

Supplemental materials

Supplemental Table 1. Summary of guideline recommendations on duration of therapy for select outpatient conditions

Outpatient condition	Population	Guideline citation	Guideline-recommended durations of non-azithromycin antibiotic therapy, when systemic antibiotics are indicated
Streptococcal pharyngitis	Adults and children	Shulman ST, Bisno AL, Clegg HW, et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis 2012 ; 55(10): e86-102.	-10 days for oral agents -Penicillin intramuscular injection single dose
Sinusitis	Adults	Chow AW, Benninger MS, Brook I, et al. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults. Clin Infect Dis 2012 ; 54(8): e72-e112.	5-7 days recommended for patients with uncomplicated acute bacterial sinusitis without risk factors for resistance and with initial improvement after 3-5 days
		Rosenfeld RM, Piccirillo JF, Chandrasekhar SS, et al. Clinical practice guideline (update): adult sinusitis. Otolaryngol Head Neck Surg 2015 ; 152(2 Suppl): S1-S39.	5-10 days, notes 5-7 days may be as effective with side effects less common
	Children	Chow AW, Benninger MS, Brook I, et al. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults. Clin Infect Dis 2012 ; 54(8): e72-e112.	10-14 days
		Wald ER, Applegate KE, Bordley C, et al. Clinical practice guideline for the diagnosis and management of acute bacterial sinusitis in children aged 1 to 18 years. Pediatrics 2013 ; 132(1): e262-280.	No recommendation for duration.
Acute otitis media (AOM)	Children	Lieberthal AS, Carroll AE, Chonmaitree T, et al. The diagnosis and management of acute otitis media. Pediatrics 2013 ; 131(3): e964-99.	-10 days for oral agents -1-3 doses of ceftriaxone intramuscular injection (non-first line) -7 days likely effective for children 2-5 years with mild or moderate AOM -5-7 days likely effective for children 6 years and older with mild or moderate AOM

Outpatient condition	Population	Guideline citation	Guideline-recommended durations of non-azithromycin antibiotic therapy, when systemic antibiotics are indicated
Community acquired pneumonia	Adults	Metlay JP, Waterer GW, Long AC, et al. Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. <i>Am J Respir Crit Care Med</i> 2019 ; 200(7): e45-e67.	No less than 5 days, validated by measures of clinical stability; 5-day durations appropriate for most patients. CAP due to MRSA or <i>P. aeruginosa</i> should be treated for 7 days.
	Children over 3 months	Bradley JS, Byington CL, Shah SS, et al. The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. <i>Clin Infect Dis</i> 2011 ; 53(7): e25-76.	No recommendation for duration. Guidelines note: "Treatment courses of 10 days have been best studied, although shorter courses may be just as effective, particularly for more mild disease managed on an outpatient basis"
Cellulitis	Adults and children	Stevens DL, Bisno AL, Chambers HF, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. <i>Clin Infect Dis</i> 2014 ; 59(2): e10-e52.	5 days, with extension of antibiotic therapy duration if infection has not improved
Abscess	Adults and children	Stevens DL, Bisno AL, Chambers HF, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. <i>Clin Infect Dis</i> 2014 ; 59(2): e10-e52.	5-10 days
Acute uncomplicated cystitis	Pre-menopausal, non-pregnant women	Gupta K, Hooton TM, Naber KG, et al. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: A 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. <i>Clin Infect Dis</i> 2011 ; 52(5): e103-20.	Varies by agent: -Trimethoprim-sulfamethoxazole or trimethoprim for 3 days -Fosfomycin trometamol single dose -Nitrofurantoin for 5 days -Ofloxacin, ciprofloxacin, or levofloxacin for 3 days (non-first line) -Beta-lactam agents including amoxicillin-clavulanate, cefdinir, cefaclor, or cefpodoxime-proxetil for 3-7 days (non-first line)

Supplemental Table 2. Diagnosis category definitions, IQVIA National Disease and Therapeutic Index (NDTI) 2017

Syndrome	NDTI descriptions included in case definition^A
Pharyngitis	Acute pharyngitis; Streptococcal sore throat; Acute tonsillitis (except acute viral tonsillitis); Tonsillopharyngitis
Sinusitis	Acute sinusitis
Acute otitis media	Acute otitis media; otitis media NOS; suppurative otitis media
Community onset pneumonia	Pneumonia NOS; Pneumococcal pneumonia; Bacterial pneumonia (except Klebsiella and Pseudomonas); Pleuropneumonia; Atypical pneumonia; Bronchial pneumonia; Pneumonia organism unspecified
Skin and soft tissue infection	Cellulitis and abscess ^B ; Paronychia; Lymphadenitis; Abscess; Ecthyma; Local infections of skin; Infective eczematoid dermatitis; Carbuncle and furuncle
Acute cystitis	Acute cystitis; Unspecified cystitis

^A IQVIA NDTI uses a proprietary diagnosis coding scheme and does not use *International Classification of Diseases (ICD)* codes.

^B NDTI contains diagnosis descriptions with both cellulitis and abscess in the same description. For duration analyses, we categorized these as cellulitis.

Supplemental Table 3. Values used as recommended minimum antibiotic therapy duration for calculation of excessive antibiotic therapy days

Outpatient condition	Population	Minimum guideline-recommended antibiotic therapy duration used for calculation of potentially excessive days of therapy^{A,B}
Streptococcal pharyngitis	Adults and children	10 days
Sinusitis	Adults	7 days
	Children	14 days
Acute otitis media (AOM)	Children <2 years	10 days
	Children ≥2 years	7 days
Community acquired pneumonia	Adults	5 days
	Children	N/A
Cellulitis	Adults and children	5 days
Abscess	Adults and children	10 days
Acute uncomplicated cystitis	Women, 12-64	Varies by agent: -Trimethoprim-sulfamethoxazole/ trimethoprim: 3 days -Fluoroquinolones: 3 days -Urinary anti-infectives ^C : 5 days -Beta-lactam agents ^D : 7 days

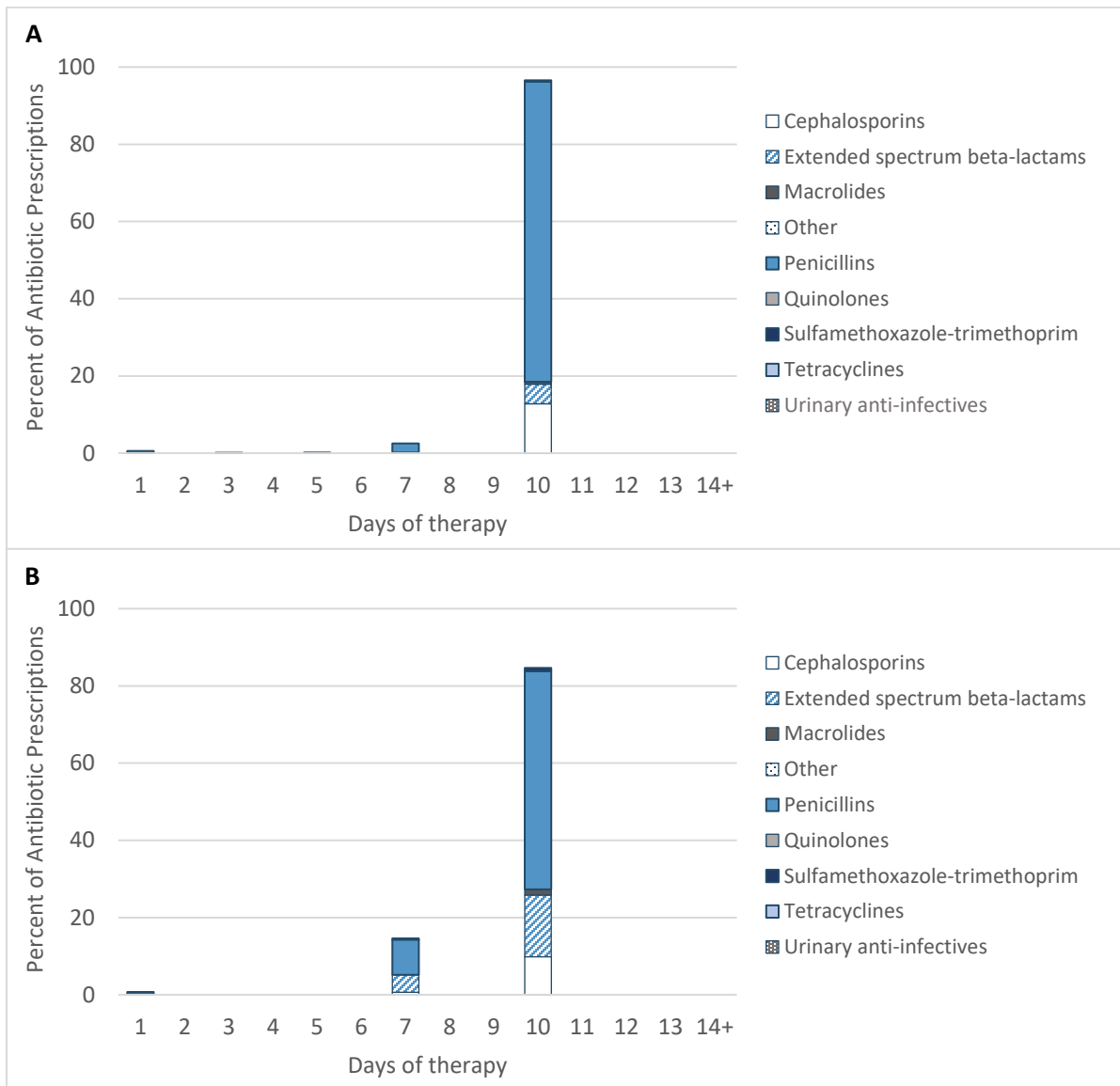
^A Calculated for each prescription as: days of therapy – minimum guideline recommended antibiotic therapy duration. For prescriptions where the prescribed days of therapy are less than or equal to the minimum guideline recommended duration, we considered the potentially excessive days of therapy to be 0.

^B Potentially excessive days of therapy, as calculated here, should be considered an upper-bound estimate, as we were not able to account for patients with clinical factors necessitating longer durations of antibiotic therapy.

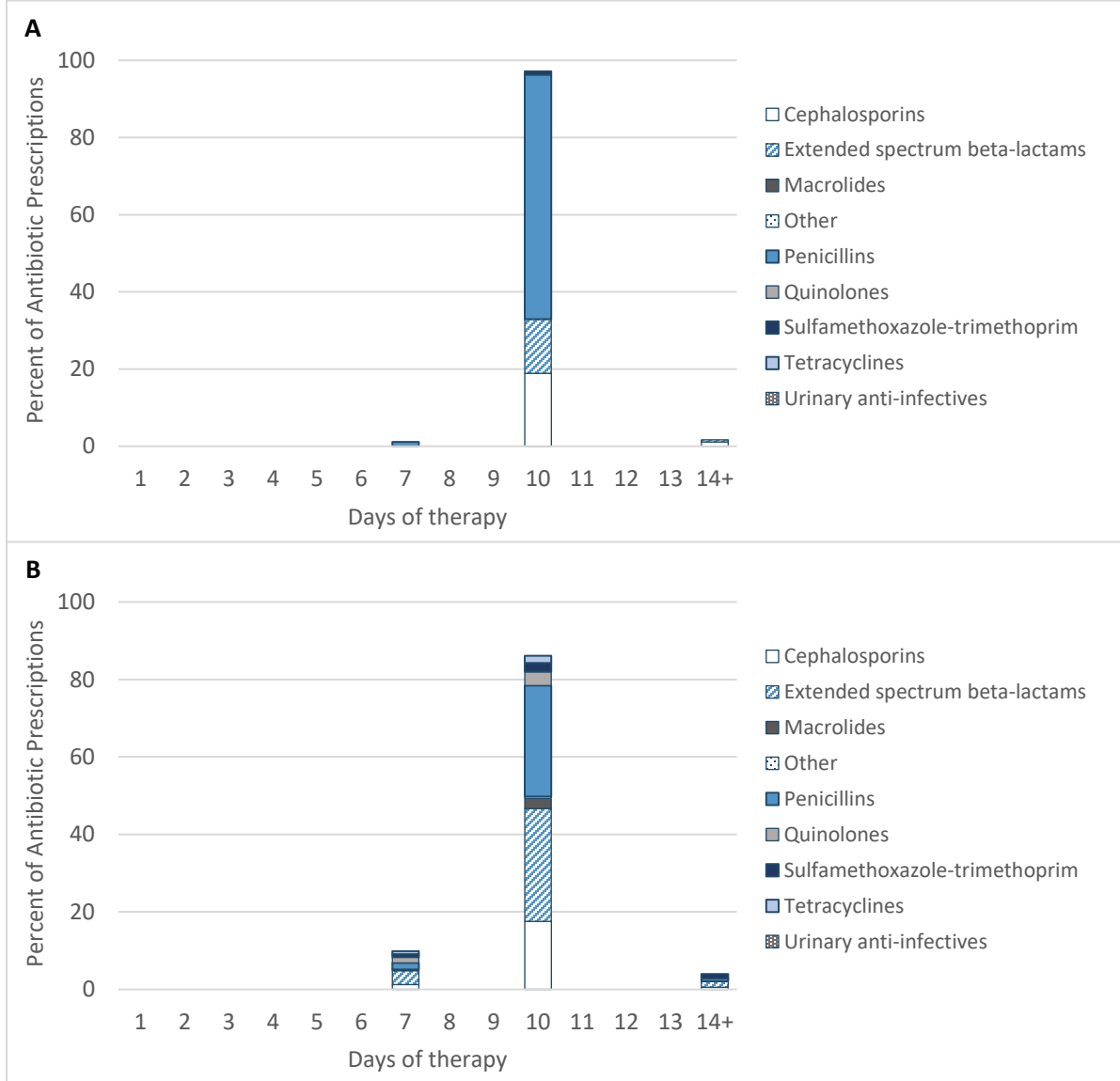
^C Based on recommendation for nitrofurantoin.

^D Penicillin class prescriptions grouped with beta-lactam agents for estimation of potentially excessive days of therapy.

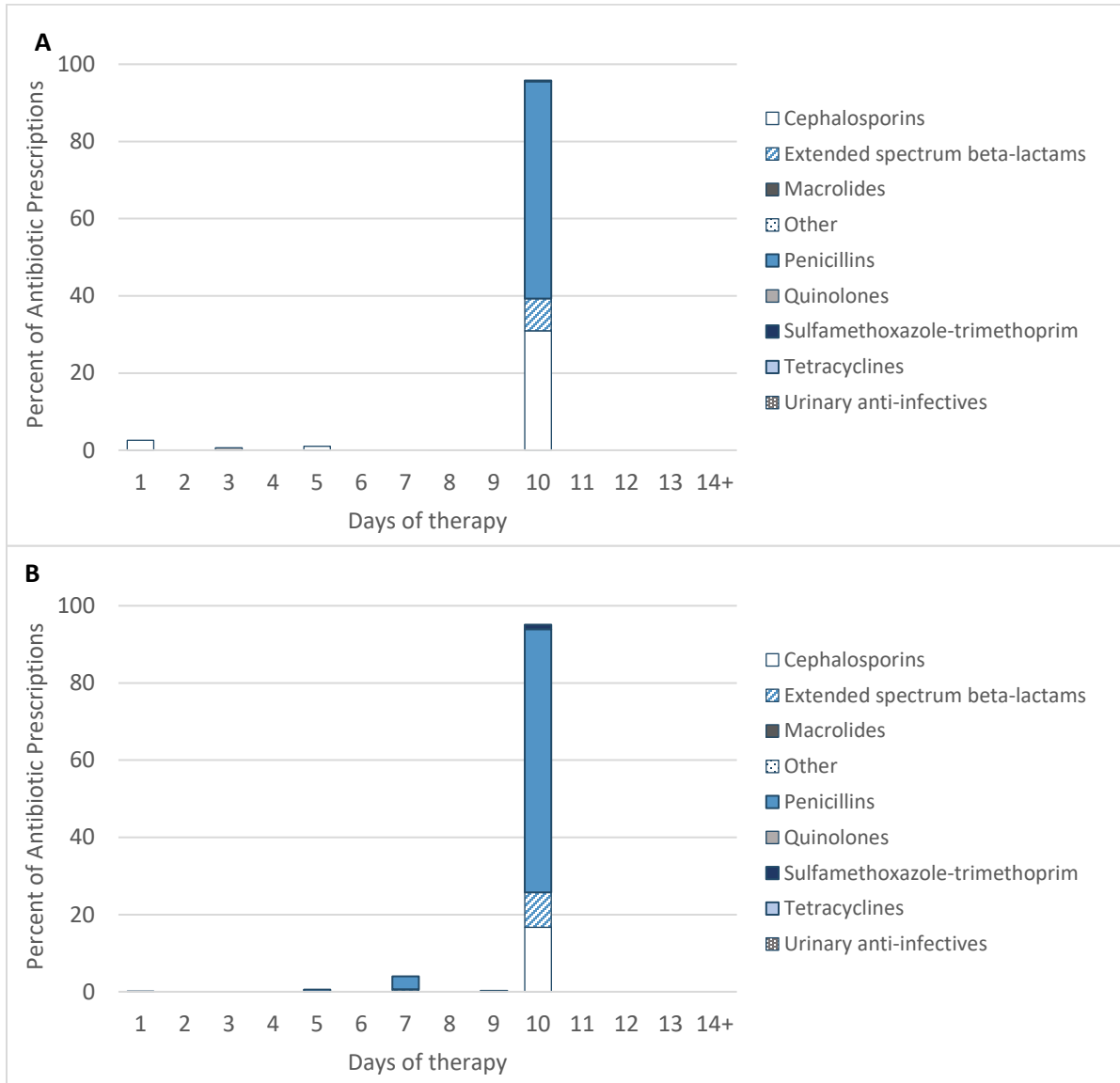
Supplemental Figure 1. Duration of antibiotic therapy by antibiotic category for pharyngitis in A) Children (<18 years) and B) Adults (≥18 years), IQVIA National Disease and Therapeutic Index (NDTI) 2017



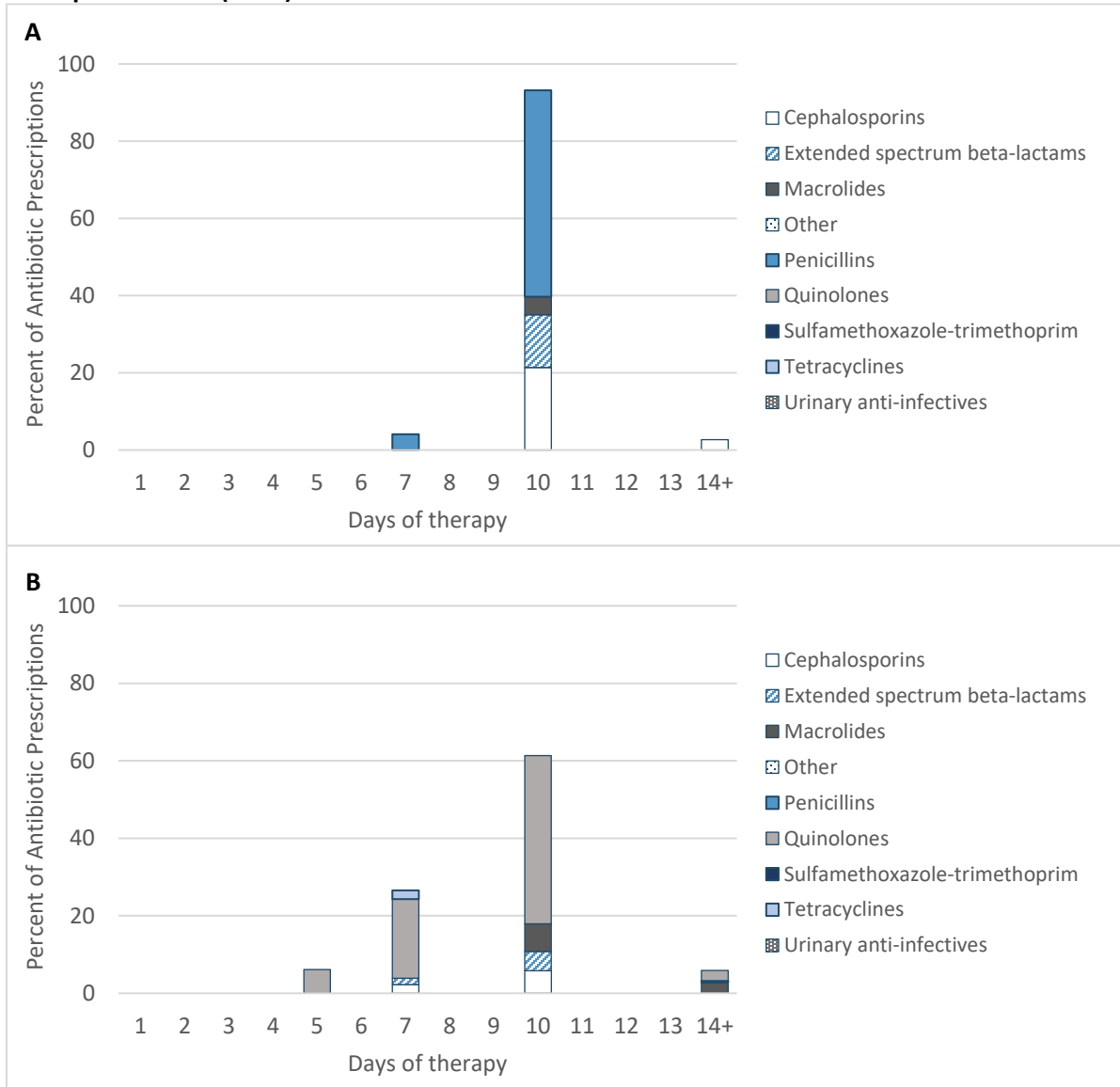
Supplemental Figure 2. Duration of antibiotic therapy by antibiotic category for sinusitis in A) Children (<18 years) and B) Adults (≥18 years), IQVIA National Disease and Therapeutic Index (NDTI) 2017



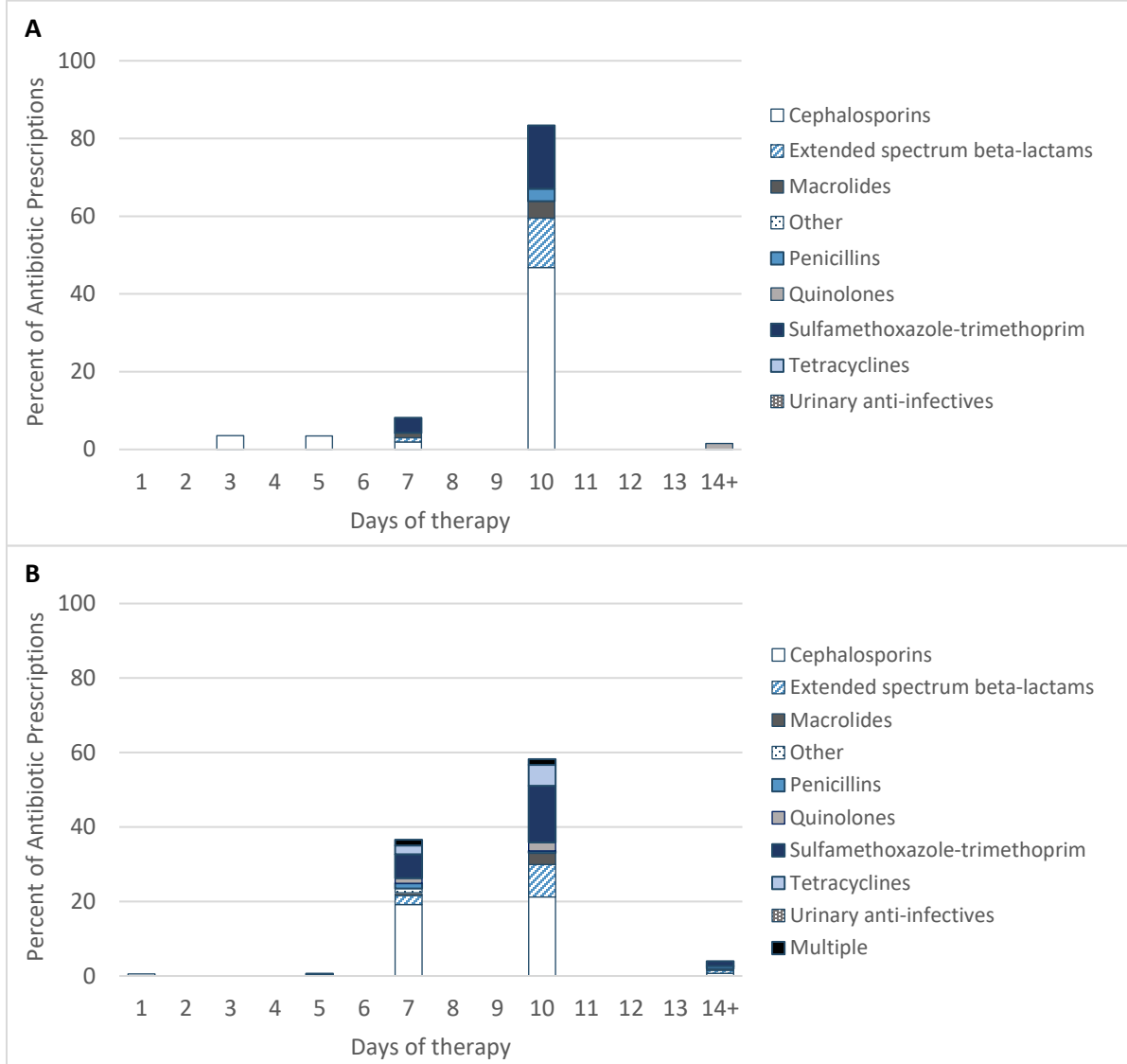
Supplemental Figure 3. Duration of antibiotic therapy by antibiotic category for acute otitis media (AOM) in A) Children (<2 years) and B) Children (2-18 years), IQVIA National Disease and Therapeutic Index (NDTI) 2017



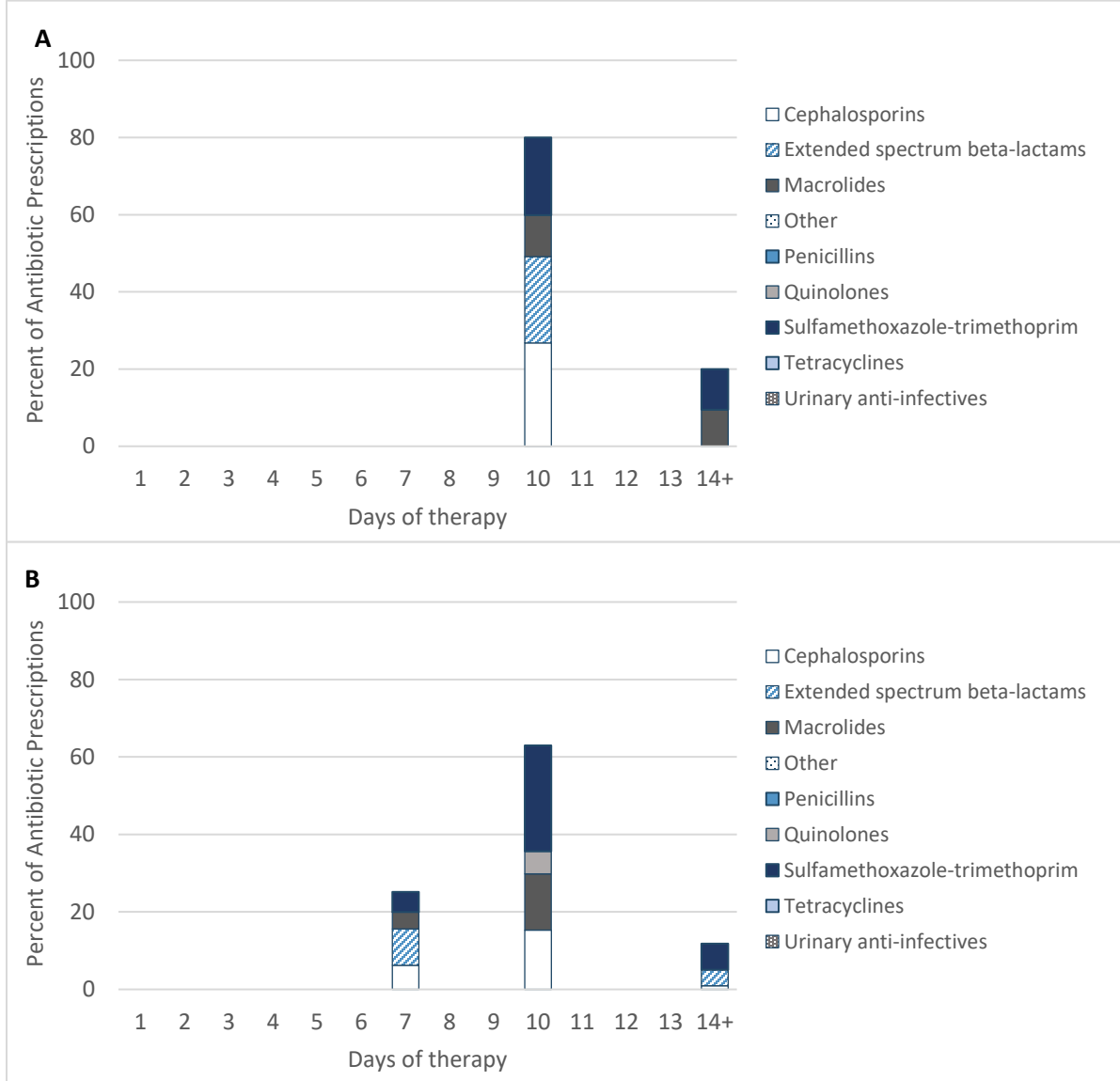
Supplemental Figure 4. Duration of antibiotic therapy by antibiotic category for community acquired pneumonia (CAP) in A) Children (<18 years) and B) Adults (≥18 years), IQVIA National Disease and Therapeutic Index (NDTI) 2017



Supplemental Figure 5. Duration of antibiotic therapy by antibiotic category for cellulitis in A) Children (<18 years) and B) Adults (≥18 years), IQVIA National Disease and Therapeutic Index (NDTI) 2017



Supplemental Figure 6. Duration of antibiotic therapy by antibiotic category for abscess in A) Children (<18 years) and B) Adults (≥18 years), IQVIA National Disease and Therapeutic Index (NDTI) 2017



Supplemental Figure 7. Duration of antibiotic therapy by antibiotic category for acute cystitis in non-pregnant females, 12-64 years, IQVIA National Disease and Therapeutic Index (NDTI) 2017

