Unlocking insights into medication utilization patterns in Nepalese healthcare: a meta-analysis and systematic review using WHO prescribing indicators

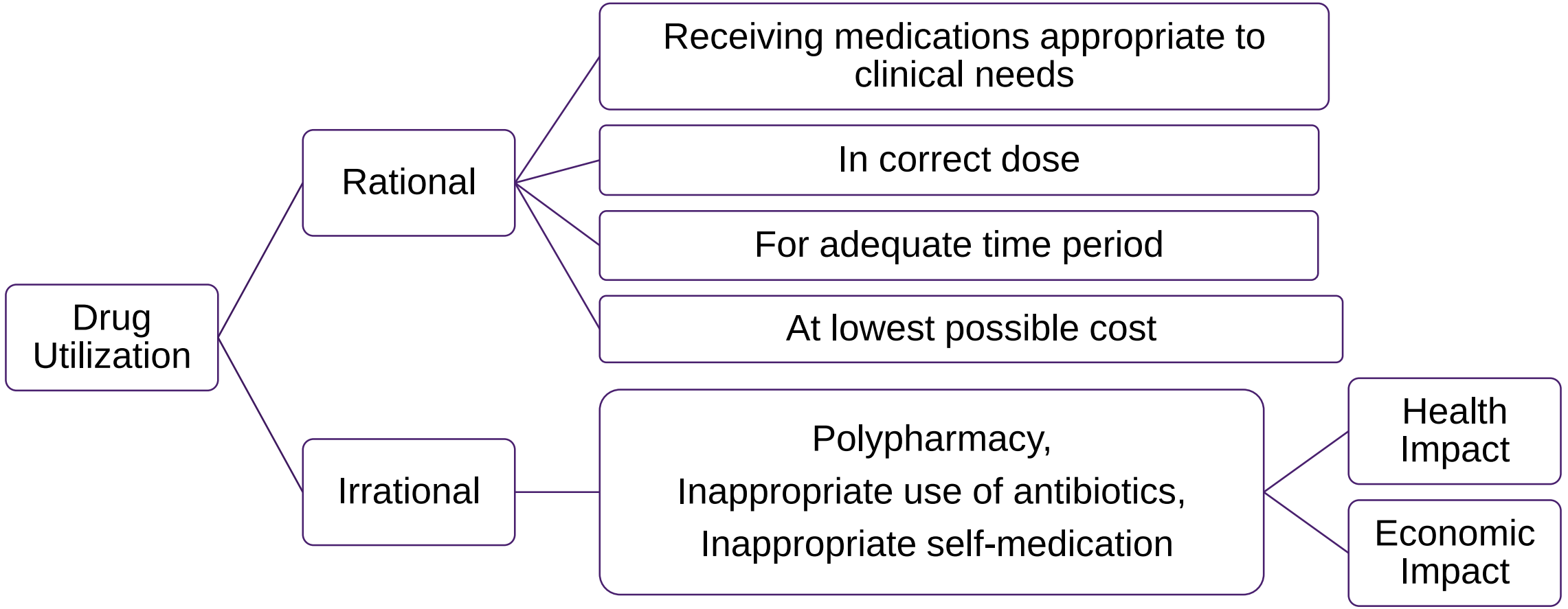
Rohit Agrawal, *Purbanchal University, Nepal*

Rajeev Shrestha, *Newcastle University, United Kingdom*

Dr Ramesh Sharma Poudel, *INF Nepal Green Pastures Hospital and Rehabilitation Centre, Nepal*

Dr Shakti Shrestha, *School of Pharmacy, The University of Queensland, Australia*

Background


Drug Utilization
Rational
Receiving medications appropriate to clinical needs
In correct dose
For adequate time period
At lowest possible cost
Irrational
Polypharmacy,
Inappropriate use of antibiotics,
Inappropriate self-medication
Health Impact
Economic Impact

Background contd..

WHO Core prescribing indicators

- Highly standardized, widely accepted
- Benchmarks for evaluating rationality and quality of prescriptions
- Includes:
  - Average number of drugs prescribed per encounter
  - Percentage of drugs prescribed by generic name
  - Percentage of drugs prescribed from essential drug list (WHO or National)
  - Percentage of encounters with antibiotics prescribed
  - Percentage of encounter with injections prescribed

Background contd..

Rational

- Limited studies have reported the drug utilisation pattern
- Studies reported variable patterns of drug utilisation across the countries
- Lack of systematic synthesis of literature has been performed to provide the drug utilisation pattern in Nepal using WHO core prescribing indicators

Aim

- To quantitatively summarize the published studies assessing drug utilization across various healthcare settings in Nepal using at least one WHO core prescribing indicator

Methods

Study Retrieval

- Databases: Pubmed, Embase, CINAHL, INRUD bibliography, NepJOl, NepMed, Google Scholar
- Keywords, MeSH terms, Embase subject headings

Inclusion criteria

- Observational, interventional or mixed studies
- Assessing drug utilization in healthcare facilities of Nepal
- Reporting at least one WHO prescribing indicator

Exclusion criteria

- Studies not specifying total number of patient encounters
- Studies using only number of prescriptions as a sampling unit

Methods contd..

Data extraction

- Using pre-specified form
- For interventional studies: only baseline data
- For studies with multiple settings: separate data
- Extracted data
  - Study characteristics (title, journal, year of publication)
  - Methods (design, study population, setting, sample size)
  - Outcome (WHO core prescribing indicators)

Critical appraisal of studies

- 14-point scoring system; incorporates WHO recommendations on investing drug use in health facilities
- Study quality classified as high (≥70%), moderate (69-51%) and low (≤50%)

Methods contd..

Data analysis

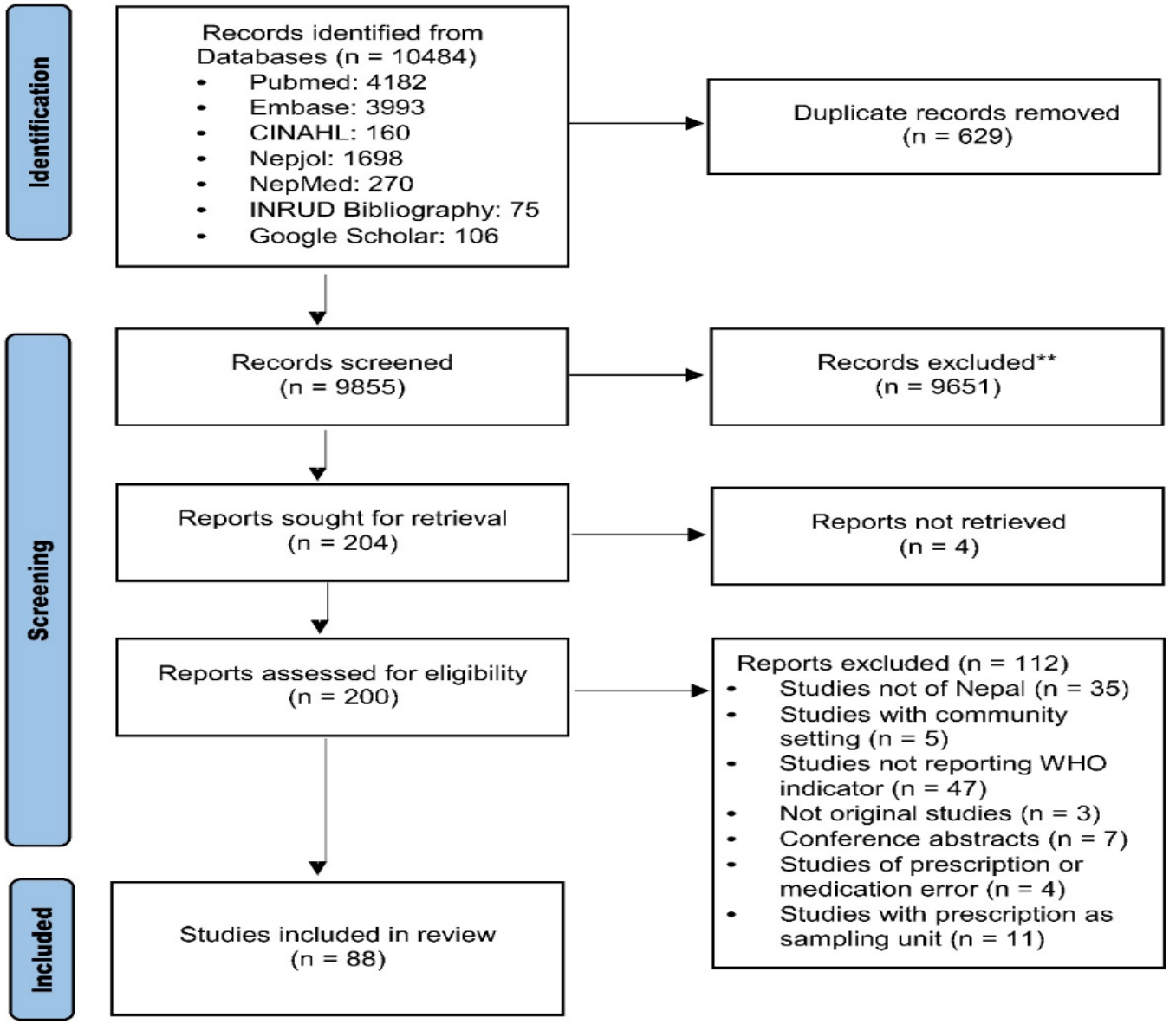
- Unit of analysis: Study setting
- Data point: measurement of a specific medicine use indicator at a specified time for specified provider in specific setting
- Outcome variables
    1. Average number of drug per encounter
    2. Percentage of drugs prescribed by generic name
    3. Percentage of encounter with antibiotics prescribed (PEAP)
    4. Percentage of encounter with injections prescribed (PEIP)
    5. Percentage of drug from WHO EML
    6. Percentage of drugs from Nepal EML
- Median and 95% confidence interval for outcome 1

Methods contd..

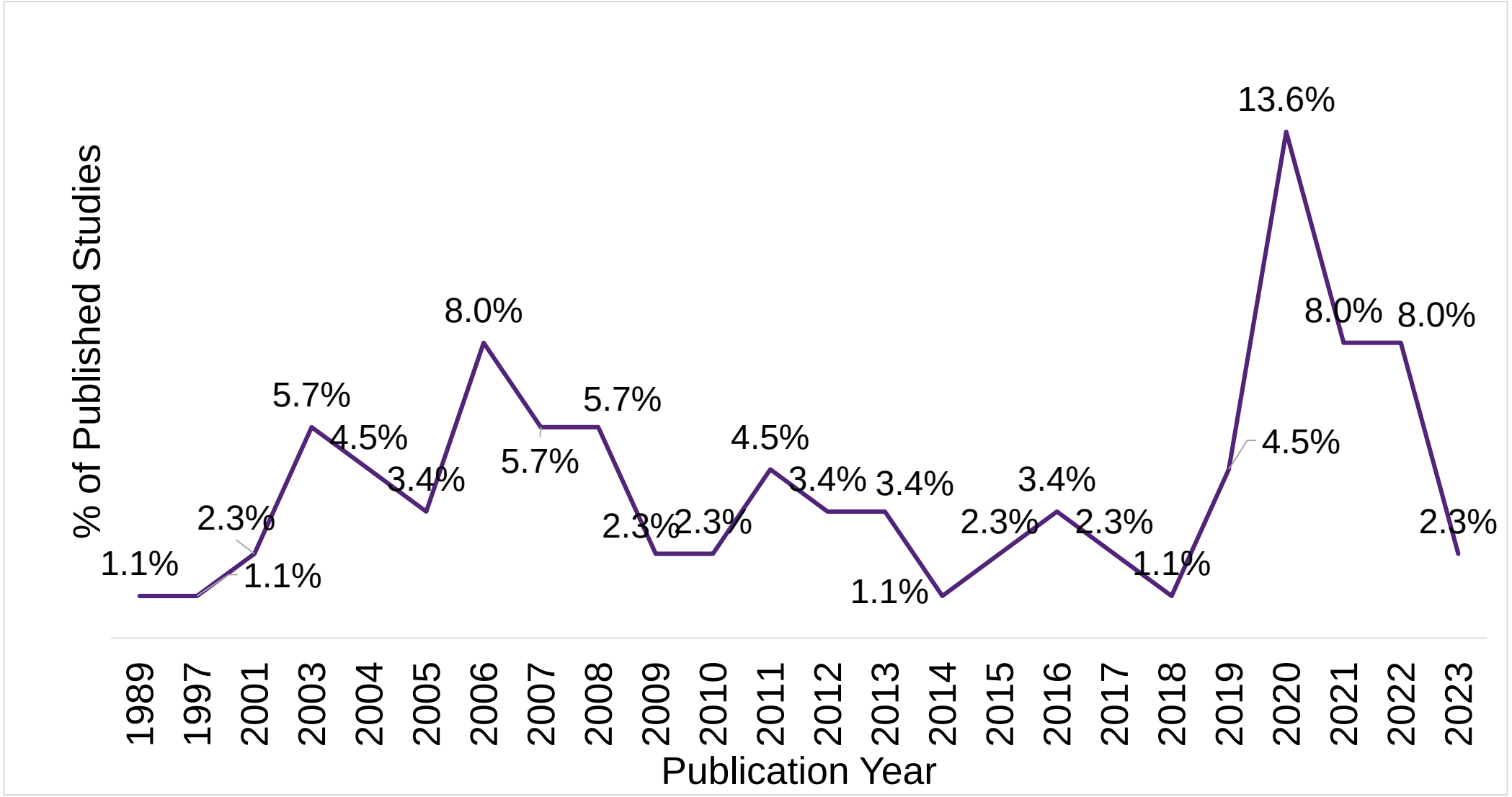
- Proportional meta-analysis
  - For outcome 2 through 6
  - Random effect model with DerSimonian and Laird estimator
  - Heterogeneity: Cochran's Q test and I^2 statistic
  - Publication bias: Funnel plot, Egger's regression test
  - Sub-analysis variables
    - Health care facility characteristics (Level, administration)
    - Prescription period, study quality
    - Drug categories studied, disease categories studied
- Sub-set meta-analysis: Studies not targeting a specific drug or drug class or a specific disease condition
- Software: IBM SPSS , R version 4.3.2

Results

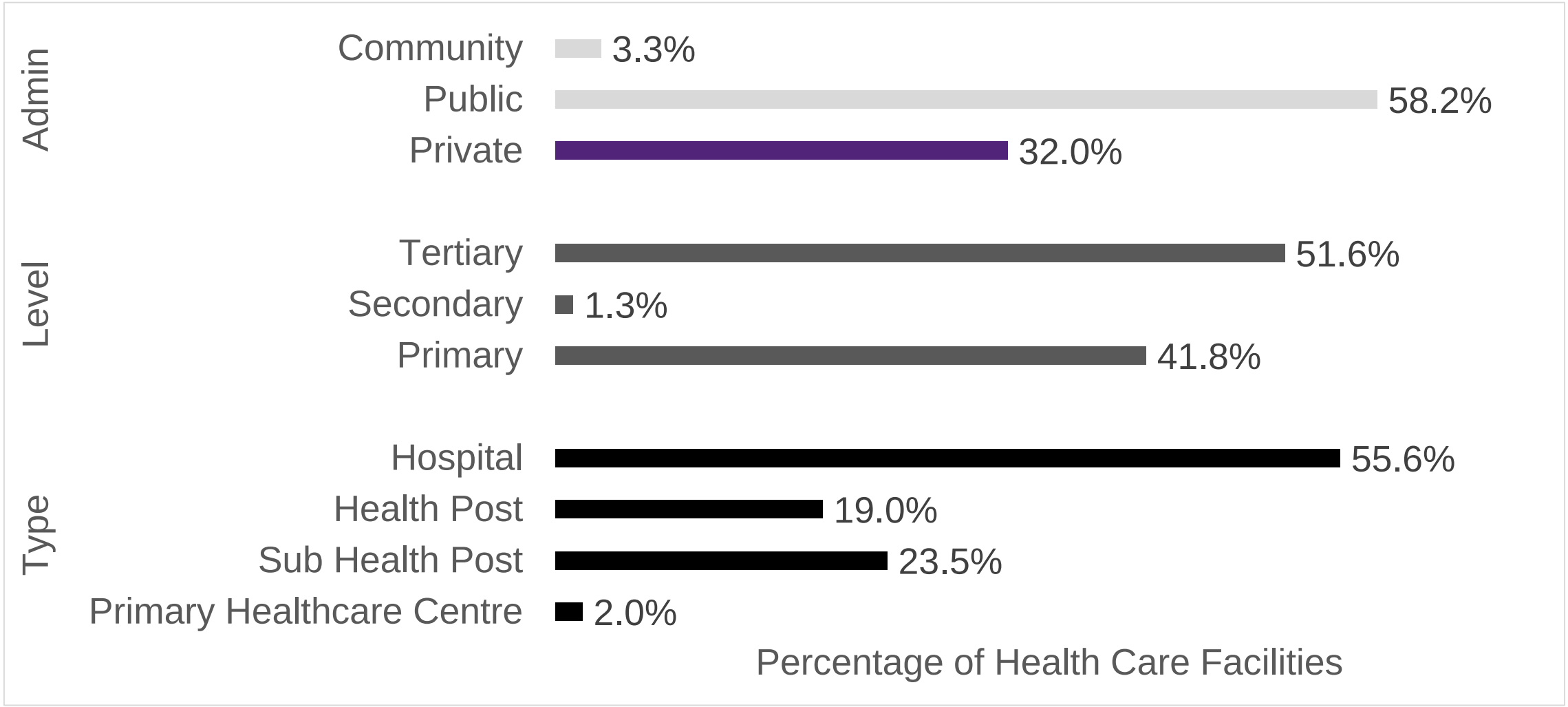
Studies identified and retrieval



Trends of drug utilization studies of Nepal (n=88)



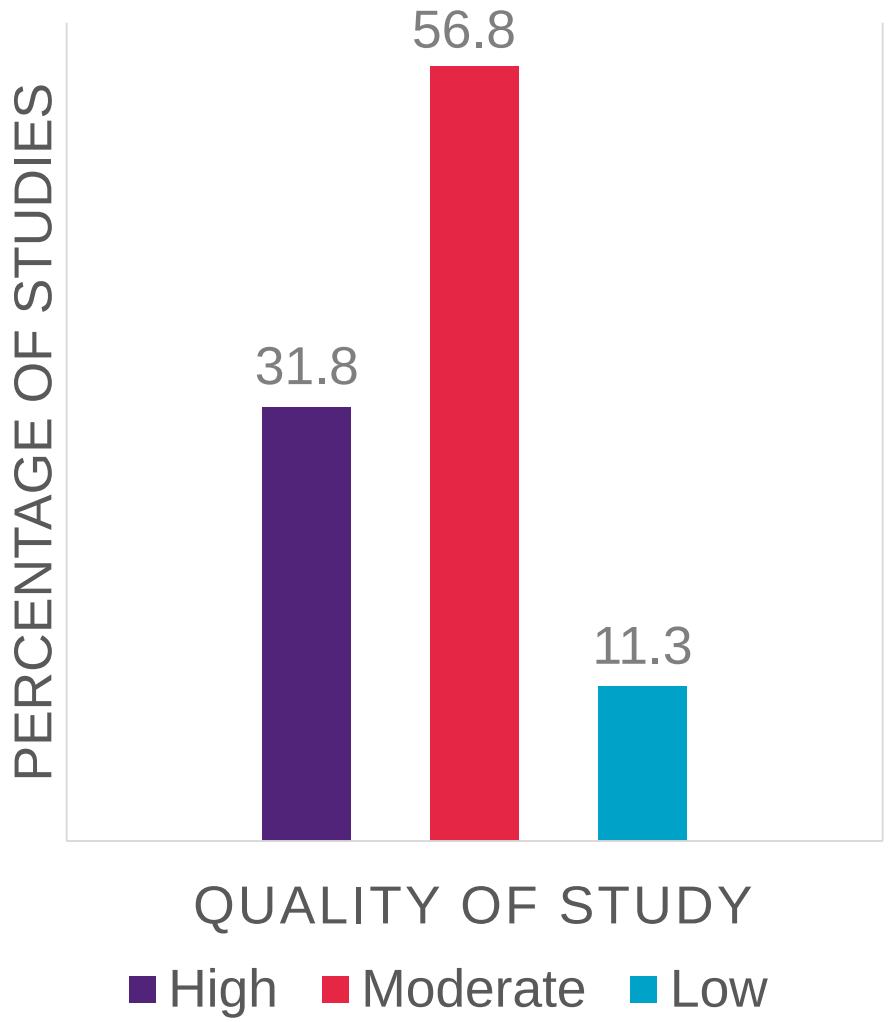
Type, level and administration of health care facilities (n=153)



Critical appraisal of included studies

Major non-compliance criteria

- Adequate sample size (minimum of 600 encounters)
- Describing how medicine were counted
- Defining medicine to be regarded as antibiotic
- Defining medicine to be regarded as injection
- Describing how missing data were handled

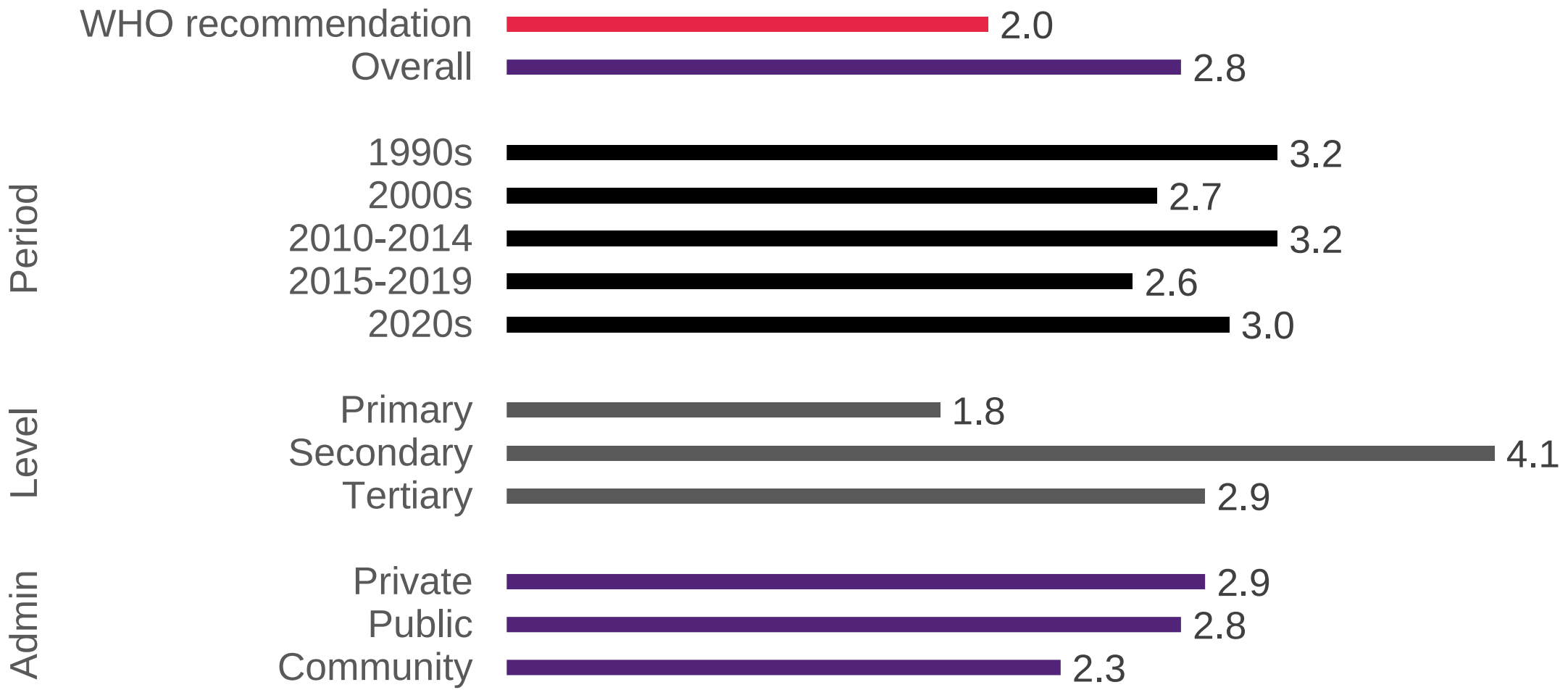


Quantitative synthesis

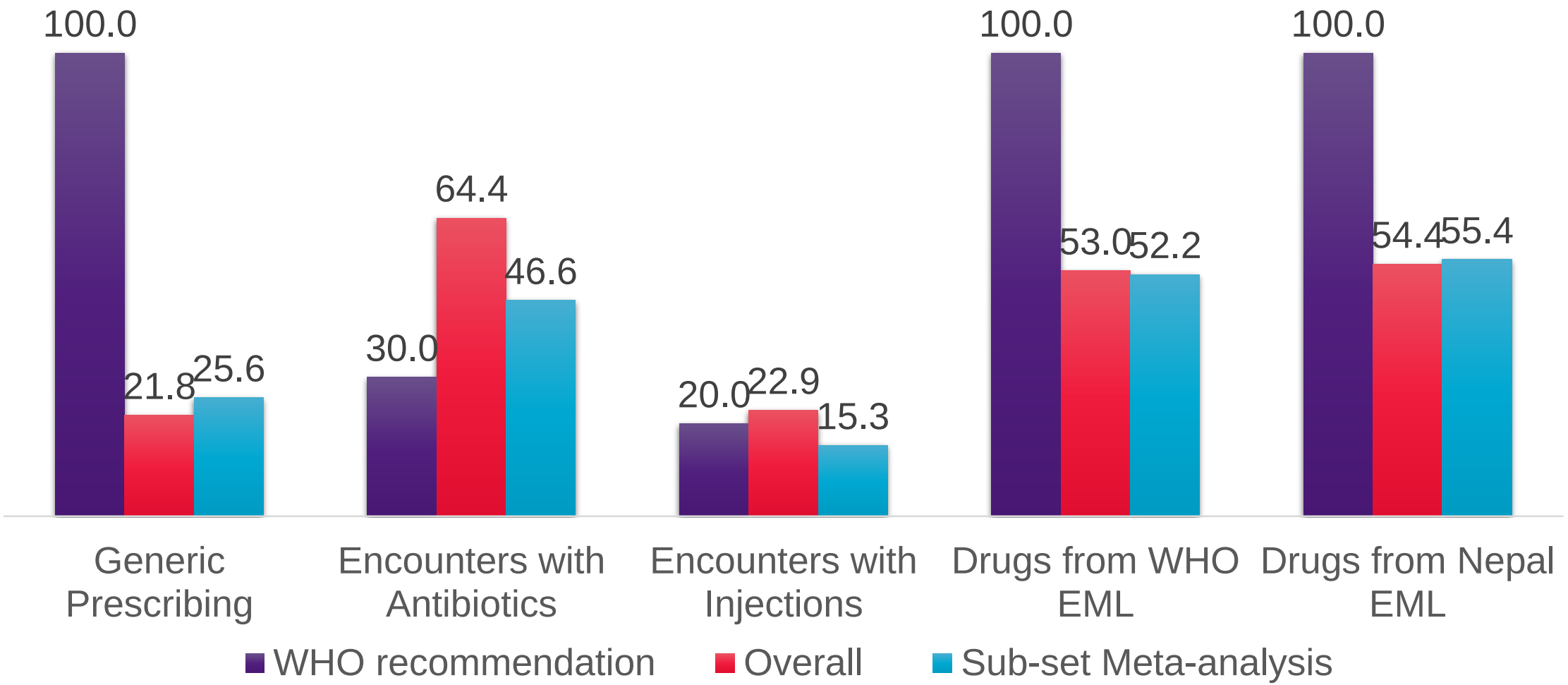
This review obtained 283 separate data points from the 88 studies for the six WHO drug use indicators, which assessed a total of 2,108 healthcare facilities and 60,191 patient encounters.

- Average no of drugs per encounter: 43069 patient encounters
- Percentage of drugs prescribed in generic name: 26196 encounters
- Percentage of encounters with antibiotic prescribed: 37032 encounters
- Percentage of encounters with injection prescribed: 17287 encounters
- Percentage of drugs prescribed from WHO EML: 11070 encounters
- Percentage of drugs prescribed from Nepal EML: 19597 encounters

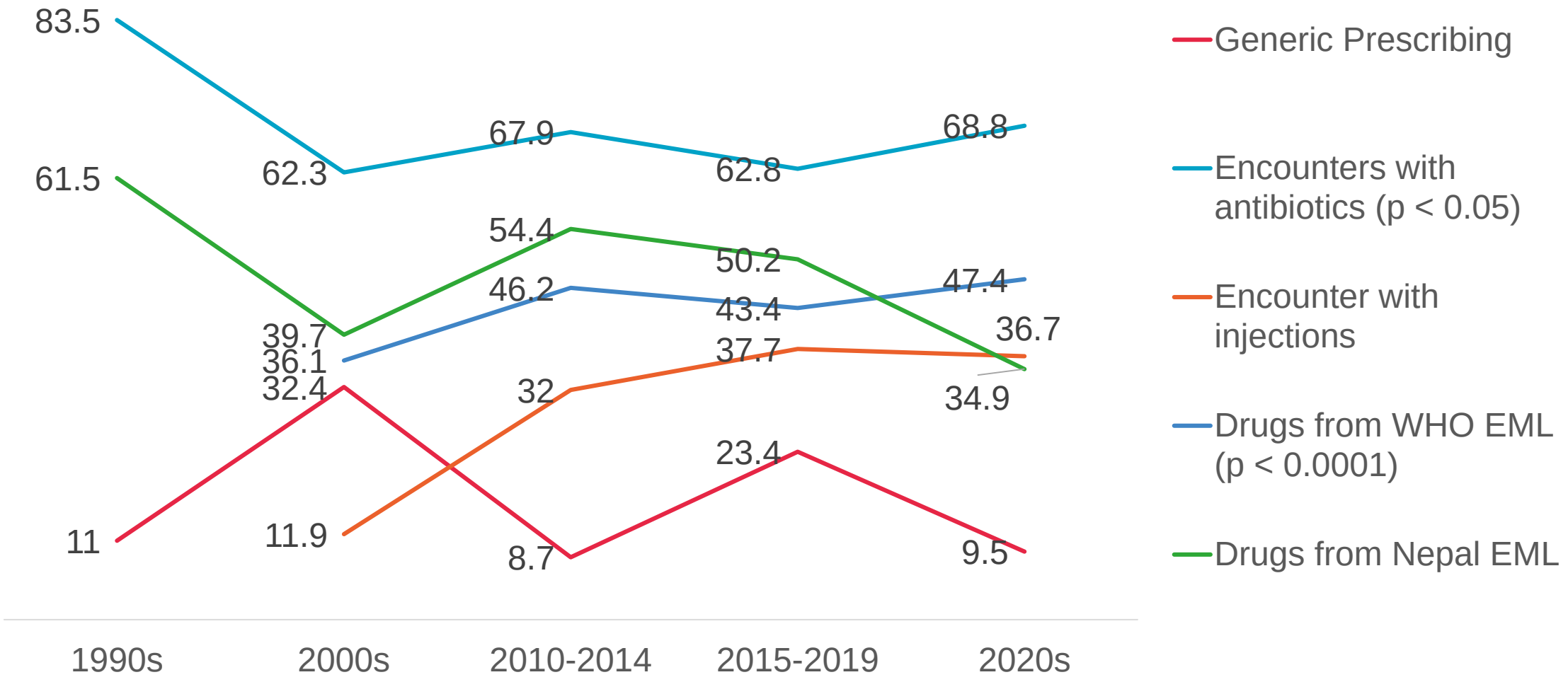
Average number of drugs prescribed per encounter (Median)



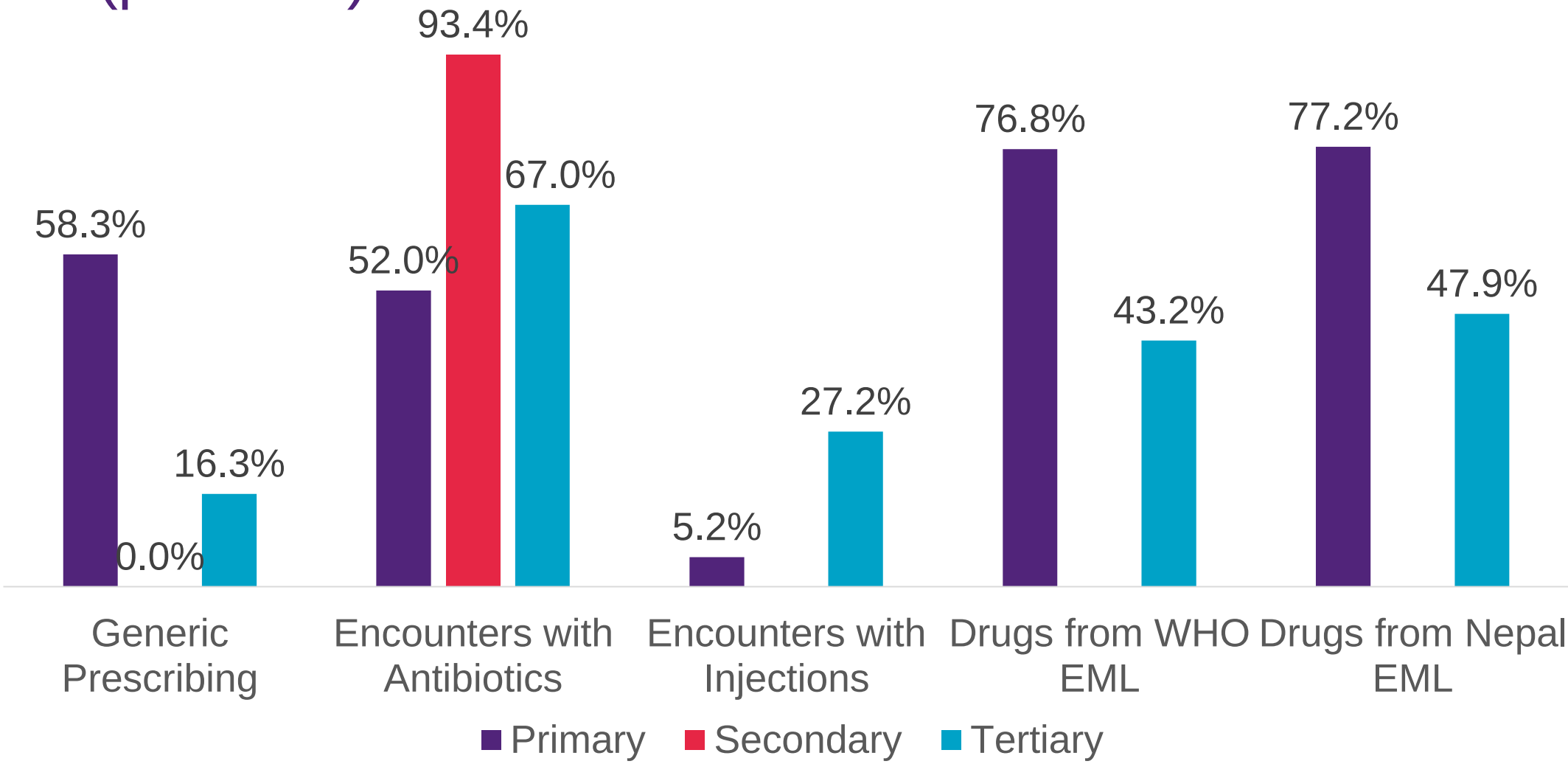
Pooled percentage of WHO core prescribing indicators



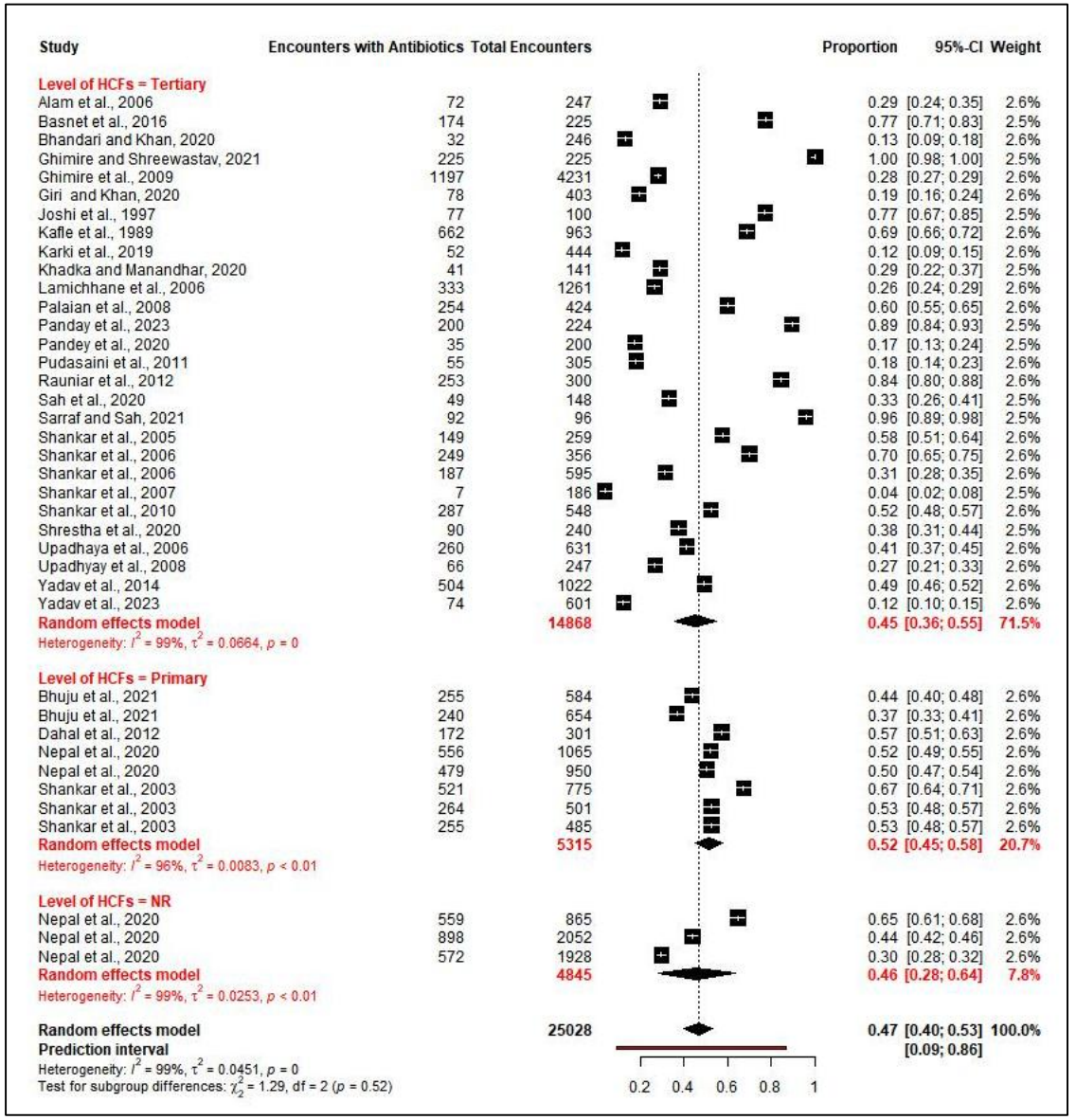
Trend of WHO core prescribing indicators



WHO core prescribing indicators among different Level of HCFs (p < 0.05)

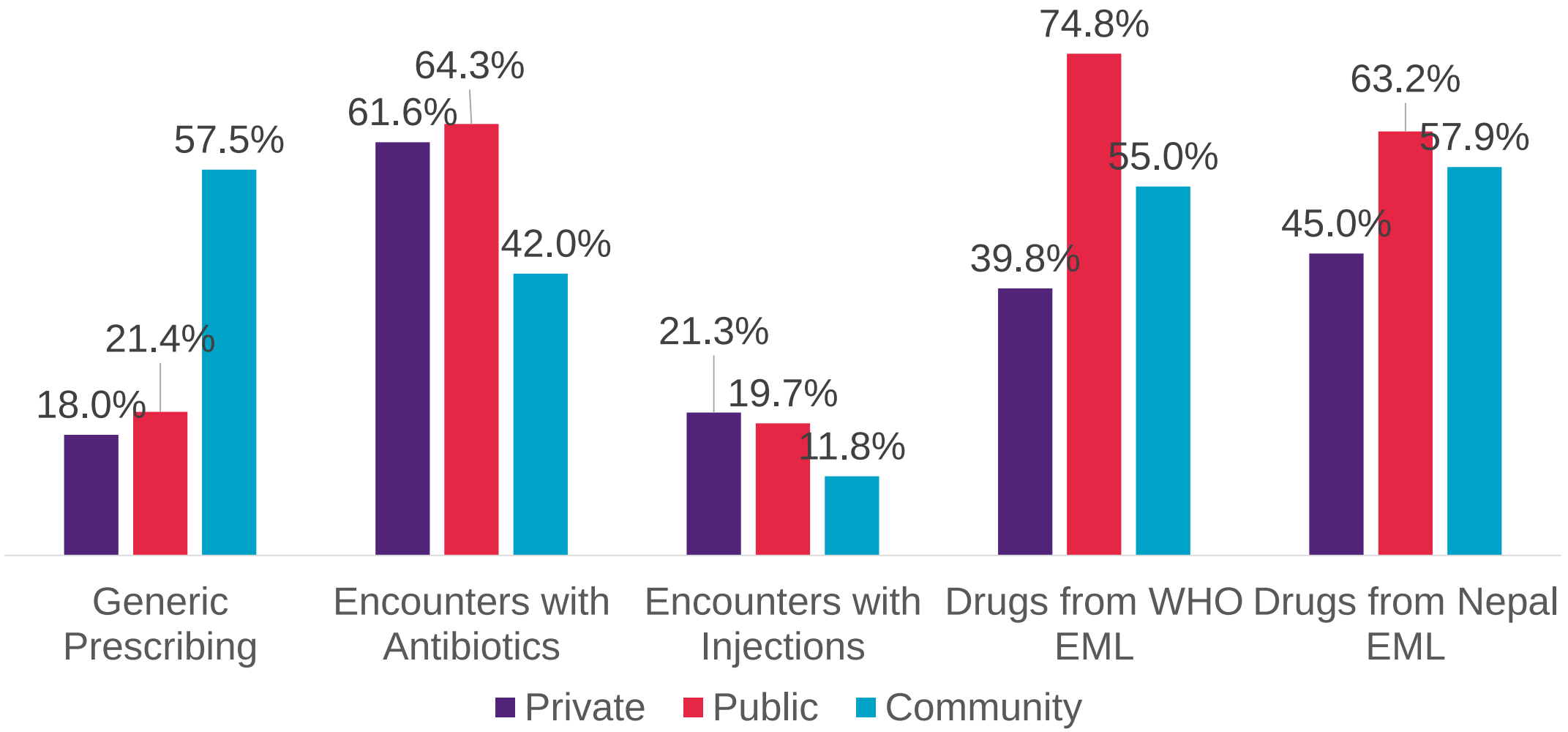


Forest Plot – Encounter with antibiotics X Level of health care facilities (subset meta-analysis)

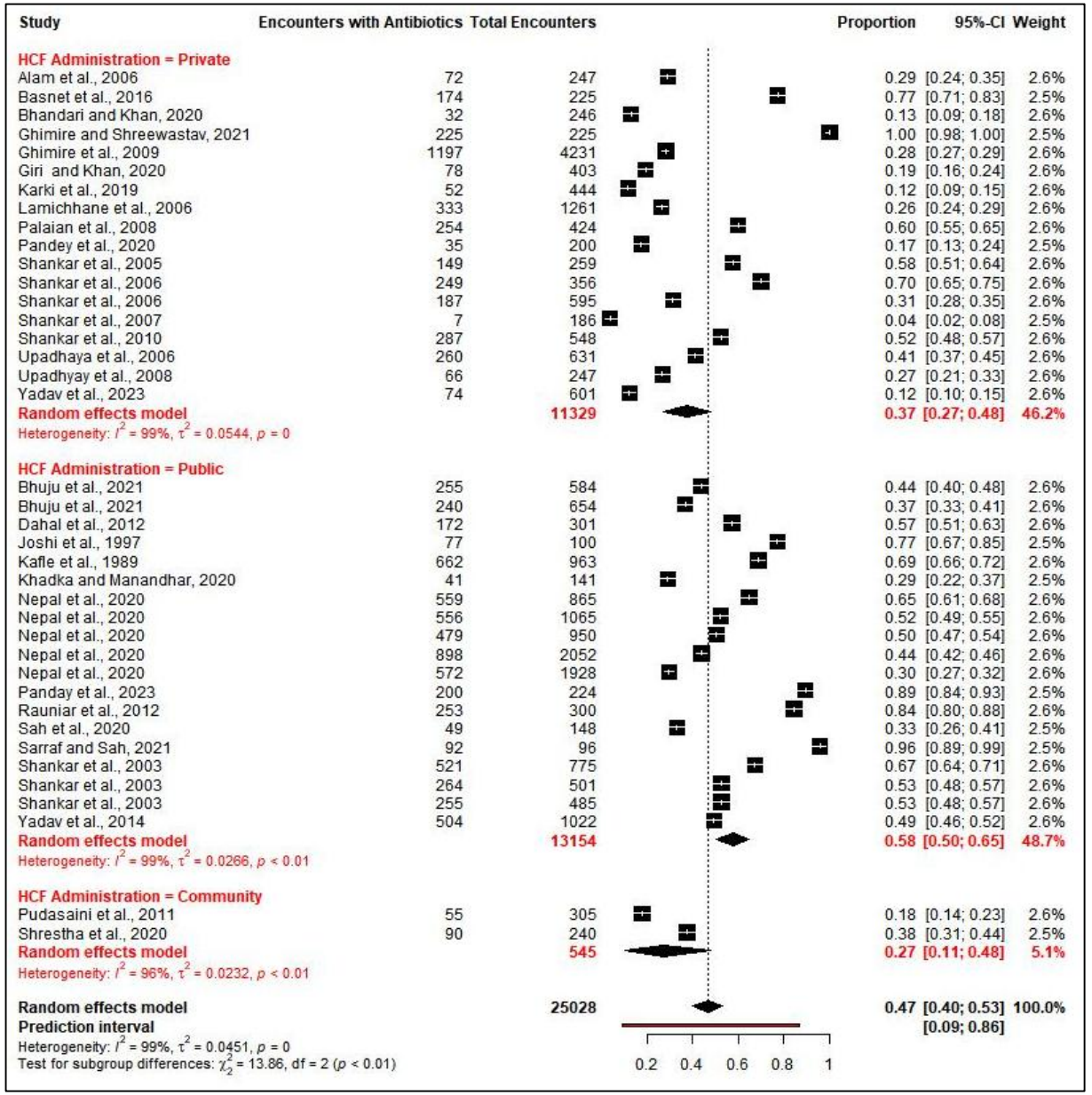


- Subset meta-analysis showed lower PEAP in tertiary compared to primary
- Contrast to original meta-analysis

WHO core prescribing indicators among HCFs administration (p < 0.05)



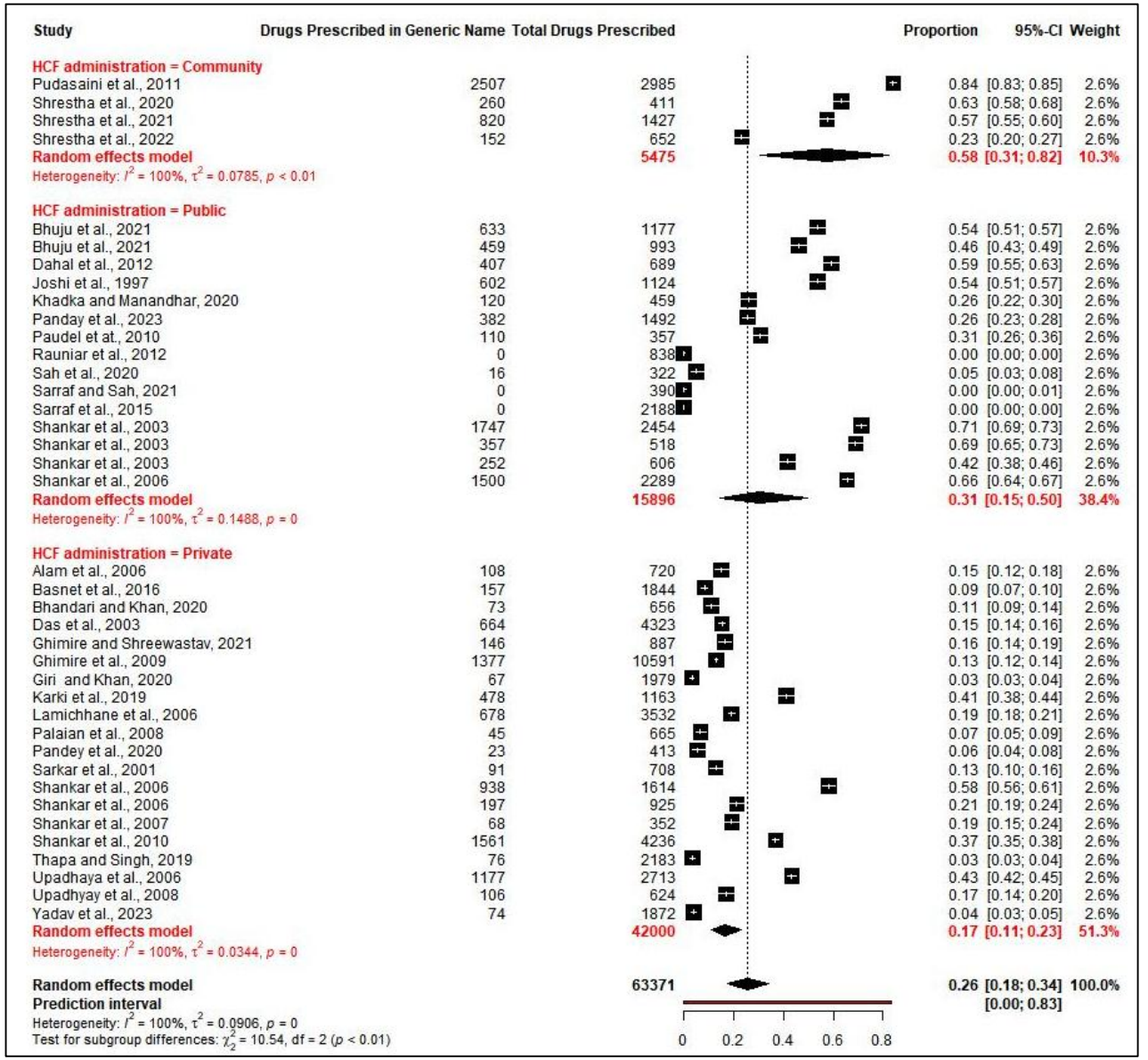
Forest Plot – Encounter with antibiotics X Administration of health care facilities (subset meta-analysis)



Significantly (p <0.01) larger difference of percentage encounter with antibiotic between public and private healthcare facilities; 1.5 times higher in public

Forest Plot – Generic Prescribing X Administration of health care facilities (subset meta-analysis)

Significantly (p <0.01) larger difference of percentage of drugs prescribed in generic name between public and private healthcare facilities; 2 times higher in public



Key findings

- Irrational prescribing practices were identified based on WHO core prescribing indicators.
- Overuse of antibiotics (potential antimicrobial resistance risk).
- Under-prescription of drugs from the Essential Medicines List (EML) (limited access to essential medications).
- Minimal generic prescribing (affecting affordability and standardization).

Key recommendations

- Targeted interventions based on variations in prescribing patterns across facility locations and types.
- Education programs for prescribers to enhance rational prescribing.
- Effective implementation of a generic prescribing policy to increase accessibility and affordability.
- Regular drug utilization review and monitoring to ensure guideline adherence.
- Routine prescription auditing and intervention to optimize medication use and improve healthcare outcomes.

THANK YOU

ROHIT AGRAWAL

- B. Pharm (2018), Shree Medical and Technical College, Purbanchal University, Bharatpur, Chitwan
- Currently studying M.Pharm in Clinical Pharmacy (Final semester)
- Research Interests: Drug use, Geriatric patients, Medication related quality of life, Quality use of medications