Monitoring and Evaluation to Optimize Microbiology and Care System to Inform Clinical Practice.

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Hosted by Martin Kiernan

Disclosures

- Founder of Monarch Informatics, a data analytics company specializing in Data Monitoring and Evaluation.
- Supported by support from the University Kingston Hospital Foundation via a Clinical Chair in Genomics.
- Recipient of Research Grants from the CIHR, NSERC, The Gates Foundation, The NIH, The Southeastern Academic Medical Organization (SEAMO), and The Weston Foundation.
- Monarch Informatics recently received Helix Funding from the Kingston Economic Development fund.

The Core Team

Kingston Health Sciences Centre
Centre des sciences de la santé de Kingston
Hôpital Hotel Dieu Hospital
Hôpital Général de Kingston General Hospital

Queen's University

Centre for Advanced Computing

Paige Beddoe

Dr. Hung Tam

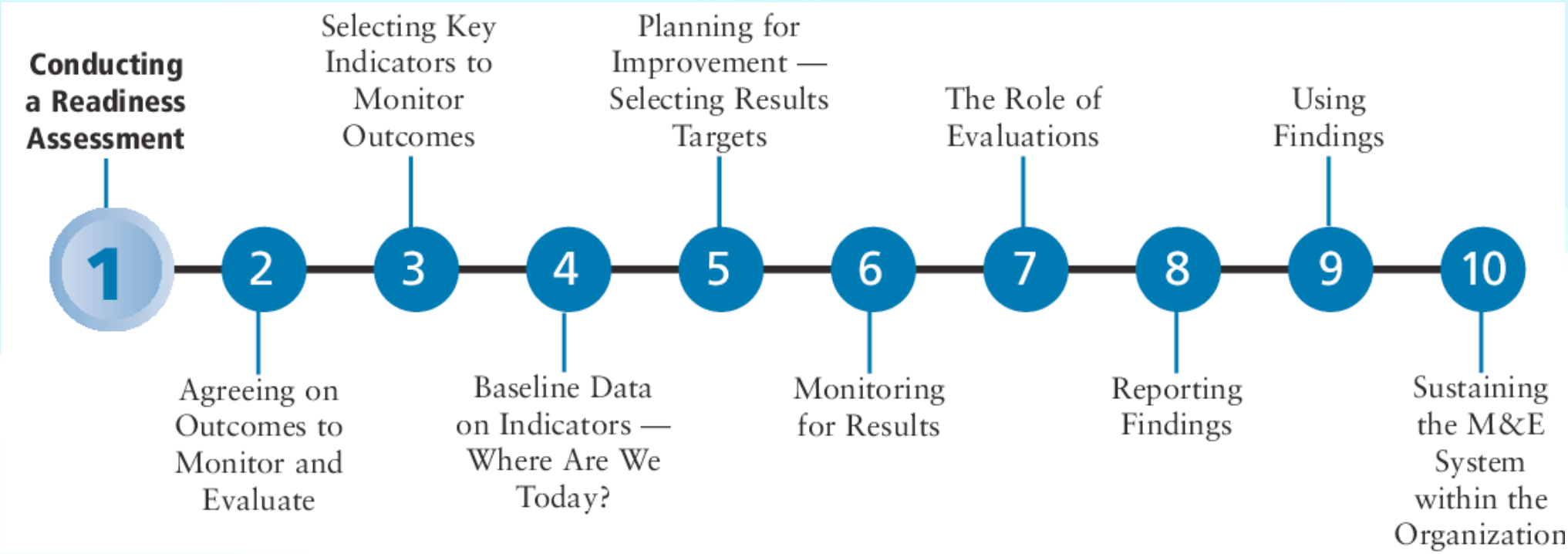
Dr. Amal Khalil

Monarch Informatics

Objectives

- Review current methods of monitoring and evaluating data.
- Outline the requirements for the development of an effective Monitoring and Evaluation platform for laboratory data.
- Examine the impact of the new Real-Time Autonomous monitoring system developed for infectious disease monitoring.
- Consider future implications of data-driven decision making to patient care, IPAC and changes in clinical practice.

Monitoring and Evaluation (M&E) System



Kusek et al, 2004. Ten Steps to a Results-Based Monitoring and Evaluation System: A Handbook for Development Practitioners

The Importance of and M&E in the Clinical Labs.

Why Does It Matter?

70% of today's medical decisions depend on laboratory test results, showing the important role of clinical laboratories in today's healthcare system

~260,000 CLIA-certified laboratories across the country represent the cornerstone of diagnostic medicine today

14 billion laboratory tests are ordered annually—safety, quality, and cost effectiveness in laboratory testing are required for effective diagnosis and treatment of disease

Threats to **national security and health** can happen at any time, such as disease outbreaks, bioterrorist attacks, or chemical or radiological releases

Experts estimate that **40,000–80,000 deaths** occur annually from preventable diagnostic errors

Patients in **rural areas** often experience barriers to healthcare and laboratory services that limit their ability to receive the care they need

Why CDC?

Strong clinical laboratories provide the foundation for accurate and timely disease diagnosis, prevention, and control to improve the health and safety of Americans. CDC's **Division of Laboratory Systems** is uniquely positioned to support clinical laboratories in several ways

What is a Quality Indicator?

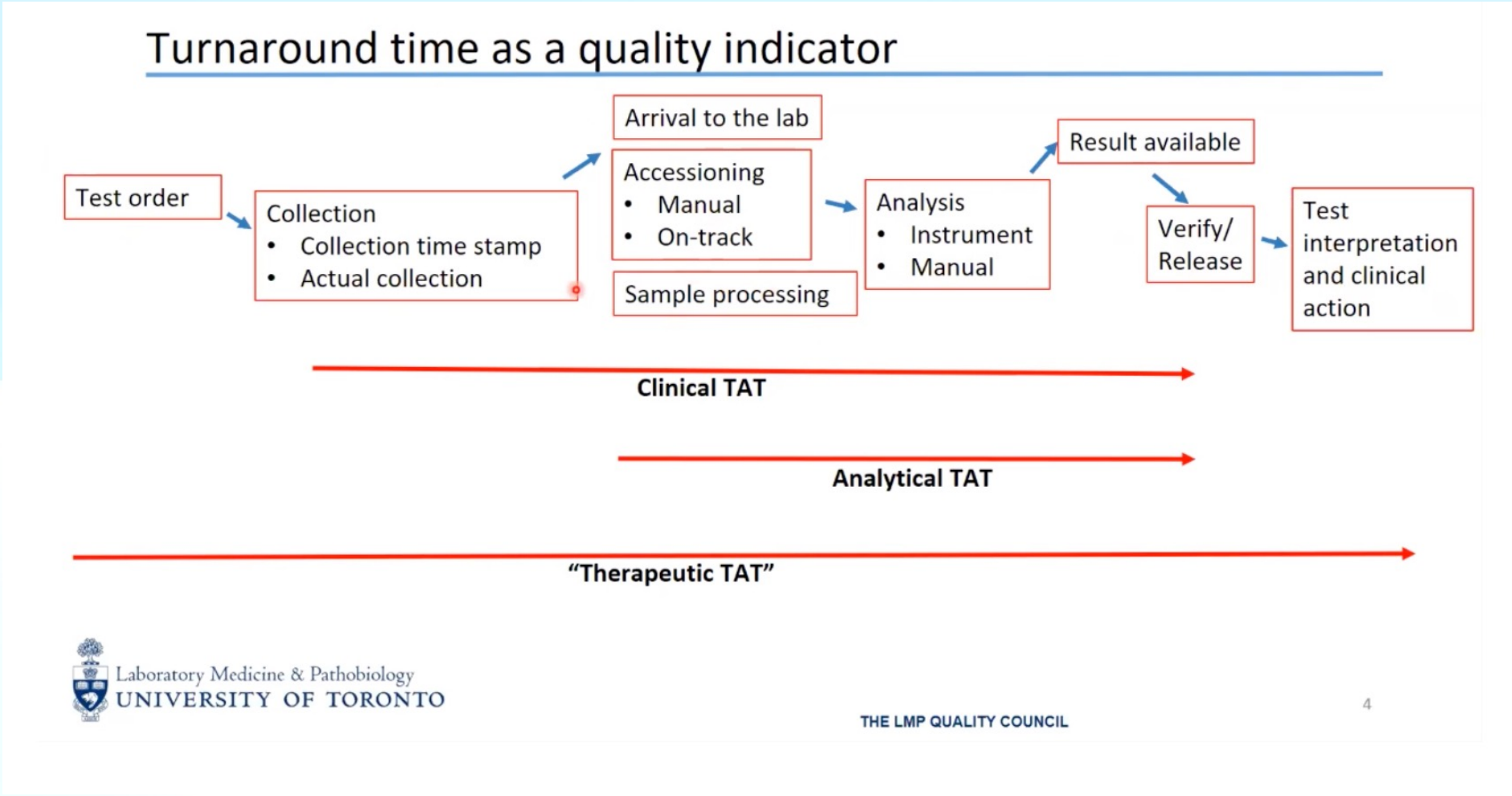
REMINDER:

"Quality Indicator" refers to a systematic measurement process intended to provide information about the quality of a system.[5]

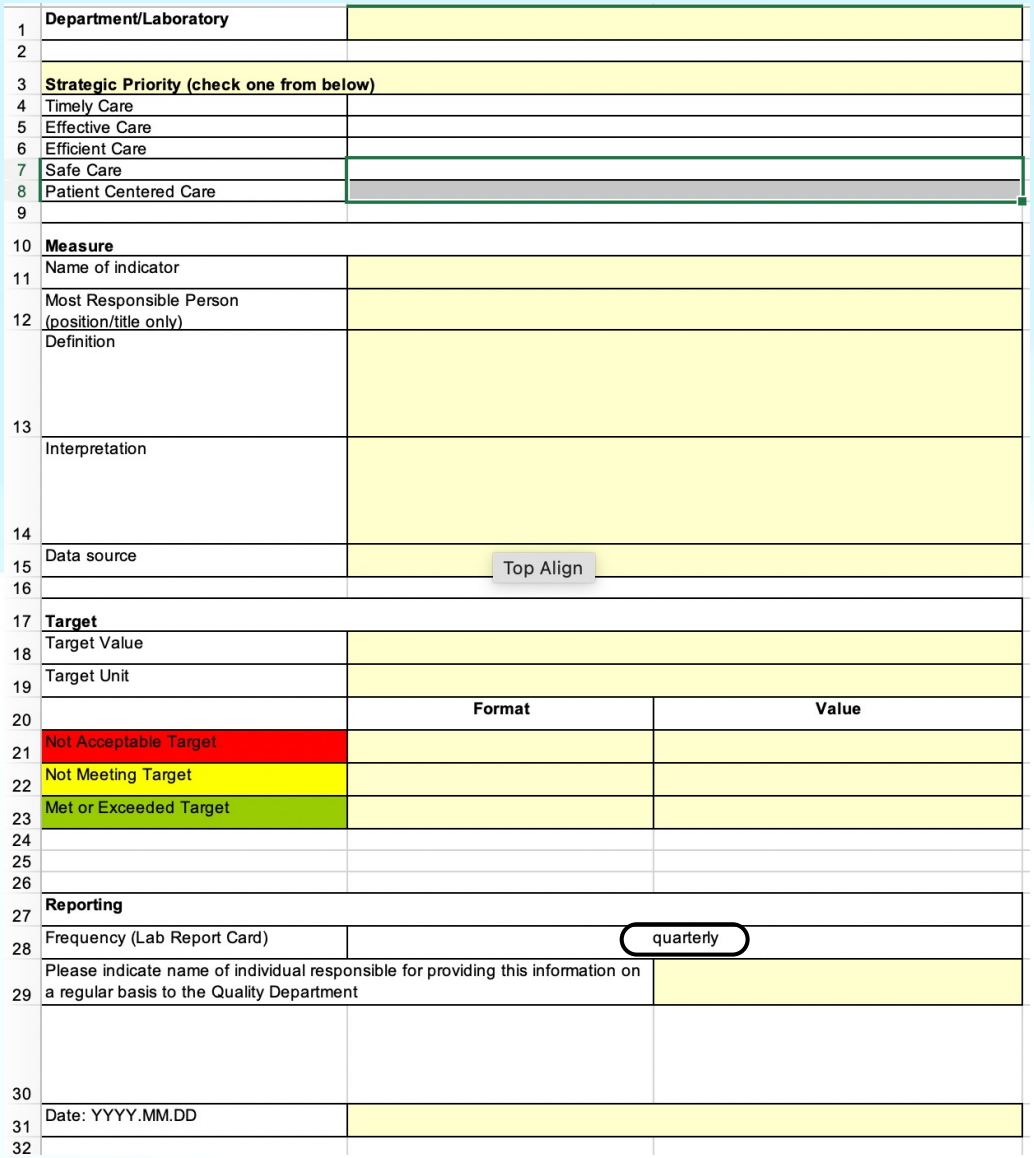
ISO 15189 [4.12.4] **states that the laboratory shall implement quality indicators to systematically monitor and evaluate the laboratory's contribution to patient care.** When the programme identifies opportunities for improvement, the laboratory management shall address them, regardless of where they occur. Also, it is stated that laboratory management shall ensure that the medical laboratory participates in quality improvement activities that deal with relevant areas and outcomes of patient care.

CLSI QMS12-A ; Development and use of Quality Indicators for Process Improvement and Monitoring of Laboratory Quality; Approved Guideline

Quality Indicator - Turn Around Time



Current M&E Method



1	**Department/Laboratory**		
2			
3	**Strategic Priority (check one from below)**		
4	Timely Care		
5	Effective Care		
6	Efficient Care		
7	Safe Care		
8	Patient Centered Care		
9			
10	**Measure**		
11	Name of indicator		
12	Most Responsible Person (position/title only)		
13	Definition		
14	Interpretation		
15	Data source		
16			
17	**Target**		
18	Target Value		
19	Target Unit		
20		**Format**	**Value**
21	Not Acceptable Target		
22	Not Meeting Target		
23	Met or Exceeded Target		
24			
25			
26			
27	**Reporting**		
28	Frequency (Lab Report Card)	quarterly	
29	Please indicate name of individual responsible for providing this information on a regular basis to the Quality Department		
30			
31	Date: YYYY.MM.DD		
32			

Top Align

- Select the Quality indicators.
- Designate frequency of the reporting of the quality indicator.
- Outline how it aligns with strategic priorities of the organization currently
- Quarterly/Monthly/Annual monitoring.

The trouble with metrics…

The Trouble With Metrics

- Why track metrics if they have no impact on laboratory performance?
- Even useful metrics may have limited impact if not utilized appropriately.
- Large amounts of data generally lay around and do nothing.
- Reviewing metrics once a month offers limited opportunities for meaningful feedback or intervention in real time.

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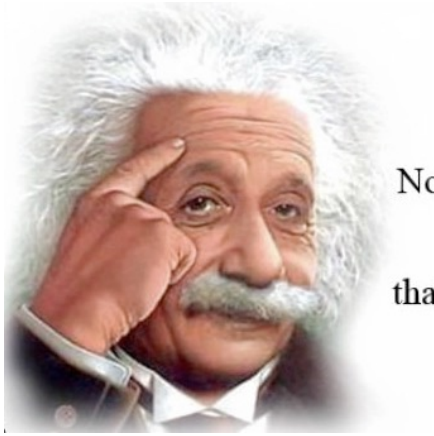

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Albert Einstein

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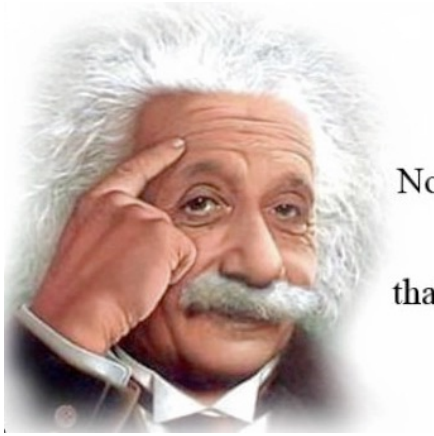

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Selected Metrics..

Blood Culture Contamination Rate

- Blood culture contamination rate.
  - What is the definition?
    - CAP Qprobes: A blood culture was considered to be contaminated if 1 or more of the following organisms were identified in only 1 of a series of blood culture specimens: coagulase-negative *Staphylococcus* species, *Propionibacterium acnes*, *Micrococcus* species, "viridans"-group streptococci, *Corynebacterium* species, or *Bacillus* species. A blood culture series was defined as 1 or more specimens collected serially within a 24- hour period to detect a bacteremic episode.[3]
  - <3% recommended.
  - Median laboratory contamination rate was 2.89%[3].
  - Target rates <2%?
  - How do you calculate contamination rates - Lack of consistency in methods used.

[3]Arch Pathol Lab Med-Vol 129, Oct 2005.

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Monitoring Metrics

The Solution

- Pick a limited number of metrics.
- Set specific targets and timeframe for achieving that target.
- Delegate responsibility to specific individuals.
- Collect pre-intervention data.
- Review frequently: daily/weekly.
- Multiple rounds of interventions may be necessary.
- Collect post-intervention data at each stage.
- Move on to other metrics.

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The ‘Dream’ Monitoring System

1. Consistent
2. Autonomous
3. Easy to use
4. Customizable
5. Monitors multiple indicator seamlessly
6. Real-time data (or close)
7. Interactive (passive and active).
8. Built in thresholds/alerts
9. Allows for modelling (predictive).

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Back-end Data Collection

C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
tubeNo	OrderLocation	OrderLocatior	Delivery	CollectionSite	Sex	DOB	Bottle	GramStainResult	Organism	Suscep	Final	Utilization	contamination	CollectDT	ReceiveDT
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1	ER-B	KGH Emerg	Core Lab	Peripheral	M	1976/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 22:20	2023/02/28 22:59

Back-end Data Collection

Pre-analytics floor

Order Location

Delivery Method

Collection Site

C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
tubeNo	OrderLocation	OrderLocatior	Delivery	CollectionSite	Sex	DOB	Bottle	GramStainResult	Organism	Suscep	Final	Utilization	contamination	CollectDT	ReceiveDT
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Pre-analytics laboratory

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Lab Receipt Time

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1	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:28
2	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:28
3	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:29
4	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:29
1	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
2	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
3	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:26
4	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
1	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1929/11/06	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:34	2023/02/28 21:45
2	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1929/11/06	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:34	2023/02/28 21:45
1	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:45
2	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:46
3	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:43
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2	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
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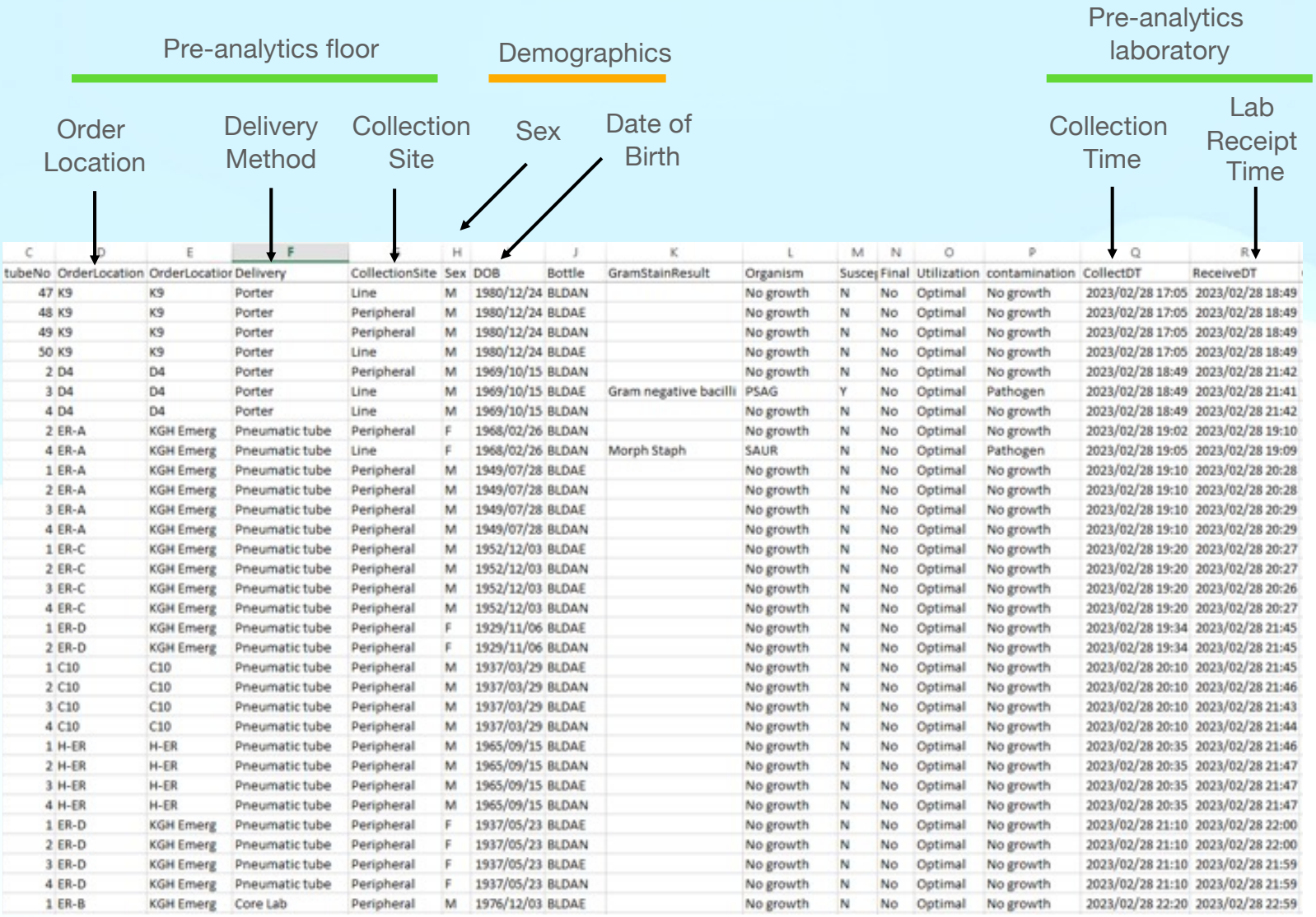
4	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
1	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 22:00
2	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 22:00
3	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 21:59
4	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 21:59
1	ER-B	KGH Emerg	Core Lab	Peripheral	M	1976/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 22:20	2023/02/28 22:59

Back-end Data Collection



C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
tubeNo	OrderLocation	OrderLocatior	Delivery	CollectionSite	Sex	DOB	Bottle	GramStainResult	Organism	Suscep	Final	Utilization	contamination	CollectDT	ReceiveDT
47	K9	K9	Porter	Line	M	1980/12/24	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
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49	K9	K9	Porter	Peripheral	M	1980/12/24	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
50	K9	K9	Porter	Line	M	1980/12/24	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
2	D4	D4	Porter	Peripheral	M	1969/10/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 18:49	2023/02/28 21:42
3	D4	D4	Porter	Line	M	1969/10/15	BLDAE	Gram negative bacilli	PSAG	Y	No	Optimal	Pathogen	2023/02/28 18:49	2023/02/28 21:41
4	D4	D4	Porter	Line	M	1969/10/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 18:49	2023/02/28 21:42
2	ER-A	KGH Emerg	Pneumatic tube	Peripheral	F	1968/02/26	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:02	2023/02/28 19:10
4	ER-A	KGH Emerg	Pneumatic tube	Line	F	1968/02/26	BLDAN	Morph Staph	SAUR	N	No	Optimal	Pathogen	2023/02/28 19:05	2023/02/28 19:09
1	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:28
2	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:28
3	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:29
4	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:29
1	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
2	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
3	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:26
4	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
1	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1929/11/06	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:34	2023/02/28 21:45
2	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1929/11/06	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:34	2023/02/28 21:45
1	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:45
2	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:46
3	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:43
4	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:44
1	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:46
2	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
3	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
4	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
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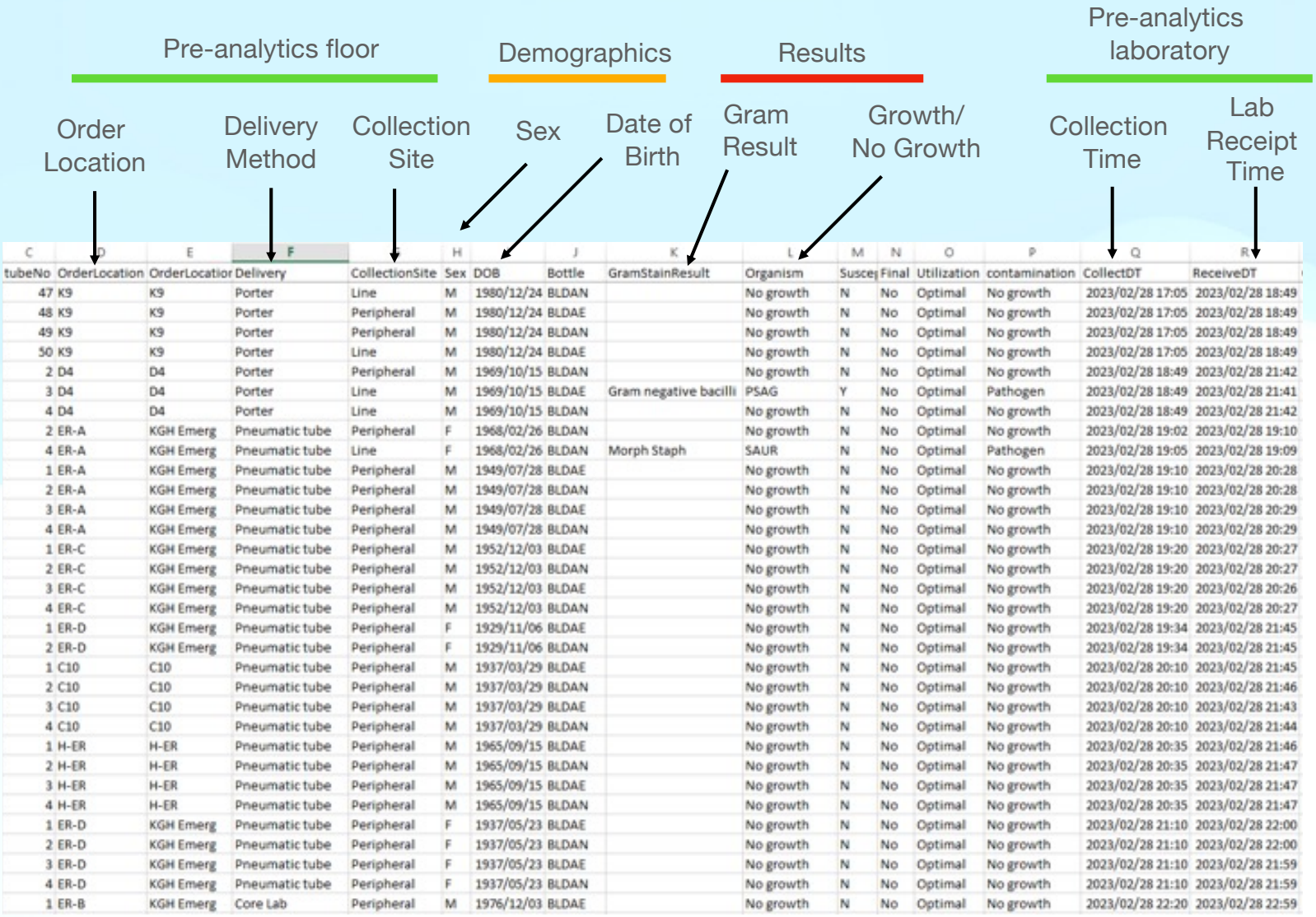
3	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 21:59
4	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 21:59
1	ER-B	KGH Emerg	Core Lab	Peripheral	M	1976/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 22:20	2023/02/28 22:59

Back-end Data Collection



C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
tubeNo	OrderLocation	OrderLocatior	Delivery	CollectionSite	Sex	DOB	Bottle	GramStainResult	Organism	Suscep	Final	Utilization	contamination	CollectDT	ReceiveDT
47	K9	K9	Porter	Line	M	1980/12/24	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
48	K9	K9	Porter	Peripheral	M	1980/12/24	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
49	K9	K9	Porter	Peripheral	M	1980/12/24	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
50	K9	K9	Porter	Line	M	1980/12/24	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 17:05	2023/02/28 18:49
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3	D4	D4	Porter	Line	M	1969/10/15	BLDAE	Gram negative bacilli	PSAG	Y	No	Optimal	Pathogen	2023/02/28 18:49	2023/02/28 21:41
4	D4	D4	Porter	Line	M	1969/10/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 18:49	2023/02/28 21:42
2	ER-A	KGH Emerg	Pneumatic tube	Peripheral	F	1968/02/26	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:02	2023/02/28 19:10
4	ER-A	KGH Emerg	Pneumatic tube	Line	F	1968/02/26	BLDAN	Morph Staph	SAUR	N	No	Optimal	Pathogen	2023/02/28 19:05	2023/02/28 19:09
1	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:28
2	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:28
3	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:29
4	ER-A	KGH Emerg	Pneumatic tube	Peripheral	M	1949/07/28	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:10	2023/02/28 20:29
1	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
2	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
3	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:26
4	ER-C	KGH Emerg	Pneumatic tube	Peripheral	M	1952/12/03	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 19:20	2023/02/28 20:27
1	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1929/11/06	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 19:34	2023/02/28 21:45
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1	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:45
2	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:46
3	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:43
4	C10	C10	Pneumatic tube	Peripheral	M	1937/03/29	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:10	2023/02/28 21:44
1	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:46
2	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
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4	H-ER	H-ER	Pneumatic tube	Peripheral	M	1965/09/15	BLDAN		No growth	N	No	Optimal	No growth	2023/02/28 20:35	2023/02/28 21:47
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3	ER-D	KGH Emerg	Pneumatic tube	Peripheral	F	1937/05/23	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 21:10	2023/02/28 21:59
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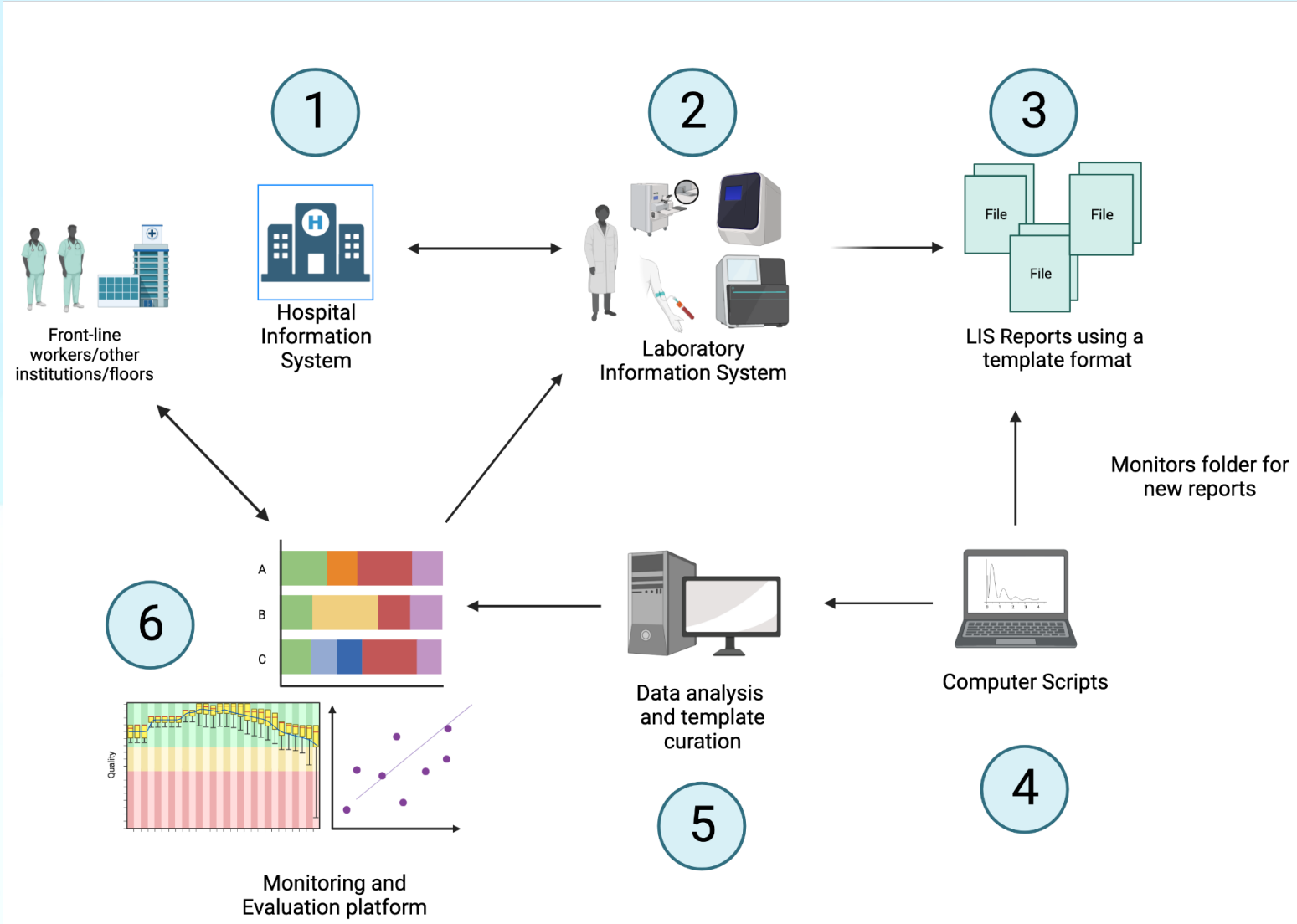
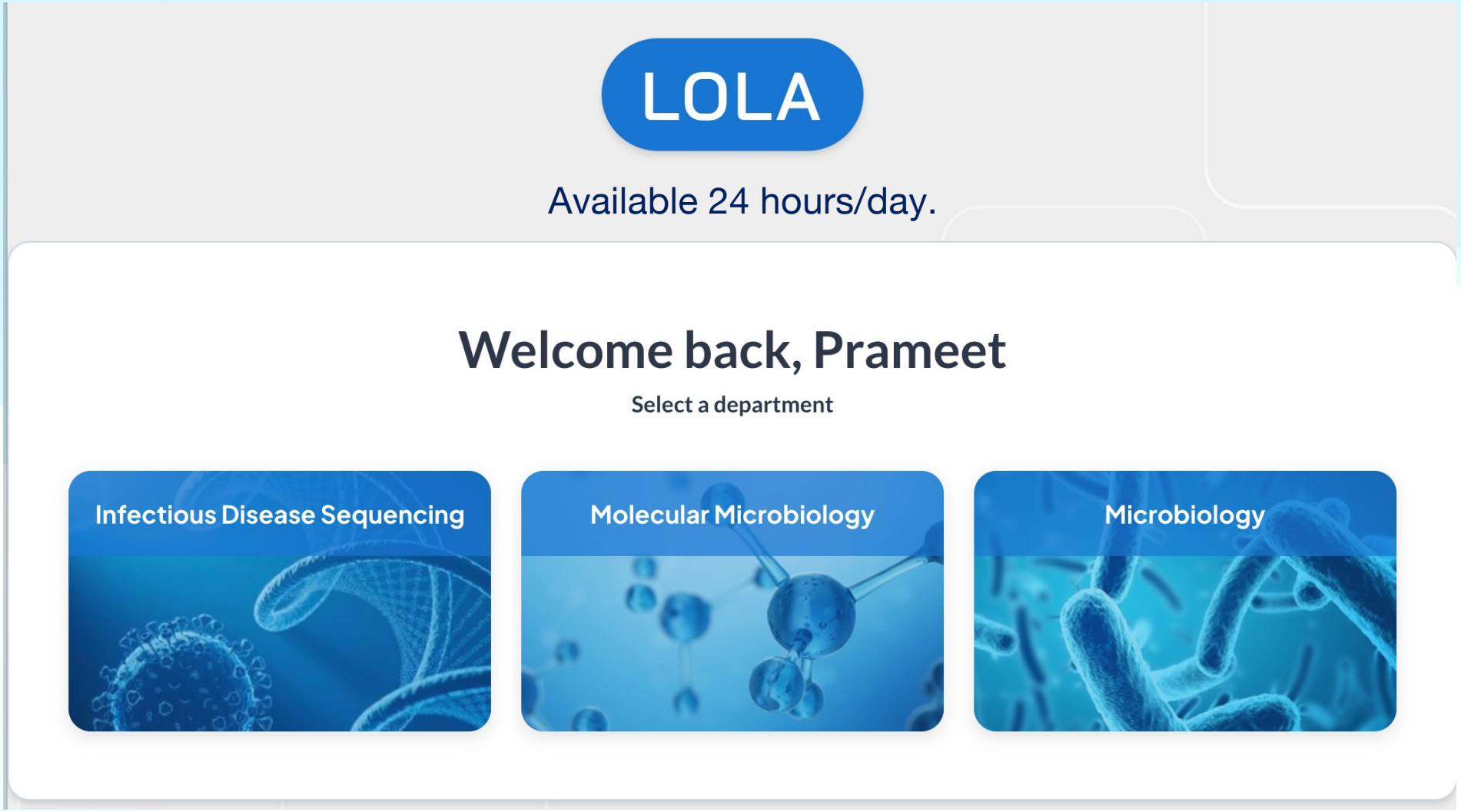
1	ER-B	KGH Emerg	Core Lab	Peripheral	M	1976/12/03	BLDAE		No growth	N	No	Optimal	No growth	2023/02/28 22:20	2023/02/28 22:59

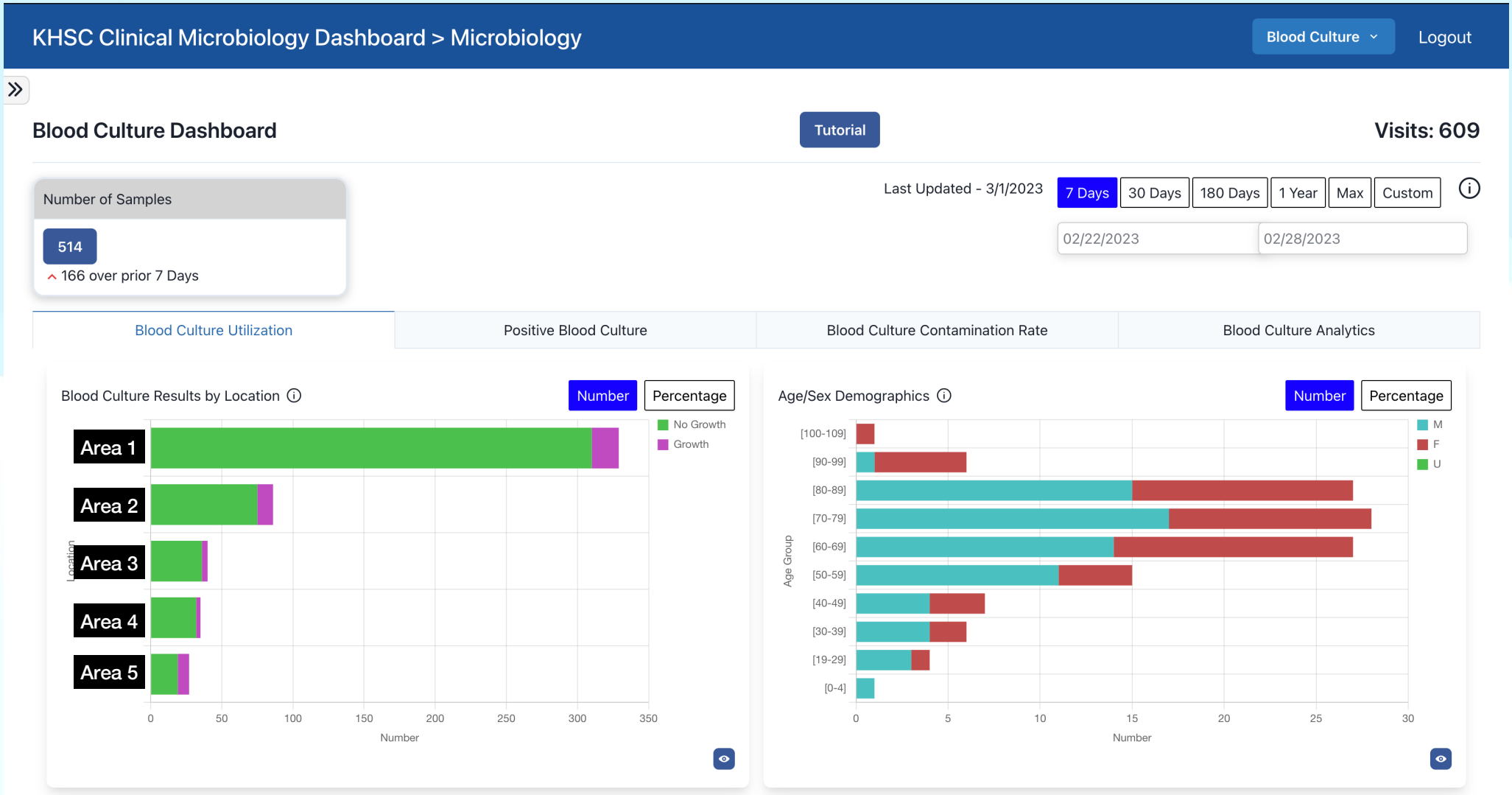
Data Flow and Processing.



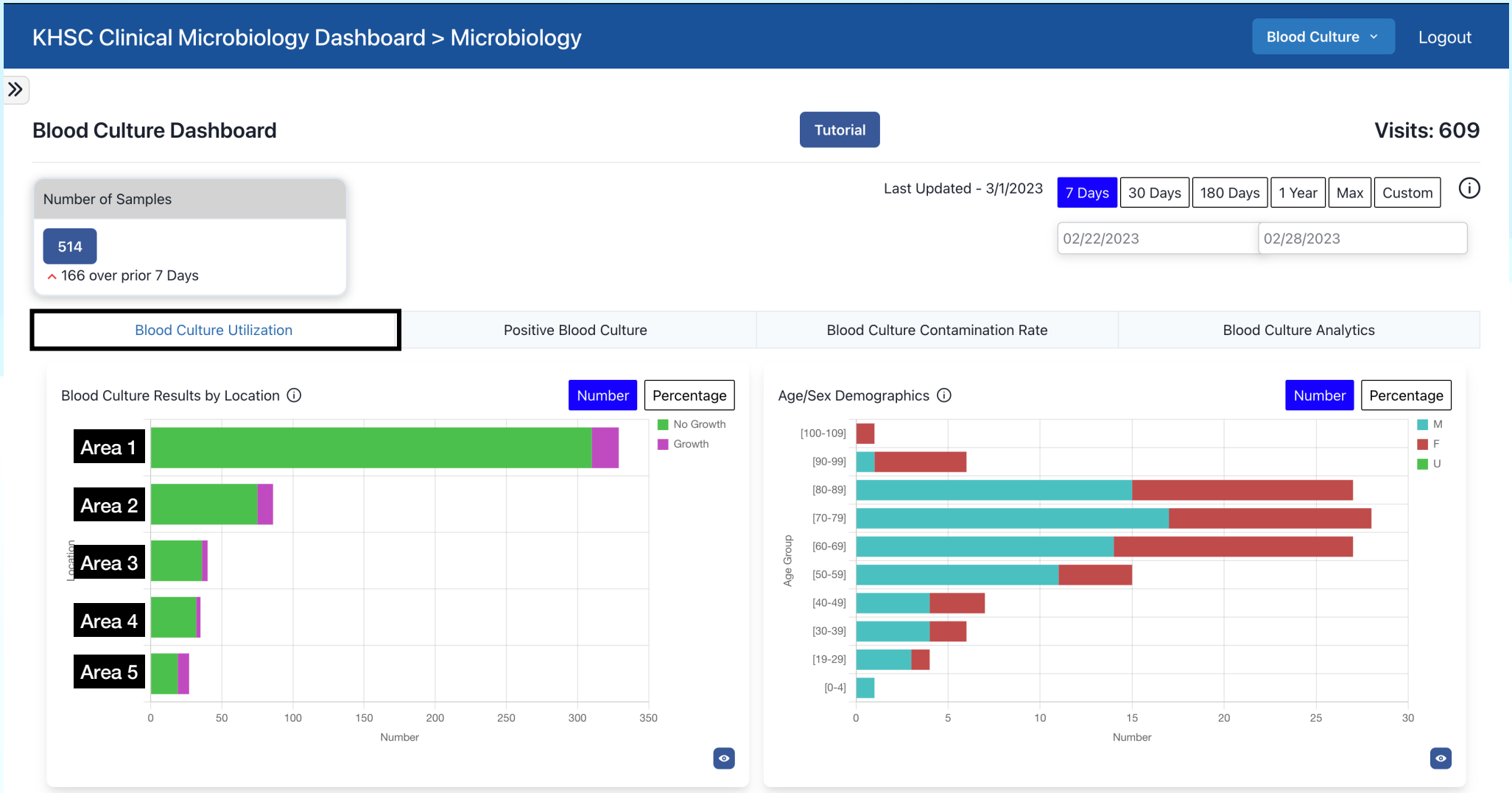
KHSC Microbiology
Blood Culture (BC) Monitoring System



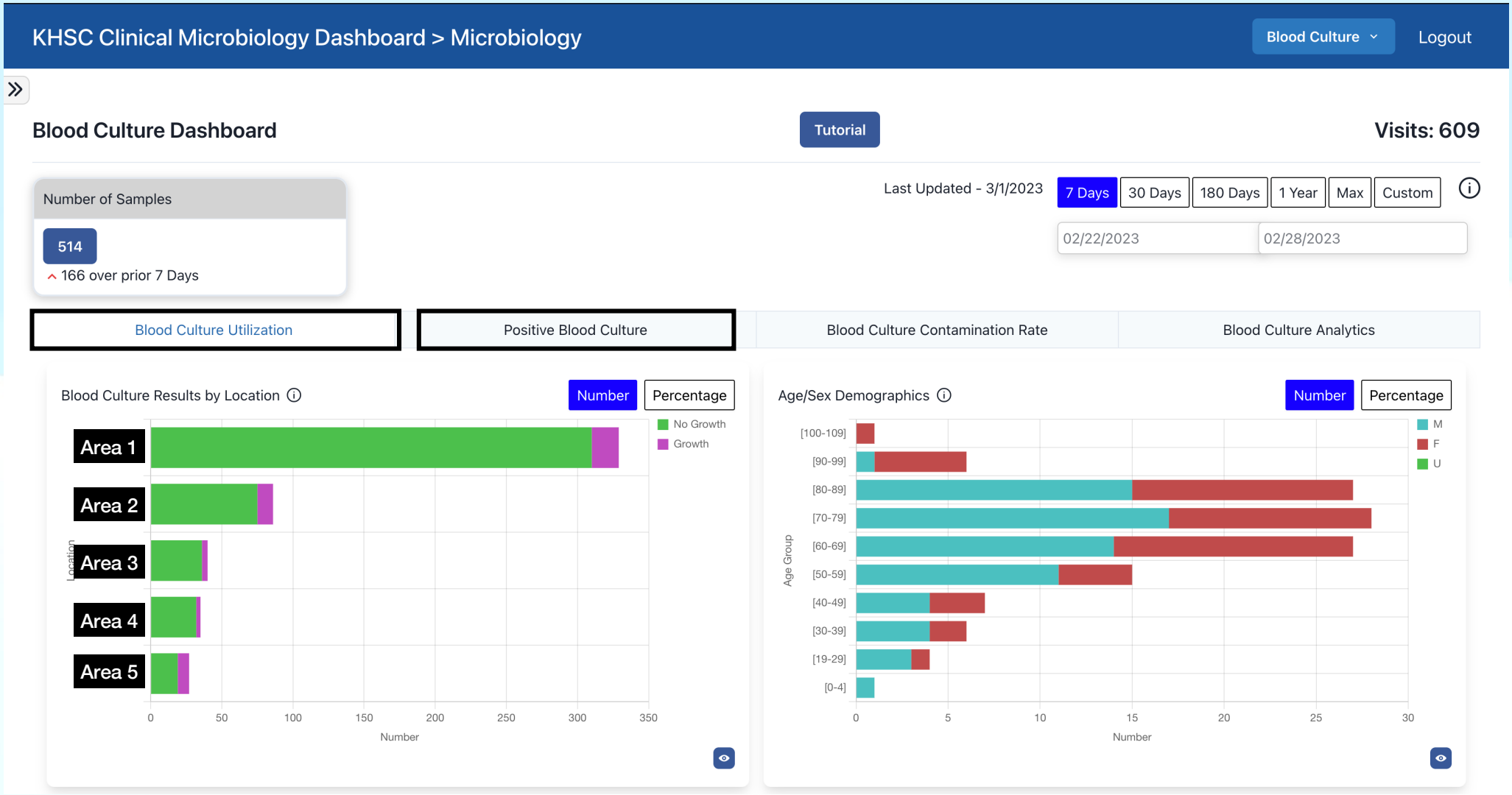
KHSC Blood Culture Monitoring



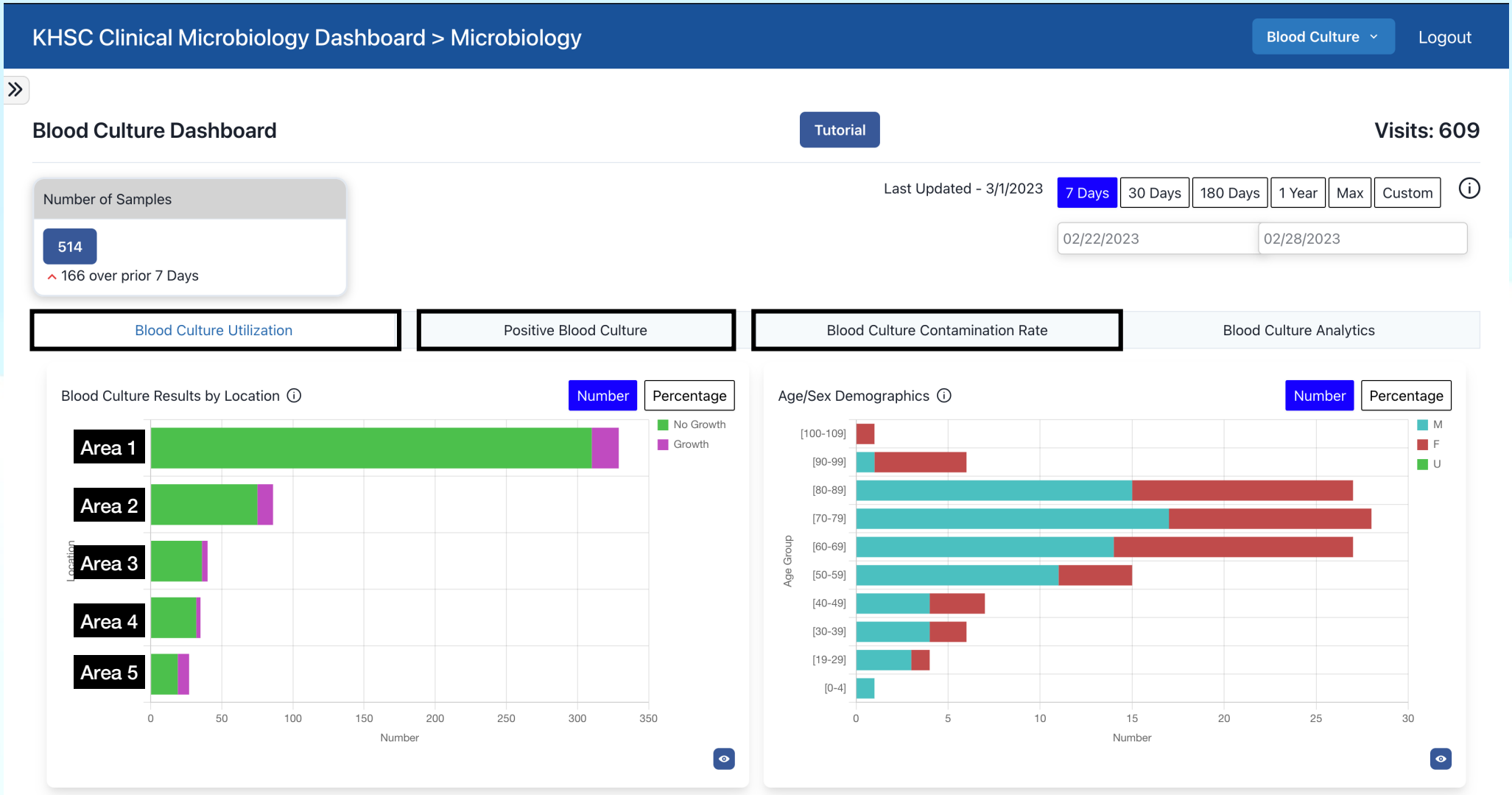
KHSC Blood Culture Monitoring



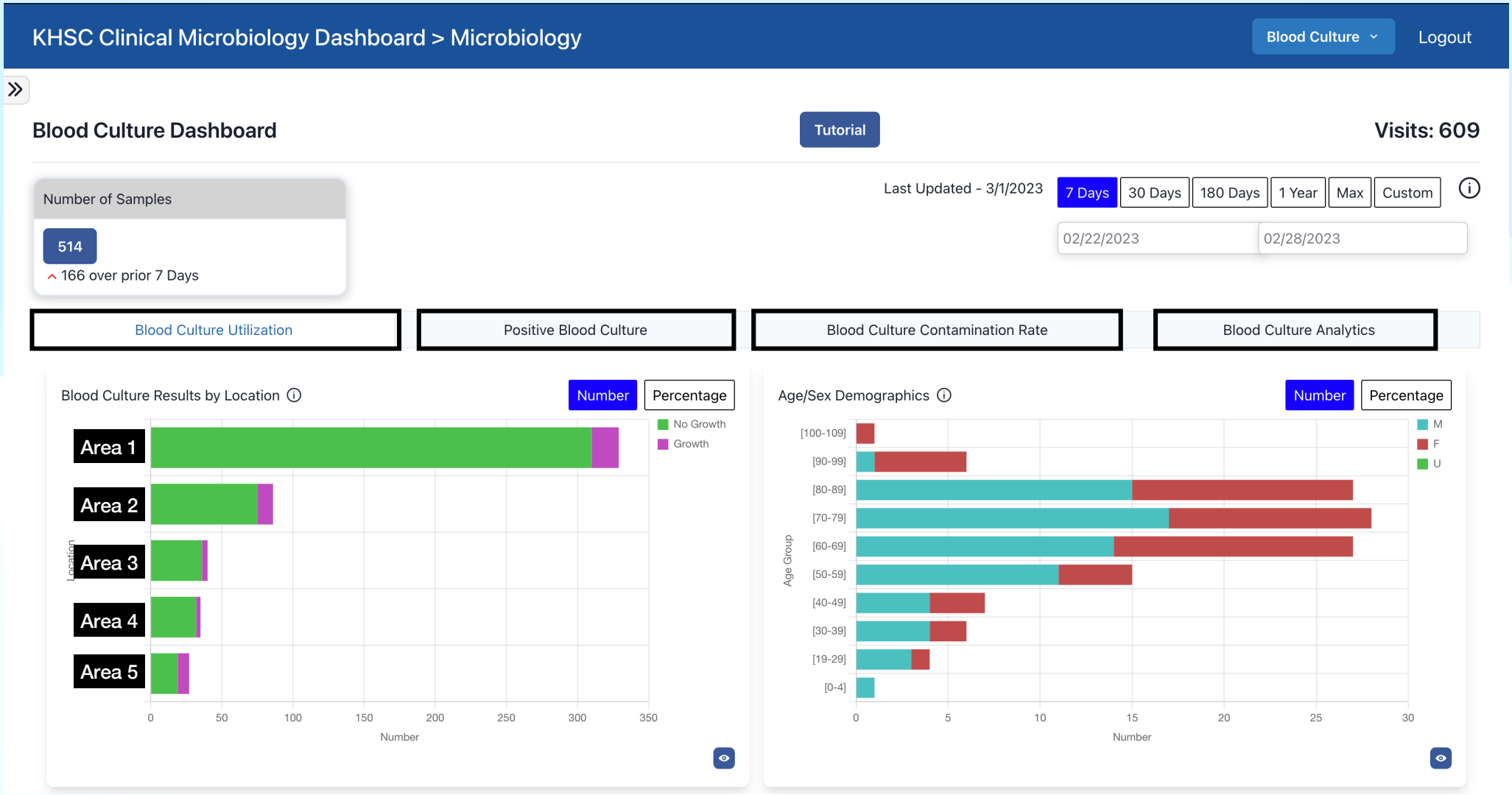
KHSC Blood Culture Monitoring



KHSC Blood Culture Monitoring



KHSC Blood Culture Monitoring



Blood Culture Utilization

KHSC Clinical Microbiology Dashboard > Microbiology

Blood Culture | Logout

Blood Culture Dashboard

Tutorial

Visits: 609

Number of Samples

2171

96 over prior 30 Days

Last Updated - 3/1/2023

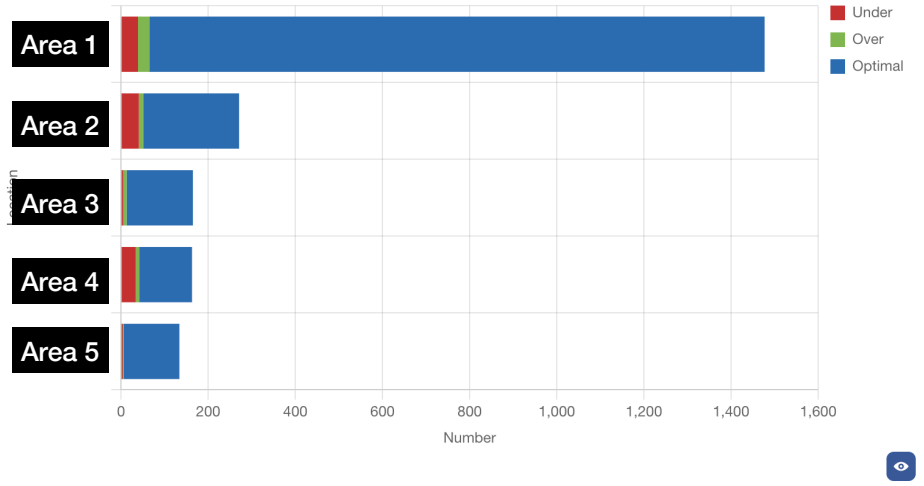
7 Days | 30 Days | 180 Days | 1 Year | Max | Custom

01/30/2023 — 02/28/2023

Blood Culture Utilization | Positive Blood Culture | Blood Culture Contamination Rate | Blood Culture Analytics

Utilization by Location

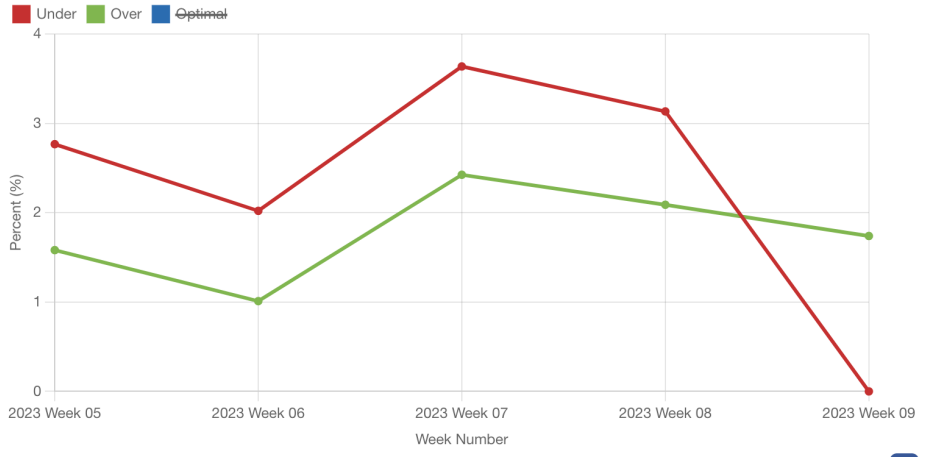
Number | Percentage



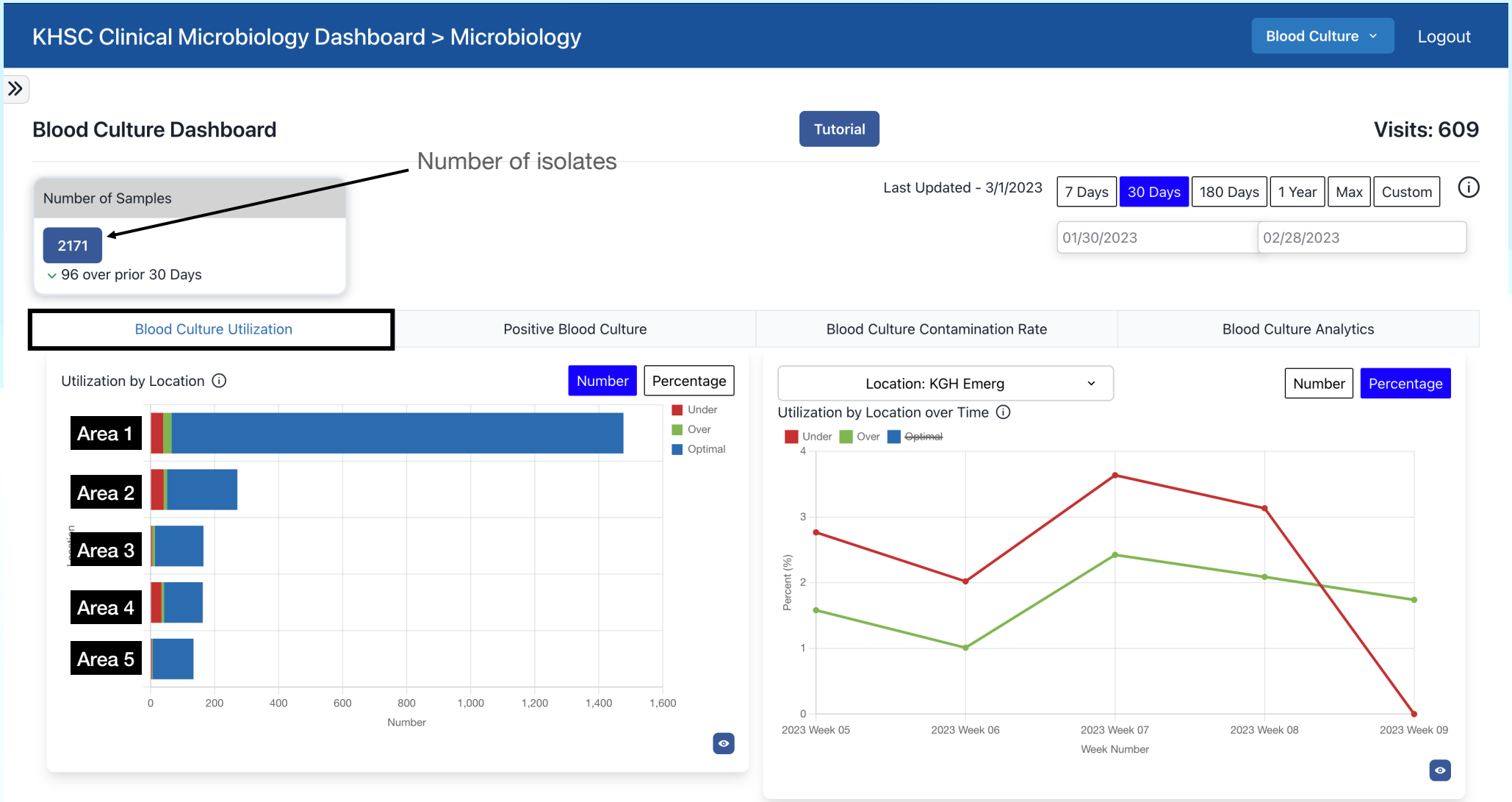
Location: KGH Emerg

Number | Percentage

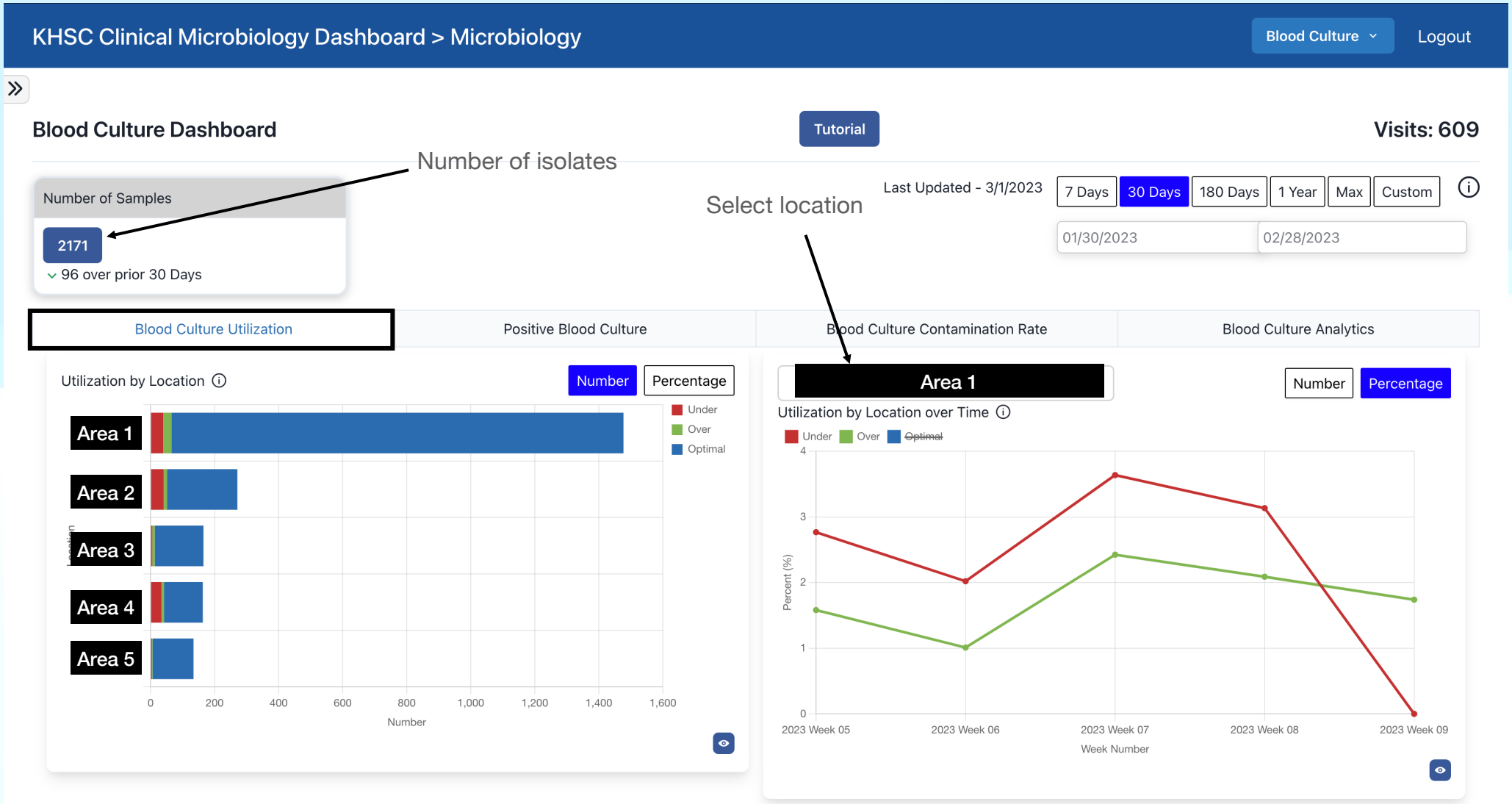
Utilization by Location over Time



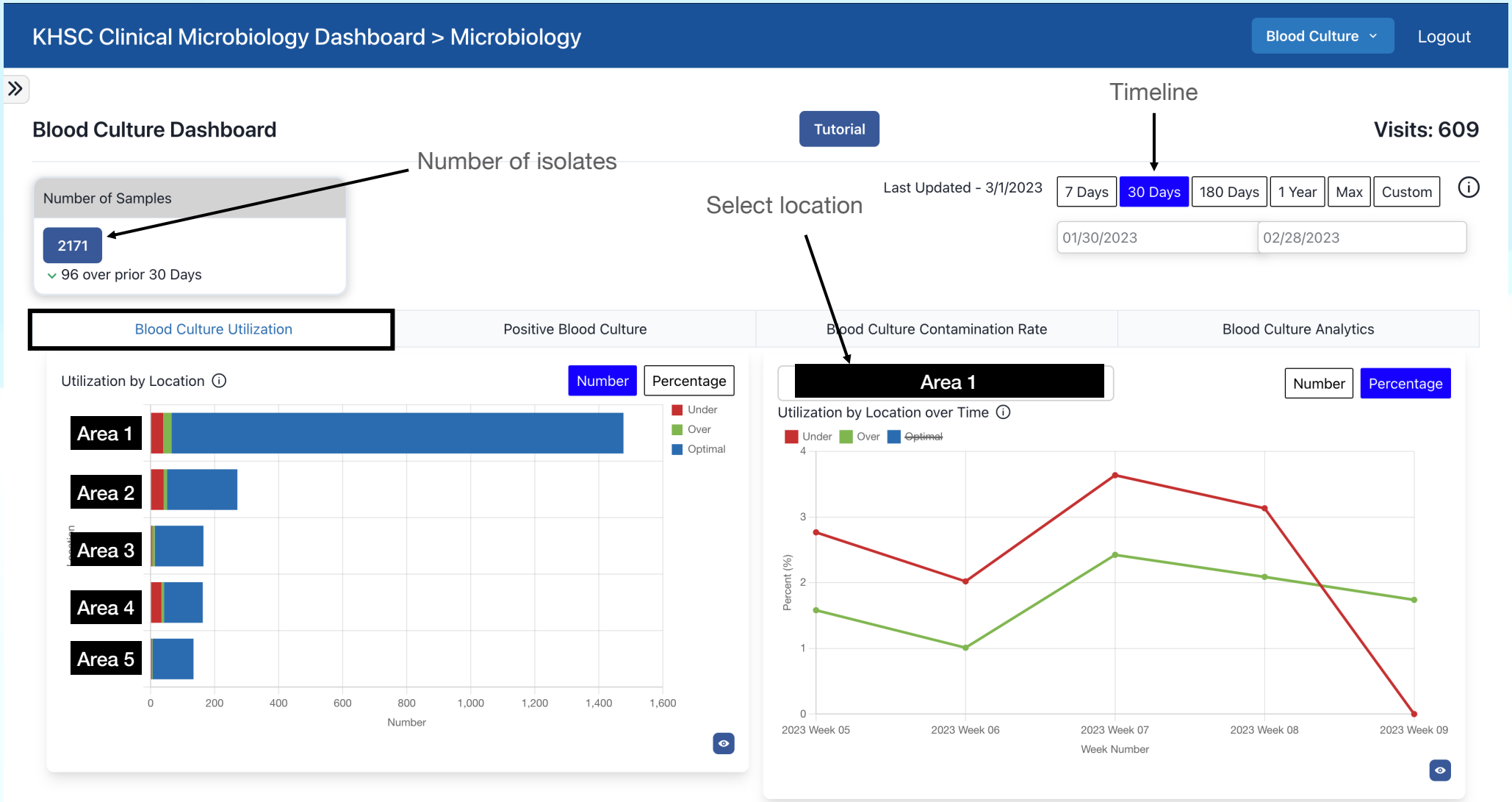
Blood Culture Utilization



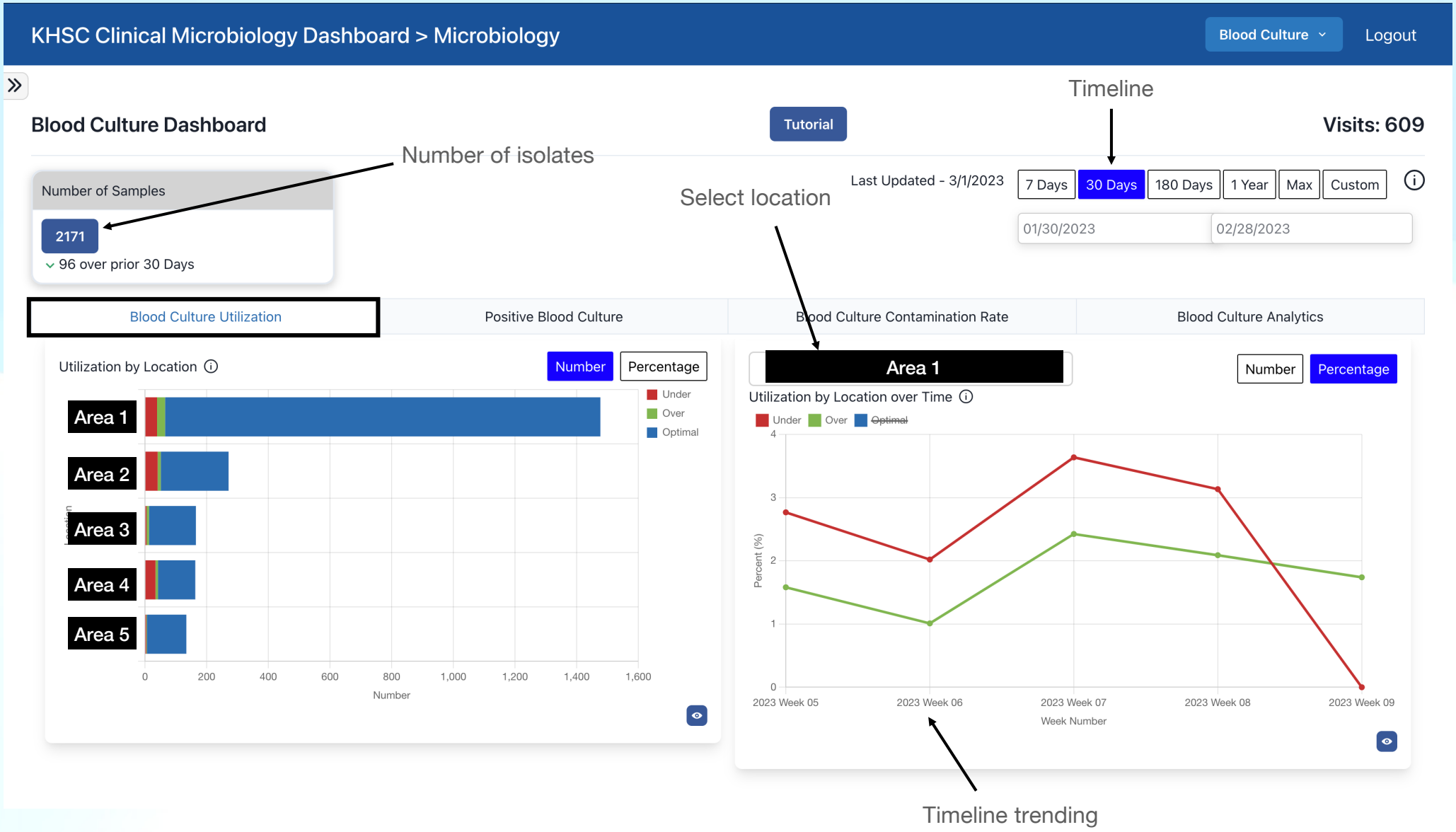
Blood Culture Utilization



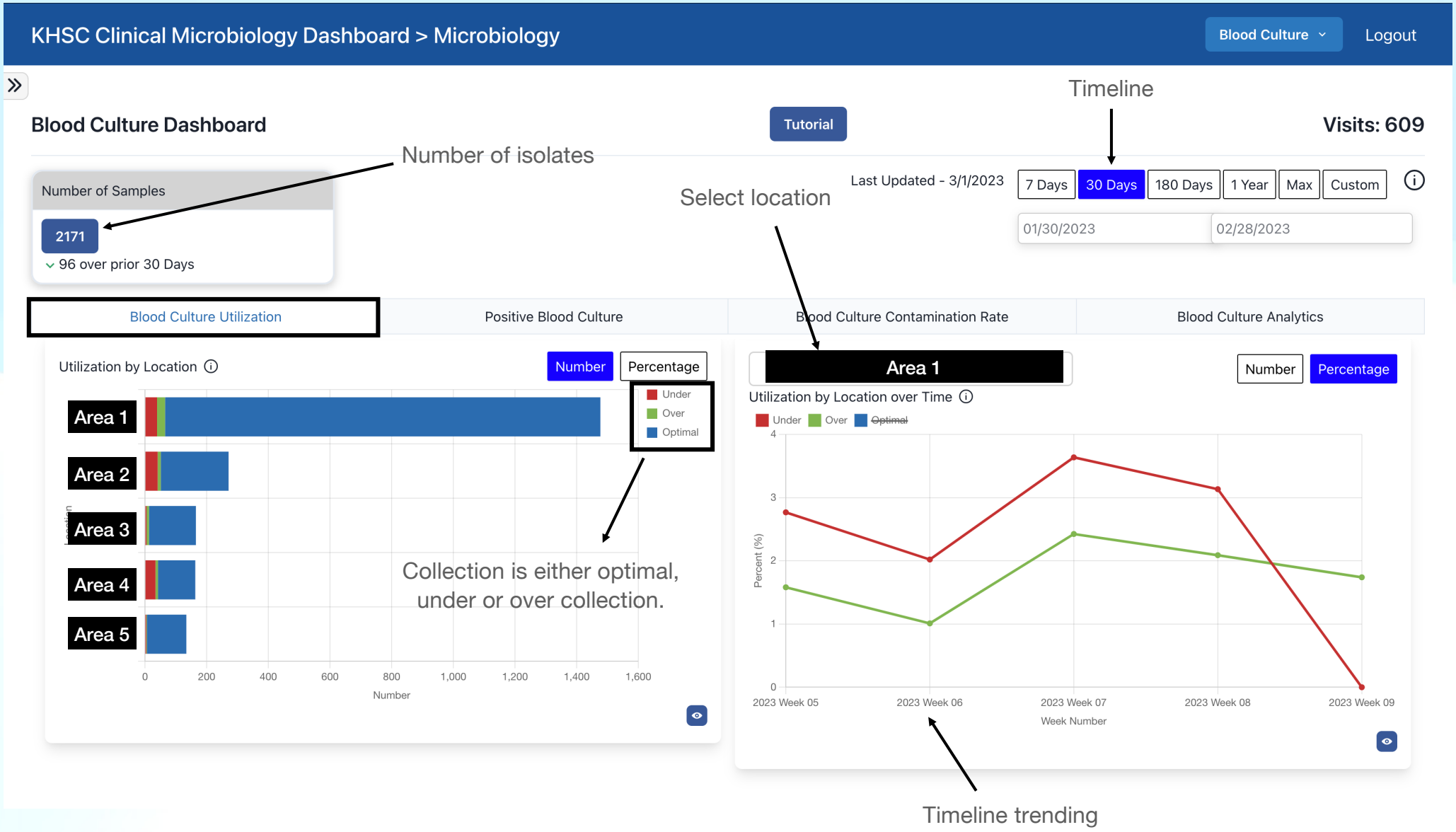
Blood Culture Utilization



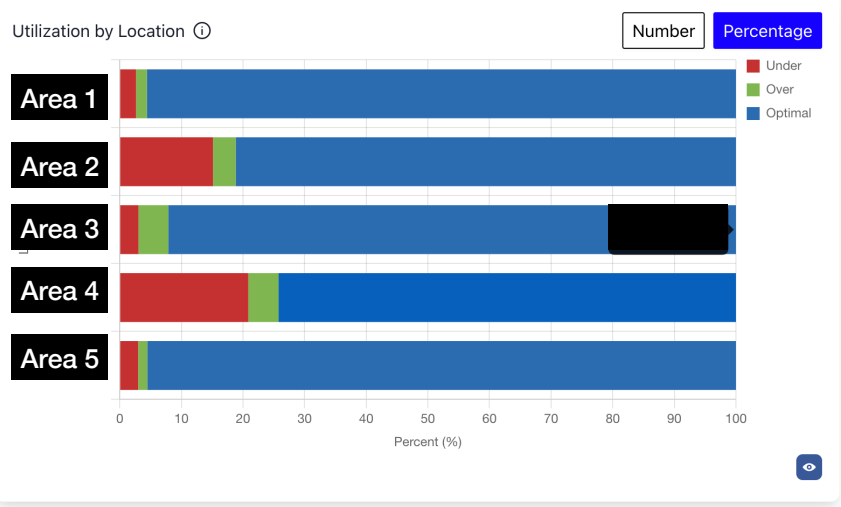
Blood Culture Utilization

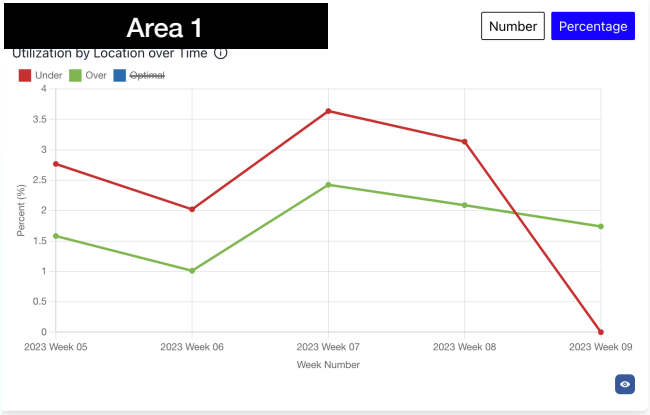


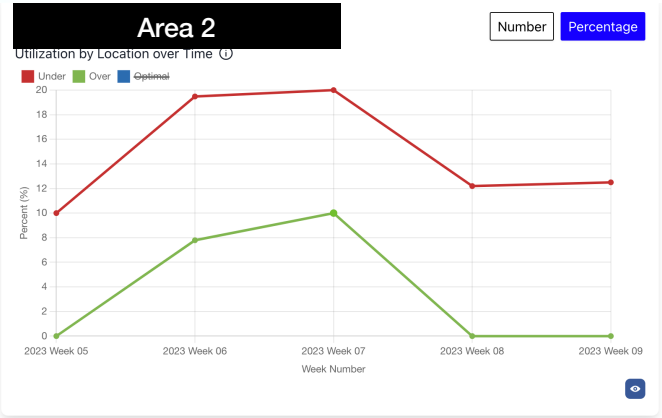
Blood Culture Utilization



Blood Culture Utilization







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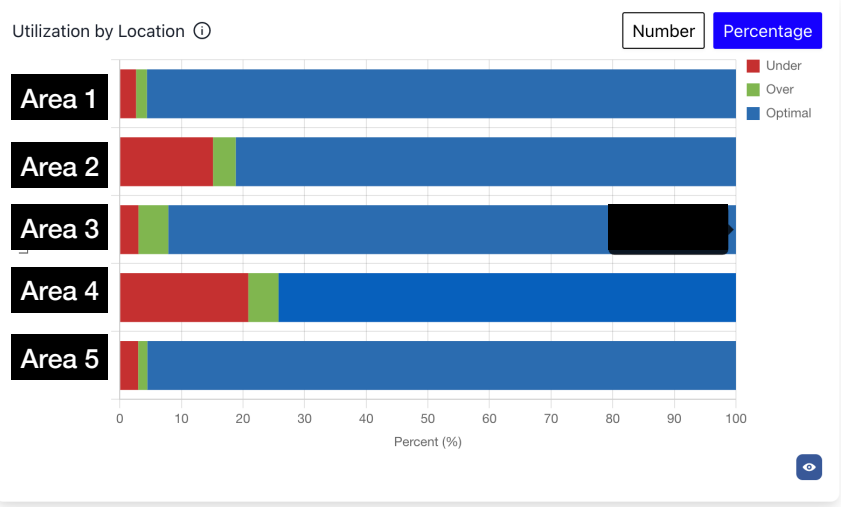

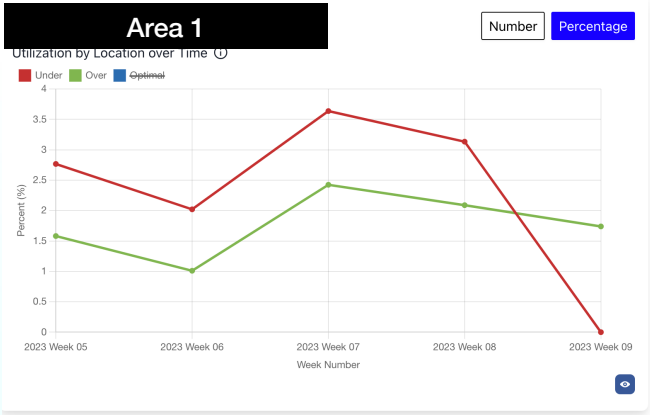

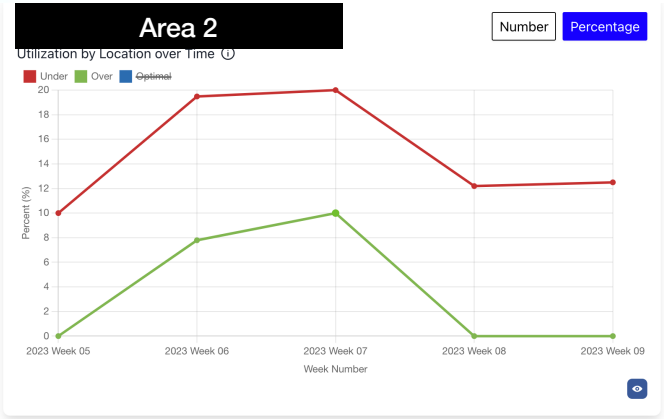

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BMC Research Notes

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Research article | Open Access | Published: 28 August 2015

Correlation between mass and volume of collected blood with positivity of blood cultures

Lariessa Neves, Alexandre Rodrigues Marra, Thiago Zinsly Sampaio Camargo, Maura Cristina dos Santos, Flávia Zulin, Patrícia Candido da Silva, Natália Ariede de Moura, Elivane da Silva Victor, Jacyr Pasternak, Oscar Fernando Pavão dos Santos, Michael B. Edmond & Marines Dalla Valle Martino

BMC Research Notes **8**, Article number: 383 (2015) | Cite this article

3570 Accesses | **14** Citations | Metrics

Abstract

Background

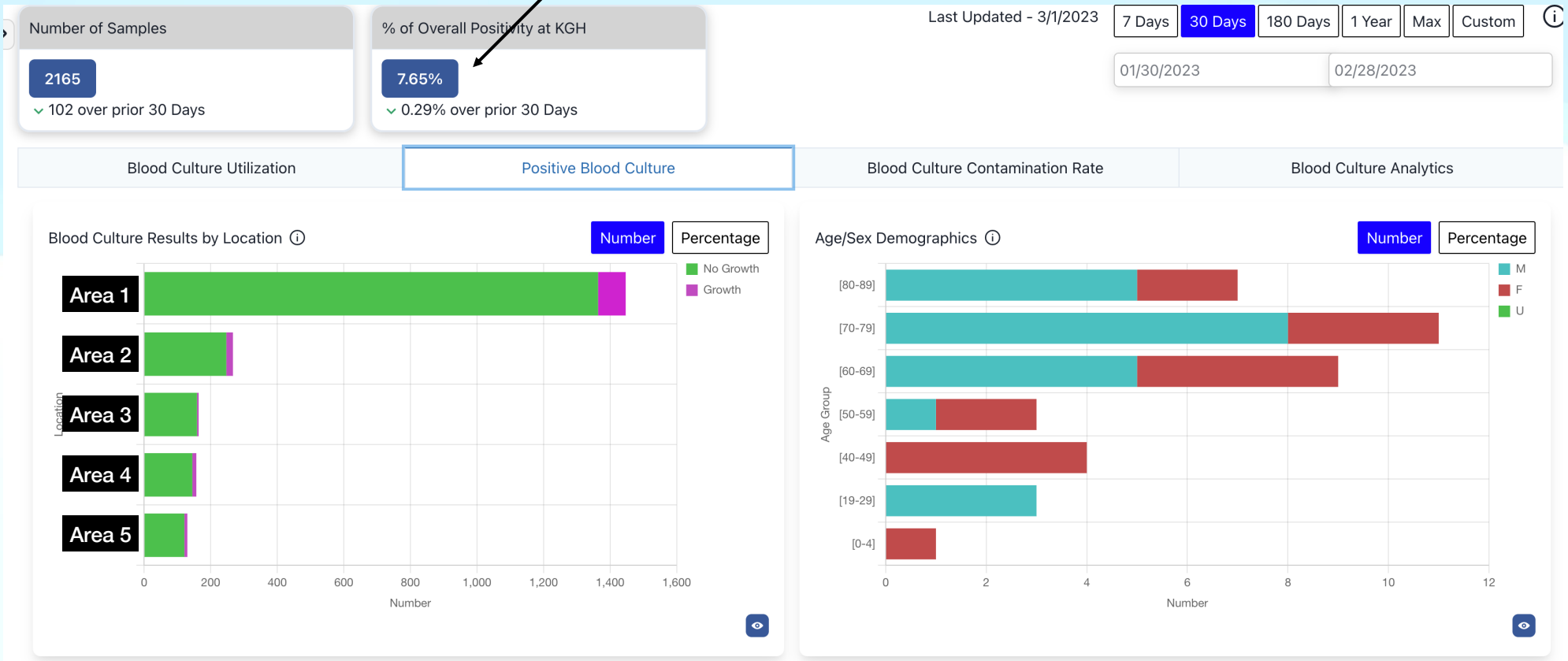
The collection of blood cultures is an extremely important method in the management of patients with suspected infection. Microbiology laboratories should monitor blood culture collection.

Methods

Over an 8-month period we developed a prospective, observational study in an adult Intensive Care Unit (ICU). We correlated the mass contained in the blood vials with blood culture positivity and we also verified the relationship between the mass of blood and blood volume collected for the diagnosis of bloodstream infection (BSI), as well as we explored factors predicting positive blood cultures.

Positive Blood Culture Monitoring

The American Society of Microbiology recommends a rate of positivity of 7-10%.



Positive Blood Culture Monitoring

The American Society of Microbiology recommends a rate of positivity of 7-10%.

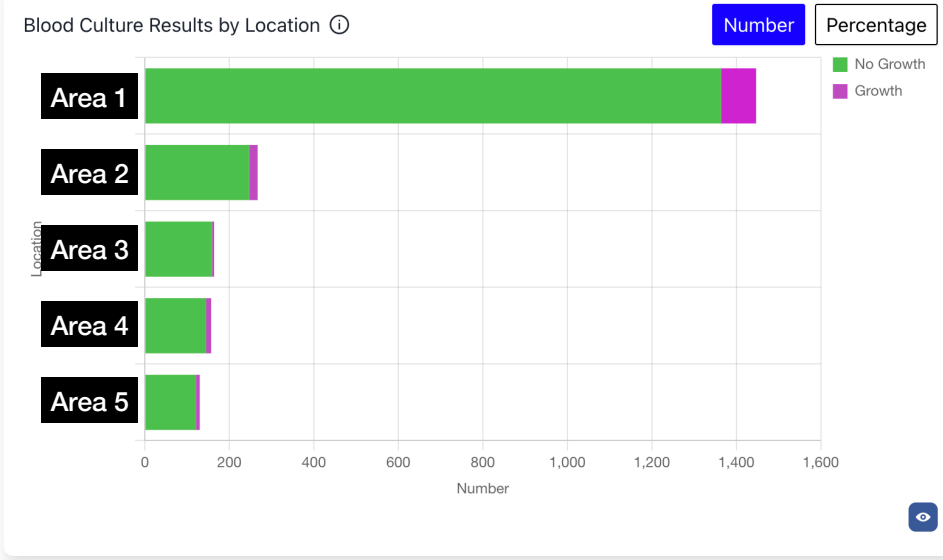
Number of Samples	% of Overall Positivity at KGH
2165	7.65%
102 over prior 30 Days	0.29% over prior 30 Days

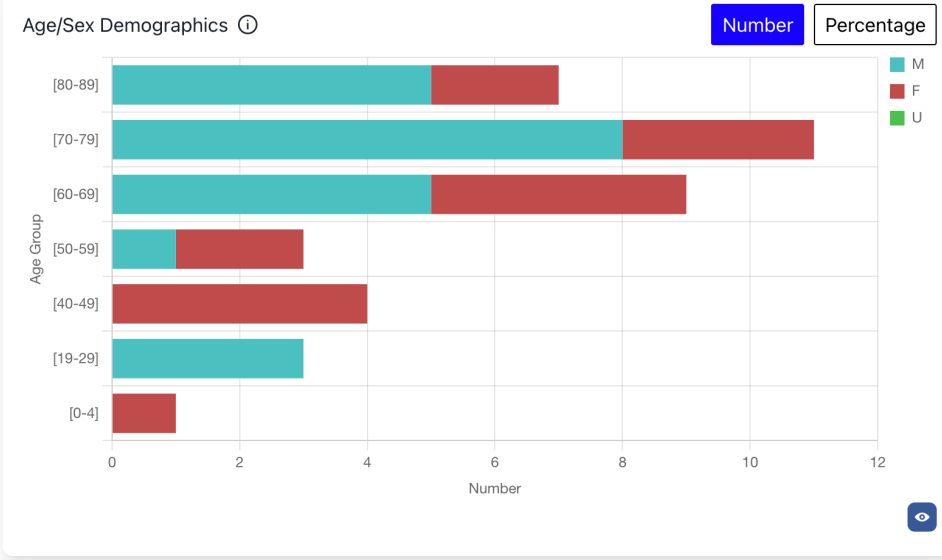
Last Updated - 3/1/2023

7 Days | 30 Days | 180 Days | 1 Year | Max | Custom

01/30/2023 — 02/28/2023

Blood Culture Utilization | Positive Blood Culture | Blood Culture Contamination Rate | Blood Culture Analytics





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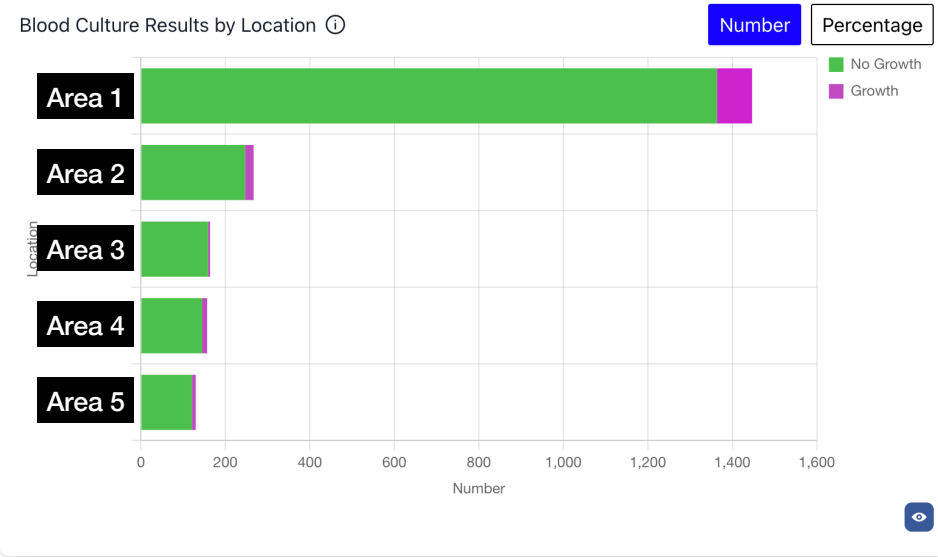
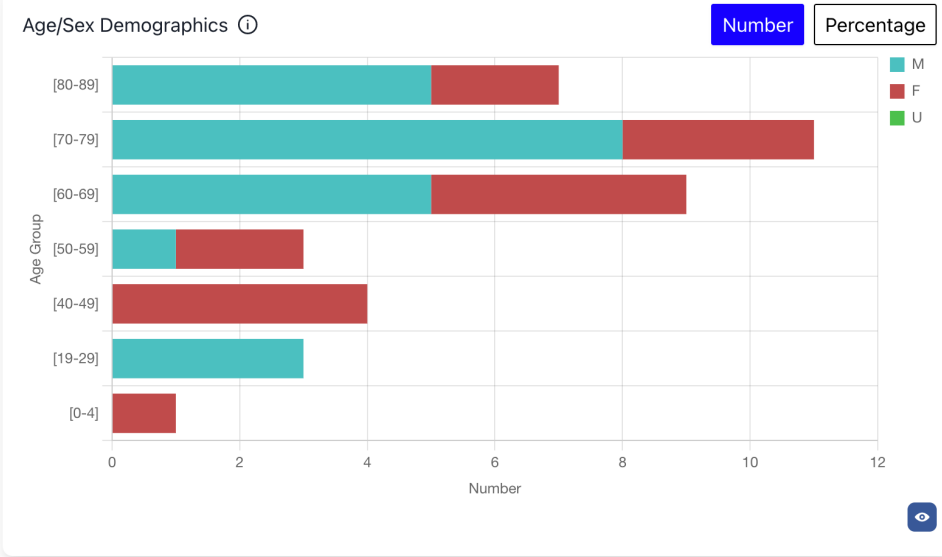




Positive Blood Culture Monitoring

Number of Blood cultures

The American society of Microbiology recommends a rate of positivity of 7-10%.

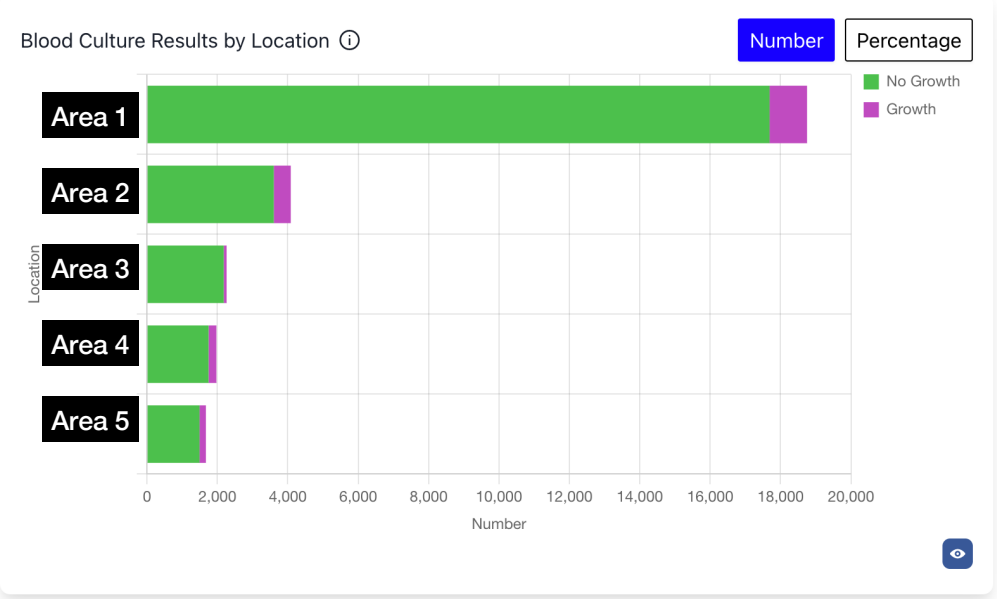
Number of Samples	% of Overall Positivity at KGH
28745	7.88%
1298 over prior 1 Year	1.46% over prior 1 Year

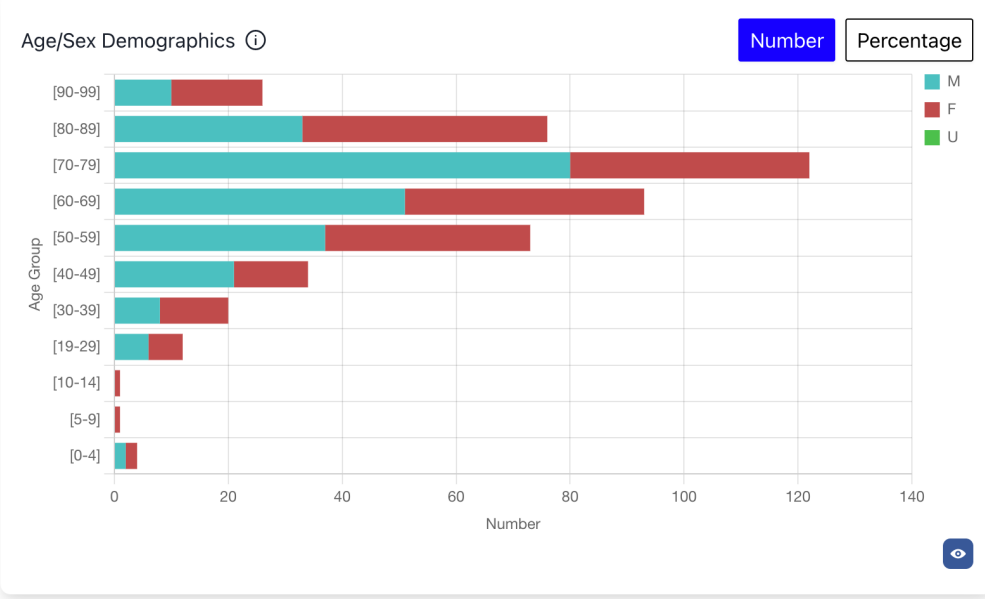
Last Updated - 3/1/2023

7 Days | 30 Days | 180 Days | 1 Year | Max | Custom

03/01/2022 — 02/28/2023

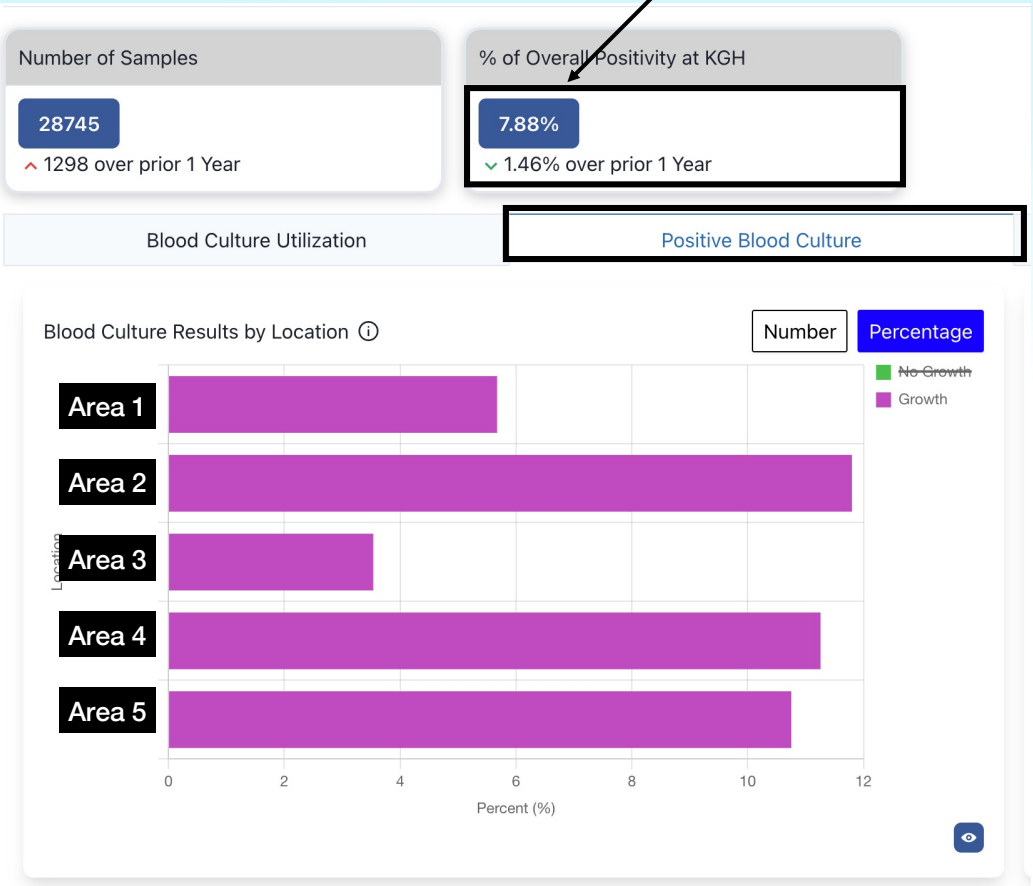
Blood Culture Utilization | Positive Blood Culture | Blood Culture Contamination Rate | Blood Culture Analytics





KHSC Blood Culture Dashboard

The American society of Microbiology recommends a rate of positivity of 7-10%.



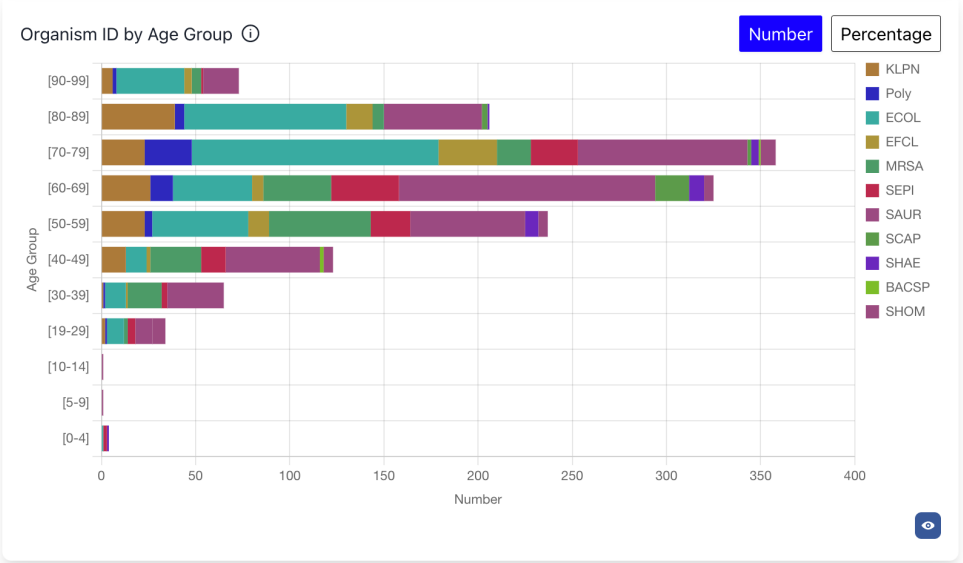
- Several areas in the hospital below and above the recommended threshold.

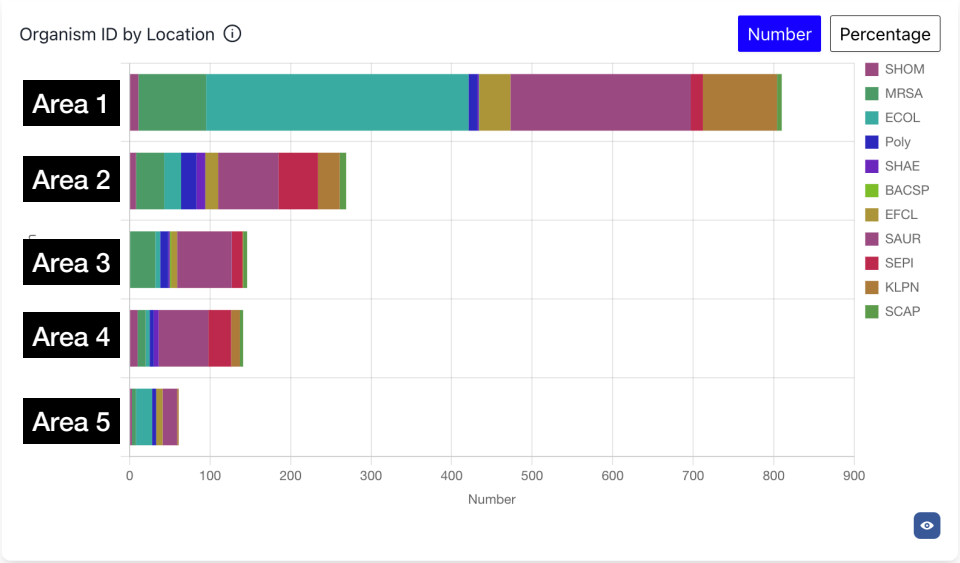
Under 7% = misses bacteremia's.

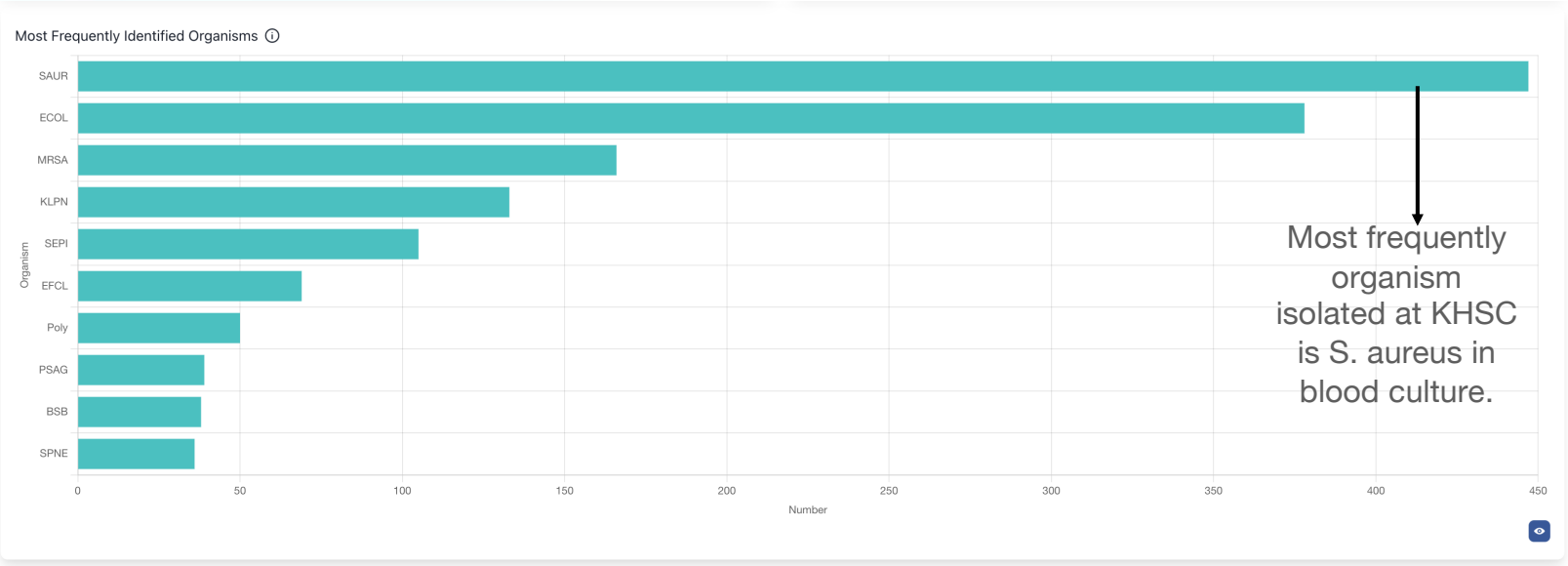
Over 10% = waste of resources, waste of blood with limited diagnostic value.

- We are over collecting in some areas and under collecting in others to balance things out!.

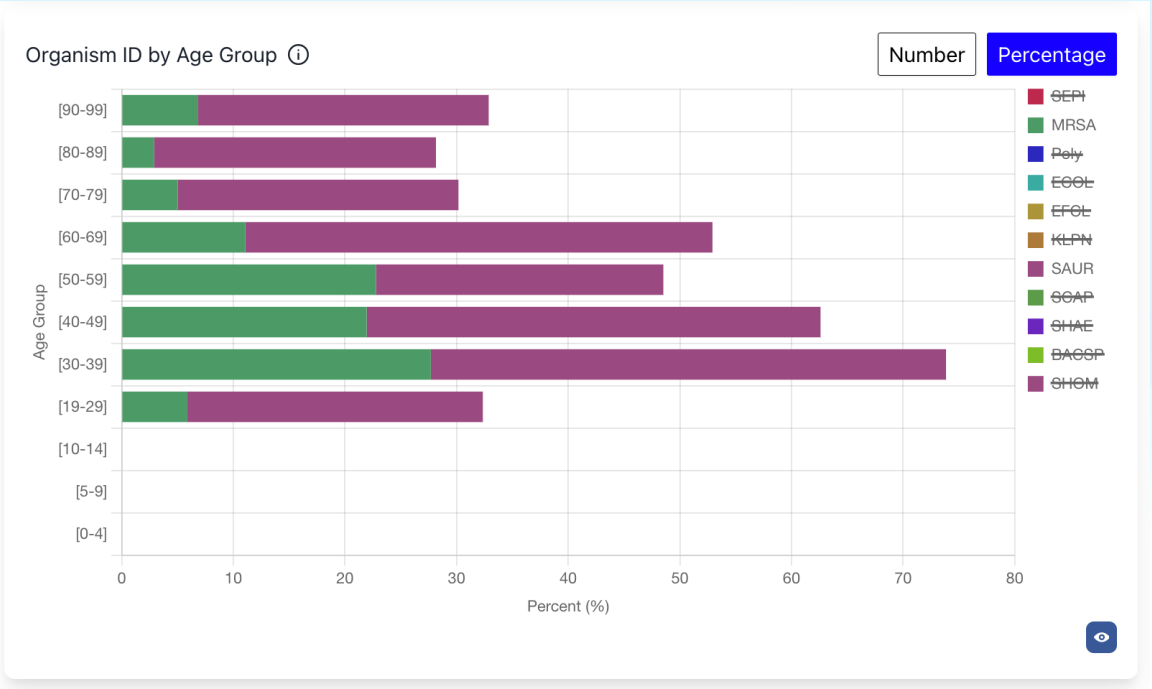
Understand the Epidemiology of Bacteremia at KHSC.





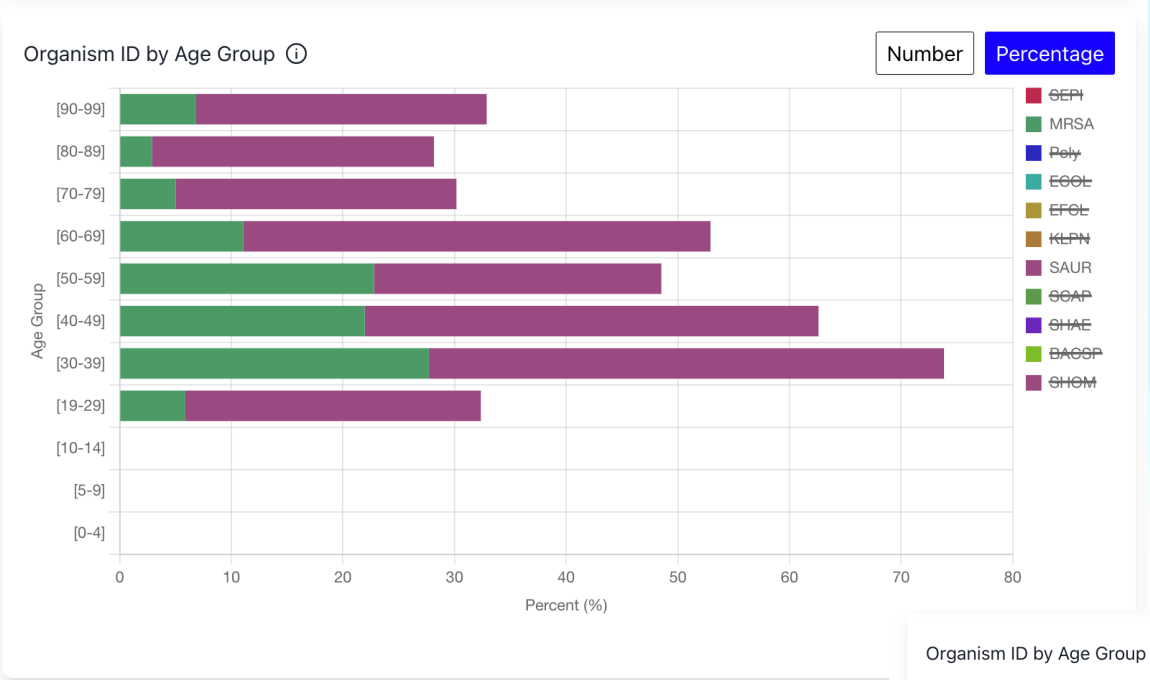


Potential to Inform change?



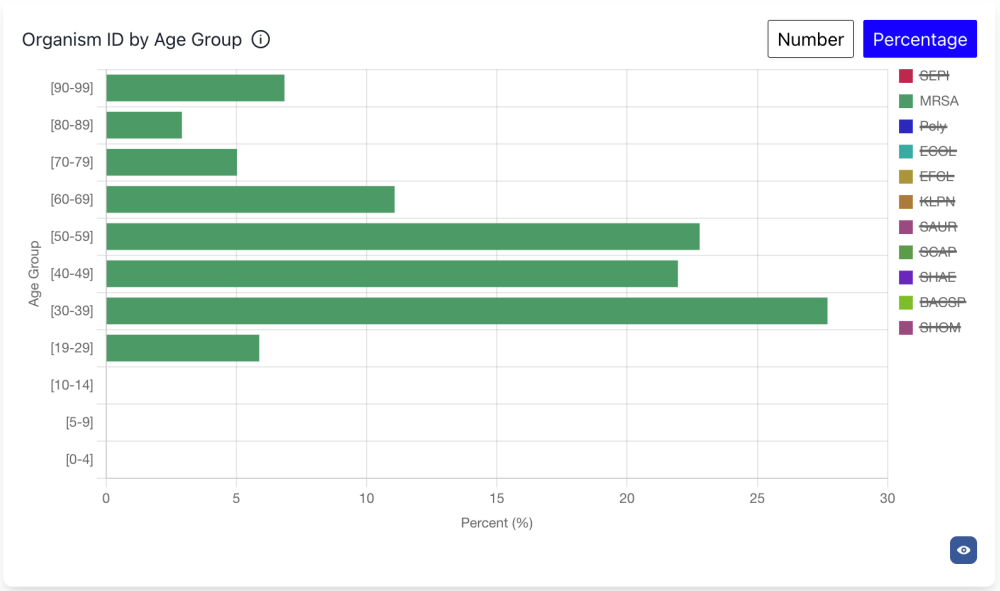
- Our KHSC antibiogram suggests that ~ 25% of our S.aureus are MRSA.
- But MRSA phenotype seems to most commonly seen in patients between the ages of 30 - 59.

Potential to Inform change?

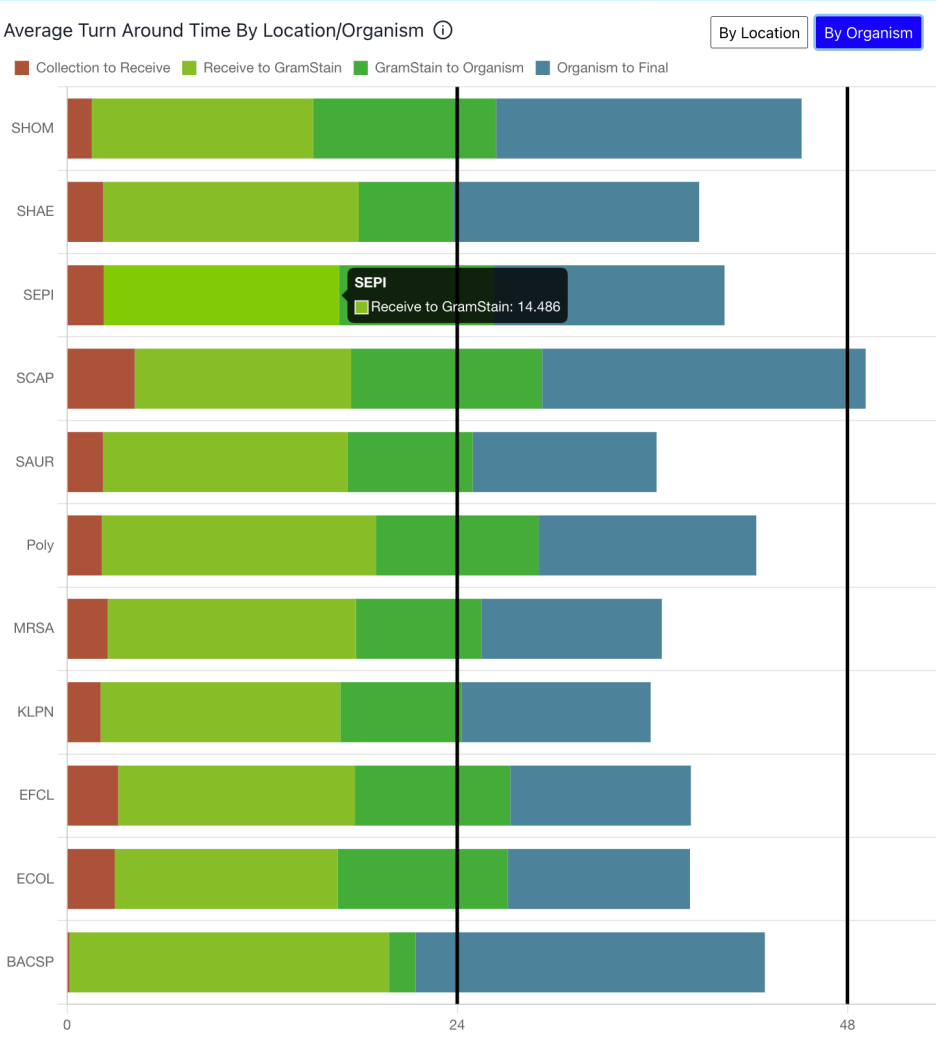


- Our KHSC antibiogram suggests that ~ 25% of our S.aureus are MRSA.
- But MRSA phenotype seems to most commonly seen in patients between the ages of 30 - 59.

- Potential for an age-based interventional approach for antibiotic choice?
- Could we do this for gram negative infections as well based on large data sets ?

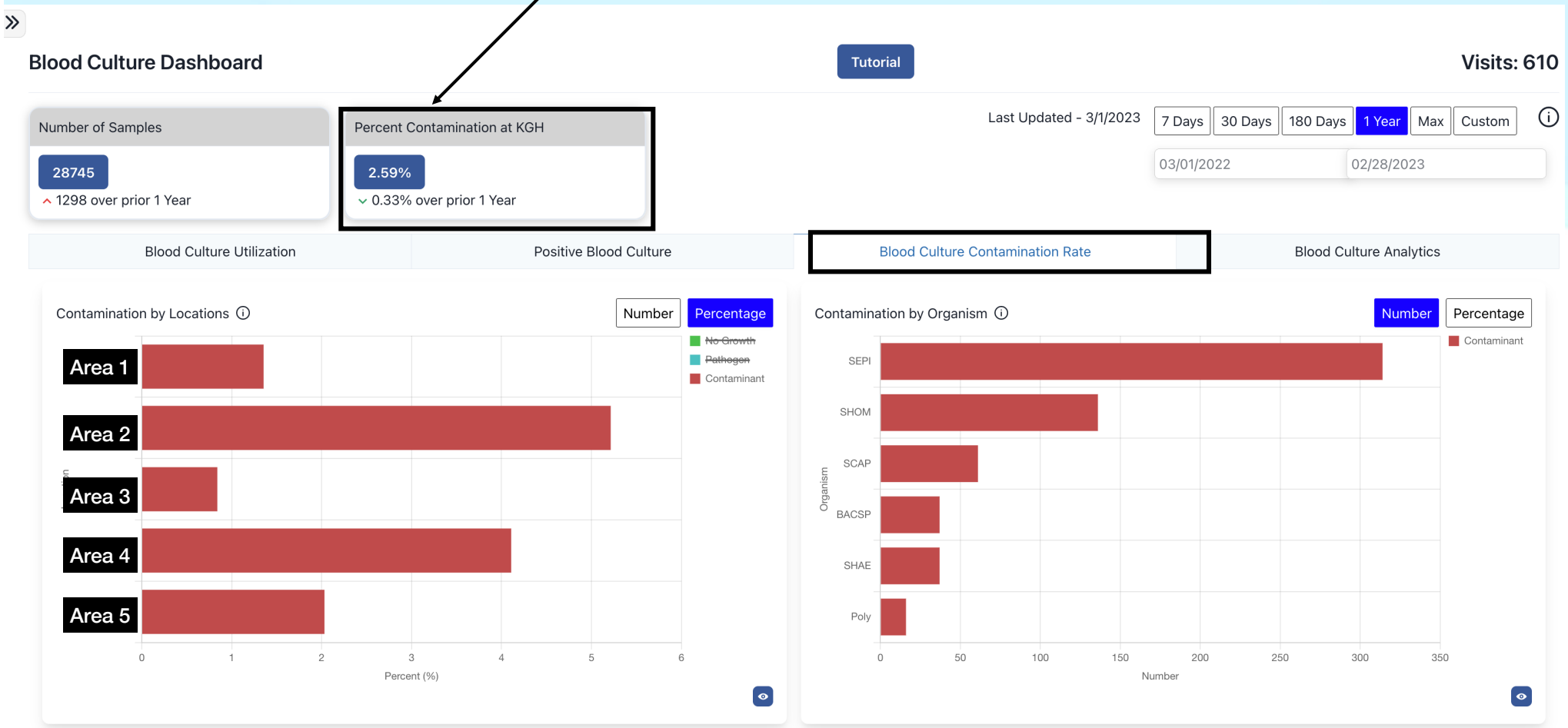


Monitoring Laboratory Metrics

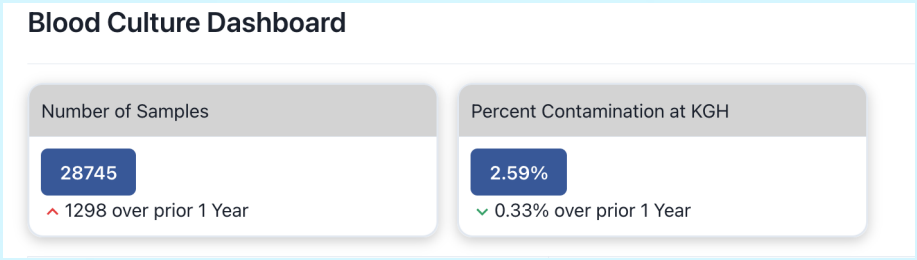


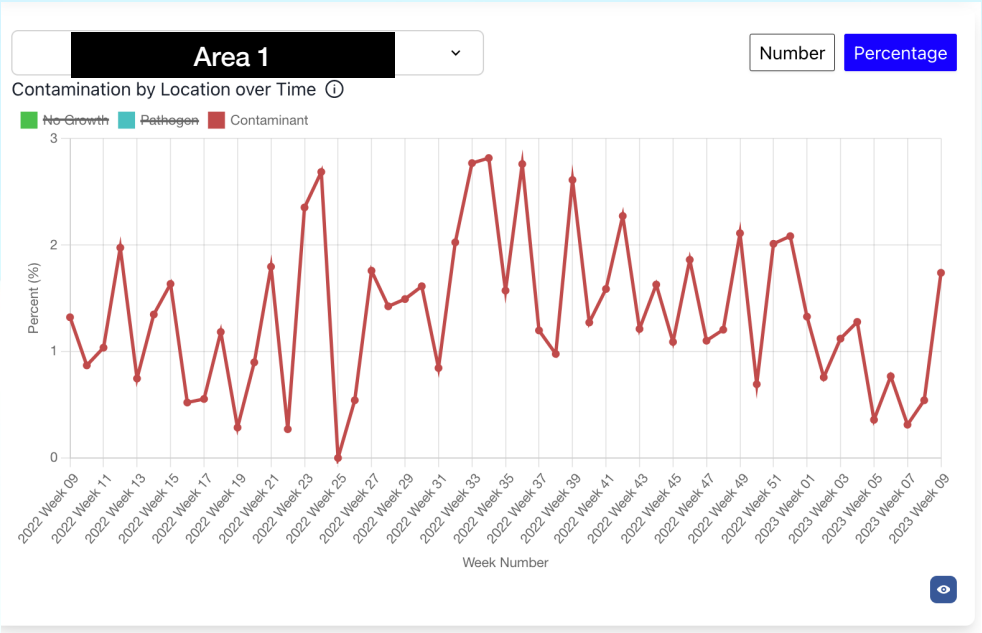
BC Contamination Rates

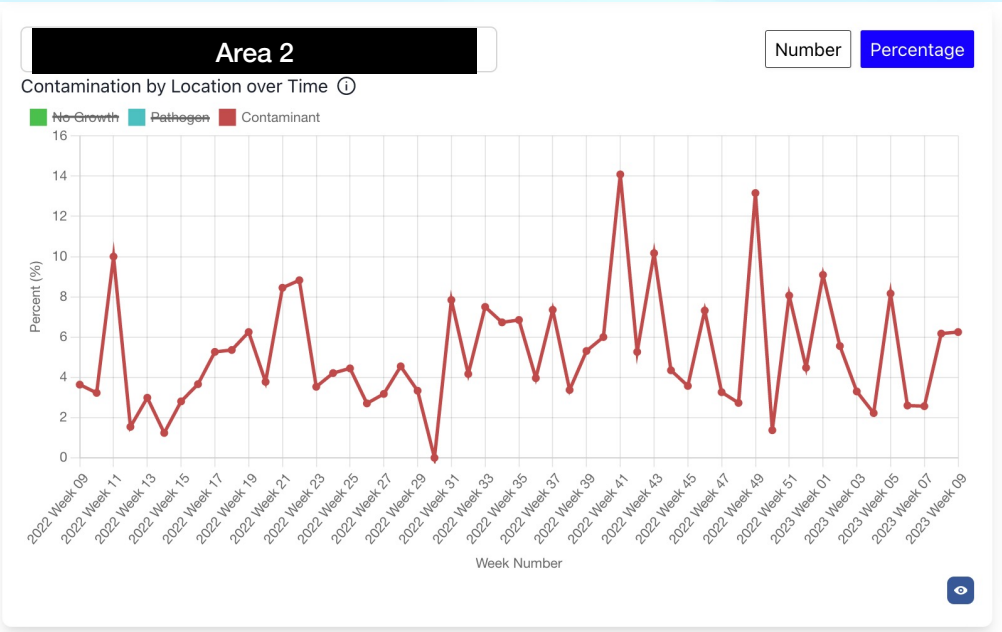
The American society of Microbiology
recommends a contamination rate for Blood cultures < 3%



BC Contamination Rates

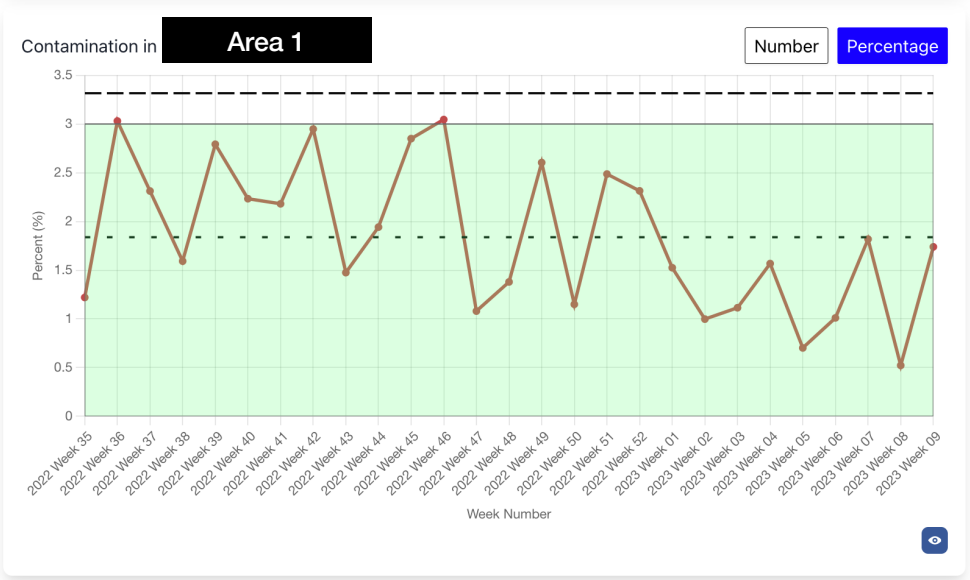




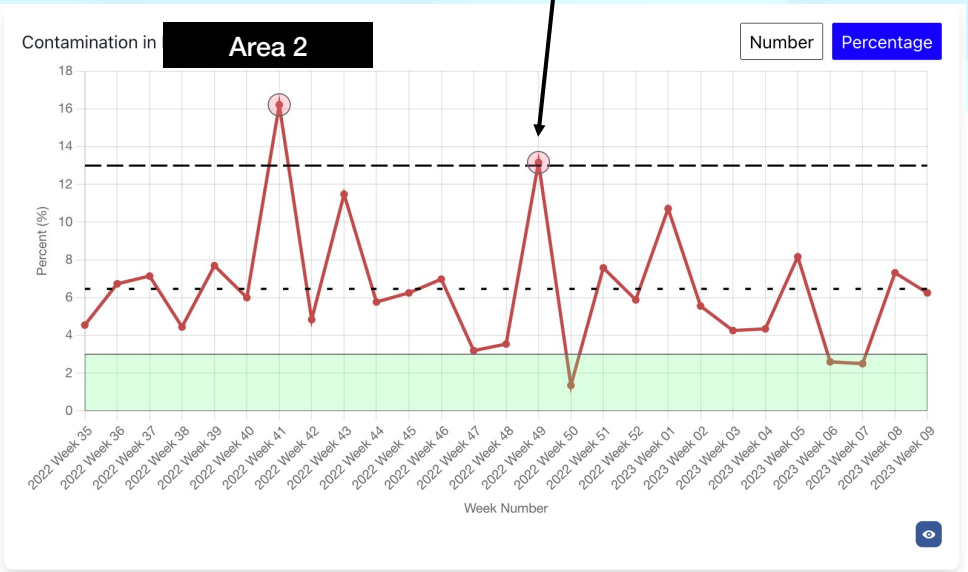


- Again, some areas doing really well and others not doing well. But overall measures miss this opportunity to determine root-cause and potential intervention.

Real-time Analytics and Flags



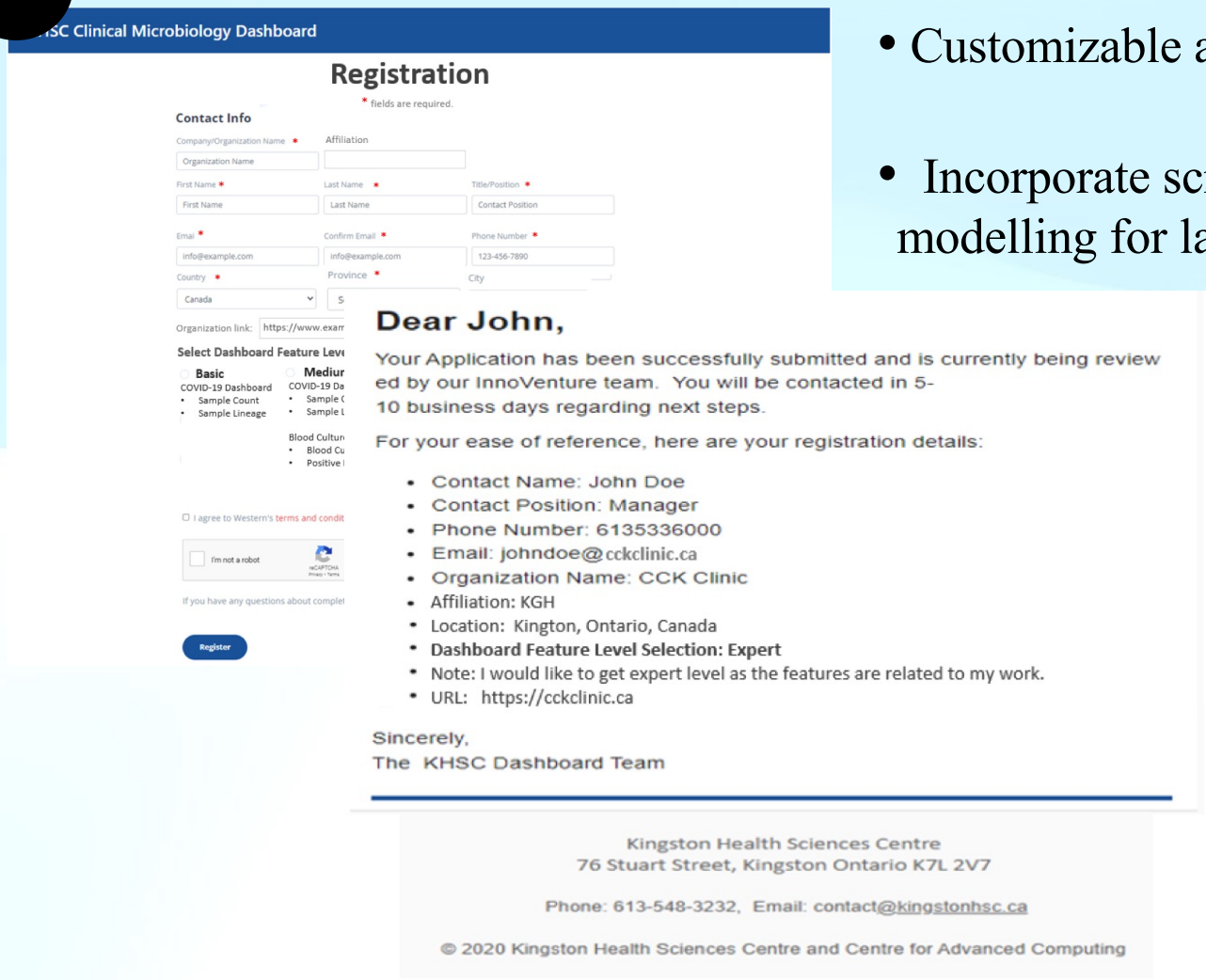
Flags to inform and alert - set to any threshold.
by the user.



- Alert system would include sending an email or a text msg to the interested users.

Next Steps for the M&E system.

1



Dear John,

Your Application has been successfully submitted and is currently being reviewed by our InnoVenture team. You will be contacted in 5-10 business days regarding next steps.

For your ease of reference, here are your registration details:

- Contact Name: John Doe
- Contact Position: Manager
- Phone Number: 6135336000
- Email: johndoe@cckclinic.ca
- Organization Name: CCK Clinic
- Affiliation: KGH
- Location: Kington, Ontario, Canada
- **Dashboard Feature Level Selection: Expert**
- Note: I would like to get expert level as the features are related to my work.
- URL: https://cckclinic.ca

Sincerely,
The KHSC Dashboard Team

Kingston Health Sciences Centre
76 Stuart Street, Kingston Ontario K7L 2V7

Phone: 613-548-3232, Email: contact@kingstonhsc.ca

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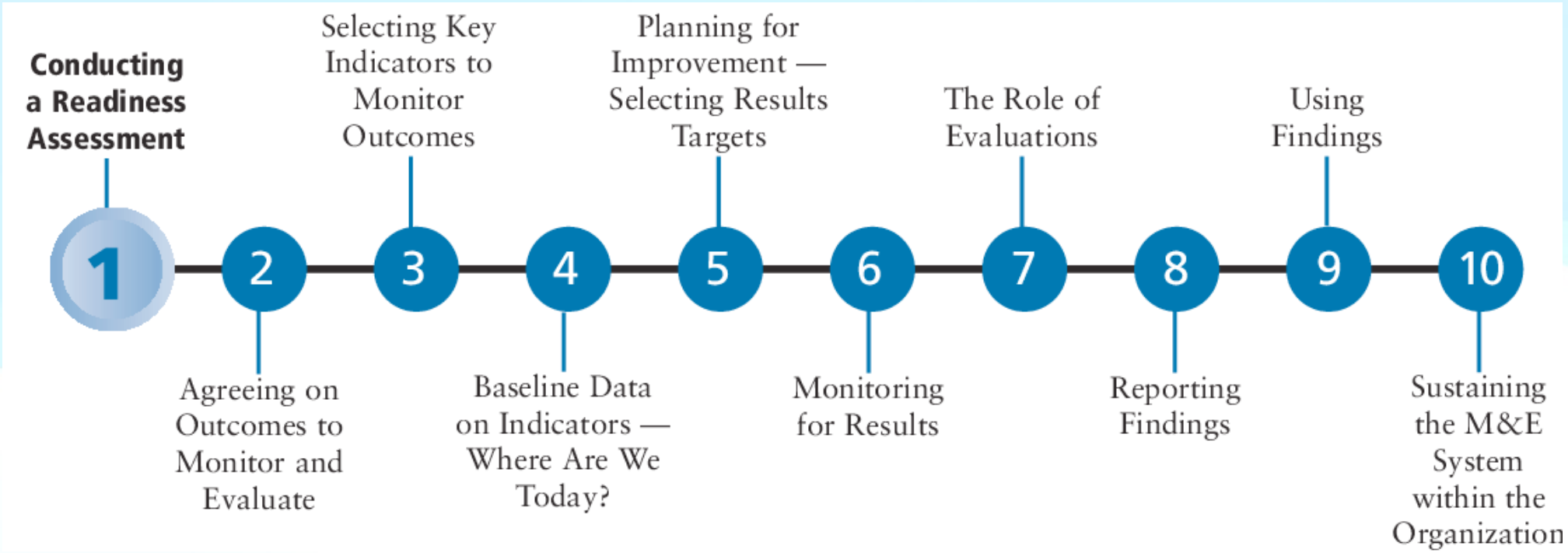
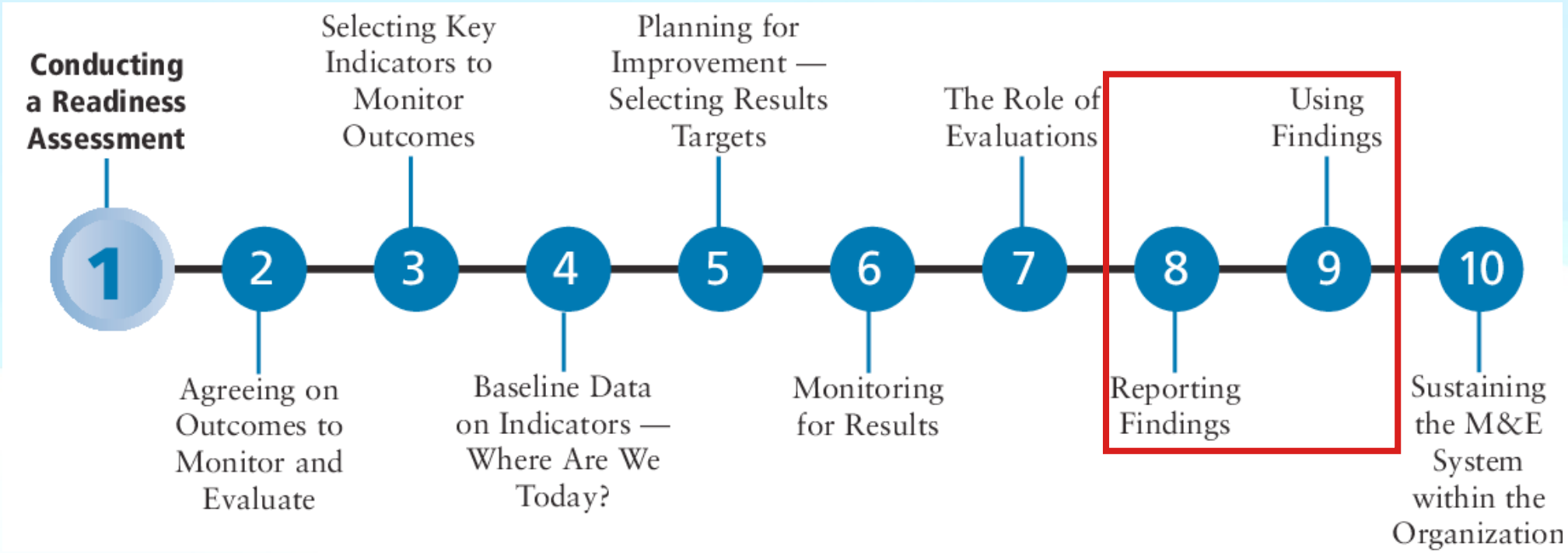
- Customizable automated registration for users.
- Incorporate scripts for forecasting and modelling for laboratory and research needs.

Next Steps


Conducting a Readiness Assessment
1
Agreeing on Outcomes to Monitor and Evaluate
2
Selecting Key Indicators to Monitor Outcomes
3
Baseline Data on Indicators — Where Are We Today?
4
Planning for Improvement — Selecting Results Targets
5
Monitoring for Results
6
The Role of Evaluations
7
Reporting Findings
8
Using Findings
9
Sustaining the M&E System within the Organization
10

Next Steps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5 Planning for Improvement — Selecting Results Targets
6 Monitoring for Results
7 The Role of Evaluations
8 Reporting Findings
9 Using Findings
10 Sustaining the M&E System within the Organization

Respiratory Viruses Monitoring

Respiratory Dashboard

Report Preview | Tutorial | Visits: 1017

RESP 1 Positivity Total Specimens: 6333

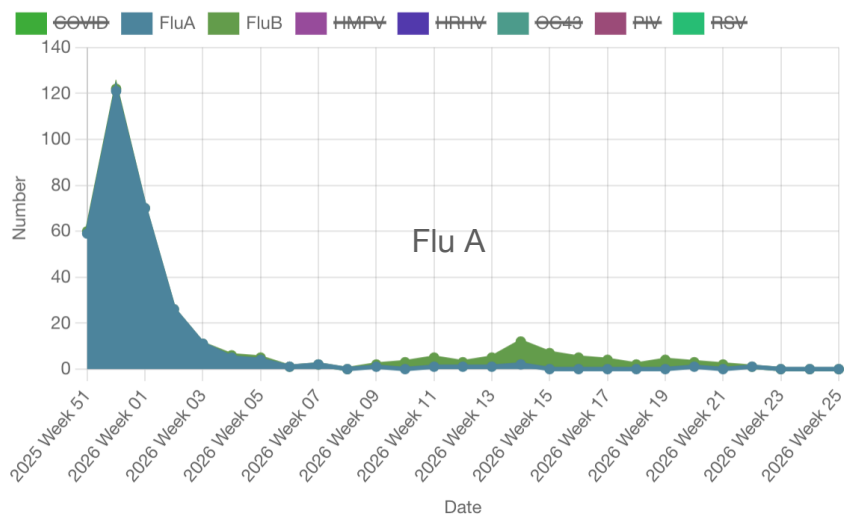
VIRUS	COUNT	PERCENT
COVID	198 (▲ 20)	3.09% (— 0%)
FluA	307 (▲ 129)	4.79% (▲ 1%)
FluB	54 (▲ 53)	0.84% (— 0%)
RSV	236 (▲ 221)	3.68% (▲ 3%)
Total	795 (▲ 423)	12.41% (▲ 4%)

RESP 2 Positivity Total Specimens: 5409

VIRUS	COUNT	PERCENT
OC43	33 (▲ 29)	0.52% (— 0%)
HMPV	109 (▲ 103)	1.70% (▲ 1%)
PIV	52 (▲ 22)	0.81% (— 0%)
HRHV	250 (▼ 143)	3.90% (▼ 4%)
Total	444 (▲ 11)	7.00% (▼ 1%)

Last Updated: 6/15/2026

Positive Tests Over Time by Viruses ⓘ — Number | Percentage

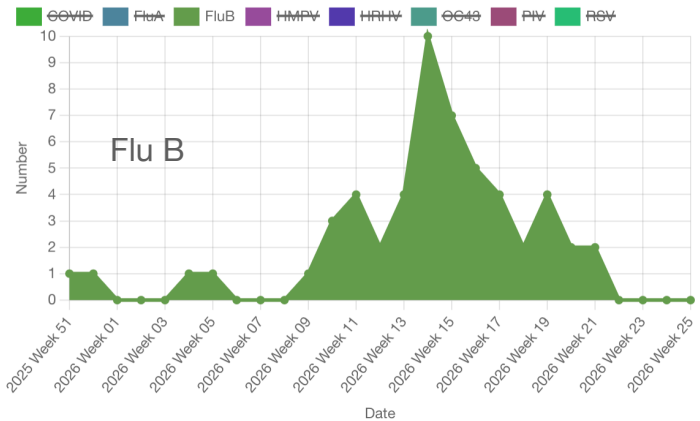


Show results for the past: ⓘ

7 Days | 30 Days | 180 Days | 1 Year | Max | Custom

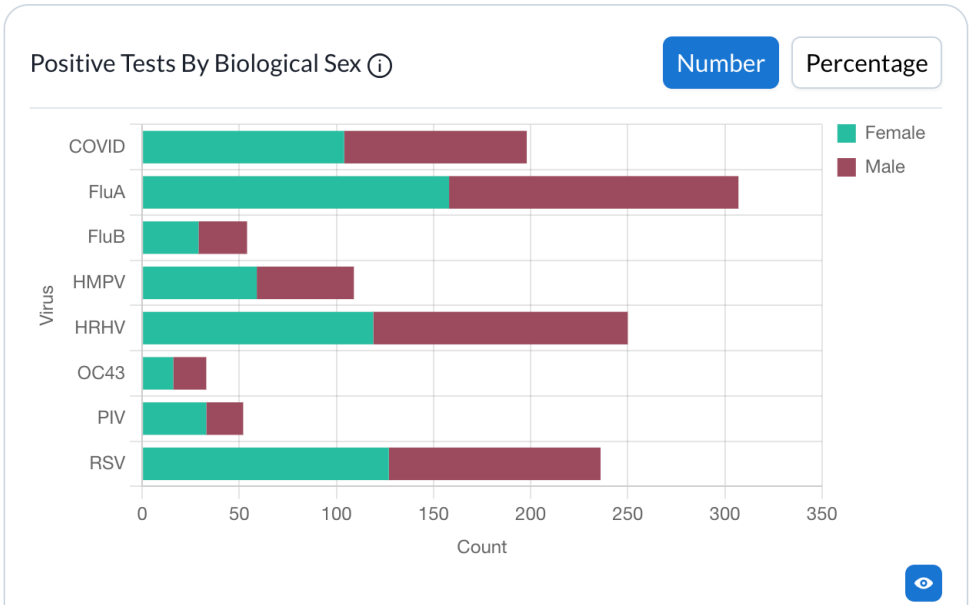
12/17/2025

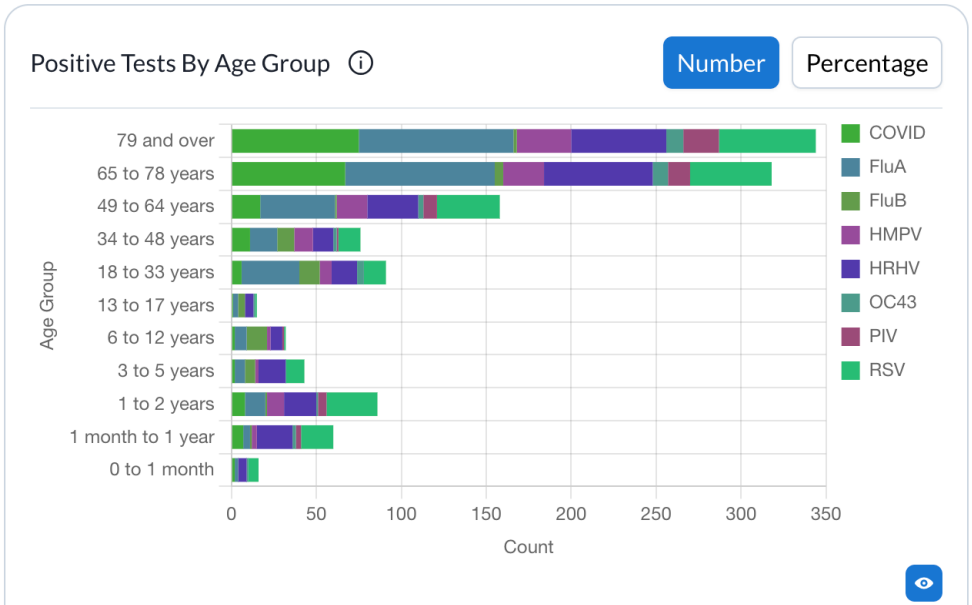
Positive Tests Over Time by Viruses ⓘ — Number | Percentage

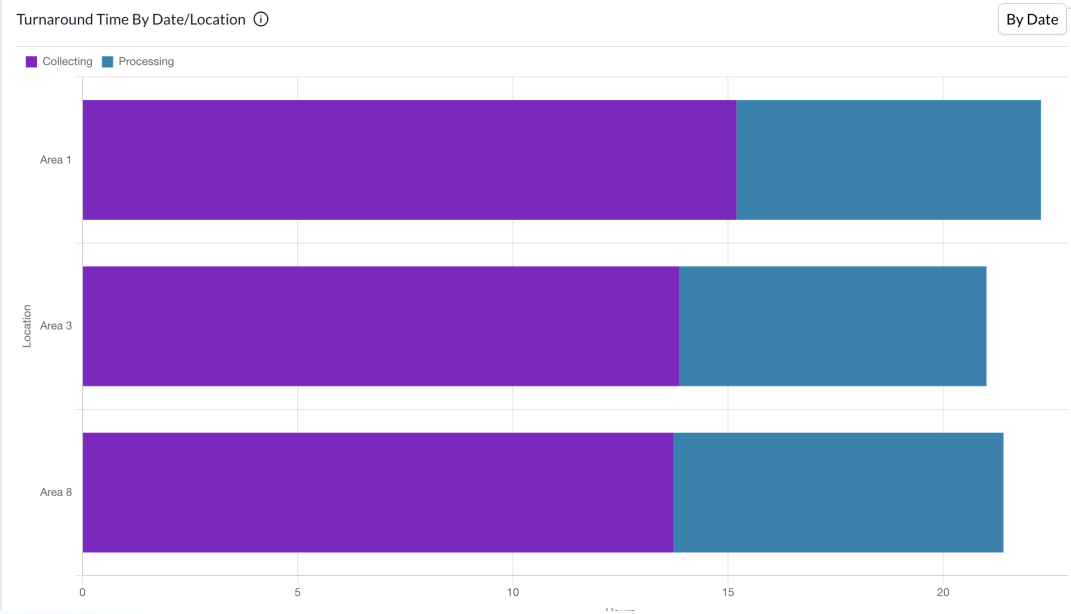


Respiratory Virus Epidemiology

Cases Over Time | **Demographics** | Turnaround Time | Threshold Insights

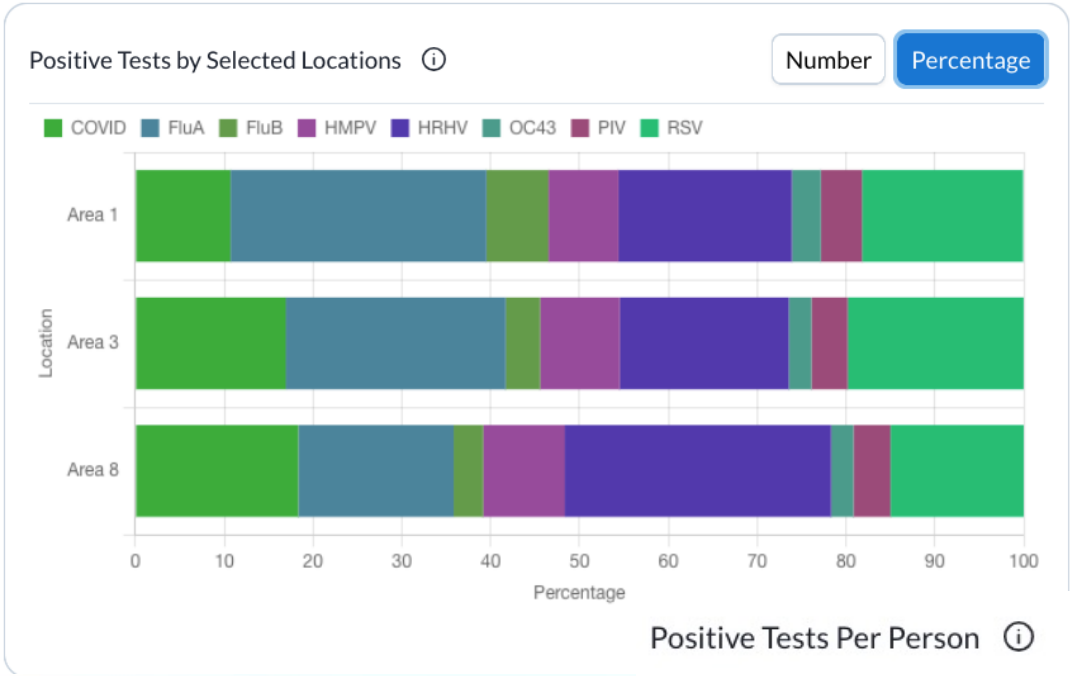


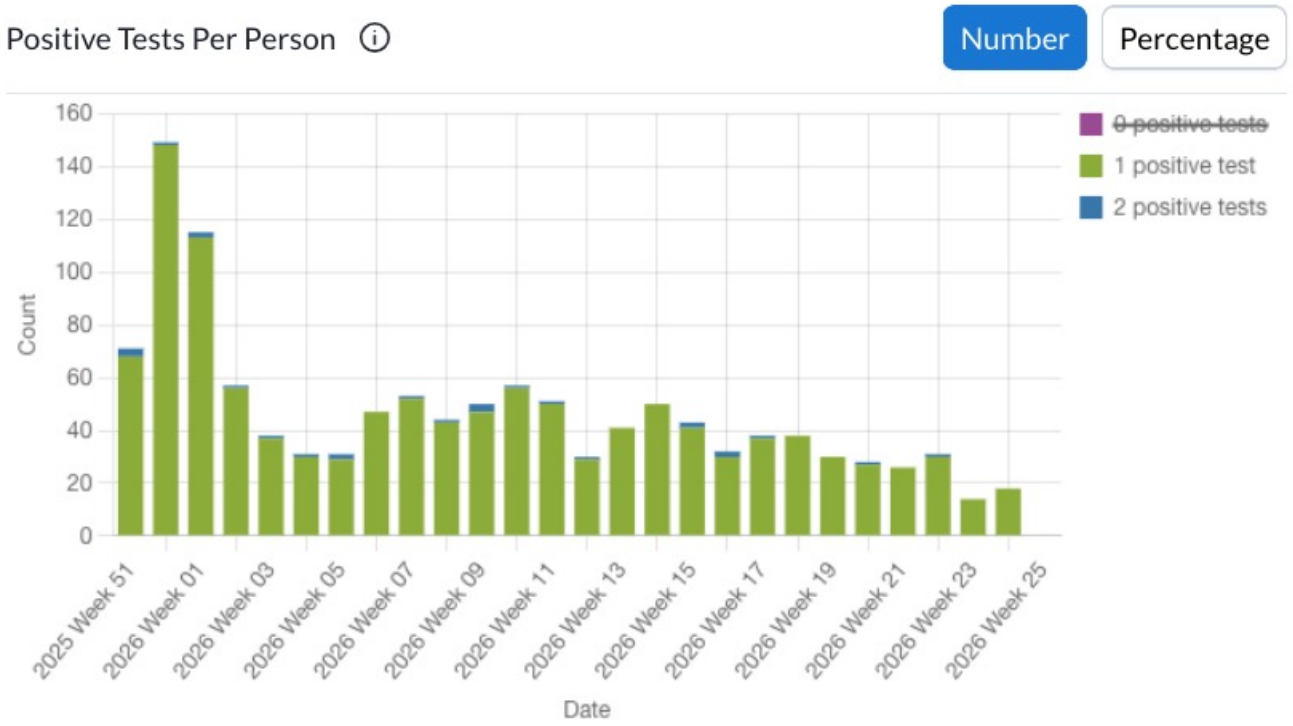




Turn around time
Pre-analytics

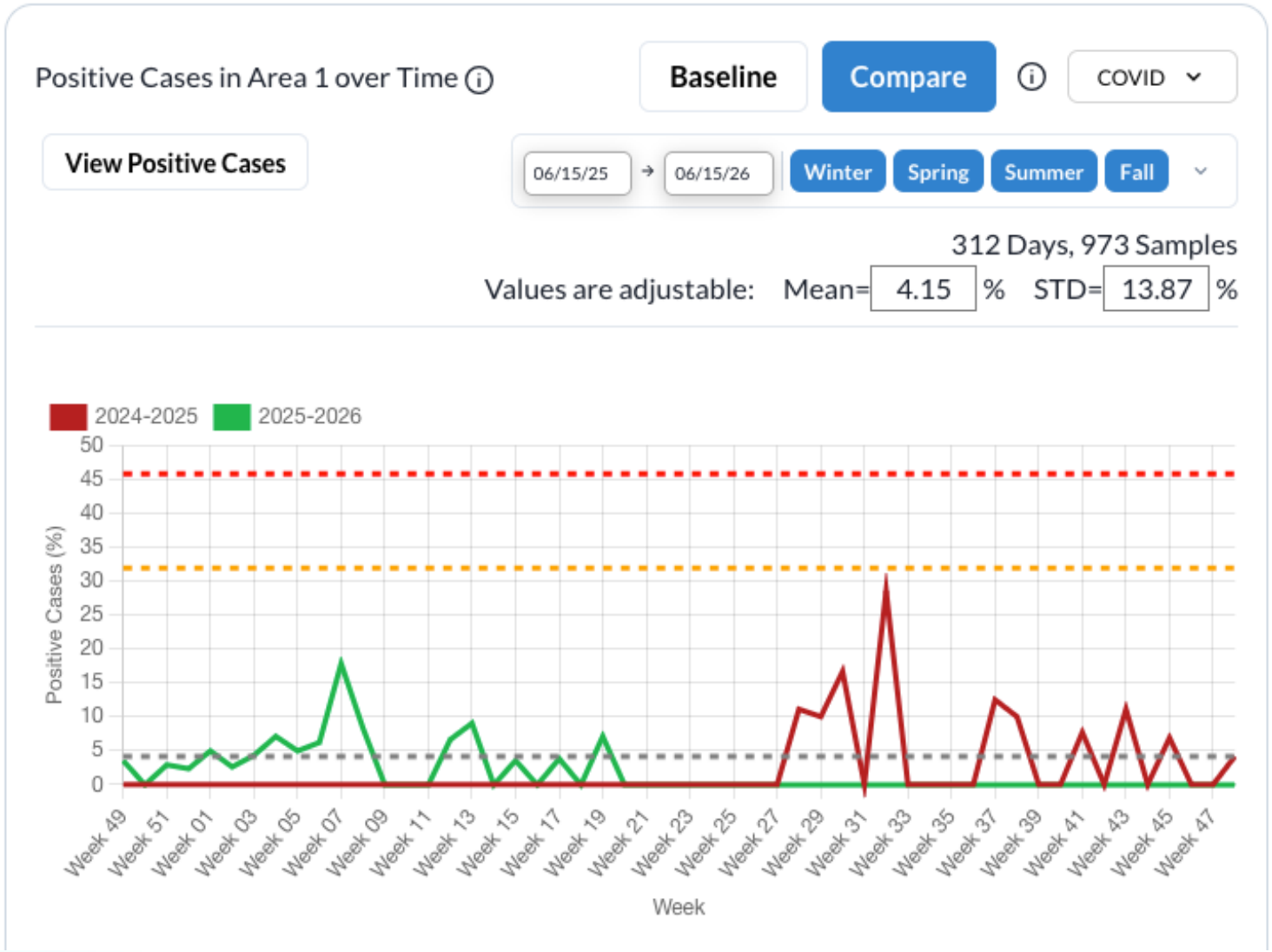
Respiratory Virus Epidemiology





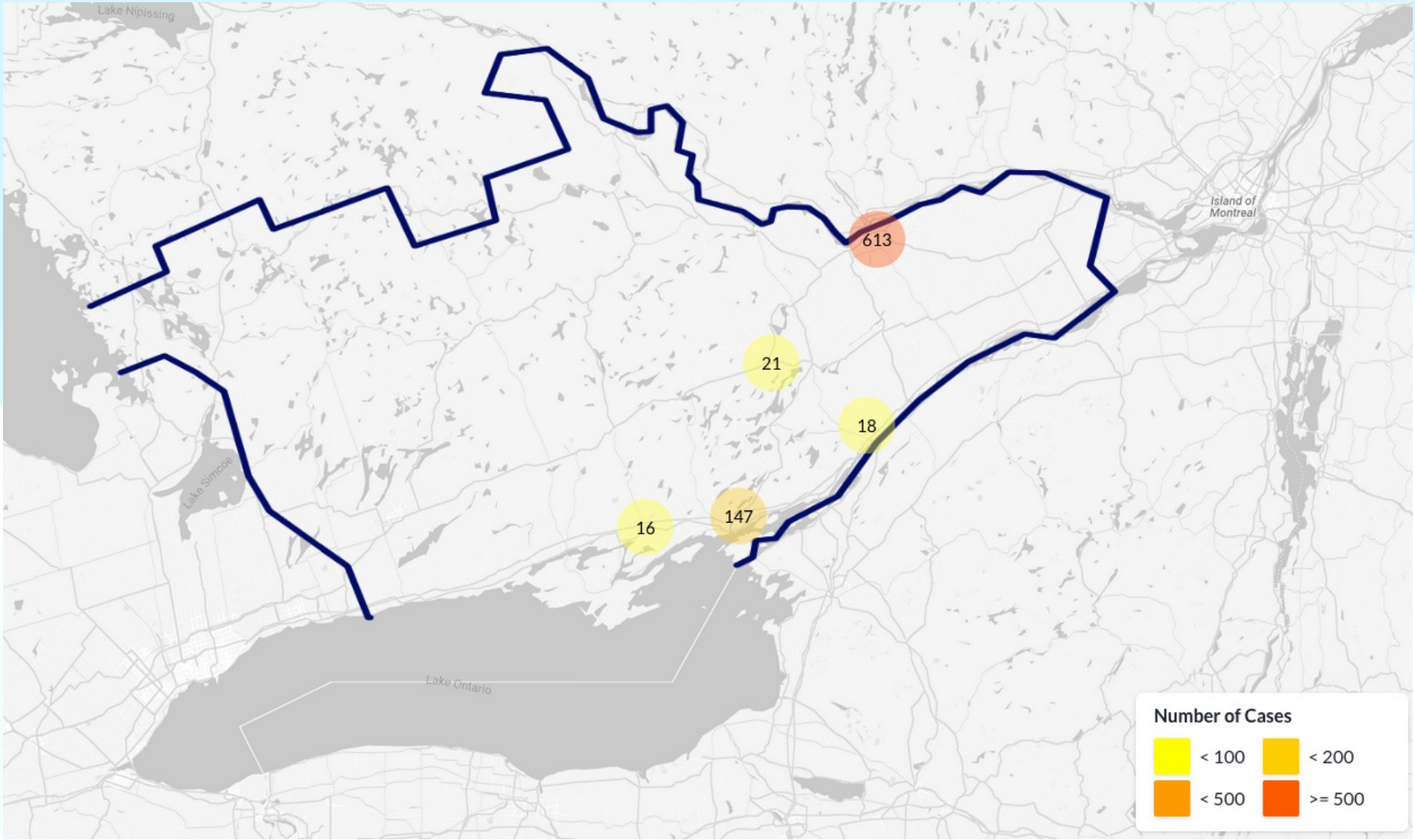
Thresholding

Baseline Period (used to calculate Mean and STD)



Set it and forget it!

Geospatial Modelling



Thank you and
Happy to Take Questions

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25 YEARS ANNIVERSARY

TUE
23

June 23 @ 2:30 pm CEST

The Role of the Environment in the Transmission of Infection – How Can We Intervene?

An International Federation of Infection Control (IFIC) teleclass
Prof. Elaine Cloutman-Green, Great Ormond Street Hospital, UK

Free

IFIC International Federation of Infection Control

July 2026

THU
9

July 9 @ 1:30 pm EDT

Mycobacterium tuberculosis Transmission in Healthcare Settings

Prof. Michael Klompas, Harvard University

Free

THU
16

July 16 @ 1:30 pm EDT

LTC Preparedness for the Next Pandemic Part 2 – Getting Ready

Dr. James Ayukekbong, Editor-in-Chief, Canadian Journal of Infection Control

Free

THU
23

July 23 @ 1:30 pm EDT

National and Local IPC Improvement Steps – What it Takes for Success

Presented by the International Federation of Infection Control (IFIC)
Dhouha Ammar Hamdani and **Dr. Ali Jameela**, Ministry of Health, Qatar

Free

IFIC International Federation of Infection Control

August 2026

THU
13

August 13 @ 1:30 pm EDT

What is Our Role in Preventing Infections Across Borders?

An International Federation of Infection Control (IFIC) teleclass

IFIC International Federation of Infection Control

Thanks to Teleclass Education

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