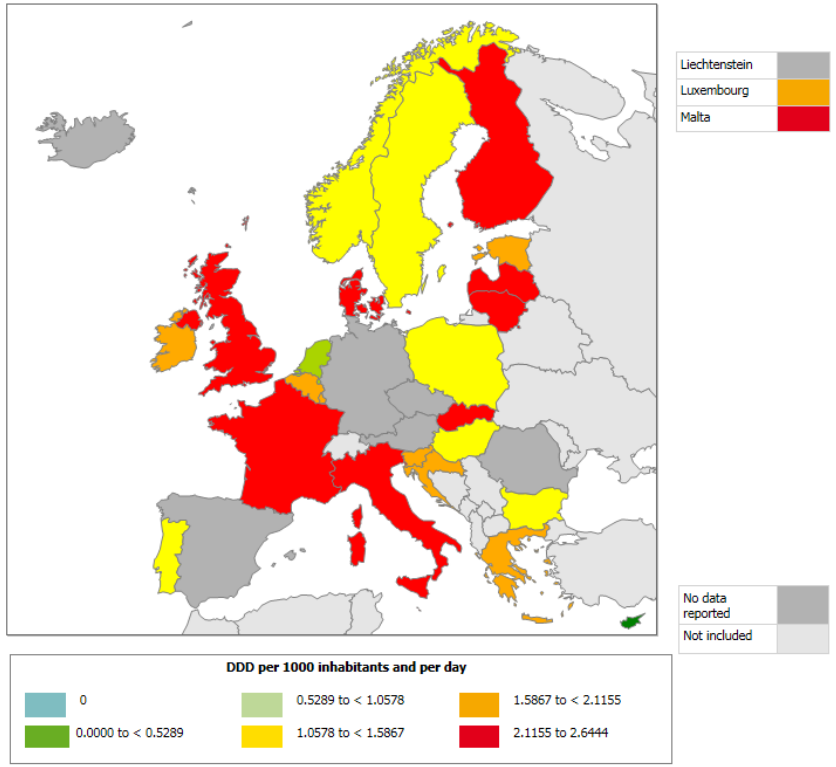
Geographical distribution of the consumption of Antibacterials For Systemic Use (ATC group J01) in the community (primary care sector) in Europe, reporting year 2014

Consumption of Antibacterials For Systemic Use (ATC group J01) in the community (primary care sector) in Europe, reporting year 2014



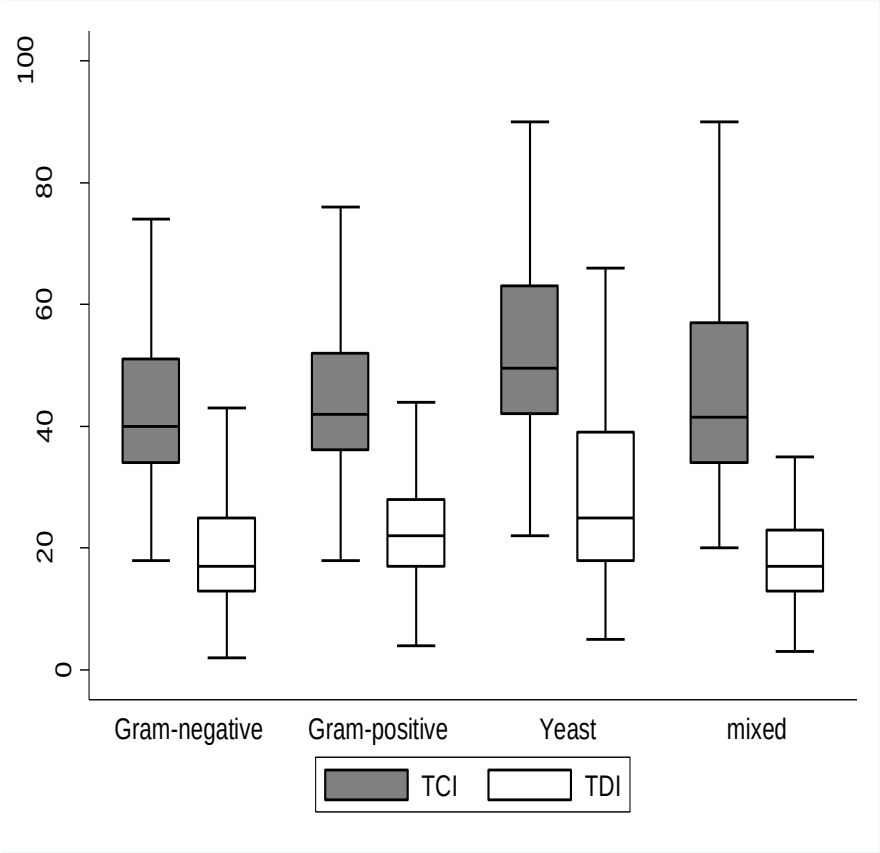
Geographical distribution of the consumption of Antibacterials For Systemic Use (ATC group J01) in the hospital sector in Europe, reporting year 2014

Consumption of Antibacterials For Systemic Use (ATC group J01) in the hospital sector in Europe, reporting year 2014



Time to identification

- The median time to positivity was 12.2 hours (IQR: 8.2-17.5), ranging from 10.4 h (IQR: 7-15.1) for Gram-negative bacteria, to 15.2 h (IQR: 10.3-18.5) for Gram-positive isolates. It was 16.4 h (IQR: 10.3-28) for yeasts and 10.5 h (IQR: 6-16) for polymicrobial cultures.
- The median time to identification for the direct method was 19.5 hours (IQRs: 14.3-26.5 h) (range: 17.2 h for Gram-negatives to 21.5 h for gram-positives and yeasts) and that for the comparison culture-based method was 41.7 h (IQRs, 35.5-53 h)



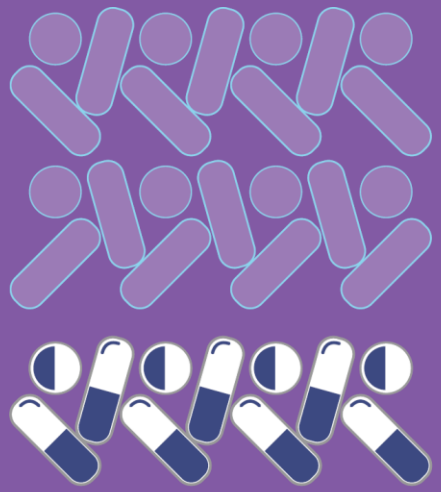
TCI, time to culture-based identification results ; TDI, time to direct identification results.

WE NEED TO USE EXISTING ANTIMICROBIALS BETTER

Improving availability of existing antimicrobials and using better dosing strategies would go a long way in helping current antimicrobials last longer.

2/3rd

A study in 2012 found that 2/3rds of selected antibiotics were not available in more than half the included countries.



1/2

A study in 2015 found that nearly half the children and newborns in the sample were treated with sub-optimal doses of commonly used antifungals.

Antimicrobial Therapy

Appropriate initial antibiotic while improving patient outcomes and heathcare

Unnecessary antibiotics and adverse patient outcomes and increased cost

A Balancing Act

Other sites: ECDC | European Antibiotic Awareness Day | ESCAIDE - Scientific conference | Eurosurveillance journal

European Centre for Disease Prevention and Control
An agency of the European Union

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ReAct

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