

# OPEN-SOURCE HEALTH ECONOMICS AND OUTCOMES RESEARCH: WHY AND HOW TO DO IT? HOW TO CONNECT WITH USERS?

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# Today's schedule

- ▶ Introduction to Open-Source Models (OSMs)
  - ▶ X. Pouwels, University of Twente
- ▶ Why and when developing OSMs?
  - ▶ R. Hart, BresMed
- ▶ Experiences of developing OSMs and challenges of OSMs publication
  - ▶ H. Thom, University of Bristol
- ▶ Q&A



# Conflict of interests

- ▶ None to declare
- ▶ Member of the ISPOR Open-Source Models Special Interest Group



# Open-Source Models

## What are they?

The theory - good modeling practices  
Transparency is key  
Transparency contributes to building trust  
Models' descriptions should allow replication

Health economic modelling → inform decision making

The practice  
Proprietary, confidential, privacy-sensitive data  
Lack of transparency (e.g., model assumptions and calculations)  
"Black box"-feeling



Open-Source Models (Jansen et al. 2019)  
Publicly available  
Access to source code and calculations  
Potential access to underlying data



# Poll question 1

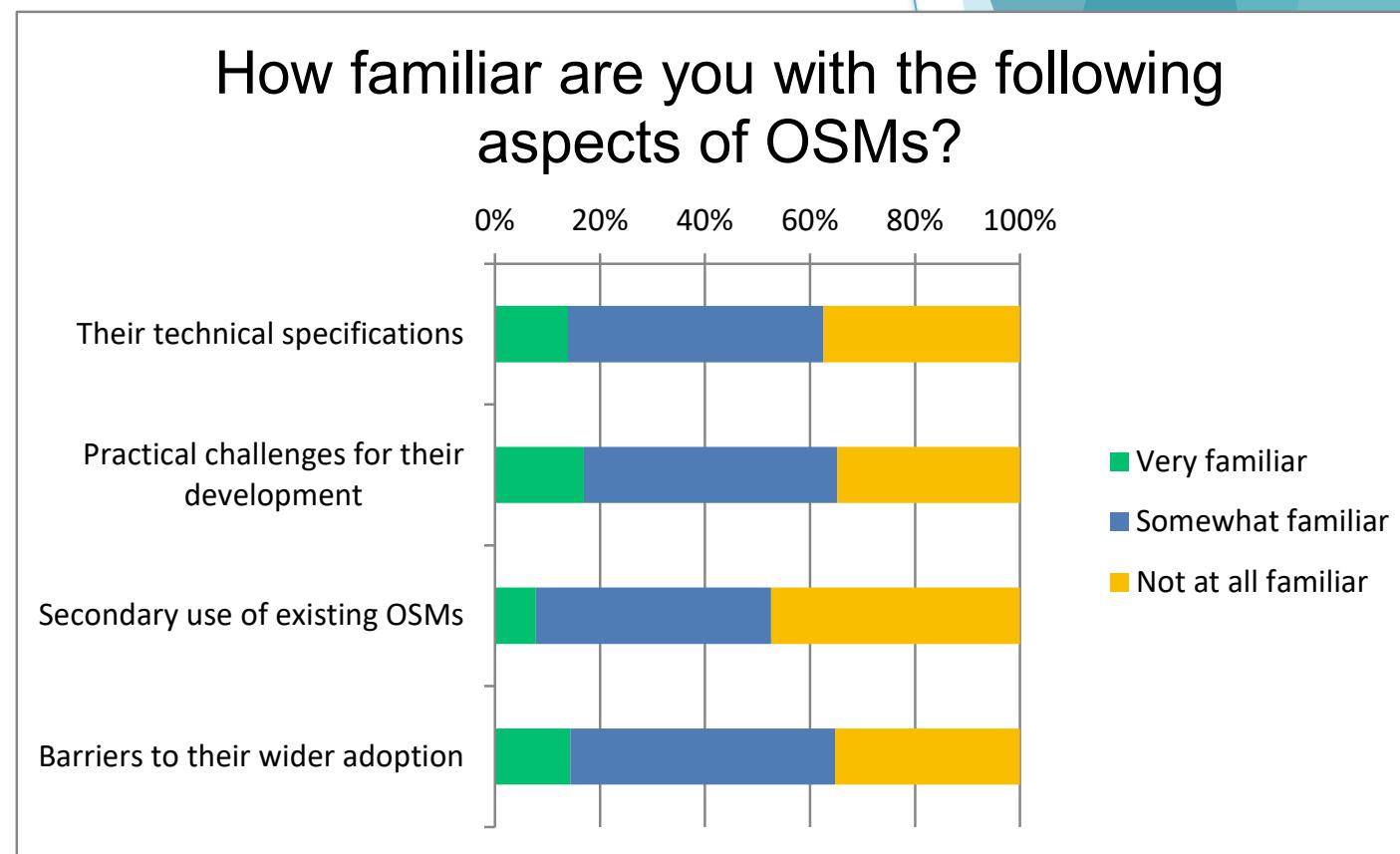
Given this definition of OSMs (“Models which are publicly available for use and provide access to the underlying source code and calculations” Jansen et al. 2019). Do you have experience with developing and publishing OSMs?

- A. Yes, a lot (I have developed > 5 OSMs)
- B. Yes, a little (I have developed 1-5 OSMs)
- C. No, but I am aware of the concept of OSMs
- D. No, I am new to the topic



# Open-Source Models The reality check

- ▶ Survey among ISPOR members (Pouwels et al. Accepted)
- ▶ 230 respondents
- ▶ Familiarity with OSMs concepts is limited





# Open-Source Models

## The reality check

- ▶ Multiple initiatives to promote OSMs development, use, and sharing
  - ▶ DARTH workgroup (<http://darthworkgroup.com/>)
  - ▶ Peer Models Network (<https://www.peermodelsnetwork.com/>)
  - ▶ Innovation & Value Initiative (<https://www.thevalueinitiative.org/>)
  - ▶ Open-Source Model Clearinghouse (<http://ghcearegistry.com/orchard/about-the-clearinghouse>) - 3 November 2021: 16 OSMs
  - ▶ ISPOR Open-Source Models Special Interest Group
  - ▶ ...
- ▶ Uptake is limited (Dunlop et al. 2017, Emerson et al. 2019)

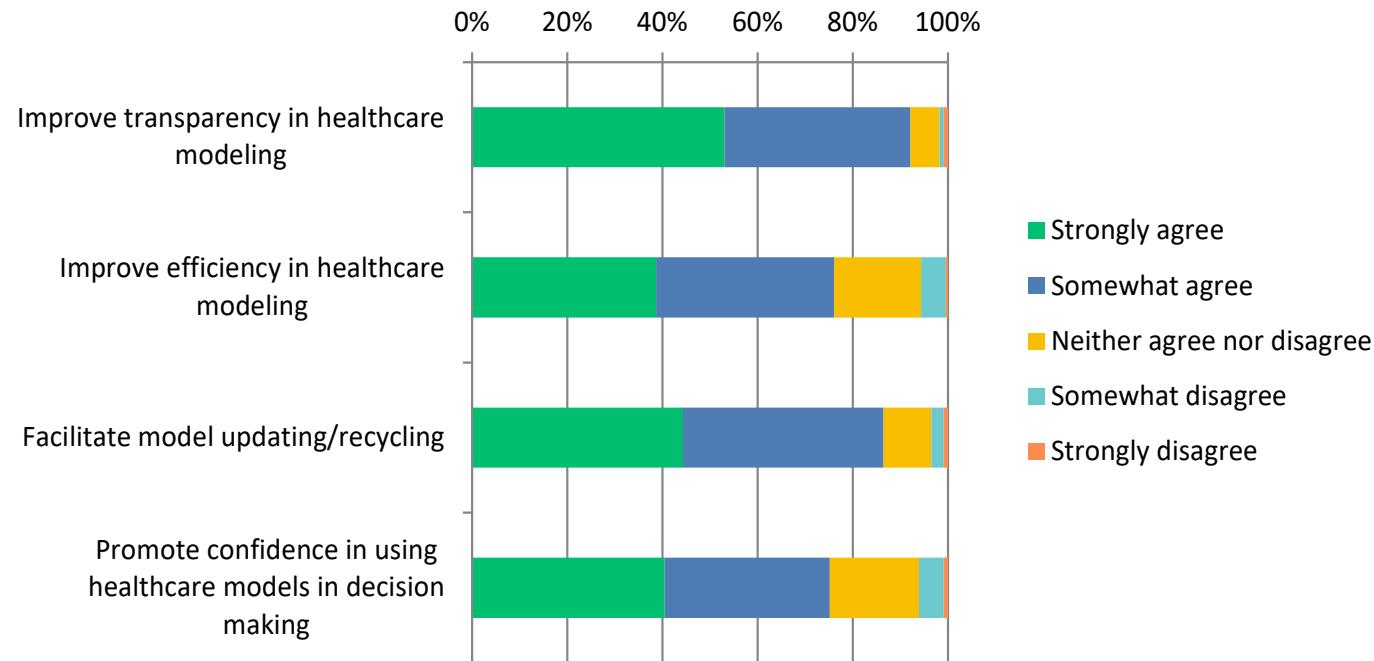


# Open-Source Models

## Why develop them?

- ▶ Increased transparency & reproducibility
  - ▶ Increased credibility - confidence!
- ▶ Increase re-use of (parts of) OSMs
- ▶ Improve stakeholders' participation
- ▶ May encourage/facilitate collaborations

To what extent do you agree or disagree with the following statements about OSMs

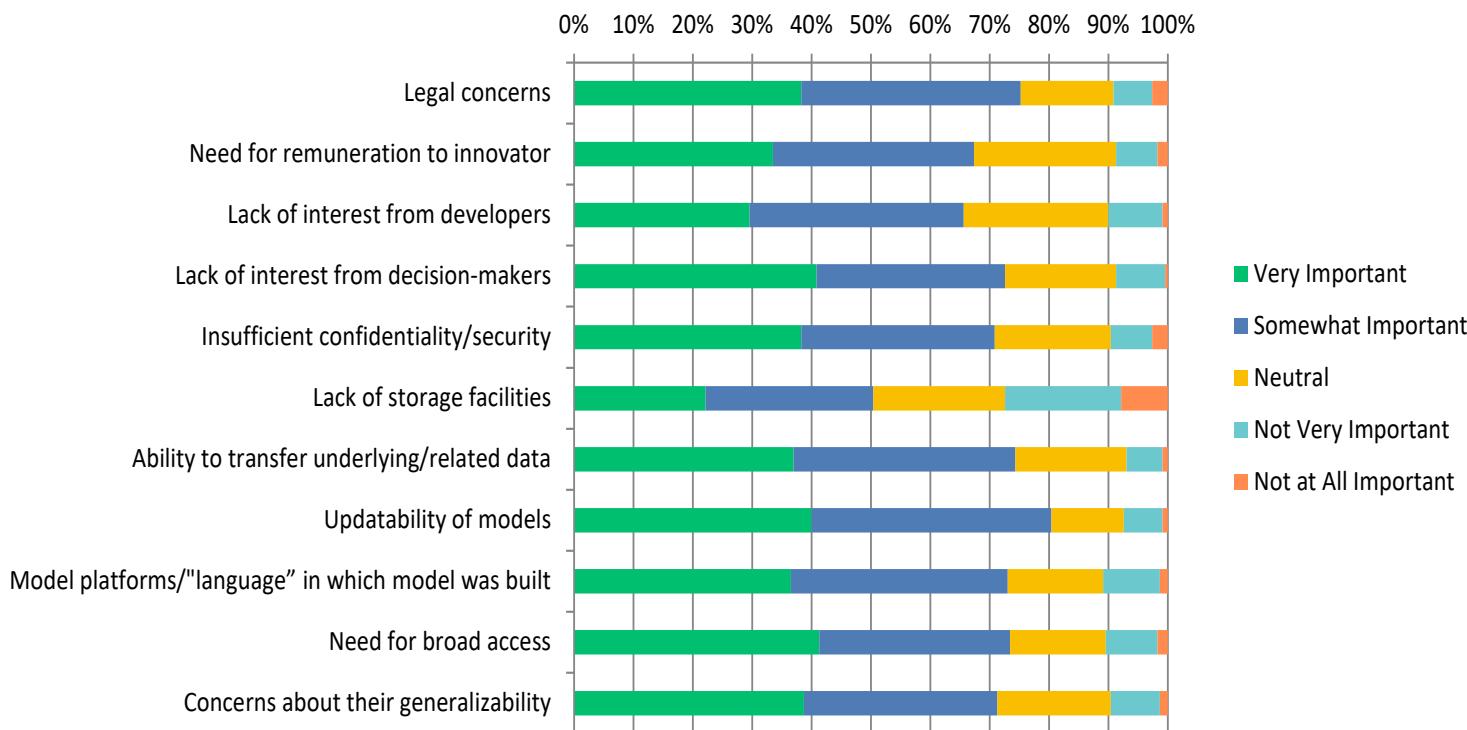




# Open-Source Models Challenges

- ▶ Time-consuming
- ▶ Technical skills
- ▶ Lack of incentives
- ▶ Legal issues
- ▶ Protection of intellectual property
- ▶ Misuse
- ▶ Accountability
- ▶ Model maintenance organisation?

How important do you consider each of the following potential barriers to the development and use of OSMs?





# Wrap-up

- ▶ OSMs have a lot of advantages
  - ▶ Increased transparency, reproducibility, re-use, and credibility
- ▶ Uptake is currently low
  - ▶ Technical barriers
  - ▶ Lack of incentives
  - ▶ Legal and organisational issues
- ▶ OSMs are not an end-goal
- ▶ Infrastructures to develop, maintain, and share OSMs are available
  - ▶ Use them!



# References

- ▶ Dunlop WCN, Mason N, Kenworthy J, Akehurst RL. Benefits, Challenges and Potential Strategies of Open Source Health Economic Models. *PharmacoEconomics*. 2017;35(1):125-8. doi:10.1007/s40273-016-0479-8.
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- ▶ Pouwels XGLV, Sampson C, Arnold R. Opportunities and barriers to the development and use of open source health economic models: a survey. *Value in Health* (Accepted)