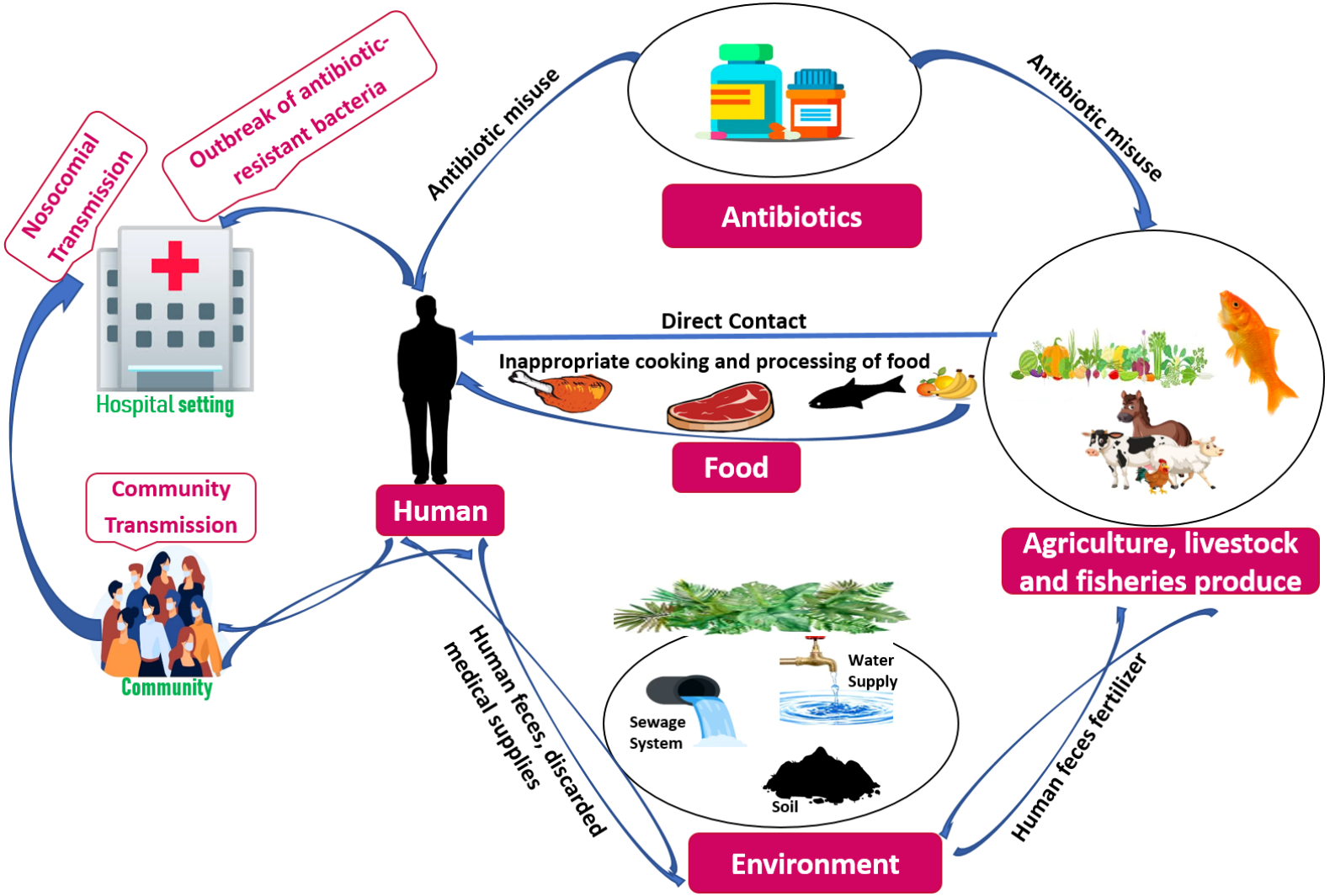
L’antibiotico-resistenza ed il corretto uso degli antibiotici in ambito territoriale

3 Novembre 2026 – Venezia

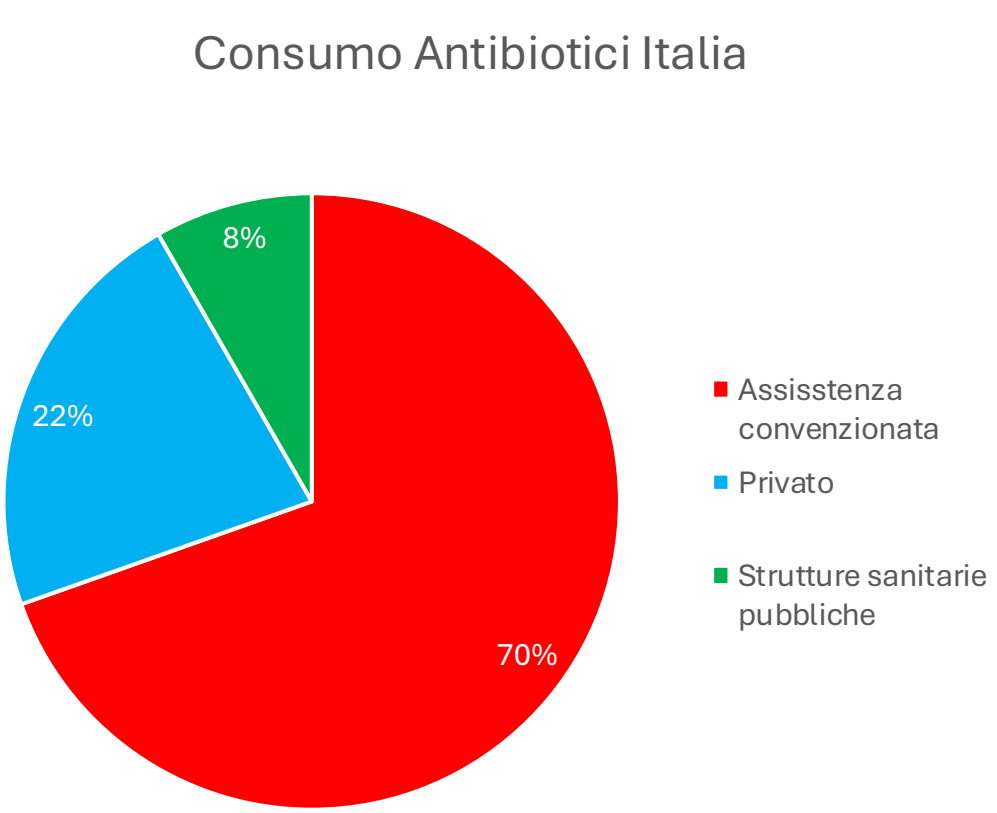
Dr. Zuglian Gianluca

UOC Malattie Infettive - Venezia



Ahmad, Nayeem, Ronni Mol Joji, and Mohammad Shahid. "Evolution and implementation of One Health to control the dissemination of antibiotic-resistant bacteria and resistance genes: A review." *Frontiers in cellular and infection microbiology* 12 (2023): 1065796.

Consumo di antibiotici in Italia





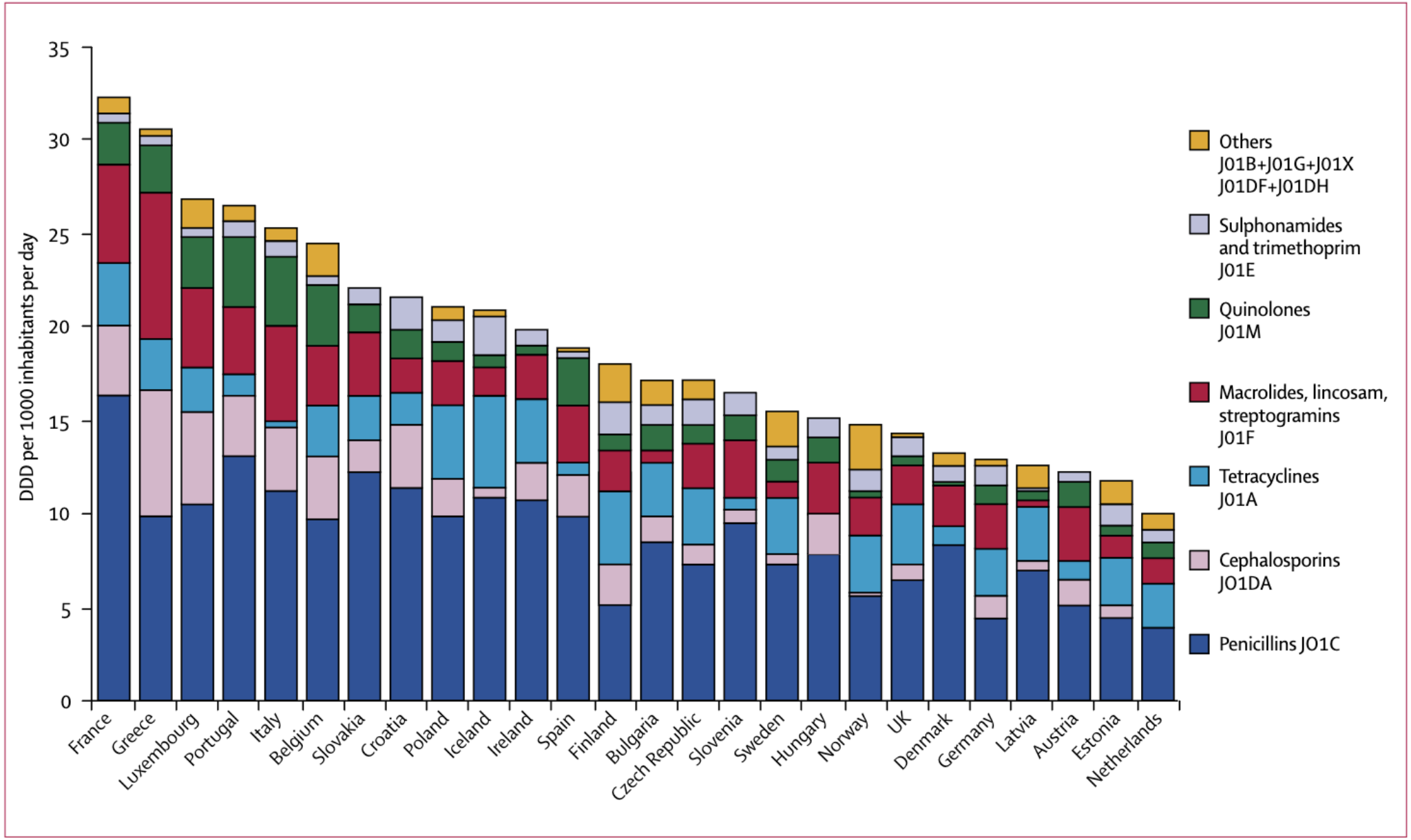


Figure 1: **Total outpatient antibiotic use in 26 European countries in 2002**

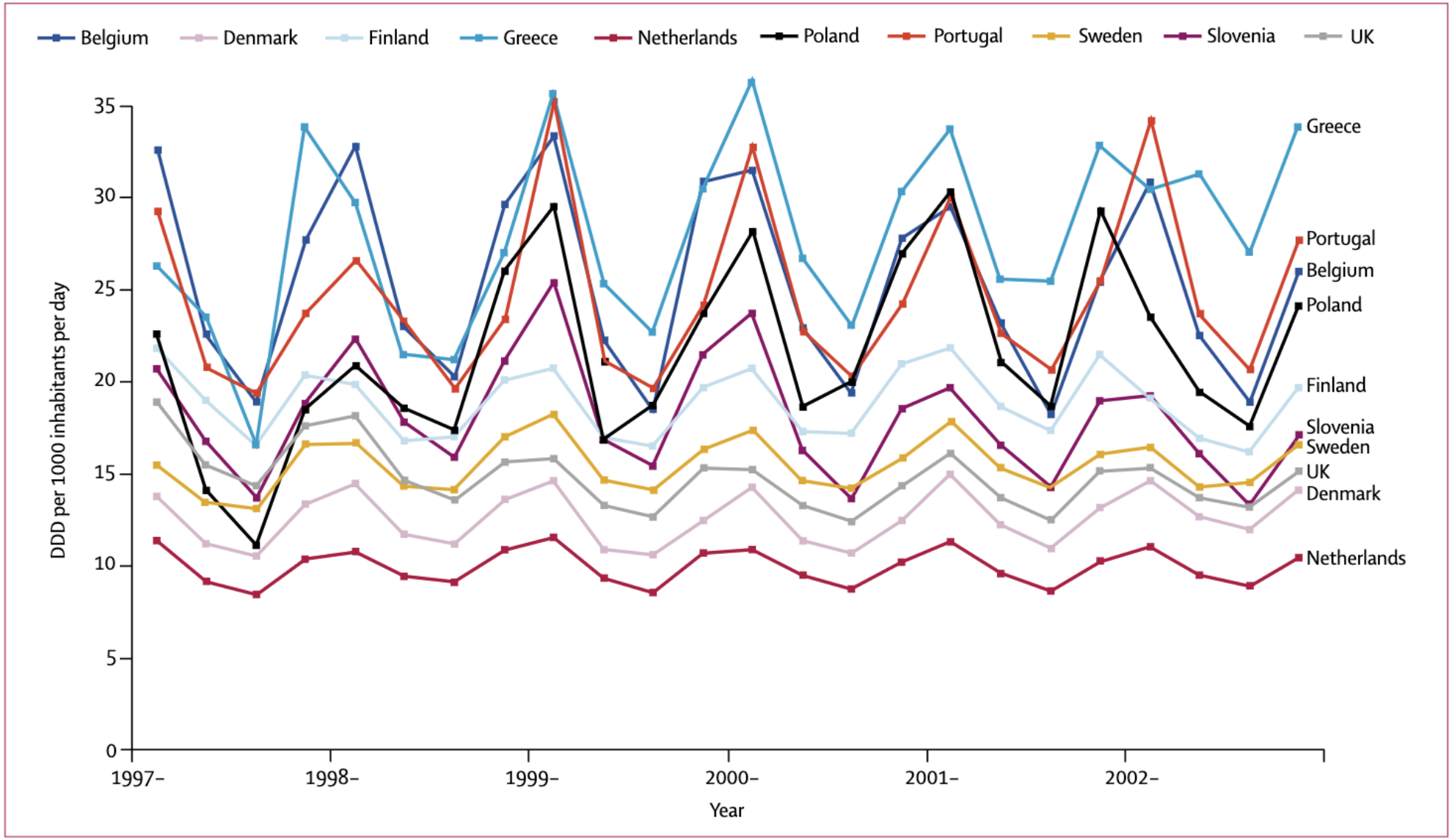
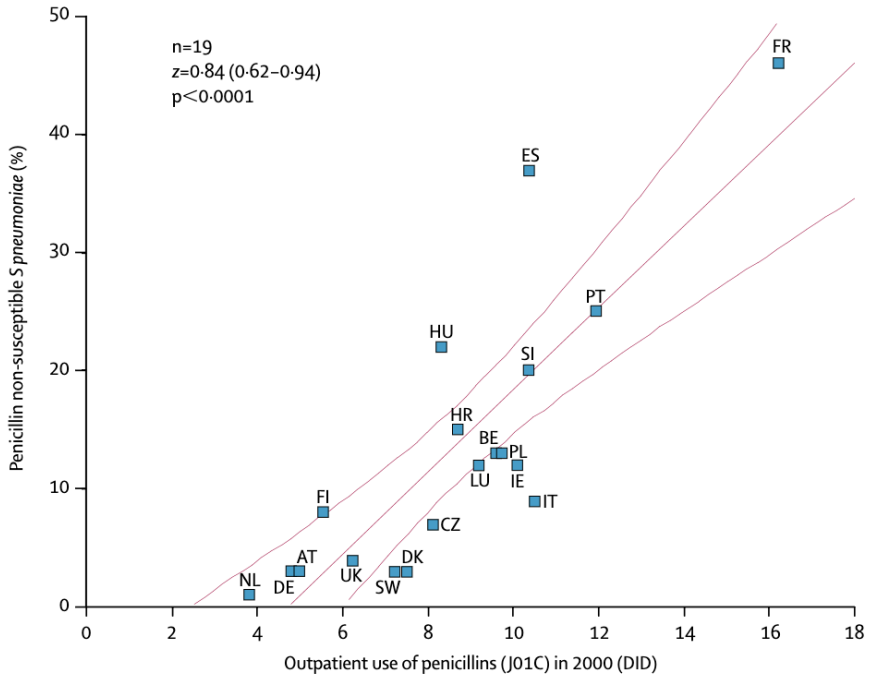


Figure 2: **Seasonal variation of total outpatient antibiotic use in ten European countries between 1997 and 2002**



	Antibiotic resistance	Antibiotic use, ATC group (year of data)	Number of countries	Spearman correlation (95% CI)	p
S pneumoniae 1999/2000[10]	Erythromycin	Macrolides, J01FA (1998)	16	0·83 (0·67–0·94)	0·0008
S pneumoniae 2001[9]	Penicillin	Penicillins, J01C (2000)	19	0·84 (0·62–0·94)	<0·0001
		Cephalosporins, J01DA (2000)		0·68 (0·33–0·87)	0·0014
S pyogenes 1999/2000[10]	Erythromycin	Macrolides, J01FA and lincosamides, J01FF (1998)	21	0·65 (0·25–0·86)	0·0015
E coli 1999/2000[11]	Ciprofloxacin	Quinolones, J01M (1999)	14	0·74 (0·35–0·91)	0·0023
	Co-trimoxazole	Co-trimoxazole, J01EE01 (1999)		0·71 (0·29–0·90)	0·0048

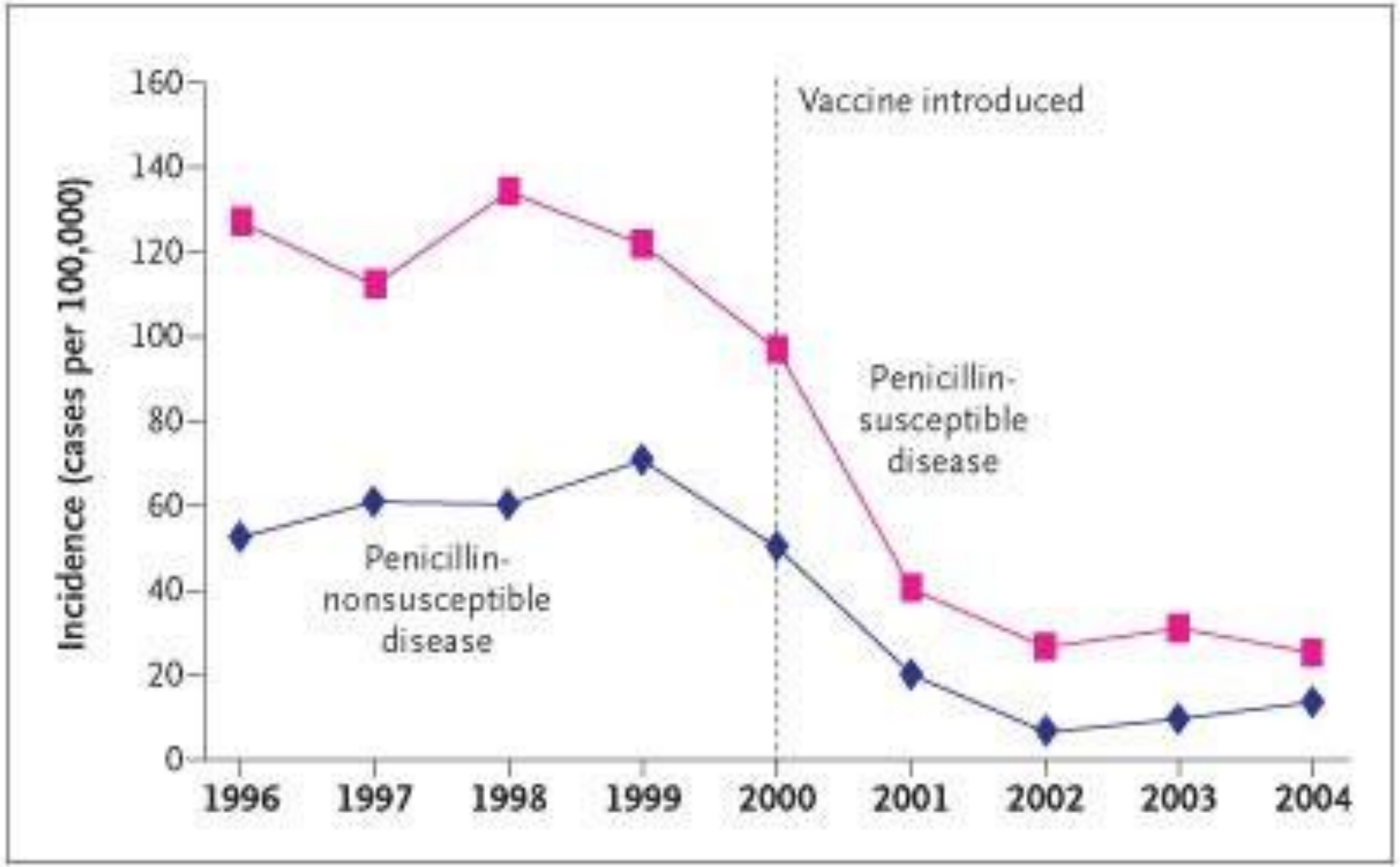
Table: **Correlation between antibiotic use and resistance, by organism and year of isolation**

Cosa possiamo fare?

- Prevenzione primaria
- *Diagnostic stewardship*
- Infezioni delle vie urinarie
- Infezioni delle vie respiratorie
- Consigli di viaggio

Prevenzione primaria

- Vaccinazioni
  - *S. pneumoniae*
  - *H. influenzae*
  - Influenza
  - SARS-CoV-2



Kyaw, Moe H., et al. "Effect of introduction of the pneumococcal conjugate vaccine on drug-resistant Streptococcus pneumoniae." *New England Journal of Medicine* 354.14 (2006): 1455-1463.

COVID-19 Vaccination is Associated with Reduced Outpatient Antibiotic Prescribing in Older Adults with Confirmed SARS-CoV-2: A Population Wide Cohort Study

POPULATION

Outpatients 66 years and older with confirmed SARS-CoV-2 infection, from nursing homes (13,529) and the community (50,885), between Jan 1st 2020 to Dec 31st 2021.

METHODOLOGY

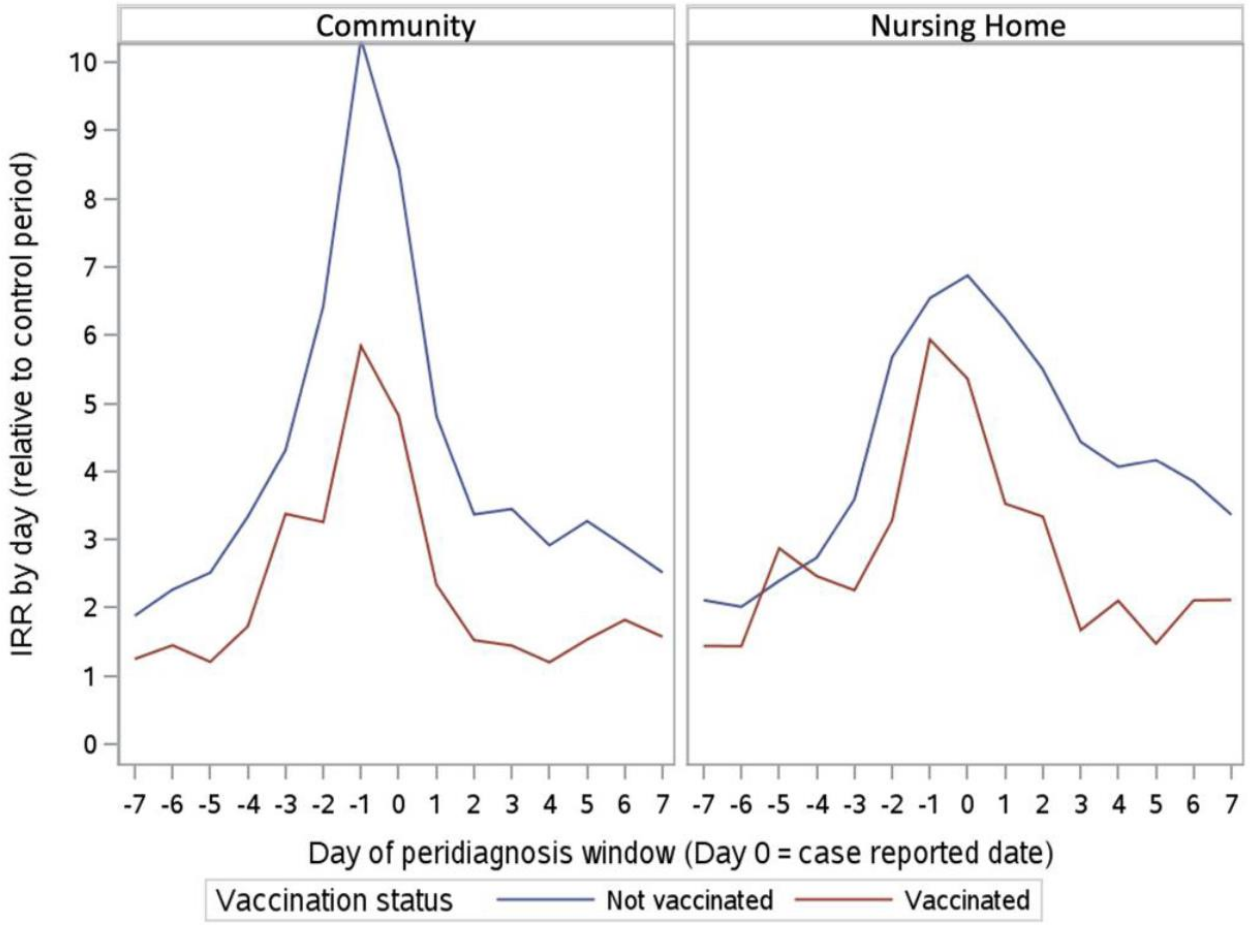
We determined the prevalence and rates of antibiotic prescribing within 1-week before and 1-week after SARS-CoV-2 diagnosis. We evaluated predictors of prescribing, including a primary COVID-19 vaccination series.

RESULTS

Antibiotic prescribing was common (13-22%). COVID-19 vaccination was associated with reduced prescribing with adjusted incidence rate ratios of 0.7 (95%CI 0.4-1) in nursing homes and 0.3 (95%CI 0.3-0.4) in the community.

Outpatient antibiotic use was common in patients with SARS-CoV-2. COVID-19 vaccination was associated with reduced antibiotic prescribing.

MacFadden et al. Clinical Infectious Diseases 2023



MacFadden, Derek R., et al. "Coronavirus disease 2019 vaccination is associated with reduced outpatient antibiotic prescribing in older adults with confirmed severe acute respiratory syndrome coronavirus 2: a population-wide cohort study." *Clinical Infectious Diseases* 77.3 (2023): 362-370.

TIMELINE OF THE APPARITION OF RESISTANCE

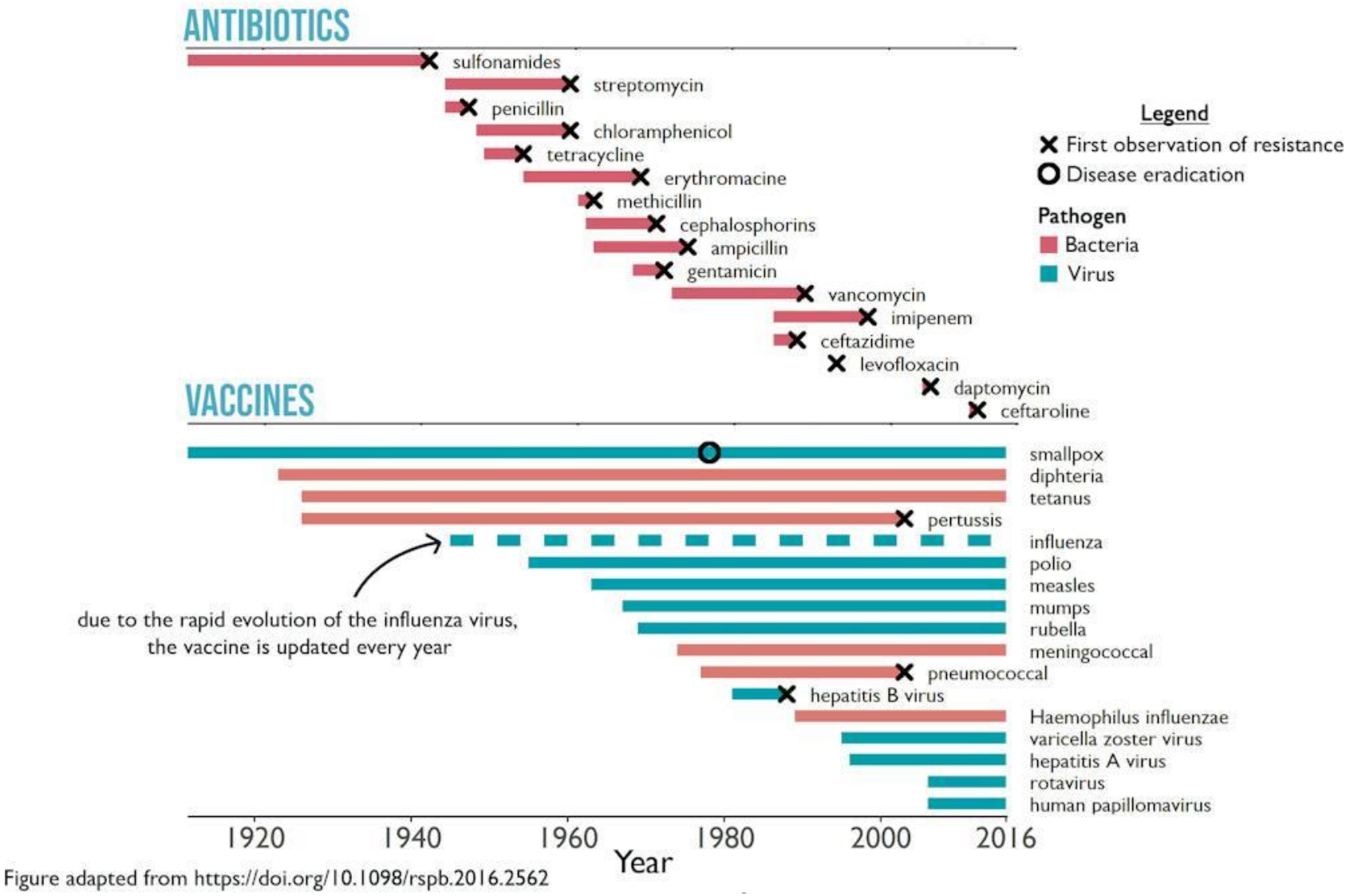
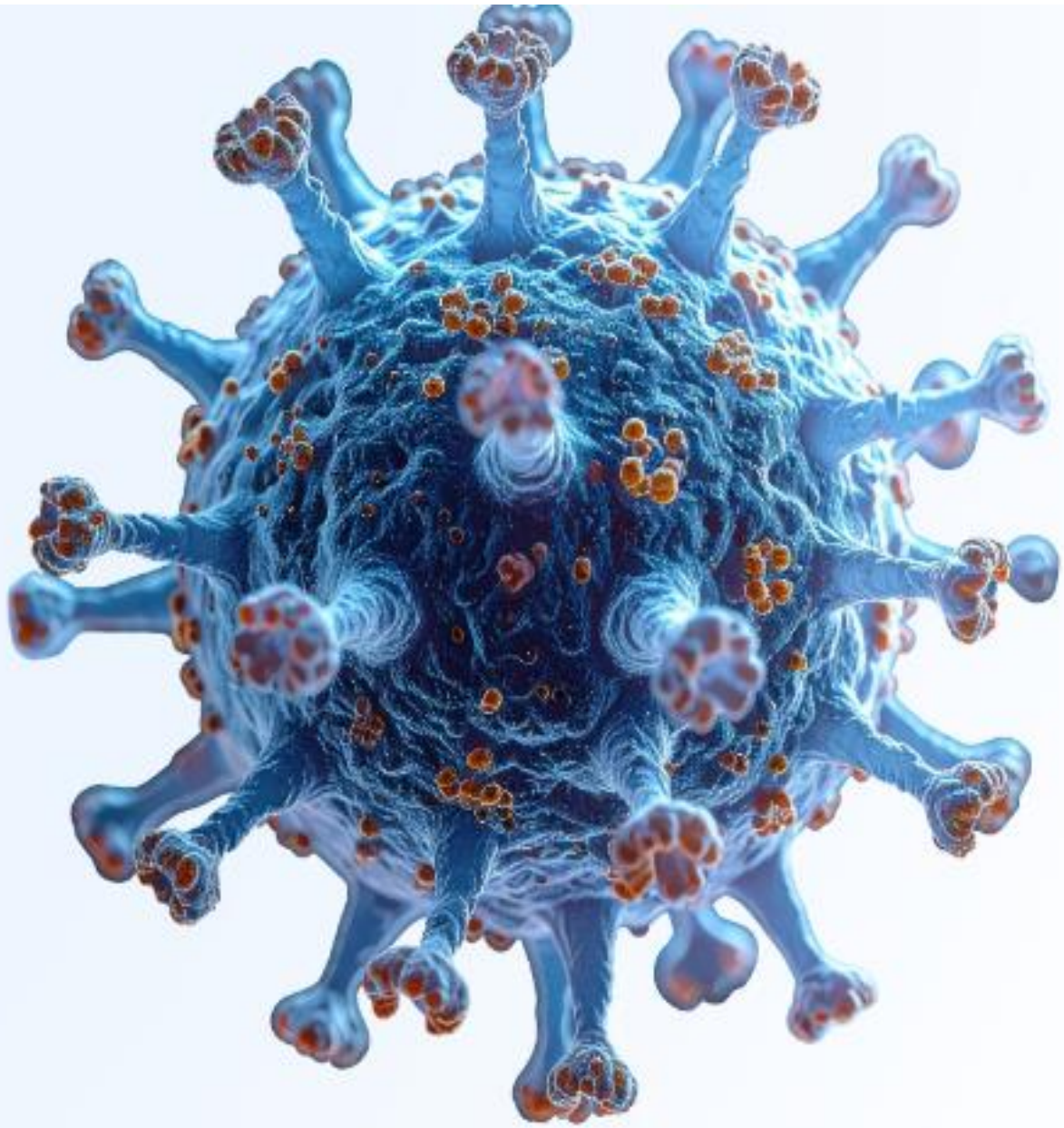
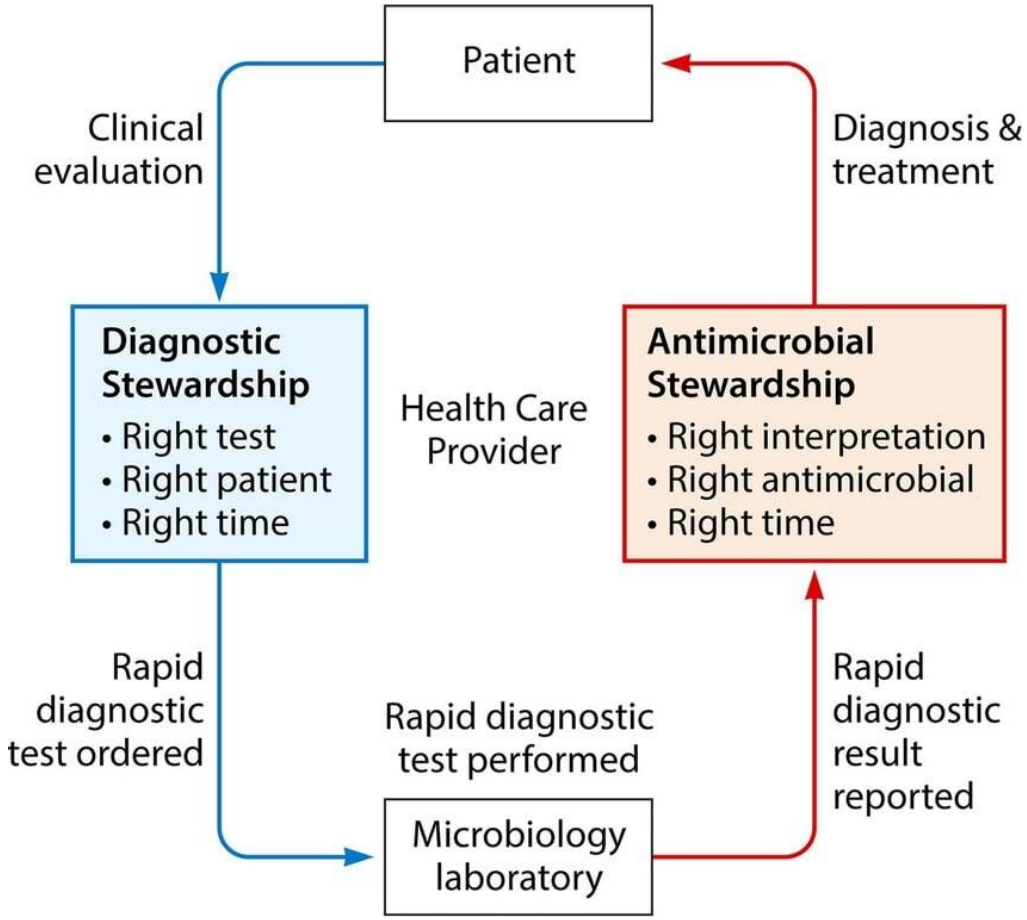


Figure adapted from https://doi.org/10.1098/rspb.2016.2562

Campagna antinfluenzale 2026/2027



Diagnostic stewardship



Messacar, Kevin, et al. "Implementation of rapid molecular infectious disease diagnostics: the role of diagnostic and antimicrobial stewardship." *Journal of clinical microbiology* 55.3 (2017): 715-723.

Cosa ci spinge a prescrivere antibiotici?

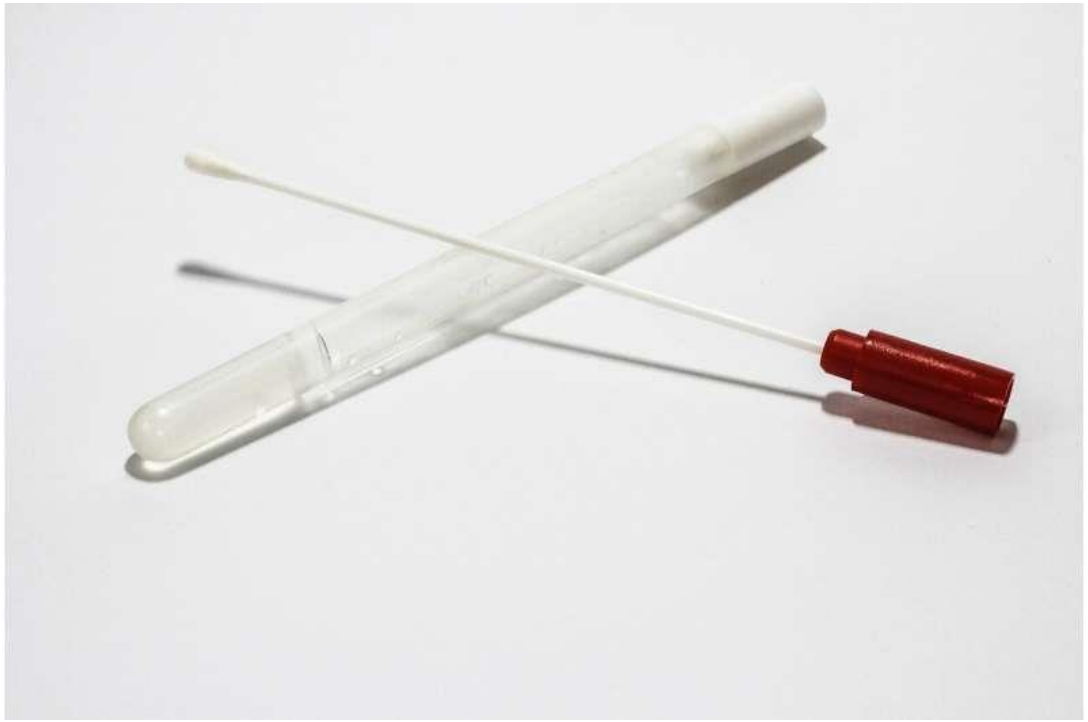
Clinicians' response regarding disease condition and antibiotic prescription likeliness

	Physician responses on diseases and antibiotics prescription likeliness						
Disease condition	**Never**	**Rarely**	**Sometimes**	**Frequently**	**Always**	**Did not respond**	**Resp**
Skin disease	11	**14**	**21**	**6**	6	13	58
Gastro-enteral disease	**24**	**17**	**2**	**4**	2	22	49
Respiratory disease	**9**	**5**	**19**	**15**	3	20	51
Urinary disease	**7**	**3**	**10**	**21**	12	18	53
Dental disease	**16**	**9**	**7**	**10**	3	26	45
Surgery prophylaxis	**9**	**5**	**6**	**12**	20	19	52
Wounds	**8**	**3**	**15**	**19**	17	9	62
Fever of unknown origin	**12**	**10**	**11**	**7**	7	24	47
Anorexia	**35**	**6**	**0**	**1**	0	29	42

Chan, Olivia SK, et al. "Prescribing antibiotics prudently—A survey of policy implementation drivers among physicians and veterinarians." *One Health* 18 (2024): 100752.

Diagnostic stewardship = utilizziamoli con cura!

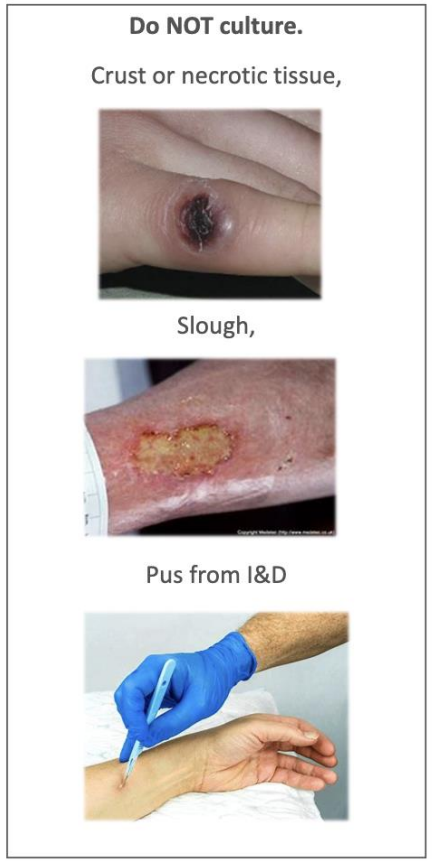
Tamponi cutanei



Urinocolture



Tamponi cutanei



- ONLY collect specimens from wounds that have clear signs of clinical infection, appear to be deteriorating, or fail to heal after 3-4 weeks of monitored treatment (i.e., failure to decrease size by 50% over 4 weeks).
  - Wound Infections that do NOT respond to standard treatment are best diagnosed by a skin biopsy culture accompanied by local anesthesia and histopathological examination. Submit viable tissue rather than superficial debris.
- Indiscriminate submission of a wound specimen(s), especially from a superficial site, may provide useless information that leads to unnecessary antibiotic treatment.
- Do NOT culture crusts, pus, wounds that have not been adequately debrided and cleansed.
- Do NOT culture fresh bite wounds, burns, or trauma within 24 hours of the occurrence.
- Do NOT culture wounds post-incision and drainage, as evidence shows little or no benefit to therapeutic management.

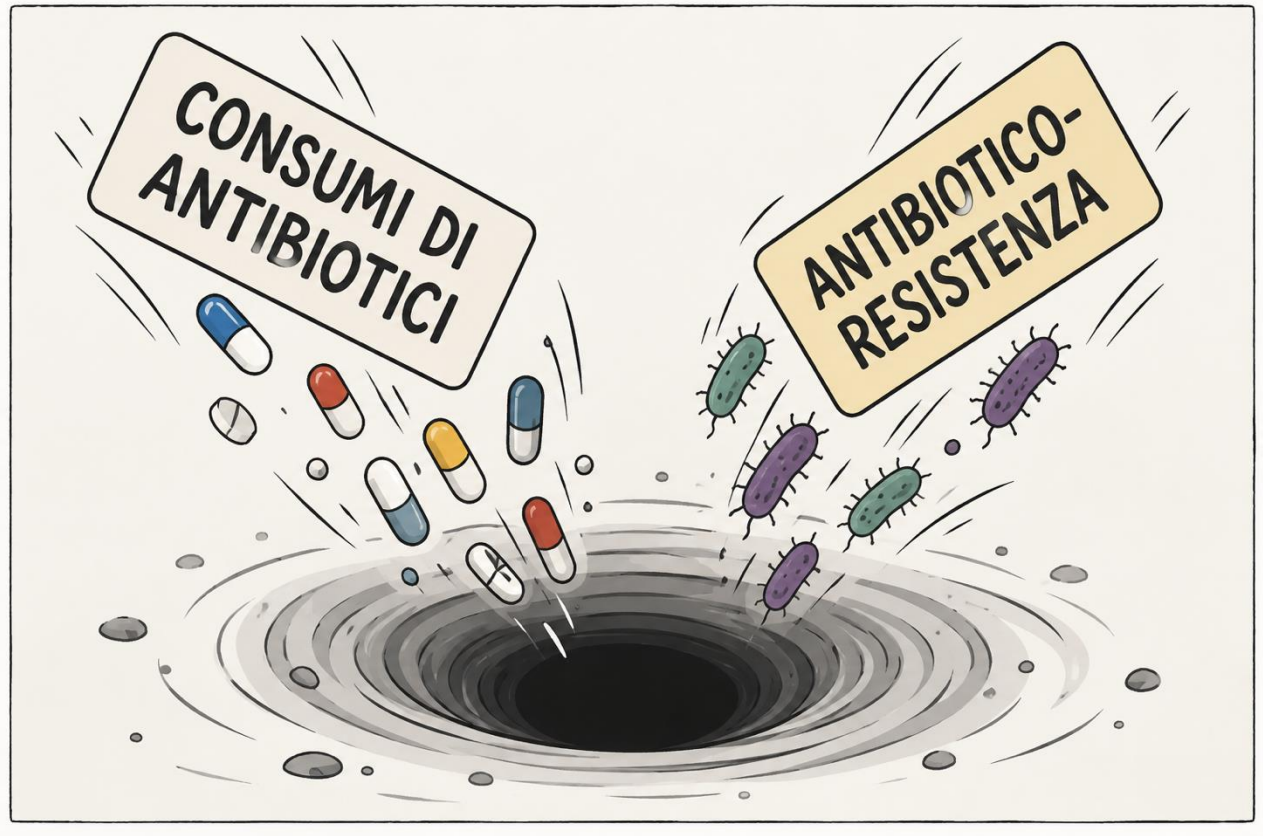
Urinocoltura

1. Indicazioni
    1. Segni/sintomi di infezione delle vie urinarie (sia basse che alte)
    2. Screening in donne in gravidanza
    3. Screening prima di interventi urologici (solo su indicazioni specialistica)

1. Controindicazioni
    1. Paziente asintomatico
    2. Di controllo dopo trattamento per IVU
    3. Nei pazienti con CV senza sintomi sistemici
    4. Nei pazienti con CV e con urine ipercromiche/maleodoranti
    5. Nei pazienti sottoposti ad interventi chirurgici non urologici e/o chemioterapie

Infezioni delle vie urinarie





Infezioni delle vie urinarie

New classifications of uUTI and cUTI

Old Classifications

Uncomplicated UTI:
Acute cystitis in afebrile nonpregnant premenopausal women with no diabetes and no urologic abnormalities



Acute Pyelonephritis: Acute kidney infection in women otherwise meeting the definition of uncomplicated UTI above



Complicated UTI: All other UTIs

New Classifications

Uncomplicated UTI: Infection confined to the bladder in afebrile women or men

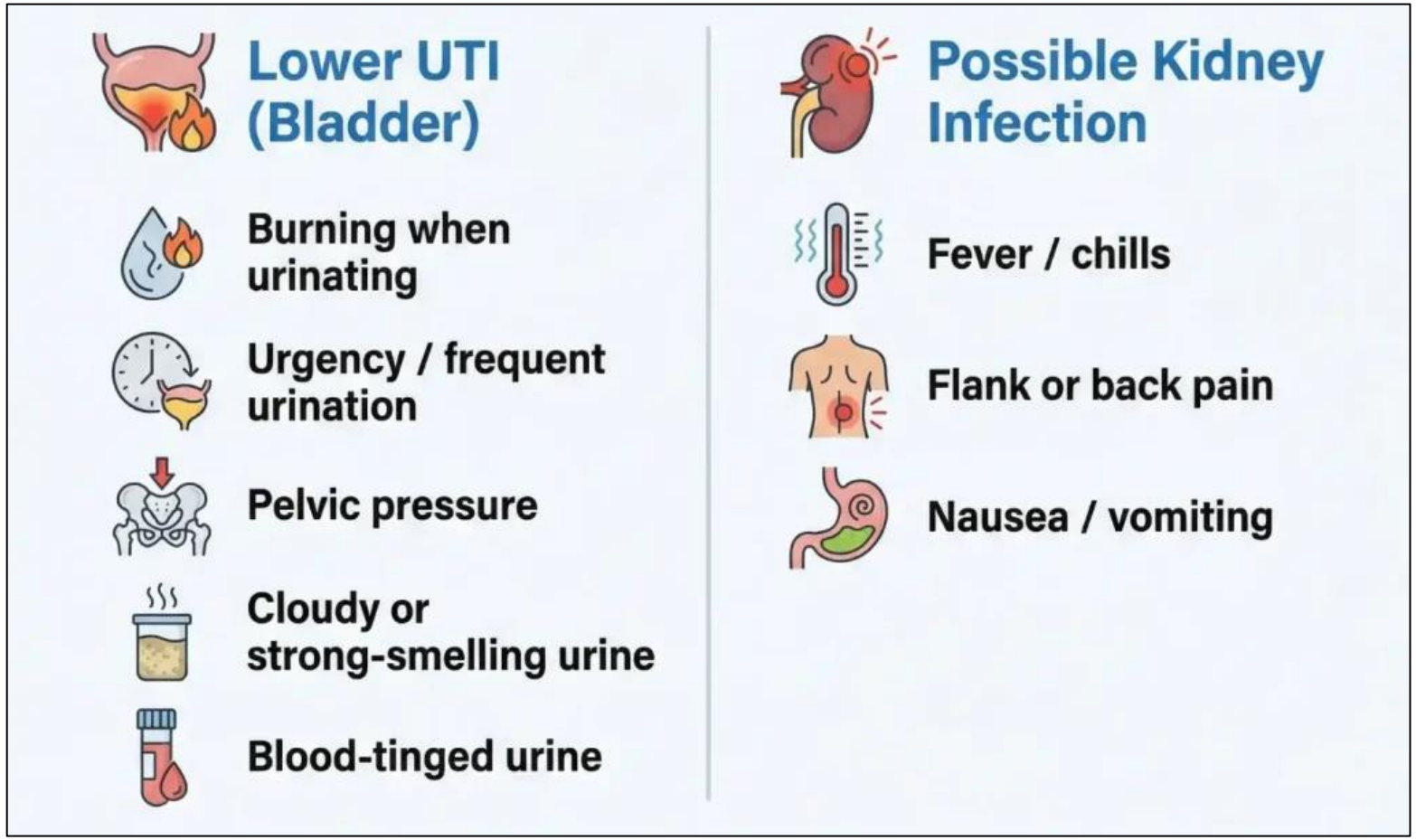
Complicated UTI: infection beyond the bladder in women or men

- Pyelonephritis
- Febrile or bacteremic UTI
- Catheter-associated (CAUTI)
- Prostatitis* (*not covered by these guidelines)



Trautner, B., N. W. Cortes-Penfield, and K. Gupta. "IDSA 2025 guideline update on complicated urinary tract infections." *Arlington, VA: Infectious Diseases Society of America* (2025).

Infezioni delle vie urinarie



La diagnosi di infezione delle vie urinarie è clinica.

L'urinocoltura e l'esame urine sono complementari alla presenza di segni/sintomi

IVU: consigli di terapia antibiotica



- Nitrofurantoina 100 mg 4 volte/die per 5 giorni;
- Bactrim 1 cp 2 volte/die per 3 giorni;
- Fosfomicina 3 gr in monosomministrazione
- Amikacina 15 mg/kg ogni 24 ore per 5 giorni
- Piperacillina/tazobactam 4.5 gr ogni 6 ore per 7 giorni
- L'uso dei fluorochinoloni come terapia di prima linea per le IVU delle vie urinarie è sconsigliato

IVU recidivanti

- Comportamenti:
  - Bere almeno 1.5-2 L di acqua al giorno
  - Bere regolarmente succo di mirtilli
  - Urinare regolarmente e dopo un rapporto sessuale
  - Dopo la defecazione, pulirsi da davanti all'indietro
  - Evitare irrigazioni o prodotti irritativi a livello genitale
  - Scaricarsi regolarmente
  - Regolare attività fisica secondo l'età e le condizioni

Fattori di rischio:

Donne premenopausa

Evitare spermici

Evitare utilizzo di diaframmi vaginali

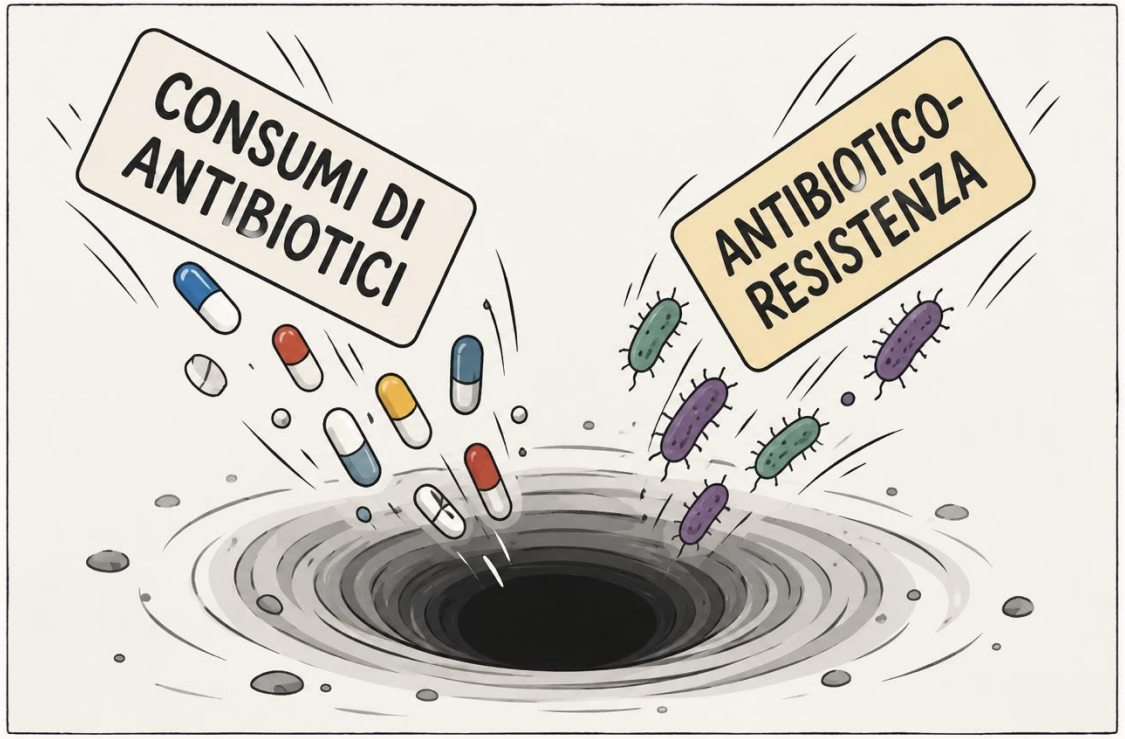
Donne postmenopausa

Utilizzo di estrogeni topici per la secchezza vaginale

- Prodotti :
  - D-mannosio 600 mg per 6 mesi
  - Probiotici orali giornailier
  - Probiotici vaginali due volte a settimana per 6 mesi
  - Urovaxom 1 cp al giorno per 3 mesi

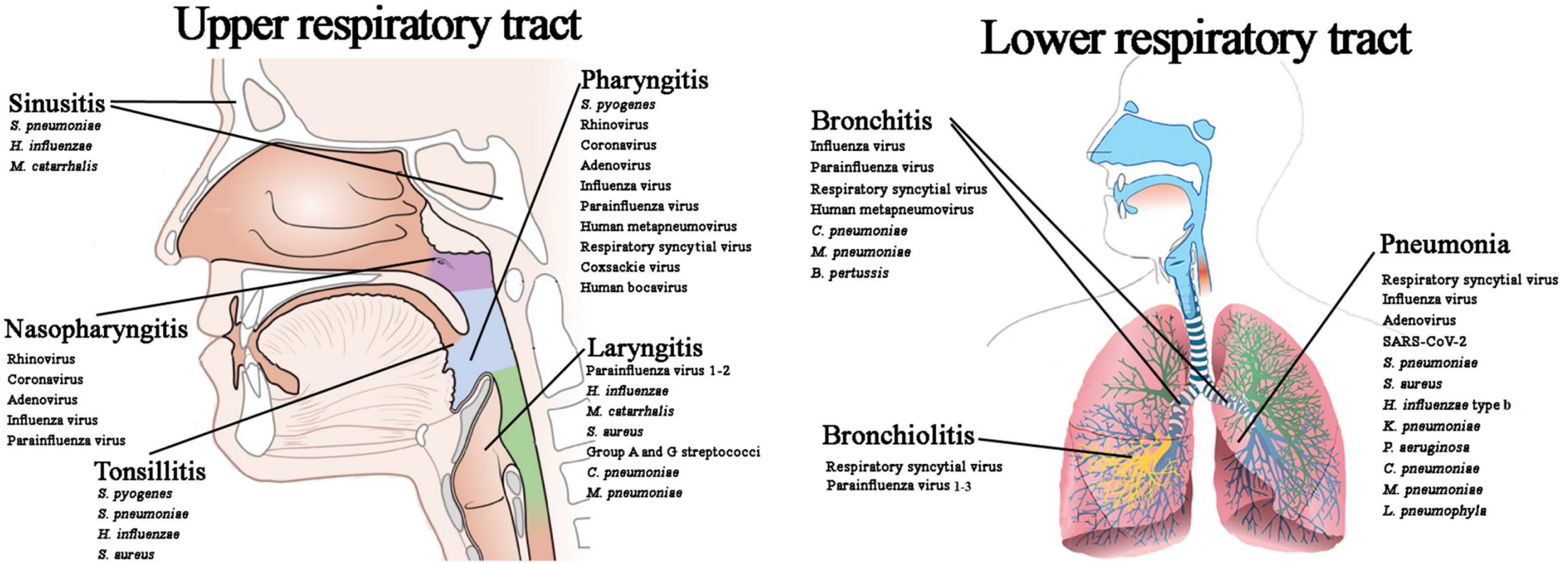
Simenacz. "Review of non-antibiotic treatment and prevention of recurrent UTIs–a summary of current guidance and suggested treatment algorithm." *Therapeutic Advances in Infectious Disease* 12 (2025): 20499361251395915; Venturini, Sergio, et al. "The management of recurrent urinary tract infection: non-antibiotic bundle treatment." *Probiotics and Antimicrobial Proteins* 16.5 (2024): 1857-1865.

Infezioni delle vie respiratorie





Infezioni delle vie respiratorie



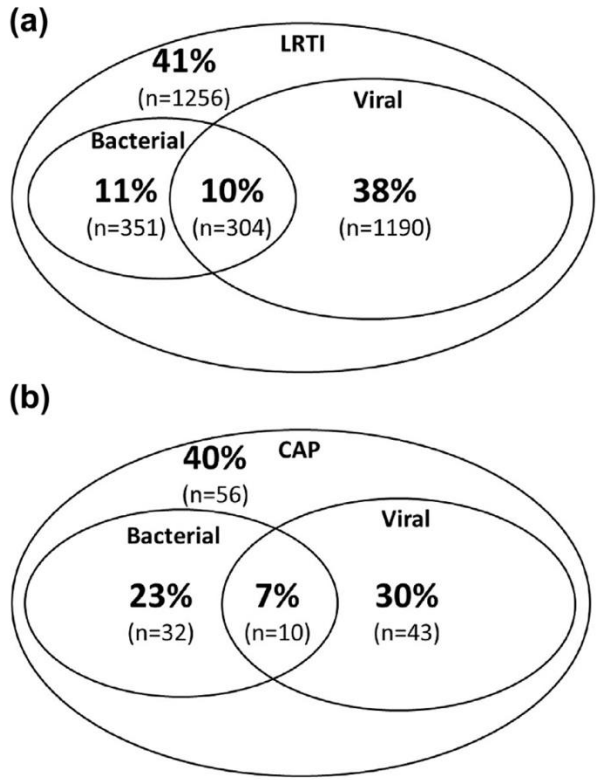
Calderaro, Adriana, et al. "Respiratory tract infections and laboratory diagnostic methods: a review with a focus on syndromic panel-based assays." *Microorganisms* 10.9 (2022): 1856.

Infezioni delle basse vie respiratorie

Table 2
Organisms detected in patients with LRTI, LRTI with CAP and LRTI without CAP

Organisms	LRTI ($n = 3104$)	LRTI with CAP ($n = 141$)	LRTI without CAP ($n = 2963$)	p-value
	n (%)	*n* (%)	*n* (%)	
Bacteria				
Streptococcus pneumoniae	172 (5.5)	13 (9.2)	159 (5.4)	0.043
Haemophilus influenzae	167 (5.4)	20 (14.2)	147 (5.0)	<0.001
Mycoplasma pneumoniae	150 (4.8)	6 (4.3)	144 (4.9)	0.738
Chlamydia pneumoniae	165 (5.3)	7 (5.0)	158 (5.3)	0.843
Bordetella pertussis	95 (3.1)	4 (2.8)	91 (3.1)	1.000[a]
Legionella pneumophila	6 (0.2)	1 (0.7)	5 (0.2)	0.236[a]
Any of the above bacteria	655 (21.1)	42 (29.8)	613 (20.7)	0.010
Viruses				
Rhinovirus	623 (20.1)	20 (14.2)	603 (20.4)	0.066
Influenza virus A/B	307 (9.9)	11 (7.8)	296 (10.0)	0.378
Coronavirus	231 (7.4)	6 (4.3)	225 (7.6)	0.134
Respiratory syncytial virus	144 (4.6)	4 (2.8)	140 (4.7)	0.289
Human metapneumovirus	138 (4.4)	9 (6.4)	129 (4.4)	0.264
Parainfluenza viruses 1–4	81 (2.6)	4 (2.8)	77 (2.6)	0.786[a]
Human adenovirus	41 (1.3)	5 (3.5)	36 (1.2)	0.037[a]
Polyomaviruses	69 (2.2)	2 (1.4)	69 (2.3)	0.769[a]
Bocavirus	18 (0.6)	0 (0.0)	18 (0.6)	1.000[a]
Any of the above viruses	1494 (48.1)	53 (37.6)	1441 (48.7)	0.010

Abbreviations: CAP, community-acquired pneumonia; LRTI, lower respiratory tract infection.
[a] Fisher's Exact test.



Lieberman, David, et al. "A comparative study of the etiology of adult upper and lower respiratory tract infections in the community." *Diagnostic microbiology and infectious disease* 42.1 (2002): 21-28.

Infezioni delle alte vie respiratorie

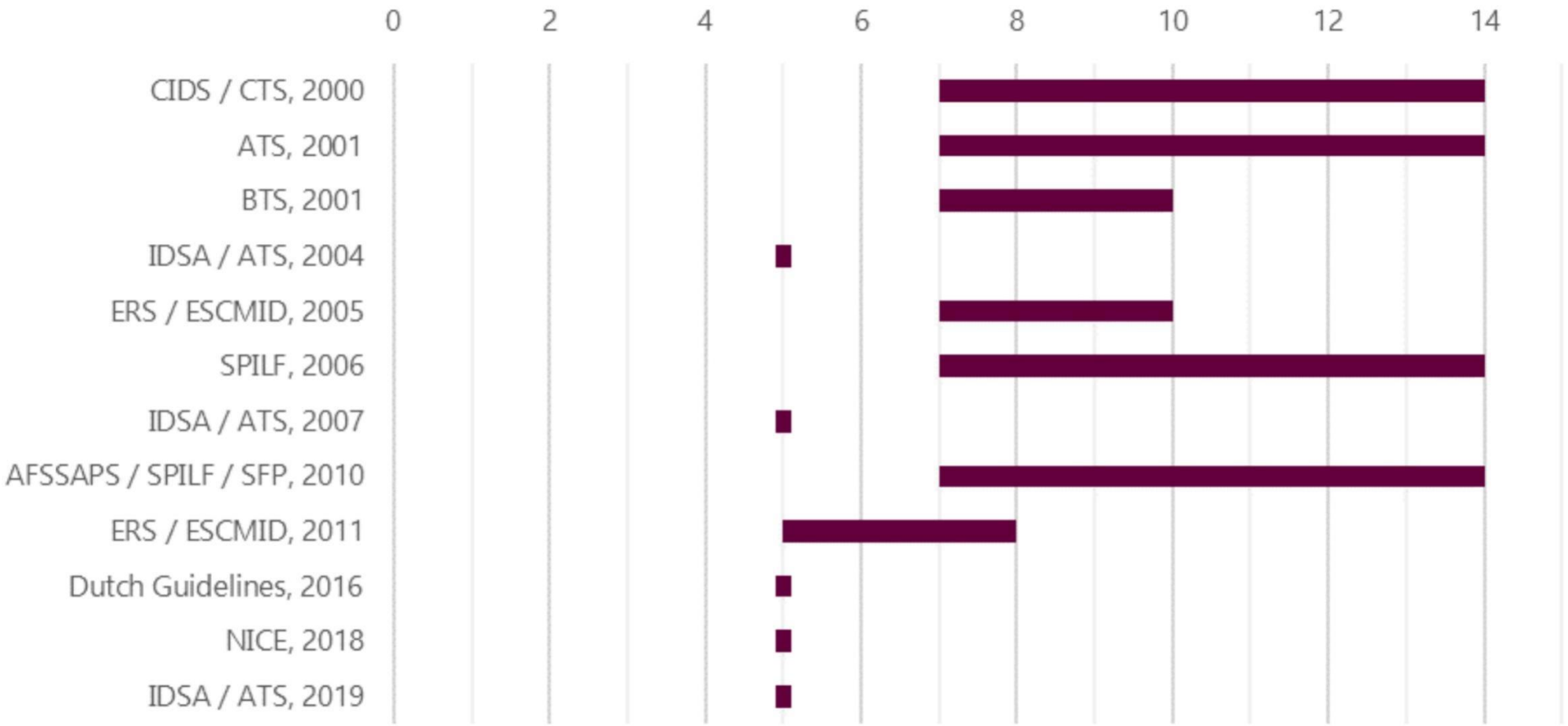
Sinusite

- Nella maggior parte dei casi, la terapia antibiotica non è necessaria e si può far ricorso a vigile attesa e rivalutazione dopo 48-72 ore.
- Valutare l'uso di antibiotici se:
  - Esordio grave (febbre con TC >39°C e secrezione purulenta o dolore facciale intenso da almeno 3-4 giorni).
  - Comorbosità (es. neoplasie, immunodeficienza, diabete mellito scompensato).
  - Rischio di complicanze (es. precedenti traumi cranio facciali).
  - Peggioramento o persistenza (peggioramento progressivo o andamento bifasico; persistenza >10 giorni).
- Nelle forme iperalgiche si può associare un breve ciclo di corticosteroidi

Bronchite

- Il trattamento antibiotico non è raccomandato e deve essere evitato.
- Terapia sintomatica:
  - Mantenere una buona idratazione e cessare il fumo.
  - Paracetamolo: 500 mg - 1 gr per OS ogni 4-6 ore (dose massima 3 gr/die).
  - Ibuprofene: 200 mg per OS ogni 4-6 ore o 400 mg per OS ogni 6-8 ore (dose massima 1.6 gr/die) se non controindicato e in assenza di rischio di grave interazione con altri farmaci (es. ACE inibitori).
- L'impiego di broncodilatatori, corticosteroidi inalatori o sistemici, in assenza di forme ostruttive (asma, BPCO), non sembra apportare beneficio.
- È importante avvisare i pazienti che la tosse può durare fino a 3-4 settimane e non necessita di terapia antibiotica.
- Istruire i pazienti a fare una nuova visita medica di rivalutazione, se la clinica peggiora velocemente o in maniera importante e se i sintomi persistono per oltre 3-4 settimane.

Polmoniti comunitarie



Dinh, Aurélien, and David Lebeaux. "Duration of antibiotic treatment for community-acquired pneumonia." *Infectious Diseases Now* (2025): 105125.

Trattamento polmoniti



- During cases of non-severe (ambulatory) and moderately severe (hospitalization other than critical care) CAP, and when stability criteria gave been fulfilled at D3, three-day antibiotic treatment is recommended (Grade A-1)*
- When, after three to five days of treatment, clinical stability has not been achieved, five-day antibiotic treatment is recommended
- In the other cases of uncomplicated CAP, seven-day antibiotic therapy is recommended (Grade A-1).

Treatment exceeding seven days can only be justified by occurrence of a complication such as a pulmonary abscess or significant pleural effusion.

Antibiotico

ACCESS Amoxicillina 1 g ogni 8h *per os*

Alternative

ACCESS Doxiciclina 100 mg ogni 12h *per os*

In alternativa alle penicilline o se forte sospetto di polmonite da batteri atipici

Durata prevista

3-5 giorni

Se *Legionella:* 7-10 giorni

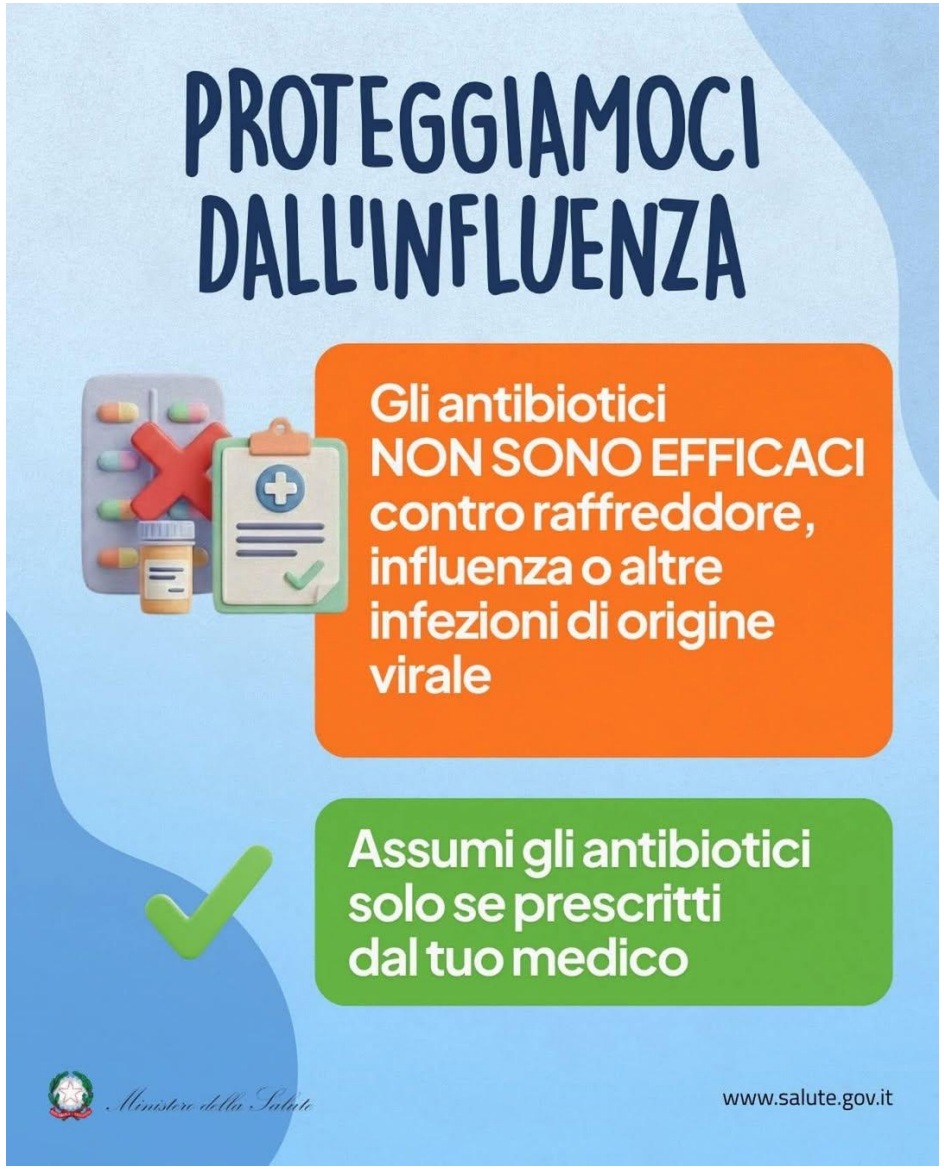
Dinh, Aurélien, and David Lebeaux. "Duration of antibiotic treatment for community-acquired pneumonia." *Infectious Diseases Now* (2025): 105125.

Consigli di viaggio









Consigli di viaggio





Grazie per l’attenzione