The background of the slide features a faded image of a multi-story building with many windows on the left and a large, detailed portrait of a man with a beard and a cap on the right. The text is overlaid on this background.

*Mapping and evaluation of national
capacities in local and regional laboratories
for the detection and characterization of
Salmonella in humans in Serbia*

NRL – *Salmonella*

Institute for Public Health of Serbia

Svetlana Mikovic Dramlic



Mapping objectives

General

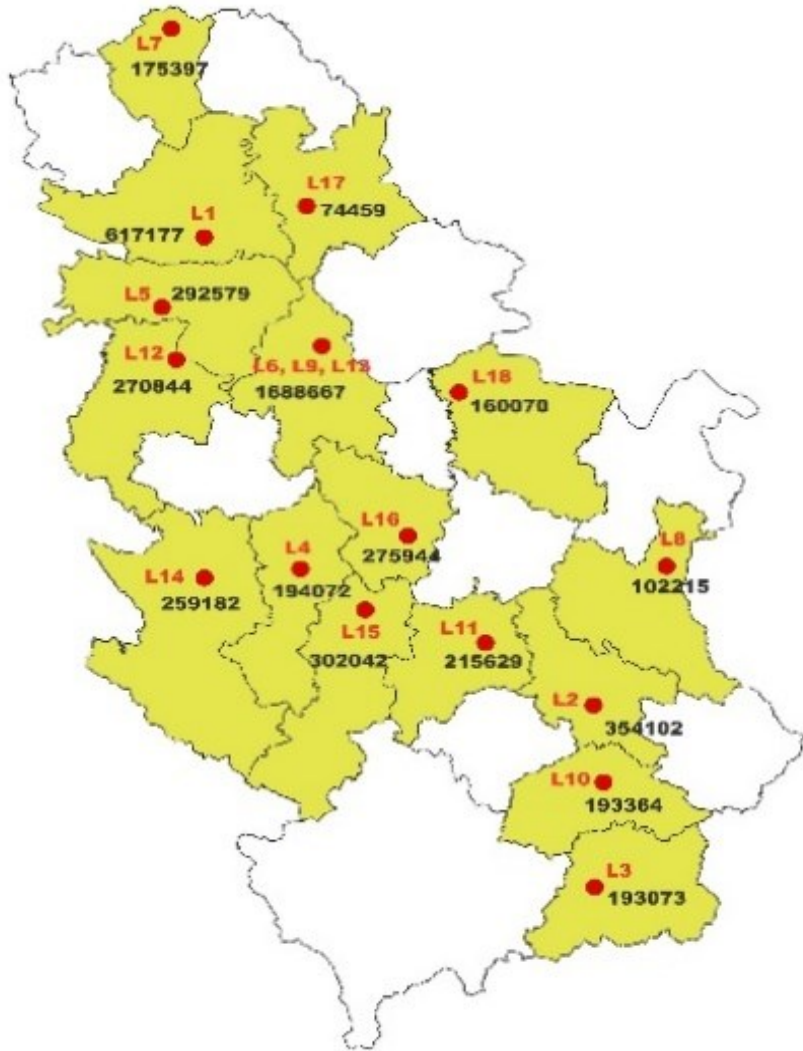
- To establish sentinel surveillance of AMR of human *Salmonella* in Serbia

Specific

- To improve referral of isolates to NRL
- To identify how many laboratories can identify *S. Enteritidis* (most prevalent serotype)
- To harmonize the methodology used for AST in the laboratories according to EU protocol
- To identify how many laboratories perform culture-independent detection of *Salmonella*



Mapping methodology - Selection of laboratories



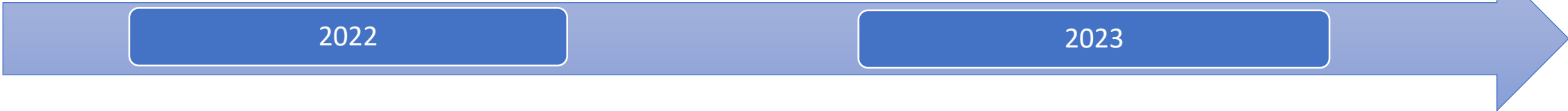
Mapped laboratories (L1-L18) in regions of Serbia with population

- All 4 regions including 16 districts
- Covering 82% of Serbian population
- Representative sample of 28% mapped laboratories in network (63 laboratories)
- 14 regional PH laboratories & 4 hospital (one pediatric)

Region	District/ Laboratory code
North Serbia	Severnobački L7
	Srednjobanatski L17
	Sremski L5
	Južnobački L1
Belgrade	L6, L9, L13
Central and West Serbia	Šumadijski L16
	Moravički L4
	Raški L15
	Rasinski L11
	Mačvanski L12
	Zlatiborski L14
South and East Serbia	Zaječarski L8
	Braničevski L18
	Nišavski L2
	Jablanički L10
	Pčinjski L3



Mapping timeline



December:

- Email invitation to laboratories
- NRL_ Questionnaire on EU Survey Platform (4 sections, 47 mandatory questions)

January:

- On –line meeting with participants - mapping and questionnaire
- Disributed web link with questionnaire to participants

February:

- Statistical analysis and evaluation of results

March:

- Summary report to RefLabCap Team

September :

- Detailed summary report to mapped laboratories

December:

- Short report to decision makers, Ministry of Health & IPHS

Upitnik za mapiranje na EUSurvey platformi

Ispitivanje kapaciteta laboratorija u Srbiji za dijagnostiku izolata *Salmonella* humanog porekla

Fields marked with * are mandatory

Napomena 1: Sa desne strane ekrana imate mogućnost da preuzmete pdf formu nepopunjene upitnika

Napomena 2: Nakon klika poja "Submit" na kraju upitnika neće biti moguća ispravka rezultata. Postoji mogućnost štampanja kompletnog upitnika sa vašim odgovorima (u pdf formatu)

Podaci o ustanovi/odgovornoj osobi

Ime i prezime odgovorne osobe iz laboratorija	Unesite ime i prezime odgovorne osobe iz laboratorija
* Naziv ustanove	
* Adresa ustanove	
* Opština	
* Okrug	
* Naziv laboratorija	
* Ime i prezime odgovorne osobe iz laboratorija	
* E-mail adresa	



National system for diagnostics of human *Salmonella*

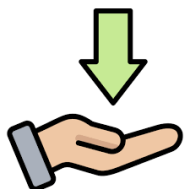
Strengths/Weaknesses/Needs



- Good geographic coverage, but not a well-functioning laboratory network in relation to referral of isolates
 - Diagnostics of human *Salmonella* is mandatory according to the Serbian Law on Protection of Population from Communicable Diseases (all laboratories are performing diagnostic)
-



- National surveillance is based on species level, reporting of serotype is not mandatory
 - National digital surveillance system for salmonellosis is not integrated with and AMR data of human *Salmonella*
 - No national requirement for accreditation of the laboratories , only one accredited (ISO 15189)
 - Number of laboratories who participated in EQAs for human *Salmonella* in last three years is negligible
 - No national guidelines for diagnostics and referral of human *Salmonella*
-



- Support from PH authorities to implement accreditation in laboratories in PHIs and to issue national diagnostics guidelines
 - NRL support through guidances, QC materials, implementation of EQA trails, consultancy to laboratories
-



Laboratory resources (human, equipment, diagnostics, funding)

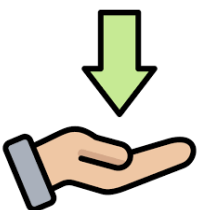
Strengths/Weaknesses/Needs



- Human resources (laboratory personel trained for diagnostic of *Salmonella*) highest grade
- Most of the laboratories are satisfied with availability and quality of laboratory equipment



- Deficit of labotratory staff (undercapacity)
- Limited resources for serotyping of *Salmonella* (low budget for purchase of antisera)
- Process of procurament of laboratory suplies and equipment maintenance situation



- Continous education of laboratory staff
- Budget improvement



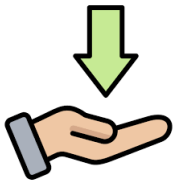
Diagnostic methods for detection – Strengths/Weaknesses/Needs



- All laboratories are using enrichment method for *Salmonella* isolation
-

- Only one laboratory is using non-culture dependant method for *Salmonella* detection
 - Choice of culture media not harmonised
 - Inadequate conditions and capacities for preservation of *Salmonella* isolates (only outbreak isolates)
-

- Harmonisation of SOPs according to NRL methodology
 - Issuing of national guidelines
 - Implementation of molecular methods for detection of *Salmonella* in clinical samples
-





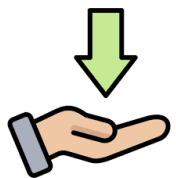
Characterization methods – Strengths/Weaknesses/Needs



- All laboratories have capacity for characterization of species and AST of *Salmonella* according to EUCAST
-

- In most laboratories capacities for serotyping of *Salmonella* are limited just to *S. Enteritidis*
 - Just a few laboratories have Maldi-tof system
 - Duplicate biochemical identification tests (manual and api 20E test),
 - AST in majority of laboratories is performed for therapeutic purpose, only few for surveillance
 - AST is not harmonised according to EU protocol
 - Half laboratories are performing DDT and automated dilution system (increasing the expences)
 - Inconsistency in performing QC by EUCAST
-

- Laboratory network needs continuous work on methodology harmonisation with support of NRL
 - Necessity of regular referall of isolates to NRL for a final characterisation
-





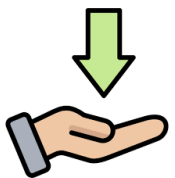
Referral of isolates/samples to NRL – Strengths/Weaknesses/Needs



- Sample referral to NRL is a legal obligation (for IPHs, not for clinical laboratories)
- Laboratories are reporting *Salmonella* to surveillance system (mostly on species level), without editing according to NRL result of serotypes



- No national guidance for handling and referring samples/isolates (irregular)
- NRL's guidance for referral isolates are not used in each laboratory
- NRL sample referral form usually filled with partial data related to the case (just gender and age, no epidemiological data, no travel history)
- 60% of laboratories are saving copies of referred samples to NRL



- Harmonization of sample referral procedure to NRL methodology
- Raise awareness of importance of referral of isolates/samples to NRL



Outcomes

1. *Salmonella* isolates referral to NRL from local/regional laboratories is significantly improved
2. NRL has updated SOPs for detection and characterisation *Salmonella*, including AST in accordance with EU protocol
3. SOPs are uploaded on official site IPHS and distributed to Serbian Medical Society https://www.batut.org.rs/index.php?category_id=69
4. NRL implemented a pilot sentinel *Salmonella* AMR surveillance with all mapped laboratories
5. Planning of first round of national EQA



Thank you!

FWD AMR - RefLabCap, physical training workshop
12-13.03.2024. DTU Copenhagen