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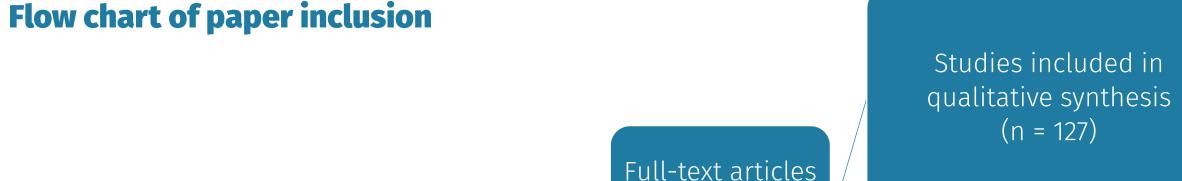
HEALTH-ECONOMIC MODELLING OF INFECTIOUS DISEASE DIAGNOSTICS: CURRENT APPROACHES AND FUTURE OPPORTUNITIES

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Background Antimicrobial resistance (AMR) is a public health threat; infections with resistant organisms are estimated to cause over 650.000 infections and over 30.000 deaths in Europe¹. AMR is associated with antibiotic consumption: appropriate prescribing of antibiotics is key in combating AMR^{2,3}. To fight this threat, it has been suggested that point-of-care diagnostics to inform antibiotics prescribing are an important tool in reducing antibiotics prescriptions.

Main objectives With the objective of knowing the state of the art on diagnostic, health-economic models, we reviewed costeffectiveness analyses (CEAs) on diagnostics for infectious disease, focusing on model types and AMR.

General conclusions of articles in two disease areas*



(n = 127) Full-text articles assessed for eligibility Population creenings (n = 218 (n = 500) Full-text (Other) no articles Records Records screened diagnostic excludec No cost strategies (n = 61) identified (n = 3538) ffectiv (n = 373)No costhrough database effectiveness analys searching analysis (n = 35) n = 206 Duplicates removed Records (n = 4638)(n = 1100) exclude n = 3186 nfectiou lisease (n = 534)* no exhaustive list of exclusion criteria is provided here

Methods

searched the literature We comprehensively through the PUBMED, Web of Science and EMBASE databases, as well as grey literature for the period 2000–2018. We included economic evaluations for diagnostic strategies for infectious disease in all geographic areas. Studies dealing with (population) screenings or disease monitoring were explicitly excluded. Data extraction was based on the CHEERS checklist⁴, using a standardized digital (Google) form, with an emphasis on model types and inclusion of AMR.

Results

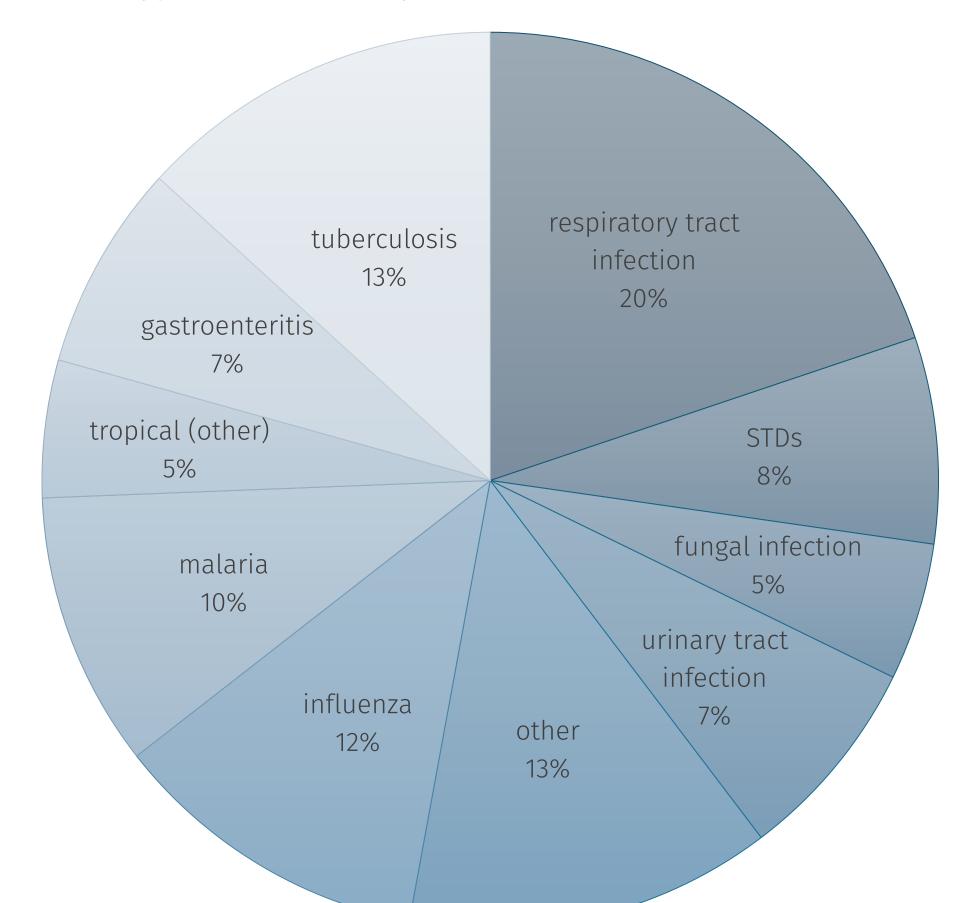
The flow diagram of included articles is shown above. Most papers are set in the primary care setting, followed by the hospital setting. A large majority of papers analyzed use a decision tree model for the calculation of qualityadjusted life years (QALYs) and costs. Often, these models use shorter time horizons, (e.g. one flu season), rather than a lifetime approach. The disease types investigated are shown in the pie chart below. Looking at the author's conclusions (see figure to the left), influenza diagnostics are not costeffective in 50% of the articles, but for respiratory infections, improved diagnostics always is cost-effective or cost-saving.



KeyMost cost-effectiveness analyses dealing with diagnosticsFindingsare for certain types of respiratory tract infections: such
as general respiratory tract infections, influenza or
tuberculosis. Sexual transmitted disease, malaria and
gastroenteritis (e.g. helicobacter infections) are also
common disease groups.

Although bacterial or viral resistance is often discussed in the included papers, it is rarely included in the analysis.

Pie chart of disease types included in systematic review



Examples of methods to include resistance are: an ICER

with prescriptions saved as an outcome; calculating the

threshold cost of resistance that would change the

Q14

Infectious disease session

November 5

conclusion of cost-effectiveness; or a point estimate of resistant pathogens.

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BibTeX file for articles included in review: https://tinyurl.com/y423k22k







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