The rise of antibiotic resistant bacteria (ARB) exacerbates the global spread and burden of infectious disease. There are no harmonized efforts for ARB surveillance and response. This study investigated the development of a culture-based indicator system for the direct detection and quantification of Extended-spectrum-β-lactamase (ESBL) and carbapenemase (KPC) producing Enterobacteriaceae in exposure-relevant environmental sites including hospital and domestic sewage, treated effluent, and surface waters. This was done by performing parallel assays using agar media supplemented with antibiotics, then analyzing the clinical media's performances via concentrations and proportions of ESBL- and KPC-producing target organisms found at all sample sites, and then confirming resistance profiles and identities of resulting isolates. The performance of the clinical medium was comparable to the gold standard for detection indicator organisms in all samples, excepting E. coli in raw sewage and surface waters. This indicator system shows promise, but more work must be done towards its iterative improvement.

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