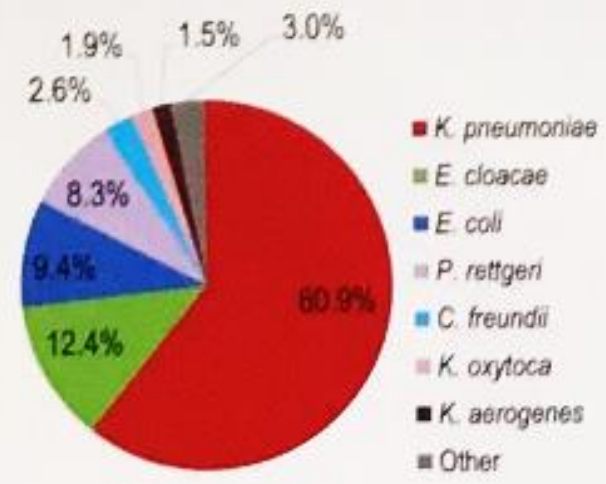


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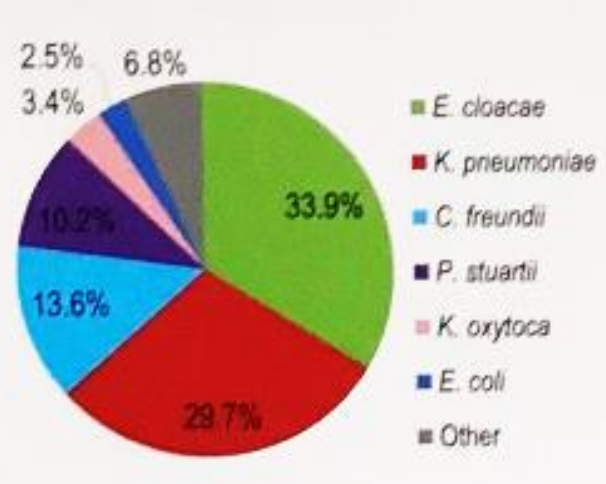


Figure 1a-c. Distribution of MBLs in *Enterobacteriaceae*

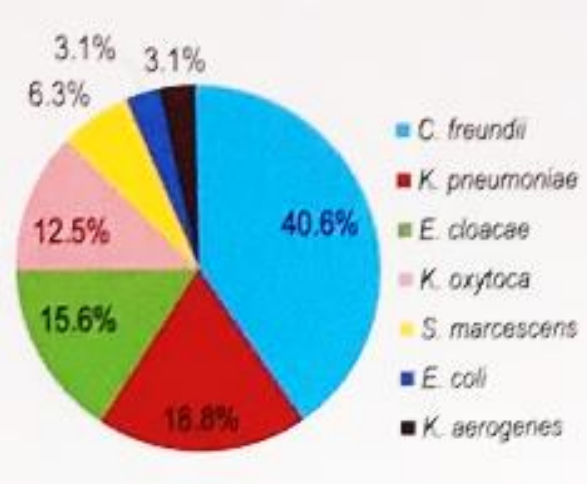
1a) NDM (n=266)*



1b) VIM (n=118)*

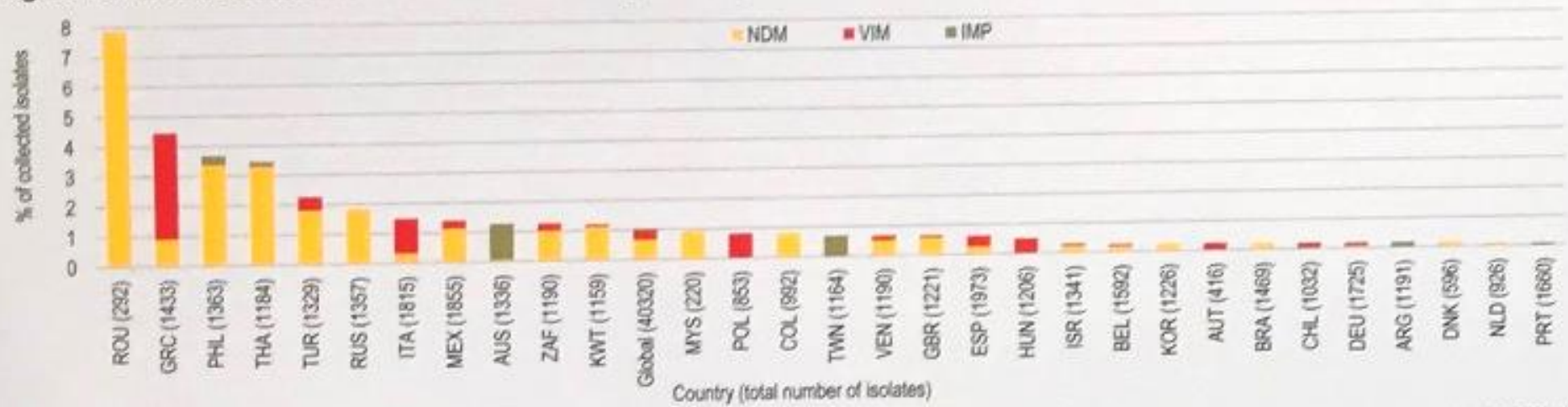


1c) IMP (n=32)



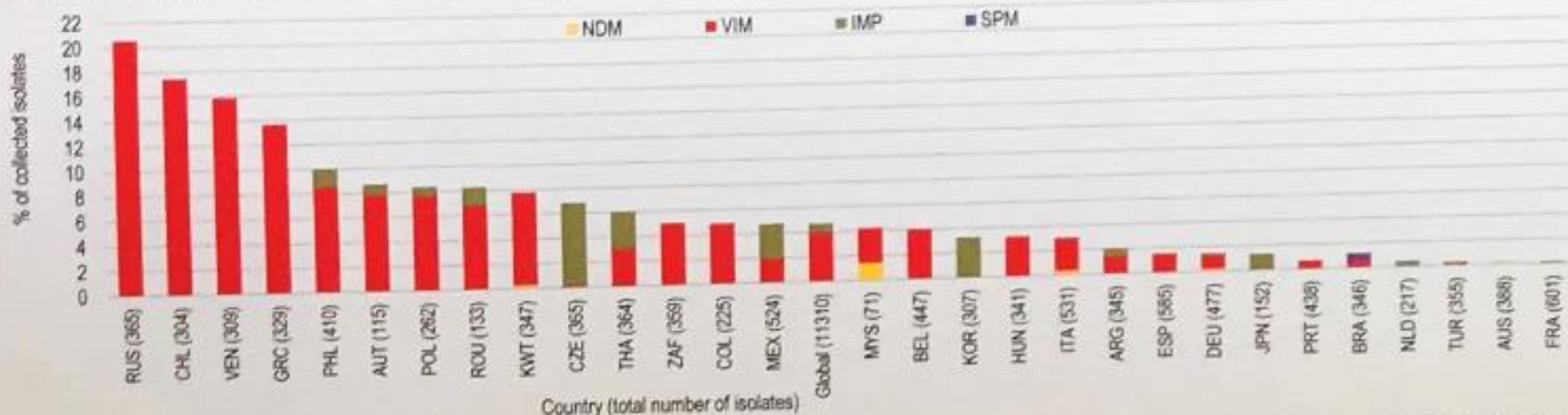
* Includes one isolate carrying both NDM and VIM

Figure 2a. MBL incidence in *Enterobacteriaceae* by country^a



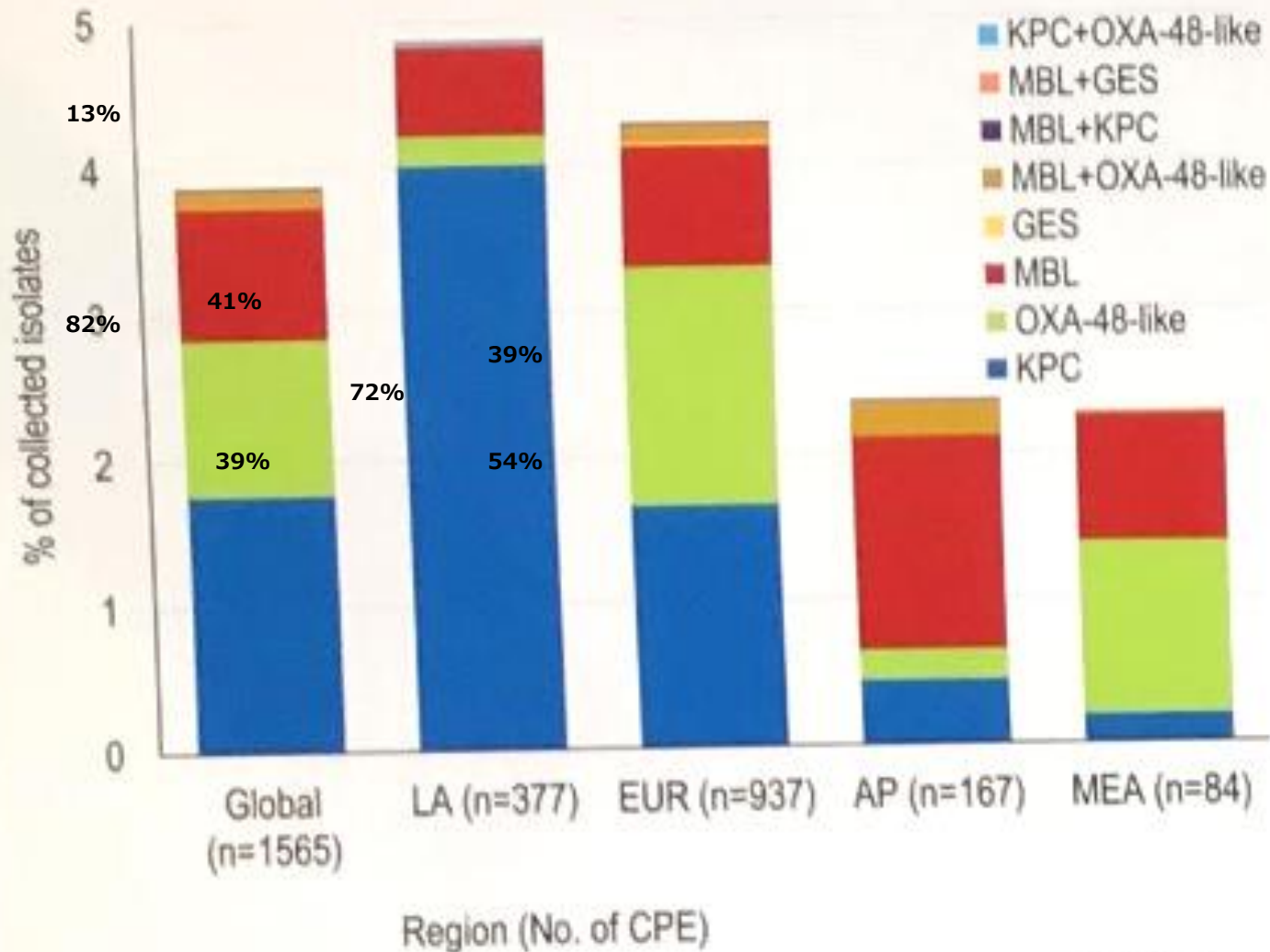
^a Includes one isolate from Turkey that co-carried NDM and VIM, 45 isolates that co-carried OXA-48-like carbapenemases and 5 isolates that co-carried KPC. A total of 383 (92.3%) of MBL-positive isolates co-carried chromosomal or plasmid-mediated ESBL or AmpC β -lactamases, including 213 isolates (51.3%) that co-carried CTX-M-15. No MBLs found in Czech Republic, France, Japan, and Sweden.

Figure 2b. MBL incidence in *P. aeruginosa* by country^a



^a Includes 439 isolates that carried VIM, 73 that carried IMP, 6 that carried NDM, and 2 that carried SPM. Four isolates from the Philippines and Argentina co-carried VIM and IMP. No MBLs found in Denmark, Israel, Sweden, Taiwan, and United Kingdom.
 ARG, Argentina; AUS, Australia; AUT, Austria; BEL, Belgium; BRA, Brazil; CHL, Chile; CZE, Czech Republic; COL, Colombia; DEU, Germany; ESP, Spain; FRA, France; GRC, Greece; HUN, Hungary; ITA, Italy; JPN, Japan; KOR, South Korea; KWT, Kuwait; MEX, Mexico; MYS, Malaysia; PHL, Philippines; POL, Poland; PRT, Portugal; ROU, Romania; RUS, Russia; THA, Thailand; TUR, Turkey; VEN, Venezuela; ZAF, South Africa.

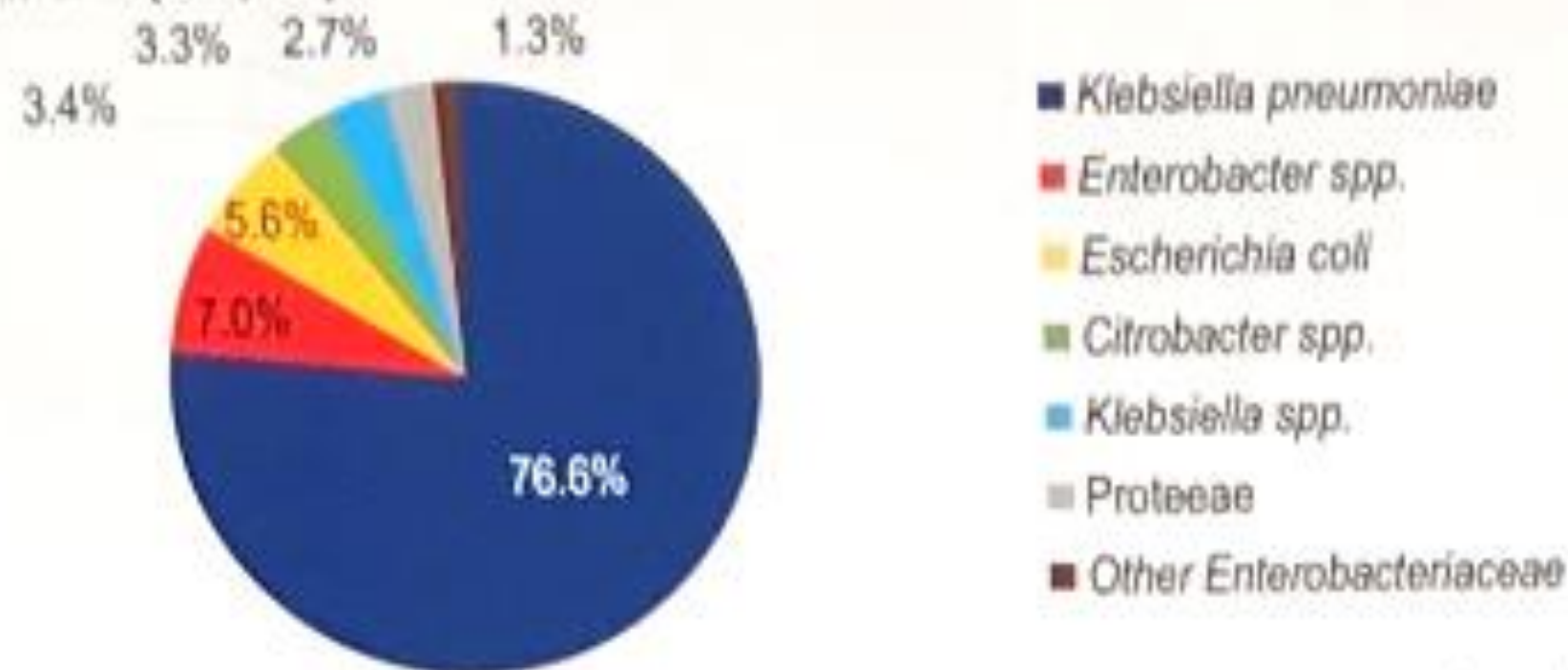
Figure 1. Distribution of resistance mechanisms among CPE, by region^a



^a Global, all; LA, Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Venezuela); EUR, Europe (Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Russia, Spain, Sweden, Turkey, United Kingdom); AP, Asia/Pacific (Australia, Japan, Malaysia, Philippines, South Korea, Taiwan, Thailand); MEA, Middle East/Africa (Israel, Kuwait, South Africa). No CPE were collected in the Czech Republic, Japan and Sweden in 2015-2017.

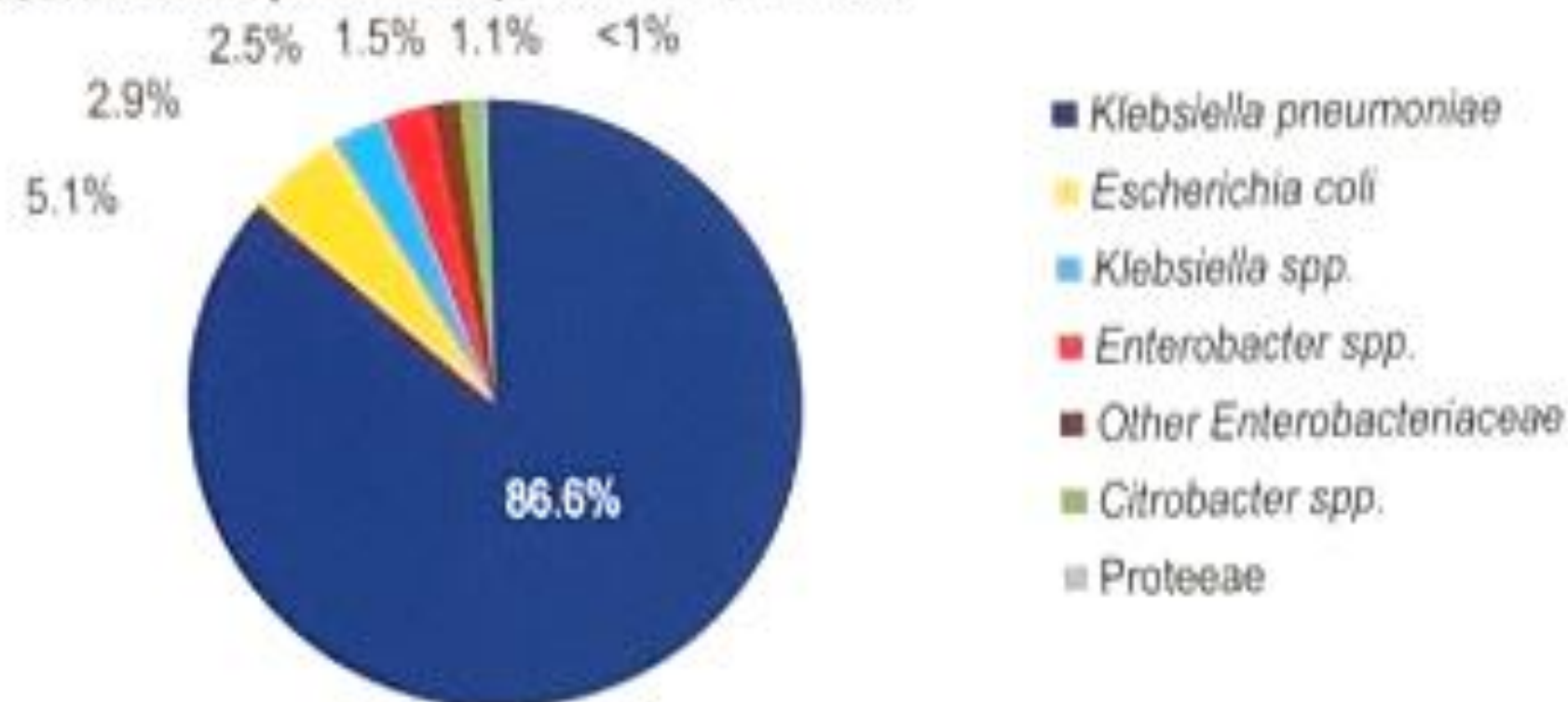
Figures 2A-2C. Species distribution of carbapenemase-positive *Enterobacteriaceae* (CPE) producing serine carbapenemases (KPC, OXA-48-like, GES) and metallo- β -lactamases (MBLs; NDM, IMP, VIM)

2A. All CPE (n=1,565)*



* *Enterobacter* spp. includes *Enterobacter cloacae* (n=104), *Enterobacter asburiae* (n=5) and *Enterobacter kobei* (n=1); *Citrobacter* spp. includes *Citrobacter freundii* (n=46), *Citrobacter farmeri* (n=3), *Citrobacter koseri* (n=3), and *Citrobacter amalonaticus* (n=1); *Klebsiella* spp. includes *Klebsiella oxytoca* (n=33), *Klebsiella aerogenes* (n=17) and *Klebsiella varicola* (n=2); Proteaceae includes *Providencia rettgeri* (n=25), *Providencia stuartii* (n=13) and *Proteus mirabilis* (n=4); Other *Enterobacteriaceae* includes *Serratia marcescens* (n=14), *Raoultella ornithinolytica* (n=4) and *Raoultella planticola* (n=3).

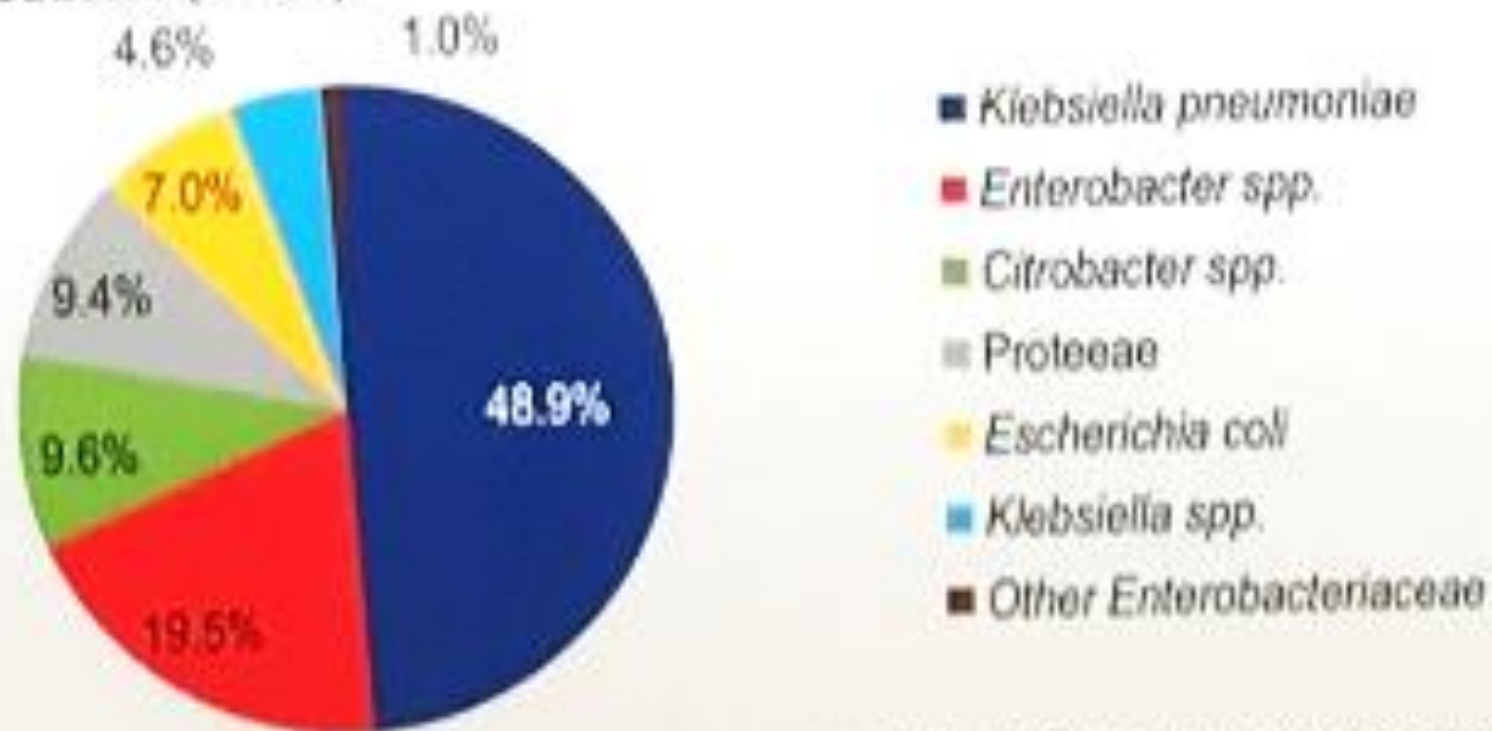
2B. Serine carbapenemase-producers (n=1,150)^{a,b}



^a Excludes isolates co-carrying serine carbapenemases and MBLs. Includes isolates carrying KPC-type (n=711), OXA-48-like (n=433), GES-type (n=4), and KPC and OXA-48-like (n=2) enzymes.

^b *Klebsiella spp.* includes *Klebsiella oxytoca* (n=20), *Klebsiella aerogenes* (n=12) and *Klebsiella variicola* (n=1); *Enterobacter spp.* includes *Enterobacter cloacae* (n=26), *Enterobacter asburiae* (n=2) and *Enterobacter kobei* (n=1); *Other Enterobacteriaceae* includes *Serratia marcescens* (n=11), *Raouffella ornithinolytica* (n=3) and *Raouffella planticola* (n=3); *Citrobacter spp.* includes *Citrobacter freundii* (n=10), *Citrobacter koseri* (n=2) and *Citrobacter amalonaticus* (n=1); *Proteaeae* includes *Providencia rettgeri* (n=3).

2C. MBL-producers (n=415)^{a,b}



^a Includes isolates carrying NDM-type (n=221), VIM-type (n=109), IMP-type (n=32), NDM and OXA-48-like (n=40), VIM and OXA-48-like (n=5), VIM and KPC-type (n=3), NDM and KPC-type (n=2), NDM and GES-type (n=2), and VIM and NDM (n=1) carbapenemases.

^b *Enterobacter spp.* includes *Enterobacter cloacae* (n=78) and *Enterobacter asburiae* (n=3); *Citrobacter spp.* includes *Citrobacter freundii* (n=36), *Citrobacter farmen* (n=3) and *Citrobacter koseri* (n=1); Proteaceae includes *Providencia rettgeri* (n=22), *Providencia stuartii* (n=13) and *Proteus mirabilis* (n=4); *Klebsiella spp.* includes *Klebsiella oxytoca* (n=13), *Klebsiella aerogenes* (n=5) and *Klebsiella varicola* (n=1); Other Enterobacteriaceae includes *Serratia marcescens* (n=3) and *Raputella ornithinolytica* (n=1).

Figure 1 Distribution of carbapenem-resistant *Enterobacterales* and occurrence of serine carbapenemases and metallo- β -lactamases stratified by geographic region

