Supplementary Information

Supplementary Methods: Statistical analysis

The primary outcomes were (i) the proportion of clinical *E. coli* isolates forming biofilm and (ii) the proportion of biofilm-forming isolates resistant to individual antibiotics. Study-level proportions were logit-transformed, with within-study variance calculated as $1/x + 1/(n - x)$, where x is the number of events and n the number of isolates; a continuity correction of 0.5 was applied to studies with zero events or with x = n. Proportions were pooled using inverse-variance random-effects models with the DerSimonian–Laird estimator of the between-study variance (τ^2) and the Hartung–Knapp–Sidik–Jonkman (HKSJ) adjustment of the 95% confidence interval (CI), which provides better coverage than the conventional Wald-type interval when heterogeneity is substantial (IntHout et al., 2014). Pooled logits and their confidence limits were back-transformed to proportions.

Heterogeneity was quantified with Cochran's Q test, τ^2 and I^2, and 95% prediction intervals (PIs), based on a t-distribution with $k - 2$ degrees of freedom, were calculated to describe the range within which the true prevalence in a comparable new setting would be expected to lie (IntHout et al., 2016). Because the DerSimonian–Laird estimator can underestimate τ^2 when heterogeneity is extreme, the primary analysis was repeated with the restricted maximumlikelihood (REML) and Paule–Mandel estimators (Veroniki et al., 2016), and a leave-one-out analysis was used to assess the influence of individual studies.

Pre-specified subgroup analyses were performed by detection method (microtiter plate, tube method, Congo red agar), biofilm production category (strong, moderate, weak, non-producer) and specimen type (urine vs. other clinical specimens), and because individual studies could report results for more than one assay, specimen type or production category, the subgroups are not mutually exclusive or independent, and subgroup estimates were therefore compared descriptively rather than with a formal test for subgroup differences; for production categories, the proportions of strong, moderate and weak producers were calculated with the number of biofilm-producing isolates (microtiter plate) as the denominator, whereas the proportion of nonproducers was calculated with the total number of isolates tested as the denominator, and each category was pooled as a separate outcome. Studies in which the reported number of positive isolates exceeded the number of *E. coli* isolates tested (e.g., counts reported for all organisms) were excluded from the corresponding analysis.

Country-level and income-level values were summarized descriptively. For antibiotic resistance, each antibiotic was analysed separately with the same model; class-level values (main text Fig. 4) are unweighted means of the antibiotic-specific pooled proportions and are presented as descriptive summaries, not as formal meta-analytic estimates.

Pooled estimates were calculated only when at least two studies contributed; where too few studies were available for a model to be estimated, this is indicated as not estimable in the tables.

Small-study effects were assessed visually with contour-enhanced funnel plots and statistically with Egger's regression test (Egger et al., 1997) and Begg's rank correlation test (Begg and Mazumdar, 1994); because these tests have low power with fewer than 10 studies, they were interpreted only when at least 10 studies were available (Sterne et al., 2011). Two-sided $p < 0.05$ was considered statistically significant, except for funnel-plot asymmetry tests, for which $p < 0.10$ was used. All analyses were performed in R version 4.3.3 using the meta package (version 8.2-1) (functions metaprop, metabias, trimfill and metainf).

When Egger's or Begg's test indicated funnel-plot asymmetry ($p < 0.10$), the trim-and-fill method of Duval and Tweedie (Duval and Tweedie, 2000) was applied as a sensitivity analysis to estimate the number of potentially missing studies and the corresponding adjusted pooled prevalence. Because funnel-plot asymmetry can arise from between-study heterogeneity, differences in assay methods or populations, and chance, as well as from publication bias, trimand-fill results were interpreted as indicating the potential influence of small-study effects rather than as bias-corrected estimates (Sterne et al., 2011). The method uses the L_0 estimator, which iteratively removes ('trims') the most extreme small studies on the side of the funnel with excess mass, re-estimates the pooled effect from the remaining studies, and then 'fills' the trimmed studies together with their mirror-image counterparts. Specifically, the number of imputed

studies is estimated as $L_0 = [4T_n - k(k + 1)]/(2k - 1)$, where T_n is the sum of the ranks of the absolute deviations from the pooled estimate for studies on the side of the funnel with excess mass and k is the number of observed studies (Duval and Tweedie, 2000). Trim-and-fill was applied to biofilm prevalence outcomes with at least 10 studies; the side of the funnel with missing studies was determined from the sign of the Egger regression intercept, the commoneffect estimate was used during the trimming iterations, and iteration continued until the number of imputed studies was stable. After filling, the adjusted pooled prevalence and 95% CI were reestimated with the DerSimonian–Laird random-effects model with HKSJ adjustment. Adjusted funnel plots are shown in Supplementary Figures S1–S4.

References cited in the Supplementary Methods are listed in the reference list of the main article.

Supplementary Table S1. Quality assessment of the included studies using the Newcastle– Ottawa Scale adapted for cross-sectional studies (item criteria in Supplementary Table S3). A total score of at least 6 (of 9) was required for inclusion.

S.N.	Study Name	Selection ★	Comparability ★	Exposure/ Outcome ★	Total ★ (out of 9)
1	Cardiliya et al. 2023	★★★	★★	★★	7
2	Purbowati et al. 2024	★★★	★	★★	6
3	Rajput et al. 2021	★★★	★★	★	6
4	Shrestha et al. 2022	★★★	★★	★★	7
5	Abbood et al. 2023	★★★	★	★★	6
6	Agarwal et al. 2013	★★★	★★	★★	7
7	Arafa et al. 2022	★★★	★	★★	6
8	Atray 2015	★★★	★★	★	6
9	Shrestha et al. 2018a	★★★	★★	★★	7
10	Baidya et al. 2021	★★★	★★	★★	7
11	Ben-Amram et al. 2024	★★	★★	★★	6
12	Bhatta et al 2019	★★★	★	★★	6
13	Bin-Hameed et al. 2022	★★★	★	★★	6
14	Boroumand et al. 2021	★★★	★★	★★	7
15	Boueroy et al. 2023	★★	★★	★★	6
16	Chaudhary et al 2019	★★★	★★	★	6
17	Shrestha et al. 2018b	★★★	★	★	6
18	Daoud et al. 2020	★★★	★★	★★	7
19	Das 2017	★★★	★	★★	6
20	Dash et al. 2018	★★★	★★	★★	7
21	Davari Abad et al. 2019	★★★	★★	★★	7
22	Dawadi et al. 2022	★★	★★	★★	6
23	Detho et al. 2024	★★★	★★	★	6
24	Dumaru et al. 2019	★★	★	★	5
25	Ebrahimi et al. 2023	★★★	★★	★★	7
26	Tajbakhsh 2016	★★★	★★	★★	7
27	Kumar et al. 2023	★★★	★	★★	6
28	Vidyasagar 2018	★★★	★★	★	6
29	Kar et al. 2021	★★★	★★	★★	7
30	Karigoudar et al. 2019	★★★	★★	★★	7
31	Lee et al. 2024	★★★	★★	★★	7
32	Liu et al. 2022	★★	★★	★★	6
33	Maharjan et al. 2018	★★★	★★	★★	7
34	Mahshouri et al. 2025	★★★	★★	★	6
35	Nikzad et al. 2021	★★★	★★	★★	7
36	Mittal et al. 2015	★★★	★	★★	6
37	Mohsenzadeh 2021	★★★	★	★★	6
38	Mumin et al. 2024	★★★	★★	★	6

39	Myat et al. 2020	★★★	★★	★★	7
40	Srivastava et al. 2022	★★★	★★	★★	7
41	Neupane et al. 2016	★★★	★	★	6
42	Oskouie et al. 2019	★★★	★	★★	6
43	Pootong et al. 2018	★★★	★★	★★	7
44	Poursina et al. 2018	★★★	★★	★	6
45	Qasemi et al. 2022	★★★	★★	★	6
46	Qian et al. 2022	★★★	★★	★★	7
47	Raksha et al. 2020	★★★	★	★★	6
48	Rastegar et al. 2023	★★★	★★	★★	7
49	Raya et al. 2019	★★	★★	★	6
50	Risal et al. 2018	★★★	★★	★	6
51	Sabir et al. 2017	★★★	★	★★	6
52	Shah et al. 2019	★★★	★★	★★	7
53	Shrestha et al. 2019	★★★	★	★	6
54	Singh et al. 2016	★★★	★★	★	6
55	Zhang et al. 2019	★★★★	★★	★★	8
56	Ahsan et al. 2021	★★★	★	★★	6
57	Hamid et al. 2024	★★★	★	★★★	7
58	Bhardwaj et al. 2018	★★★	–	★	4
59	Gunathilaka 2024	★★★	★	★★★	7
60	Taghadosi et al. 2015	★★	★	★★★	6
61	Tumbahangphe et al. 2019	★★★	★	★★★	7
62	Wu et al. 2023	★★★★	★★	★★★	9
63	Zamani & Salehzadeh 2018	★★★	★	★★★	7
64	Ponnusamy et al. 2012	★★★	★	★★★	7
65	Lagha et al. 2019	★★★	★	★★★	7
66	Golia et al. 2012	★★★★	★★	★★	8
67	Shah et al. 2020	★★★	★	★★★	7

The entries for Zhang et al. 2019 (row 55) and rows 57–67 were re-assessed from the published reports after mislabelled entries were identified. Two studies scored below the inclusion threshold of 6 (Bhardwaj et al. 2018 and Dumaru et al. 2019; see Methods).

Supplementary Table S2. Electronic search strategies, dates and numbers of records retrieved from each source.

Source	Search string	Date searched	Limits / filters	Records retrieved
PubMed	("Escherichia coli" OR "E. coli") AND (biofilm OR biofilms OR "biofilm formation") AND ("antibiotic resistance" OR "antimicrobial resistance" OR "antimicrobial susceptibility" OR "drug resistance") AND (Asia OR Nepal OR India OR China OR Iraq OR Iran OR Pakistan OR other individual Asian country names)	Up to 31 May 2025	Publication date 2010/01/01–2025/05/31; English	1,025
Google Scholar	biofilm "Escherichia coli" "antibiotic resistance" combined with "Asia" or an individual Asian country name	Up to 31 May 2025	2010–2025; all retrieved records screened	1,105
Other sources	Websites of regional journals not indexed in PubMed, e.g., Nepal Journals Online (NepJOL) and International Journal of Current Microbiology and Applied Sciences (IJCMAS), searched with the same keywords	Up to 31 May 2025	None	170

Supplementary Table S3. Newcastle–Ottawa Scale criteria adapted for cross-sectional studies of biofilm formation and antimicrobial resistance in clinical *E. coli* isolates.

Domain	Item	Criterion for award of a star
Selection (max. 4 ★)	1. Representativeness of the sample	All consecutive or randomly selected clinical isolates from a defined population, setting and time period (★)
	2. Sample size	Sample size justified, or at least 50 *E. coli* isolates (★)

	3. Isolate selection	Non-duplicate isolates (one per patient) with explicit inclusion criteria (★)
	4. Ascertainment of *E. coli*	Identification by standard biochemical, automated or molecular methods (★)
Comparability (max. 2 ★)	5. Standardized biofilm assay	Established protocol with negative and positive controls and an explicit optical-density cut-off, e.g., ODc = mean OD of negative control + 3 SD (★)
	6. Standardized susceptibility testing	Performed and interpreted according to CLSI or EUCAST, with quality-control strains (★)
Outcome (max. 3 ★)	7. Assessment of outcome	Quantitative or semi-quantitative biofilm assay, e.g., microtiter plate (★)
	8. Classification of biofilm production	Explicit criteria for strong, moderate, weak and non-producers (★)
	9. Reporting	Numerators and denominators reported for biofilm and resistance outcomes (★)

Maximum total score 9; studies scoring at least 6 were included. Adapted from Herzog et al. (2013).

Supplementary Table S4. Characteristics of the 67 included studies.

Study	Country	Clinical specimen(s)	*E. coli* isolate s (n)	Biofilmpositive (n): CRA / tube / MTP	Strong / moderate / weak / non-producers (n)	Antibiotics (n)	NOS
Cardiliya et al. 2023	India	Urine	255	22 / NR / 22	NR / 2 / 20 / 39	17	7
Purbowati and Utami 2024	Indonesia	Urine	76	NR / NR / 69	NR / NR / NR / 7	2	6
Hamid et al. 2024	Iraq	Urine	NR	NR / NR / 52	10 / 36 / 6 / 0	NR	7
Rajput et al. 2021	India	Urine	106	25 / 62 / 78	43 / 35 / NR / NR	17	6
Shrestha et al. 2022	Nepal	Urine, Blood, Sputum, Pus, Csf, Fluids, Throat swab	76	NR / NR / 21	6 / 15 / NR / 55	10	7
Abbood et al. 2023	Iraq	Urine	NR	NR / 50 / NR	5 / 36 / 9 / NR	NR	6
Agarwal et al. 2013	India	Urine	NR	NR / NR / 172	13 / 44 / 88 / 27	NR	7
Arafa et al. 2022	Saudi Arabia	Urine	50	NR / NR / 22	8 / 9 / 5 / 28	NR	6
Atray and Atray 2015	India	Urine	112	84 / 84 / NR	NR / NR / NR / 28	11	6
Shrestha et al. 2018a	Nepal	Urine	184	134 / NR / NR	NR / NR / NR / 100	NR	7
Baidya et al. 2021	Nepal	Endotracheal aspirates	4	NR / NR / 2	2 / NR / NR / 4	NR	7
Ben-Amram et al. 2024	Israel	Sputum, Bronchoalveol ar lavage	NR	NR / NR / NR	12 / NR / 23 / NR	NR	6
Bhardwaj et al. 2018	India	Urine	NR	NR / NR / NR	NR / NR / NR / 38	NR	4
Bhatta et al. 2019	Nepal	Urine	100	57 / 45 / NR	5 / 12 / 28 / 12	NR	6
Bahakim and BinHameed 2022	Yemen	Wound swabs, Urine	NR	NR / NR / 30	15 / 9 / 6 / NR	8	6
Boroumand et al. 2021	Iran	Urine	144	113 / NR / NR	22 / 27 / 64 / 31	9	7
Boueroy et al. 2023	Thailand	Urine	103	52 / NR / NR	20 / 9 / 23 / 51	NR	6
Chaudhary et al. 2019	Nepal	Urine	23	16 / NR / NR	NR / NR / NR / 7	5	6
Shrestha et al. 2018b	Nepal	Urine	44	36 / NR / NR	11 / 13 / 12 / 28	NR	6
Daoud et al. 2020	Syria	Pus, Wound swabs	51	NR / NR / 37	NR / NR / NR / 14	NR	7
Das 2017	Banglades h	Urine	60	NR / NR / NR	NR / NR / NR / NR	8	6
Dash et al. 2018	India	Urine	226	NR / NR / 123	NR / NR / NR / 103	2	7
Davari Abad et al. 2019	Iran	Urine	79	NR / NR / 74	10 / 5 / 59 / 5	7	7
Dawadi et al. 2022	Nepal	Urine	71	NR / 67 / 69	3 / 34 / 32 / 2	10	6
Detho et al. 2024	Pakistan	Urine	31	17 / 17 / NR	7 / 5 / 5 / 14	NR	6
Dumaru et al. 2019	Nepal	Blood, Urine, Pus, Csf, Sputum	121	197 / 197 / NR	NR / NR / NR / 117	9	5
Ebrahimi et al. 2023	Iran	Blood	NR	NR / NR / NR	11 / 14 / 95 / 0	13	7
Tajbakhsh 2016	Iran	Urine	NR	80 / NR / NR	15 / 20 / 45 / 50	12	7
Gunathilaka 2024	Sri Lanka	Urine, Liver, Bone marrow, Heart, Blood	132	NR / NR / 103	41 / 31 / 31 / 29	12	7
Kumar et al. 2023	India	Urine	232	NR / NR / 145	NR / NR / NR / 87	3	6
Vidyasagar et al. 2018	India	Urine	24	22 / 22 / NR	NR / NR / NR / 2	NR	6
Kar et al. 2021	Banglades h	Urine	NR	NR / NR / 31	2 / 1 / 7 / 21	11	7
Karigoudar et al. 2019	India	Urine	100	49 / 55 / 69	NR / NR / NR / 31	14	7
Lee et al. 2024	Bhutan	Ear swab	NR	NR / NR / 20	6 / 6 / 4 / 4	NR	7
Liu et al. 2022	China	Clinical sample	NR	25 / NR / 25	NR / NR / NR / NR	NR	6

Maharjan et al. 2018	Nepal	Urine	37	NR / NR / 10	1 / 4 / 5 / 27	15	7
Mahshouri et al. 2025	Iran	Urine	110	NR / NR / 80	0 / 15 / 65 / 30	9	6
Nikzad et al. 2021	Iran	Urine	NR	NR / NR / 55	31 / 10 / 14 / 9	6	7
Mittal et al. 2015	India	Urine	135	NR / NR / 18	NR / NR / NR / 117	5	6
Mohsenzadeh 2021	Iran	Clinical sample	50	24 / 26 / 38	30 / 8 / 0 / 0	NR	6
Mumin et al. 2024	Turkey	Urine, Aspirate, Wounds, Sputum, Blood	90	NR / NR / 42	4 / 12 / 26 / 48	16	6
Myat et al. 2020	Myanmar	Blood	20	NR / NR / NR	NR / NR / NR / NR	NR	7
Srivastava et al. 2022	India	Urine	120	NR / NR / 104	7 / 33 / 64 / 16	12	7
Neupane et al. 2016	Nepal	Urine	208	108 / NR / NR	42 / 42 / 24 / 100	13	6
Oskouie et al. 2019	Iran	Urine	120	NR / NR / 89	18 / 12 / 59 / 3	NR	6
Pootong et al. 2018	Thailand	Urine	119	NR / NR / 53	NR / NR / NR /	NR	7
					66		
Poursina et al. 2018	Iran	Urine	100	NR / NR / 80	29 / 34 / 17 / 20	NR	6
Qasemi et al. 2022	Iran	Urine	265	265 / NR / 107	47 / 37 / 23 / 158	16	6
Qian et al. 2022	China	Nr	NR	NR / NR / 81	46 / 15 / 8 / 12	NR	7
Raksha et al. 2020	India	Conjunctival swabs	4	4 / 4 / NR	NR / NR / NR / NR	NR	6
Rastegar et al. 2023	Iran	Urine	NR	NR / NR / 126	27 / 21 / 53 / 25	NR	7
Raya et al. 2019	Nepal	Urine	173	NR / NR / 73	7 / NR / 66 / 100	9	6
Risal et al. 2018	Nepal	Urine	50	NR / NR / 32	3 / 29 / 18 / NR	8	6
Sabir et al. 2017	Pakistan	Urine	560	NR / 385 / NR	NR / NR / NR / 175	NR	6
Shah et al. 2019	Nepal	Urine	105	65 / NR / NR	NR / NR / NR / NR	9	7
Shrestha et al. 2019	Nepal	Urine	159	NR / NR / 86	23 / 28 / 35 / 73	NR	6
Singh et al. 2016	India	Urine	NR	NR / NR / 39	20 / 11 / 2 / 0	NR	6
Zhang et al. 2019	China	Blood	324	NR / NR / 81	NR / NR / NR / 243	NR	8
Ahsan et al. 2021	Banglades h	Urine	NR	NR / NR / 30	14 / 13 / 3 / 0	NR	6
Taghadosi et al. 2015	Iran	Urine	NR	NR / NR / 35	10 / 16 / 9 / NR	NR	6
Tumbahangphe et al. 2019	Nepal	Urine	NR	NR / NR / 60	19 / 13 / 13 / 15	11	7
Wu et al. 2023	China	Urine	120	NR / NR / 75	37 / 23 / 15 / NR	NR	9
Zamani & Salehzadeh 2018	Iran	Urine	100	NR / NR / 94	36 / 48 / 10 / 6	NR	7
Ponnusamy et al. 2012	India	Urine	NR	100 / 72 / 100	6 / 80 / 14 / 46	14	7
Lagha et al. 2019	Saudi Arabia	Urine	NR	NR / NR / 50	NR / 26 / 24 / NR	NR	7
Golia et al. 2012	India	Urine	107	80 / 74 / 74	NR / NR / NR / 33	NR	8
Shah et al. 2020	India	Urine	57	NR / NR / 50	8 / 42 / NR / 7	15	7

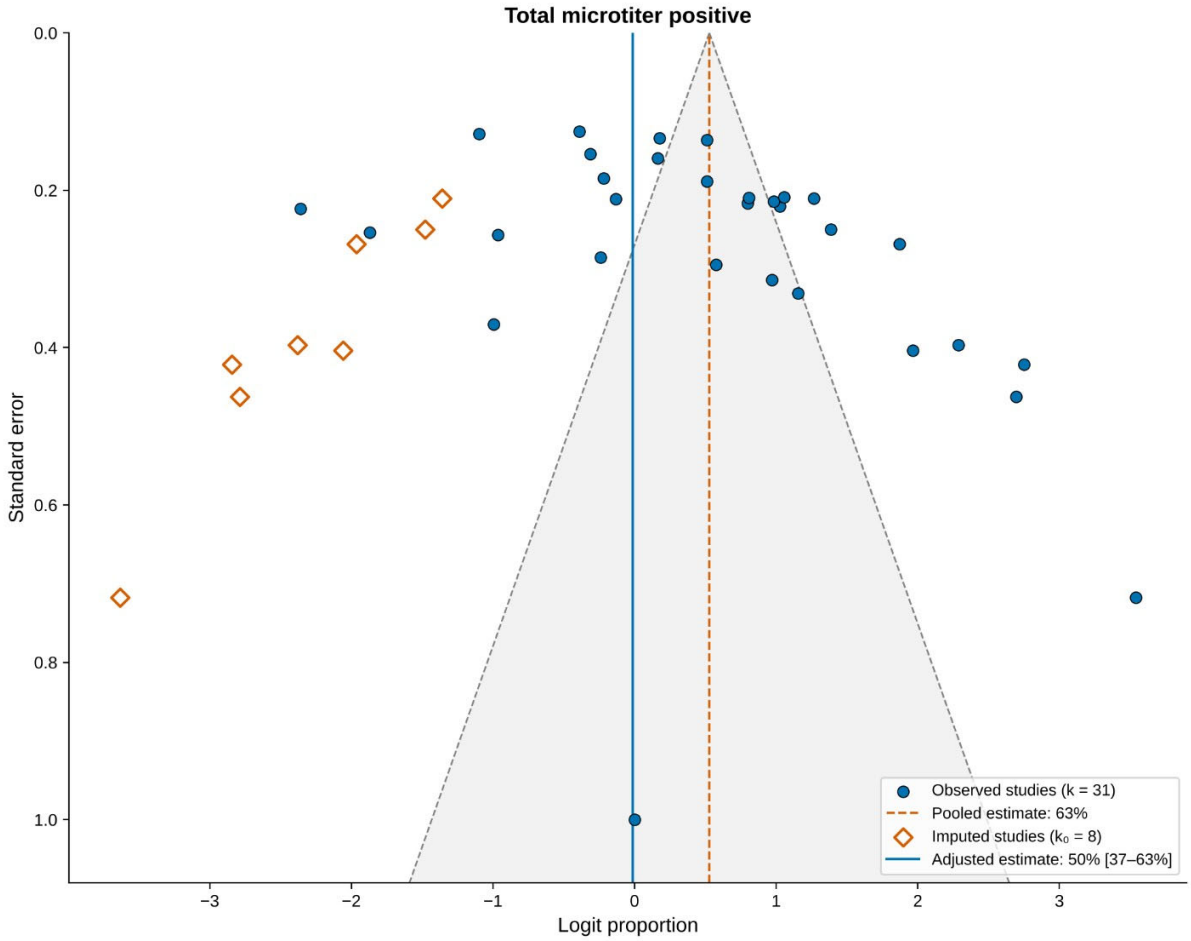
CRA, Congo red agar; MTP, microtiter plate; NOS, Newcastle–Ottawa Scale; NR, not reported.

Supplementary Table S5. Pooled resistance proportions among biofilm-forming *E. coli* clinical isolates, by antibiotic.

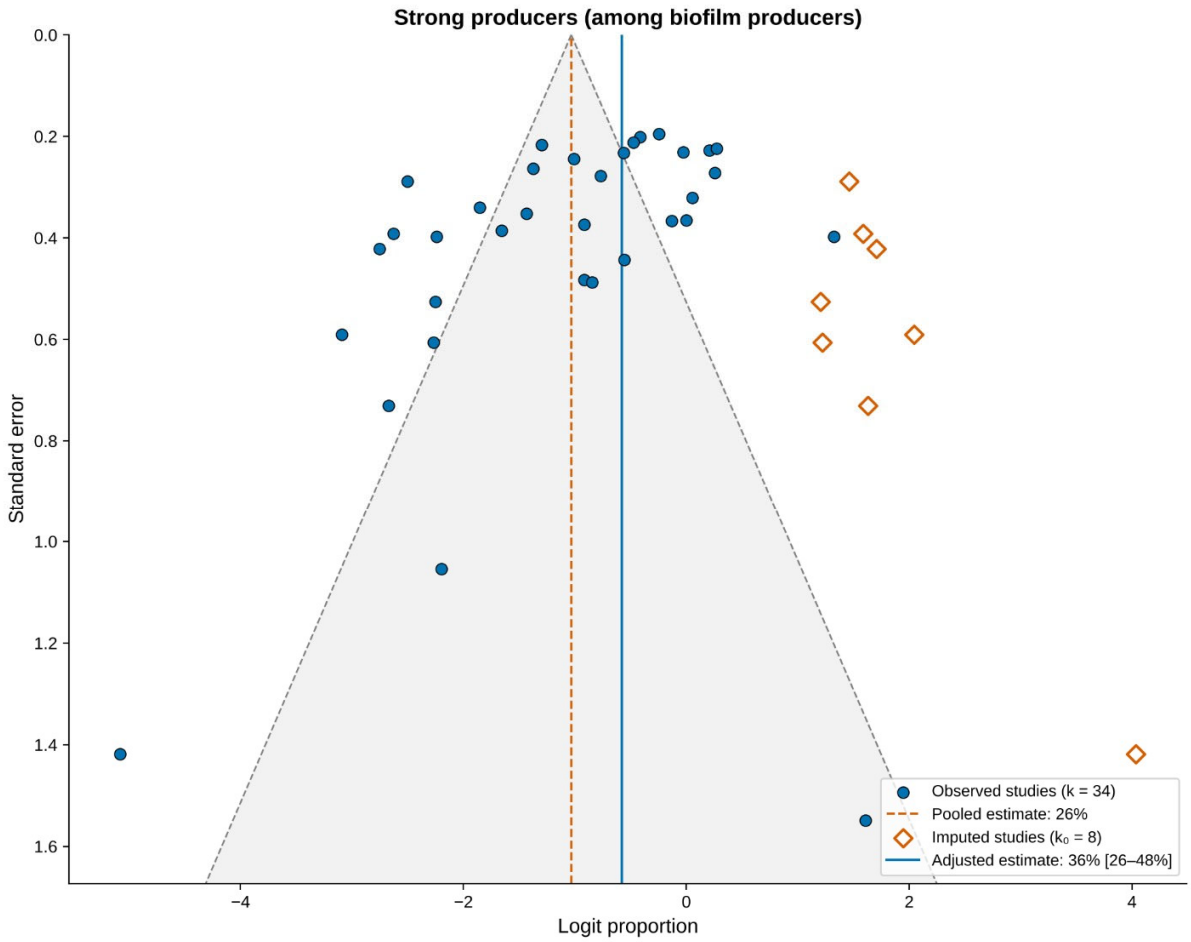
Class	Antibiotic	k	Resistance, % [95% CI]	I^2 (%)	τ^2	Egger's p	Begg's p
β-Lactam	Ampicillin	21	84 [72–92]	88.8	1.07	0.022	0.147
β-Lactam	Amoxicillin–clavulanate	11	78 [48–93]	91.6	1.82	0.023	0.484
β-Lactam	Amoxicillin	10	74 [34–94]	93.6	2.78	0.689	0.655
β-Lactam	Ceftazidime	13	69 [47–85]	92.2	1.21	0.943	0.807
β-Lactam	Aztreonam	3	68 [32–90]	82.9	0.40	NE	NE
β-Lactam	Cefotaxime	12	66 [44–83]	92.4	1.02	0.562	0.583
β-Lactam	Cefuroxime	6	66 [32–89]	83.4	0.62	NE	NE
β-Lactam	Ceftriaxone	23	59 [45–71]	90.0	0.78	0.374	0.444
β-Lactam	Cefixime	3	57 [6–97]	87.6	1.64	NE	NE
β-Lactam	Cefepime	9	43 [22–67]	91.5	1.07	NE	NE
β-Lactam	Piperacillin–tazobactam	12	36 [22–53]	85.0	0.51	0.240	0.131
β-Lactam	Imipenem	19	21 [12–33]	87.9	0.92	0.172	0.221
β-Lactam	Meropenem	8	18 [5–46]	87.5	1.27	NE	NE
β-Lactam	Ertapenem	3	8 [1–55]	66.8	0.76	NE	NE
Fluoroquinolone	Norfloxacin	9	76 [57–88]	87.7	0.67	NE	NE
Fluoroquinolone	Ciprofloxacin	24	62 [49–74]	90.7	0.96	0.128	0.112
Fluoroquinolone	Nalidixic acid	9	58 [27–83]	92.2	1.00	NE	NE
Fluoroquinolone	Levofloxacin	10	46 [29–63]	76.9	0.32	0.439	0.655
Aminoglycoside	Tobramycin	6	45 [13–82]	94.1	1.87	NE	NE
Aminoglycoside	Gentamicin	18	41 [27–56]	88.6	0.69	0.904	0.426

Aminoglycoside	Amikacin	25	31 [20–44]	90.3	0.84	0.202	0.262
Tetracycline	Doxycycline	3	72 [11–98]	94.9	1.55	NE	NE
Tetracycline	Tetracycline	9	61 [41–78]	90.5	0.69	NE	NE
Other	Trimethoprim–sulfamethoxazole	23	64 [56–72]	76.3	0.27	0.745	0.958
Other	Chloramphenicol	4	51 [0–100]	90.6	19.84	NE	NE
Other	Nitrofurantoin	20	28 [16–46]	90.2	1.03	0.839	0.364

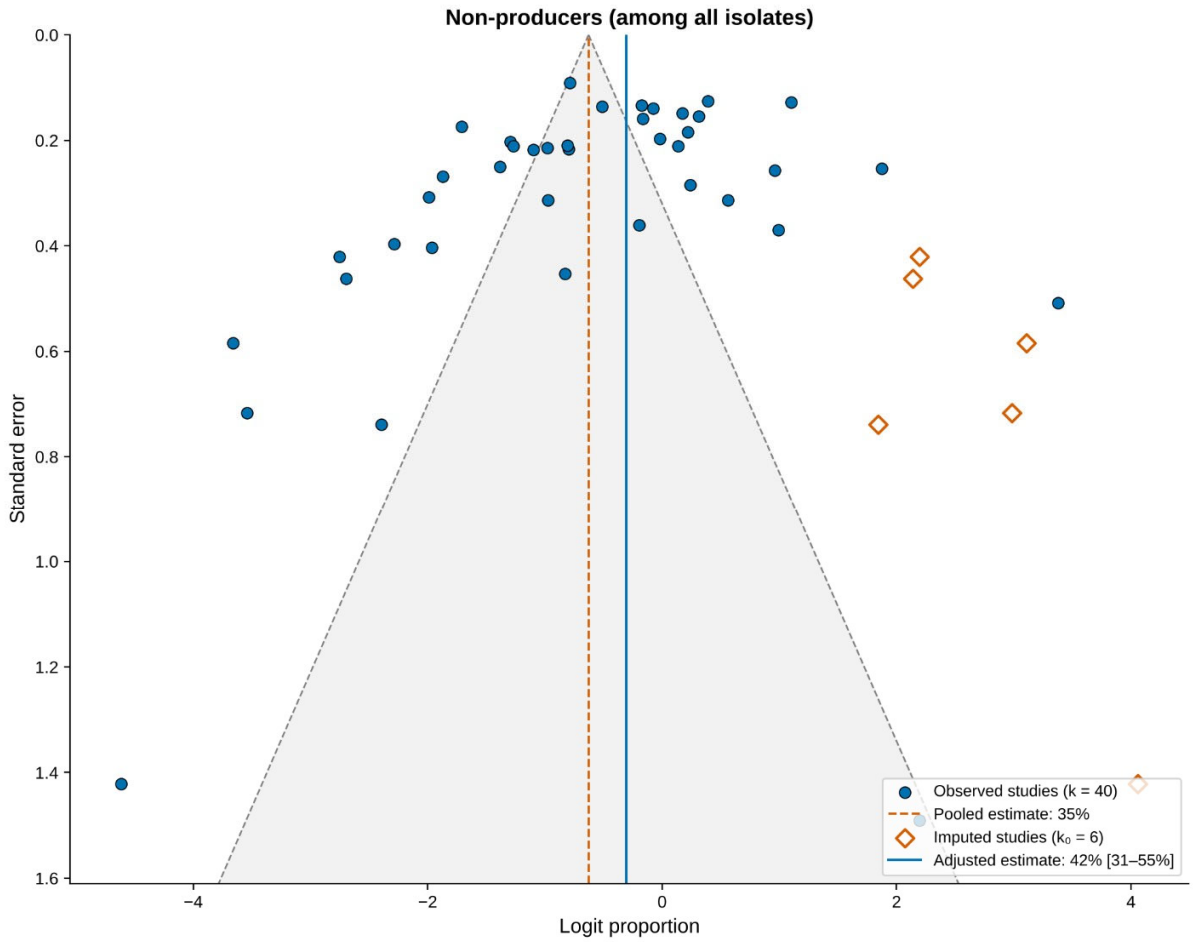
Random-effects model with logit-transformed proportions, DerSimonian–Laird τ^2 and Hartung– Knapp–Sidik–Jonkman 95% CI (R, meta package version 8.2-1); k, number of studies. Abbreviations recorded under different codes in the source studies were harmonized before pooling (gentamicin, GEN/CN; levofloxacin, LEV/LE; meropenem, MEM/MRP; cefepime, FEP/CPM). Funnel-plot tests were performed only when at least 10 studies were available (NE, not evaluated).



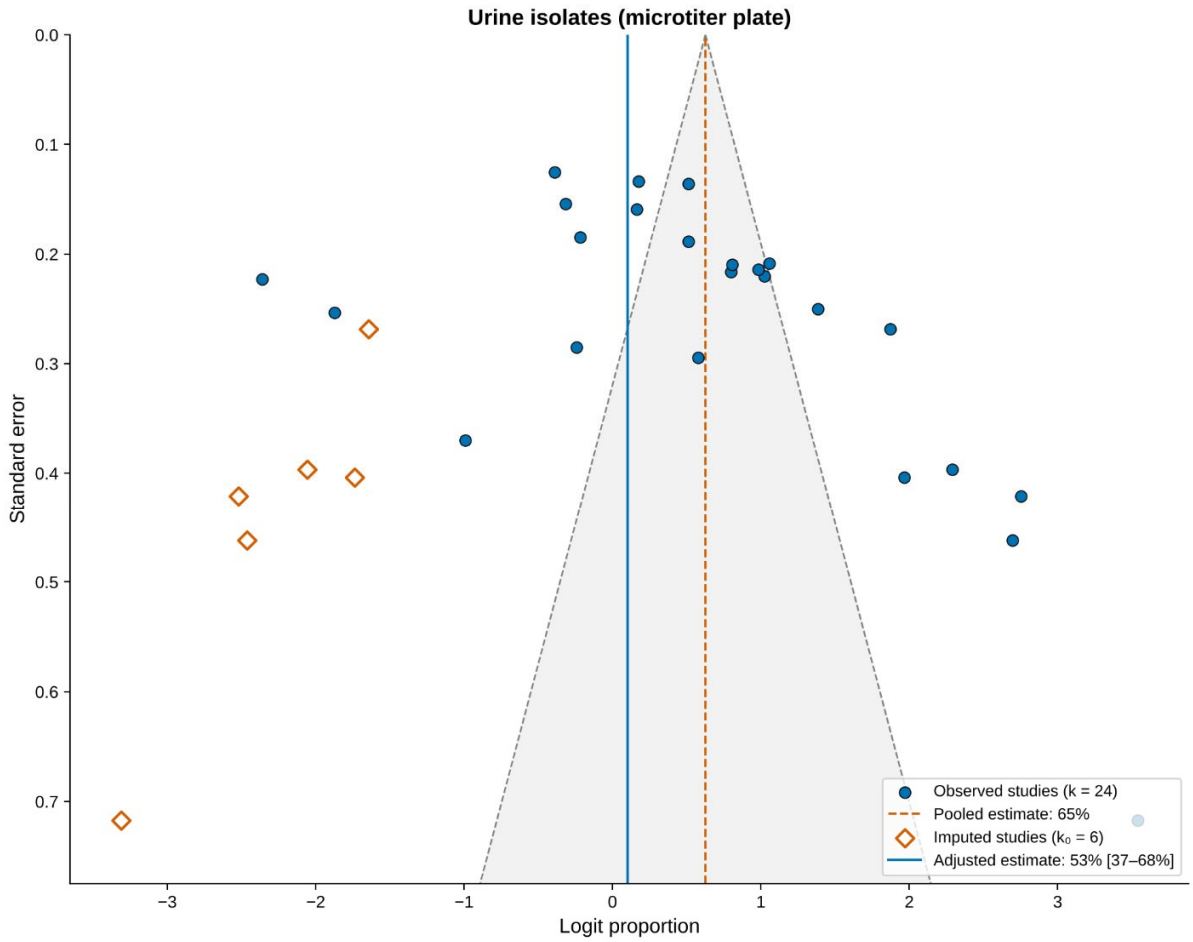
Supplementary Figure S1. Trim-and-fill funnel plot. Filled circles, observed studies; open diamonds, imputed studies (Duval & Tweedie L_0 estimator; missing studies estimated on the left side). Dashed line, original random-effects estimate; solid line, trim-and-fill adjusted estimate.



Supplementary Figure S2. Trim-and-fill funnel plot. Filled circles, observed studies; open diamonds, imputed studies (Duval & Tweedie L_0 estimator; missing studies estimated on the right side). Dashed line, original random-effects estimate; solid line, trim-and-fill adjusted estimate.



Supplementary Figure S3. Trim-and-fill funnel plot. Filled circles, observed studies; open diamonds, imputed studies (Duval & Tweedie L_0 estimator; missing studies estimated on the right side). Dashed line, original random-effects estimate; solid line, trim-and-fill adjusted estimate.



Supplementary Figure S4. Trim-and-fill funnel plot. Filled circles, observed studies; open diamonds, imputed studies (Duval & Tweedie L_0 estimator; missing studies estimated on the left side). Dashed line, original random-effects estimate; solid line, trim-and-fill adjusted estimate.

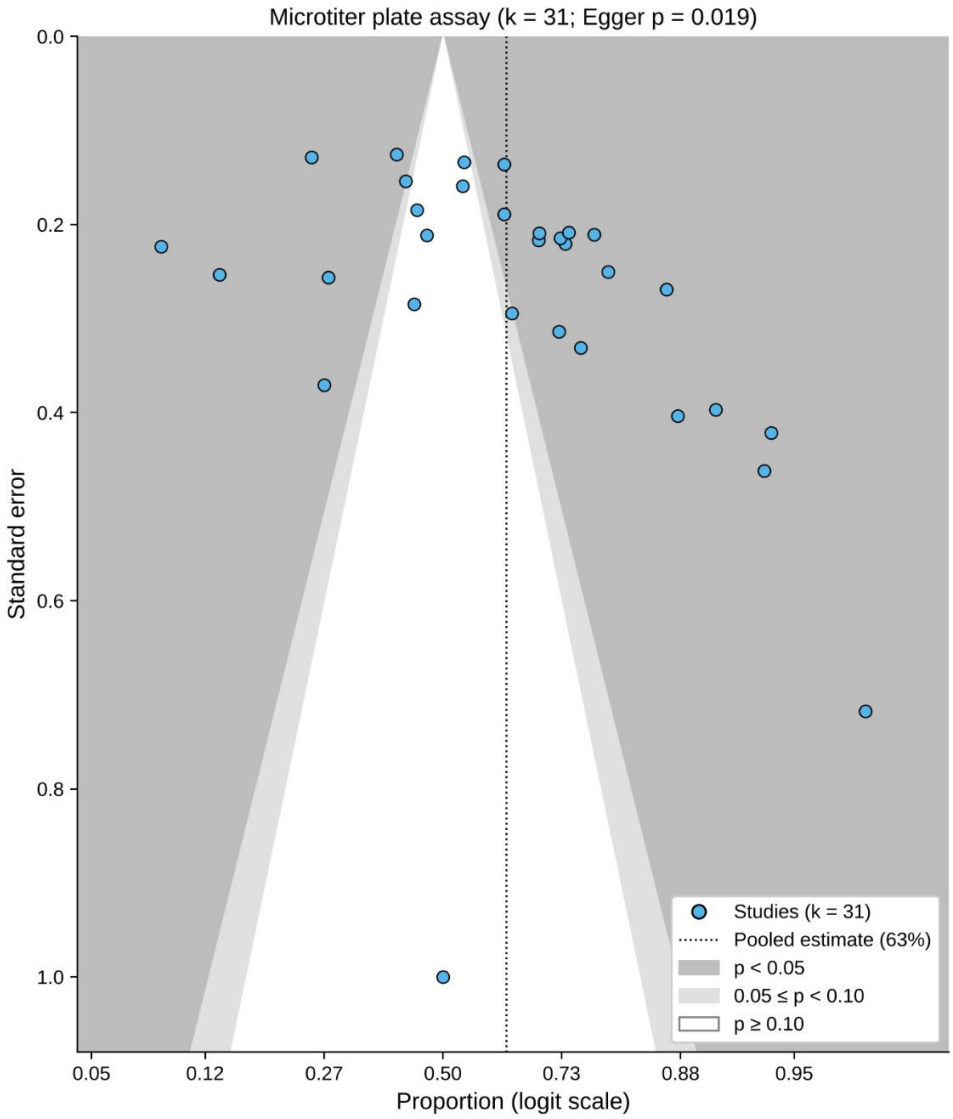


Figure S5. Contour-enhanced funnel plot (proportion on the logit scale against standard error) for the 31 studies reporting *E. coli* biofilm prevalence by the microtiter plate method. Shaded contours indicate the two-sided significance level of each study's proportion tested against 0.50 (logit 0): dark grey, $p < 0.05$; light grey, $0.05 \leq p < 0.10$; white, $p \geq 0.10$. The dotted line marks the random-effects pooled estimate (63%). Asymmetry may reflect betweenstudy heterogeneity, differences in study methods or populations, or publication bias.