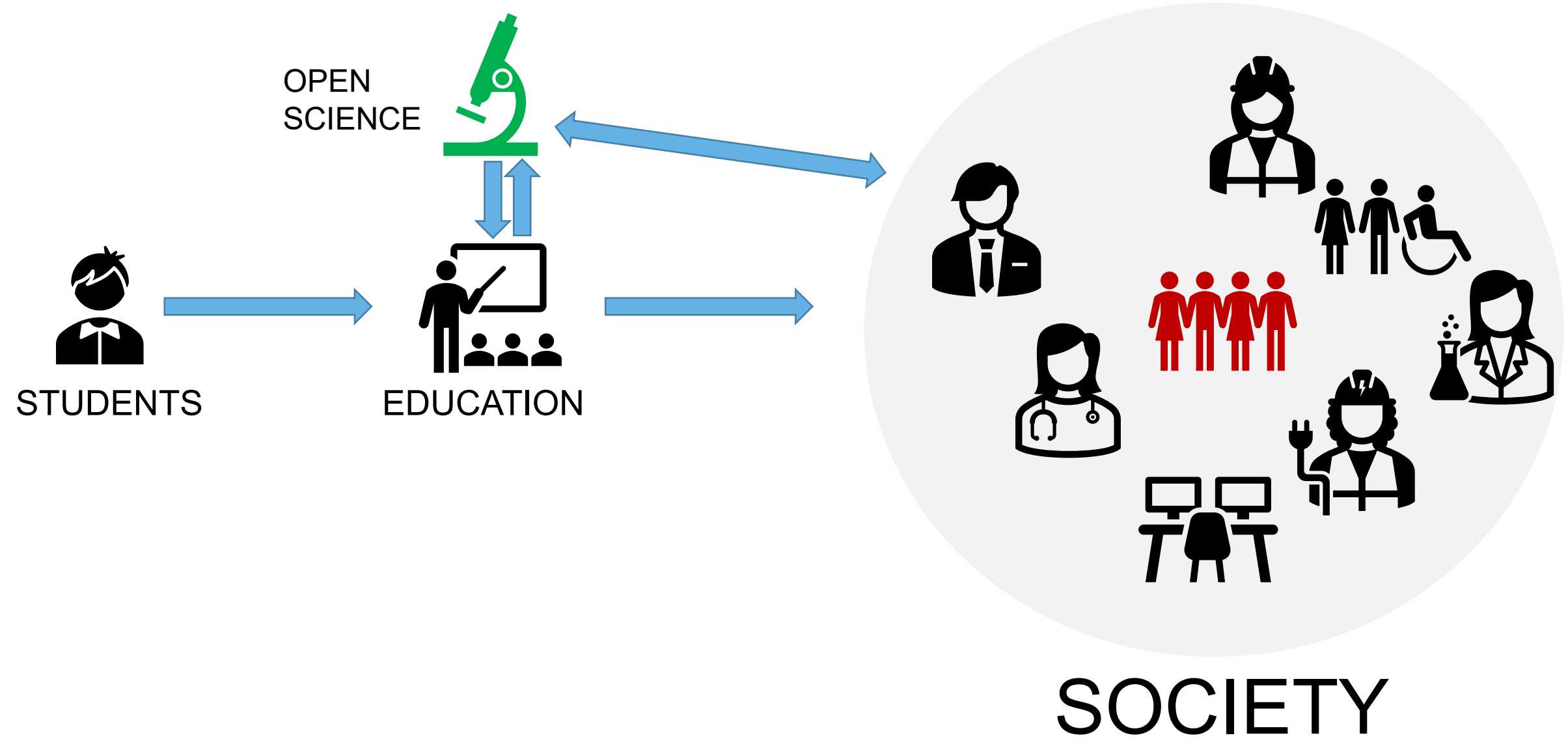
# PUBLIC & SCIENCE OUTREACH & ENGAGEMENT

# TODAY

- Public outreach
- Work on:
  - Public outreach presentation
  - Assignment Part 1


OPEN
SCIENCE
STUDENTS
EDUCATION
SOCIETY

# LEARNING OBJECTIVES

After this tutorial, you should be able to:

- Define public & science outreach & engagement
- Design a plan for a public outreach activity

# WHAT IS PUBLIC OUTREACH?

- Activity to create awareness, spark interest, educate, discuss […] science or scientific topics with a non-academic audience
- Outreach & engagement
- ~~One-way communication~~

# WHY IS PUBLIC & SCIENCE OUTREACH IMPORTANT?

- Traditional science communication doesn't reach 'the public'
- Improving the 'science-public relationship'
  - Increase public trust and interest in Science
- Contribute to society
  - Refute fake news
  - (Moral) obligation of universities to share knowledge
  - Educate 'the public'
- Increase the relevance & quality of research
- Improve you own communication skills
- Increase exposure
- It's fun!

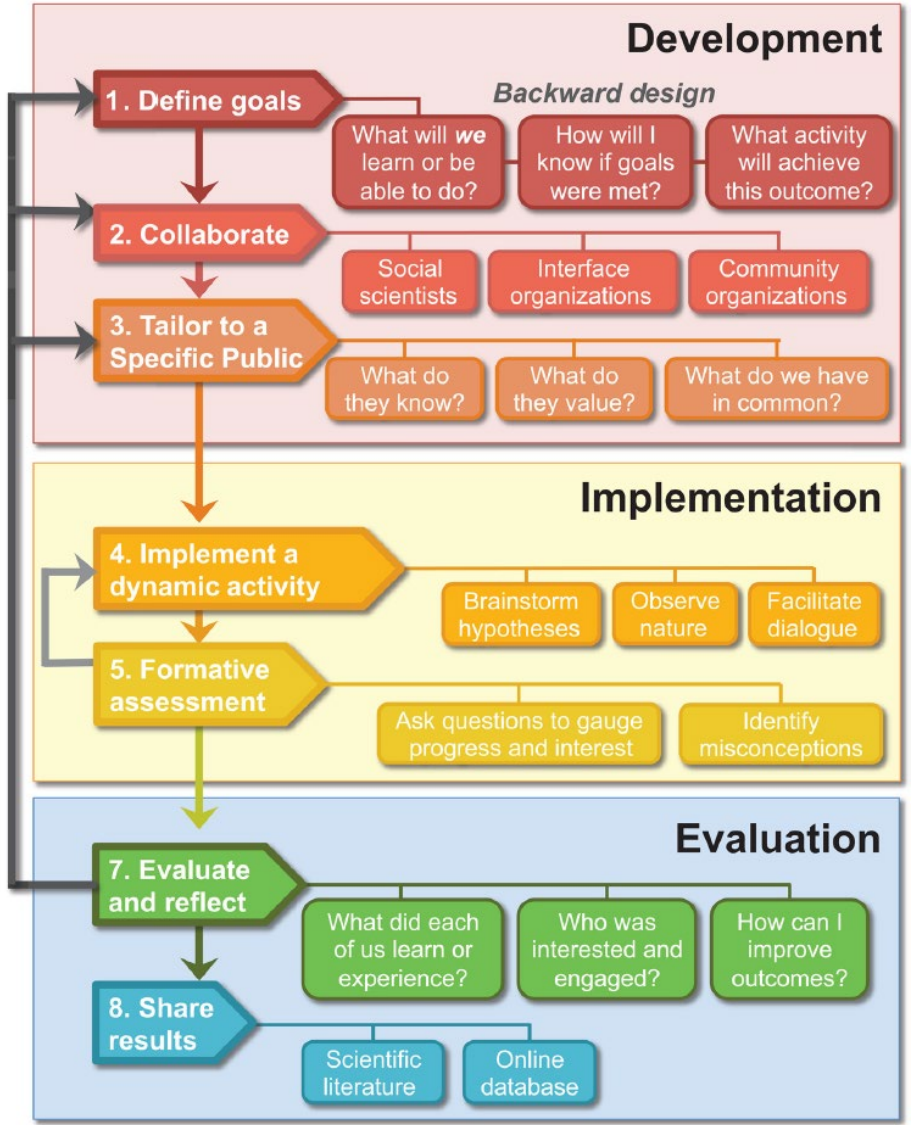
# WHAT DOES NOT WORK?

1. Thinking that “providing information or educational materials will reverse negative attitudes”. (Varner 2014)
   - There is no evidence to support this
2. Assuming the audience is homogeneous
3. Assuming the audience is not intrinsically interested in learning about science
4. One-way communication
5. Trying to persuade or create consensus
6. Not training scientists and practitioners in scientific outreach
   a. Heterogeneous initiatives
   b. Ineffective communication
   c. Getting too technical

# IMPORTANT QUESTIONS BEFORE STARTING…

1. What is your goal?
   - Which gap do you want to address?
2. Who is your audience?
   - What is their need?
3. How will you organize your science outreach activity?
   - How much time and resources do you have available?
4. How will you evaluate the effectiveness of your public outreach activity?
5. What is effective science communication?
   - Educate yourself

# IMPORTANT QUESTIONS BEFORE STARTING…




Source: Varner 2014

# WHAT IS YOUR GOAL?

- Education
- Information
- Entertainment
- “Recruit” future professionals
- Obtain feedback from your audience
- …

# WHO IS YOUR AUDIENCE?

# WHO IS YOUR AUDIENCE?

- Differences in
  - Interests
  - Preferences
  - Norms and culture
  - Background knowledge
  - …

➢Get to know your audience! (#research)

➢Which aspect of your work is best suited for communicating?

➢Adapt your communication style & platform

➢Adapt your activity!

# HOW WILL YOU EVALUATE THE EFFECTIVENESS OF YOUR PUBLIC OUTREACH ACTIVITY?

- Informal:
  - Discussion / questions during and after the activity with participants
  - Self-reflection
  - Number of interventions / reactions of the public
- Formal:
  - Surveys
  - Focus group
  - …

# WHAT IS EFFECTIVE SCIENCE COMMUNICATION?

- Educate yourself
- Free flashcard courses: https://lifeology.io/lifeology-univ-scicomm/
- See resources

# Examples of public outreach

# MY FAVOURITE…

Source: https://www.youtube.com/watch?v=Kdrh82RVl3M

# FORMS OF SCIENTIFIC OUTREACH & ENGAGEMENT

"One-way" communication

- Lay-public summary
  - Press
- Infographics
- Website / Blog (posts)
- Newsletter
- Social media posts
  - Twitter, Instagram, LinkedIn,…
- Video
- Podcasts
- Presentations (Ted talk-style)

"Two-ways" communication

- Events
  - Workshops
  - Science café
  - Festivals
- Games
- Citizen science

# HTA-RELATED EXAMPLES

- Webpage / blogs:
  - HTA-related: https://aheblog.com/
  - Bio-medical research: https://sensiblemed.substack.com/
  - Covid-19 model explanation: http://people.wku.edu/lily.popova.zhuhadar/
- Podcast:
  - https://icer.org/news-insights/commentaries/an-icer-podcast-a-prescription-for-fair-drug-pricing/

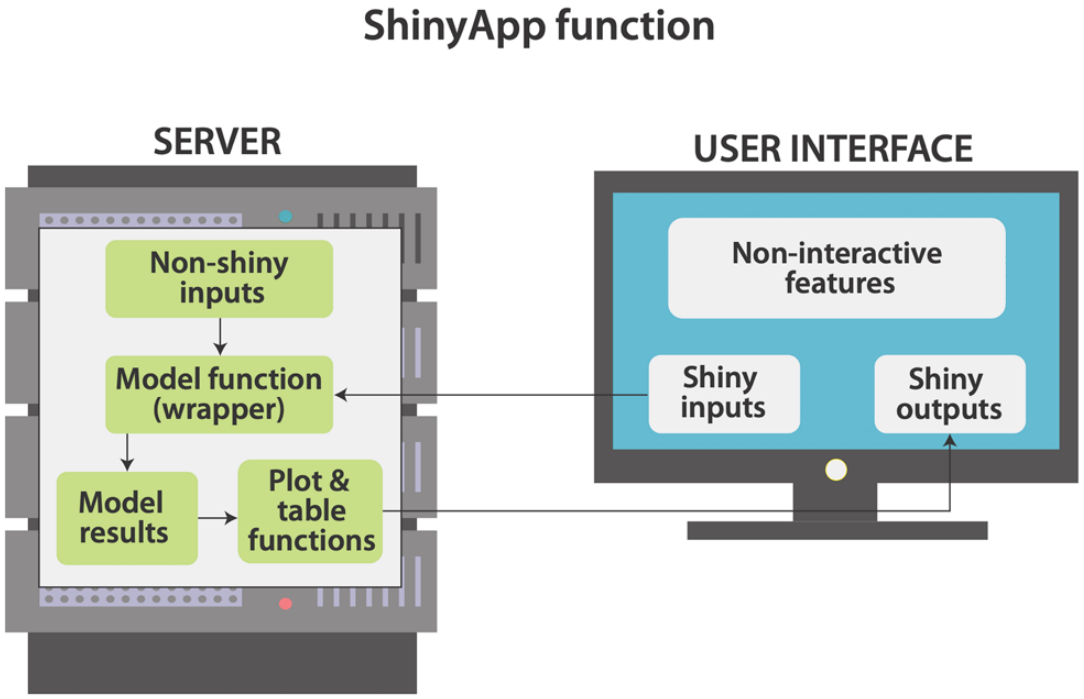
# PUBLIC OUTREACH IN HEALTH TECHNOLOGY ASSESSMENT

- YouTube channels
  - Authorities:
    - CDC economic evaluation webcast (https://www.youtube.com/watch?v=x6qgiy6-c7s)
    - CADTH: https://www.youtube.com/@CADTHACMTS/videos
    - NICE: https://www.youtube.com/@niceorguk
  - Professional communities:
    - HTAi: https://www.youtube.com/@HtaiOrg
  - Peer Models Network: https://www.youtube.com/@peermodelsnetwork
  - ICER: https://www.youtube.com/@instituteforclinicalandeco4561
  - Tutorials health economic modelling: https://www.youtube.com/@TMSnowsill
  - …

# PUBLIC OUTREACH IN HEALTH TECHNOLOGY ASSESSMENT

- Interactive web application:
  - https://mghcost-effectiveness.shinyapps.io/CEA_Q1_May12/ (Soeteman et al. 2020)
  - https://bresmed-intrface-hypothetical-car-t-model.shinyapps.io/IntRface_Model-PharmacoEconomics/ (Hart et al. 2020)
  - Tutorial: Smith R and Schneider P. Making health economic models Shiny: A tutorial. Wellcome Open Res 2020, 5:6. doi:10.12688/wellcomeopenres.15807.2
  - …
- Public / stakeholders Engagement
  - Innovation and value initiative: https://thevalueinitiative.org/
  - Peer Models Network: https://www.peermodelsnetwork.com/
- Open-source models?

# INTERACTIVE WEB APPLICATION: R SHINY




- R ‘shiny’ package
- Requires ‘user interface’ and ‘server’ functions
- Allows stakeholders to ‘play’ with your model
  - Test their own scenarios
  - Validation
  - Communication

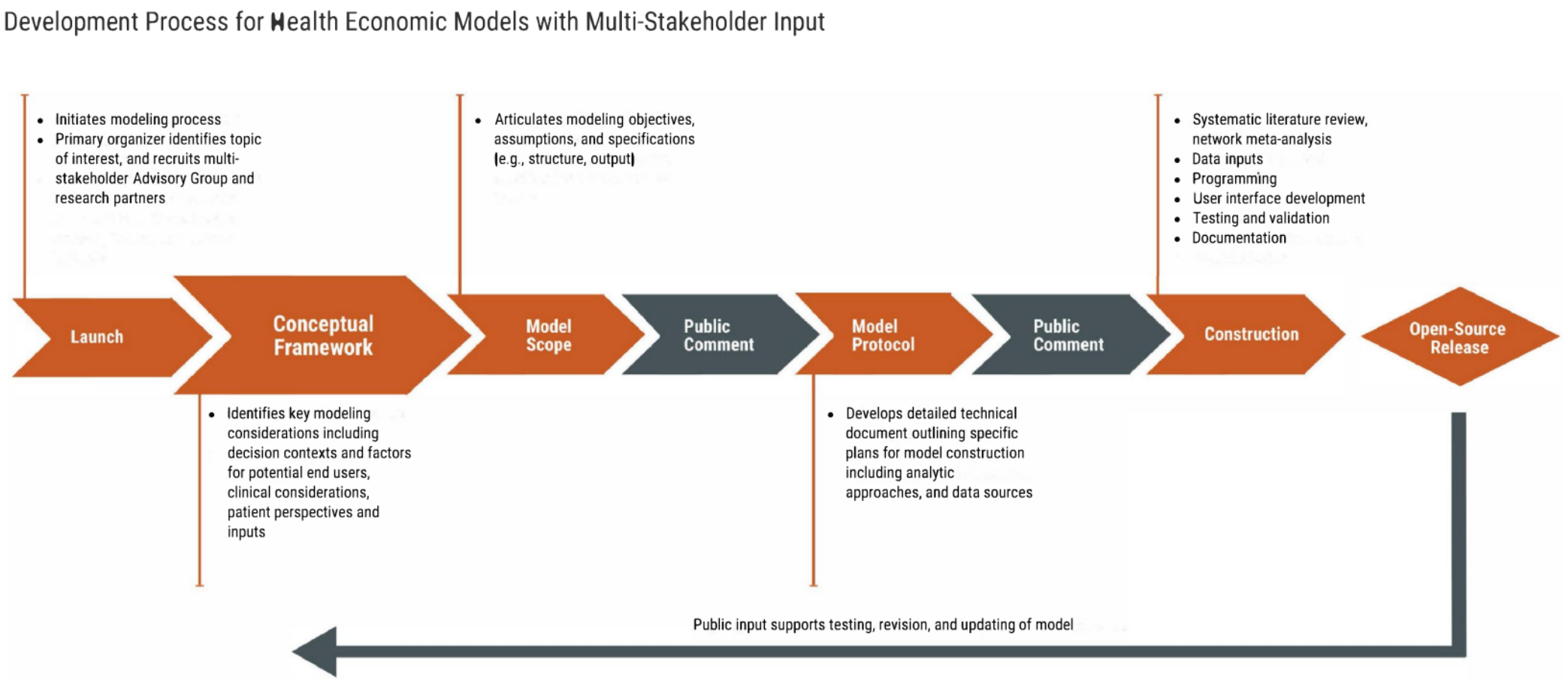
Source: Smith & Schneider 2020

# CITIZEN SCIENCE

*"Citizen science is any activity that **involves the public in scientific research** and thus has the potential to bring together science, policy makers, and society as a whole in an impactful way. Through citizen science, all people can participate in **many stages of the scientific process**, from the design of the research question, to data collection and volunteer mapping, data interpretation and analysis, and to publication and dissemination of results. Citizen science is also an approach of scientific work that may be used as a part of a broader scientific activity."*

Source: https://eu-citizen.science/

# STAKEHOLDER ENGAGEMENT IN HEALTH ECONOMIC MODEL DEVELOPMENT




Source: Xie et al. 2021

# INSIGHTS FROM THIS STAKEHOLDER INVOLVEMENT (XIE ET AL. 2021)

1. *Advisory Group (AG) input has highlighted **important decision contexts** and factors considered by end users that help inform the model specification*
2. *AG members have **shared** preliminary, and sometimes proprietary, **findings and data** from ongoing research projects that can be used as model inputs*
3. *AG members who are potential end users are interested in **engaging** in the modeling process and **applying the model** in their decision making*

# IMPACT FROM PATIENT PARTNERS ON HEALTH ECONOMIC MODELLING

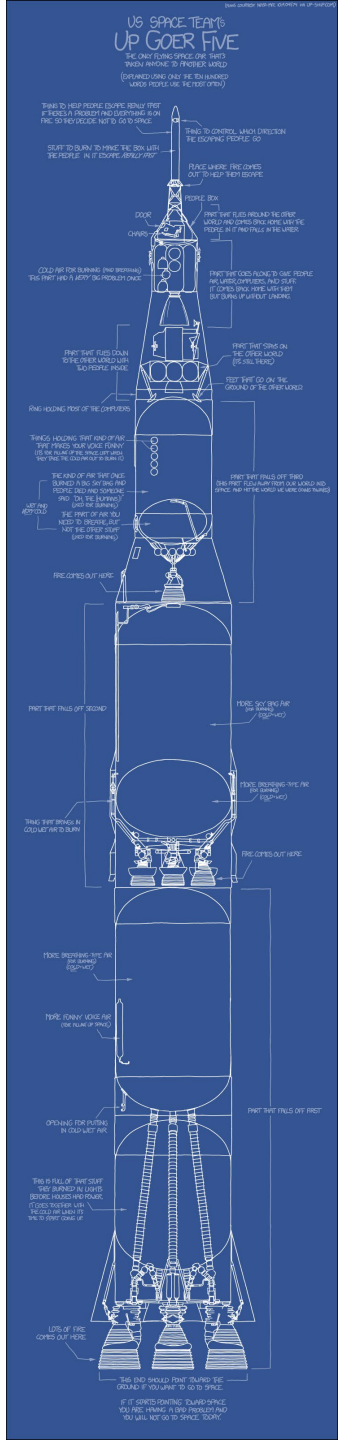
- Structured patient partners – model developer collaboration
- Impact
  - Language used in the model
  - Made suggestions concerning the model
    - Implemented
    - Acknowledge as limitation
    - Area of further research
  - Checking and discussion model assumptions
  - Emergence of new research questions based on patients' experiences

Source: Bunka et al. 2022

# WRAP UP

- Public outreach and engagement can take many different forms
  - Each require different time and resource investment
- Before starting, define your goal
- Research (your audience)
- Plan
- Evaluate

# ANY QUESTION?




Source: The Up Goer Five: https://xkcd.com/1133/

# MORE EXAMPLES…

- Infographics & lay-language:
  - The Up Goer Five: https://xkcd.com/1133/
- Events:
  - Science Café Enschede: https://sciencecafeenschede.nl/
  - Pint of Science: 22-24 May 2023
- Blogs:
  - https://medium.data4sci.com/epidemic-modeling-102-all-covid-19-models-are-wrong-but-some-are-useful-c81202cc6ee9
  - https://scienceborealis.ca/
- Presentations
  - Ted talks
  - Universiteit van Nederland

# RESOURCES


- Cooke, S. J., Gallagher, A. J., Sopinka, N. M., Nguyen, V. M., Skubel, R. A., Hammerschlag, N., ... & Danylchuk, A. J. (2017). Considerations for effective science communication. Facets, 2(1), 233-248.
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- Soeteman DI, Resch SC, Jalal H, Dugdale CM, Penazzato M, Weinstein MC, Phillips A, Hou T, Abrams EJ, Dunning L, Newell ML, Pei PP, Freedberg KA, Walensky RP, Ciaranello AL. Developing and Validating Metamodels of a Microsimulation Model of Infant HIV Testing and Screening Strategies Used in a Decision Support Tool for Health Policy Makers. MDM Policy Pract. 2020 Jun 12;5(1):2381468320932894. doi: 10.1177/2381468320932894.
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- Xie RZ, Malik ED, Linthicum MT, Bright JL. Putting Stakeholder Engagement at the Center of Health Economic Modeling for Health Technology Assessment in the United States. Pharmacoeconomics. 2021 Jun;39(6):631-638. doi: 10.1007/s40273-021-01036-3. Epub 2021 May 13. PMID: 33982198; PMCID: PMC8166701.

# RESOURCES

- Citizen science
  - 10 principles of Citizen Science: ECSA (European Citizen Science Association). 2015. Ten Principles of Citizen Science. Berlin. http://doi.org/10.17605/OSF.IO/XPR2N
  - Citizen science explained: https://www.youtube.com/watch?v=G2oen07wKKE

# (COMMERCIAL) RESOURCES

- https://commnatural.com/
- https://mindthegraph.com/
- http://www.fromthelabbench.com/about
- https://sciencecommunicationbreakdown.wordpress.com/
- https://www.informalscience.org
- https://masweb.vims.edu/bridge/index.cfm
- …