

# Emerging treatment strategies for Impetigo in endemic and non-endemic settings: a systematic review

Garima Gahlawat, Wubshet Tesfaye, Mary Bushell, Solomon Abrha, Jackson Thomas  
University of Canberra

## Introduction

- Globally, over 162 million children experience impetigo (a highly contagious bacterial skin infection) at any given time.
- Almost half of the Aboriginal children (45%) in the northern regions of Australia suffer from impetigo at any given time.
- If left untreated, impetigo may lead to severe skin, soft tissue and bone infections, debilitating kidney and heart diseases, which collectively contribute to a 5%-10% case fatality rate.
- Impetigo is typically treated with topical antibiotics, such as mupirocin or retapamulin. In remote communities, oral (such as dicloxacillin, cephalexin, and trimethoprim-sulfamethoxazole) or intramuscular (benzathine penicillin G) antibiotics are recommended.
- The increase in antimicrobial resistance to topical mupirocin and fusidic acid has had adverse consequences for individuals and communities, necessitating the development of newer treatment alternatives or strategies to promote the judicious use of existing drugs.

## Objective

- To examine the most recent evidence (since 2011) related to newer impetigo treatment options and strategies to reduce the burden of impetigo in endemic and nonendemic settings.

## Methods

- We searched PubMed, MEDLINE via EBSCOhost, CINAHL via EBSCOhost, Web of Science, and Embase via Scopus for studies published between August 1, 2011, and February 29, 2020.
- Keywords used in the search included *impetigo* OR *skin sores* OR *school sores* OR *pyoderma* AND *treatment* OR *drug therapy* OR *staphylococc\** OR *streptococc\** and *skin and infection\**
- This systematic review included randomized controlled trials (RCTs), prospective studies, and pre-post interventional studies that assessed the effect of drugs on bullous or non bullous impetigo or the prevalence of impetigo after intervention. Mass drug administration (MDA) studies that evaluated impetigo as an outcome were also included.
- We used the revised Cochrane Risk of Bias tool for randomized trials and the National Heart, Lung, and Blood Institute for nonrandomized uncontrolled studies to assess the risk of bias.

## Limitations

- The inclusion of a small number of studies with significant heterogeneity precluded a quantitative analysis of the studies.
- Due to the limited pool of high-quality studies, it was not possible to make treatment recommendations toward clinical guidelines using the GRADE (Grading of Recommendations, Assessment, Development, and Evaluations) approach.
- The limited pool of studies is mainly attributed to the lack of development of new drugs for impetigo. Some of the included studies also had small sample sizes.

## Results & Discussion

- The search resulted in a total of 4757 titles. After removal of duplicates and studies not relevant to our objectives, 47 studies were assessed for eligibility, and 10 were included in the final data synthesis as shown in Figure 1.
- These 10 studies involved 6651 participants and reported on 9 treatments and mass drug administration strategies.
- Most clinical trials targeted non bullous impetigo or did not specify this. The risk of bias varied among the studies.

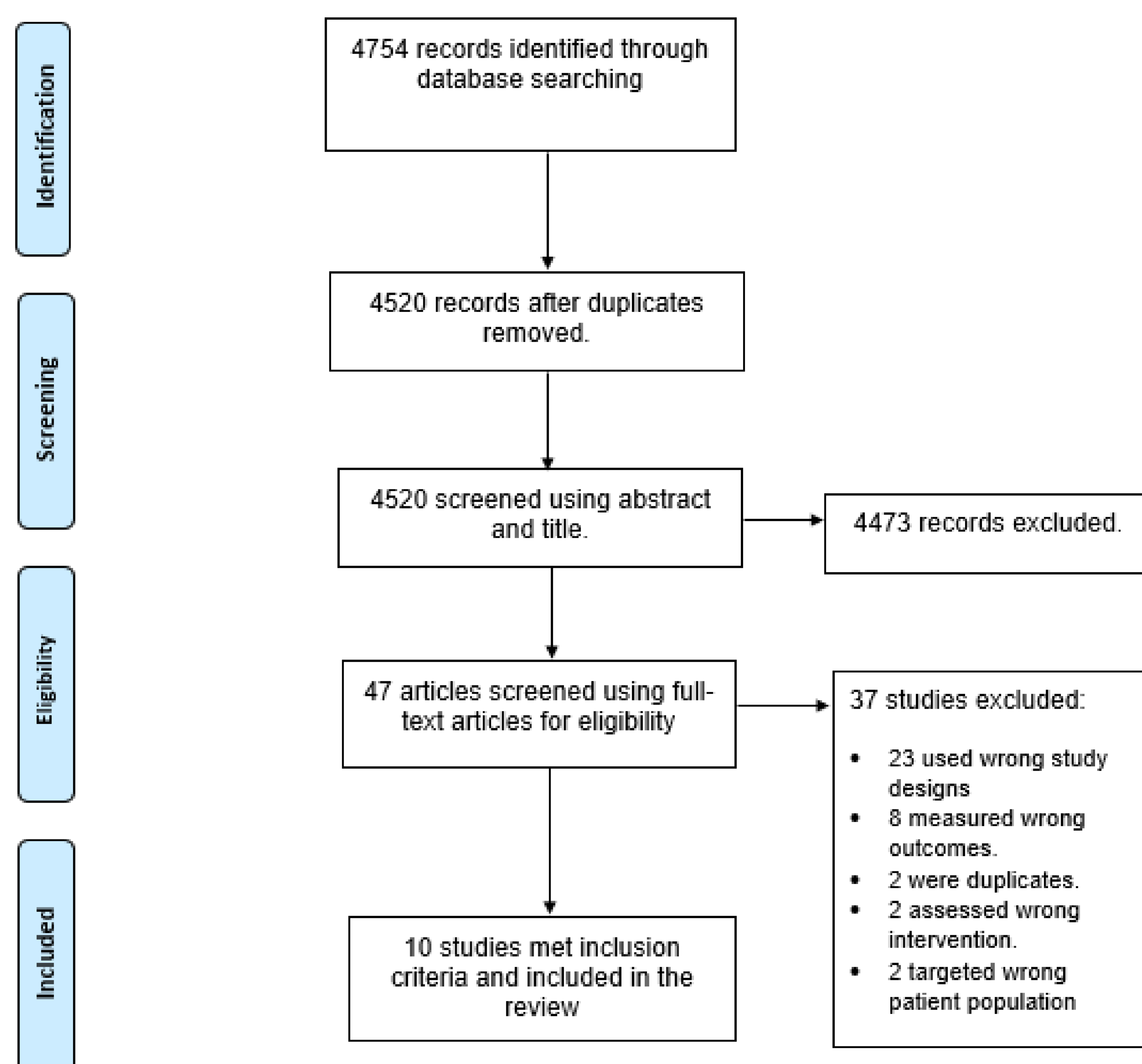


Figure 1: The Preferred Reporting for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

- In settings where impetigo is not highly prevalent, ozenoxacin 1% cream appeared to have the strongest evidence base compared with retapamulin and a new minocycline formulation.
- In endemic settings, oral co-trimoxazole and benzathine benzylpenicillin G injection were equally effective in the treatment of severe impetigo.
- Mass drug administration (MDA) interventions emerged as a promising public health strategy to reduce the prevalence of impetigo in endemic settings.

## Conclusion

- Overall, there evidence to support the use of topical ozenoxacin or retapamulin for impetigo treatment in nonendemic settings, whereas systemic antibiotics and the MDA strategy have evidence for use in settings where impetigo is highly prevalent and more severe.
- The rapid emergence of resistant bacteria across the world is endangering the clinical efficacy of antibiotics, highlighting the need for judicious use of existing antimicrobials.
- Substantial morbidity from impetigo and the resultant sequelae in endemic settings highlight the clear need for less expensive, widely available, and acceptable alternative agents and treatment strategies.
- This review calls for well-designed randomised trials on new treatments or treatment strategies to manage impetigo, particularly in settings where it has high community distribution.