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Three hours from microscopic examination to targeted therapy: the impact of fast microbiology on antimicrobial therapy in critically ill patients

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Background
In high-antimicrobial-resistance settings, fast microbiology (FM) helps guide antimicrobial treatment selection and minimize broad-spectrum antibiotic use. This study aims to quantify the impact of FM on the appropriateness of antimicrobial therapy in critically ill patients.

Methods
From 06/08/2025 to 13/11/2025 we daily analysed all positive blood cultures at IRCCS San Gerardo dei Tintori, an Italian tertiary care hospital. Patients with sepsis/septic shock underwent FM: GeneXpert® MRSA/SA (GX), Biofire® Film Array ® (BFA) or NG-Test®Carba5 (C5) according to microscopic examination. Within 3 hours of microscopic results, the ID specialist selected targeted therapy based on FM findings.

Results
During the study period, 2357 blood cultures were performed; 456 (19,3%) were positive. FM techniques were applied in 188 (41% of positive blood culture) cases: 89 GX, 96 BFA and 3 C5. Patients with sepsis/septic shock were mainly in the Emergency Room (31% of cases), Medical Area 20%, ICUs 17%, Adult Haematologic ward 14%, Surgical Area 10%, Paediatric Haematologic ward 7%. GX showed 19 (21%) MSSA, 12 (14%) MRSA, 42 (47%) CONS-MR and 16 (18%) CONS-MS. BFA detected *E. coli* genome in 34% of cases (39 *E. coli* detected), followed by *P. aeruginosa* (13,11%), *K. pneumoniae* (11, 9%) and *E. faecalis* (11, 9%), see figure 1. BFA was negative in 6 (6%) samples. Twenty-four (25% of BFA) resistance genes were identified: 10 CTX-M, 12 mecA/C, 1 NDM, 1 VanA/B. CTX-M was associated with *E. coli* genome in 60% of cases. C5 showed 2 OXA-48 and 1 negative result. Concordance between positive FM and culture results was 100%. FM results lead to treatment modification in 53% of cases (18% escalations, 11% de-escalations, see figure 2) and enabled the interruption of 35% empiric carbapenem treatment.

Conclusions
In our study, FM improved critically ill patients management, optimizing treatment in over half the cases and allowing empiric carbapenem discontinuation in more than a third. Integrating FM into sepsis protocols may enhance antimicrobial stewardship, limiting broad-spectrum antibiotic use and supporting early therapeutic decisions.

Figure 1. Biofire Film Array results

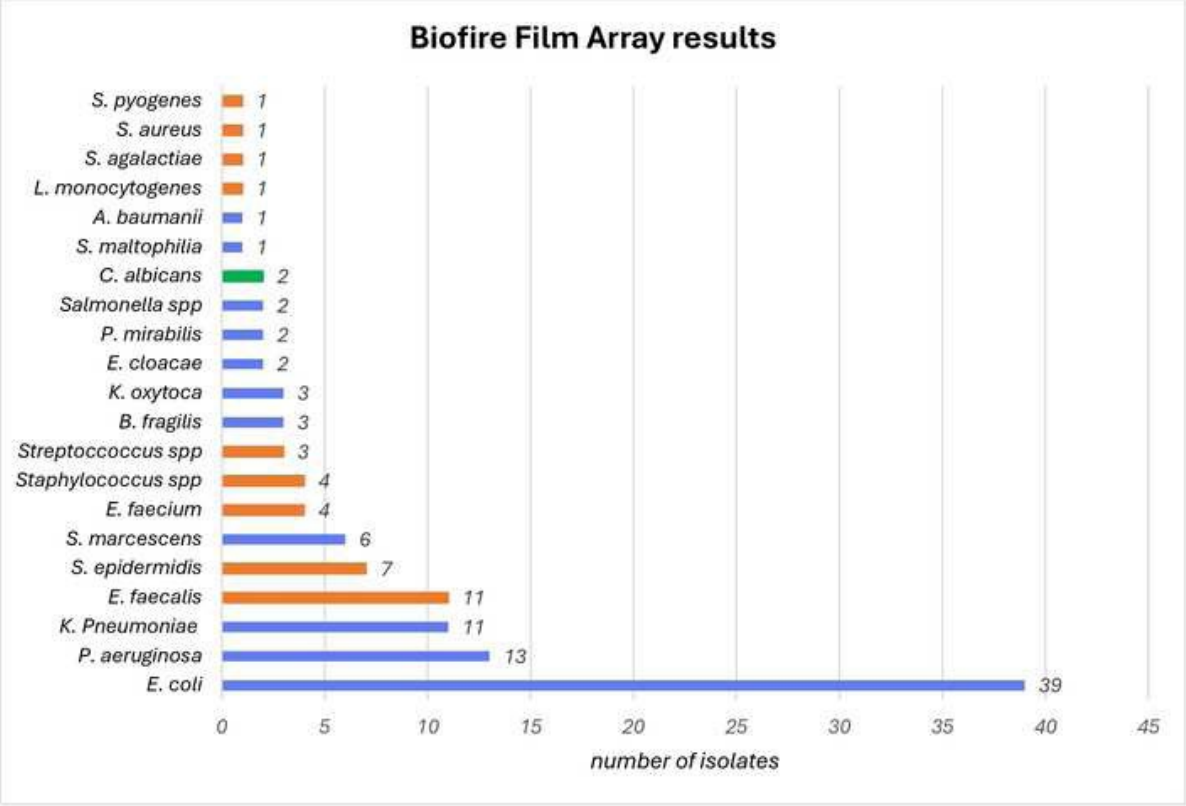
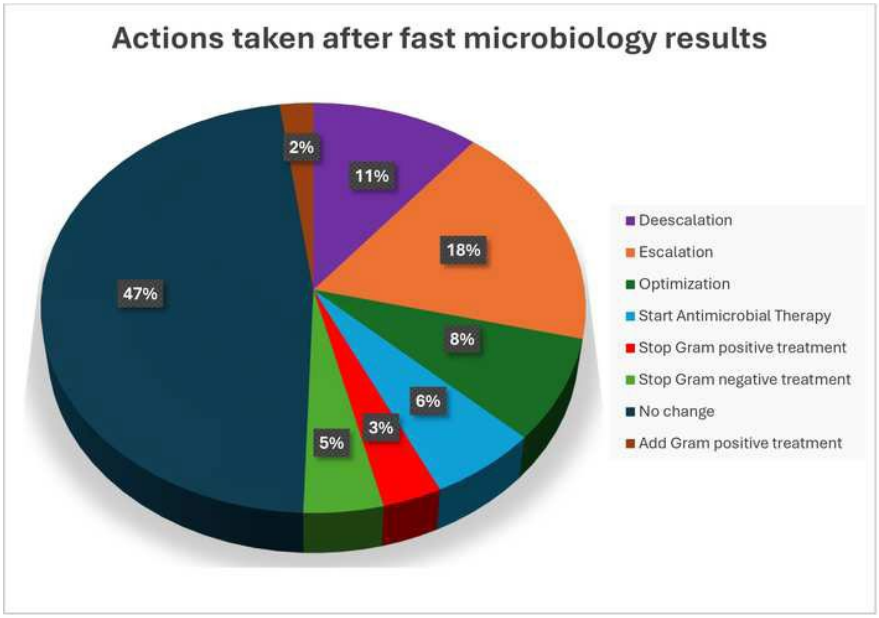


Figure 2. Actions taken after fast microbiology results



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Specialised program for infectious disease care everywhere (SPICE): piloting expert mentorship for implementation support in infectious disease care

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Background
Limited access to infectious disease (ID) expertise remains a major barrier to improving antimicrobial stewardship (AMS), laboratory diagnostics, and infection prevention and control (IPC) in low- and middle-income countries (LMICs). Sustained, context-specific mentorship may help bridge this gap. The Specialized Program for Infectious Disease Care Everywhere (SPICE) was established to address the pressing need for access to related expertise and implementation support. It represents a global network of vetted volunteer experts in ID, AMS, microbiology and IPC, offering free online and on-site mentorship. At the end of 2025, SPICE completed its one-year pilot phase.

Methods
Experts were recruited through professional networks and underwent a two-stage vetting procedure. Hospitals submitted requests for support via the SPICE platform and were matched with an expert based on expertise and needed support. Hospital teams and expert jointly developed a project plan, and the expert supported the implementation, measurement and evaluation. Demographic data from experts and hospital teams were collected on the SPICE platform.

Results
In 12 months, 58 experts were recruited, primarily from Europe (69%), followed by Asia (12%) and Africa (12%), as well as South America, North America and Australia. Sixteen support requests were submitted, of which fifteen were successfully matched to an expert. Requests for support originated from Sub-Saharan Africa (69%) and Europe (31%). One hospital could not be matched due to lack of hospital management support. Support needs included AMS (73%), laboratory support (27%) and IPC (7%).

Mentorship is still ongoing in all fifteen hospitals. To date, experts completed two field visits: laboratory training in Tanzania and an AMS assessment in Malawi. One team was supported to increase hand hygiene compliance in their ICU from 16% to 58%. Further project outcomes will be presented during ESCMID 2026.

Conclusions
The SPICE mentorship program demonstrates the willingness of ID, AMS, IPC and microbiology professionals to offer voluntary mentorship to low-resource hospitals. It also highlights the need, specifically in Sub-Saharan Africa, for access to implementation support for improved infectious disease care.