

Factors associated with antimicrobial-resistant *Campylobacter* species infections in humans: A scoping review

Christine M. Neustaedter^{a,b,c}, Kelsey Robertson^{a,b,c}, Dana Tschirter^{a,b,c,d}, Richard J. Reid-Smith^{c,d,e}, Melissa C. MacKinnon^d, Carolee A. Carson^{c,d}, Colleen P. Murphy^{c,d}, Brennan Chapman^{d,e}, Simon J. G. Otto^{a,b,c,f}

BACKGROUND

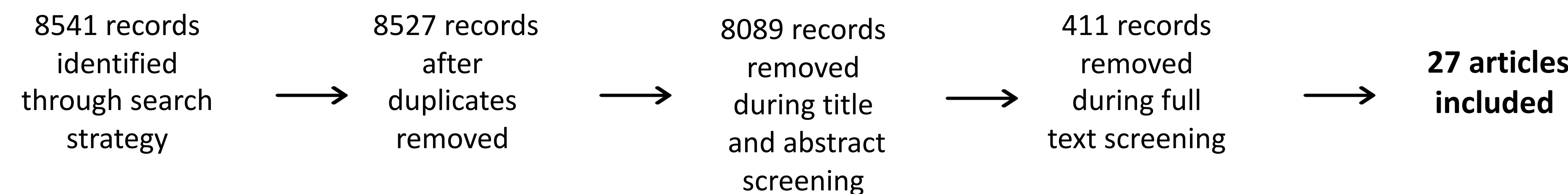
- Antimicrobial resistance (AMR) is a global public health concern and AMR may transmit to humans through the food chain.¹
- Human infection with antimicrobial resistant strains of *Campylobacter* may result in an increased risk of an adverse health event.^{2,3}
- Longer duration of illness
- Hospitalization, invasive illness or death
- Humans may be exposed to resistant *Campylobacter* from food, but to date, there is no systematic or scoping review of factors associated with infection with an antimicrobial-resistant strain.

SEARCH AND SCREENING

- Databases searched: ProQuest[®] AGRICOLA, CAB Abstracts[®] and Global Health[®], Ovid EMBASE[®], Scopus[®], Ovid MEDLINE[®] + 3 Grey literature sources
- Key search themes included: *Campylobacter*, antimicrobials, and antimicrobial resistance
- Screening by two independent reviewers
- The search was completed on February 5, 2020 and updated on May 7, 2021

Inclusion	Exclusion
Analytical study, available in English	Review articles, commentaries, opinion pieces, editorials, newspaper articles, book chapters, conference proceedings
Human <i>Campylobacter</i> infection confirmed by laboratory methods	Non-human research, infections other than <i>Campylobacter</i> , colonization, infection not confirmed by laboratory methods
Human exposure to factors potentially associated with infection with <i>Campylobacter</i> strain resistant to an antimicrobial of interest: macrolides, tetracyclines, quinolones, or fluoroquinolones	<i>Campylobacter</i> strain resistant to alternative antimicrobials
Comparator group appropriate for study design (E.g. for case-control studies comparator group = infections with strains of <i>Campylobacter</i> susceptible to antimicrobials of interest)	

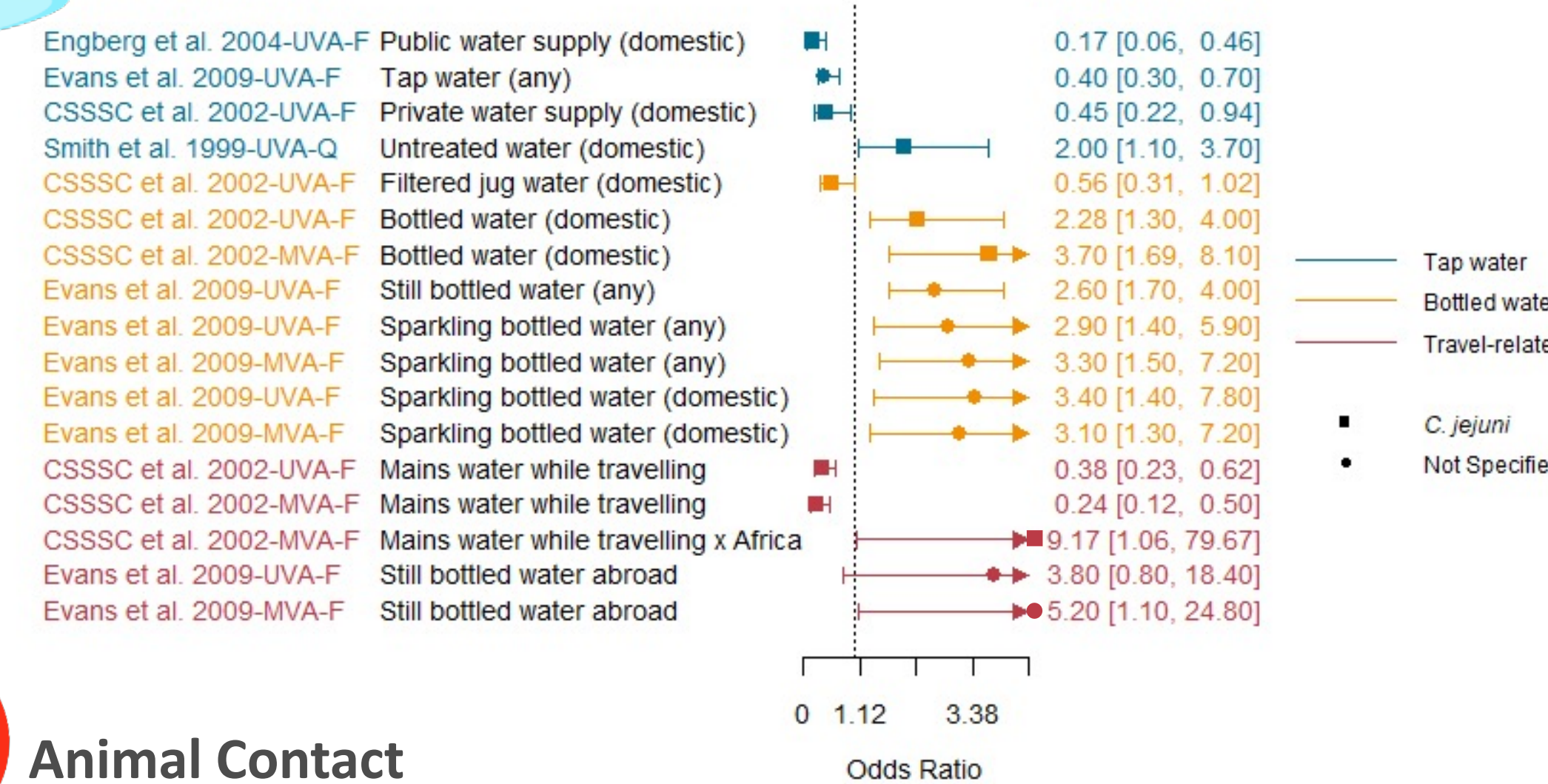
RESULTS & IMPLICATIONS



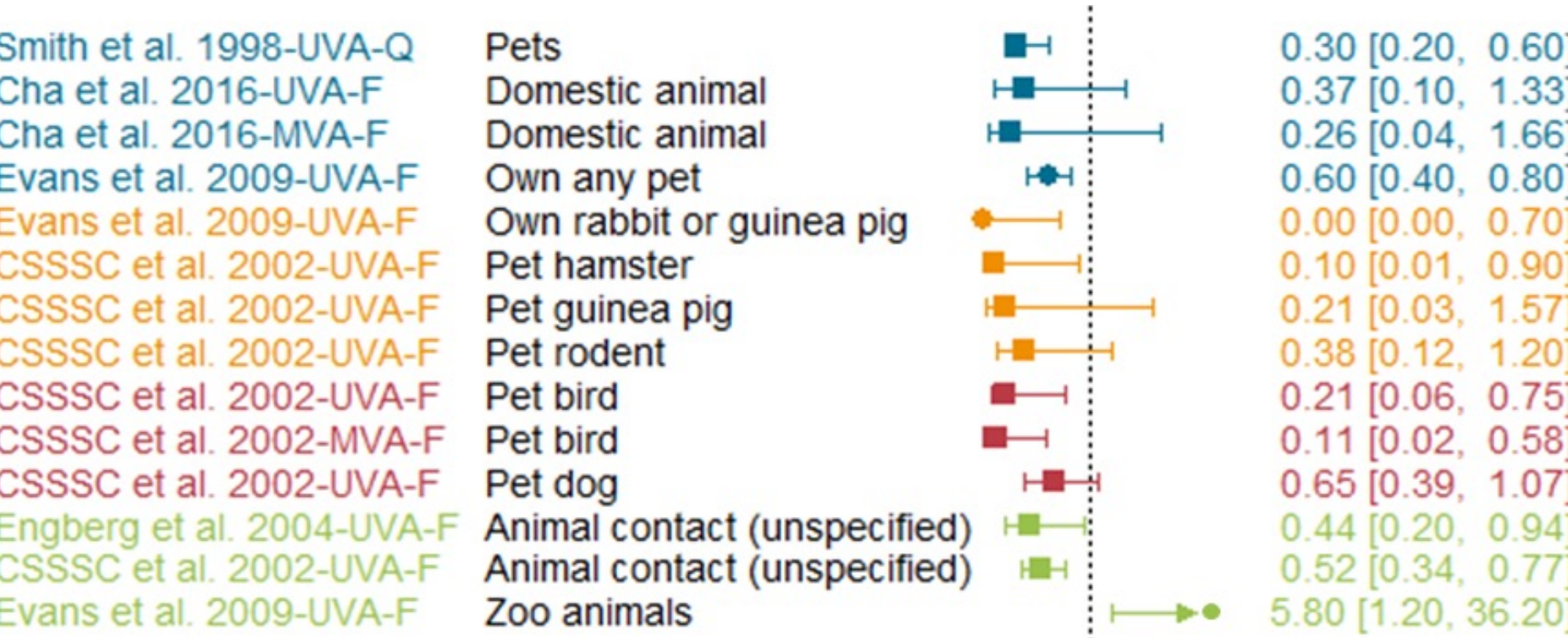
- Factors were categorized into (1) animal contact, (2) prior antimicrobial use, (3) participant characteristics, (4) food consumption and handling, (5) travel, (6) underlying health conditions, and (7) water consumption/exposure.
- Factors linked to **increased likelihood of infection** with a fluoroquinolone-resistant strain included **foreign travel** and **prior antimicrobial**.
- Most of the studies were conducted in a small number of **high-income, westernized countries**.
- Heterogeneity of the results and factor definitions provided a **broad overview**.
- Future research using an **interdisciplinary, One Health approach** is needed to prioritize important risk factors.

Drinking Water

Reference and Factor

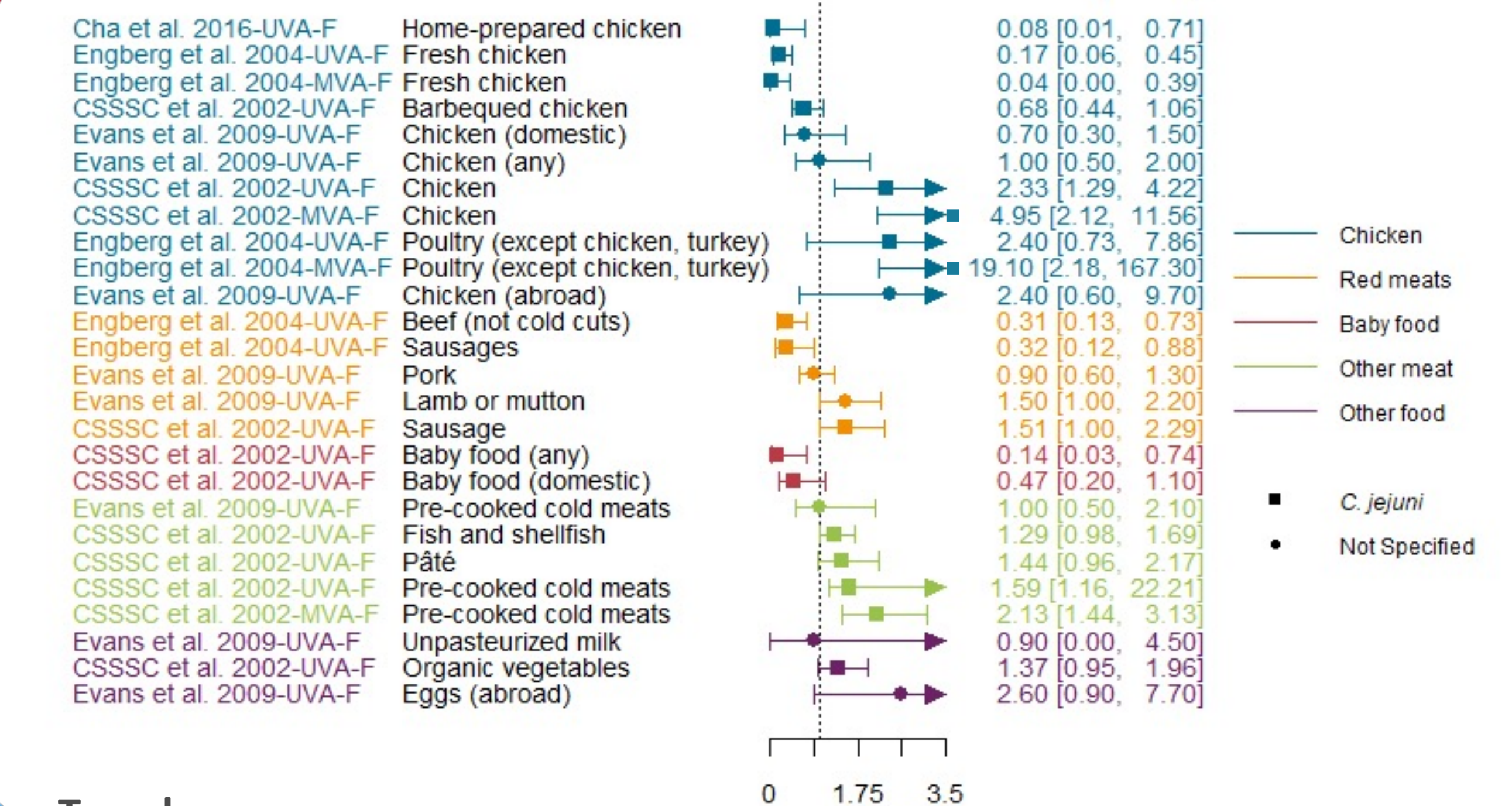


Animal Contact

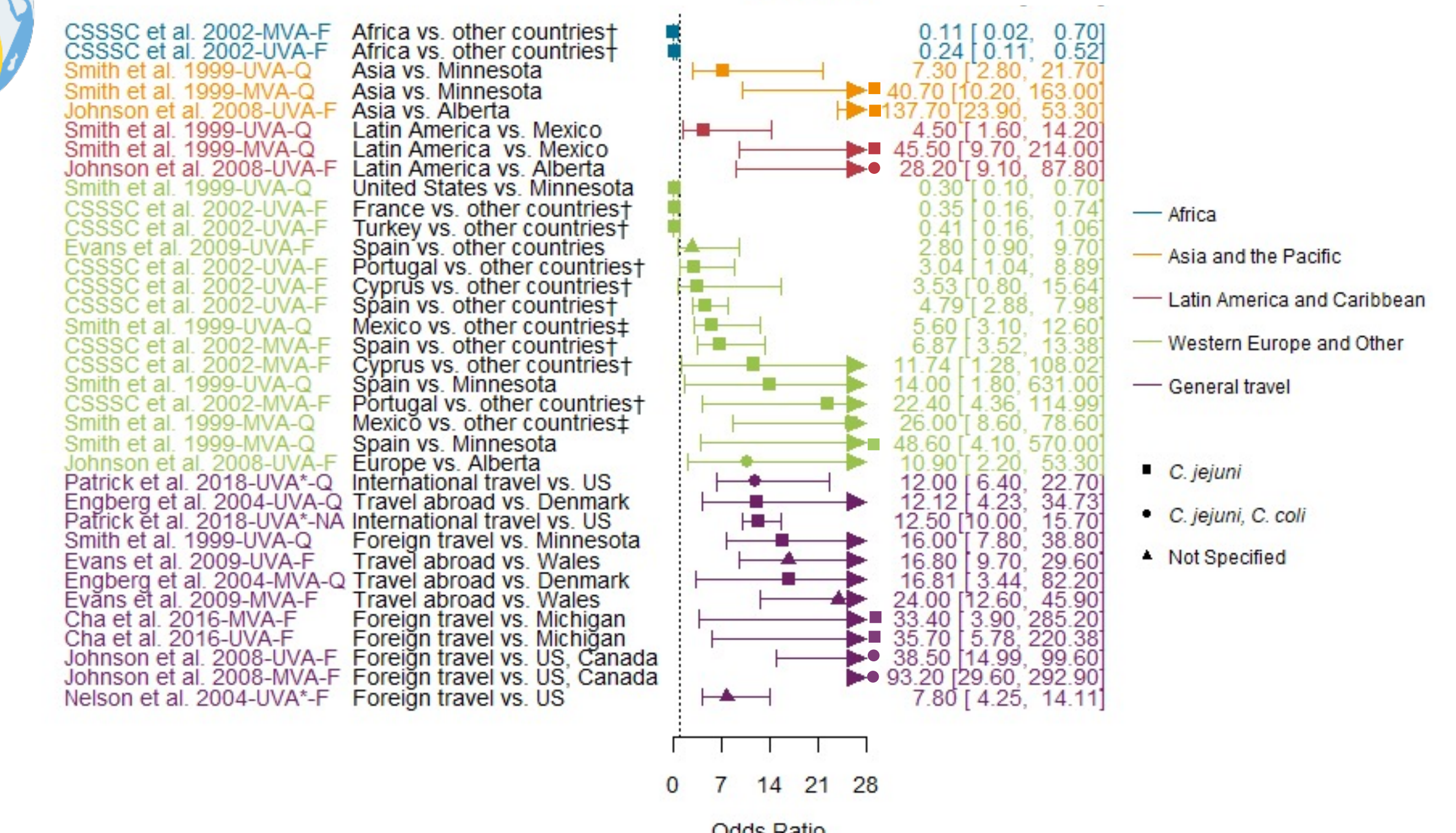


Food Consumption

Reference and Factor



Travel



Prior Antimicrobial Use

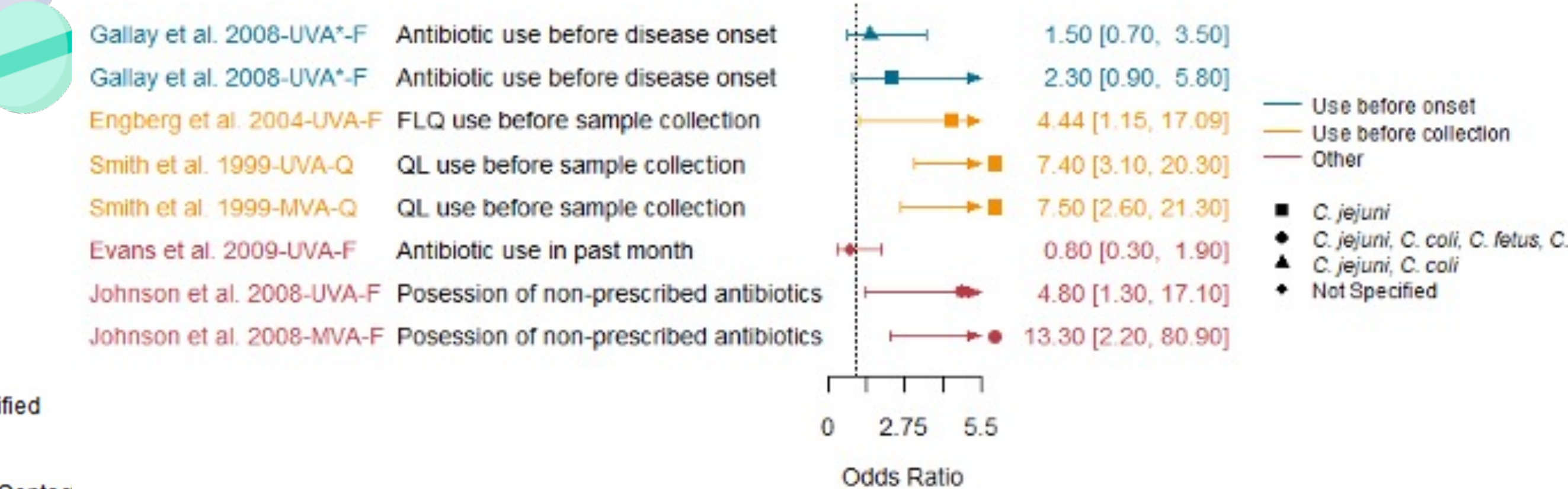


Figure Legend: UVA – univariable analysis result. MVA – multivariable analysis result. F – fluoroquinolone resistant outcome. Q – quinolone resistant outcome.

RESEARCH QUESTION

What factors are associated with an antimicrobial-resistant (AMR) *Campylobacter* infection in humans?

METHODS

- Systematic Scoping review - protocol followed Joanna Briggs Institute & PRISMA guidelines.⁴
- Protocol developed *a priori* and registered