

Summer School of Epidemiology 2024
for Hospitals Using AI System HAIDI
in Health Care Associated Infections Surveillance

4. – 6. 9. 2024

**Technical University in Liberec
Liberec, Czech Republic**

Execution and evaluation report

Authors:

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Liberec, on October 11 2024

Introduction

Healthcare-associated infections surveillance (HAI) is legally established in Act No. 258/2000 Coll., on the protection of public health, as amended, and in Decree No. 389/2023 Coll., on the system of epidemiological surveillance of selected infectious diseases. This decree refers to the HAI case definitions set out in Commission Implementing Decision (EU) 2018/945 of 22 June 2018 on communicable diseases and related special health problems to be captured by epidemiological surveillance, and the relevant case definitions. Selected hospitals in the Czech Republic and Slovakia use the HAIDI platform (Datlowe s.r.o.) for HAI surveillance purposes. HAIDI uses artificial intelligence (AI) to track HAIs, automate processes and analyse large volumes of clinical data in near real-time. To allow hospitals to compare surveillance outputs over time and among themselves, it is necessary to use standard HAI case definitions and uniform surveillance procedures across all hospitals.

The qualifications and the competences (1) of the personnel responsible for the HAI surveillance in hospitals in the Czech Republic and Slovakia differ, and HAIs are monitored in different ways in individual hospitals. These facts led to the establishment of the Summer School of epidemiology 2024 for hospitals using the AI-based HAIDI system in health care associated infections surveillance.

The aim of the Summer School was to support the standardization of HAI detection, validation and assessment approaches through lectures, exercises and workshops.

The target audience of the Summer School included employees from the departments of hospital epidemiology and hygiene in hospitals using HAIDI.

The main topics of the Summer School were:

- Surveillance
- Standardized HAI case definitions
- HAI outbreak investigations
- Experiences with using HAIDI
- Evaluation of the HAI Surveillance system that uses artificial intelligence HAIDI
- Initiation of a community of practice that uses AI for HAI surveillance

Execution of the educational activity

Before the Summer School began, the participants were given a questionnaire to gather the information about their hospital, including basic information about the infection prevention and control program and the participants' qualifications. Each lecture was followed by an exercise and a discussion on the topic presented. Each lecture was followed by a practical exercise and a discussion on the topic presented. Practical exercises focused on developing skills in data collection and proper classification according to case definitions. A workshop addressed adverse events in healthcare and encouraged participants to share their experiences. The workshops were gradually focused on sharing experiences from the functioning of HAI surveillance, the detection and investigation of outbreaks and the application of artificial intelligence tools, and the possibilities of evaluating HAI surveillance using HAIDI. The Summer School concluded with a proposal for continued cooperation through an informal community of practice, where participants could address specific HAI cases and methodological challenges.

Accreditation

The Summer School included 21 face-to-face teaching hours and was accredited by the Czech Medical Chamber with identification number 117235 and with a maximum of 18 assigned credits.

Upon completion, participating physicians received a certificate indicating the credits awarded by the Czech Medical Chamber. Non-physicians received a certificate of completion for the School.

Summer School of epidemiology 2024 for hospitals that use HAIDI				
Timetable				
from	to	4.9. Wednesday	5.9. Thursday	6.9. Friday
08:30	09:00	Registrace		
09:00		Introduction Welcome speech - vicedean FZS PhDr. Eva Procházková, PhD. Introduciton of the team Introduction of participants Logistics	Lecture Outbreak investigation The ten steps JP	Lecture Molecular methods in HAI surveillance ID
	10:30	Introductory lecture About Summer School, Information about participating hospitals VP	Excercise Example of outbreak investigation in a hospital in CR JP, VP	Workshop Exercise - MRSA, molecular methods in outbreak investigations
10:30	11:00	break	break	break
11:00		Lecture Surveillance, system description, attributes JP	Lecture Space and time, analysis of data, maps, GIS JŠ	Lecture and discussion Critical assessment of data and information, presentation and communication JP, VP
	12:30	Lecture Indicators of occurrence, frequencies, denominators MP	Exercise Presentation and interpretaion of spatial data JŠ, VP	Lecture and exercise Surveillance a její evaluace JP
12:30	13:30	Lunch	Lunch	Workshop Hospital epidemiologists community, goals and activity, Summer School evaluation Moderating VP
13:30		Lecture Presentation of HAIDI 2.0 LV	Second part of the quesitonnaire output How HAIDI works? Data and analysis LV	
	15:00	Exercise HAI definitions implementation LV, JP	Exercise Confirmation of HAI cases in HAIDI LV, JP	
15:00	15:30	break	break	Lecturers:
15:30		Lecture Hospital management and health care associated adverse events TR	Lecture HAIDI, guide, tips and shortcuts JK, LV	ID - Iva Dolinová, KNL MP - Marek Petráš, LF3 JP - Jana Prattingerová, KNL VP - Vladimír Příkazský, TUL TR - Tomáš Roubíček, KNL JŠ - Jiří Šmída, TUL
	17:00	Workshop Participants experinces with surveillance in their hospitals Moderate TR, JP, VP	Workshop HAIDI practical experiences sharing Moderate LV, JP, VP	JK - Jakub Kozák, Datlowe LV - Lenka Vraná, Datlowe KNL -Krajská nemocnice Liberec, a.s. TUL - Technická univerzita v Liberci Datlowe, s.r.o LF3 - 3. lékařská fakulta UK

Summer School team

The teaching team comprised experts in epidemiology, public health, microbiology, informatics and artificial intelligence.

Lecturers:

- MUDr. Jana Pratteringerová, professional guarantor for the CMC, KNL a FZS TUL
- MUDr. Vladimír Příkazský, CSc., FZS TUL
- doc. RNDr. Marek Petráš, PhD., 3. lékařská fakulta Univerzity Karlovy
- Mgr. Jiří Šmída, PhD., Fakulta přírodovědně-humanitní a pedagogická, TUL
- doc. MUDr. Tomáš Roubíček, PhD. FESC, KNL a FZS TUL
- Mgr. Iva Dolinová, PhD., KNL
- Mgr. Lenka Vraná, PhD., Datlowe, s.r.o
- Mgr. Jakub Kozák, Datlowe, s.r.o

Administration and logistics:

- Ing. Tereza Murdychová, FZS TUL
- Ing. Lenka Kozáková, FZS TUL
- Blanka Kučabová, FZS TUL

Sponsors:

- FZS TUL contributed with 10000,- Kč
- FP TUL provided premisses free of charge
- Roche diagnostica contributed with 13000,- Kč, bez DPH
- Thermo Fischer Scientific poskytli 10000,- Kč, bez DPH

The company Datlowe s.r.o., whose experts participated in the preparation and implementation of the professional program, provided also an informal program in the iQLANDIA Science Center.

Participants: maximum capacity has been set for 30 participants, that has been filled.

Among participants five were physicians-epidemiologists and 25 non-medical staff, 24 from CR and 6 from Slovakia.

Number of participants of the Summer School by title and a country			
Title	Participant's country		Total
	Czech Republic	Slovakia	
Bc.	4	0	4
Bc. Dis.	1	0	1
Mgr.	6	5	11
univ.doc, RNDr., Mgr.	0	1	1
MUDr.	5	0	5
Without a title	8	0	8
Total	24	6	30

Five participants were from primary-type hospitals, 6 secondary-type, 5 tertiary-type, 1 specialized, and information about one hospital was not provided. Information on the size of hospitals and other parameters was anonymous, therefore it was not possible to analyse it together with the characteristics of the participants.

Logistics

- Dates of Summer School: from September 4, 2024, to September 6, 2024.
- The Summer School was delivered in FP TUL premises in Liberec, bld. G.
- Course fee: 2200,- Kč
- Catering: lunch and refreshment were provided by the organizer, covered by the course fee.
- Housing was upon participants themselves.
- Webpage of the Summer School: <https://kgd.fp.tul.cz/akce/lsepida2024>.

Evaluation of the Summer School was anonymous after each training day and in sum at the end the School. Participants received a QR code and completed the questionnaire online.

Evaluation 4.9.2024

Link to the questionnaire:



Introductory lecture (V. Príkazský)

The content was useful	Yes, sure 15	Rather yes 4	Don't know 4	Don't know 0	Not at all 0
The content was		Simple 22	Just right 0	Complicated 1	

Surveillance, system description, attributes, exercise (J. Prattingerová)

The content was useful	Yes, sure 17	Rather yes 5	Don't know 0	Don't know 0	Not at all 0
The content was		Simple	Just right 22	Complicated	
Interaction	Not important 0	Less important 0	Rather important 13	Very important 10	

Indicators of occurrence, frequencies, denominators (M. Petráš)

The content was useful	Yes, sure 20	Rather yes 2	Don't know 1	Don't know 0	Not at all 0
The content was		Simple 0	Just right 21	Complicated 2	

Presentation of HAIDI 2.0 and definitions exercise (L. Vraná)

The content was useful	Yes, sure 25	Rather yes 0	Don't know 1	Don't know 0	Not at all 0
The content was		Simple 5	Just right 18	Complicated 0	
Interaction, exercise	Very simple 0	Rather simple 7	Just right 14	Rather complicated 2	Complicated 0

Lecture "Hospital management.." and a workshop (T. Roubíček)

The content was useful	Yes, sure 17	Rather yes 6	Don't know 0	Don't know 0	Not at all 0
The content was		Simple 1	Just right 22	Complicated 0	

Evaluation 5.9.2024

Link to the questionnaire:



Outbreak investigation, lecture and exercise (J. Prattingerová)

The content was useful	Yes, sure 18	Rather yes 3	Don't know 0	Don't know 0	Not at all 0
The content was		Simple 0	Just right 20	Complicated 0	
Interaction, exercise	Very important 11	Rather important 9	Less important 1	Unimportant 0	
Enough time for interaction	Few 1	Rather few 3	Just right 16	Rather too much 1	Too much

Space and time, analysis of data, maps, GIS (J. Šmída)

The content was useful	Yes, sure 13	Rather yes 3	Don't know 5	Don't know 0	Not at all 0
The content was	Simple 1	Rather Simple 2	Just right 15	Rather complicated 3	Complicated 0
Interaction, exercise	Very important 6	Rather important 11	Less important 4	Unimportant 0	
Enough time for interaction	A few 0	Rather few 1	Just right 15	Rather too much 1	Too much 0

How HAIDI works, data and analysis (L. Vraná)

The content was useful	Yes, sure 21	Rather yes 0	Don't know 0	Don't know 0	Not at all 0
The content was	Simple 0	Rather simple 0	Just right 20	Rather complicated 1	Complicated 0
Enough time for interaction	A few 1	Rather few 6	Just right 11	Rather too much 1	Too much 0

HAIDI 2.0, guide, tips and shortcuts and workshop (L. Vraná)

The content was useful	Yes, sure 15	Rather yes 0	Don't know 0	Don't know 0	Not at all 0
The content was	Simple 0	Rather simple 1	Just right 14	Rather Complicated 0	Complicated 0
The workshop was	Useful 11	Rather useful 3	Don't know 0	Rather not useful 1	Not useful 0

Evaluation 6.9.2024

Link to the questionnaire:



Molecular methods in HAI surveillance and workshop (I. Dolinová)

The content was useful	Yes, sure 15	Rather yes 2	Don't know 2	Don't know 0	Not at all 0
The content was	Simple 0	Rather simple 0	Just right 8	Rather Complicated 11	Complicated 0
Interaction, exercise	Very important 3	Rather important 9	Less important 5	Unimportant 0	
Enough time for interaction	A few 3	Rathere few 3	Just right 8	Rather too much 1	Too much 0

Critical assessment of data and information, presentation and communication (J. Prattergerová)

The content was useful	Yes, sure 14	Rather yes 3	Don't know 1	Don't know 0	Not at all 0
The content was	Simple 0	Spíše Simple 1	Just right 17	Rather Complicated 0	Complicated 0
Discussion was	Very important 5	Rather important 8	Less important 2	Unimportant 1	
Enough time for interaction	A few 0	Rather few 3	Just right 13	Rather too much 0	Too much 0

Surveillance and its evaluation, lecture and exercise (J. Prattergerová)

The content was useful	Yes, sure 14	Rather yes 2	Don't know 2	Don't know 0	Not at all 0
The content was	Simple 0	Rather s Simple 0	Just right 12	Rather Complicated 4	Complicated 0
Enough time for interaction	A few 0	Rather few 3	Just right 13	Rathe too much 0	Too much 0

Hospital epidemiologists community, workshop (V. Příkazský)

The content was useful	Yes, sure 11	Rather yes 1	Don't know 2	Don't know 0	Not at all 0
Interested to participate	Yes, sure 4	Rather yes 5	Don't know 3	Don't know 1	Not at all 1

Summary evaluation of the Summer School

Themes fulfilled my expectations:	Yes, sure 12	Rather yes 3	Don't know 3	Don't know 0	Not at all 0
Themes were well chosen:	Yes, sure 10	Rather yes 4	Don't know 4	Rathe not 0	Not at all 0
The total time was	Very short 1	Rather short 1	Just right 15	Rather long 1	Very long 0
Should the course with adapted content be repeated?	Yes, sure 14	Rather yes 3	Don't know 0	Rathe not 1	Not at all 0
Logistics of the course was satisfactory?	Yes, sure 13	Rather yes 2	Don't know 2	Rather not 1	Not at all 0

Which theme would you propose for the next edition of the Summer School?

- Hand hygiene in health care facilities
- EBM in the application of preventive measures, multimodal strategy
- Discussion of individual HAI types and their evaluation
- Focus on resistant microorganisms
- Working with HAIDI outputs
- Workshop on the use of statistical indicators of HAI incidence directly in the hospital

Do you have other comments that we should apply in the preparation of the next course?

- Focus more on topics for epidemiological nurses, solving daily problems in practice
- I would definitely include more work in mixed groups, so that members connect and share different perspectives on the situation.
- Involvement of HAIDI users in (self) presentation....steps from everyday life/procedure/practice
- More workshops for working with HAIDI, for example HAI recognition training on case studies

Participants recommendations:

- Direct focus on data and "Focus on hospital hygiene"
- Assign the responsibility for hand hygiene to other institutions (e.g. NCO NZO or university).
- Allow more time for working with HAIDI 2.0, including practical demonstrations and experience sharing
- Interpretation of data and indicators, how to link data to practical use in IPC within hospitals, discussion of HAI types and their epidemiological significance
- EBM in the application of preventive measures using a multimodal strategy
- HAI definitions - this issue must be resolved with the NRC for HAI and with other competent instances.

Lecturer's comments

The goal of the Summer School was to standardize, harmonize approaches and procedures in HAI surveillance using AI (HAIDI). The lectures, training, exercises and workshops provided were the first step in this endeavour. The participants gained the knowledge they can apply in practice. The

Summer School started the skills that participants will use in their activities in HAI surveillance activities. To ensure the sustainability of the acquired abilities, it is recommended to monitor their application and provide professional support as needed. During the Summer School, a community of practice (CP) was proposed and the evaluation showed that some participants were willing to join this community. Monitoring the use of knowledge and skills after the School and offering active support can be one element of the CP content.

1. Potential blocks for further editions of Summer School and for Community of Practice:
 - Surveillance and investigation of epidemics
 - Processing of data and outputs from HAIDI into a management report and HAI surveillance report.
 - Outbreak management
 - Case definitions
 - Evaluation of the surveillance system
2. EBM, scientific writing (elements)
 - Writing and graphical documentation scientific articles, with good practices for data quality and graphical presentation
 - Critical assessment of scientific articles from Czech journals
 - Elements of statistics for HAI epidemiology, including indicators and denominators

Sources:

1. European Centre for Disease Prevention and Control. Core competencies for infection control and hospital hygiene professionals in the European Union. Stockholm: ECDC; 2013
2. Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals – 2022-2023, ECDC, <https://www.ecdc.europa.eu/en/publications-data/PPS-HAI-AMR-acute-care-europe-2022-2023>, přistoupeno 08.10.2024
3. European Centre for Disease Prevention and Control. Protocol for validation of point prevalence surveys of healthcare-associated infections and antimicrobial use in European long-term care facilities - 2016–2017 version 1.1. Stockholm: ECDC; 2016.
4. Provděcí rozhodnutí Komise (EU) 2018/945 ze dne 22. června 2018 o přenosných nemocích a souvisejících zvláštních zdravotních problémech, které musí být podchyceny epidemiologickým dozorem, a o příslušných definicích případů. 2018. Dostupný na www: <https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32018D0945>.

Execution and evaluation report of the Summer School – shared with:

- Dean and Vicedean for education and pedagogy, FZS TUL
- Medical director of the Regional Hospital Liberec, a.s.
- Datlowe, s. r.o.
- Lecturers of the summer School
- Participants
- EPIET Alumni Network

Web page of the Summer School 2024

