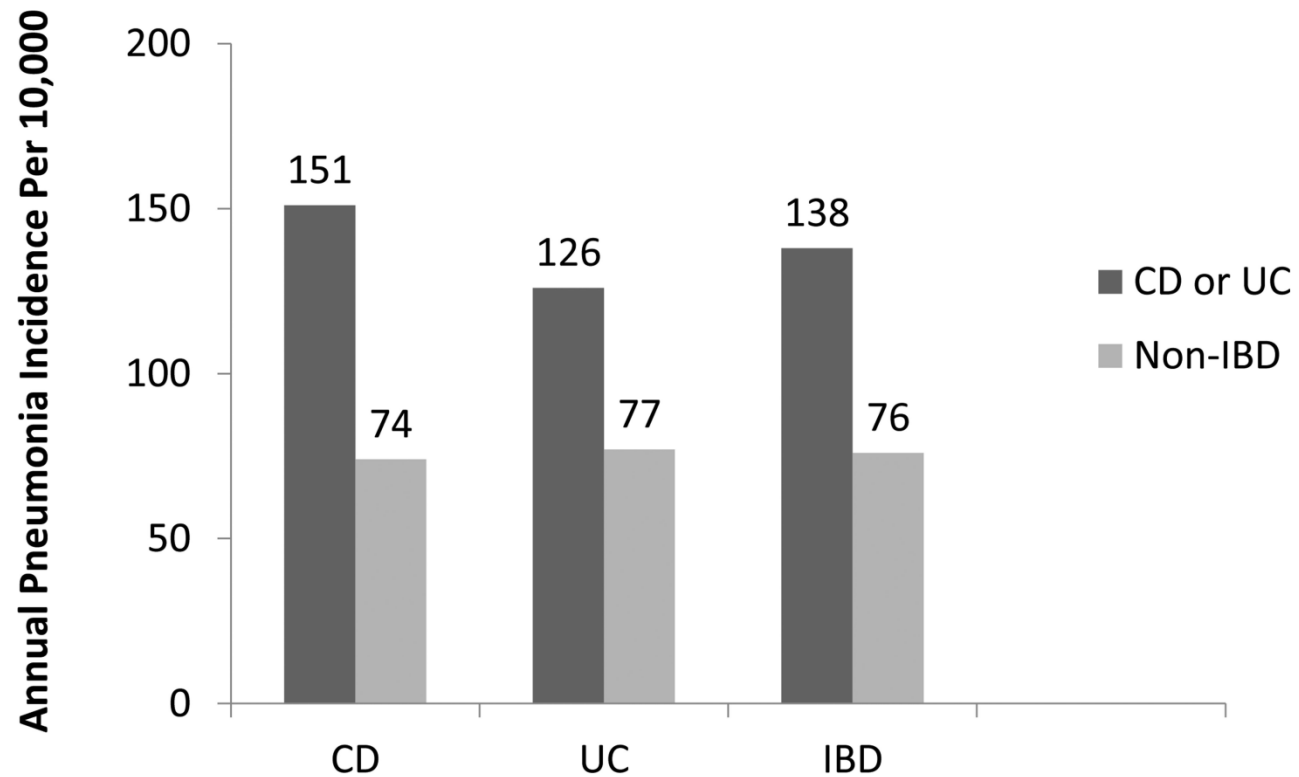


# The role of seasonal vaccines for IBD patients

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# Incidence of Recorded Pneumonia in IBD and non-IBD Populations



# Risk of infections associated with the treatment in IBD

**Table 4.** Multivariable Adjusted HRs (95% CIs)<sup>a</sup> of Opportunistic Infections According to Medication Exposure, Overall and by Pathogen

Type of Infection	Exposed to Combination Therapy vs Anti-TNF Monotherapy	Exposed to Combination Therapy vs Thiopurine Monotherapy	Exposed to Anti-TNF Monotherapy vs Thiopurine Monotherapy
Opportunistic infections, overall	1.96 (1.32–2.91)	2.11 (1.45–3.08)	1.08 (0.83–1.40)
Viral infections	1.98 (1.00–3.94)	1.13 (0.62–2.08)	0.57 (0.38–0.87)
Mycobacterial infections	2.17 (1.08–4.36)	4.30 (2.10–8.80)	1.98 (1.15–3.40)
Bacterial infections	1.99 (0.99–4.01)	4.73 (2.10–10.7)	2.38 (1.23–4.58)
Fungal infections	0.78 (0.21–2.88)	0.96 (0.26–3.61)	1.24 (0.49–3.16)

**Table 3.** Multivariable Adjusted HRs (95% CIs)<sup>a</sup> of Serious Infections According to Medication Exposure, Overall and by Infection Site

Type of Infection	Exposed to Combination Therapy vs Anti-TNF Monotherapy	Exposed to Combination Therapy vs Thiopurine Monotherapy	Exposed to Anti-TNF Monotherapy vs Thiopurine Monotherapy
Serious infections, overall	1.23 (1.05–1.45)	2.11 (1.80–2.48)	1.71 (1.56–1.88)
Pulmonary infections	1.40 (0.99–1.98)	3.14 (2.24–4.40)	2.24 (1.83–2.75)
GI infections	1.34 (0.93–1.93)	1.84 (1.30–2.60)	1.37 (1.12–1.68)
Skin infections	1.08 (0.76–1.54)	1.86 (1.30–2.68)	1.72 (1.38–2.15)
Urinary tract infections	0.89 (0.56–1.41)	1.69 (1.07–2.67)	1.90 (1.47–2.45)
ENT infections	1.47 (0.60–3.59)	1.95 (0.80–4.73)	1.32 (0.83–2.12)
Musculoskeletal infections	1.89 (0.78–4.55)	2.58 (1.07–6.23)	1.36 (0.68–2.73)
Other infections	1.26 (0.89–1.79)	2.03 (1.44–2.87)	1.61 (1.29–2.01)

# Immunosuppression level

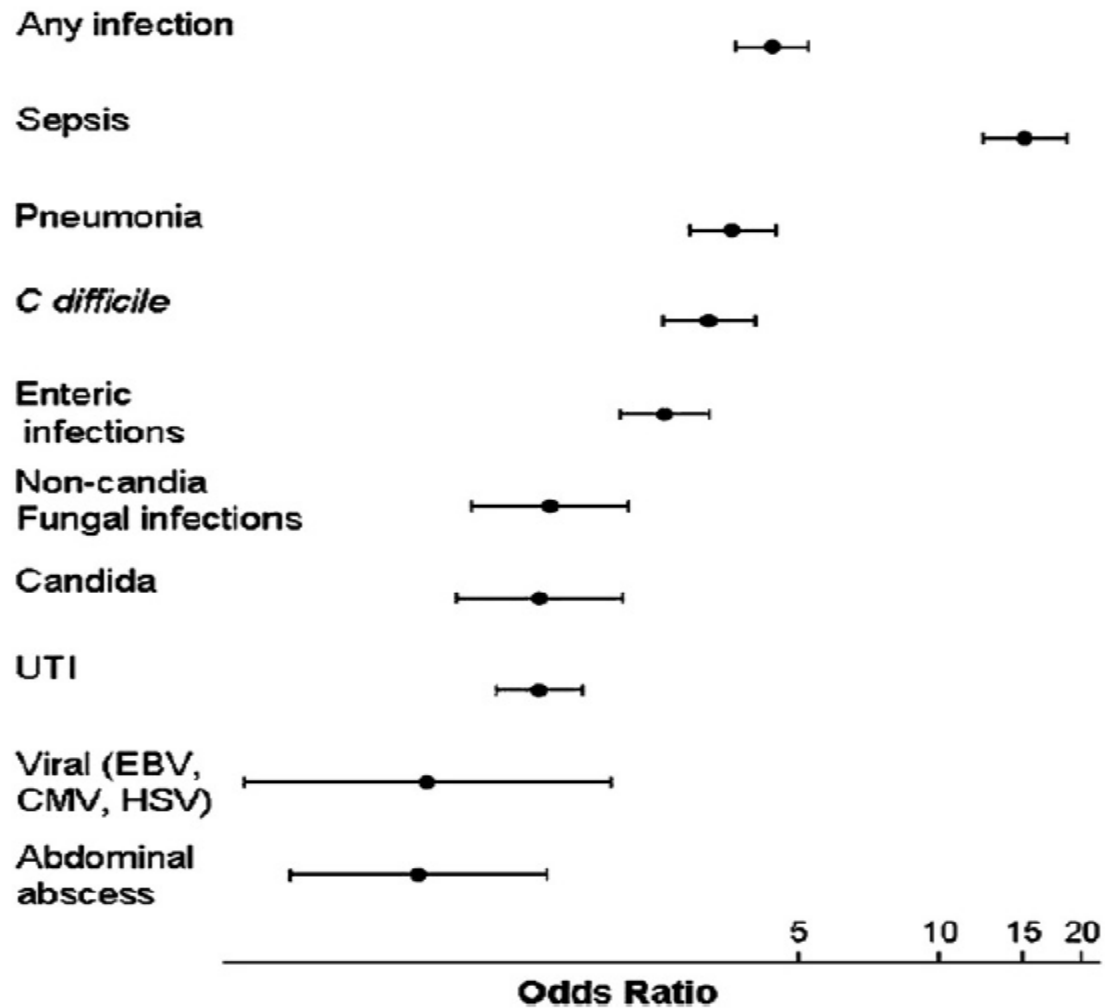
## High

- daily steroid therapy >20 mg of prednisone (equiv), for > 14 days
- anti-TNF agents, ustekinumab, tofacitinib
- severe protein calorie malnutrition

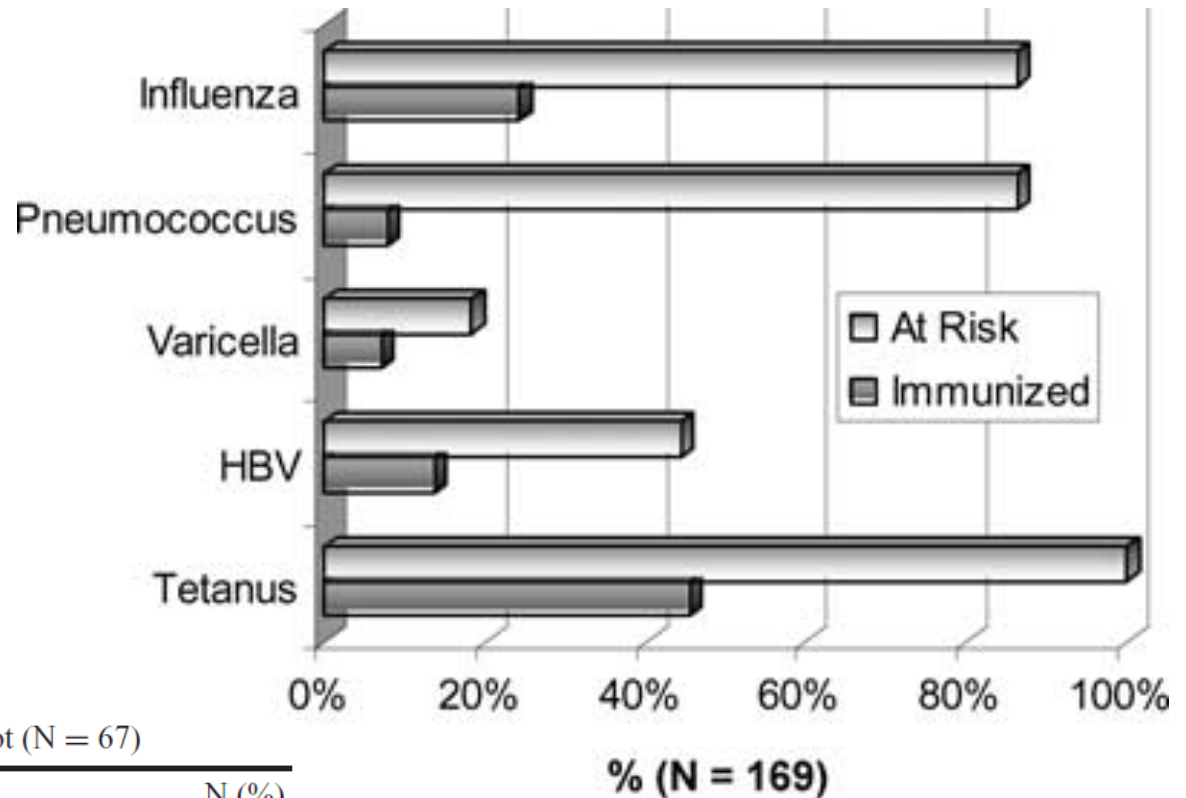
## Low

- <20 mg of prednisone, <14 days
- methotrexate <0.4 mg/kg per week
- azathioprine <3 mg/kg per day or 6-mercaptopurine <1.5 mg/ kg per day

# Effect of infections on *in hospital* mortality in patients with IBD



# How high are the vaccination rates in the real world?



**Table 2.** Reasons For Not Receiving Flu Shot (N = 67)

Reason	N (%)
Didn't know I needed it	33 (49)
Afraid of side effects	12 (18)
No specific reason	10 (15)
Did not believe vaccine effective	4 (6)
Vaccine not available	3 (4)
Other*	5 (7)

\*Includes "personal philosophy against vaccination," needle aversion.

# Types of vaccines

Live-attenuated vaccines	use an attenuated form of the causative germ (Measles, mumps, rubella, smallpox, BCG)
Inactivated vaccines	use a dead microorganism (flu, polio)
Subunit, recombinant, polysaccharide, and conjugate vaccines	Use only a part (inactive) of the germ (hepatitis B, Streptococcus pneumoniae)
Toxoid vaccines	use a toxin of the germ

# Recommended vaccines

Vaccination	Timing	Schedule
MMR (Measles, Mumps, Rubella)	All ages with negative titers prior to starting immunosuppressant therapy All patients with increased risk from new outbreaks Contraindicated if immunocompromised*	Two doses  Additional third dose
Varicella	All ages if no history of vaccination or negative titers prior to starting immunosuppressant therapy Contraindicated if immunocompromised*	Two doses
Hepatitis A	All ages with negative serology	Two doses 6 months apart
Hepatitis B	All ages with negative serology	Three doses at 0, 1, and 6 months respectively
HPV (Human papillomavirus)	Ages 9-15 Ages 16-45	Two doses 6 months apart Three doses at 0, 1-2, and 6 months respectively
Tdap (Tetanus, Diptheria, Pertussis)	Ages >11	One dose followed by booster every 10 years
Meningococcal	Ages 16-23	Two doses 1-6 months apart
Influenza	All ages	One dose annually
Pneumococcal Pneumonia	Ages >19	One dose PCV13 followed by one dose PPSV23, 2-12 months later depending on immune status Second dose PPSV23 5 years after first dose and again after age 65
Zostavax (Herpes Zoster)	Age >60 before starting immunosuppressant therapy Contraindicated if severely immunocompromised *	One dose
Shingrix (Herpes Zoster)	Ages >50	Two doses 2-6 months apart



# Recommended (seasonal) vaccinations

- Influenza: **inactivated**, annually, regular dose, independent of IS; vaccinate also close contacts
- Pneumococcal Disease: several types combined (booster doses at 8w and 5y), independent of IS

# Other recommended vaccines

- Hepatitis B: subunit, several regimens; possible during IS
- Papilloma virus: recombinant, possible during IS
- Herpes zoster/MMR/varicella: **live**; must precede IS by at least a few weeks