



Supplemental material

Table S1: Keywords and MeSH classification of the four concepts identified for the scoping review

Data S1: List of 220 articles identified by systematic review through Medline

Figure S1: Flow chart of the scoping review

Table S2: Number of articles found by countries

Table S3: Number of participating hospitals for four HAI-NET's surveillance programs, European Centre for Disease Prevention and Control

Table S4: Infections surveyed in national surveillance programs, 37 countries, 2021

Table S1: Keywords and MeSH classification of the four concepts identified for the scoping review

Concept 1—Nosocomial	Concept 2—Epidemiology	Concept 3—Surveillance	Concept 4—Administration
Hospital-acquired infection	Hospital mortality ^a	Surveillance	Government agencies ^a
Hospital-associated infection	Hospital ^a	Monitoring	Health facilities ^a
Hospital infection	Infection ^a	Public health surveillance	Data collection ^a
Healthcare-associated infection	Epidemiology ^a	Population surveillance ^a	Interinstitutional relations ^a
Healthcare-acquired infection	Drug resistance ^a	Antimicrobial surveillance	National health programs ^a
Healthcare infection	Bacterial infection ^a	Sentinel surveillance ^a	Sentinel surveillance
Nosocomial	-	Monitoring tools	Practice guideline as topic ^a
Healthcare-associated infection	-	Patient safety ^a	Population surveillance
Healthcare-associated infections	-	Surgical site infection	Electronic health records ^a
Infection control ^a	-	Drug surveillance program ^a	Epidemiological methods ^a
Infection prevention	-	Public reporting	Public health ^a
Nosocomial infection	-	Healthcare data	-
Cross infection ^a	-	Epidemiological monitoring ^a	-
-	-	National surgical site infection surveillance	-
-	-	Health survey ^a	-
-	-	Antibiotic resistance ^a	-
-	-	Antibiotic sensitivity	-

Abbreviations: MeSH, Medical Subject Headings; -, not applicable

^a Terms used as keywords and MeSH



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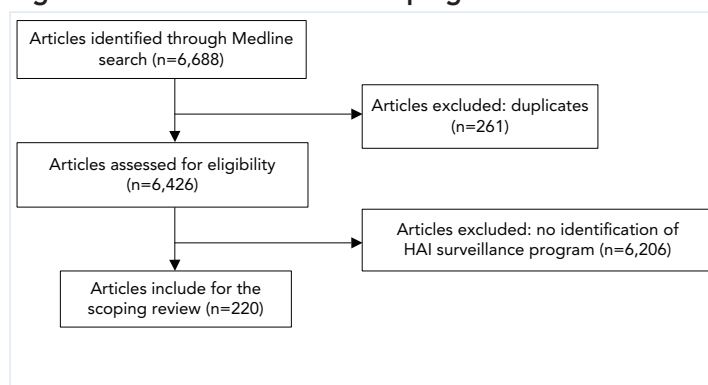
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Figure S1: Flow chart of the scoping review



Abbreviation: Healthcare-associated infection

Table S2: Number of articles found by country

Country	Number of identifying articles
Australia	11
Austria	4
Belgium	3
Canada	5
Croatia	0
Cyprus	0
Czech Republic	0
Denmark	2
ECDC	5
England	6
Estonia	1
Finland	2
France	5
Germany	31
Greece	3
Hungary	1
Iceland	0
Ireland	11
Italy	13
Latvia	0
Lithuania	0
Luxembourg	0
Malta	0
Netherlands	10
Norway	5
Poland	1
Portugal	0
Slovakia	1
Slovenia	0
Spain	15
Sweden	3
UK-North Ireland	1
UK-Wales	0
UK-Scotland	0
US	106
Total	245

Abbreviations: ECDC, European Centre for Disease Prevention and Control; UK, United Kingdom; US, United States

**Table S3: Number of participating hospitals for four HAI-NET's surveillance programs, European Centre for Disease Prevention and Control**

Country	CDI ^a		SSI ^b		ICU ^b	PPS ^c		# Hospitals in the country 2011
	# Participating hospital	%	# Participating hospital	%	# Participating ICU	# Participating hospital	%	
Austria	1	1	32	17	-	9		189
Belgium	129	66	-	-	8	52	27	194
Bulgaria ^d	-	-	-	-	-	42	17	241
Croatia	26	43	-	-	-	11	18	60
Cyprus	-	-	-	-	-	8	100	8
Czech Republic	19	12	-	-	-	14	9	158
Denmark	-	-	-	-	-	3	6	52
Estonia	4	10	2	5	4	4	10	40
Finland	13	22	12	20	-	59	100	59
France	203	13	339	22	199	54	3	1,558
Germany	-		541	3	838	46	3	1,736
Greece	2	1	-	-	-	37	27	137
Hungary	58	54	33	31	9	29	27	108
Iceland	-	-	-	-	-	2	25	8
Ireland	1	2	-	-	-	50	83	60
Italy	2	0	94	9	104 ^e	49	5	1,023
Latvia	1	6	-	-	-	15	88	17
Lithuania	3	3	23	25	36	44	48	92
Luxembourg	-	-	-	-	10	9	100	9
Malta	1	33	-	-	1	3	100	3
Netherlands	1	1	80	83	-	33	34	96
Norway	-	-	61	102	-	7	12	60
Poland	46	6	-	-	-	35	4	795
Portugal	-	-	51	5	43	57	56	101
Romania ^d	-	-	-	-	10	10	3	311
Slovakia	36	32	5	4	8	40	36	112
Slovenia	3	14	-	-	-	21	100	21
Spain	4	1	-	-	188	59	11	550
Sweden	-	-	-	-	-	4	5	80
UK-England	-	-	316	125	-	51	20	253
UK-Northern Ireland	-	-	10	63	-	16	100	16
UK-Scotland	3	6	-	-	22	52	100	52
UK-Wales	-	-	12	13	-	22	25	89
Europe	556	7	1,611	19	1,460	947	11	8,288

Abbreviations: CDI, *Clostridioides difficile* infections; GiViTi, Gruppo italiano per la Valutazione degli interventi in Terapia intensiva; HAI-NET, Healthcare-Associated Infections Surveillance Network; ICU, intensive care unit; PPS, point prevalence survey; SPIN-UTI, Italian Nosocomial Infections Surveillance in Intensive Care Units; SSI, surgical site infections; UK, United Kingdom

^a 2016 report

^b 2017 report

^c 2011–2012 report

^d Although Bulgaria and Romania are not considered high-income countries, they were kept as they participate in the ECDC program

^e GiViTi and SPIN-UTI together



Table S4: Infections surveyed in national surveillance programs, 37 countries, 2021

Program	Country	Infection	Mandatory - Voluntary	Incidence - Prevalence	Frequency of reporting to		Benchmark	# participating hospitals ^a		Total number hospitals in the country ^a	
					Ministry	Public		N	%		
Oceania											
ACSQHC ^b	Australia	CDI	V	I	Monthly, quarterly or annually	Annual, quarterly	Yes	-	-	693 public and 657 private	
		SSI	M,V	I	-	Annual, quarterly	Yes	-	-		
		BSI ^c	M	I	-	Annual, quarterly	-	-	-		
		CLABSI	M,V	I	-	Annual, quarterly	-	-	-		
		ANZICS ^b	CLABSI	M,V	-	Monthly	Annual	Yes	-		-
		AIHW	BSI ^c	M	-	Annually	-	Yes	>700 public and 183 private		100 public, 27.9 private
AGAR		ARO ^d (VRE, MRSA, MSSA, CPE ^e , Gram-)	-	P	-	Annual	-	38 laboratories	-	-	
North America											
CNISP	Canada	CDI	V	I	Annually	Annual	Yes	68	11.0	620	
		VRE, MRSA	V	I	Annually	Annual	Yes	62	10.0		
		CPE	V	I	Annually	Annual	Yes	59	9.5		
		ARO	V	I	Annually	Annual	Yes	65	10.5		
		CLABSI, SSI, C. auris, CSF	V	I	Annually	Annual	Yes	-	-		
		PPS	V	P	Annually	Annual	-	-	-		
NHSN	US	VRE, MRSA, MSSA, CDI, CPE, CLABSI, SSI, UTI, Ventil ^f , ARO	V	I	Monthly	Annual	Yes	3,889	63.3	6,146	
Europe											
ANISS	Austria	SSI	V	I	-	Annual	Yes	53	28.0	189	
		ICU	V	I	-		-	46	24.3		
		PPS	V	P	-		-	47	24.9		
NSIH	Belgium	BSI	M	I	Quarterly	Annual	-	96	93.2	103	
		CDI	V	I	Quarterly	Annual	-	87	84.5		
		SSI	V	I	Quarterly	Annual	-	63	61.2		
		CLABSI ^g , UTI ^g	V	I	Quarterly	Annual	-	14	13.6		
		Ventil ^{f,g}	M	I	-	Annual	-	-	-		
		MRSA, Gram-	M	I	-	Annual	-	-	-		
		VRE	V	I	-	Annual	-	-	-		
^b	Croatia	-	-	-	-	-	-	-	-		
NRC-HAI ^b	Czech Republic	CDI, SSI, ICU	U	U	-	-	-	-	-	-	
		PPS	U	P	-	-	-	-	-	-	
HAIBA		CDI, SSI, UTI, BSI	U	I	Daily or monthly	Annual	-	-	-	32	
DANMAP	Denmark	AMR (VRE, MRSA, CPE ^e)	M	P	-	-	-	10 (departments clinical microbiology)	-	10 (departments clinical microbiology)	



Table S4: Infections surveyed in national surveillance programs, 37 countries, 2021(continued)

Program	Country	Infection	Mandatory - Voluntary	Incidence - Prevalence	Frequency of reporting to		Benchmark	# participating hospitals ^a		Total number hospitals in the country ^a
					Ministry	Public		N	%	
Europe (continued)										
HAI-NET	ECDC	SSI	V	I	At the end of the surveillance period	Annual	-	1,611	29.1	5,532
		CDI	V	I	At the end of the surveillance period	Annual	-	556	10.4	5,324
		ICU	V	I	At the end of the surveillance period	Annual	-	589 ICU	15.3	3,839
		PPS	V	P	-	Every 5 years	-	947	11.4	8,288
SIRO ^b	Finland	BSI, CDI, SSI	M	I	At the end of the surveillance period	Annual	-	59	100	59
		PPS	V	P	-	-	-	50 to 59	84.7 to 100	
RAISIN-I	France	SSI	V	I	-	Annual	-	357	22.9	1,558
RAISIN-P		PPS	V	P	One day	Every 5 years	-	1,533	98.4	
KISS ^b	Germany	CDI, ARO (VRE, Gram-)	V	I	Monthly	Annual	Yes	-	-	1,914
		UTI ⁹ , LRI ⁹ , BSI ⁹ , NEO	V	I	Monthly	Annual	-	-	-	
		SSI	V	I	Quarterly	Annual	Yes	-	-	
		Vent ^f	V	I	-	Annual	Yes	-	-	
		MRSA	V	I	Annually	Annual	Yes	-	-	
NNSR	Hungary	ARO, CDI, BSI, Outbreak	M	I	-	Annual	-	169	100	169
		SSI, ICU, NEO	V	I	-	Annual	-	47	27.8	
		ICU	V	I	-	Annual	-	34	20.1	
		NEO	V	I	-	Annual	-	10 NEO	-	
HPSC	Ireland	CDI	V	I	Quarterly	Quarterly/ Annual	Yes	56	93.3	60
		MRSA ^d / MSSA ^d	V	I	Quarterly	Quarterly/ Annual	-	-	-	
		PPS	M	P	-	Quarterly/ Annual	-	-	-	
		CPE ^e	M	I	Monthly	Quarterly/ Annual	-	-	-	
		VRE ^d , Gram- ^d	V	I	-	Quarterly/ Annual	-	-	-	
		Vent ^{f,9}	M	I	-	-	Yes	-	-	
SPIN-UTI	Italy	CLABSI ⁹ , BSI ⁹ , UTI ⁹ , Vent ^{f,9}	V	I	Annually	Every 2 years	-	41 ICU	-	1,023
GiViTi		CLABSI ⁹ , BSI ⁹ , Vent ^{f,9}	V	I	-	Annual	No	230 ICU	-	
-	Lithuania	ICU	V	I	-	Annual	Yes	28	30.4	92
		SSI	V	I	-	Annual	Yes	27	29.3	
		PPS	M	I	-	-	Yes	95	100	



Table S4: Infections surveyed in national surveillance programs, 37 countries, 2021(continued)

Program	Country	Infection	Mandatory - Voluntary	Incidence - Prevalence	Frequency of reporting to		Benchmark	# participating hospitals ^a		Total number hospitals in the country ^a
					Ministry	Public		N	%	
Europe (continued)										
NOSIX ^b	Luxembourg	-	-	I	-	-	-	-	-	-
PREZIES ^b	Netherlands	CLABSI, SSI	M	I	Annually (online form)	Annual	-	-	-	96
		Prevalence	V	P	After the study period (twice a year)	Annual	-	-	-	
SWAB		ARO (outbreak)	V	P	Monthly	Annual	-	38 hospitals (30 laboratories)	39.6	
NOIS	Norway	SSI	M	I	-	Annual	-	61	100	60
		PPS	V	P	Twice a year	-	-	-	-	
		UTI, BSI	M	I	-	Annual	-	-	-	
		Neo, LRI, Venti ^f	U	I	-	-	-	-	-	
-	Poland	BSI ^g , UTI ^g , Venti ^{f,g}	V	I	After the study period	-	-	11	1.4	795
		PPS	V	P	After the study period	Annual	-	160	20.1	
PPCIRA	Portugal	SSI	V	I	-	-	-	54	53.5	101
		CLABSI ^g , Venti ^{f,g}	V	I	-	-	-	30	29.7	
		CLABSI ^h , Venti ^{f,h}	M	I	-	-	-	All	-	
EPIS ^b	Slovakia	-	-	-	-	-	-	-	-	112
ENVIN	Spain	CLABSI ^g , BSI ^g , UTI ^g , Venti ^{f,g}	V	I	1 quarterly per year	Annual	-	230	41.8	550
Neo-KissEs ^b		CLABSI ^h , CSF ^h	V	I	-	-	Yes	50	9.1	
EPINE		PPS	P	V	-	Annual	-	-	-	
INCLIMECC ^b		CLABSI ^g , BSI ^g , UTI ^g , Venti ^{f,g}	M	I	Annual	-	-	-	-	
		PPS	M	P	Annual	-	-	-	-	
SSI, CPE ^e , CDI, MRSA	M	I	Annual	-	-	-	-			
SALAR ^b	Sweden	PPS	M	P	Twice year	Twice a year	-	-	-	80
United Kingdom										
PHE	England	MRSA ^d , MSSA ^d , CDI, gram-	M	I	Monthly	Monthly, annual	-	148	58.5	253
		SSI	M,V	I	Quarterly		Yes	195	77.1	
-	North-Ireland	SSI	M	I	Quarterly	Quarterly	-	-	-	16
		MRSA, CDI	M	I	-	Quarterly	-	All	-	
		PPS	V	P	-	Every 5 years	-	-	-	
WHAIP	Wales	CDI	M	I	-	Bi-annual	-	77	98.7	78
		SSI, Venti ^f	M	I	-	Annual	-	68	87.2	
		BSI	M	I	-	Bi-annual	-	78	100	



Table S4: Infections surveyed in national surveillance programs, 37 countries, 2021(continued)

Program	Country	Infection	Mandatory - Voluntary	Incidence - Prevalence	Frequency of reporting to		Benchmark	# participating hospitals ^a		Total number hospitals in the country ^a
					Ministry	Public		N	%	
United Kingdom (continued)										
SSHAIP	Scotland	CDI	M	I	6 months or annual		-	All	100	89
		PPS	M	P	Annual		-			
		BSI ^g	M	I	Quarterly		-			
		ICU	M	I	Monthly	Annual, monthly	Yes			
		CPO, UTI	U	I	-		Yes (CPO)	-	-	
		SSI	M,V	I	Quarterly		-			
		MRSA ^d , Gram ^{-d} , CLABSI ^g , Venti ^{f-g} , Outb: Noro	M	I	-			-	All	

Abbreviations: ACSQHC, Australian Commission on Safety and Quality in Health Care; AGAR, Australian Group on Antimicrobial Resistance; AIHW, Australian Institute of Health and Welfare; ANISS, Austrian Nosocomial Infection Surveillance System; ANZICS, Australian And New Zealand Intensive Care Society; ARO, antimicrobial-resistant organisms; BSI, bloodstream infections; CDI, *Clostridioides difficile*; CLABSI, central line-associated bloodstream infection; CNISP, Canadian Nosocomial Infection Surveillance Program; CPE, carbapenemase-producing Enterobacteriaceae; CPO, carbapenemase-producing organisms; CRE, carbapenem-resistant Enterobacteriaceae; CSF, cerebrospinal fluid shunt; DANMAP, Danish Integrated Antimicrobial Resistance Monitoring and Research Programme; ECDC, European Centre for Disease Prevention and Control; ENVIN, Estudio Nacional de Vigilancia de Infección Nosocomial en Servicios de Medicina Intensiva; EPINE, study on the prevalence of nosocomial infections in Spain; EPIS, national epidemiologic surveillance systems; GIVITI, Gruppo italiano per la Valutazione degli interventi in Terapia intensiva; HAIBA, Healthcare-Associated Infections Database; HAI-NET, Healthcare-Associated Infections Surveillance Network; HPSC, Health Protection Surveillance Center; I, incidence; ICU, intensive care unit; INCLIMECC, Indicadores Clínicos de Mejora Continua de la Calidad; KISS, German Nosocomial Infection Surveillance System; LRI, lower respiratory infection; M, mandatory; MRSA, methicillin-resistant *Staphylococcus aureus* bloodstream infections; MSSA, methicillin-susceptible *Staphylococcus aureus* bloodstream infection; NEO-KISS, Neonatology-KISS; NHSN, National Healthcare Safety Network; NNSR, National Nosocomial Surveillance System; NOIS, surveillance system for hospital acquired infections; NOSIX, Luxembourg Nosocomial Infection Surveillance System; NRC-HAI, National Reference Center for Healthcare Associated Infections; NSIH, National Surveillance of Healthcare associated and antimicrobial resistance; P, prevalence; PHE, Public Health England; PPCIRA, Programa de Prevenção e Controlo de Infecções e de Resistência aos Antimicrobianos; PPS, point prevalence survey; PREZIES, Prevention of Nosocomial Infection through Surveillance; RAISIN, Réseau d'Alerte, d'Investigation et de Surveillance des Infections Nosocomiales; SALAR, Swedish Association of Local Authorities and Regions; SIRO, Finnish Hospital Infection Programme; SPIN-UTI, Italian Nosocomial Infections Surveillance in Intensive Care Units; SSHAIP, Scottish Surveillance of Healthcare Associated Infection Programme; SSI, surgical site infection; SWAB, Dutch Working Party on Antibiotic Policy; U, unknown; UTI, urinary tract infection; V, voluntary; VAE, ventilator-acquired event; VAP, ventilator-acquired pneumonia; VRE, vancomycin-resistant enterococci; WHAIP, Welsh Healthcare Associated Infection Programme; -, not applicable

^a Last available version
^b no report found (only protocol)
^c *Staphylococcus aureus*
^d Sepsis
^e CPE and/or CPO and/or CRE
^f VAP and/or VAE
^g ICU
^h Neonatal