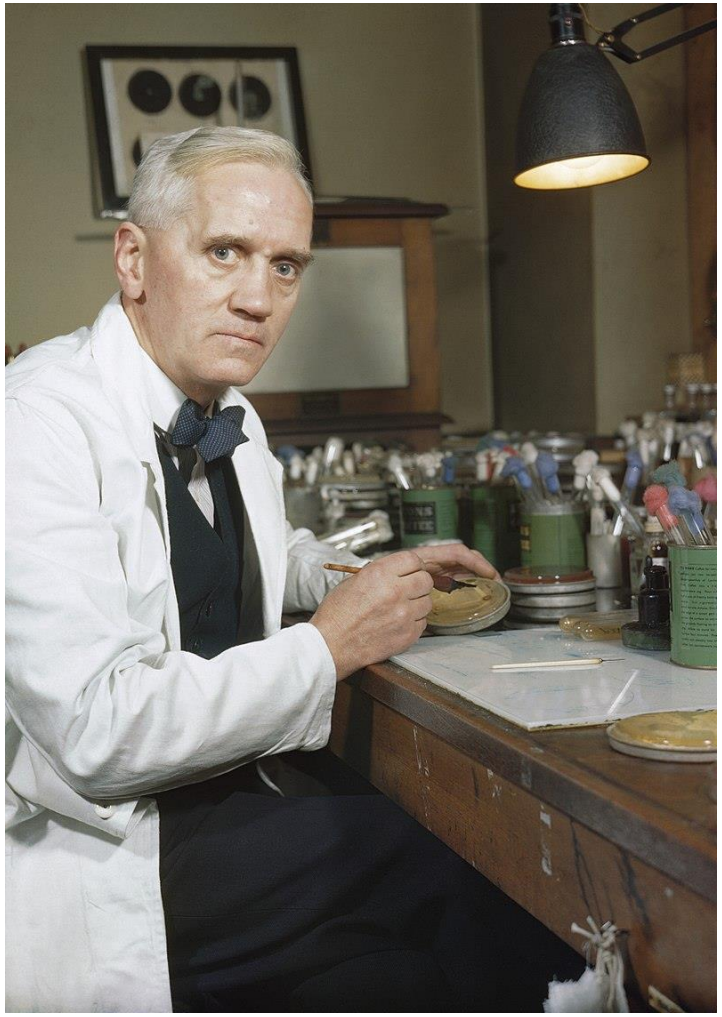
L’apport des solutions DATA & IT dans la prise en charge des patients : l’approche de bioMérieux

Stéphanie Le Page – PharmD, PhD

Global Medical Affairs

ANTIMICROBIAL RESISTANCE (AMR) IS A GLOBAL PUBLIC HEALTH CONCERN THAT WAS PREDICTED …



"The time may come when penicillin can be bought by anyone in the shops. Then **there is the danger** that the ignorant man may easily under dose himself and, by exposing his microbes to non-lethal quantities of the drug, educate them to resist penicillin."

Sir Alexander Fleming
Nobel lecture, 1945

THE CHALLENGES OF SEPSIS AND AMR

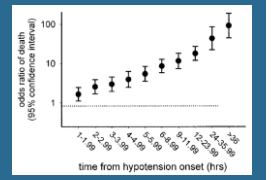
TODAY

Illustration:
Sepsis, where accurate and rapid diagnostics are key

1,270,000 deaths per year as a result of AMR[1]
1 death every 25 seconds

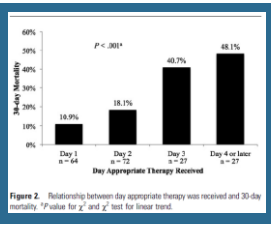
2050
10,000,000
global deaths annually[1]

1 HOUR *delay in time to effective antibiotics* = **7.6%** *Reduced survival rate[2]*



48 HOUR *delay in time to effective antibiotics* = **9.1** *Increase Odd Ratio of Death[3]*

Each DAY *delay in time to effective antibiotics* = *Increased 30 -Day Mortality[4]*



1. Murray C. et al.. (2022) 2. Kumar A et al., (2006) 3. Marchaim et al., (2010) 4. Zasowski et al., (2016)

ANTIMICROBIAL RESISTANCE (AMR) IS A GLOBAL PUBLIC HEALTH CONCERN THAT WILL INCREASE IN MAGNITUDE IN THE FUTURE IF NOT BETTER HANDLED COLLECTIVELY

Increased length of stay

Increased cost of treatment

Precaution measures are expensive

Constant monitoring

OUR PLEDGE TO CURBING ANTIMICROBIAL RESISTANCE

Providing **high medical value diagnostic solutions** to guide effective and rational use of antibiotics

Developing **innovative antibiotic susceptibility testing** and automated detection of resistance

Providing **actionable insights**, based on consolidated data to support medical decisions

Producing **education material and raising awareness** on the value of diagnosis and rational use of antibiotics.

80%

OF OUR R&D BUDGET IS DEDICATED TO THE FIGHT AGAINST AMR

DATA ENVIRONMENT IN HOSPITAL

DATA ENVIRONMENT IN HOSPITALS

- Medical history
- Diagnoses
- Medications
- Treatment plans
- Immunization dates
- Allergies
- Radiology images
- Laboratory & test results

PHYSICIANS

EHR
Electronic Health Record

RIS (radiology information system)

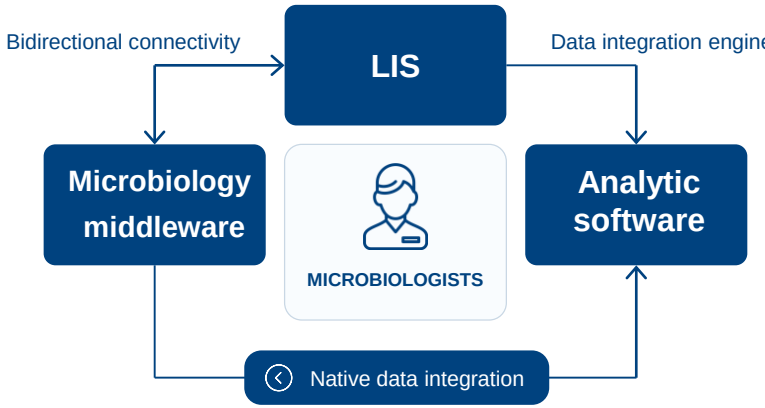
PIS (pharmacy information system)

CIS (clinical information system)

PHARMACISTS

Microbiology middleware

The middleware for routine instrument workflow management



LIS (Laboratory Information System)

Biological/final result validation and transmission to the EHR

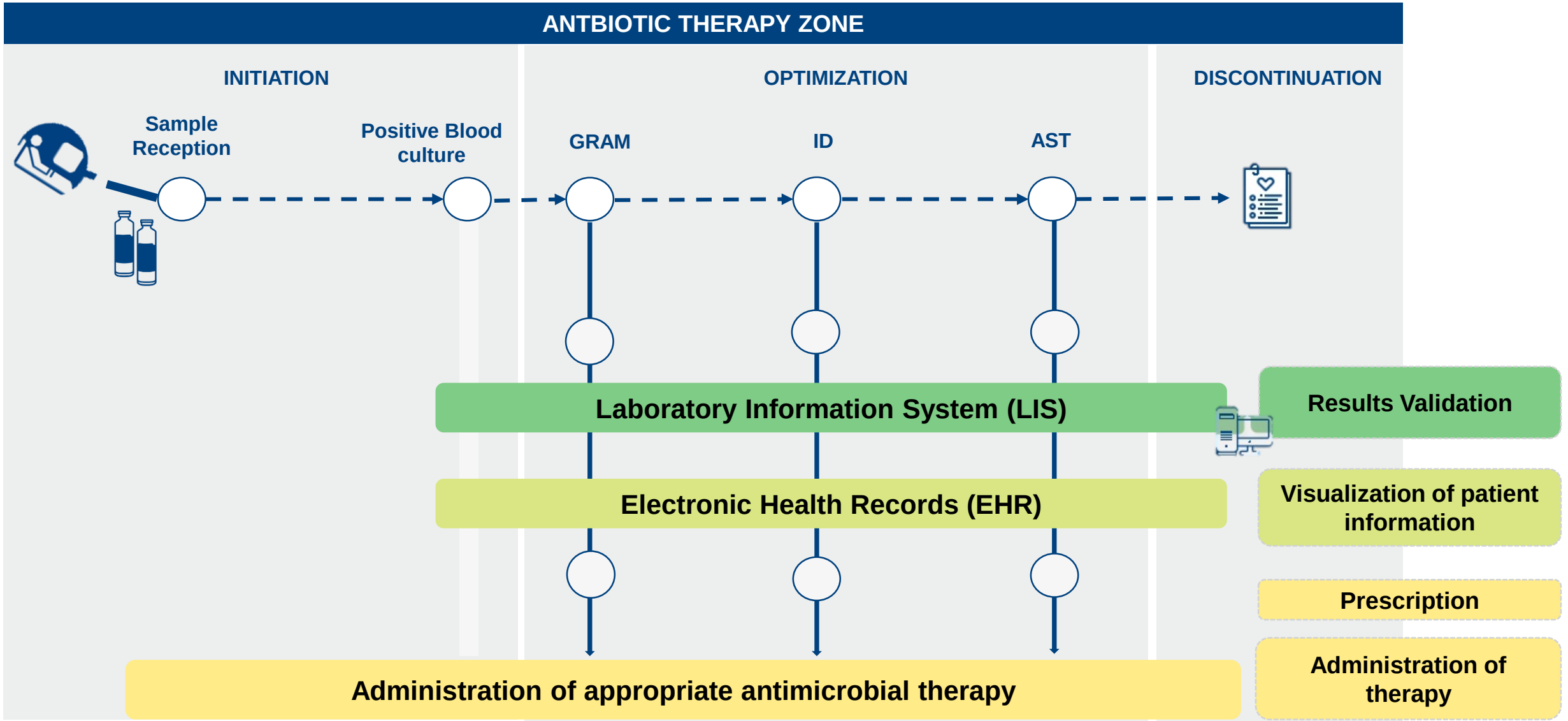
Results from other instruments not connected to MAESTRIA™ or MYLA®

Analytic

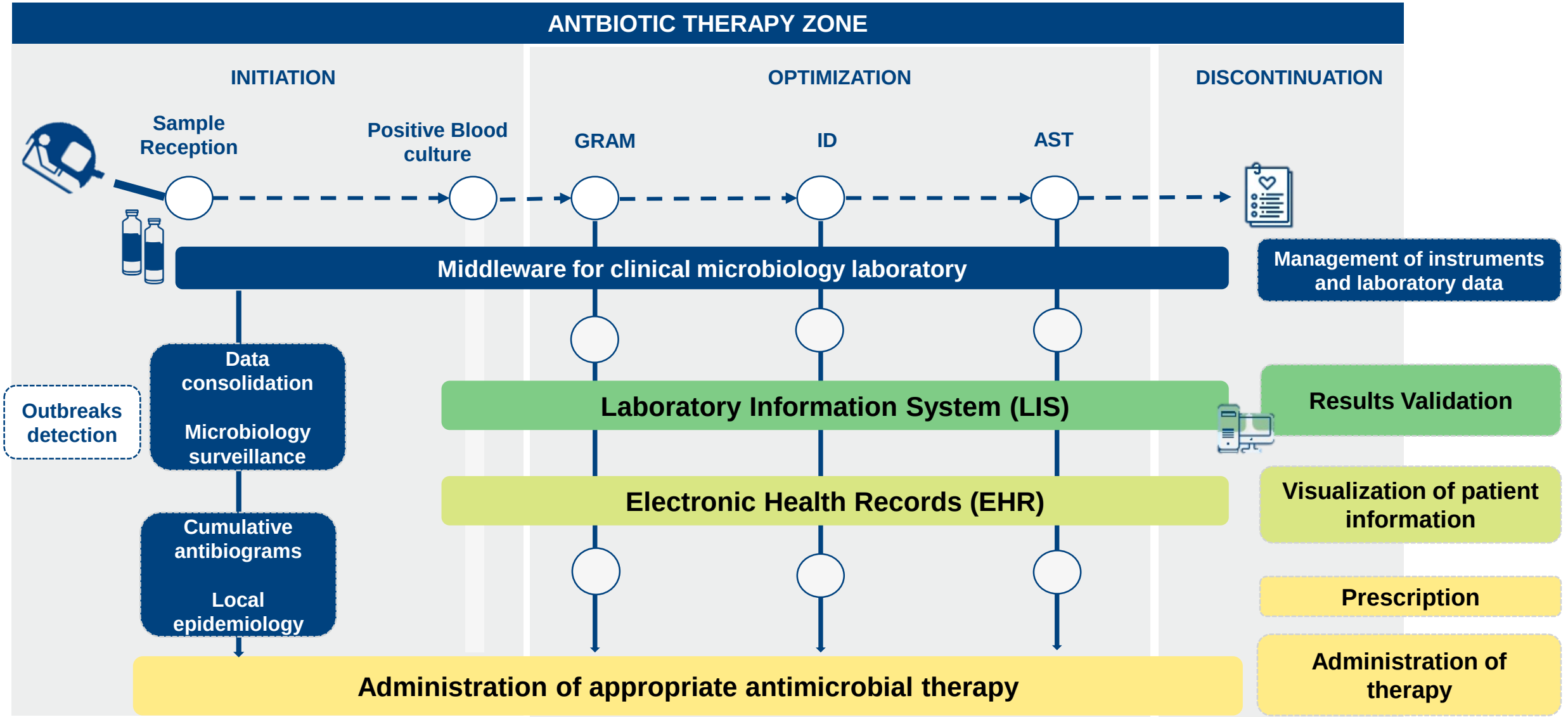
Analytics solution to transform data into actionable insights

Data aggregation: generation of series of indicators (KPIs) and specific dashboards

LABORATORY WORKFLOW: generation of data



LABORATORY WORKFLOW: generation of data



SEVERAL PRINCIPLES SHOULD BE APPLIED TO IMPROVE PATIENT OUTCOMES

IMPROVE LABORATORY MANAGEMENT EFFICIENCY

DECREASE THE TIME TO AN ACTIONABLE DIAGNOSTIC RESULT

IMPROVE THE ACCURACY OF INITIAL EMPIRIC ANTIBIOTIC THERAPY

SHORTEN THE TIME TO ADJUSTMENT WHEN EMPIRIC THERAPY IS INCORRECT

ANTICIPATE EMERGING THREATS THROUGH EFFECTIVE SURVEILLANCE

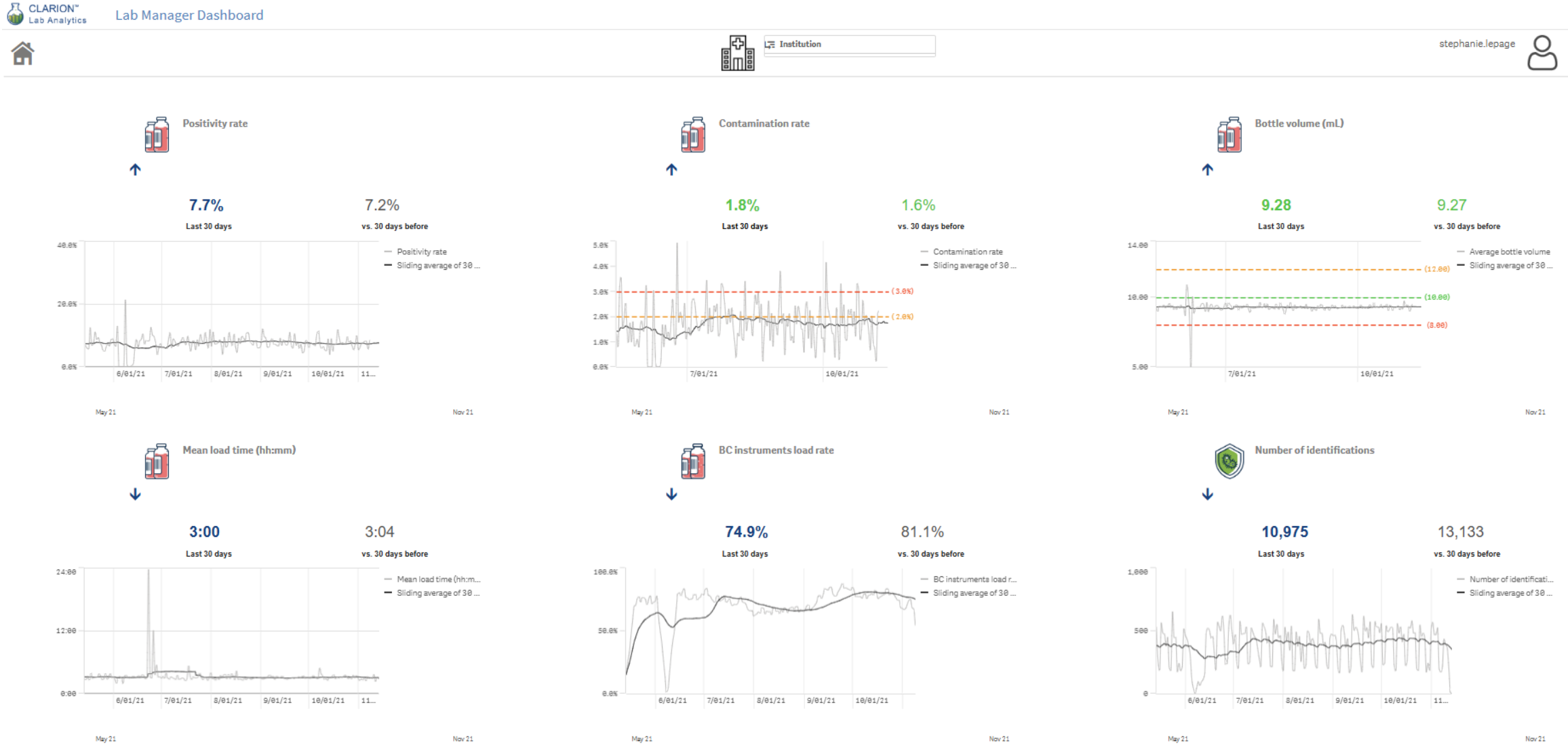
IMPROVING LABORATORY MANAGEMENT EFFICIENCY

FROM THE LAB

Microbiology middleware

FROM THE LAB

Performance indicators generation



DECREASING THE TIME TO AN ACTIONABLE DIAGNOSTIC RESULT

THE CURRENT TYPICAL PATIENT DIAGNOSIS JOURNEY CAN BE REALLY LONG – THERE ARE OPPORTUNITIES TO DECREASE TIME TO RESULTS

*If customers use their own short incubation protocol for VITEK MS

**Gram Negative bacteria only

***Theoretical based on instrument run times

THE USE OF MULTIPLEX RAPID DIAGNOSTIC TESTS COMBINED WITH AMS CAN DECREASE TTR & IS ASSOCIATED WITH A SIGNIFICANT DECREASE IN MORTALITY FOR BLOOD STREAM INFECTIONS

Clinical Infectious Diseases

MAJOR ARTICLE

The Effect of Molecular Rapid Diagnostic Testing on Clinical Outcomes in Bloodstream Infections: A Systematic Review and Meta-analysis

Tristan T. Timbrook,[1,4] Jacob B. Morton,[1,4] Kevin W. McConeghy,[2] Aisling R. Caffrey,[1,2,4] Eleftherios Mylonakis,[3] and Kerry L. LaPlante[1,2,4]

[1]Rhode Island Infectious Diseases Research Program, Providence Veterans Affairs Medical Center, [2]Center of Innovation in Long Term Services and Supports, Providence Veterans Affairs Medical Center, [3]Infectious Diseases Division, Warren Alpert Medical School of Brown University, Providence, and [4]College of Pharmacy, University of Rhode Island, Kingston

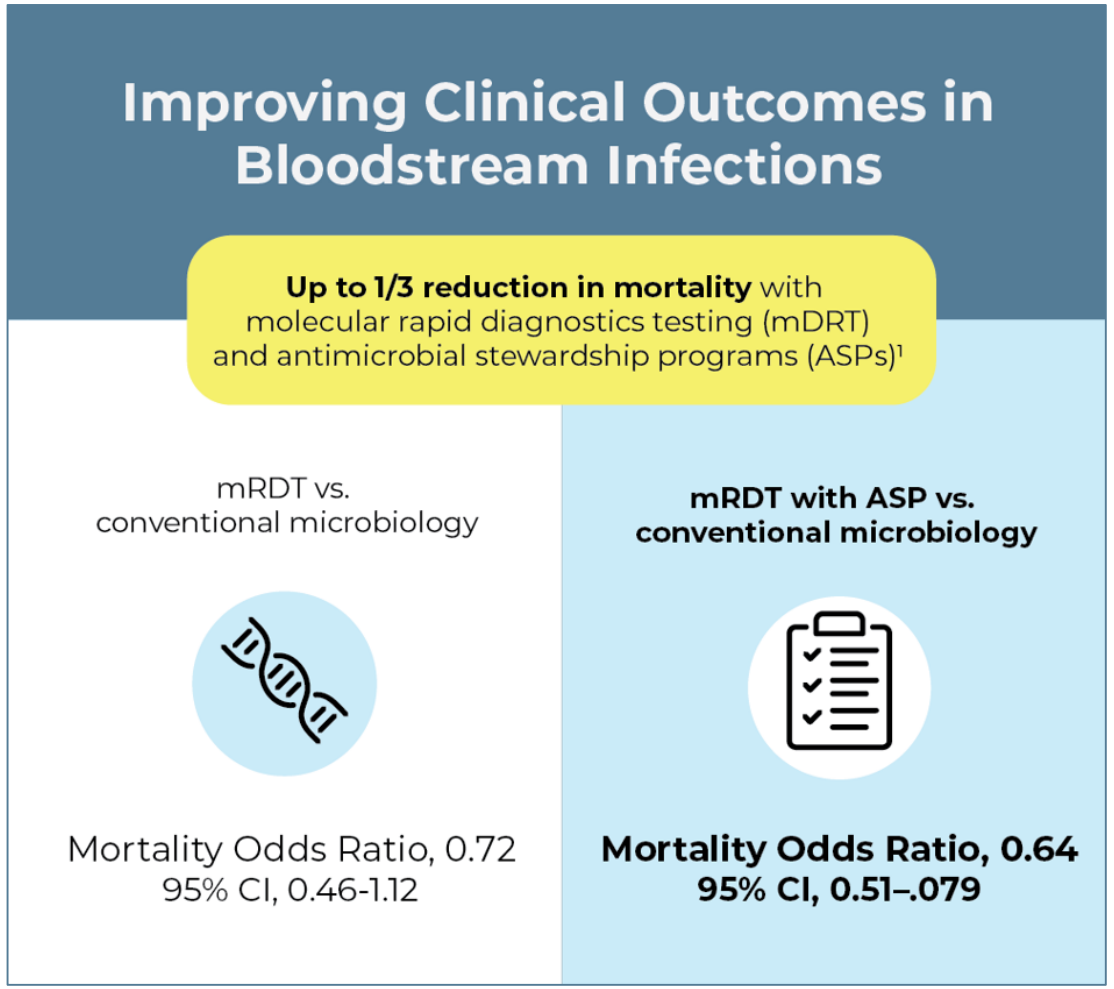
Background. Previous reports on molecular rapid diagnostic testing (mRDT) do not consistently demonstrate improved clinical outcomes in bloodstream infections (BSIs). This meta-analysis seeks to evaluate the impact of mRDT in improving clinical outcomes in BSIs.

Methods. We searched PubMed, CINAHL, Web of Science, and EMBASE through May 2016 for BSI studies comparing clinical outcomes between mRDT and conventional microbiology methods.

Results. Thirty-one studies were included with 5920 patients. The mortality risk was significantly lower with mRDT than with conventional microbiology methods (odds ratio [OR], 0.66; 95% confidence interval [CI], .54–.80), yielding a number needed to treat of 20. The mortality risk was slightly lower with mRDT in studies with antimicrobial stewardship programs (ASPs) (OR, 0.64; 95% CI, .51–.79), and non-ASP studies failed to demonstrate a significant decrease in mortality risk (0.72; .46–1.12). Significant decreases in mortality risk were observed with both gram-positive (OR, 0.73; 95% CI, .55–.97) and gram-negative organisms (0.51; .33–.78) but not yeast (0.90; .49–1.67). Time to effective therapy decreased by a weighted mean difference of −5.03 hours (95% CI, −8.60 to −1.45 hours), and length of stay decreased by −2.48 days (−3.90 to −1.06 days).

Conclusions. For BSIs, mRDT was associated with significant decreases in mortality risk in the presence of a ASP, but not in its absence. mRDT also decreased the time to effective therapy and the length of stay. mRDT should be considered as part of the standard of care in patients with BSIs.

Keywords. rapid diagnostic tests; bloodstream infections; meta-analysis; antimicrobial stewardship.



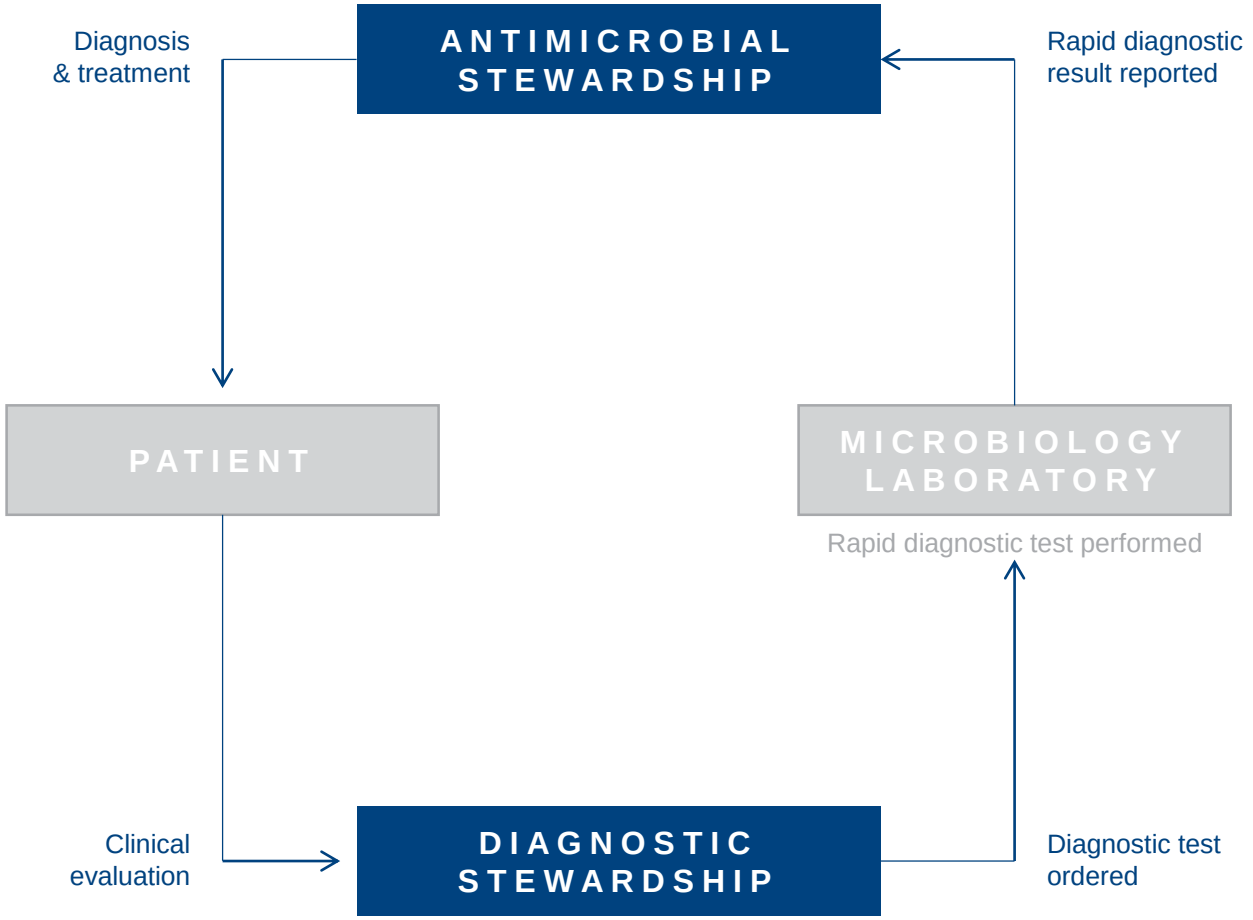
5920 patients
31 studies

"In BSI patients, mRDT should be considered as part of the standard care"

MICROBIOLOGY RESULTS ARE KEY TO MANAGE PATIENTS WITH INFECTION

CLINICIAN

The **right drug**
at the **right dose**
for the **right patient**



LABORATORY PROFESSIONAL

The **right test**
with the **right interpretation**
at the **right time**

Adapted from Messacar et al. J. Clin. Microbiol 2017;55:715-723.

ADVANCED ANALYTICS

TRANSFORM DIAGNOSTICS DATA INTO ACTIONABLE INSIGHTS

SUPPORT INFECTIOUS DISEASE MANAGEMENT

- Guiding decisions with Antibiogram

OPTIMIZE QUALITY RESULTS

- Identify sample quality issues & ineffective collection practices

DRIVE LAB PERFORMANCE

- Optimize microbiology lab workflow and time-to-results

HOW DATA & IT CAN IMPROVE BSI

HOW TO IMPROVE BLOODSTREAM INFECTION DIAGNOSTICS?

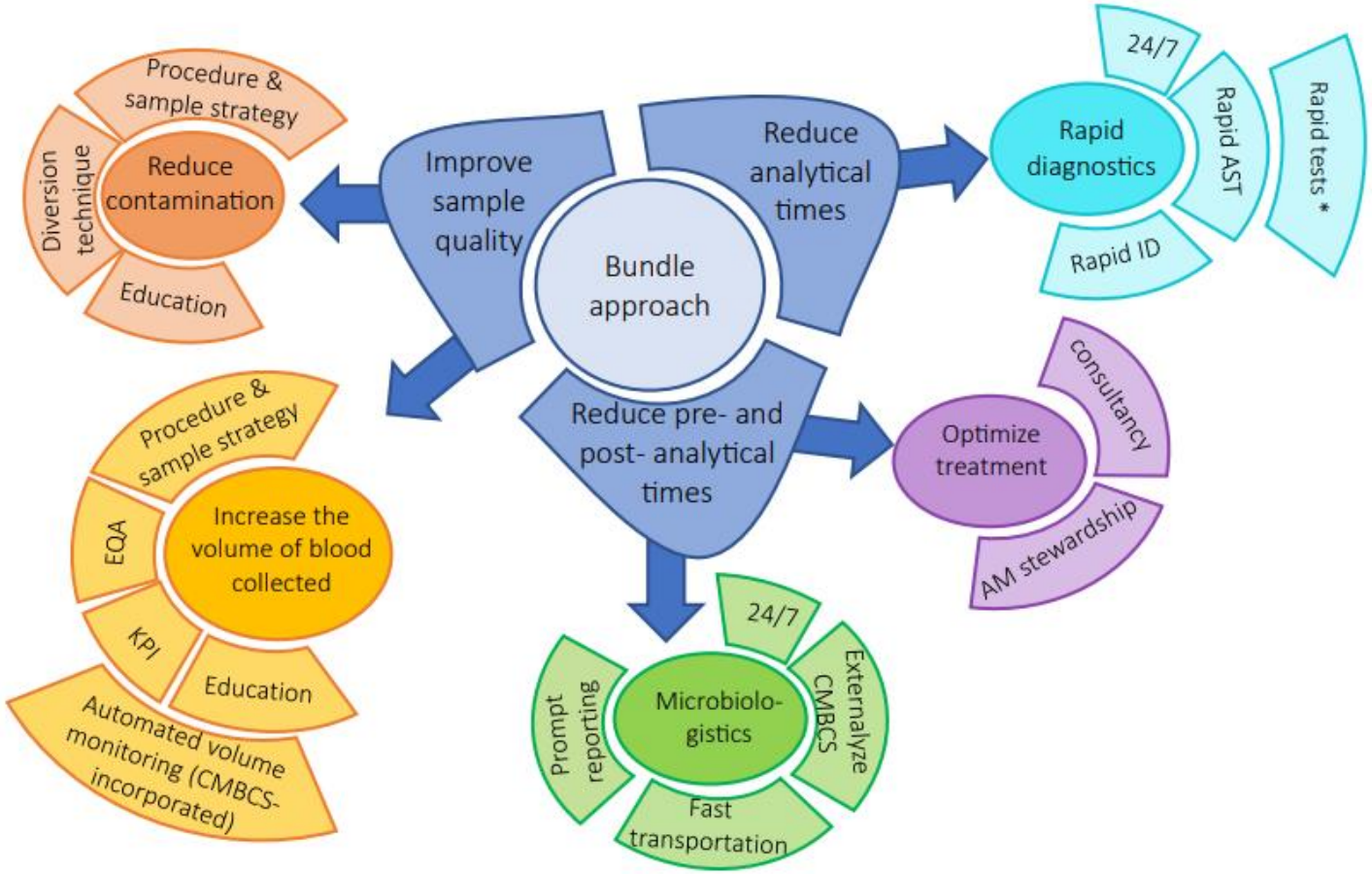


Fig. 1. Summary of all the actions to improve the bloodstream infection pathogen diagnostics. Types of actions belong to three complementary axes and actions aim to manage sample quality, times before and after analysis and analytical times. Each action per se is associated with a limited improvement but combination of several actions significantly improves diagnosis. Improvement is maximum when programme include actions on sampling quality, rapid diagnostics and logistics. KPI, key performance indicator; EQA, external quality assessment; CMBCS, continuous-monitoring blood culture system; AM stewardship, antimicrobial stewardship. *Rapid tests (e.g. *mecA* detection) may be needed in area of high level of resistance.

M.D. Gonzalez *et al*. Modern Blood Culture Management Decisions and Method Options. Clin Lab Med 40. 2020. 379-392.

BLOOD CULTURE KPI

BLOOD SAMPLING	BOTTLE-FILLING	SPECIMEN TRANSPORTATION	SPECIES IDENTIFICATION	AST
AMS KPI	AMS KPI	AMS KPI	AMS KPI	AMS KPI
Target: **Contamination rate < 3% (optimally < 1%)**	Target: **Quantity 8-10 mL** Increasing the blood volume increases the chance of recovering microorganisms	Target: **< 4 hours**	Target: **Same day of Blood Culture (BC) positivity**	Target: **Preliminary or final available on the same day of next day**
Contamination Rates	**Bottle Volume**	**Mean Load Time**	**TTR, Fast ID**	**TTR**

CN CLARION™ MA MAESTRIA™

BLOOD CULTURE KPI: CONTAMINATION RATE

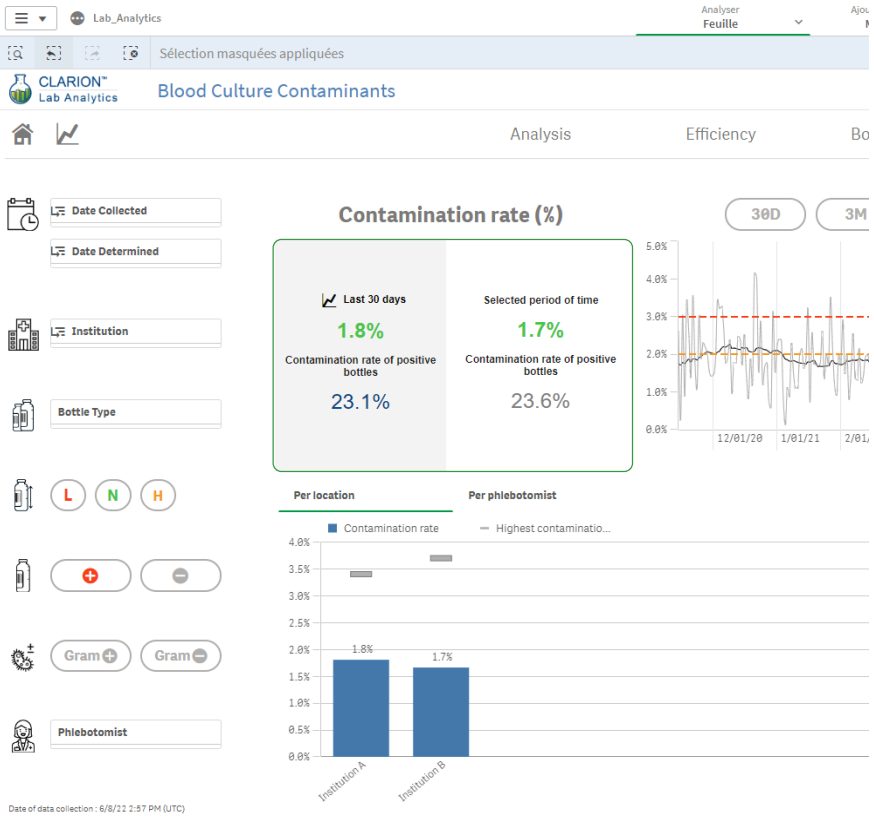
BLOOD SAMPLING

AMS KPI

Target:

Contamination rate < 3% (optimally < 1%)

Contamination Rates



CN **CLARION™**

MA **MAESTRIA™**

Impact on AMS:

- **Unnecessary treatment increase antibiotic exposure[1]**
  - Unneeded intravenous antibiotics
  - Prolonged therapy
- **Potential adverse event including:**
  - Allergic reaction
  - Antibiotic resistance emergence
  - Disruption of the host microbiome
- **Cost associated:**
  - For the lab: increase unnecessary workflow
  - For the hospital: potential increase in length of hospital stay or follow up testing

Actions of improvement:

1. **Identify areas of high contamination** (e.g. specific ward)
2. **Targeted education** for specific institutions across network, specific units, and even specific individuals for proper blood culture collection technique
3. **Data can be utilized to improve resource utilization**

BLOOD CULTURE KPI:

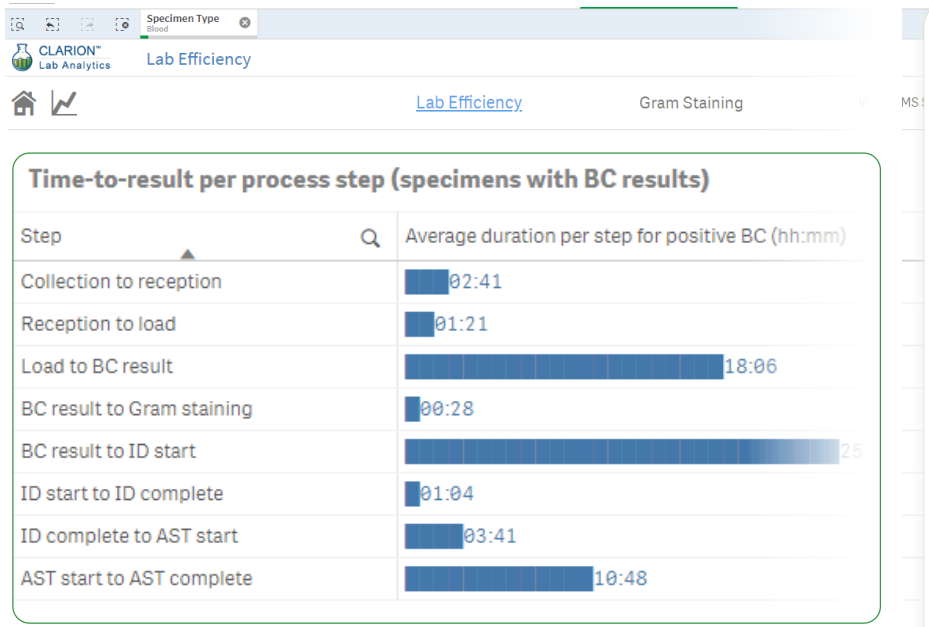
SPECIES IDENTIFICATION

AMS KPI

Target:

Same day of Blood Culture (BC) positivity

TTR, Fast ID



Impact on AMS:

- **Better diagnose Bloodstream infection**
- **Appropriateness of empiric antibiotic therapy**
- **Impact on time to appropriate therapy**
- **Hospital cost[1]**
- **Mortality and morbidity**

Actions of improvement:

Rapid identification

- Rapid tests: syndromic panel
- FAST AST: VITEK® REVEAL
- 24/7: workflow modification
- Availability of the results: 24/7

CN CLARION™ **MA** MAESTRIA™

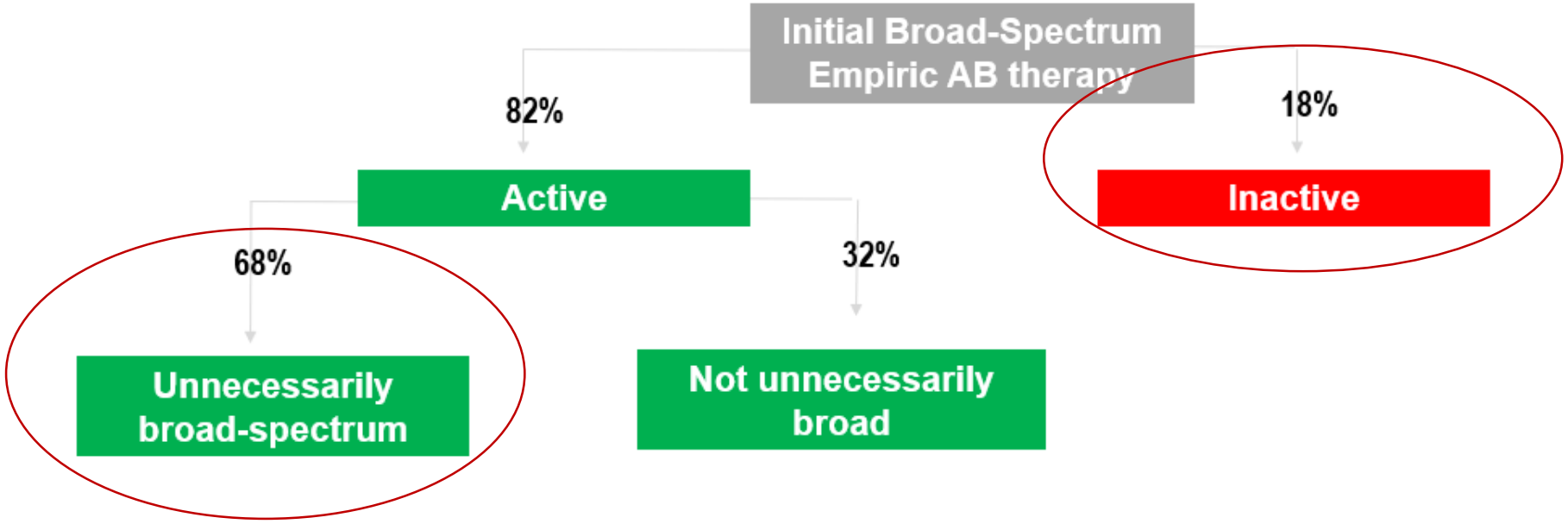
BIOMÉRIEUX

[1]*R. Nasef et al. The Impact of Integrating Rapid PCR-Based Blood Culture Identification Panel to an Established Antimicrobial Stewardship Program in the United Arab of Emirates. Int jour of infectious diseases. 2020*

IMPROVING THE ACCURACY OF INITIAL EMPIRIC ANTIBIOTIC THERAPY

EMPIRIC TREATMENTS CAN BE FREQUENTLY WRONG OR UNNECESSARILY BROAD

- 17 430 adults with culture positive sepsis admitted to 104 US hospitals
- Resistant G+ organisms isolated in 13.6% of patients & Resistant G- organismes in 13.2%



Rhee C et al. Prevalence of Antibiotic-Resistant Pathogens in Culture-Proven Sepsis and Outcomes Associated With Inadequate and Broad-Spectrum Empiric Antibiotic Use. *JAMA Network Open*. 2020;3(4):e202899.

WHO IS SUPPORTING THE USE OF SURVEILLANCE TOOLS TO IMPROVE DIAGNOSTIC STEWARDSHIP AND INFORM TREATMENT GUIDELINES

GLASS

Diagnostic stewardship

A guide to implementation in antimicrobial resistance surveillance sites

World Health Organization

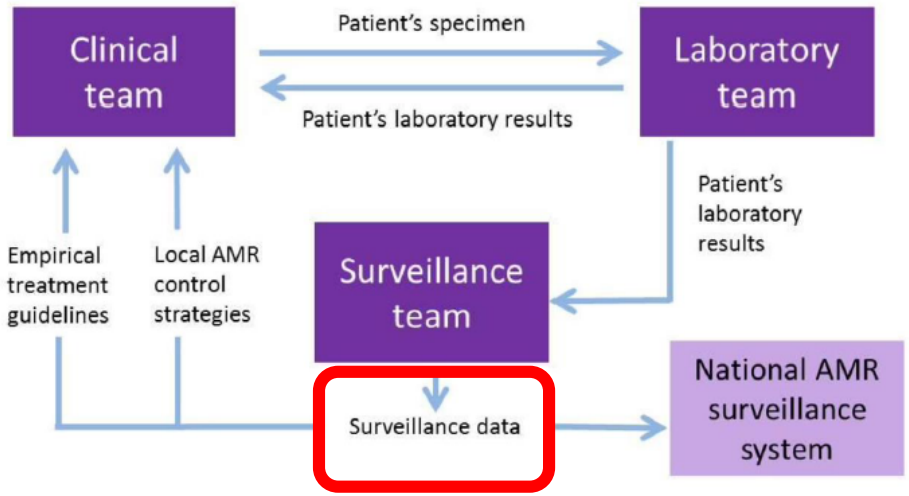
*"**coordinated guidance and interventions to improve appropriate use of microbiological diagnostics to guide therapeutic decisions.** It should promote appropriate, timely diagnostic testing, including specimen collection, and pathogen identification and accurate, timely reporting of results to guide patient treatment."*

The main objective of microbiological diagnostic stewardship is to deliver:

- appropriate, timely diagnostic testing, including specimen collection, and pathogen identification and accurate, timely reporting of results
- patient management guided by timely microbiological data to deliver safer and more effective and efficient patient care

accurate and representative AMR surveillance data to inform treatment guidelines, and AMR control strategies.

Figure 1: Relationship between individual care and surveillance data



Good communication between the different professionals involved, namely the laboratory, clinical, and surveillance teams, plays a critical role in successful diagnostic stewardship.

WHO/DGO/AMR/2016.3

ROUTINE ANTIBIOGRAM

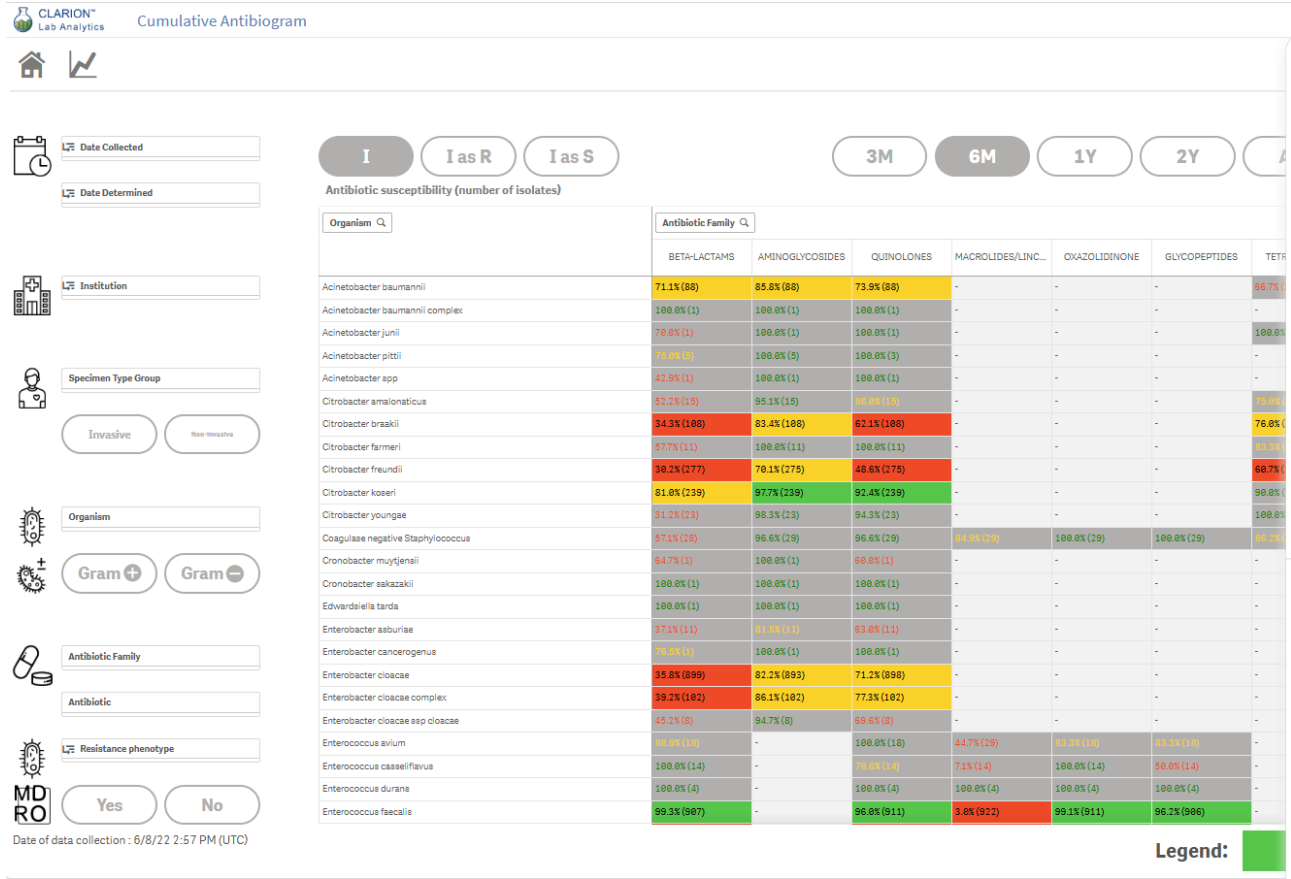
ROUTINE ANTIBIOGRAM

AMS KPI

- Deliver and analyse annually the routine antibiogram (min)

- Reflects % of first isolates (per patient) of a given species that is susceptible to each of the antimicrobial agents routinely tested (deduplication)

- Aggregate of all patients from all locations for the prior calendar year



Impact on AMS:

- **Guiding clinicians in the selection of empirical antimicrobial therapy** for initial infections before definitive susceptibility results become available or when definitive susceptibility results are not available[1,2]
- **ASP will update local empiric therapy guidelines (annually): antimicrobial formulary**
- **Monitoring changes resistance over time**

Actions of improvement:

- **Increase awareness of antibiotic resistance**
- **Education for the interpretation of real-time antibiograms**

CN **CLARION™**

MA **MAESTRIA™**

BIOMÉRIEUX

[1]PJ. Simner et al. What's New in Antibiograms? Updating CLSI M39 Guidance with Current Trends. Journal of clin microbiology. 2022

[2]KP. Klinker et al. Antimicrobial stewardship and antibiograms: importance of moving beyond traditional antibiograms. Therapeutic Advances in infect disease. 2021

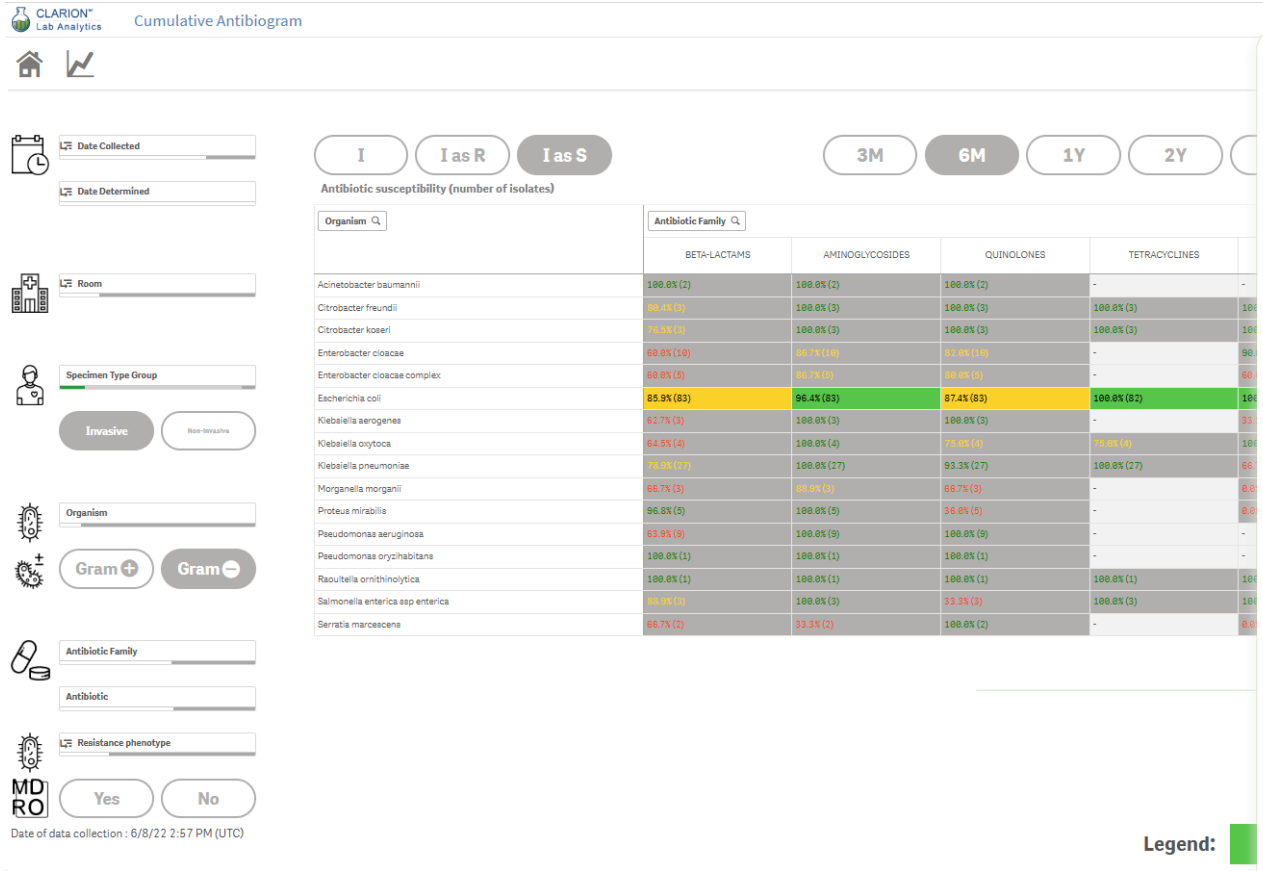
ADVANCED ANTIBIOGRAM

ROUTINE ANTIBIOGRAM

AMS KPI

- **On demand by ASP** (mainly ID pharmacist, ID physician)

- Advanced antibiogram allows ID and clinical microbiology experts to filter results to better match the particular patient in need.



Usage:

- **If questions come up on susceptibility patterns on specific floor/unit**
- **Susceptibility patterns on rarely encountered organisms**
- **Specific patient condition**

Impact on AMS:

- **Syndromic antibiogram** provides an increased likelihood of appropriate empiric antibiotic therapy for a specific infectious syndrome, considering the weighted incidence of pathogens causing the syndrome
- **Assist with more targeted empirical therapy based on infection type, patient type, organism, isolate source, patient location**

Actions of improvement:

- **Increase awareness of antibiotic resistance**
- **Education for the interpretation of real-time antibiograms**

CN **CLARION™** MA **MAESTRIA™**

BIOMÉRIEUX

[1]PJ. Simner et al. What's New in Antibiograms? Updating CLSI M39 Guidance with Current Trends. Journal of clin microbiology. 2022

[2]KP. Klinker et al. Antimicrobial stewardship and antibiograms: importance of moving beyond traditional antibiograms. Therapeutic Advances in infect disease. 2021

SHORTENING THE TIME TO ADJUSTMENT WHEN EMPIRIC THERAPY IS INCORRECT

THE USE OF RDT COMBINED WITH AN ASP AND A CLINICAL DECISION SUPPORT SYSTEM CAN DECREASE THE TIME TO APPROPRIATE THERAPY FOR BLOOD STREAM INFECTIONS

J Antimicrob Chemother 2024; **79** Suppl 1: i37–i43
https://doi.org/10.1093/jac/dkae277

Journal of Antimicrobial Chemotherapy

Time to effective antibiotic therapy for ESBL-producing organisms not empirically covered decreased from 17.7 to 2.8 hours after BCID2 implementation (*p = 0.0041*).

Getting rapid diagnostic test data into the appropriate hands by leveraging pharmacy staff and a clinical surveillance platform: a case study from a US community hospital

Jeremy Frens [1]*, Tyler Baumeister[2], Emily Sinclair[1], Dustin Zeigler[1], John Hurst[3], Brandon Hill[3], Sonya McElmeel[4] and Stéphanie Le Page[5]

[1]Department of Pharmacy, Cone Health, 1200 North Elm Street, Greensboro, NC, USA; [2]Department of Pharmacy, Williamson Medical Center, Franklin, TN, USA; [3]bioMérieux US Medical Affairs, bioMérieux, Durham, NC, USA; [4]Department of Pharmacy, University of North Carolina Health, Chapel Hill, NC, USA; [5]bioMérieux Global Medical Affairs Microbiology, bioMérieux, Marcy-l'Étoile, France

*Corresponding author. E-mail: Jeremy.frens@conehealth.com

Received 1 September 2023; accepted 17 June 2024

Objectives: To outline the procedural implementation and optimization of rapid diagnostic test (RDT) results for bloodstream infections (BSIs) and to evaluate the combination of RDTs with real-time antimicrobial stewardship team (AST) support plus clinical surveillance platform (CSP) software on time to appropriate therapy in BSIs at a single health system.

Methods: Blood culture reporting and communication were reported for four time periods: (i) a pre-BCID [BioFire® FilmArray® Blood Culture Identification (BCID) Panel] implementation period that consisted of literature review and blood culture notification procedure revision; (ii) a BCID implementation period that consisted of BCID implementation, real-time results notification via CSP, and creation of a treatment algorithm; (iii) a post-BCID implementation period; and (iv) a BCID2 implementation period. Time to appropriate therapy metrics was reported for the BCID2 time period.

Results: The mean time from BCID2 result to administration of effective antibiotics was 1.2 h (range 0–7.9 h) and time to optimal therapy was 7.6 h (range 0–113.8 h) during the BCID2 Panel implementation period. When comparing time to optimal antibiotic administration among patients growing ceftriaxone-resistant Enterobacterales, the BCID2 Panel group (mean 2.8 h) was significantly faster than the post-BCID Panel group (17.7 h; $P=0.0041$).

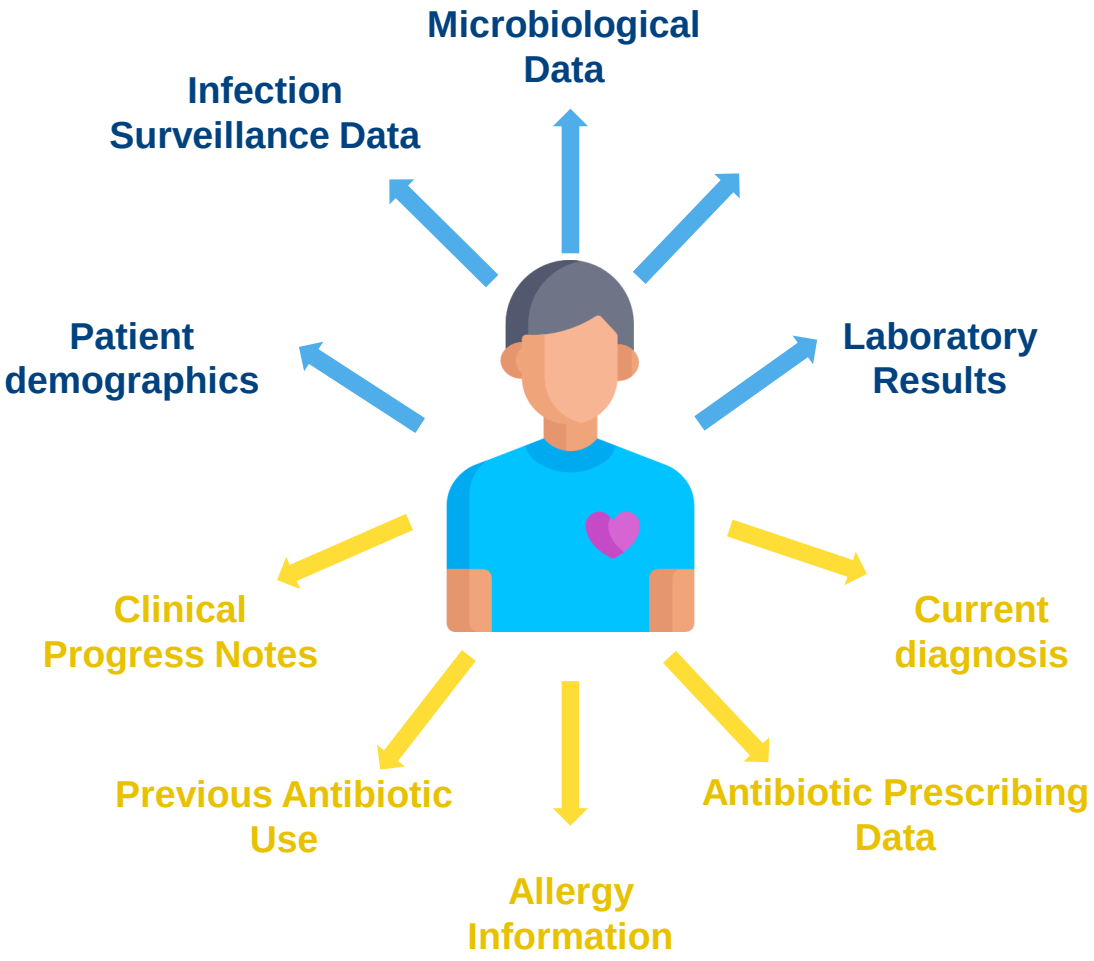
Conclusions: Challenges exist in communicating results to the appropriate personnel on the healthcare team who have the knowledge to act on these data and prescribe targeted therapy against the pathogen(s) identified. In this report, we outline the procedures for telephonic communication and CSP support that were implemented at our health system to distribute RDT data to individuals capable of assessing results, enabling timely optimization of antimicrobial therapy.

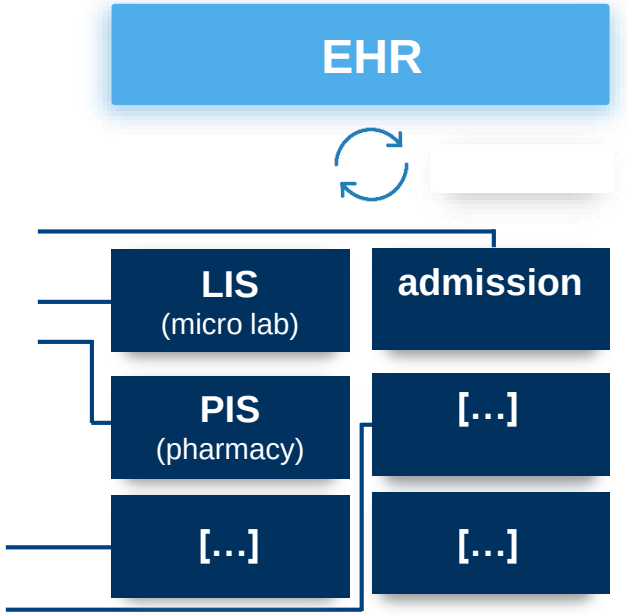
Table 2. Mean time to effective therapy from BCID2 result to administration of effective therapy for isolates not empirically covered

	Mean time to effective therapy from BCID2 result to administration of effective therapy for isolates not empirically covered, h (mean ± SD)
Before BCID2—ceftriaxone-resistant isolates	17.7 ± 22.0
After BCID2—CTX-M-positive isolates	2.8 ± 2.1
P value	0.0041

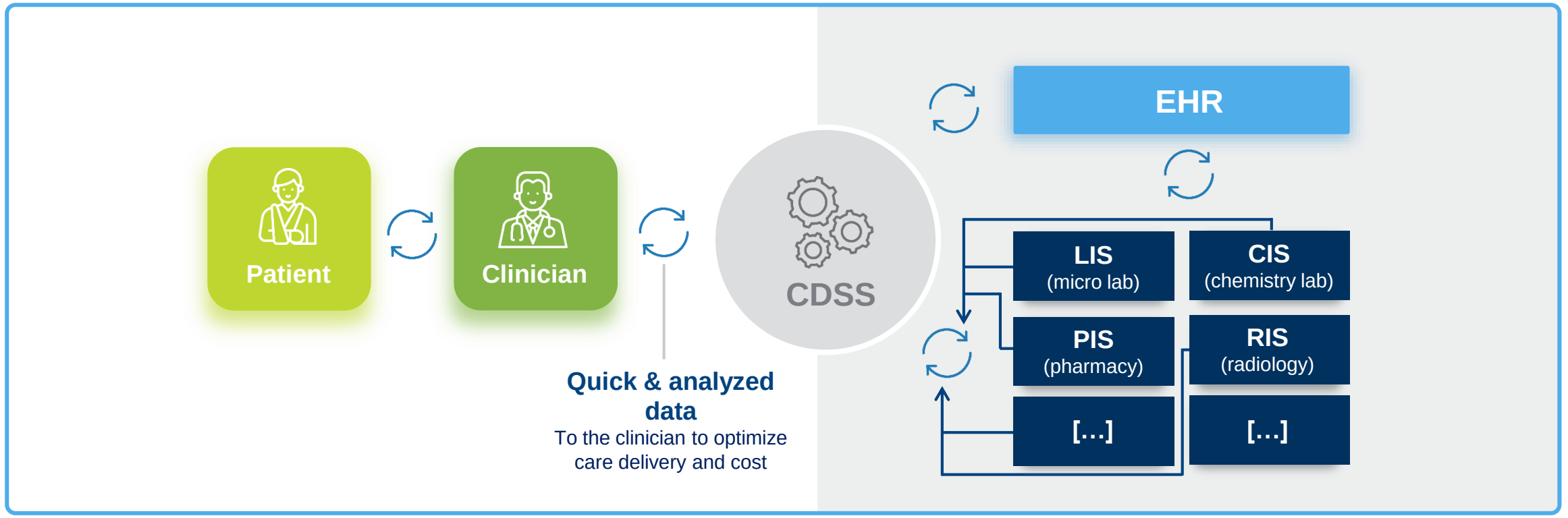
"The combination of RDT, ASP support and CDSS can greatly aid in optimizing the timing of appropriate antibiotic therapy in patients with BSIs. "

TO TAKE RIGH DECISION, THERE IS A NEED TO ACCESS TO PATIENT DATA FROM SEVERAL DATA SOURCES





CLINICAL DECISION SUPPORT SYSTEMS (CDSS) INTEGRATED WITH EFFECTIVE DIAGNOSTICS PLAY A KEY ROLE IN ANTIBIOTIC STEWARDSHIP BY GUIDING APPROPRIATE TREATMENT DECISIONS, REDUCING UNNECESSARY ANTIBIOTIC USE, LOWERING ANTIBIOTIC CONSUMPTION, ENHANCING GUIDELINE ADHERENCE, AND NARROWING THE SPECTRUM OF ANTIBIOTIC PRESCRIBING.



LIS: Laboratory Information Systems CIS: Clinical Information Systems, RIS: Radiology Information Systems, PIS: Pharmacy Information Systems, EHRs: Electronic Health Records, or EHRs,

LUMED IS A CLINICAL DECISION SUPPORT SYSTEM THAT ALLOW TO IDENTIFY AND PRIORITIZE PATIENTS WITH INAPPROPRIATE ANTIMICROBIAL TREATMENT

APSS + Patient selection

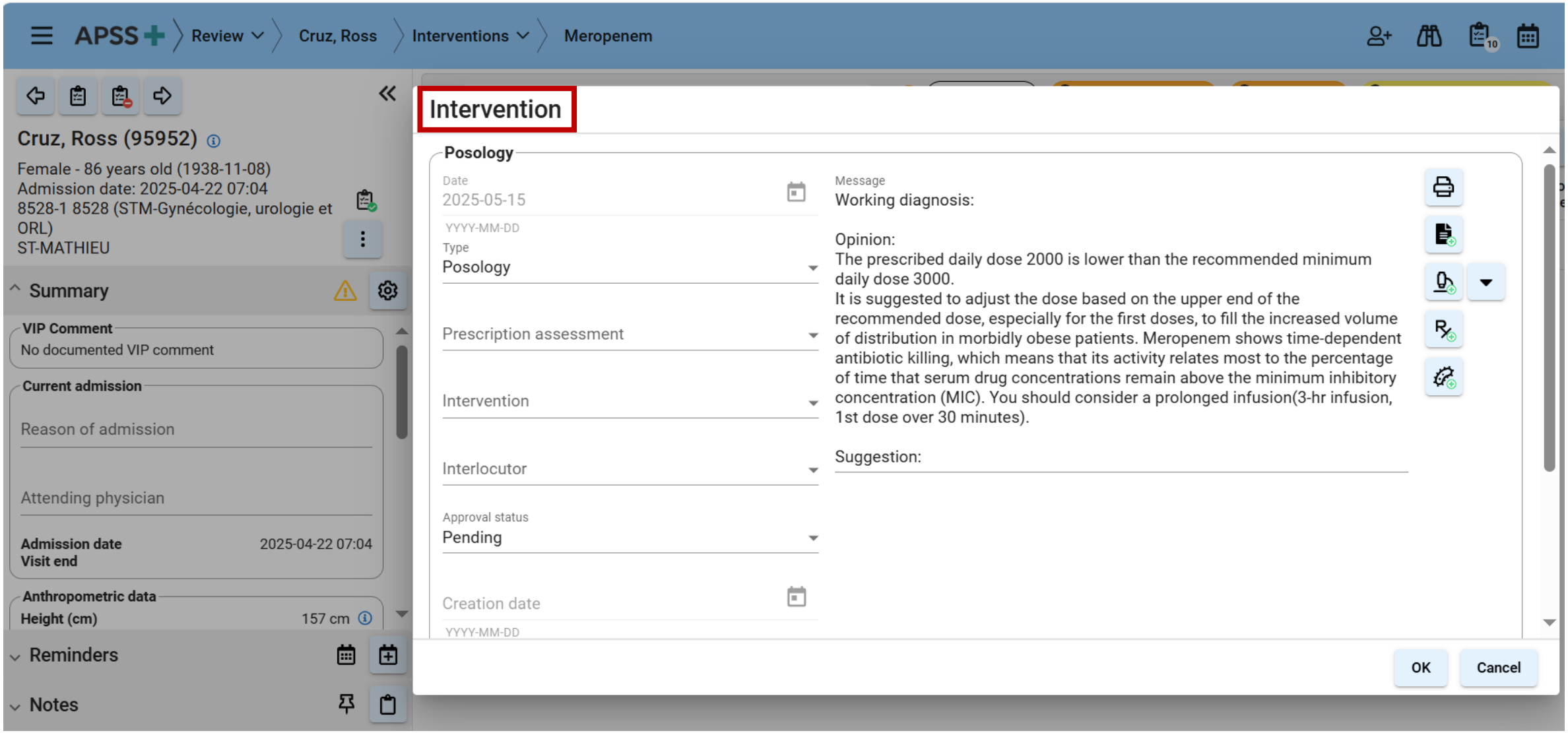
Preset filters | Customized preset filters

Filters | Current filter: Alert score min. 1 | Hospitalized Yes | Age (min.) 18

Alert	Alert types	Int.	Patient	Patient ID	Age	Gender	Bed	Location	Facility	Length of stay	Length of treatment	Monitored
19	Potentially ineffective treatment, Iv->Po, Redundant antimicrobial spectra	1	Edwards, Mitchell	92885	68 years	Male	4338-1	STV-Médecine	ST-VINCENT	3 days	2 days	Trimethopı
19	Iv->Po, Frequency too high	1	Jones, Davis	92911	88 years	Male	9538-2	STL-Cardiologie et p...	ST-LOUIS	6 days	6 days	Ceftazidim
19	Iv->Po, Renal failure	1	Rodriguez, Lee	94467	68 years	Male	9529-2	STL-Cardiologie et p...	ST-LOUIS	32 days	31 days	Doxycyclin
19	Iv->Po		Reed, Flores	95337	85 years	Female	5384-2	STV-Unité d'isoleme...	ST-VINCENT	5 days	5 days	Piperacillir
19	Protected agent, Iv->Po, Low dose, Frequency too high		Sanders, Reyes	95817	71 years	Male	8509-2	STM-Gynécologie, u...	ST-MATHIEU	24 days	23 days	Famciclovi
19	Protected agent, Duration, Iv->Po, Minimum daily dose		Cruz, Ross	95952	86 years	Female	8528-1	STM-Gynécologie, u...	ST-MATHIEU	22 days	16 days	Meropener
19	Iv->Po, High dose		Bailey, Bell	96009	77 years	Male	8538-2	STM-Gynécologie, u...	ST-MATHIEU	5 days	4 days	Piperacillir
19	Iv->Po		Brown, Allen	96955	68 years	Female	4382-1	STV-Médecine	ST-VINCENT	16 days	15 days	Cefazolin
19	Iv->Po, Low dose, Frequency too high		Allen, Peterson	97707	86 years	Male	5136	STV-Médecine géné...	ST-VINCENT	11 days	9 days	Imipenem/
19	Iv->Po		Flores, Roberts	97744	59 years	Female	6390	STV-Chirurgie	ST-VINCENT	11 days	11 days	Vancomyc
19	Iv->Po, Redundant antimicrobial spectra		Adams, Kelly	97822	58 years	Male	4384-1	STV-Médecine	ST-VINCENT	7 days	6 days	Piperacillir

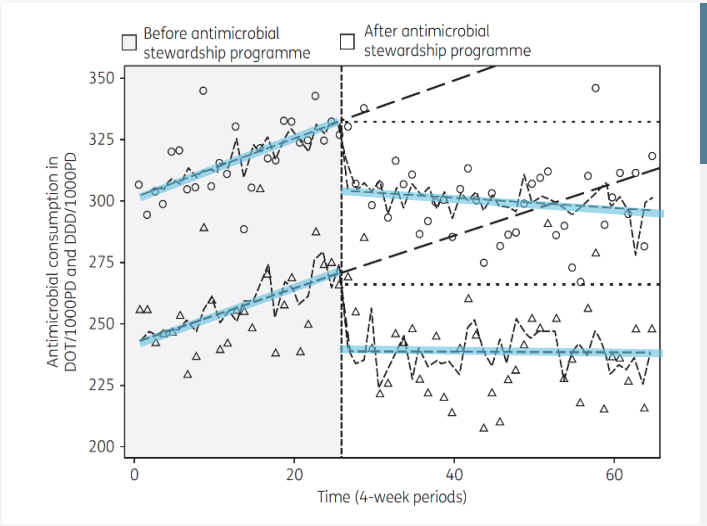
ALERTS EXPLAINING WHAT COULD BE DONE AND…

PROPOSING INTERVENTION TO SHORTEN THE TIME TO APPROPRIATE THERAPY



CLINICAL DECISION SUPPORT SYSTEMS ARE SUCCESSFUL WHEN INTEGRATED INTO WIDER STEWARDSHIP PROGRAMS

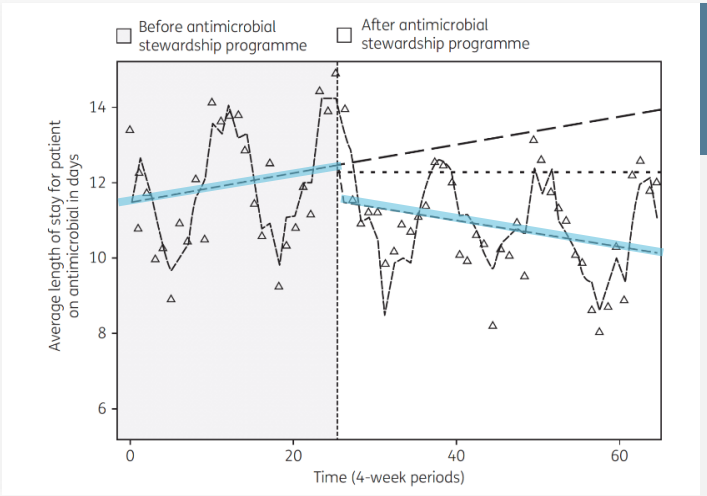
Consumption pre- and post-implementation



Antimicrobial consumption

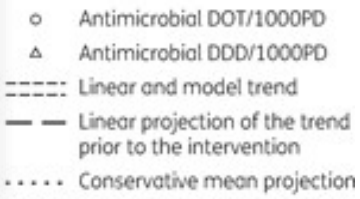
~24%

Length of stay pre- and post-implementation



Length of stay

~2 days



Antimicrobial Prescription Surveillance System for pharmacist-led prospective audit and feedback.

Interrupted time series analysis of intervention for **35,778 patients** receiving antimicrobials **over a 6-year period in CANADA.**

Surveillance system **led to reductions** in:

- **Antimicrobial consumption**
- **Antimicrobial spending**
- **Patient length of stay**
- **Inappropriate prescriptions**

Nault et al. Journal of Antimicrobial Chemotherapy 2017

ANTICIPATING EMERGING THREATS THROUGH EFFECTIVE SURVEILLANCE

MDRO SURVEILLANCE

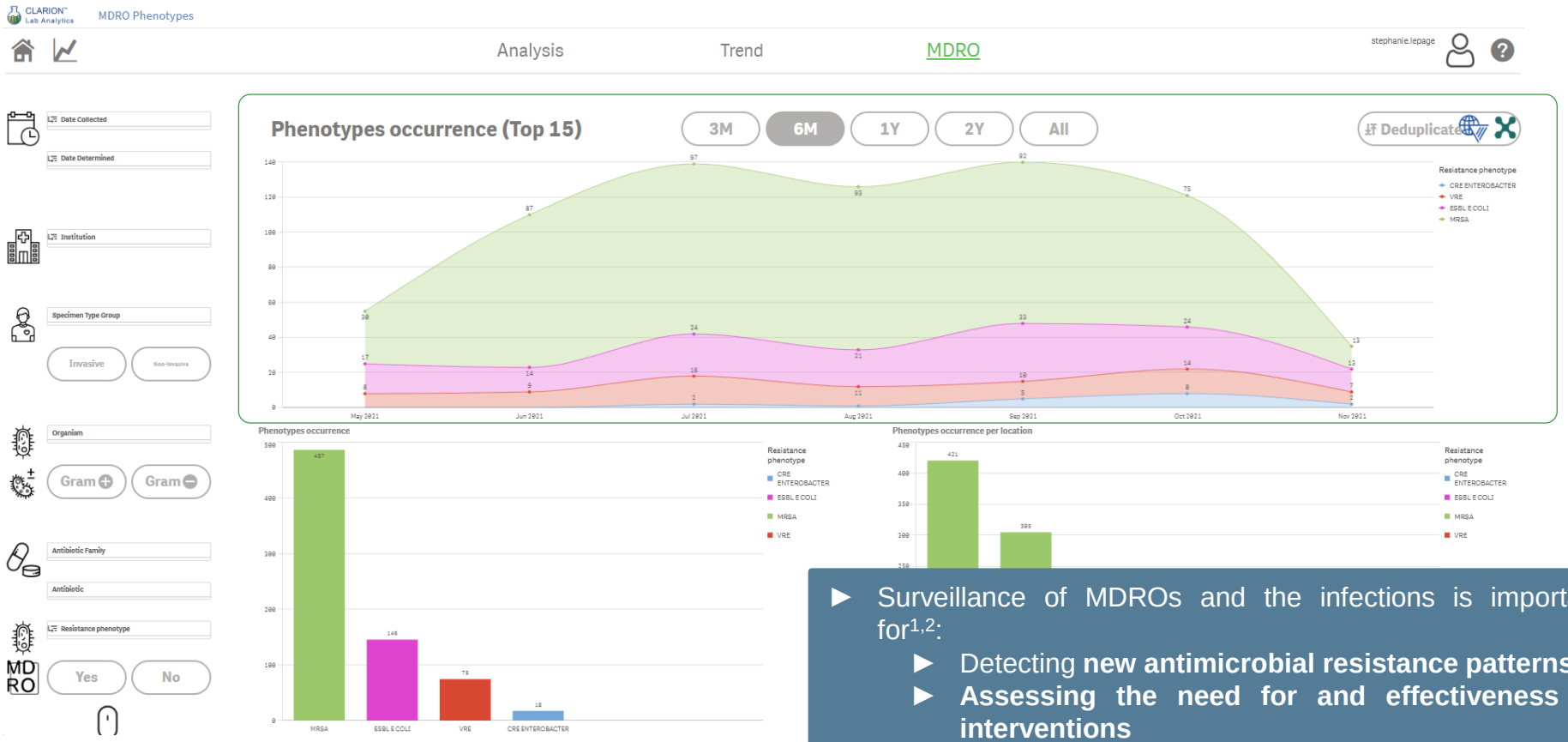
MDROs

AMS KPI

Target:

Monitoring of MDRO (report incidence and analyze trends)

MDRO dashboard



- Surveillance of MDROs and the infections is important for[1,2]:
  - Detecting **new antimicrobial resistance patterns**
  - **Assessing the need for and effectiveness of interventions**
- Overview of MDRO phenotypes found in the **institution** and their distribution **per organism**.
- **Regular reports** needed by the lab director or Infection Prevention and Control practitioners

CN **CLARION™**

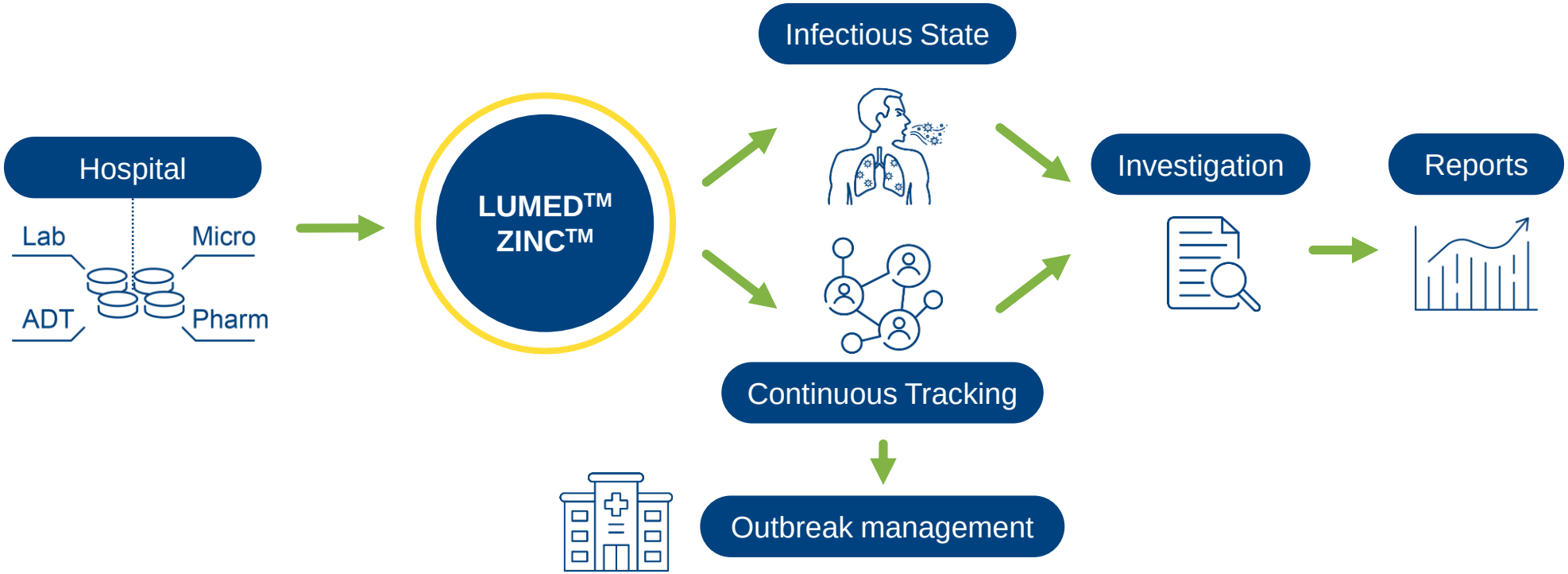
MA **MAESTRIA™**

[1]*Multidrug-Resistant Organism & Clostridioides difficile Infection (MDRO/CDI) Module. Training National Healthcare Safety Network.. 2024*

[2]*AL. Cohen et al. Recommendations For Metrics For Multidrug-Resistant Organisms In Healthcare : SHEA/HICPAC Position PaperJ ournal of clin microbiology. 2022*

LUMED ZINC FOR INFECTION PREVENTION AND CONTROL IS A REAL TIME TOOL TRACKING HOSPITAL AQUIRED INFECTIONS AND OUTBREAKS (BOTH BACTERIAL & VIRAL) – PRIORITIZING & PROPOSING ACTIONS

Preventing the spread



TRACK ALL PATIENTS AT RISK IN REAL TIME
From data to action:

ACTIVATE WORKFLOWS THAT PROMPT IMMEDIATE ACTION BASED ON REAL-TIME ALERTS TO MITIGATE THE RISK OF SPREADING DANGEROUS PATHOGENS

KEY-MESSAGES

- **Improve laboratory management efficiency**
- **Decrease the time to an actionable diagnostic result**
- **Improve the accuracy of initial empiric antibiotic therapy**
- **Shorten the time to adjustment when empiric therapy is incorrect**
- **Anticipate emerging threats through effective surveillance**

QUIZZ MMM X BIOMERIEUX

- Quizz lancé en scannant le code QR
- Les résultats seront annoncés le 23 Mai à 13h30 au niveau du stand biomérieux x MMM
- Plusieurs cadeaux prévus pour les gagnants
- Bonne chance !

PIONEERING DIAGNOSTICS