associazione microbiologi clinici italiani

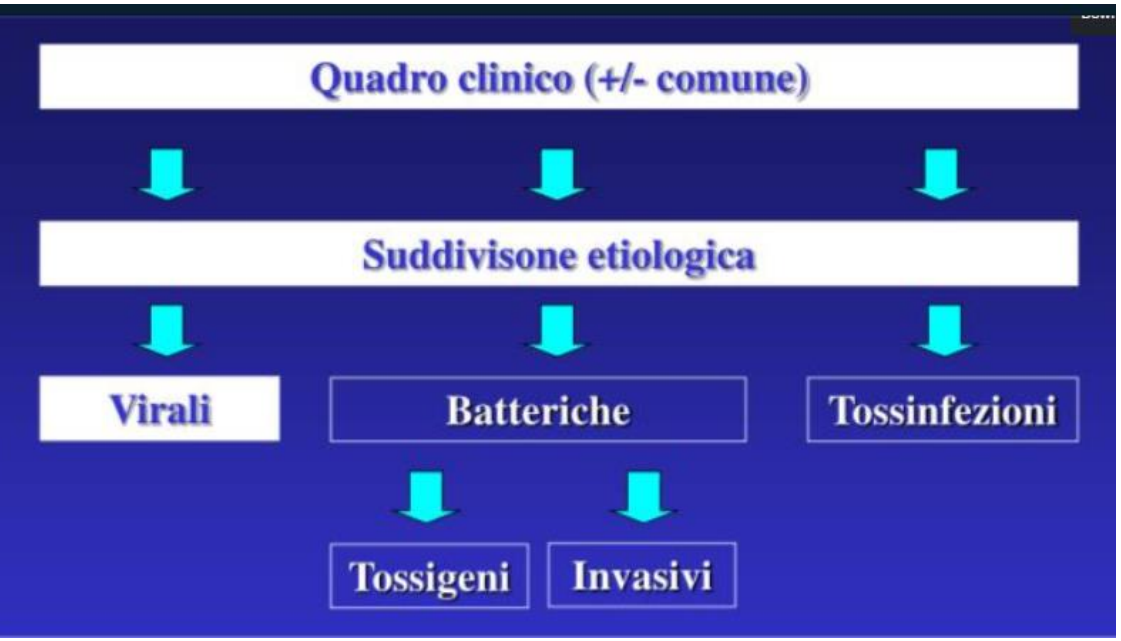
Ente del Terzo Settore

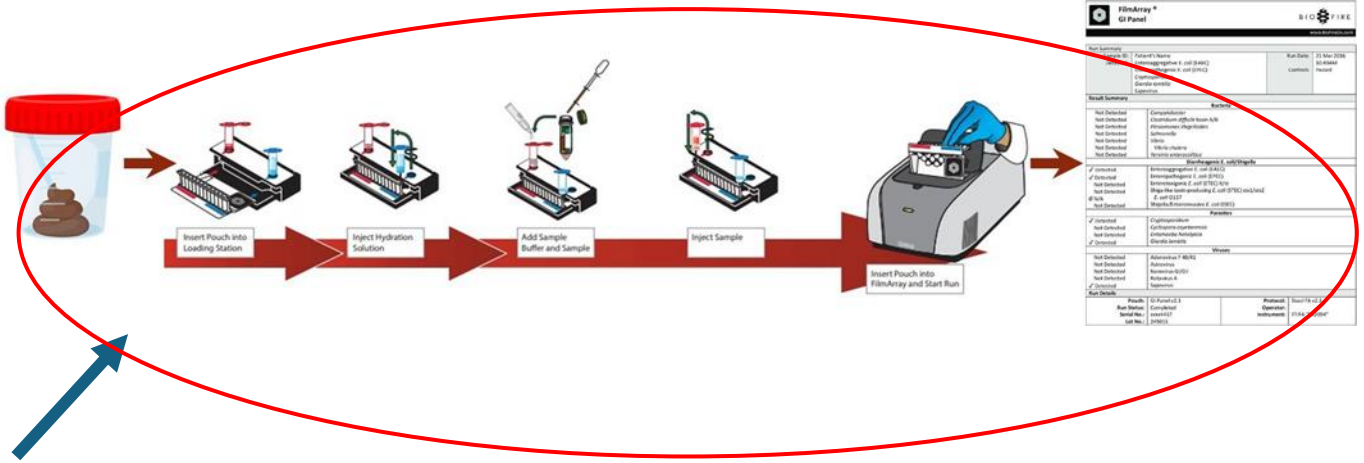
CATANZARO - 12 APRILE 2024

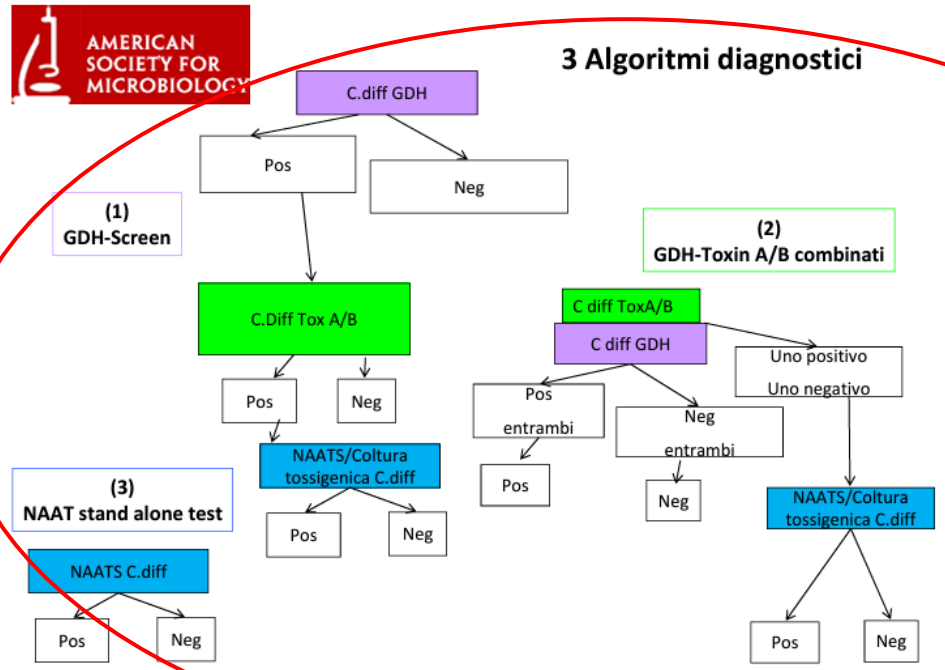
GASTROENTERITI INFETTIVE:
NUOVI PERCORSI DIAGNOSTICI

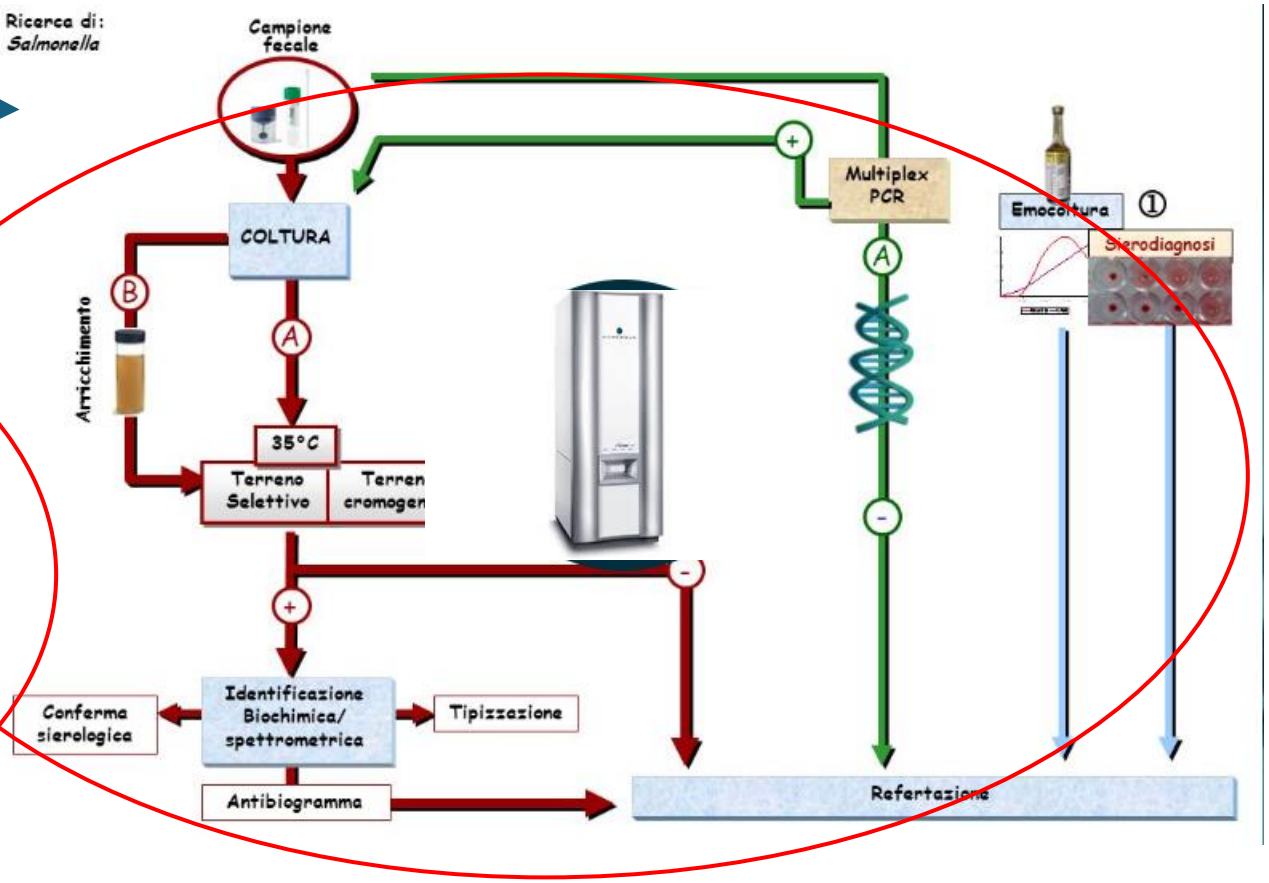
Patogeni enterici in pazienti ospedalizzati: esperienza *real-life* in un Policlinico Universitario

Angela Quirino
Università degli Studi «Magna Graecia» di Catanzaro









Le infezioni da *Clostridium difficile*: epidemiologia e aspetti microbiologici

Review > Gastroenterol Clin North Am. 2021 Jun;50(2):283-304. doi: 10.1016/j.gtc.2021.02.002. Epub 2021 Apr 23.

Acute Bacterial Gastroenteritis

James M Fleckenstein [1], F Matthew Kuhlmann [2], Alaullah Sheikh [2]

Affiliations + expand

PMID: 34024442 PMCID: PMC8793005 DOI: 10.1016/j.gtc.2021.02.002

Table 3

Complications and sequelae of gastroenteritis

condition	associated pathogens	^risk/predispositions	references
bacteremia; extraintestinal infections	non-typhoidal *Salmonella*>*Campylobacter*, *Yersinia*	elderly, immunosuppressed infants, young children, mutations in TLR genes, immunocompromised adults in LMICs[a]	95
intestinal perforation, toxic megacolon	*Shigella dysenteriae*, infrequently complicates infection with other *Shigella* serotypes and other etiologies of colitis	typically, *S. dysenteriae* infections	51,179
nonsuppurative complications			
reactive arthritis	Campylobacter, Salmonella, Shigella, Yersinia,	adult females, severe illness ±HLA-B27, ? PPI[b], ?antibiotic administration, SNP[c] in IFNG[d], duration of diarrhea	108,180–184 106,107
Guillain-Barré syndrome	*Campylobacter jejuni*	males ~1.5 × females, molecular mimicry of lipopolysaccharides of some strains and host gangliosides. SNPs in some host genes may contribute.	185
erythema nodosum	Yersinia, Shigella, Salmonella		90,186,187
sequelae of enteric infections in low-middle income countries			
tropical sprue	?toxin-producing *E. coli Enterobacteriaceae*	expatriates with extended exposure (*e.g.*, Peace Corp volunteers) and residents of LMICs	114–116,119,124,125
environmental enteric dysfunction	ETEC[e] and DEC[f] pathovars, *Shigella*, *Campylobacter*	young children in LMICs	133,134,137,139

[a]LMIC low-middle income country

[b]PPI proton pump inhibitor

[c]SNP single nucleotide polymorphism

[d]INFG interferon gamma gene

[e]ETEC enterotoxigenic *E. coli*,

[f]DEC diarrheagenic *E. coli*

Summary of common bacterial enteropathogens associated with acute gastroenteritis syndromes

pathogen(s)	exposures	clinical presentation	diagnostic tests		references
			culture	CIDT	
Campylobacter spp	poultry; unpasteurized dairy products, travel abroad, puppies, reptiles, contaminated water	abdominal pain, fever, nausea, vomiting, diarrhea (often bloody), rarely bacteremia	yes	yes	25,161–164
nontyphoidal *Salmonella* spp	eggs, chicken, multiple foods, backyard flocks, *broad* range of pets including amphibians and reptiles	abdominal pain, fever, nausea, vomiting, diarrhea, bacteremia more frequent with some serotypes *	yes	yes	40,165
STEC	numerous foodborne outbreaks with multiple vehicles of transmission including beef (particularly ground), sprouts, salad greens, cookie dough, petting zoos, childcare centers	diarrhea abdominal pain vomiting >bloody diarrhea (90%)->HUS (15%)	yes	yes	49,166,167
Shigella spp.	foodborne, travel abroad, homeless, easily transmitted person>person, daycares, MSM[a]	1–2 day incubation period; serotype *sonnei* causes most disease in US. typically milder illness. watery/bloody/ mucoid stool; fever, abdominal pain, nausea	yes	yes	56–58,62,168–170
Yersinia enterocolitica	pork, pork intestines (chitlins); unpasteurized milk/dairy	abdominal pain (may mimic appendicitis) diarrhea/bloody persistent diarrhea; bacteremia, particularly with iron overload states; metastatic infections	yes	yes	171,172
non-cholera *Vibrio spp*	raw or undercooked shellfish		yes	yes	173–175
ETEC[b]	international travel, domestic foodborne outbreaks.	abdominal pain, watery diarrhea occasionally profuse & cholera-like, occasionally prolonged duration of illness (median up to 7days) fever, vomiting infrequent.	no	yes	53,74,78
other DEC[c]	international travel, domestic foodborne(?); EAEC[d] has been associated with protracted diarrhea in HIV+ patients; EPEC[e] previously identified as a cause of infant diarrhea in U.S.	typically, watery diarrhea; borborygmi, low grade fever, nausea.	no	yes	176–178
pre-formed enterotoxin syndromes					
Clostridium perfringens	beef, poultry, catered, pre-warmed foods; restaurants	diarrhea and cramps within 6–24 (median 11) hours of ingestion. fever and /or vomiting are very infrequent.	no	no **	87
Bacillus cereus	rice/fried rice; meat; restaurants	2–12 (median 5) hours, vomiting, diarrhea	no	no **	87
Staphylococcus aureus	diverse vehicles; restaurants	sudden onset nausea, vomiting, abdominal pain, diarrhea within 30 minutes to 8 hours (median 4 hours) of ingestion. self- limited.	no	no **	87,89

*Dublin>Cholerasuis>Schwarzengrund>Heidelberg>Enteriditis~Typhimurium

**preformed toxin detection by reference/public health laboratory

[a]men who have sex with men

[b]ETEC enterotoxigenic E. coli;

[c]DEC diarrheagenic E. coli,

Jeffs et al. BMC Public Health (2019) 19:18
https://doi.org/10.1186/s12889-018-6229-4

BMC Public Health

RESEARCH ARTICLE Open Access

The epidemiology of non-viral gastroenteritis in New Zealand children from 1997 to 2015: an observational study

Emma Jeffs[1†], Jonathan Williman[2†], Natalie Martin[1], Cheryl Brunton[2] and Tony Walls[1*†]

La Nuova Zelanda dispone di un sistema di monitoraggio efficiente delle malattie soggette a notifica, in base al quale alcune malattie trasmissibili vengono notificate all'ufficiale sanitario locale per consentire una tempestiva azione di sanità pubblica.

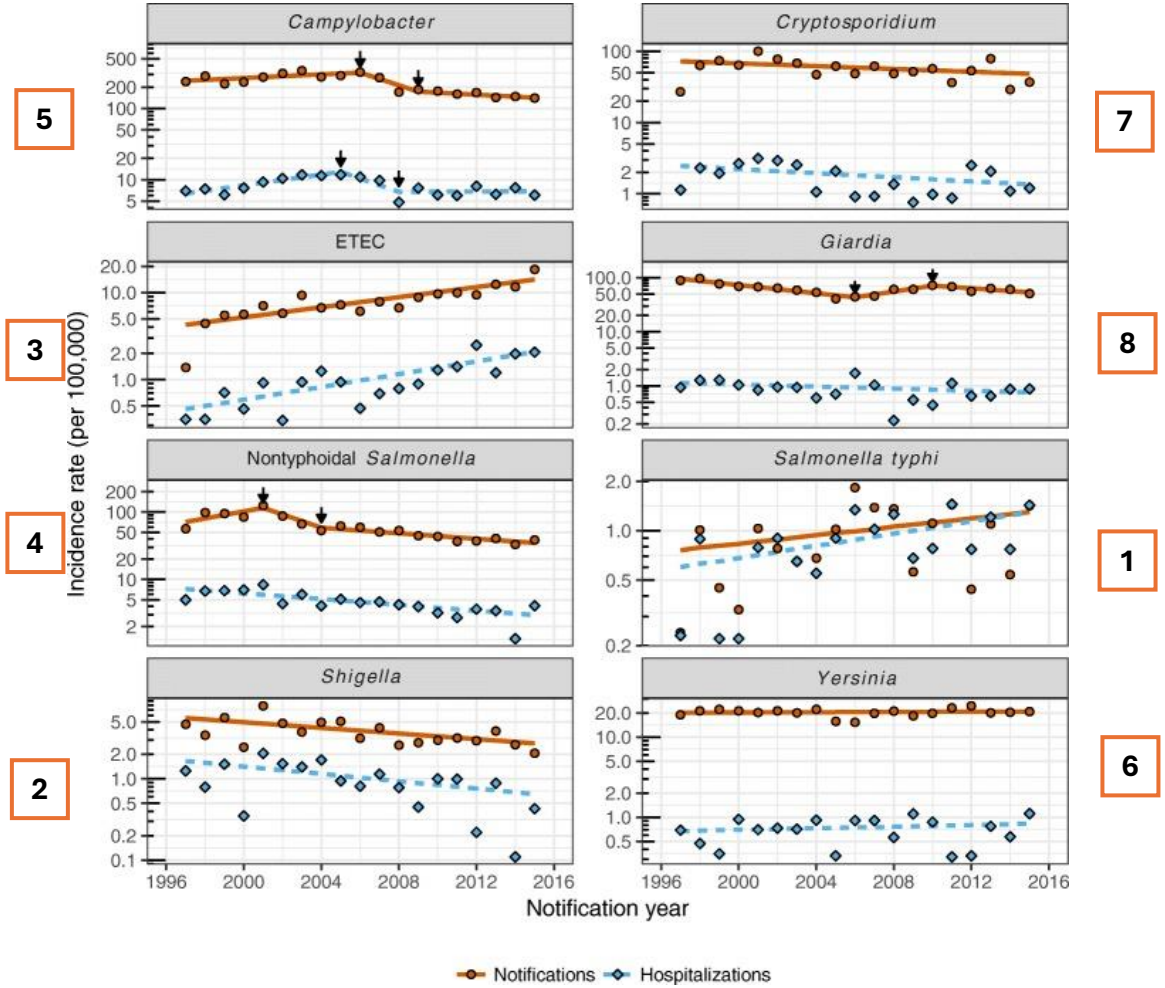
I patogeni batterici soggetti a notifica includono:

- *Campylobacter*
- *Shigella*
- *Salmonella*
- *Yersinia*
- *Escherichia coli* enterotossigenico produttore di verotossina o tossina shiga (ETEC)

mentre i patogeni protozoari soggetti a notifica includono:

- *Giardia*
- *Cryptosporidium*

Lo scopo di questo studio è stato quello di determinare il carico di malattia dovuto a gastroenterite non virale nei bambini neozelandesi, descrivendo le tendenze dei ricoveri ospedalieri e delle notifiche di malattia dal 1997 al 2015.



I tassi di ospedalizzazione erano in genere molto più bassi dei corrispondenti tassi di notifica per ciascuna malattia da infezione

I rapporti tra ricoveri e notifiche erano, in ordine dal più alto al più basso,

1. Salmonella typhi (1:1.09),
2. Shigella (1:4.0),
3. ETEC (1:7.81),
4. Salmonella non tifoide (1:13.1),
5. Campylobacter (1:27.8),
6. Yersinia (1:29.2),
7. Cryptosporidium (1:33.4)
8. Giardia (1:72.5).

	Years	Change in age adjusted rate (per 100,000)	Annual percentage change	Direction
Notifications				
Campylobacter	1997 to 2006	239 to 326	3.0 (0.2 to 5.9, p = 0.040)	▲
	2006 to 2009	326 to 185	-18.6 (-42.3 to 14.9, p = 0.216)	—
	2009 to 2015	185 to 141	-3.2 (-9.4 to 3.5, p = 0.304)	—
Cryptosporidium	1997 to 2015	27.1 to 37.1	-2.2 (-4.9 to 0.5, p = 0.103)	—
ETEC	1997 to 2015	1.37 to 18.4	6.9 (4.8 to 9.0, p = <0.001)	▲
Giardia	1997 to 2006	88.7 to 44.2	-8.4 (-10.7 to -6.0, p = <0.001)	▼
	2006 to 2010	44.2 to 71.7	13.2 (-2.7 to 31.8, p = 0.098)	—
	2010 to 2015	71.7 to 50.9	-5.5 (-11.3 to 0.6, p = 0.071)	—
Nontyphoidal *Salmonella*	1997 to 2001	56.5 to 125	12.8 (-0.5 to 27.9, p = 0.058)	—
	2001 to 2004	125 to 53.3	-20.3 (-46.0 to 17.8, p = 0.227)	—
	2004 to 2015	53.3 to 38.7	-4.6 (-7.7 to -1.4, p = 0.009)	▼
Salmonella typhi	1997 to 2015	0.241 to 1.42	3.0 (-1.3 to 7.5, p = 0.163)	—
Shigella	1997 to 2015	4.65 to 2.06	-3.9 (-6.4 to -1.3, p = 0.006)	▼
Yersinia	1997 to 2015	19 to 20.8	0.2 (-0.8 to 1.2, p = 0.665)	—
Hospitalisations				
Campylobacter	1997 to 2005	6.95 to 11.8	9.2 (4.9 to 13.5, p = <0.001)	▲
	2005 to 2008	11.8 to 4.82	-19.4 (-42.0 to 12.0, p = 0.177)	—
	2008 to 2015	4.82 to 6.07	0.3 (-5.0 to 5.8, p = 0.918)	—
Cryptosporidium	1997 to 2015	1.13 to 1.2	-3.3 (-6.8 to 0.4, p = 0.077)	—
ETEC	1997 to 2015	0.35 to 2.07	8.8 (5.5 to 12.3, p = <0.001)	▲
Giardia	1997 to 2015	0.936 to 0.884	-2.2 (-5.2 to 0.9, p = 0.155)	—
Nontyphoidal *Salmonella*	1997 to 2015	4.97 to 4.07	-4.8 (-6.8 to -2.8, p = <0.001)	▼
Salmonella typhi	1997 to 2015	0.23 to 1.43	4.4 (0.8 to 8.1, p = 0.020)	▲
Shigella	1997 to 2015	1.25 to 0.434	-5.1 (-9.1 to -0.9, p = 0.021)	▼
Yersinia	1997 to 2015	0.695 to 1.11	1.2 (-2.1 to 4.5, p = 0.466)	—

Tendenza verso un calo sia delle notifiche che dei ricoveri per la maggior parte dei patogeni non virali

La maggior parte di questi agenti patogeni sono prevalentemente di origine alimentare e il declino osservato potrebbe essere dovuto a:

- **cambiamenti nella sicurezza alimentare,** come gli standard dell'industria alimentare relativi alla manipolazione degli alimenti
- **maggiore consapevolezza dei consumatori sulla sicurezza alimentare**
- **cambiamenti nel settore della produzione alimentare,** compresa l'agricoltura, come l'aumento della meccanizzazione
- **monitoraggio più rigoroso degli indicatori di sicurezza alimentare e di Igiene**

Campylobacter è stato identificato come **l'agente patogeno associato alla maggior parte delle notifiche e dei ricoveri**
In particolare tra il 2006 e il 2009 c'è stata una riduzione delle notifiche di *Campylobacter* che è stata coerente in tutte le fasce d'età. Questa riduzione **ha coinciso con l'introduzione di una serie di interventi volontari e normativi per ridurre la contaminazione da Campylobacter nel pollame.**

IL DATO FORNISCE LA PROVA DEGLI EFFETTI POSITIVI DI UNA MISURA DI SICUREZZA ALIMENTARE SULLA SALUTE DEI BAMBINI

Per le **Salmonelle non tifoidi,** principale causa di enterocolite batterica infantile, è stata osservata parallelamente al ***Campylobacter,*** la **riduzione dell'incidenza della malattia**.

Il numero di notifiche di infezione da **ETEC è aumentato costantemente dopo il 1997.** Questo aumento può, in parte, essere dovuto:

- **ai cambiamenti nelle pratiche di test di laboratorio**, con saggi e algoritmi sempre più sensibili
- **ai miglioramenti nella sorveglianza** a causa di una maggiore preoccupazione per la salute pubblica

EUROPEAN FOOD SAFETY AUTHORITY

The European Union One Health 2022 Zoonoses Report

Published: 12 December 2023 | **Approved:** 8 November 2023

Share:

Il **12 dicembre 2023**, l'Autorità europea per la sicurezza alimentare (EFSA) e il Centro europeo per la prevenzione e il controllo delle malattie (ECDC) hanno pubblicato il **rapporto annuale sulle zoonosi, agenti di zoonosi e sui focolai epidemici di malattie a trasmissione alimentare**

IN EUROPA...

I dati del 2022 in sintesi

- Nel 2022, i casi di zoonosi maggiormente segnalati nell'uomo nell'UE sono stati la campilobatteriosi (137 mila segnalazioni, stabile rispetto al 2021) e la salmonellosi (65 mila segnalazioni, in lieve aumento).
- Nel settore animale, sono stati 19 gli Stati membri dell'UE e l'Irlanda del Nord che hanno raggiunto tutti gli obiettivi di riduzione della prevalenza dei sierotipi oggetto dei Piani nazionali di controllo delle salmonellosi nelle popolazioni avicole (pollame).
- La yersiniosi è stata la terza zoonosi più segnalata nell'uomo, seguita dalle infezioni da *Escherichia coli* produttore di Shigatossina (STEC) e da Listeria monocytogenes.
- Le infezioni da *L. monocytogenes* e da West Nile virus sono state le malattie zoonotiche più gravi, con i tassi di decesso tra i casi più elevati.
- Nel complesso, nell' UE il numero di focolai e casi di origine alimentare, ricoveri e decessi segnalati nel 2022 è stato superiore rispetto al 2021.
- *S. Enteritidis* è rimasto l'agente eziologico più frequentemente segnalato nelle epidemie di origine alimentare.
- Il numero di decessi dovuti a focolai epidemici è stato il più alto mai segnalato nell'UE negli ultimi dieci anni, causati principalmente da *L. monocytogenes* e *Salmonella*.

IN ITALIA...

La **salmonellosi** continua a rappresentare la **malattia zoonotica maggiormente segnalata nell'uomo,** seguita dalla **campilobatteriosi**

Tabella 1: Casi confermati notificati e tassi di notifica (per 100.000) per le principali zoonosi segnalate in Italia nel periodo 2018-2022 (Fonte EFSA/ECDC: EFSA and ECDC, 2023. The European Union One Health 2022 Zoonoses Report)

Zoonosi	2022		2021		2020		2019		2018	
Copertura nazionale	N casi	Tasso[a]	N casi	Tasso[a]	N casi	Tasso[a]	N casi	Tasso[a]	N casi	Tasso[a]
Campylobacter[b]	N	1.539	–	1.541	–	1.418	–	1.633	–	1.356	–
Salmonella[c]	Y	3.302	5,6	1.776	3,0	2.713	4,5	3.256	5,4	3.635	6,0
Listeria	Y	345	0,58	230	0,39	155	0,26	202	0,34	178	0,29
STEC[b]	N	118	–	65	–	45	–	62	–	73	–
Tubercolosi da *M. bovis/M. caprae*	Y	15	0,03	12	0,02	6	0,01	11	0,02	17	0,03
Brucella	Y	20	0,03	32	0,05	18	0,03	49	0,08	94	0,16
Trichinella	Y	4	0,01	0	0	79	0,13	10	0,02	2	<0.01
Yersinia	N	36	–	35	–	21	–	12	–	14	–
Febbre Q	Y	0	0	0	0	0	0	6	0,01	1	<0.01
Tularemia	Y	3	0,01	3	0,01	0	0	1	0	0	0
West Nile Virus	Y	723	1,2	65	0,11	69	0,12	54	0,09	610	1,0

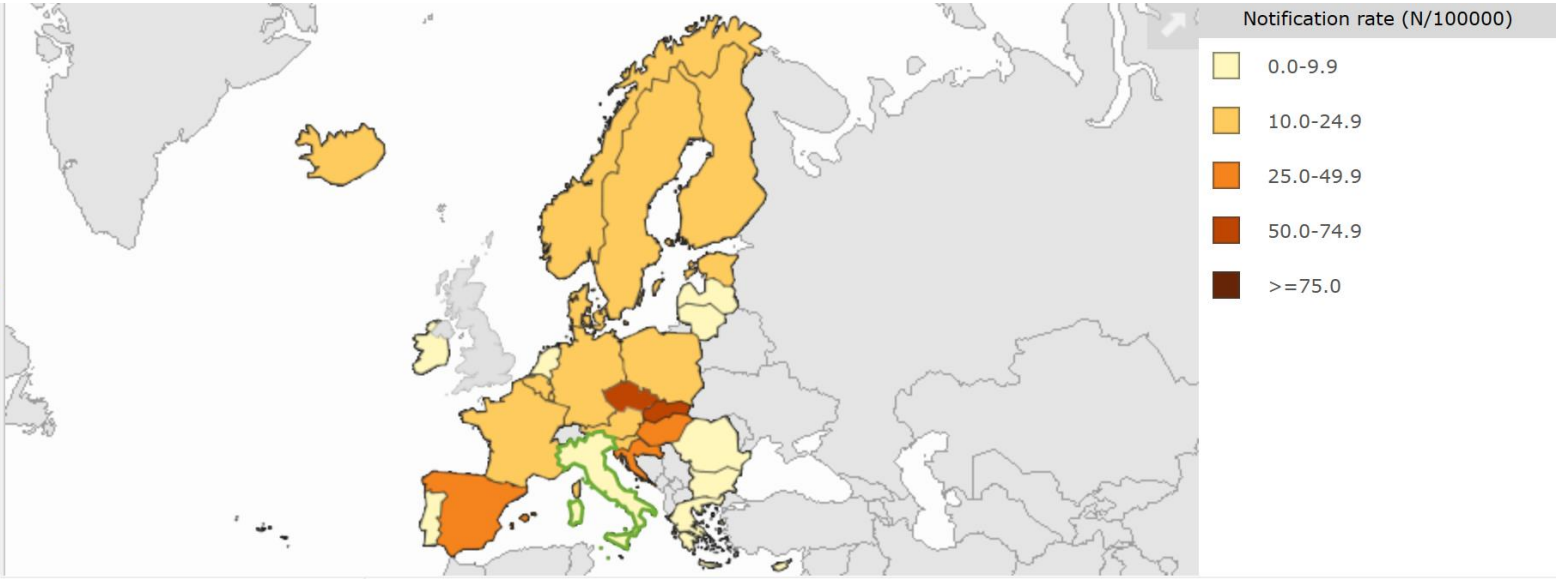
(a): Sorveglianza sentinella; il tasso di notifica non può essere calcolato poiché non sono disponibili informazioni sul livello di copertura della sorveglianza
(b): Secondo i dati pubblicati sull'European Union One Health zoonoses report del 2021 (EFSA, ECDC 2022), l'Italia ha riportato 3.768 casi confermati nel 2021, corrispondenti a 6,4 casi per 100 000 abitanti
(c): Malattia non soggetta a sorveglianza

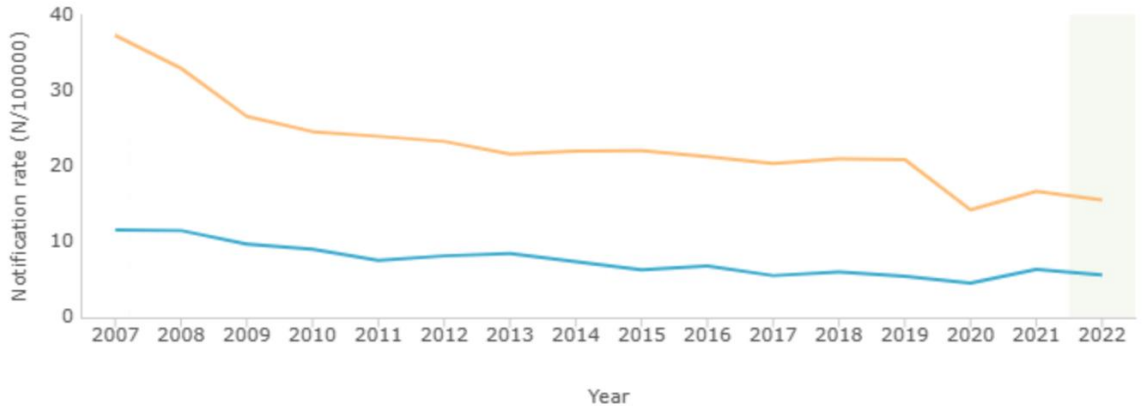
SALMONELLOSIS

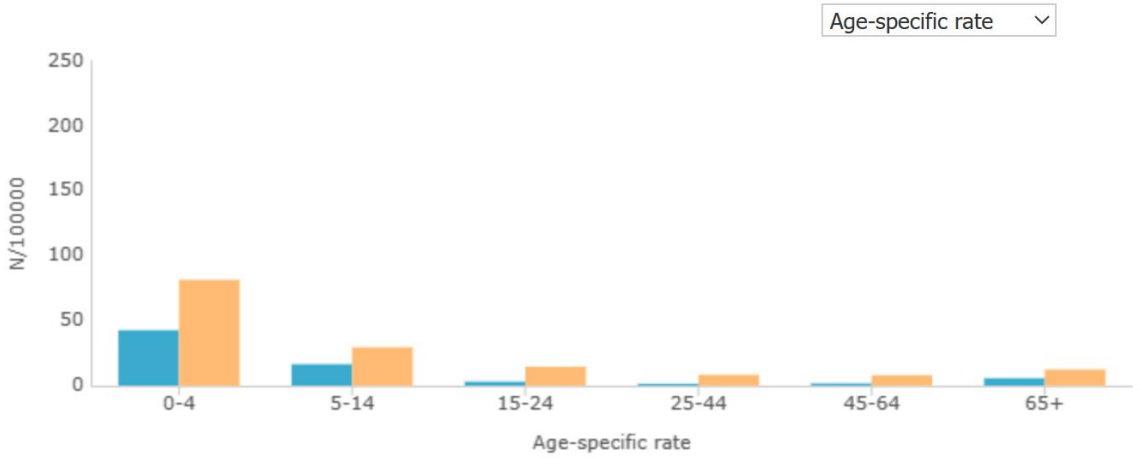
EU/EEA trend with Italian Focus

NOTIFICATION RATE 2022

Region	Notification rate (N/100000)
Hungary	33.53
Iceland	11.16
Ireland	6.72
Italy	5.59
Latvia	4.80
Liechtenstein	12.72
Lithuania	8.34
Luxembourg	24.95
Malta	38.20
Netherlands	9.12
Norway	13.12
Poland	16.08
Portugal	3.98







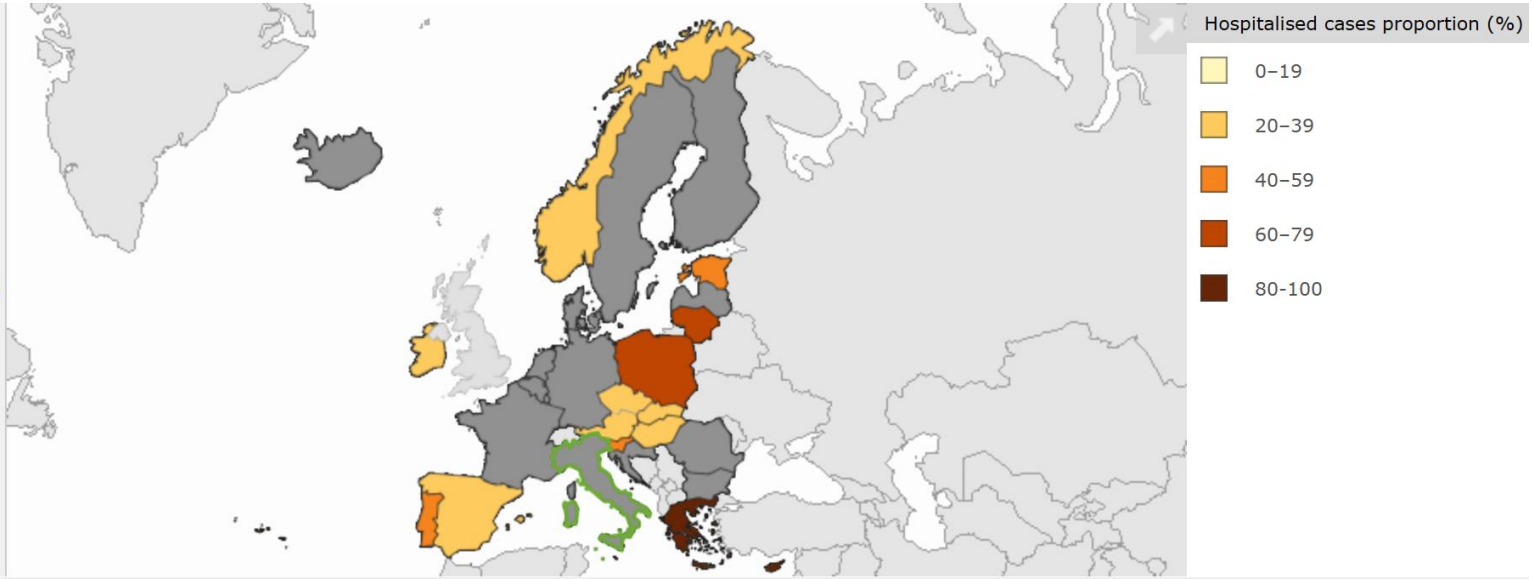
Italy EU/EEA (without UK)

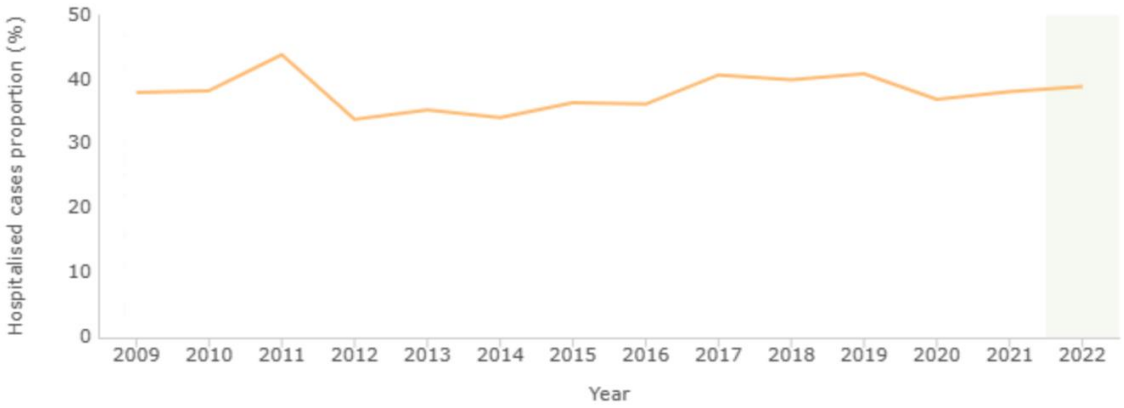
SALMONELLOSIS

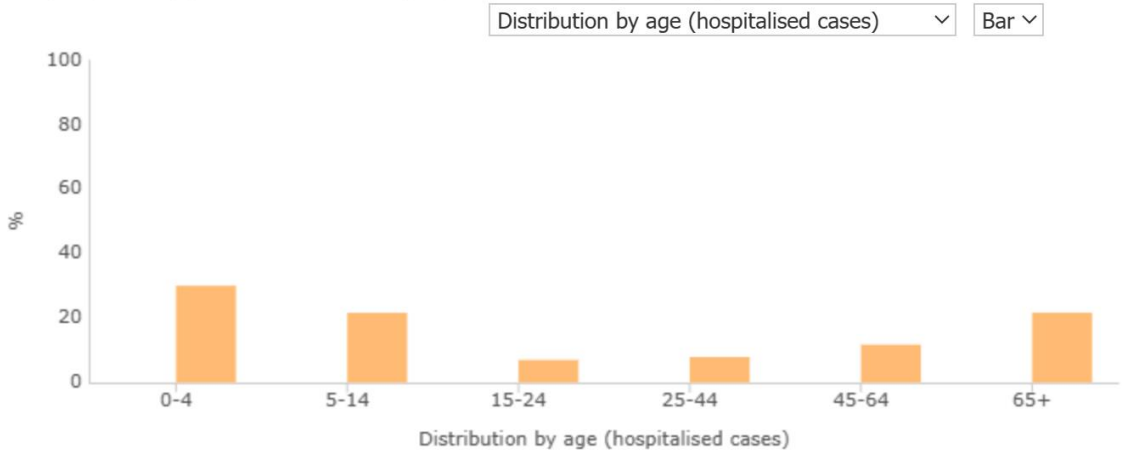
EU/EEA trend with Italian Focus

HOSPITALISED CASES PROPORTION 2022

Region	Hospitalised cases proportion (%)
Greece	83.1
Hungary	26.5
Iceland	-
Ireland	31.8
Italy	-
Latvia	-
Liechtenstein	-
Lithuania	79.9
Luxembourg	-
Malta	69.2
Netherlands	-
Norway	38.9







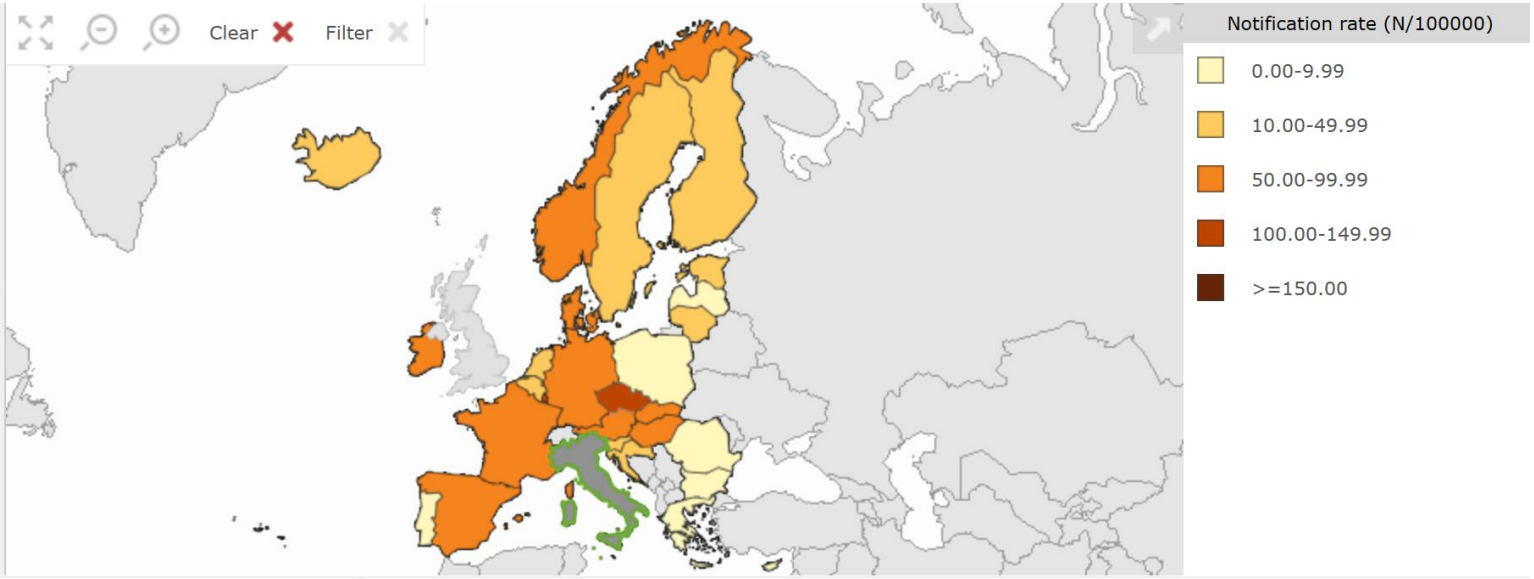
Italy EU/EEA (without UK)

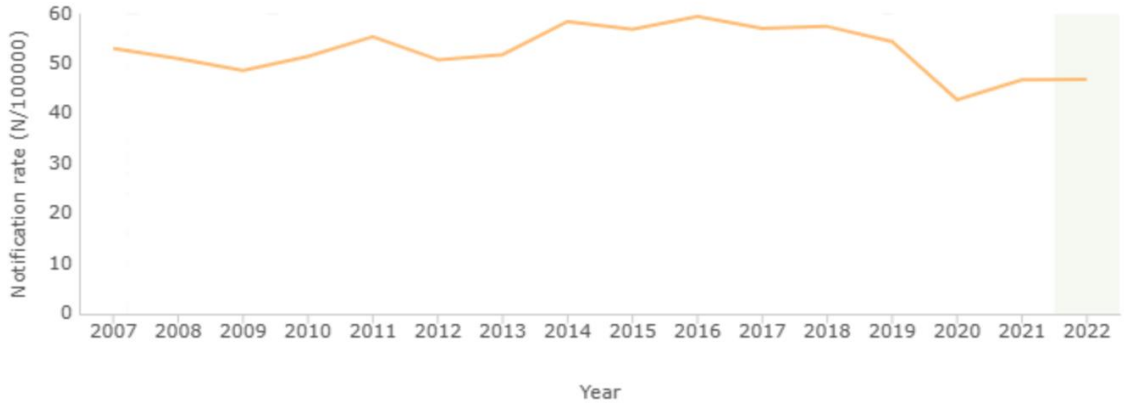
CAMPYLOBACTERIOSIS

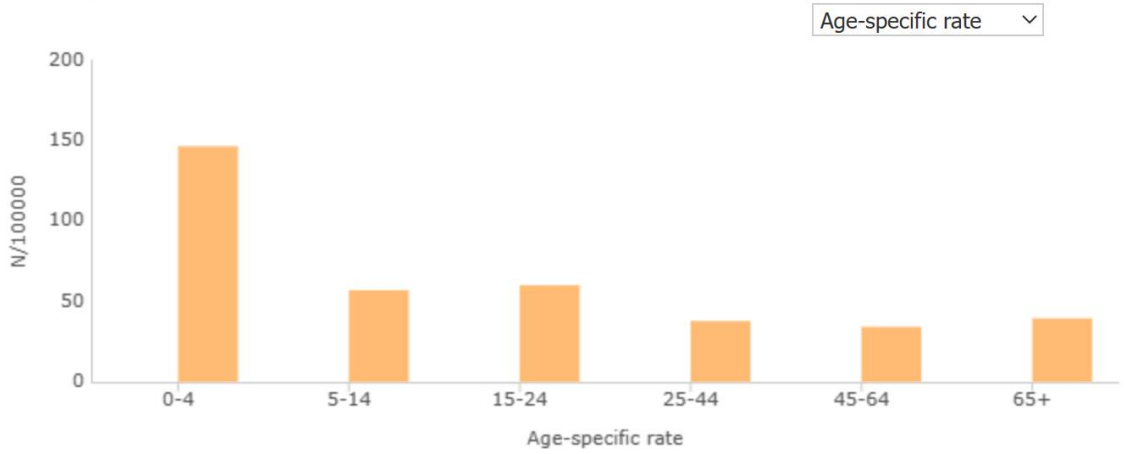
EU/EEA trend with Italian Focus

NOTIFICATION RATE 2022

Region	Notification rate (N/100000)
Greece	2.89
Hungary	52.12
Iceland	27.64
Ireland	71.48
Italy	-
Latvia	9.17
Liechtenstein	127.20
Lithuania	17.71
Luxembourg	141.31
Malta	71.41
Netherlands	26.91
Norway	54.93
Poland	1.40







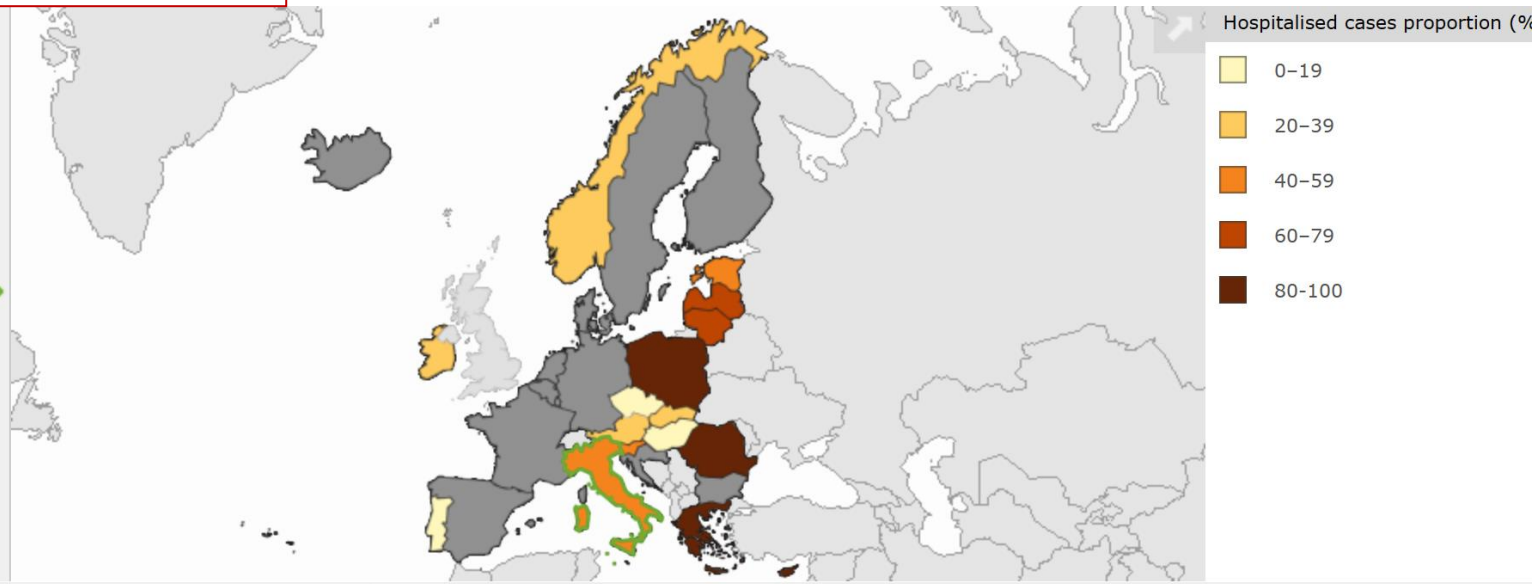
Italy EU/EEA (without UK)

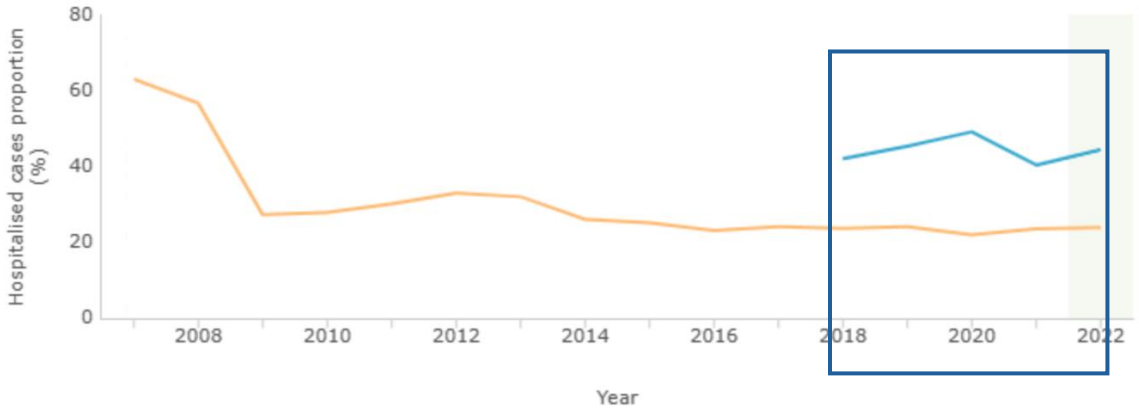
CAMPYLOBACTERIOSIS

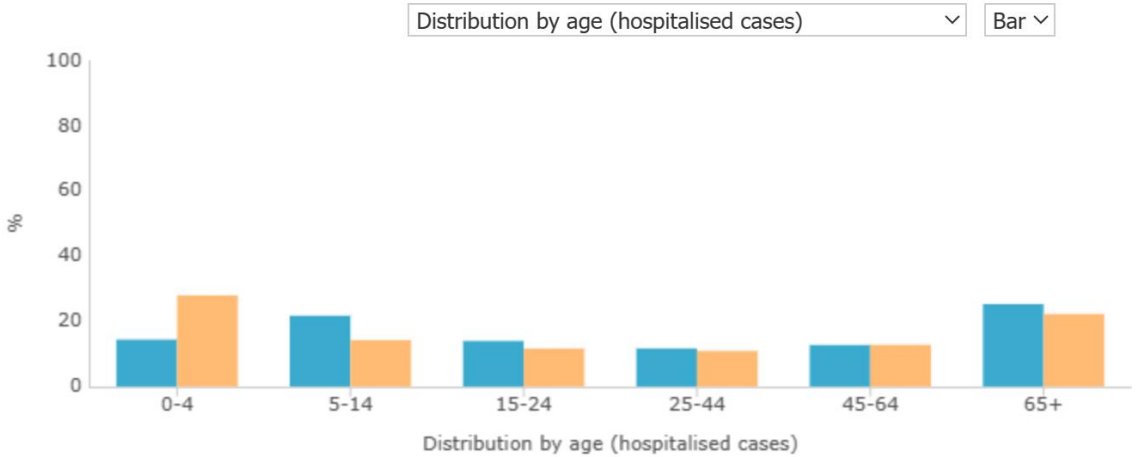
EU/EEA trend with Italian Focus

HOSPITALISED CASES PROPORTION 2022

Region	Hospitalised cases proportion (%)
Germany	-
Greece	87.2
Hungary	15.7
Iceland	-
Ireland	27.6
Italy	44.5
Latvia	79.7
Liechtenstein	-
Lithuania	68.8
Luxembourg	-
Malta	-
Netherlands	-
Norway	30.7







Italy EU/EEA (without UK)

Eur J Clin Microbiol Infect Dis. 2024 Mar 12. doi: 10.1007/s10096-024-04803-0.
Online ahead of print.

Human Campylobacter spp. infections in Italy

Verena Zerbato [1], Stefano Di Bella [2], Riccardo Pol [3], Roberto Luzzati [2], Gianfranco Sanson [2], Simone Ambretti [4 5], Stefano Andreoni [6], Richard Aschbacher [7], Mariano Bernardo [8], Alessandra Bielli [9], Gioconda Brigante [10], Marina Busetti [11], Giulio Camarlinghi [12], Davide Carcione [10], Antonella Carducci [10], Nicola Clementi [13 14], Edoardo Carretto [15], Chiara Chilleri [16 17], Giulia Codda [18], Alessandra Consonni [19], Venera Costantino [11], Venere Cortazzo [20 21], Manuela Di Santolo [11], Saveria Dodaro [22], Barbara Fiori [23], Aurora García-Fernández [24], Claudio Foschi [4 5], Elisa Gobbato [6], Francesca Greco [22], Roberto Marcello La Ragione [25 26], Nicasio Mancini [27 28], Alberto Enrico Maraolo [29], Anna Marchese [18 30], Daniela Marcuccio [31], Roberta Marrollo [15], Carola Mauri [19], Annarita Mazzariol [32], Gianluca Morroni [33], Adriana Mosca [34], Giacomo Nigrisoli [4], Elisabetta Pagani [7], Eva Maria Parisio [12], Simona Pollini [16 17], Mario Sarti [35], Annarita Sorrentino [32], Domenico Trotta [33], Laura Villa [24], Chiara Vismara [9], Luigi Principe [31]

Affiliations + expand

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Abstract

Purpose: Campylobacter is a frequent cause of enteric infections with common antimicrobial resistance issues. The most recent reports of campylobacteriosis in Italy include data from 2013 to 2016. We aimed to provide national epidemiological and microbiological data on human Campylobacter infections in Italy during the period 2017-2021.

Methods: Data was collected from 19 Hospitals in 13 Italian Regions. Bacterial identification was

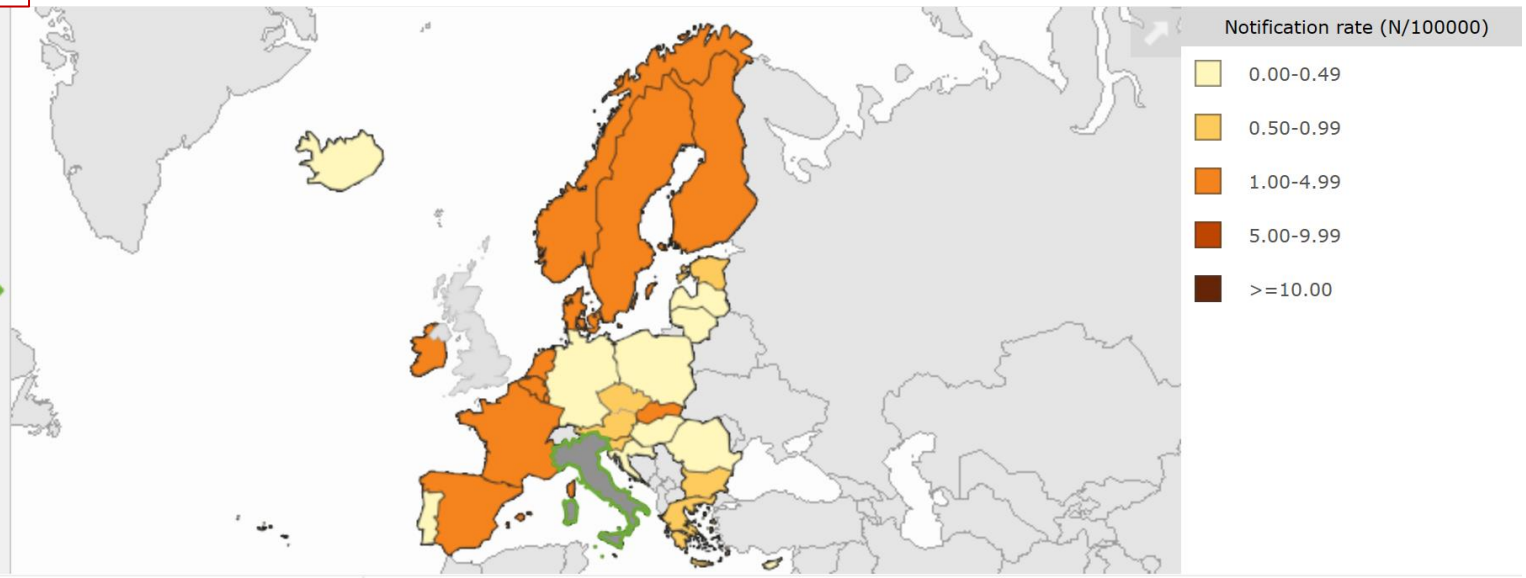
In total, **5419** isolations of *Campylobacter* spp. were performed. The most common species were *C. jejuni* (n = 4535, 83.7%), followed by *C. coli* (n = 732, 13.5%) and *C. fetus* (n = 34, 0.6%). The mean age of patients was 34.61 years and 57.1% were males. Outpatients accounted for 54% of the cases detected. *Campylobacter* were isolated from faeces in 97.3% of cases and in 2.7% from blood. *C. fetus* was mostly isolated from blood (88.2% of cases). We tested for antimicrobial susceptibility 4627 isolates (85.4%). Resistance to ciprofloxacin and tetracyclines was 75.5% and 54.8%, respectively; resistance to erythromycin was 4.8%; clarithromycin 2% and azithromycin 2%. 50% of *C. jejuni* and *C. coli* were resistant to ≥ 2 antibiotics. Over the study period, resistance to ciprofloxacin and tetracyclines significantly decreased ($p < 0.005$), while resistance to macrolides remained stable.

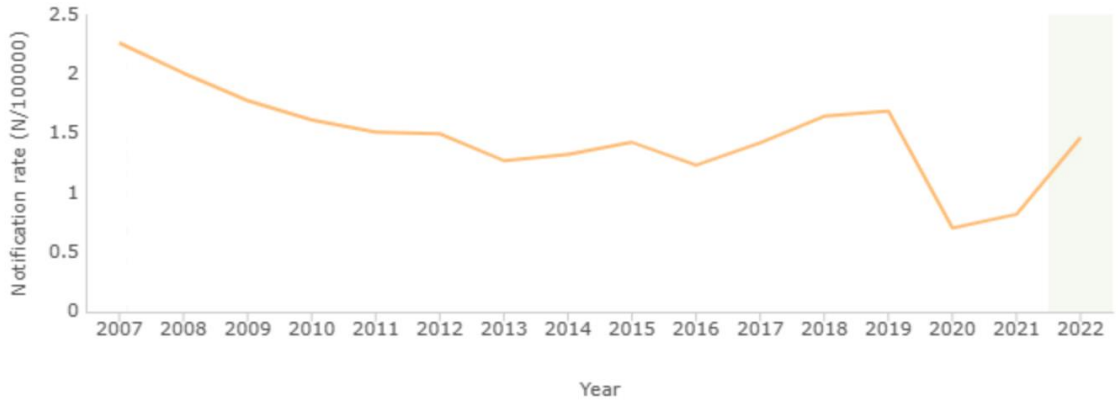
SHIGELLOSIS

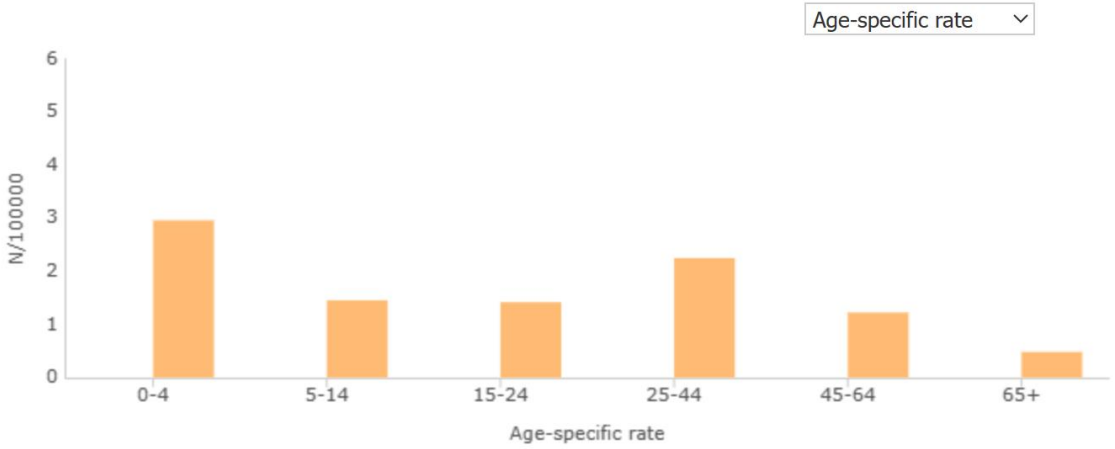
EU/EEA trend with Italian Focus

NOTIFICATION RATE 2022

Region	Notification rate (N/100000)
France	4.32
Germany	0.41
Greece	0.57
Hungary	0.19
Iceland	0.00
Ireland	2.57
Italy	-
Latvia	0.16
Liechtenstein	0.00
Lithuania	0.21
Luxembourg	4.18
Malta	0.96







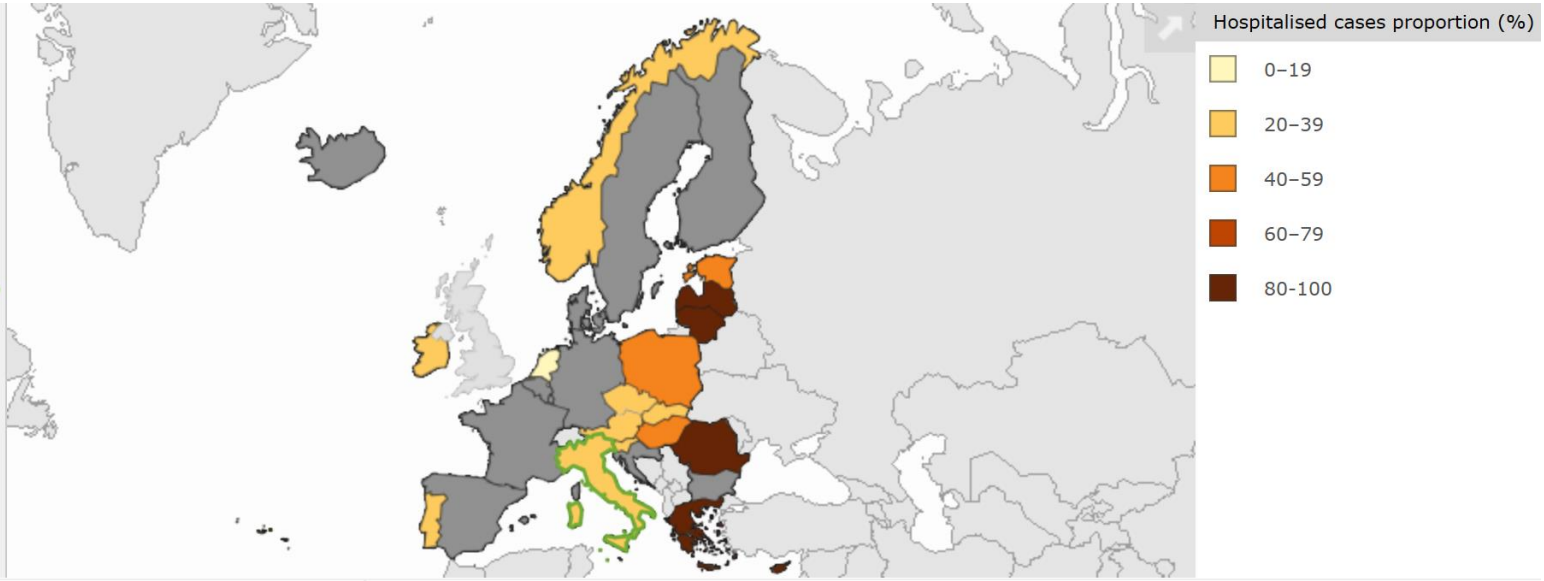
Italy EU/EEA (without UK)

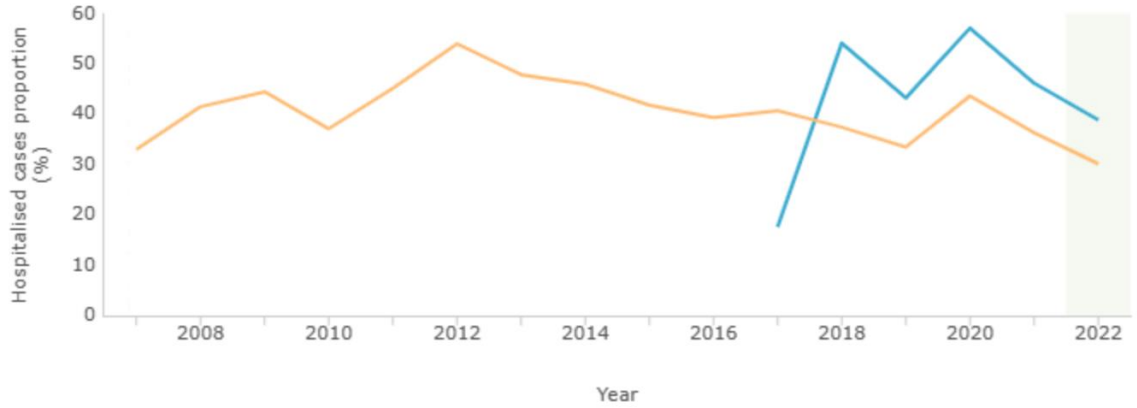
SHIGELLOSIS

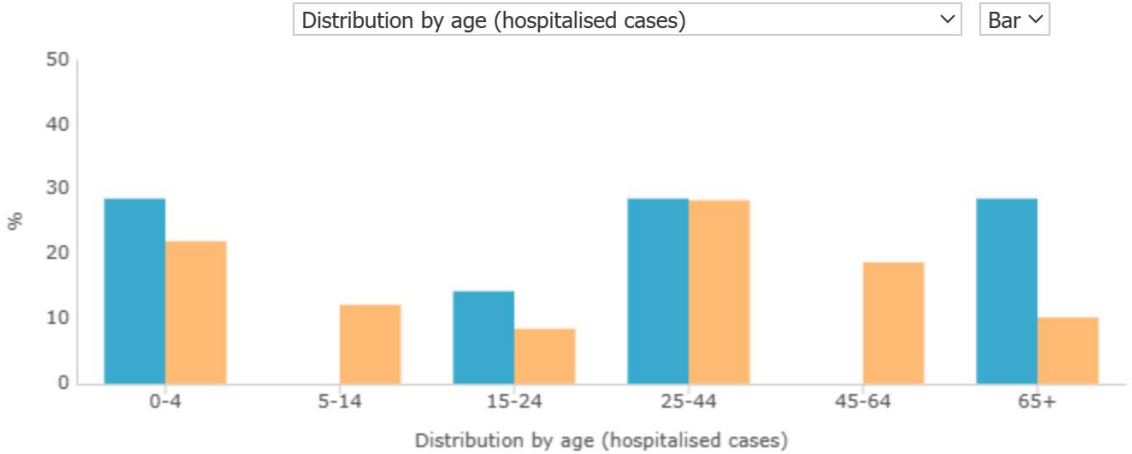
EU/EEA trend with Italian Focus

HOSPITALISED CASES PROPORTION 2022

Region	Hospitalised cases proportion (%)
Greece	88.1
Hungary	44.4
Iceland	-
Ireland	27.6
Italy	38.9
Latvia	100.0
Liechtenstein	-
Lithuania	83.3
Luxembourg	-
Malta	-
Netherlands	12.6
Norway	32.9
Poland	47.4







Italy EU/EEA (without UK)

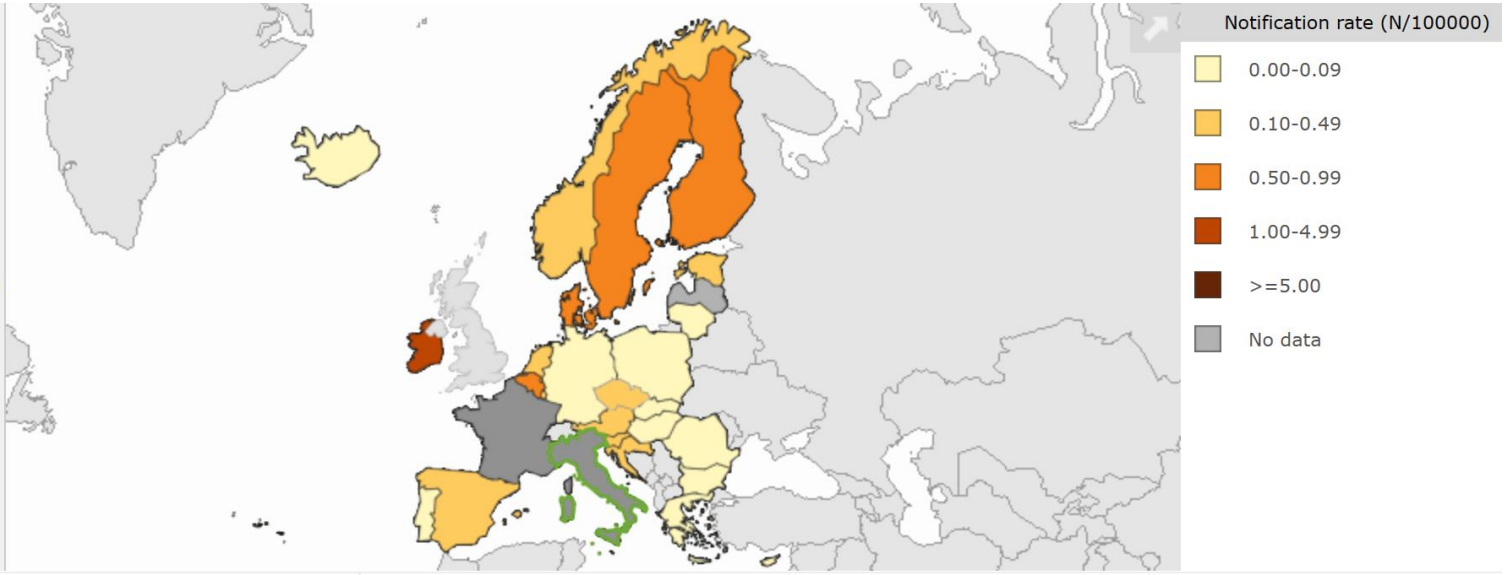
Surveillance Atlas of Infectious Diseases

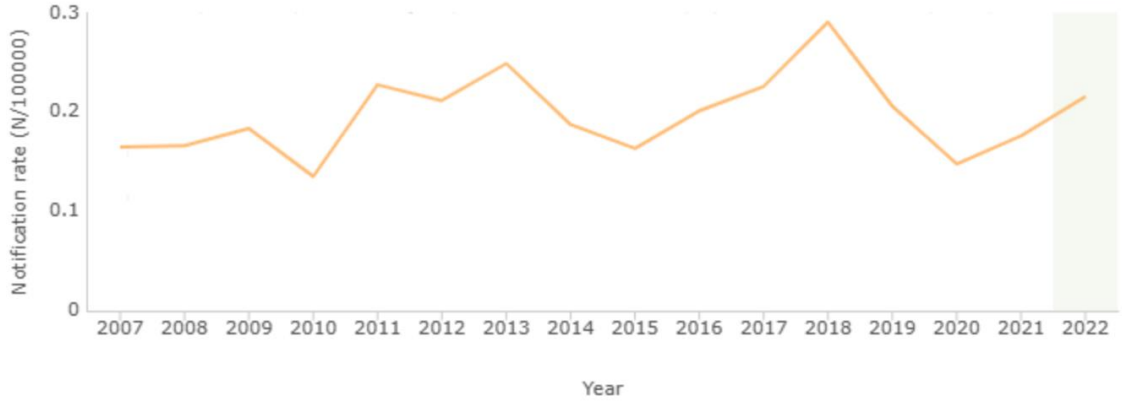
STEC/VTEC infection O-157 Serotype Group

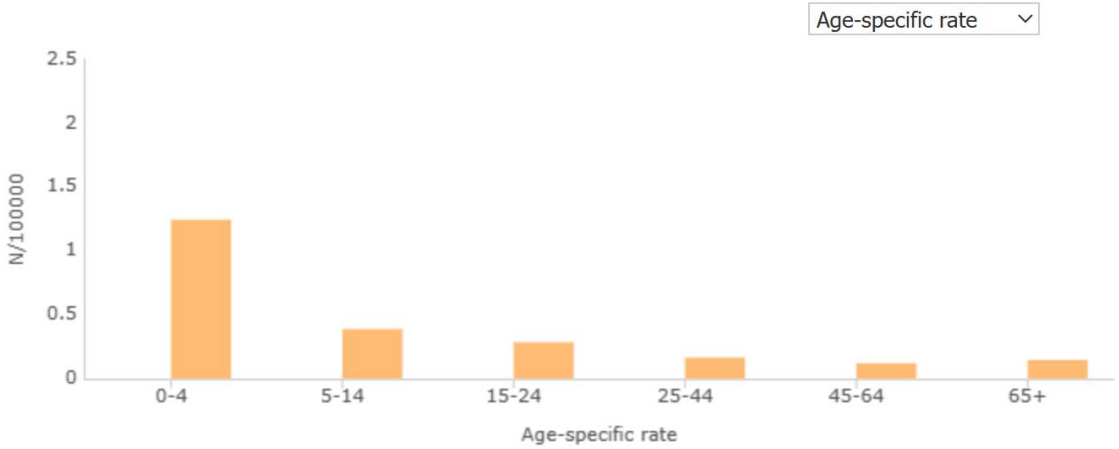
EU/EEA trend with Italian Focus

NOTIFICATION RATE 2022

Region	Notification rate (N/100000)
Germany	0.07
Greece	0.02
Hungary	0.01
Iceland	0.00
Ireland	3.04
Italy	-
Latvia	.
Liechtenstein	0.00
Lithuania	0.00
Luxembourg	0.46
Malta	0.19
Netherlands	0.40
Norway	0.41







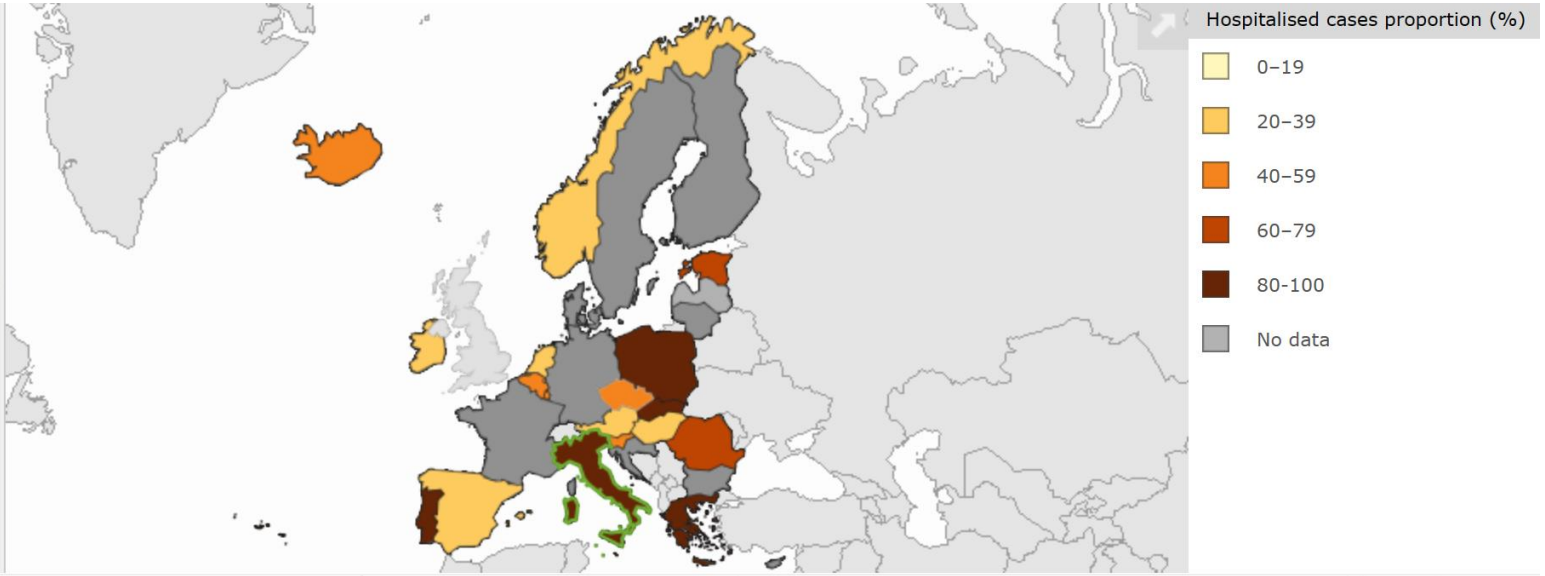
Italy EU/EEA (without UK)

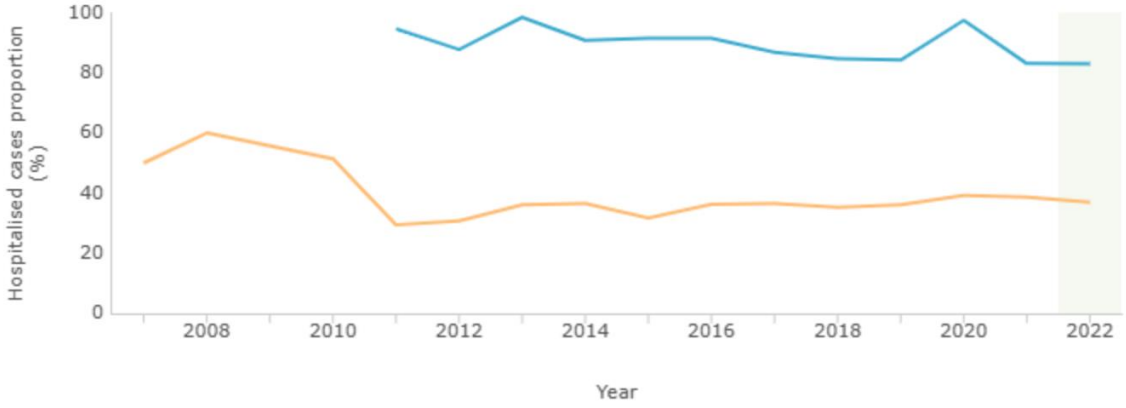
STEC/VTEC infection O-157 Serotype Group

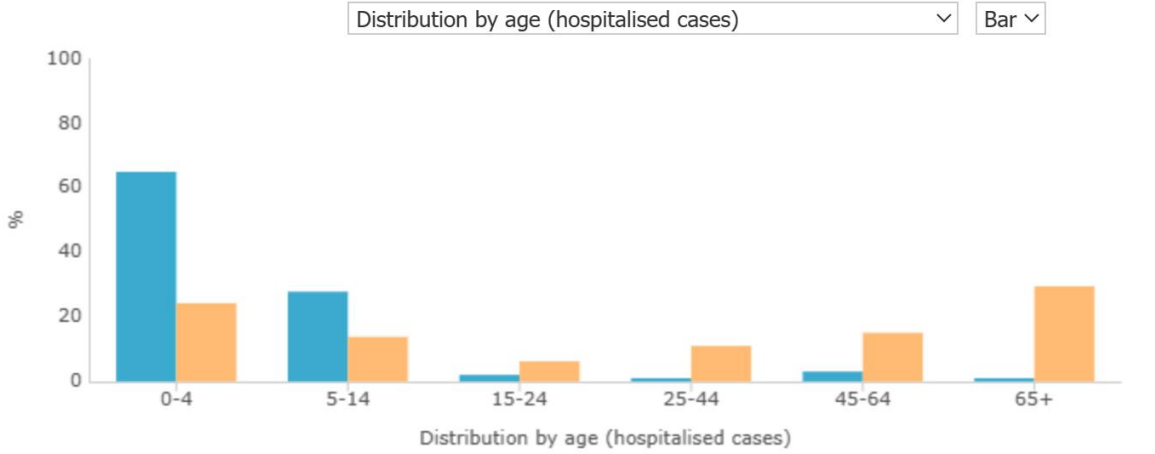
EU/EEA trend with Italian Focus

HOSPITALISED CASES PROPORTION 2022

Region	Hospitalised cases proportion (%)
Greece	100.0
Hungary	34.6
Iceland	50.0
Ireland	36.1
Italy	83.1
Latvia	.
Liechtenstein	25.0
Lithuania	-
Luxembourg	50.0
Malta	66.7
Netherlands	24.8
Norway	28.0
Poland	82.4







Italy EU/EEA (without UK)

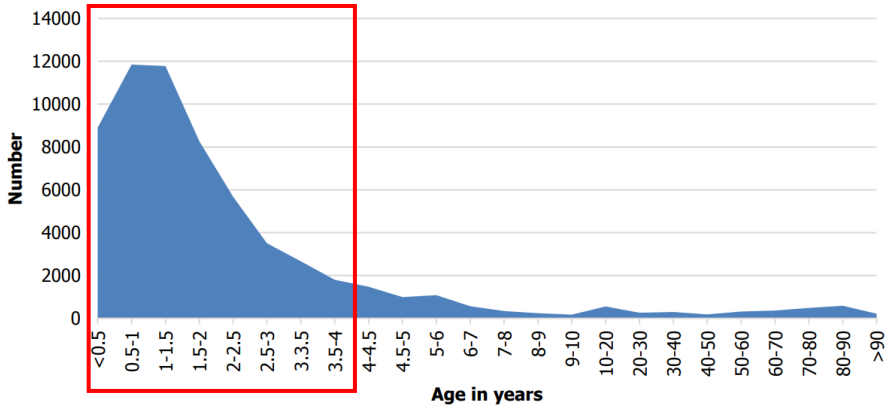
Viral AGE agents	Impact Worldwide	Symptoms	Ages group incidence	Prevalence
Rotavirus	Most common agent causing AGE in children worldwide	Infectious diarrhoea, vomiting, and higher frequency of fever	Mostly reported among children aged 0–14 years old, with the highest incidence among children less than 5 years	The prevalence was highly reported during the dry season, bottle-fed children, and children with group A blood type
Norovirus	Cause of acute gastroenteritis, responsible for approximately 17–18% of all acute gastroenteritis cases worldwide, especially among developed countries. Recent epidemiological data observed that GII.2 [P16] is currently an emerging norovirus strain in East Asia and Europe	Norovirus infections are observed to cause more severe symptoms of gastroenteritis in children compared with rotavirus, especially after the introduction of the rotavirus vaccination period	The age group under 1 year old has the highest frequency of norovirus infection with additional risk factors which include male sex	Norovirus is detected throughout the year, with the autumn and winter seasons observed to report a higher frequency of cases; the detection rate of norovirus cases correlates positively with humidity
Astrovirus	Astrovirus-causing acute gastroenteritis' global average incidence of 11%	Patients usually manifested with diarrhoea, fever, vomiting, and abdominal pain	Highest prevalence of human astrovirus (HAstV) infections was in the group of children between 37 and 48 months old	HAstV infection mainly occurs during the dry season in the African continent; meanwhile, the highest occurrence reported in the tropical areas is often in the rainy season and winter season in temperate climate countries
Enteric Adenovirus Serotypes 40 and 41	Between 2.3 and 5% of the diarrhoea cases in children were caused by adenoviruses (AdV) serotypes 40 and 41	Mild fever and vomiting, abdominal pain, bloody diarrhoea, respiratory symptoms such as cough, and/or secondary lactose malabsorption. Patients with adenovirus gastroenteritis have a significantly higher CRP (mean 3.4 mg/dL) compared with other gastroenteritis pathogens, and pulmonary-associated symptoms and vomiting frequency are increased in patients with this infective gastroenteritis. Elevation in lymphocyte counts (specifically CD4) were correlated with the clearance of AdV infection and improvement in survival	Enteric adenovirus serotypes 40 and 41 account for both sporadic or epidemic gastroenteritis in infants and young children	Are detected throughout the year with a summer peak between May and July.

Hasan et al., 2021 Children **2021**, 8, 1112

ROTAVIRUS
EU/EEA trend

SAMPLES PER AGE GROUPS

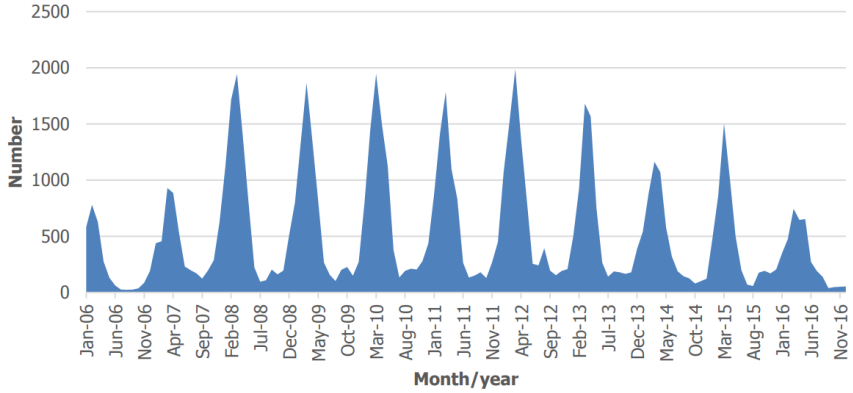
Figure 1. Number of rotavirus samples per age group (years) submitted to 16 EU/EEA countries' rotavirus reference laboratories for genotyping 2006–2016 and reported to EuroRotaNet*, showing that the major burden of disease is in the 0–3 year age group but disease is reported in all age groups



Further information available at www.eurorota.net

TEMPORAL DISTRIBUTION SEASONS 2006-2016

Figure 4. Temporal distribution of rotavirus positive samples submitted to the EuroRotaNet strain surveillance network database in consecutive seasons 2006 to 2016*



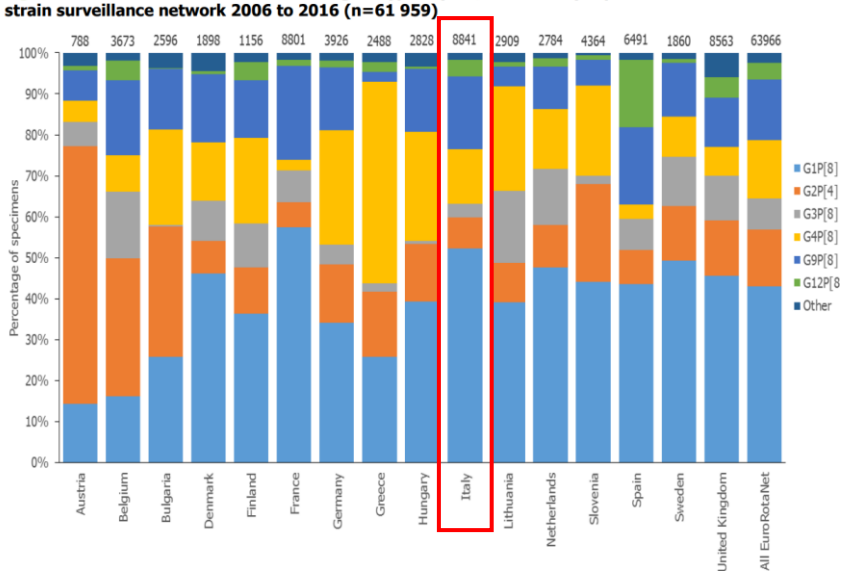
** With seven of the countries conducting rotavirus strain surveillance having introduced routine rotavirus vaccination for all infants, an overall decline in number of samples sent for genotyping has been observed since 2014.*

Source: Eurorotanet

Last report: September 2017

GENOTYPES DISTRIBUTION SEASONS 2006-2016

Figure 5. Overall distribution of rotavirus genotypes by EU/EEA country reported to the EuroRotaNet strain surveillance network 2006 to 2016 (n=61 959)



Epidemiology

No formal surveillance of rotavirus infections or circulating strains is available in the EU/EEA.

From burden-of-disease studies it is noted that rotaviruses cause seasonal peaks of diarrhoeal disease between December and May in EU/EEA. However, sustained low-grade transmission is identified all year round.

Most children acquire their primary rotavirus infection between 6 and 36 months of age. Subsequent rotavirus infections occur throughout life but only rarely lead to severe disease leading to medical attention or hospitalisation.

Severe RV GE disease may develop in any child. However, a limited number of risk factors for development of severe disease have been identified including low-birth-weight infants (<2,500 g), another child <24 months of age in the household and severe immunodeficiency conditions.

Circulating rotavirus genotypes vary by season and country and co-circulation of several genotypes are noted each year.

Transmission

- The incubation period is 1-2 days.
- The infective period is 1-3 weeks. Asymptomatic carriers are common.
- Rotaviruses are mainly transmitted from person-to-person through the faecal-oral route, but transmission may also occur through contaminated objects (e.g. door-handles, water-taps, toilet-seats and toys), airborne droplets and contaminated water or food.

ENTEROVIRUS

Echovirus 11 (E11) Italian reported cases

Eurosurveillance

Rapid communication

Open Access

Fulminant echovirus 11 hepatitis in male non-identical twins in northern Italy, April 2023

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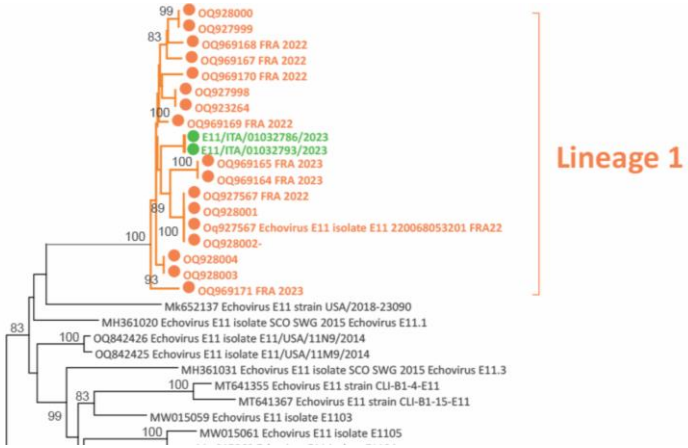
Antonio Piralla[1,*], Alessandro Borghesi[2,*], Amelia Di Comite[2], Federica Giardina[3], Guglielmo Ferrari[1], Simona Zanette[2], Tiziana Angelica Figar[2], Micol Angelini[2], Camilla Pisoni[2], Antonino Maria Guglielmo Pitrolo[1], Stefania Paolucci[1], Francesca Rovida[1,3], Isabella Pellicioli[4], Ezio Bonanomi[4], Fausto Baldanti[1,3,**], Stefano Ghirardello[2,**]

The World Health Organization (WHO) has recently reported an increasing number of severe neonatal infection associated with a specific species B enterovirus type, echovirus 11 (E11) [1]. By July 2022, nine cases of neonatal sepsis with liver disease and multi-organ failure had been reported in France from three metropolitan regions [2]. The European Centre for Disease Prevention and Control (ECDC) has recently included this virus in the ECDC Communicable Disease Threat Report [3]. According to the WHO, the public health risk for the general population is low, but the increase in reported cases remains a concern. Here, we report life-threatening E11 infection in a pair of dichorionic twins with a presentation and clinical course closely resembling those reported in the French cases [1,2].



Laboratory testing results on day 9 of life, twin neonates with echovirus 11 infection, Italy, April 2023

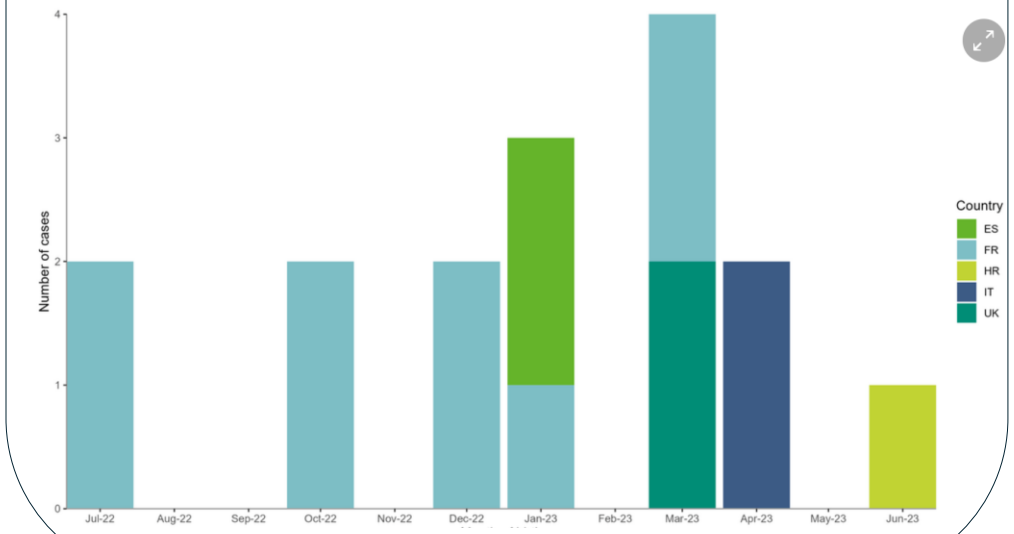
Laboratory test	P1	P2	Reference range
Aspartate transaminase (mU/mL)	294	2,740	11.0–39.0
Alanine transaminase (mU/mL)	291	11,925	11.0–34.0
Gamma-GT (mU/mL)	191	202	11.0–53.0
Creatinine (mg/dL)	0.39	0.46	0.30–0.70
Total bilirubin (mg/dL)	2.11	11.28	0.2–1.1
Direct bilirubin (mg/dL)	Not available	2.73	0.00–0.25
Plasma prothrombin (%)	94.00	Undetectable	70.00–120.00
Thromboplastin time (s)	42.90	Undetectable	20.00–32.00
Fibrinogen (mg/dL)	374	Undetectable	170–410
International normalised ratio	1.03	Unmeasurable	0.90–1.20
Hepatic cholinesterase (mU/mL)	5,656	2,986	5,300–12,900
Plasma ammonium (µg/dL)	160	192	19.0–94.0
Ferritin (ng/mL)	2,542	124,801	8–398

Epidemiological update: Echovirus 11 infections in neonates

Epidemiological update

19 Jul 2023

Figure 1. Distribution of confirmed and probable cases of severe neonatal Echovirus 11 infection in the EU/EEA and UK as of June 2023



Microbiol Spectr. 2024 Mar 5;12(3):e0400723. doi: 10.1128/spectrum.04007-23. Epub 2024 Feb 12.

Effect of COVID-19 protective measures on the epidemiology characteristics of rotavirus, adenovirus, and coinfections among pediatric patients with acute gastroenteritis in Hangzhou, China

Jianming Zhou [1], Yanhong Sun [1]

March 2024 Volume 12 Issue 3

TABLE 1 Comparison of demographic characteristics and positive rate (%) of enteroviruses between the pre-COVID-19, COVID-19, and post-COVID-19 periods

	Pre-COVID-19	COVID-19 pandemic			Post-COVID-19			
Demographics	Jan 2019 to Dec 2019	Jan 2020 to Dec 2020	Jan 2021 to Dec 2021	Jan 2019 to Dec 2022	Jan 2023 to Aug 2023	Total	χ^2 value	*P* value
Total positive specimens	6,262	1,678	4,345	2,477	1,149	15,911	1,432.33	<0.001
Total negative specimens	23,801	12,347	20,479	18,042	11,469	86,138		
Total tested specimens	30,063	14,025	24,824	20,519	12,618	102,049		
Positive rate	20.83%	11.96%	17.50%	12.07%	9.11%	15.59%		
Gender								
Male (total)	3,669/17,781	981/8,202	2,522/14,468	1,476/12,194	697/7,488	9,345/60,133	0.289	0.591
Female (total)	2,593/12,282	697/5,823	1,823/10,356	1,001/8,325	452/5,130	6,566/41,916		
Male (RV)	3,107/17,781	807/8,202	1,632/14,468	980/12,194	285/7,488	6,811/60,133	1.061	0.303
Female (RV)	2,234/12,282	562/5,823	1,164/10,356	686/8,325	189/5,130	4,835/41,916		
Male (AdV)	550/17,781	172/8,202	866/14,468	425/12,194	393/7,488	2,406/60,133	0.251	0.616
Female (AdV)	348/12,282	134/5,823	643/10,356	279/8,325	247/5,130	1,651/41,916		
Male (coinfection)	12/17,781	2/8,202	24/14,468	71/12,194	19/7,488	128/60,133	0.588	0.443
Female (coinfection)	11/12,282	1/5,823	16/10,356	36/8,325	16/5,130	80/41,916		
Virus detection, *n* (%)								
RV	5,341 (17.77)	1,369 (9.76)	2,796 (11.26)	1,666 (8.12)	474 (3.76)	11,646 (11.41)	11,845.0	<0.001
AdV	898 (2.99)	306 (2.18)	1,509 (6.08)	704 (3.43)	640 (5.07)	4,057 (3.98)		
Coinfection	23 (0.07)	3 (0.02)	40 (0.16)	107 (0.52)	35 (0.28)	208 (0.20)		

From 2019 to 2023, the epidemiological characteristics of rotavirus, adenovirus, and coinfections have shown some interesting trends. Before the COVID-19 pandemic, the overall positive rate for these viruses was 20.83%. However, in 2020, during the pandemic, this rate dropped significantly to 11.96%. In the following years, there was a slight increase in positive rates, with 17.50% in 2021, 12.07% in 2022, and 9.11% in 2023

……I nostri dati

EPIDEMIOLOGY OF ENTERIC PATHOGENS IN HOSPITALIZED PATIENS WITH SUSPECTED ACUTE DIARRHOEA: A TWO-YEAR PERIOD STUDY.

B. Brescia[1], G. S. Barreca[1], C. Peronace[1], L. Gallo[1], C. Riillo[1], G. Pavia[1], R. Sinopoli[1], F. Mongiardo[1], N. Raso[1], N. Marascio[1], A. Quirino[1] and G. Matera[1]

[1]Unit of Clinical Microbiology, Department of Health Sciences, "R. Dulbecco" University Hospital, Catanzaro, Italy.

Our study included patients with diarrhoea and other gastrointestinal symptoms, attending to University Hospital "Renato Dulbecco" of Catanzaro from January 2021 to December 2023. Stool samples were analyzed using the BioFire® FilmArray® Gastrointestinal Panel (FA-GP) (Biomérieux, Italy) **(Figure 1)**.

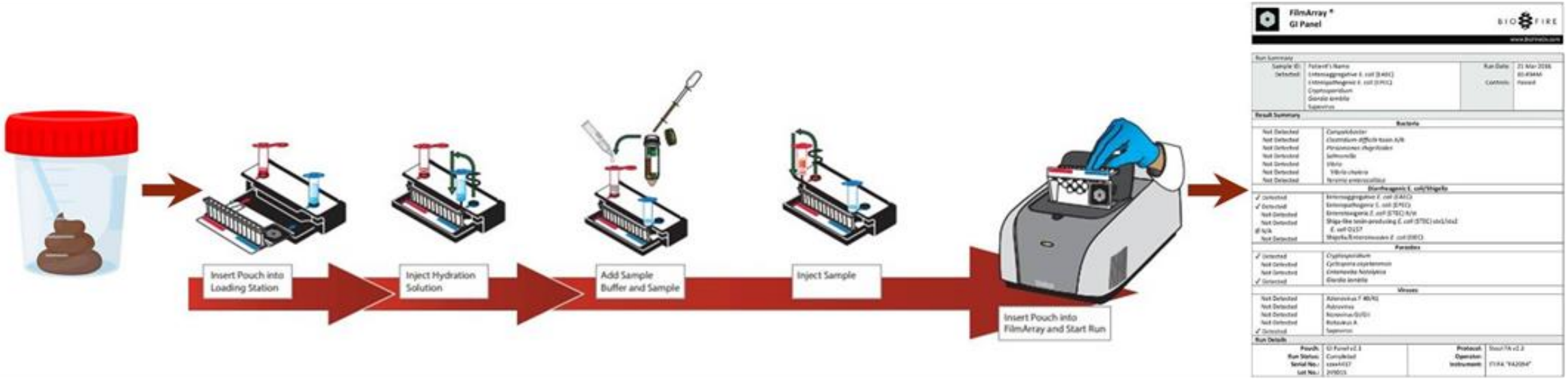


Figure 1. Stool sample processing.

A total of 562 stool samples were evaluated. FA-GP showed a positive result in 217 (38,6%) specimens, among them 202 (93%) showed a single etiological agent and 15 (7%) co-infected specimens.
The most frequent bacterial agents were Enteropathogenic *E. coli* (EPEC) (69/217, 32%) and *C. difficile* toxin A/B (50/217, 23%), followed by Enteroaggregative *E. coli* (EAEC) (28/217, 13%), Enterotoxigenic *E.coli* (ETEC) and Shiga-like toxin-producing *E.coli* (STEC) stx1/stx2 (24/217, 11%).
Regarding viral circulation, Norovirus GI/GII was the most prevalent virus (30/217, 14%), followed by Adenovirus F 40/41, Astrovirus, Sapovirus (4/217, 2%) and Rotavirus (2/217, 1%) **(Figure 2)**.
Six parasite agents (3%) have also been observed. In paediatrics and gastroenterology units EPEC was the most circulating enteric pathogen. Conversely, *C. difficile* was the most prevalent microorganism isolated in infectious diseases, oncology and nephrology wards. **(Figure 3)**.

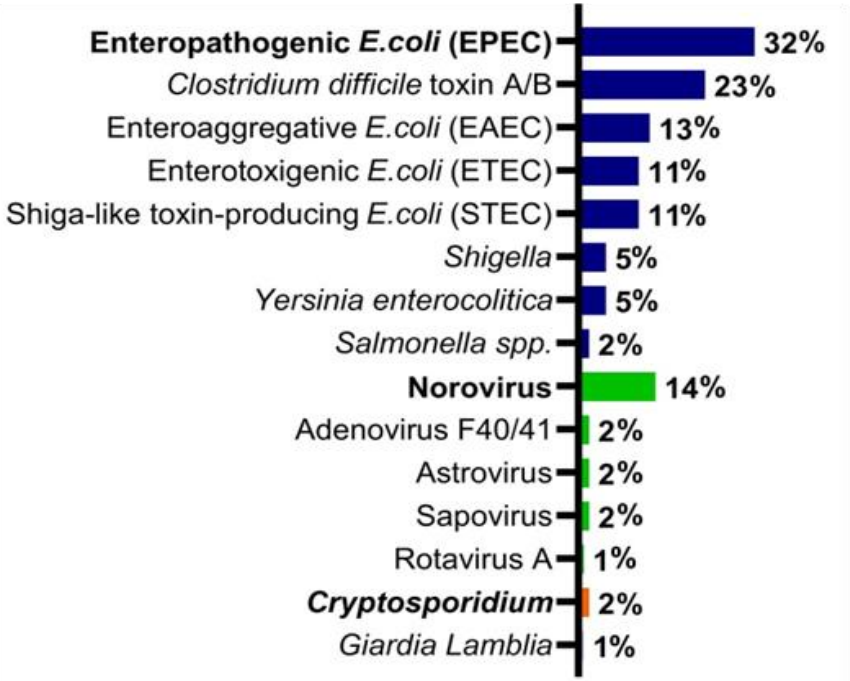


Figure 2. Percentage of Bacteria (blue), Viruses (green) and Parasites (orange) in positive results.

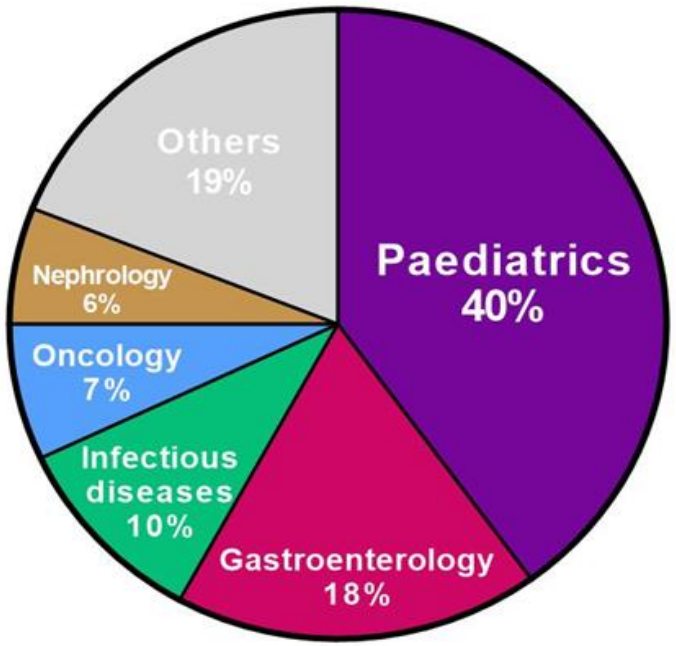
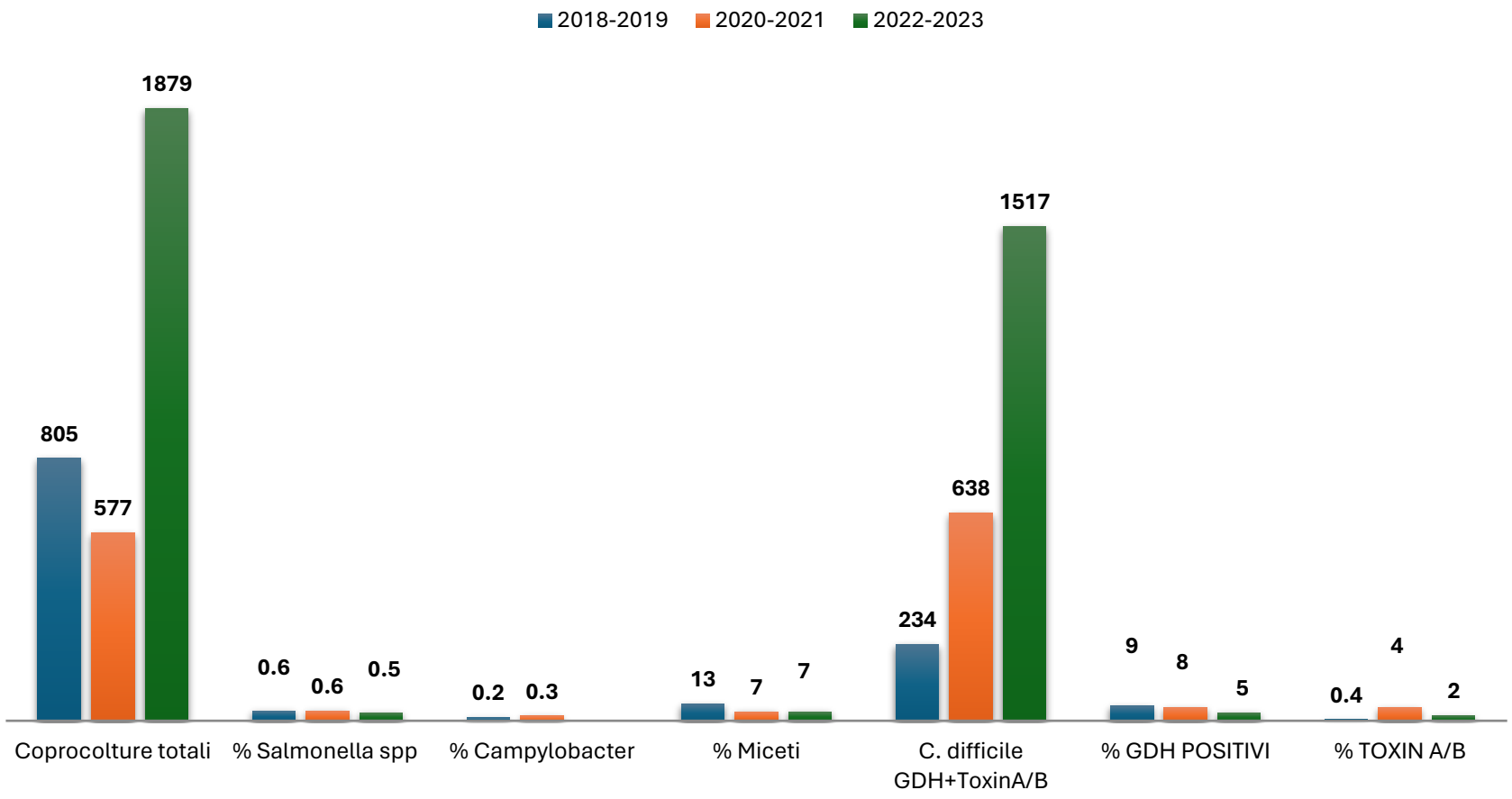
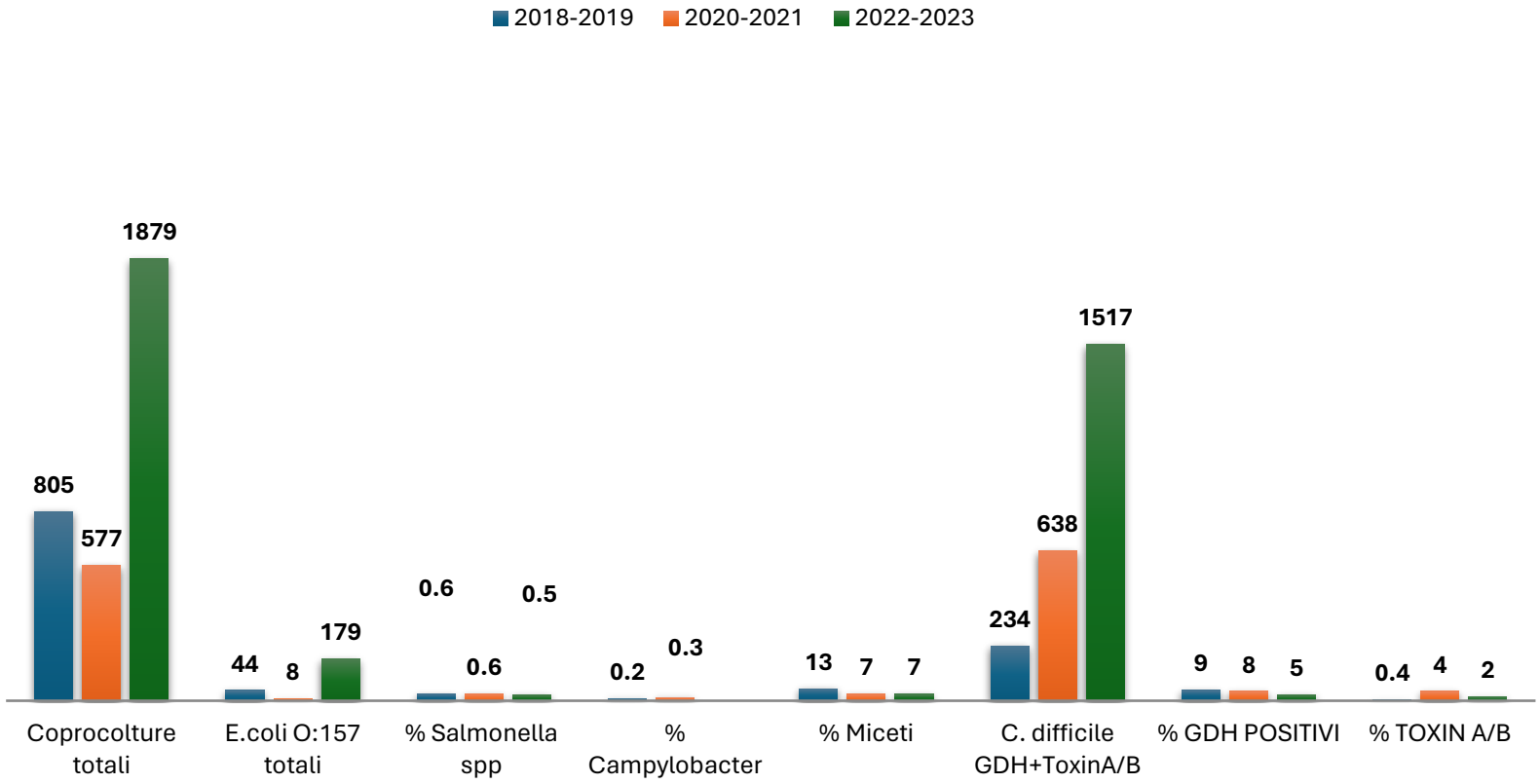


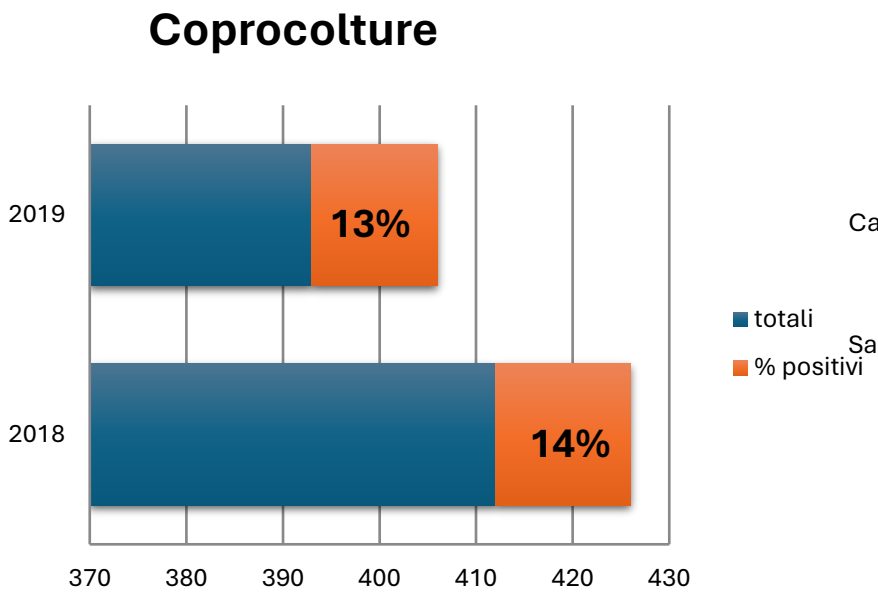
Figure 3. Percentage of most circulating enteric pathogens in "R. Dulbecco" University Hospital.

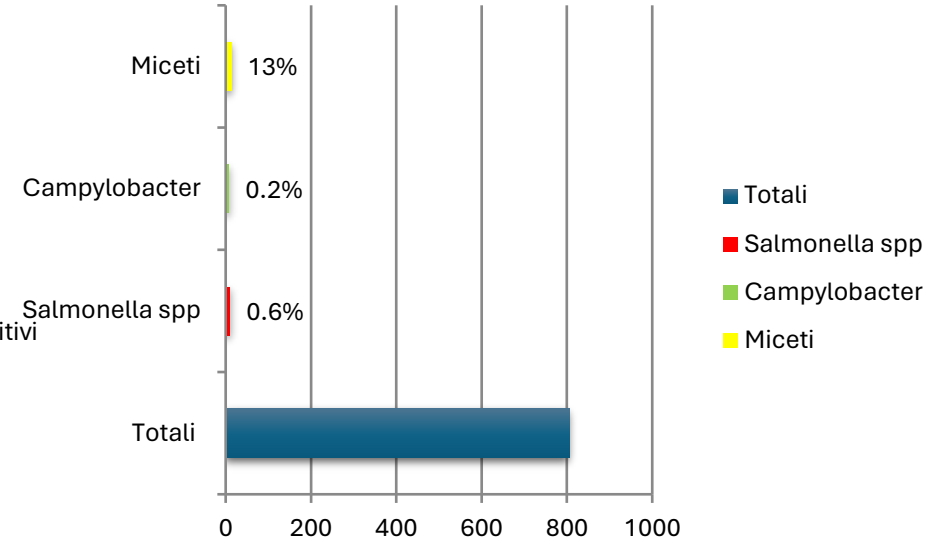
Coprocoltura e ricerca *C. difficile* GDH/Toxin A/B e

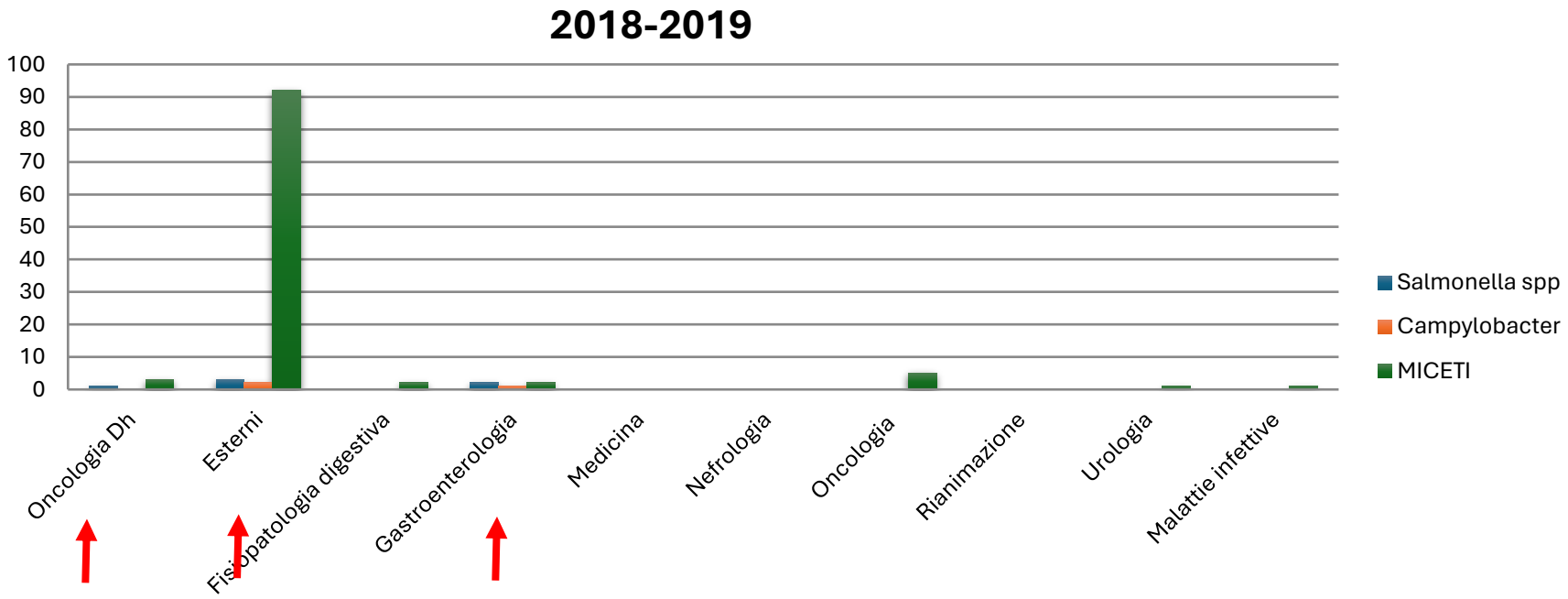


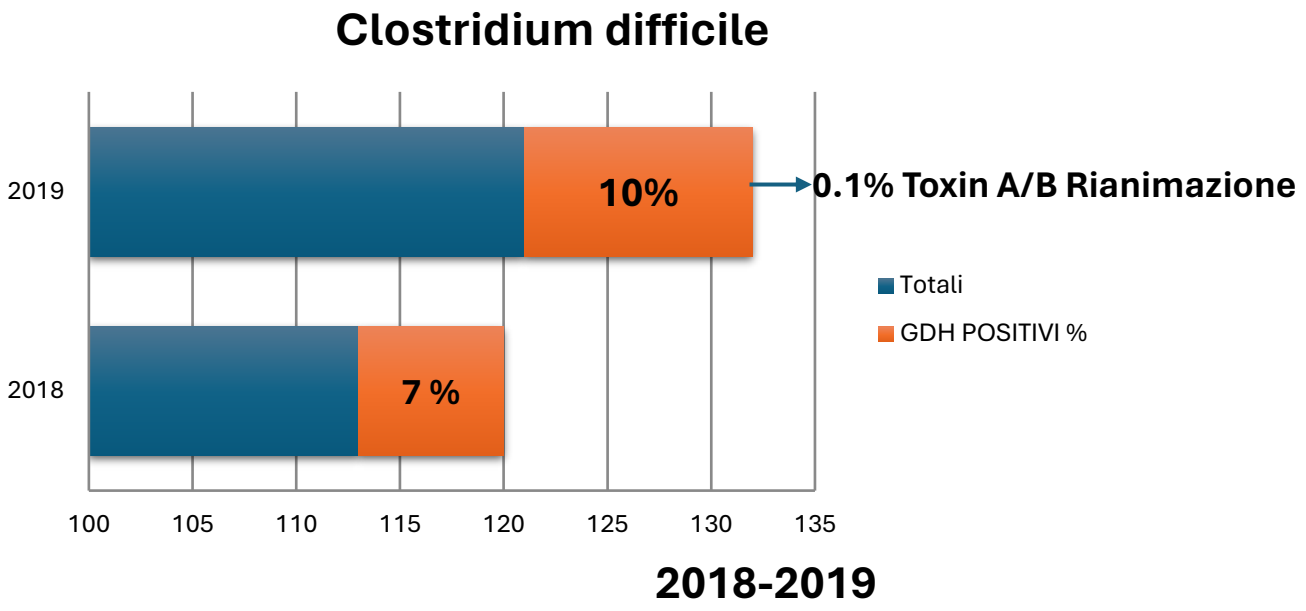
Coprocolture, *E.coli O:157, C. difficile* **GDH e/o Toxin A/B**

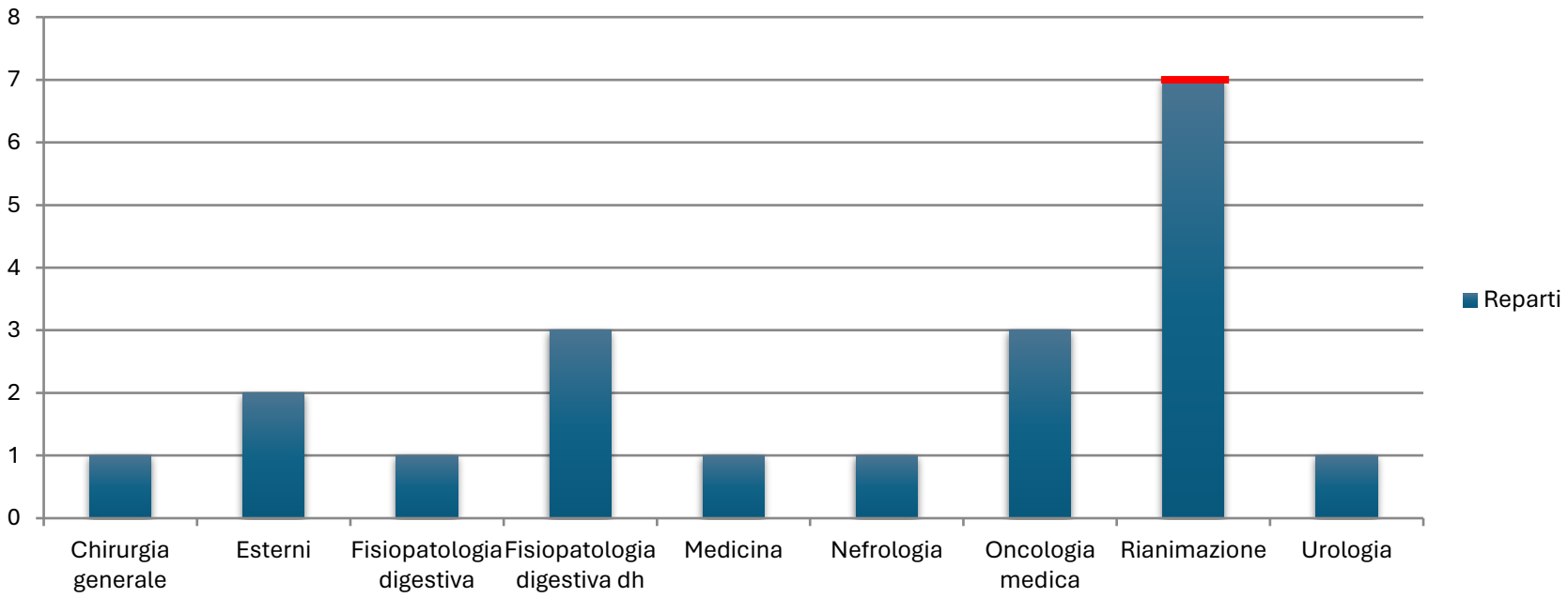


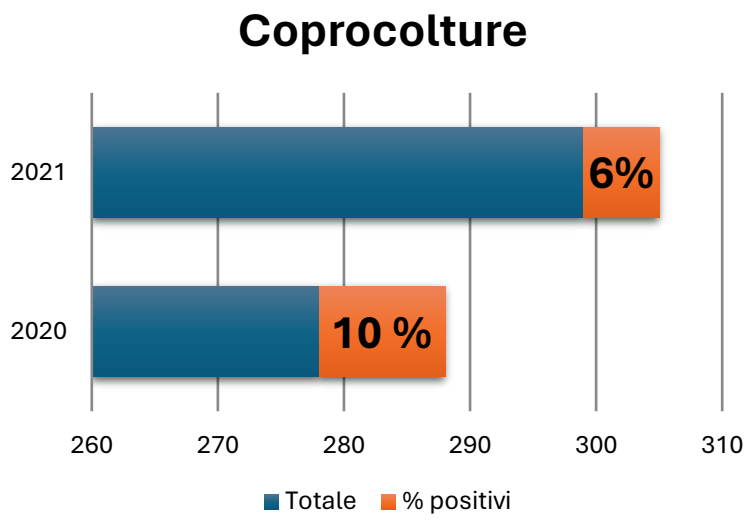

Coprocolture
2019
2018
13%
14%
370
380
390
400
410
420
430
totali
% positivi

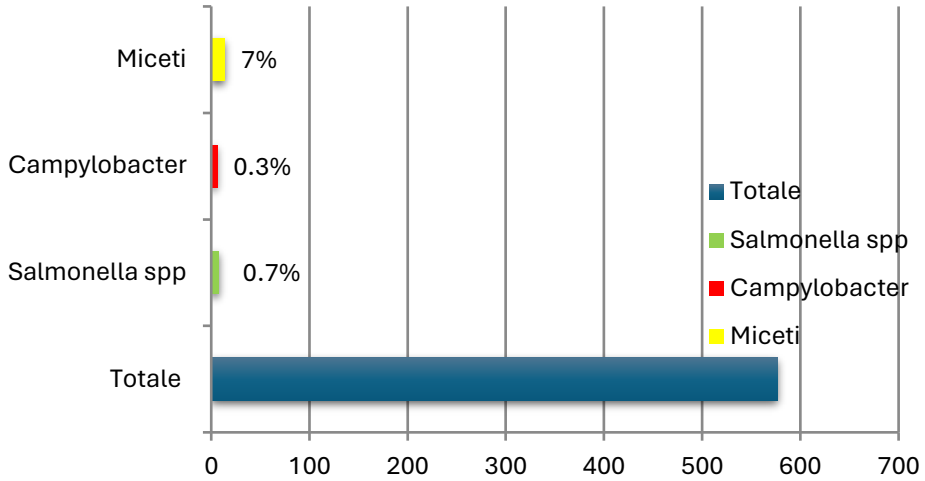

Miceti
13%
Campylobacter
0.2%
Salmonella spp
0.6%
Totali
0
200
400
600
800
1000
Totali
Salmonella spp
Campylobacter
Miceti

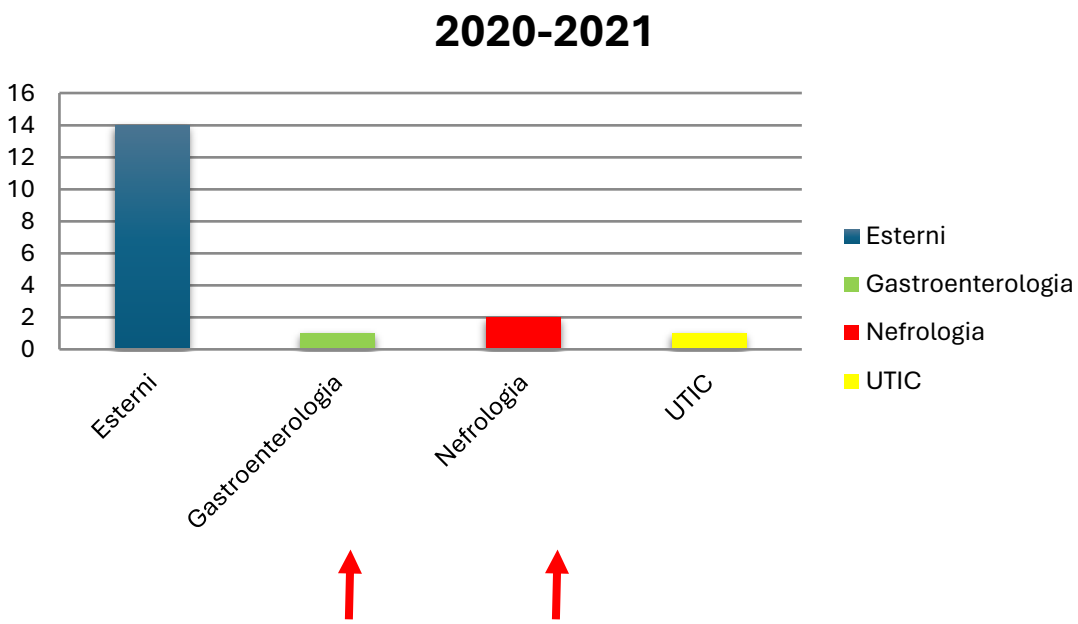

2018-2019
100
90
80
70
60
50
40
30
20
10
0
Oncologia Dh
Esterni
Fisiopatologia digestiva
Gastroenterologia
Medicina
Nefrologia
Oncologia
Rianimazione
Urologia
Malattie infettive
Salmonella spp
Campylobacter
MICETI

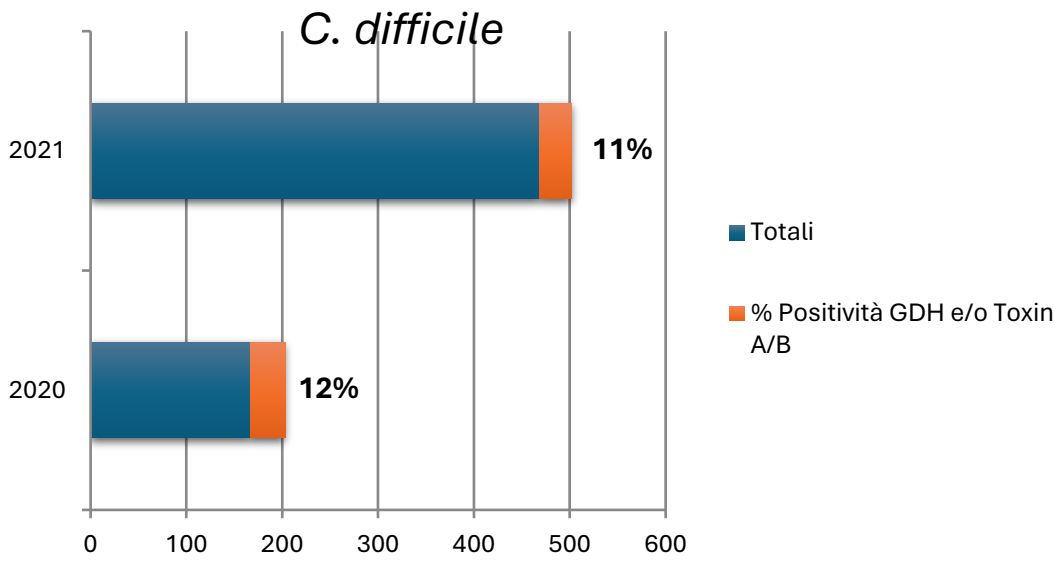

Clostridium difficile
2019
2018
10%
7 %
0.1% Toxin A/B Rianimazione
Totali
GDH POSITIVI %
100
105
110
115
120
125
130
135
2018-2019

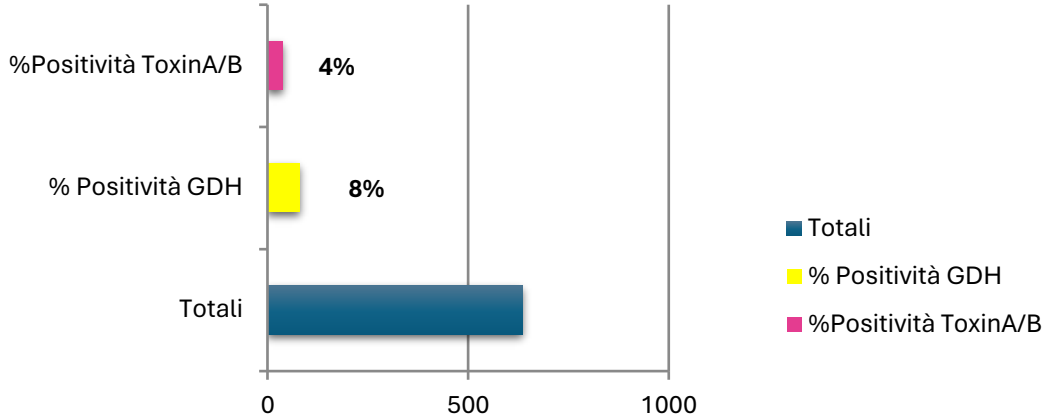

8
7
6
5
4
3
2
1
0
Chirurgia generale
Esterni
Fisiopatologia digestiva
Fisiopatologia digestiva dh
Medicina
Nefrologia
Oncologia medica
Rianimazione
Urologia
Reparti

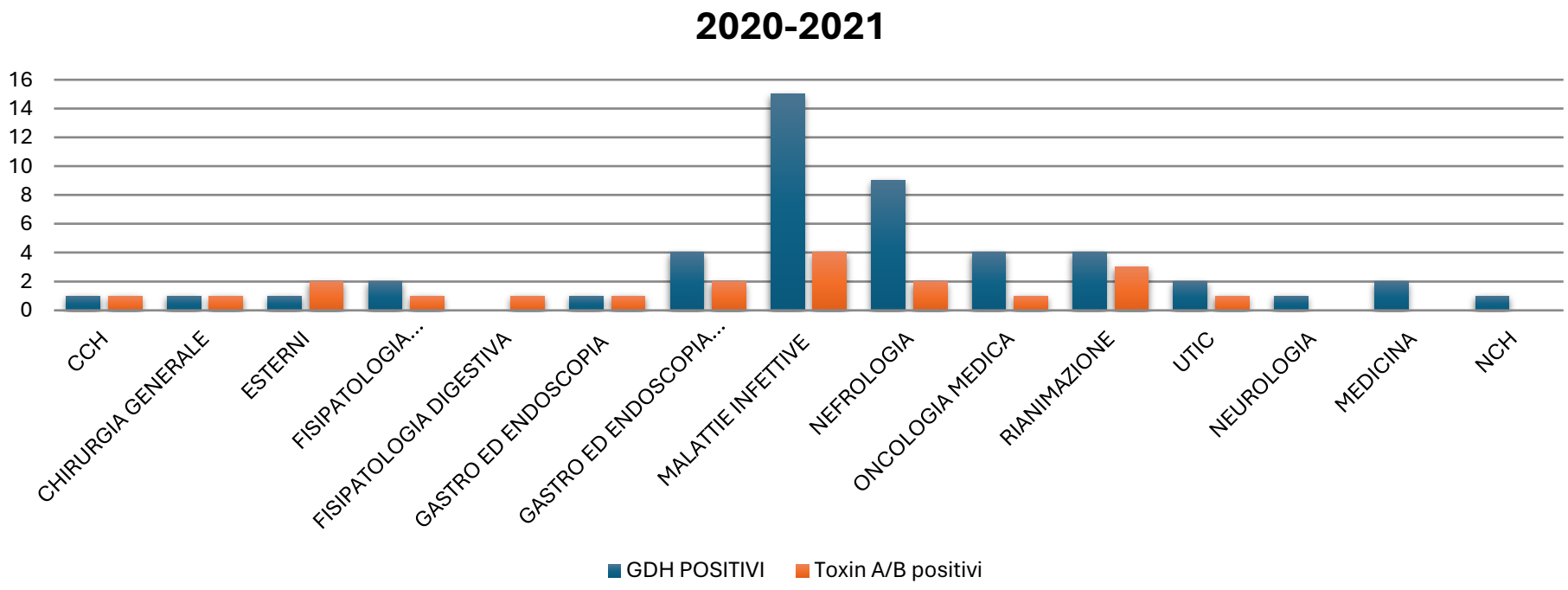

Coprocolture
2021
2020
6%
10 %
260
270
280
290
300
310
Totale
% positivi


Miceti
7%
Campylobacter
0.3%
Salmonella spp
0.7%
Totale
0
100
200
300
400
500
600
700
Totale
Salmonella spp
Campylobacter
Miceti

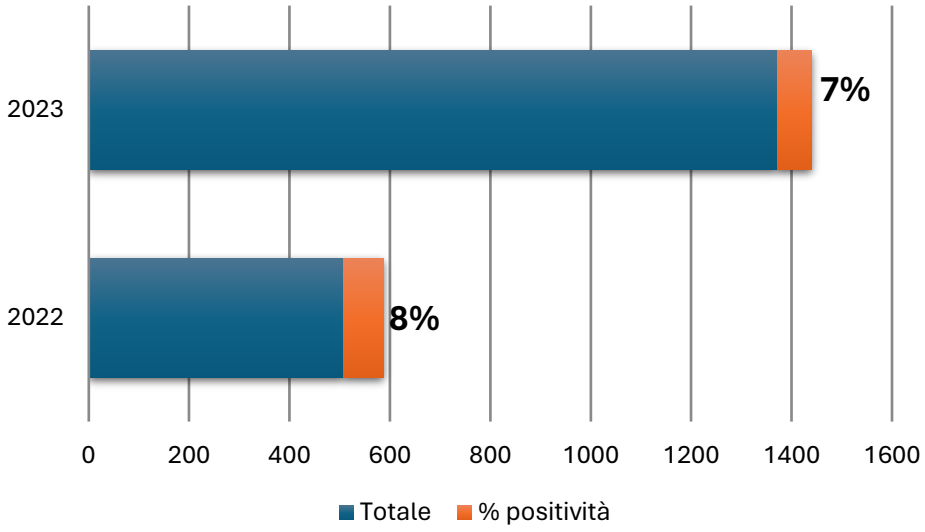

2020-2021
16
14
12
10
8
6
4
2
0
Esterni
Gastroenterologia
Nefrologia
UTIC
Esterni
Gastroenterologia
Nefrologia
UTIC

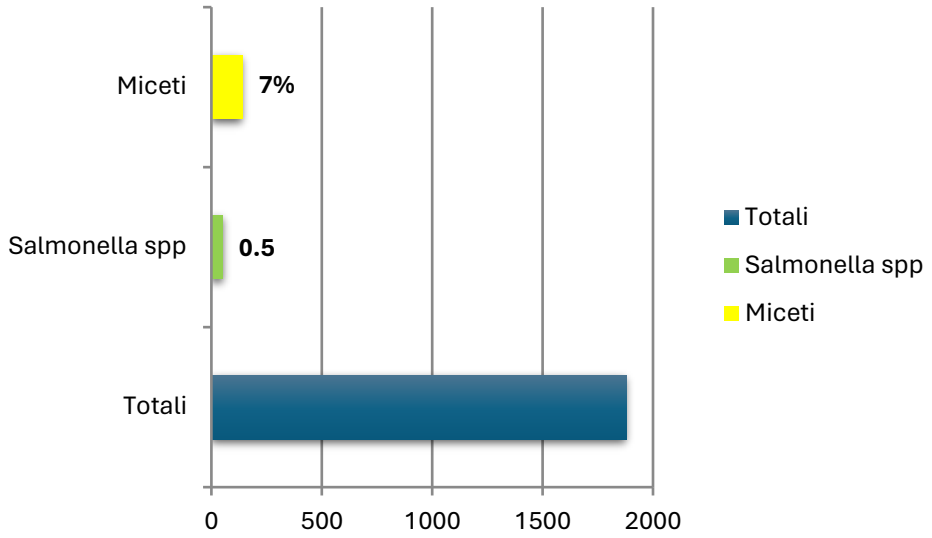

C. difficile
2021
2020
11%
12%
0
100
200
300
400
500
600
Totali
% Positività GDH e/o Toxin A/B


%Positività ToxinA/B
% Positività GDH
Totali
4%
8%
0
500
1000
Totali
% Positività GDH
%Positività ToxinA/B

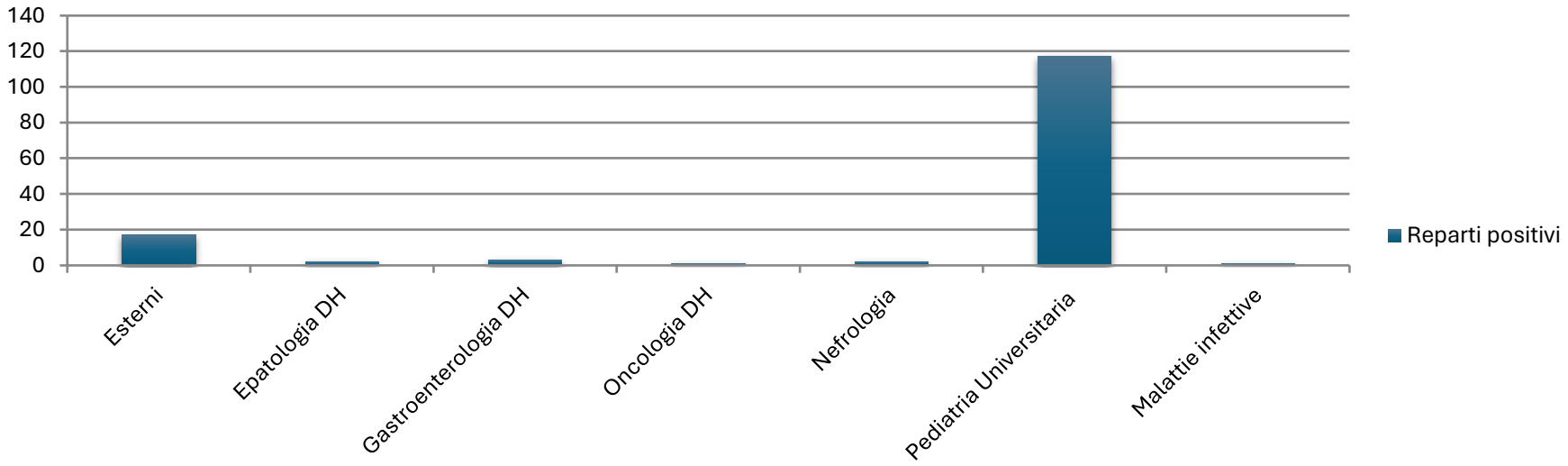

2020-2021
16
14
12
10
8
6
4
2
0
CCH
CHIRURGIA GENERALE
ESTERNI
FISIPATOLOGIA...
FISIPATOLOGIA DIGESTIVA
GASTRO ED ENDOSCOPIA
GASTRO ED ENDOSCOPIA...
MALATTIE INFETTIVE
NEFROLOGIA
ONCOLOGIA MEDICA
RIANIMAZIONE
UTIC
NEUROLOGIA
MEDICINA
NCH
GDH POSITIVI
Toxin A/B positivi

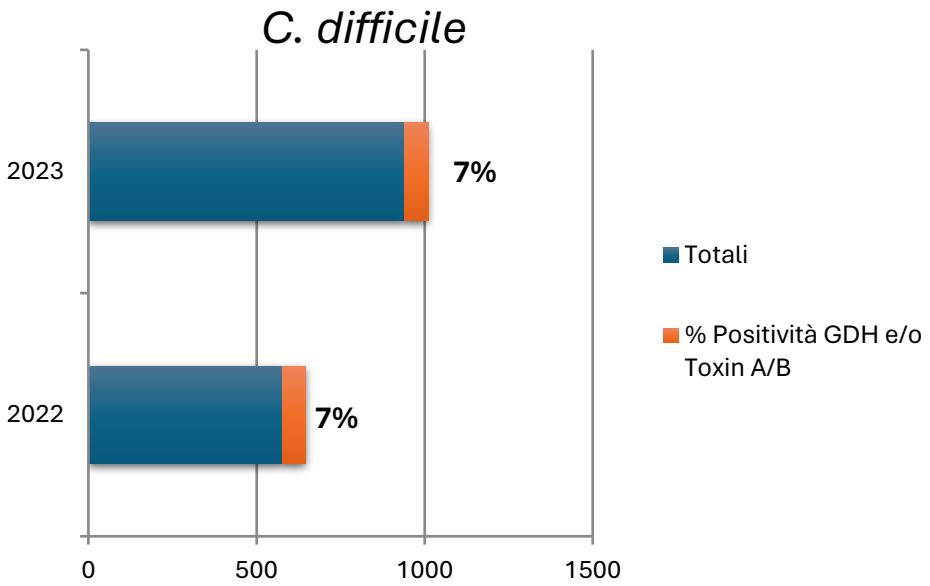
Coprocolture

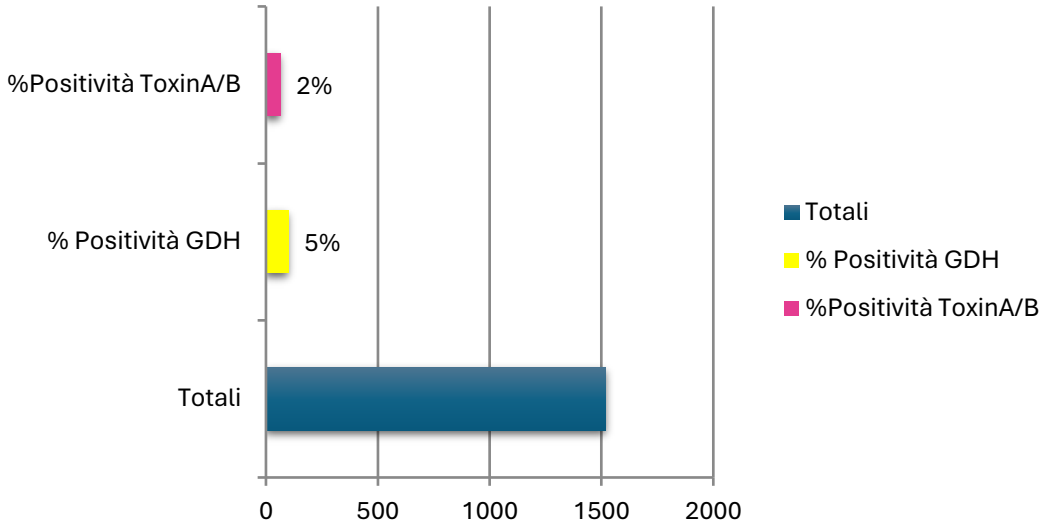


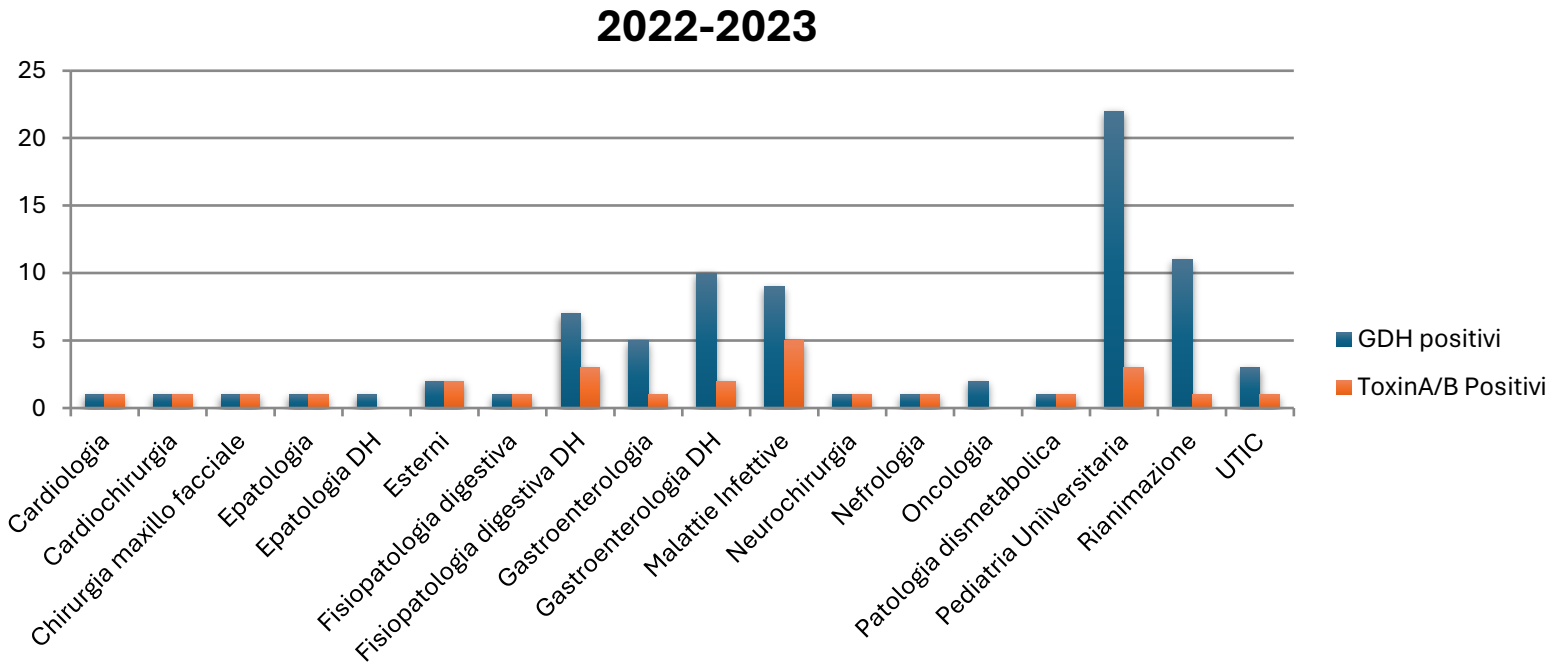


2022-2023




C. difficile
2023
2022
7%
7%
0
500
1000
1500
Totali
% Positività GDH e/o Toxin A/B


%Positività ToxinA/B
% Positività GDH
Totali
2%
5%
0
500
1000
1500
2000
Totali
% Positività GDH
%Positività ToxinA/B


2022-2023
25
20
15
10
5
0
Cardiologia
Cardiochirurgia
Chirurgia maxillo facciale
Epatologia
Epatologia DH
Esterni
Fisiopatologia digestiva
Fisiopatologia digestiva DH
Gastroenterologia
Gastroenterologia DH
Malattie Infettive
Neurochirurgia
Nefrologia
Oncologia
Patologia dismetabolica
Pediatria Universitaria
Rianimazione
UTIC
GDH positivi
ToxinA/B Positivi

Accuratezza, Rapidità, Comunicazione