Supplementary materials.

Reason	Phase I (2023)	Phase II (2024)	Phase III (Dec 2024–Feb 2025)
Age < 18 years	4	1	11
Intensive care unit	3	5	10
No antibacterial therapy	23	24	32
Included	626	627	420
Included consultations with a prescribing action recorded	626	625	420
Included consultations with an antibacterial agent prescribed (AWaRe outcomes)	569	579	389
Patients included (Table 1)	351	366	258
Patients evaluable for 30-day in-hospital mortality	350	366	257

Group	Consultations	Age, median	Female	In-hospital death, n/N (%)
Age < 18 years	16	17	37.5%	0/16 (0.0%)
Intensive care unit	18	63	38.9%	6/17 (35.3%)
No antibacterial therapy	79	62	40.5%	2/79 (2.5%)
Included	1673	70	39.8%	230/1673 (13.7%)

Supplementary Table S1. Consultations excluded by reason and phase (criteria applied in sequence), comparison of excluded and included consultations, and denominators of the analyses by phase.

In-hospital death: denominator = consultations with a recorded outcome (the outcome was missing in one of the 18 intensive care unit consultations). AWaRe outcomes: consultations with at least one antibacterial agent prescribed after the consultation. No prescribing action was recorded in 2 Phase II consultations, which were excluded from the analyses of empiric therapy, stewardship actions and targeted therapy. Thirty-day mortality could not be assessed in 2 patients (Phase I: no valid date of the first consultation; Phase III: recorded date of death preceding the first consultation).

Outcome	Analysis	N	OR Phase II vs I (95% CI)	OR Phase III vs I (95% CI)
Carbapenem prescription	Main adjusted model	1673	0.57 (0.35–0.92)	0.39 (0.22–0.70)
	First consultation of each patient (logistic regression)	975	0.80 (0.56–1.14)	0.67 (0.45–0.99)
	Consultations of the first admission	1461	0.54 (0.34–0.86)	0.42 (0.24–0.73)
	At least one risk factor recorded	925	0.96 (0.59–1.55)	0.59 (0.36–0.95)
	Additionally adjusted for ward	1673	0.59 (0.38–0.93)	0.41 (0.24–0.71)
	Months shared by Phases I and II	827	0.66 (0.39–1.13)	—
	All consultations, no exclusions	1786	0.56 (0.36–0.87)	0.40 (0.23–0.67)
Stewardship actions	Main adjusted model	1671	1.38 (1.04–1.82)	1.94 (1.40–2.69)
	First consultation of each patient (logistic regression)	973	1.30 (0.95–1.77)	1.29 (0.91–1.82)
	Consultations of the first admission	1459	1.37 (1.02–1.84)	1.92 (1.36–2.70)
	At least one risk factor recorded	924	1.06 (0.73–1.53)	1.82 (1.29–2.56)
	Additionally adjusted for ward	1671	1.38 (1.04–1.84)	1.89 (1.35–2.65)
	Months shared by Phases I and II	827	1.72 (1.20–2.48)	—
	All consultations, no exclusions	1782	1.35 (1.04–1.76)	1.98 (1.45–2.69)

Same covariates as the main adjusted model without the no-risk-factor indicator when only patients with at least one risk factor recorded are analyzed; with ward added in the ward-adjusted analysis. Phase III is not represented in the analysis of the months shared by Phases I and II. Stewardship actions: consultations with no prescribing action recorded are excluded.

Supplementary Table S2. Sensitivity analyses for the primary outcomes (adjusted models).

Pathogen	March 2023	June-August 2023	March-July 2024	December 2024-February 2025
Citrobacter spp.	1 (5.6%)	3 (3.4%)	5 (3.0%)	4 (4.3%)
Enterobacter spp.	0 (0.0%)	2 (2.2%)	9 (5.4%)	1 (1.1%)
Escherichia coli	11 (61.1%)	58 (65.2%)	88 (52.7%)	57 (62.0%)
Klebsiella pneumoniae	3 (16.7%)	15 (16.9%)	29 (17.4%)	12 (13.0%)

Proteus mirabilis	0 (0.0%)	10 (11.2%)	33 (19.8%)	17 (18.5%)
Serratia spp.	1 (5.6%)	1 (1.1%)	0 (0.0%)	0 (0.0%)
Klebsiella aerogenes	1 (5.6%)	0 (0.0%)	1 (0.6%)	0 (0.0%)
Providencia spp.	1 (5.6%)	0 (0.0%)	1 (0.6%)	1 (1.1%)
Morganella morganii	0 (0.0%)	0 (0.0%)	1 (0.6%)	0 (0.0%)
Total	18 (100.0%)	89 (100.0%)	167 (100.0%)	92 (100.0%)

Supplementary Table S3. Distribution of ESBL-producing organisms

Pathogen	March 2023	June-August 2023	March-July 2024	December 2024-February 2025
Acinetobacter baumannii	7 (15.6%)	24 (19.7%)	34 (17.5%)	12 (10.8%)
Escherichia coli	4 (8.9%)	6 (4.9%)	9 (4.6%)	2 (1.8%)
Klebsiella oxytoca	0 (0.0%)	2 (1.6%)	0 (0.0%)	2 (1.8%)
Klebsiella pneumoniae	23 (51.1%)	66 (54.1%)	102 (52.6%)	64 (57.7%)
Pseudomonas aeruginosa	11 (24.4%)	24 (19.7%)	46 (23.7%)	24 (21.6%)
Enterobacter spp.	0 (0.0%)	0 (0.0%)	1 (0.5%)	0 (0.0%)
Providencia spp.	0 (0.0%)	0 (0.0%)	1 (0.5%)	1 (0.9%)
Raoultella spp.	0 (0.0%)	0 (0.0%)	1 (0.5%)	0 (0.0%)
Klebsiella aerogenes	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (2.7%)
Proteus mirabilis	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (2.7%)
Total	45 (100.0%)	122 (100.0%)	194 (100.0%)	111 (100.0%)

Supplementary Table S4. Distribution of carbapenemase-producing organisms (CPO)