Economic Burden of *Chlamydia trachomatis*: A Targeted Literature Review and Gap Analysis

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OBJECTIVE

This study aimed to conduct a targeted literature review (TLR) on the economic burden and quality of life (QoL) and psycho-social (PS) impact of chlamydia in USA and five major European countries (EU5) and Netherlands (NL).

BACKGROUND

- Chlamydia is the most common bacterial STI worldwide, caused by infection with *Chlamydia trachomatis.* [1]
- Age-standardized incidence rates (per 100,000 population):
  - USA: 553 (3,728 cases per 100,000 females in the 15-24 years in 2019).[1]
  - EU: 157 (985 cases per 100,000 cases in the 15-24 years in 2019). [2]
- 95% of chlamydia cases can be cured with antibiotics
  - doxycycline and azithromycin among two most prescribed. [3]
- Most infections are asymptomatic: at least 70% in women and 50% in men. [4]
- Main long-term complications of chlamydia[5]
  - Women: Pelvic inflammatory disease, scar tissues which block fallopian tubes, ectopic pregnancy, infertility,
  - Men: Prostatitis, infertility

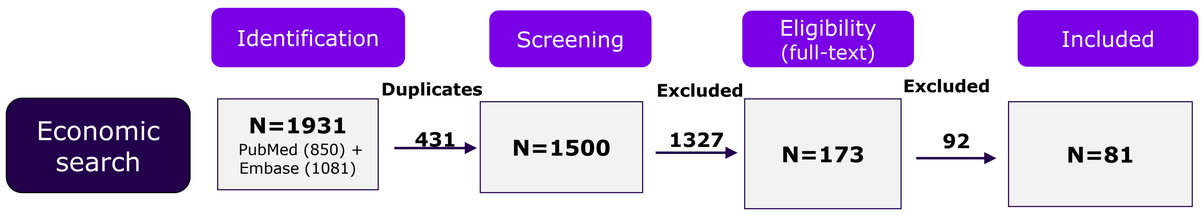
METHODS

- Two targeted search strategies for economic and humanistic burden
  - PubMed and Embase over the last 10 years
  - From Jan 1st, 2013, to Jan 2nd, 2023
  - Search strings: "chlamydia", "economics", "quality of life", "patient reported outcome (PRO) " (+ related terms for all keywords) as MeSH or Emtree terms.
  - Limits: English-written articles; US and/or EU5 + Netherlands (NL)
- Outcomes of interest
  - Economic: direct and indirect costs, productivity losses, resource use, and economic models.
  - Humanistic: QoL, PROs, utilities, and psychosocial impact.
  - Outcomes were categorized based on study design, objective and economic analysis. They can fit into multiple categories, so they are not mutually exclusive (Figs 2 & 3).

RESULTS

Economic burden TLR

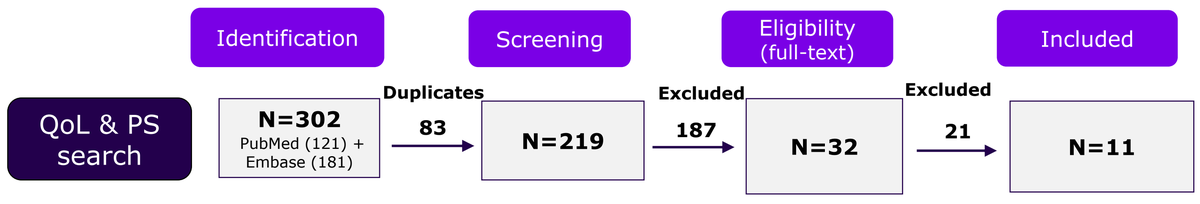
Figure 1a: PRISMA diagram Economic search



By type of study outcome	By country
▪ 44 studies direct and indirect costs ▪ 37 reported economic modelling analyses	▪ 44 studies in the USA, ▪ 27 in the EU5 and 6 in the NL ▪ 4 multinational
Majority by study design (for details see Figure 2 & 3)	**Majority topics identified (for details see Figure 2 & 3)**
▪ 18 Retrospective studies ▪ 30 cost effectiveness analysis	▪ 48 cost of screening programs ▪ 10 direct costs of chlamydia

QoL & PS burden TLR

Figure 1b: PRISMA diagram QoL and PS search



By study design	By publication type
▪ 3 observational studies ▪ 3 literature reviews ▪ 2 cross-sectional studies ▪ 2 RCTs ▪ 1 feasibility study	▪ 7 full text ▪ 4 conference abstracts
	By country ▪ 3 in the USA ▪ 6 in the EU5 ▪ 2 multinational

Overall

- Majority of publications address economic evaluation of screening programs, deemed to be cost-effective
- Due to low frequency of chlamydia sequelae, lifelong medical costs per case are low: USD 46 and USD 262, for men and women, respectively. [6]
- Nevertheless, there is substantial variation in cost estimates for chlamydia sequelae. [7]

Figure 2: Type study design and number of studies reporting cost outcomes (n-44)

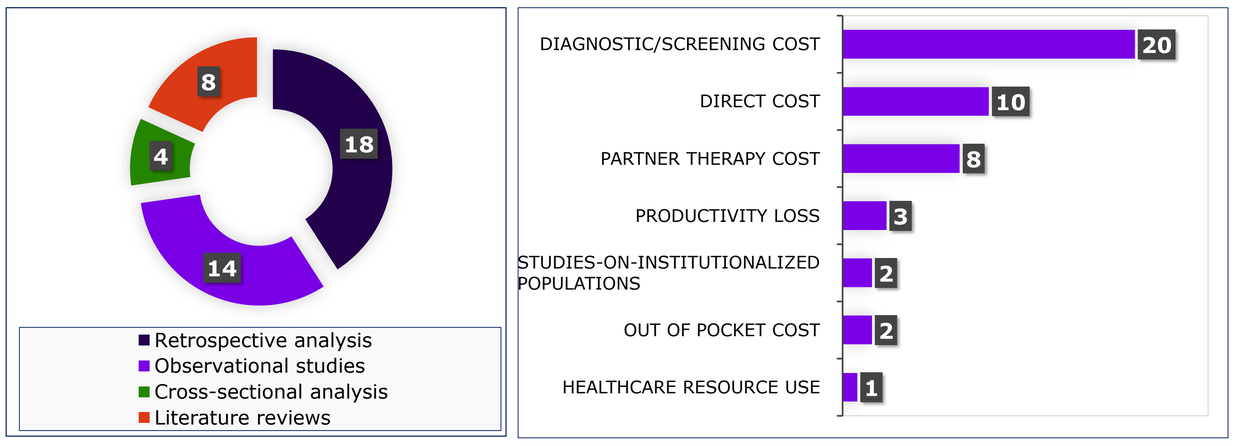
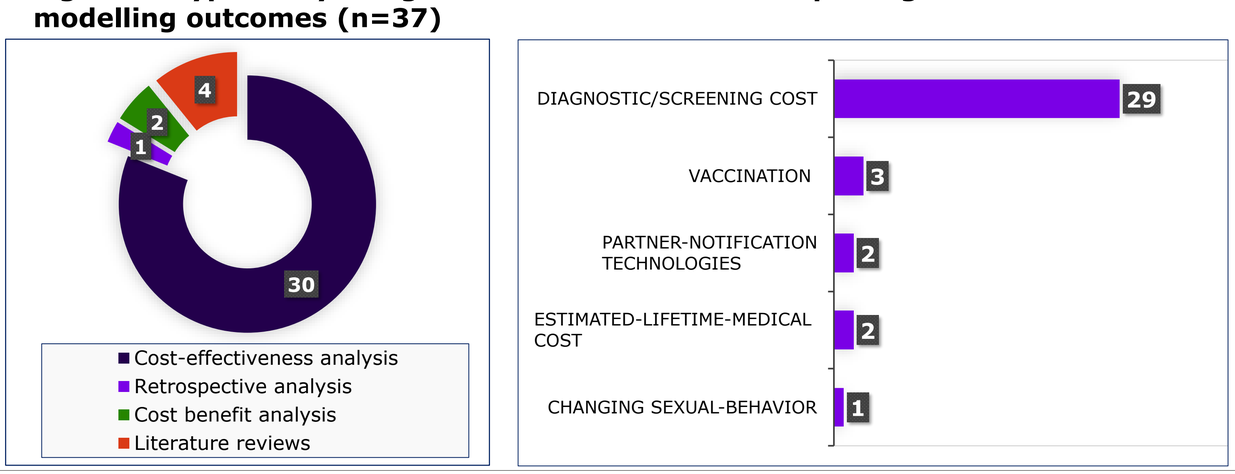


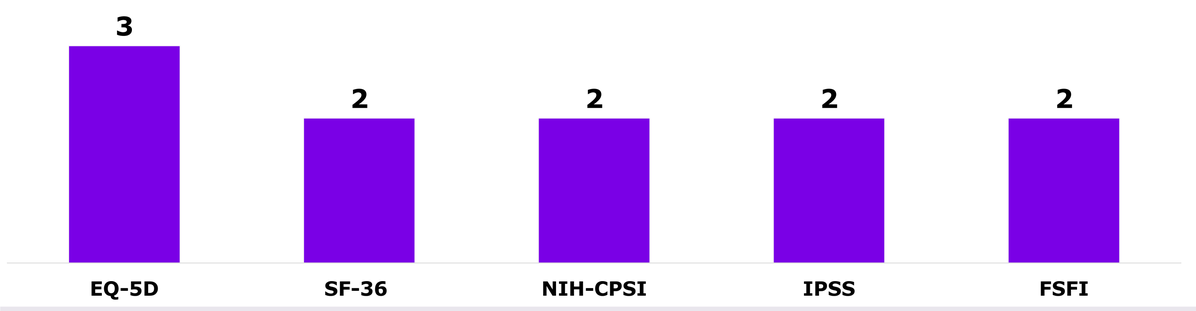
Figure 3: Type study design and number of studies reporting economic modelling outcomes (n=37)



Overall

- Studies used generic HRQoL tools like EQ-5D and SF-36 and Disease Specific Measures (DSM) like NIH CPSI and IPSS (Figure 4).
- Men affected by chronic bacterial prostatitis (CBP) due to chlamydia showed lower SF-36 scores as compared to patients with CBP caused by common uropathogen bacteria (96.5 [±1.1] vs. 99.7 [±1.3], P < 0.0001). [8]
- Reasons for lower SF-36 scores were premature ejaculation and urinary symptoms such as nocturia, which were more common in men affected with chlamydia. [8]
- Genital chlamydia infection increases anxiety in young sexually active women, with the Multidimensional Sexual Self-Concept Questionnaire (75% vs. 26%, P = 0.02) [9]
- Genital chlamydia further reduces sexual satisfaction,inducing poor sexual QoL [10]
- Clear lack of data on PS in chlamydia infection, especially in women.

Figure 4: Top 5 of the most frequently used QoL and DSM instruments in studies identified



EQ-5D, EuroQol 5D (EQ-5D); SF-36, Short Form-36; NIH-CPSI, NIH-Chronic Prostatitis Symptom Index); IPSS, International Prostate Symptom Score; FSFI, Female Sexual Function Index; DSM, disease specific measure

DISCUSSION

- **Data gaps**
  - Limited amount of literature especially on productivity losses due to chlamydia complications.
  - Insufficient regional data on chlamydia's economic impacts in EU5.
  - Lack of chlamydia sensitive QoL PROs. EQ-5D recorded similar scores in women with and without symptomatic chlamydia infection, implying asymptomatic nature and potential need to capture health effects of the disease.
- Chlamydia still poses an economic burden owing to its silent nature, with impact largely driven by persistent complications arising from re-infections or undetected cases.

CONCLUSIONS

- Economic burden and QoL impact of chlamydia are mainly driven by its complications which disproportionately affect young women in the USA and EU5.
- However, they are not extensively documented. Evidence gaps need to be addressed to improve the prevention of chlamydia complications.

REFERENCES

1. Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/2019/std-surveillance-2019.pdf
2. ECDC. https://www.ecdc.europa.eu/en/publications-data/chlamydia-infection-annual-epidemiological-report-2019
3. NHS Chlamydia treatment. https://www.nhs.uk/conditions/chlamydia/treatment/
4. https://www.ecdc.europa.eu/en/chlamydia/facts
5. Chlamydia – CDC Basic Fact Sheet. https://www.cdc.gov/std/chlamydia/stdfact-chlamydia.htm
6. Kumar S *et al.* (2021). *Sex Transm Dis* 48: 238–46. doi: 10.1097/OLQ.0000000000001357
7. Ong KJ *et al.* (2017). *Sex Transm Infect* 93: 18–24. doi: 10.1136/sextrans-2016-052597
8. Cai T *et al.* (2014). J Sex Med 11: 3085-92. doi: 10.1111/jsm.12699
9. Jackson LJ and Roberts TE *(2016).* Sex Transm Dis 43:152-64. doi: 10.1097/OLQ.0000000000000407
10. Cai T *et al. (2011).* J Sex Med 8:1131-7. doi: 10.1111/j.1743-6109.2010.02194.x

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